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SEXUALITY IN THE CAPE AREA OF SOUTH AFRICA: DYNAMICS AND CONTEXTS

By

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A thesis submitted to the Faculty of Humanities and Social Sciences, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Doctor of Philosophy (PhD.) in Demography and Population Studies

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The Cape Area Panel Study (CAPS) Waves 1-2-3 were collected between 2002 and 2005 by the University of Cape Town and the University of Michigan, with funding provided by the U.S. National Institute for Child Health and Human Development and the Andrew W. Mellon Foundation.

DECLARATION

I, Amos Olugbenga OYEDOKUN, declare that this thesis is my own unaided work. It is being submitted for the degree of Doctor of Philosophy (PhD.) in Demography and Population Studies of the University of the Witwatersrand, Johannesburg, South Africa. To the best of my knowledge, it has not been submitted before in part or in full for any degree or examination at this or any other University.

Student Name: Amos Olugbenga OYEDOKUN

Student Number: 0614833K

Signature: ……...

Signed and dated on the……day of

……20.....in.....

DEDICATION

With humility, gratitude and love, to my family of procreation:

Adebimpe,

Joy, and

Alfred

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My sincere gratitude goes to the Almighty God, the uncreated Creator, for His support and enablement in the course of preparing this thesis. I know practically now that with YOU all things are possible. To my able supervisor and dear mentor, Professor Clifford Obby Odimegwu, I say a hearty thank you for making this work a reality and a success even after all hopes were lost on my side. I will forever be grateful for all the support you have given me since we met some eighteen years ago. I also appreciate the valuable role played by my supervisor's wife, Mrs. Apollonia Odimegwu, in this novel accomplishment, God bless you.

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criterion
AIDS	Acquired Immune Deficiency Syndrome
BIC	Bayesian Information Criterion
CAPS	Cape Area Panel Study
CDC	Center for Disease Control
CI	Confidence Interval
CMSPs	Current Multiple Sexual Partnerships
CPO	Centre for Population Options
GLLAMM	Generalised Linear Latent and Mixed Model
HIV	Human Immuno-deficiency Virus
HR	Hazard Ratio
ICPD	International Conference on Population and Development
IEC	Information Education and Communication
KAP	Knowledge, Attitude and Practice
MDG	Millennium Development Goal
NGO	Non-governmental Organisation
n.d.	No date
OR	Odds Ratio
PRB	Population Reference Bureau
SCT	Social Cognitive Theory
SES	Socio-Economic Status
STIs	Sexually-Transmitted Infections

UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund
WHO	World Health Organisation
WITS	University of the Witwatersrand

ABSTRACT

CONTEXT: South African adolescents and young adults are persistently engaging in risky sexual behaviour by way of early initiation of unprotected sexual activity leading to stubbornly high prevalence of Sexually-Transmitted Infections (STIs) including Human Immuno-deficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS), and other social problem such as teenage pregnancy, despite the efforts of South African governments at various levels and that of the civil society organisations at preventing such unsafe sexual behaviours. Also, many of the studies on young people's sexual and reproductive behaviours in South Africa have concentrated on the individual-level factors to the detriment of the community-level or institutional (contextual) factors, and are cross-sectional in design with the limitation of no theoretical basis for analysis. Moreover, many of the intervention programmes in South Africa lacked theoretical basis for implementation, hence, their failure.

However, intervention programmes designed based on Social Cognitive Theory have been found to be effective and successful in other western settings, while the applicability of such a theory in a middle-income country such as South Africa needs empirical testing. As a result, this study identifies the levels and patterns of sexual and contraceptive behaviours of young people living in Cape Town; investigates the trends or changes in their sexual and contraceptive practices; determine the factors predicting their sexual and contraceptive behaviours and at the same time examines the associated social contextual factors, using panel data collected between 2002 and 2005.

METHODS: The Cape Area Panel Study data were analysed to identify the factors associated with the reporting of risky sexual behaviours among 3,210 selected adolescents and young adults who participated in the three waves of data collection between 2002 and 2005. The statistical methods used were simple descriptive statistics, chi-square test of association, correlation, stepwise regression, multi-level logistic regression and Cox proportional hazard regression models together with their associated estimators. The secondary quantitative analysis was done using Stata/SE version 12 with Generalised Linear Latent And Mixed Model (GLLAMM) for multi-level modelling and Microsoft Excel analytical package.

RESULTS: The median age at first sexual intercourse in the study area remains 16 years during the study period between 2002 and 2005 with a difference of one year in favour of females only at the third wave of data collection. Most of the respondents had their first sexual experience with their girlfriend/boyfriend, a term that has sexual connotation in South African context, with many staying in that sexual relationships for more than one year, while others experienced it with a casual friend, casual acquaintance, relative or sex worker. Male respondents are prone to having their first sexual experience with a younger female while female respondents tend to have their first sexual experience with older males, and the virgins differ from the sexually active respondents when examined according to the constructs within the Social Cognitive Theory. The significant predictors of timing of first sexual intercourse between 2002 and 2005 using the Cox proportional hazards regression model were age, sex, population group, educational level, degree of happiness as a measure of self-efficacy, type of family structure, school attendance, childhood place of residence, peer sexual characteristics (whether peers were sexually active), educational aspiration, neighbourhood type and participation in prosocial activities.

The practice of current multiple sexual partnerships declined from 29 percent in 2002 to 16 percent in 2005 with a concomitant increase in the adoption and practice of safe sexual relations from 71 percent at the baseline to 84 percent in 2005. Using a multi-level logistic regression model and controlling for all the variables in the study, the predictors of multiple sexual partnerships between 2002 and 2005 were sex of the respondents, population group, educational level, rating of opportunity in life, degree of happiness, alcohol/drug use, participation in prosocial activities and early sexual activity.

Those who used contraceptives at the first sexual intercourse increased from 53 percent in 2002 to 59 percent at the third wave in 2005. With respect to the multi-level modelling, the predictors of use of contraceptives at the event of first sexual intercourse when all the variables are controlled for were age of the respondents, degree of happiness, HIV-risk assessment and belief about the preventability of HIV/AIDS as measures of outcome expectancies, religious affiliation, school attendance, alcohol/drug use, type of family structure, childhood place of residence and circumstance of first sexual intercourse (whether willing or forced).

The proportion of those currently using contraceptives increased slightly from 71 percent at the baseline to 74 percent at the third wave in 2005. The predictors of use of contraceptives at the event of most-recent sexual intercourse at the baseline when all the variables are included were sex of the respondents, population group, school attendance, type of neighbourhood racial concentration, religious affiliation and contraceptive use at first sexual intercourse. At the second and third wave, contraceptive use at first sexual intercourse, expectation to live long and school attendance significantly predict current use of contraceptives (used at most-recent sexual intercourse).

With regard to the consistency of condom use, those adolescents and young adults who always used condoms decreased from a high of 69 percent at the baseline in 2002 to 47 percent at the third wave in 2005, while inconsistent users of condom at their most-recent sexual intercourse increased from 31 percent at the baseline to 53 percent in 2005. Examining the predictors of consistency of using condoms with most-recent sexual partner at the baseline, self-efficacy of using condom at the first sexual intercourse, positive school attitude and participation in prosocial activities increased the odds of consistently using condom at the event of most-recent sexual intercourse in the study area, while childhood place of residence being rural reduces the odds of consistently using condom at the event of most-recent sexual intercourse.

However, condom use at first sexual intercourse was more important for males in particular, while positive school attitude and monetary support was relevant for the female adolescents and young adults. At the second wave of data collection in 2003/2004, those out of school were significantly less likely to consistently use condoms at the most-recent sexual intercourse (OR: 0.90; $p<0.05$) while at the third wave of data collection in 2005, age, sex, population group, degree of happiness, expectation to live long and school attendance predicted condom use consistency. Those adolescents who used condom at their first sexual intercourse, those who believed in condom as a way of protecting against HIV/AIDS, those who were Christians and those with external monetary support were significantly more likely to consistently use condom at their last sexual intercourse in 2005.

CONCLUSIONS: This study, using a longitudinal dataset, concluded that arrays of individual and social/contextual factors were independently influencing the sexual and contraceptive behaviours of young people in the Cape Area of South Africa between 2002 and 2005. While there seems to be a positive change with regard to current multiple sexual partnerships, intervention and programme efforts need to be geared up to encourage young people to use condoms consistently as a modern method of contraception because of its dual advantage.

Although Bandura's Social Cognitive Theory has not been frequently applied to African settings, this theory has been found to be relevant to adolescent sexuality and sexual behavioural research in South Africa, as shown in this study, the framework has much to offer regarding the design and implementation of programmes addressing young people's sexual behaviour.

Specifically, with respect to the timing of first sex, the socio-demographic factors- age, sex, racial group, and educational level; the self-efficacy factor measured through degree of happiness; and the socio-structural factors of not attending school, having low educational aspirations and type of family structure must be the focus of intervention programmes if age at first sexual intercourse is to be raised, risky sexual behaviours prevented and the upcoming generation protected, in the study area in particular, and South Africa in general.

The contribution of this study to knowledge is strengthened because of the longitudinal data used and analytical methods employed. Scholars investigating similar phenomena in South Africa or in the study area in the future should pay attention to both individual-level

and neighbourhood contextual factors, and policy-makers should come up with policies and intervention programmes that take into consideration the individual-level and neighbourhood contextual factors found to be significant in this study.

For instance, with respect to the timing of first sex, the socio-demographic factors of being older, being a female, being of the Coloured or White racial group, having at least secondary level education, and the contextual factors of not attending school and having low educational aspiration seem to significantly associate with increased survival in the study area between 2002 and 2005, while the degree of happiness (a measure of self-esteem/self-efficacy) and the contextual factors of living in a single-parent family as opposed to being complete orphans seem to be associated with decreased survival, raising the question of positive role models in the family. It appears that the presence of parents is becoming irrelevant in South Africa as far as transition to sexual activity among youths is concerned, and interventions that restore sanity and parental influence to the family would not be out of place. With respect to MSPs, the following variables are relevant: sex, racial group, self-efficacy of ratings of opportunity in life (marginally), using alcohol/drugs, academic aspirations and early age at first sex.

For contraceptive use at first sexual intercourse, the individual factors of age and educational level; self-efficacy of degree of happiness in life; the outcome expectancies of HIV-risk assessment and belief in the preventability of HIV/AIDS; and the socio-structural factors of religious affiliation, current school attendance, circumstances of first sexual intercourse (forced or not), participation in prosocial activities, and to a lesser extent type of family structure and childhood place of residence are the significant factors to be reckoned with. With respect to contraceptive use at the most-recent sexual intercourse, the

individual factors of sex and to a lesser extent racial group; the goal factor of not being sure whether they will live long to old age; and the socio-structural factors of use of contraceptives at first sexual intercourse, current school status and to a lesser extent religious affiliation and living in predominantly Coloured or White neighbourhoods exerted significant influence in the study during the reference period.

Lastly, with respect to consistency of condom use with the most-recent sexual partner, the individual factors of age and racial group to a lesser extent, sex of the respondents being female; self-efficacy factors of degree of happiness and using condom at the event of first sexual activity; the outcome expectancy of believing in condoms as a way of protecting against HIV; the goal factor of being unsure about living long up to old age (marginally) and socio-structural factors of being out of school as a measure of current school attendance, being Christian, having external monetary support and, marginally, childhood rural place of residence, having a positive attitude toward school/education and participation in prosocial activities are significant.

CHAPTER 1: GENERAL INTRODUCTION

1.1 Background to the Study

Sexuality has been defined as a complex, multidimensional, and very broad phenomenon (Holland et al. 1990 cited in MacPhail & Campbell 2001; Marge 1998 cited in De Francisco et al. 2007) and sexual behaviour being a subset of sexuality is also complex, with bodies of literature pointing to its complexity (Eaton et al. 2003). *"An individual's sexuality is defined by whom one has sex with, in what ways, why, under what circumstances, and with what outcomes. It is more than sexual behaviour and is a multidimensional and dynamic concept. Explicit and implicit rules imposed by society, as defined by one's gender, age, economic status, ethnicity, race and other factors, influence an individual's sexuality"* (Zeidenstein & Moore 1996; Dixon-Mueller 1993 cited in Gupta 2000, p.2). *"Sexuality according to Holland and colleagues (1990) is not only sexual practices, but also what people know and believe about sex; particularly what they think is natural, proper and desirable. Sexuality also includes people's sexual identities in all their cultural and historical variety with the assumption that while sexuality cannot be divorced from the body, it is also socially constructed"* (MacPhail and Campbell 2001 p. 1614).

More than half of the world's population is below the age of 25 and four out of five young people live in developing countries (WHO/UNFPA/UNICEF 1999). Around the world, about 6000 young people aged 15-24 years are infected with HIV each day; it was estimated that 7.3 million young women and 4.5 million young men were living with HIV or AIDS almost ten years ago (UNFPA 2003; UNAIDS 2004; Department of Economic and Social Affairs 2004). It had been found that less than 5% of the poorest young people use modern contraceptive methods such as condoms, intra-uterine devices and injectables

(UNFPA 2003). About 14 million adolescents aged 15-19 years give birth each year (Treffers 2002), and in the developing world, an average of 40 percent of women give birth before the age of 20 (Noble et al. 1996), an indication that young people are engaging in sexual activity without adequate protection. United Nations Population Fund (UNFPA) 2003 reported that 10-14% of young unmarried women around the world have unwanted pregnancies, a measure of unmet need for contraception among young people. Where abortion is highly restricted by law as in many developing countries, adolescents undergo risky and unsafe abortions with serious complications such as sepsis, haemorrhage, uterine and bowel perforations, and secondary infertility (Treffers 2002; McIntyre 2002). For instance, among those admitted for hospital treatment of complications, women aged below 20 account for 36-68% of cases in some developing countries (PRB/CPO 1994; Noble et al. 1996; PRB 2000; Olukoya et al. 2001).

Various international fora such as the 1994 International Conference on Population and Development (ICPD) held in Cairo, Egypt, the 1997 African Forum on Adolescent Reproductive Health in Addis Ababa, Ethiopia and the 1999 World Youth Forum at The Hague, Netherlands have addressed adolescent and youth sexual and reproductive health issues (Tawiah 2002). Facing up to adolescent and young people's sexuality remains a challenge in most societies, and governments in both developed and developing countries are reluctant to tackle adolescent sexual and reproductive health issues in case this earns the disapproval of parents and other adults. It was reported more than a decade ago that the world population of young people aged between 10 and 19 years is over one billion (Noble et al. 1996). With marriage taking place later nearly everywhere especially because of the desire to attain higher levels of education in many developing countries, more and more adolescents and young adults are starting sexual activity before marriage (Wellings et al.

2006). This could be due to the age factor coinciding with biological maturity and peer pressure as young people are exposed to the opposite sex. Despite huge cultural variations influencing the onset of sexual activity, by age 20 the level of sexual experience is high in most countries (Alan Guttmacher Institute 1998).

Issues concerning adolescents and young adults are premised on an awareness of the social and public health challenges that their sexual behaviour and its consequences pose for so many nations in both the developed and developing regions of the world. Globally, rates of sexually transmitted infections (STIs) among young people are soaring: one-third of the 340 million new STIs each year occur in people under 25 years of age. Each year, more than one in every 20 adolescents contracts a curable sexually transmitted infection (PRB 2000) and 150,000 people lose their life every month to completely avoidable STIs in developing countries (Lamptey et al. 2006). More than half of all new Human Immunodeficiency Virus (HIV) infections occur in people between the ages of 15 and 24 years. This situation persists, as analysts observe, in a policy climate that, in many nations, continues to deny adolescents the information and services they need to make informed choices about their sexual and reproductive health. In many other contexts, such services and the development of life-skills for adolescents remain in an early stage (UNAIDS 2006).

The situation becomes more challenging against the backdrop of a globalised world in which the conditions of life of many young people have changed and with these larger social changes have come changes in patterns of sexual behaviour. In general, earlier puberty, later marriage, and changes in family dynamics have led to less adult control and more adolescent autonomy (Feyisetan and Pebley 1989). These factors, combined with

intense exposure to sexual stimuli via the mass media and travel across cultural boundaries, have made premarital adolescent sexual activity more common. This has added to the traditional problems associated with early marriage, newer problems of premarital pregnancy and childbirth, and induced abortion outside marriage, as well as rising levels of STIs including HIV and AIDS (Mensch et al. 2005; Feyisetan & Pebley 1989).

The World Youth Report indicated that three-quarters of women in Africa become sexually active during adolescence (United Nations 2003), and consistent with global and local trends, young people in South Africa are embarking on sexual relationships at earlier ages (Biddlecom and Bakilana 2003; Eaton et al. 2003). Earlier sexual debut outside of stable relationships increases the likelihood of HIV infection, as well as unplanned and unwanted pregnancy (Miller et al. 1997; Morrison et al. 2005). South African youths are vulnerable to HIV infection, as data from a population-based survey in 2002 and 2005 indicate that about 9.0% and 10.3% of 15-24 year olds nationally (12% and 13.3% of females; 6.1% and 8.2% of males) are infected respectively (Mandela Foundation/HSRC 2002, 2005) with 11.2% HIV-prevalence rate reported among people between the ages of 15 and 24 living in Western Cape (Shisana & Simbayi 2002 cited in Simbayi et al. 2005). The data show an increase in the HIV-prevalence rate among South African youths and this is presumably for the most part connected with their sexual and reproductive behaviours. These rates are very high, and the behaviour of this group over the next few years will help determine the trajectory of the HIV and AIDS pandemic in the coming decades (Macintyre et al. 2004). Studies have shown that South African youths often report high risk sexual and contraceptive behaviours (MacPhail & Campbell 2001; Simbayi et al. 2005; Hartell 2005). The concerns about how individual-level and community-level factors are affecting the life of adolescents and young adults are all the more urgent and crucial because of the

changing demographic profile of many developing countries, characterised by unprecedented growth in the size of the population of young people, and the high rate of STIs including HIV within this sub-population.

The foregoing is complicated in many developing countries by weak and declining economies, together with complex political and environmental crises, and in the case of South Africa, poverty and inequalities because of the history of apartheid. In addition, prevention approaches for sexual and reproductive health have evolved from an emphasis on individually-focused models of behaviour change to recognition that risk reduction occurs within a context of social norms where individuals are entrenched. The failure of the HIV-prevention programmes in South Africa reported by the United Nations Joint Programme on AIDS might be connected with the fact that many of the prevention and intervention strategies adopted fail to understand and acknowledge the dynamics and the contexts in which young people's sexual and reproductive behaviours take place (UNAIDS 2006).

By dynamics, I mean changes taking place in the sexual and reproductive behaviours of young people in the study area, and contexts on the other hand mean the circumstances under which an event occurs; a setting or conditions that predispose young people to doing what they do. Therefore, understanding how social structure influences sexual and reproductive behaviours can improve prevention and intervention programmes (Thomas 2000; Hartell 2005; Stephenson 2009). Hence, this study examines the dynamics and contexts of sexuality including the sexual and contraceptive behaviours of adolescents and young people in the Cape Area of South Africa between 2002 and 2005 using panel data.

1.2 Statement of the Problem

Adolescents and young people are at high risk of unintended pregnancy and STIs including HIV and AIDS, because of their sexual behaviour, their lack of information, and limited access to sexual and reproductive health services; and studies have shown that about 12 million babies are born to adolescent mothers every year by either adolescent fathers or adults thereby endangering the health of both mother and infant (WHO 1998; Nishimura et al. 2007). Globally, the HIV incidence rate is believed to have peaked in the late 1990s and to have stabilised subsequently, notwithstanding increasing incidence in a number of countries. In several countries, favourable trends in incidence are related to changes in behaviour and prevention programmes (UNAIDS 2006), as in the case of Uganda. In sub-Saharan Africa, the region with the largest burden of the AIDS epidemic, data also indicate that the HIV incidence rate has peaked in most countries. However, the epidemics in this region are highly diverse and especially severe in Southern Africa, where some of the epidemics are still expanding (UNAIDS 2006).

South Africa's AIDS epidemic is one of the worst in the world and shows no evidence of a decline. Based on its extensive antenatal clinic surveillance system, as well as national surveys with HIV testing and mortality data from its civil registration system, an estimated 5.5 million people were living with HIV in 2005. Almost one in three pregnant women attending public antenatal clinic were living with HIV in 2004 and trends over time show a gradual increase in HIV prevalence (Department of Health South Africa 2005). In Western Cape, the HIV prevalence rate for young people aged 15 to 24 year olds was the highest when compared to age-categories (Chimere-Dan and Makiwane 2009), and past research has shown that South African youth report high rates of risky behaviours, multiple sex partners, and infrequent condom use (Eaton et al. 2003; Kelly 2000; Reddy et al. 1999,

2000; Shisana & Simbayi 2002 cited in Simbayi et al. 2005). The 2005 National Household HIV Survey found high levels of HIV infection among young people aged 15-24 years, which were about the same as those found in National Young People Survey in 2003, a sign that the epidemic has not lost momentum (Shisana et al. 2005; Reproductive Health Research Unit and Medical Research Council 2004). It has been noted that while South Africa's treatment efforts have made significant progress, her HIV prevention efforts have not made notable inroads against the epidemic (WHO/UNAIDS 2006).

Early sexual debut has been found to be common in South Africa (Biddlecom & Bakilana 2003), as in other parts of the world, and this debut when outside stable relationships increases the likelihood of HIV infection, as well as unplanned and unwanted pregnancy (Miller et al. 1997; WHO 1998). Also, while South Africa's total fertility rate is relatively low compared to other African countries, fertility among adolescent and young adult females is high (Biddlecom & Bakilana 2003), an indication that young people are engaging in unprotected sexual intercourse. Moreover, the Status of Youth Report Survey found that 32 percent of all respondents had been pregnant or had made someone pregnant, and just over a quarter of African females aged 18 to 24 years had fallen pregnant (Richter et al. 2005; Richter & Panday 2006). Forced sex is a common occurrence in South Africa; the Reproductive Health Research Unit (RHRU) 2003 study found that ten percent of females aged 15-24 years were forced to have sex (McIntyre 2002) and this has implications for the sexual and reproductive health of young people in South Africa.

The explanations given for the risky sexual behaviours of South African youths include early sexual activity, with the average age of onset for sexual activity with several partners being 15 years (Hartell 2005). Reasons adduced for this early age of first sexual activity

include peer pressure, curiosity, and (particularly for young girls) coercion and material gain (Varga & Makubalo 1996; Varga 1997; Wood & Jewkes 1997; MacPhail 2004). Adolescents appear to have a high level of awareness about HIV and AIDS but this has not translated into substantial behaviour change, as is seen in the practice of risky sexual behaviour such as having more than one sexual partner concurrently. It has been documented that between 40% and 60% of adolescents have more than one sexual partner within a 6-month period; few perceive themselves to be at risk of HIV infection; few take the need for safer sex seriously; and most do not see AIDS as a personal threat, although most adolescents acknowledge the disease's severity (MacPhail & Campbell 2001, Hartell 2005; WHO 1998).

Adolescents do not practise safe sex in general; use of preventative measures is poor, with more than 50% of the sexually active adolescents never using a condom and less than 10% using a condom regularly during sexual intercourse. Failure to practise safe sex is related to pressure to engage in early and unprotected intercourse, pressure to have a child (Preston-Whyte & Zondi 1992 in Nicholas et al. (n.d.)), lack of access to youth-friendly reproductive health services, negative perceptions about condoms, low perceptions of personal risk, and low perceived self-efficacy in preventative behaviour such as ability to enforce use of condoms during sexual activity.

The general knowledge of adolescents about the transmission of disease was found on the whole to be inadequate to provide a foundation for developing positive attitudes and safer sexual behaviour. It was found that many young people receive conflicting messages about sex and sexuality: non-penetrative sex is not considered to be proper sex; widely believed myths reinforce negative attitudes about safer sex and contraceptive use; most adolescents

make decisions about engaging in sex without having accurate information and access to support and services; they lack knowledge and negotiation skills in sexual relationships; and many do not acknowledge the disease to be a problem in their area or in their race group (MacPhail & Campbell 2001; Hartell 2005).

A study of this nature, which is on the dynamics and contexts of sexual and reproductive behaviours among young people in the Cape Peninsula, seizes the opportunity of the CAPS unique dataset and is crucial because of the difficulty in establishing causality among factors that contribute to the early onset of sexual activity and practice of unsafe sex in the study area, due to the fact that many of the past studies in South Africa have been cross-sectional. Embarking on such a study as this provides a platform to investigate comprehensively the risk factors associated with the early onset of sexual activity and practice of unsafe sex among young people (those highly susceptible to and affected by STIs including HIV/AIDS) in the study area.

There is also an added advantage of investigating trends in the sexual and contraceptive behaviour of the young people in question using advanced statistical techniques to measure the impact of socio-structural factors affecting their sexual and contraceptive behaviour. Moreover, the theoretical basis of the analyses in this thesis is Social Cognitive Theory (SCT), which had been found to be very useful in other western settings but largely neglected in non-western settings as far as the formulation of policies and design of effective and efficient programmes targeted at behavioural change are concerned. The overall benefit of an endeavour such as this is the design of better and more effective preventive and intervention strategies, able to stand the test of time in enhancing the sexual and reproductive health of young people in the study area.

The aspects of adolescents and young people's sexual behavioural-dynamics and contexts examined in this study are: whether the adolescents and young adults start sexual activity early or late; whether an adolescent has had one sexual partner or many concurrently during the reference period; whether any contraceptive method was used at the time of first sexual intercourse as this has implication for subsequent and future use; and whether a condom was used subsequently in a consistent manner or not (etc.). Institutional and community factors that impact on whether young people start sexual intercourse early or late and whether they practise safe sex are also investigated.

Against this backdrop, this study seeks to investigate the dynamics and contexts of sexual and contraceptive behaviours of young people in Cape Town, identify the array of forces within and outside the adolescents and young people that shape their sexual and contraceptive choices, and trace the implications of this information for future sexual and reproductive health. Understanding these issues is important for contributing to policies aimed at improving sexual and reproductive health at the early stages of the life course, particularly curbing the spread of HIV and AIDS pandemic and other related STIs, as this is crucial to the achievement of the sixth Millennium Development Goal (MDG) (United Nations 2010).

1.3 Research Questions

(1.) What are the levels, patterns and trends of sexual and contraceptive behaviours among adolescents and young adults in the Cape Area of South Africa between 2002 and 2005?

(2.) What are the factors affecting the sexual and contraceptive behaviours of

adolescents and young adults in the Cape Area of South Africa between 2002 and 2005?

(3.) Are there socio-structural factors influencing the sexuality of young people living in the Cape Area of South Africa? If yes, what are they?

1.4 Objectives

1.4.1 General objective

This study seeks to investigate the dynamics and contexts of sexual and contraceptive behaviours of adolescents and young people in the Cape Area of South Africa.

1.4.2 Specific objectives

(1.) To identify the pattern/levels of sexual and contraceptive behaviours of young people in the Cape Area of South Africa.

(2.) To investigate the changes in the reported sexual and HIV risk-related behaviours in the Cape Area of South Africa between 2002 and 2005.

(3.) To determine the predictors of timing of sexual initiation, current multiple sexual partnerships and contraceptive behaviours among young people in the Cape Area of South Africa.

(4.) To examine the social contextual factors associated with sexual and contraceptive behaviours of young people in the study area.

1.5 Significance of the Study

Given the numerous consequences of risky/unprotected sexual intercourse among young people, the current state of HIV and AIDS, the number of persons (adolescents and young adults) at risk, and the lack of viable cure, changing sexual behaviour has been identified as one of the few options in combating its spread (Ulin 1992, Sibthorpe 1992; Orubuloye, Caldwell & Caldwell 1993; LeFranc et al. 1996; Cubbin 2005; Agha et al. 2006). Available information on sexual issues and AIDS among African adolescents (especially in sub-Saharan Africa) is limited in scope because of the traditional approach of investigating only knowledge, attitude and practice (KAP) to the neglect of social contexts (Nichols et al. 1987; Ajayi et al. 1991; Boohene et al. 1991; Agyei & Epema 1994; MacPhail & Campbell 2001). Such works have not been able to provide a strong descriptive foundation for understanding adolescent and young adult sexual behaviours and sexuality. It had been noted that comprehensive studies on how adolescents in developing countries make decisions about sexual and reproductive behaviour have rarely been undertaken (Agha et al. 2006).

Much of the existing literature on young people's sexuality and sexual behaviour has concentrated on levels and patterns of sexual activity, premarital childbearing, contraceptive use, condom use, and the risk of HIV infection and moreover are concentrated largely in the West. However, much remains to be learned about the effect of institutional and community-levels influences on the sexual behaviour of adolescents and young adults in non-Western settings, where communities may be closer knit and community members' attitudes and beliefs may exercise a powerful influence on such behaviour (Billy et al. 1994; Agha et al. 2006). It has been widely acknowledged that personal, social, structural and environmental factors often beyond the scope of individual

control are instrumental in making sense of the diversity of factors which combine to shape and influence sexual behaviour; and understanding the complex interplay of the factors will be beneficial to the development of effective prevention and health promotion programmes (Eaton et al. 2003; Klepp et al. 2008).

Eaton and colleagues (2003) indicate that HIV risk behaviour is influenced by factors at three levels: within the person, within the proximal context (interpersonal relationships, physical and organisational environment), and within the distal context (culture and structural factors). Cubbin (2005) noted that an exclusive focus on behaviour and personal responsibility will have a limited effect on sexual initiation unless contextual influences at the community or neighbourhood level are also taken into consideration, and that longitudinal approaches and designs are needed for better understanding of the relevant mechanisms that would be useful in the design of programmes for interventions in different settings. This study is anchored on that idea.

Unsafe sex and STIs, including HIV, has been ranked first of the most important risk factors of disease in South Africa (South African MRC 2005/06). The increased vulnerability of adolescents and young adults in sub-Saharan Africa to the risk of STIs including AIDS; the potential risks to adolescent health of early pregnancy, and the negative consequences of early and non-marital childbearing for young people's life prospects; the overwhelming population of adolescents and young adults; and the failure of past interventions based on solely individualistic models all present good reasons for the discussion of dynamics and contexts of sexuality and sexual behaviours of young people. Contextual studies are essential because they go beyond providing a descriptive foundation for understanding sexual behaviour to explaining the socio-cultural, structural and

interpersonal factors which influence young people's sexual behaviour (Varga 1997; Goodson et al. 1997). Understanding the way adolescents make sexual and reproductive choices, which is largely only possible through the comprehensive explanation offered by contextual studies, will enable population and health professionals to design better preventive and intervention strategies that target the most influential components of adolescent sexual behaviour.

Lastly, the fact that this study is based on data from a panel survey presents an opportunity to describe patterns of change and to establish the direction and magnitude of causal relationships between variables of interest. The primary advantage of longitudinal databases is that they can measure change and allow us to use sophisticated analytic strategies to measure the impact of various covariates (non-time-varying such as gender or race and time-varying such as age, weight, income, exposure; metric and non-metric etc.) on the outcome variable with reasonable precision. The fact that longitudinal data help to trace the dynamics of behaviours, identify the influence of past behaviours on current behaviours and control for unobserved fixed characteristics in the investigation of the effect of time-varying exogenous variables on endogenous behaviours has been documented in the literature (Alderman et al. 2001; Diggle et al. 2002).

This study will definitely improve our understanding of the influence of a wide range of factors, including institutional and community-level factors, on the sexual and reproductive behaviours of adolescents and young adults in Cape Town specifically, and in South Africa in general, thereby extending the literature on adolescents' and young adults' sexual and contraceptive behaviour. A study such as this is currently non-existent in the study area to the best of my knowledge, and there have been very few in South Africa as a whole. This

understanding is imperative and useful in the formulation of appropriate policies that takes into consideration the important factors, and the designing of effective prevention and intervention programmes. The ultimate goals of policies and prevention programmes are the delaying of onset of sexual debut among those who are not sexually active, and the elimination of high-risk sex or the promotion of safer sexual behaviours among sexually active young people.

1.6 Organisation of the Thesis

The present document is organised into eight chapters. Chapter 1 serves as the general introduction and presents the problem statement, research questions to be answered, objectives of the study, justification for the study and the organisation of the chapters in this thesis. Chapter 2 presents critical reviews of relevant empirical literature on the sexual and contraceptive behaviours of adolescents and young people, including the theoretical and conceptual frameworks used in this study. Chapter 3 presents an overview of the Cape Area Panel Study (CAPS) datasets, the sampling method used, and methods used for the analyses. Chapter 4 presents the results of the data analysis, including the profile of the respondents across the three waves, with the aim of establishing the patterns, levels and trends of sexual and contraceptive behaviours of the respondents interviewed between 2002 and 2005. Chapter 5 shows the transitions in reported sexual and HIV risk-related behaviours of the young people between 2002 and 2005. Chapter 6 presents the result of the analysis with particular focus on the predictors of age at first sexual intercourse, and Chapter 7 presents the results of the multi-level logistic regression models employed in examining the social contextual factors associated with sexual (current multiple sexual partnerships) and contraceptive behaviours (contraceptive use at first and most-recent sexual intercourse, and consistency of condom use at the most-recent sexual intercourse) of

young people in the study area. Chapter 8 comprises the summary and discussion of key findings, conclusion, recommendations/policy implications based on the research findings, and direction for future research.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This section begins with a critical review of the literature about factors found to be influential in young people's sexual and contraceptive behaviours (both outside and within South Africa), with the sole aim of highlighting the gap that currently exists which necessitates a study such as this.

This is followed by a section on the theoretical framework of interest from which the conceptual framework for this important study emanated. The different studies found for this review include those with individual-level and group-level determinants, and studies that examine the impact of parents, peers, and school or community variables/factors on adolescents' sexual and reproductive behaviours. The last section in this chapter is a brief summary relating this approved study to the past, current and future research endeavours in the field of young people's sexual and contraceptive behaviour in South Africa.

2.1.1 Methods

Various journal articles reviewed for this study were located using different sources and search engines such as the e-journal facilities of the University of the Witwatersrand's libraries, Jstor database accessed through WITS Library, Findarticles, Google and Googlescholar, PubMed, BioMed Central, Popline, and International Family Planning Perspectives (IFPP) CD-ROM. Relevant articles were retrieved using various combinations of the following key words: adolescents, young people, sexuality, sexual behaviour, and

contraceptives (etc.). Other useful materials consulted were dissertations and theses relevant to this study. The articles were included in this review if they fulfilled the criterion of examining adolescents or young people's sexuality and sexual behaviour from the perspectives of individual, peer, family or community contexts, with special emphasis on contextual factors. They include quantitative, qualitative and mixed method studies from different settings.

2.2 Global Studies

Several surveys in both developed and developing countries have investigated adolescents' and young people's sexuality and sexual behaviour in relation to teenage pregnancy and the transmission of STIs including HIV/AIDS (Brewster et al. 1993; Billy et al. 1994; Asuzu 1994; Stanton et al. 1998; Venier et al. 1998; Juarez & LeGrand 2005). With the passage of time, there has been a major shift in policy rationale from focusing solely on the reduction of out-of-wedlock teenage pregnancies resulting in childbirth or abortion, although this is still a major challenge in many settings and many parts of the world, especially in the developing countries.

With the urgency of the international AIDS crisis comes the intensification of research on sexual behaviour of young people to understand what young people do sexually (Dixon-Mueller 1993; Odimegwu et al. 2002; Eaton et al. 2003; Wellings et al. 2006; Hallett et al. 2007; Morrison et al. 2005; Agha et al. 2006; Guiella & Madise 2007; Mberu 2008; Stephenson 2009). Comprehensive sex education and the provision of reproductive/sexual health services or programmes among young people has been identified as the solution to lack of knowledge and involvement in risky sexual behaviours, since the global youth

culture in many developing countries reflects the pattern in the United States (Mensch et al. 1998).

2.2.1 Global perspective of adolescents' and young adults' sexuality and sexual behaviours: empirical evidence

The age at which individuals become sexually active and the timing of sexual debut have been linked with a number of important demographic, sociological, sexual and reproductive health outcomes, ranging from the risk of infection with HIV and other sexually-transmitted infections (STIs), the inability to negotiate safe sex to the greater number of sexual partners over a lifetime (Hallett et al. 2007; Mensch et al. 1998). There has been an increasing trend in sexual activity among adolescents and young people since the 1970s, and a large proportion of these sexually active young people are having sexual intercourse without protection, where protection refers to contraceptive methods (Cooksey et al. 1996; Hayes 1987; Sonenstein et al. 1989; CDC 1992; Sells and Blum 1996 cited in Ramirez-Valles et al. 1998). For example, a study in the United States found high levels of adolescent heterosexual activity, pregnancy and abortion (Zelnick & Shah 1983 cited in Dixon-Mueller 1993).

Patterns of youth sexual risk behaviour and their consequences have been found to be partly defined by social class (determined for example by education and employment), race, and gender in the United States (Browning et al. 2004). For instance, African American males (supposedly an economically disadvantaged group) have the highest percentage of sexually active youth; African American females under 15 years had a higher pregnancy rate than their white counterparts and these young people in general had a higher rate of STIs (CDC 1992; Sells & Blum 1996; Taylor & Katz 1996 cited in Ramirez-Valles et al. 1998). These sexual and reproductive health problems are fuelled by

poverty levels, as those living in poverty are more likely to initiate sexual activity at an early age with less power to negotiate safe sex (Allen & Mitchell 1996; Taylor & Katz 1996 cited in Ramirez-Valles et al. 1998).

A voluminous literature has shown adolescent sexual behaviour to vary across socio-demographic groups, while local concepts of sexuality including sexual behaviour vary across culture, race, countries and regions (Mensch et al. 1998). Also in the United States, on average, males become sexually active at a younger ages than females; Blacks and Hispanics have higher rates of early sexual activity than Whites (Moore et al. 1995; Santelli et al. 2000 in Bozick 2006; Browning et al. 2004); older teens are found to be more likely to engage in penetrative sex than younger ones (Alan Guttmacher Institute 1994 in Bozick 2006); and teens living in two-parent families are more likely to delay their transition into first sex than their counterparts in step- and single-parent families because of higher parental supervision, support and control, which is suppressive to adolescent sexual activity (Hogan & Kitagawa 1985; Moore 2001; Upchurch et al. 1999 cited in Bozick 2006; Browning et al. 2005).

In addition, adolescents from high-socioeconomic-status families are more likely to view life opportunities such as college attendance and white-collar job as attainable and as a result refrain from risky sexual behaviour. It has been found that young people in families with highly educated parents and plentiful economic resources are likely to delay sexual intercourse (Hogan & Kitagawa 1985; Moore 2001 in Bozick 2006). On the contrary, Juarez and LeGrand (2005) found higher socioeconomic status associated with earlier sexual activity for boys in Brazil, although with the greater likelihood of using condoms

during first intercourse. This shows the inconclusive nature of some of the studies investigating adolescent and young people's sexual and reproductive behaviours.

The findings on the relationship between pubertal development (a demographic measure) and young people's sexual activity have been inconsistent, although it has been generally reported that girls experience pubertal development earlier than boys (Westney et al. 1984 cited in Russell 1994; Mensch et al. 1998). Some researchers believed that the association between pubertal development and sexual activity is strong only for males since they physically mature later but reported earlier sexual initiation (Westney et al. 1984 cited in Russell 1994), while others reported contradictory findings (Brook-Gunn 1989; de-Anda 1990; Miller & Moore 1990 cited in Russell 1994).

School/academic factors (success within the classroom and the larger school environment) have been shown to influence adolescent sexual activity. Doing well in school has been linked to lofty aspirations and goals for the future and a strong orientation toward educational pursuits, which are at variance with risky behaviours (Michael & Bickert 2001; Miller & Sneesby 1988 in Bozick 2006); and students attending public schools have been found to be engaging in sexual activity more than their counterparts attending private schools (Teitler & Weiss 2000 in Bozick 2006).

Exploring the relationship between employment and first sexual intercourse in the early teen years in the United States, Bozick (2006) found that working more than four hours a week and holding an adult-type job is associated with an increased risk of engaging in sexual intercourse in early adolescence. These effects remain after controlling for socio-demographic variables, family and academic factors, and measures of age-graded

development. The findings therefore lend support to the precocious development hypothesis, which posits that taking on adult roles at an early age may speed up the onset of other adult behaviours such as experimenting with sex (Bozick 2006).

In many sexuality and sexual-behavioural studies about adolescents and young adults, boys are reportedly more likely than girls to have ever had sexual intercourse at a given age, have experienced it earlier, and have had more sexual partners (Wellings et al. 2006), to have intercourse more often, and to report having had a sexually transmitted infection (STI) (Dixon-Mueller 1993; Mensch et al. 2001, Brockerhoff & Biddlecom 1999 in Mberu 2008). In some settings, boys are likely to have had their first sexual encounter with a prostitute (Herold et al. 1988 in Dixon-Mueller 1993), while a higher proportion of girls than boys are more likely to have experienced a "non-consensual" sexual encounter (Moore et al. 1989 cited in Dixon-Mueller 1993; Mensch et al. 1998). This shows that gender is a significant predictor of premarital sexual activities. This has implication for the design of any intervention programme worth its salt. Such intervention must take into consideration the differences between boys and girls because they are following different sexual pathways (Dixon-Mueller 1993).

In a review by Goodson et al. (1997) of forty-nine peer-reviewed published articles between 1984 and 1994, on the correlates of early onset of sexual intercourse among female adolescents in the United States, using Social Cognitive Theory as a framework for classification, it was found that 61% and 47% of the studies reported environmental and biological correlates respectively to be significantly associated with early initiation of sexual intercourse. Religious affiliation, a factor negatively associated with early onset of sexual intercourse, was a common environmental finding among studies. One study,

however, reported that the church as a source of information about contraception was negatively associated with onset of sexual activity.

Among biological factors, age was the most common variable positively associated with onset of sexual intercourse among girls. Also, race was a frequent finding as being black was associated with earlier ages of onset of sexual activity. Among factors classified under reciprocal determinism, church attendance was the most commonly reported finding with a negative association.

Other behaviours generally classified as risk behaviours, such as drug use, cigarette smoking, and alcohol use, were found to be positively associated with early sexual initiation for females. However, a major limitation of many of the studies reviewed by Goodson et al. (1997) was that they focused solely on female adolescents and young people thereby excluding males. There is a need to focus on both male and female adolescents and young people, as is the case in this work.

Contraceptive use (as protection against disease and pregnancy) at first sexual encounter has been identified as an important indicator of fewer adverse outcomes and has also been linked to teens' propensity to use contraception consistently and regularly thereafter (Abma & Mcgill 2007; Nishimura et al. 2007; Shafii et al. 2004 cited in Mberu 2008). Data emanating from studies in the Caribbean countries, for example, indicate that many girls experience early initiation of sexual activity (forced or consensual), which, coupled with failure to use contraceptives, frequently results in unwanted or unplanned pregnancies (WHO 1998; Morrison et al. 2005).

Studies from Jamaica also indicate that girls experience sexual intercourse as early as eleven (11) years old, and 80-83% of births to teen girls are characterised as unintended or mistimed (McFarlane et al. 1997; Wyatt et al. 1999 cited in Morrison, 2005). This indicates the level of unmet need for contraception among young people in the study area. Early initiators in the same area were found to be more likely to be from rural, lower socio-economic settings, to be less likely to use protection and to have less knowledge about STIs (Morrison et al. 2005).

2.2.2 Socio-contextual studies in adolescents' and young adults' sexuality and sexual behaviours: global perspective

Although there is widespread agreement that social contexts are influential in shaping adolescents' and young adult's sexual behaviour (Billy et al. 1994; Brewster et al. 1993; Ramirez-Valles et al. 1998; Juarez & LeGrand 2005; Undie et al. 2007; Roche et al. 2005: Browning et al. 2005; Uthman 2008), such behaviours have been explained largely with reference to individual-level determinants (Upchurch et al. 1999) in the developing countries, and especially in South Africa. Multi-factorial approaches to understanding influences on risky sexual behaviour among young people seem logical especially in this era of high HIV and AIDS pandemic (Dixon-Mueller 1993).

There is a need to address the broader determinants of sexual behaviour, particularly those that relate to the social context. Comprehensive behavioural interventions are needed that take account of the social context in mounting individual-level programmes, attempt to modify social norms to support the uptake and maintenance of behaviour change, and tackle the structural factors that contribute to risky sexual behaviour (Marston & King 2006; Wellings et al. 2006; Uthman 2008).

Past studies on adolescent sexuality and sexual behaviour reveal a widespread agreement that social contexts exert a very great influence in shaping adolescents' and young adult's sexual and reproductive behaviour (Brewster et al. 1993; Billy et al. 1994; Roche et al. 2005; Browning et al. 2005). Some of the factors identified to be playing major roles are locus of control and self-esteem, family background, relationship with peers and family, and institutional factors like church, school and community. Communities, families, schools and peers have had demonstrable effects on several dimensions of young people's sexual behaviour (Rutter 1993; Resnick et al. 1997; Kirby 2001; Brookes-Gunn et al. 1997; Mullan Harris & Ryan 2001; Jaccard et al. 1996; National Campaign to Prevent Teenage Pregnancy (NCPTP) 1999 cited in Kaufman et al. 2002; Cubbin 2005; Marston and King 2006).

As mentioned earlier, these research efforts have been limited to developed countries and largely to the United States (Small & Luster 1994; Demo & Acock 1996; Feldman & Brown 1993; Jaccard et al. 1996; Whitbeck et al. 1992, 1993; Young et al. 1991 in Upchurch et al. 1999; Day 1992; Furstenberg et al. 1987; Billy 1983; Hogan et al. 1985; Hogan & Kitagawa 1985; Ku et al. 1993; Freshnock & Cutright 1979 in Brewster et al. 1993; Billy et al. 1994; Morrison et al. 2005).

One study has linked a number of community characteristics to a breakdown in the normative order regulating pre-marital or non-marital sexual behaviour, including geographical mobility, unemployment rates, and marital instability (Freshnock & Cutright 1979 in Brewster et al. 1993). Also, studies have linked the residence of girls in economically disadvantaged rural communities, living in female-headed low-income households, with its attendant poverty and typical "transactional sex" with older men, to

increased vulnerability to HIV infection, due to the fact that girls and women in such situations will not be able to negotiate safe sex (Howe & Cobley 2000; Kempadoo 2004 cited in Morrison et al. 2005).

Community social context has been identified as a viable resource and mediator of health and well-being (Minkler & Wallerstein 1997; McKnight & Kretzman 1997 in Morrison et al. 2005; Roche et al. 2005). This is closely linked with the issue of social capital, which reflects the social processes, norms and trust among community members as an important resource for community health promotion (WHO 1998 cited in Morrison et al. 2005). As a whole, these studies propose that variations in sexual risk behaviour are rooted in differential access to the economic and organisational resources that shape youths' socialisation patterns in inner-city neighbourhoods (Ramirez-Valles et al. 1998)

Social capital includes elements such as social networks, community participation, information sharing, trust and reciprocity among community residents (Putnam 1993, 1995, 1996 cited in Morrison et al. 2005), and these elements have been found to be instrumental in buffering the effects of poverty on health and well-being (Campbell 2000; Campbell & Gillies 2001; Cattell 2001; Kawachi et al. 1999 in Morrison et al. 2005). Hence, socio-economically advantaged communities or neighbourhoods with high social capital are often able to shield children and youth from a range of negative health outcomes such as engaging in risky sexual behaviours (Furstenburg & Hughes 1995; Garmezy 1991; Morrow 2000; Runyan et al. 1998 cited in Morrison et al. 2005; Cubbin 2005).

There is consistency in that the findings of many of the aforementioned contextual studies

stress the importance of social context as we examine the sexuality of young people. For example, Brewster et al. (1993) explored the role of community characteristics in determining two critical features of adolescent non-marital sexual activity: the timing of first intercourse and contraceptive use at that event. They found that the local opportunity structure and normative environment shape the behaviours of adolescents, and that social disintegration, socioeconomic status, and the availability of employment opportunities for women emerged as particularly important influences on young women's reproductive choices.

Similarly, Billy et al. (1994) found that the likelihood of first sexual intercourse and subsequent sexual behaviour among black and non-black teens in the U.S are shaped by a number of community characteristics, including social disorganisation, closely-linked contextual and individual level socioeconomic factors (which include neighbourhood contexts; family structure and class position; race; and gender), religiosity, female labour force participation, population composition, and the availability of family planning services.

Greater parental involvement and monitoring was related to a lower likelihood of sexual initiation (Browning et al. 2005), only when youth lived in socio-economically advantaged neighbourhoods. Parental decision-making centred on the child's activities within (e.g. watching television) and outside (e.g. 'hanging out' with friends) the home was associated with a lower likelihood of sexual initiation for adolescents in disadvantaged neighbourhoods but to a greater likelihood of sexual initiation for youth in advantaged

neighbourhoods. The study concluded that neighbourhood context matters in designing preventive interventions aimed at discouraging adolescent involvement in sexual intercourse (Roche et al. 2005). However, in contrast to the developed nations, the form or scope of the contextual influences likely to affect young people's sexual behaviour has received scant attention in developing countries despite its numerous advantages to the formulation of efficient policies and the design of effective intervention programmes. Hence, this work seeks to capture the full range of influences on sexual and contraceptive behaviours of young people in the Cape Area of South Africa.

2.3 African Studies

There are several studies on sexuality, sexual behaviour and contraceptives among adolescents and young adults in and around Africa as a continent. The following are some of the findings of studies conducted within Africa, with a separate section for South Africa:

2.3.1 Review of empirical studies regarding adolescents' sexuality and sexual behaviours: African perspective

The age at which individuals become sexually active and the timing of first sexual activity have been linked with a number of important demographic, sociological, sexual and reproductive health outcomes ranging from the risk of infection with HIV and other STIs, and the inability to negotiate safe sex to a greater lifetime number of sexual partners (Twa-Twa 1997; Clark 2004 cited in Mensch et al. 2005; Mensch et al. 2005; Hallett et al. 2007).

Several studies have been conducted in Africa that describe the trends and gender differences in young people's sexual experiences. Some of these studies have found high

levels of adolescent heterosexual activity, pregnancy and abortion, especially in settings where abortion is illegal (Feyisetan & Pebley 1989; Nichols et al. 1986, 1987 cited in Dixon-Mueller 1993; Buseh 2004). Differences between boys and girls have been documented with respect to adolescents and young people's sexual partnerships and risk-taking in an African setting (Twa-Twa 1997; Rakgoasi & Campbell 2004; Guiella & Madise 2007; Fatusi & Blum 2008). Although Buseh (2004) found no gender differences in relation to sexual activity and experience of sexual coercion among the secondary students studied in Swaziland, Erulkar (2004) did find a gender difference in relation to experience of sexual coercion in Kenya thereby pointing to the inconclusive nature of some of the studies in Africa.

Studies have shown that as chronological age increases, the likelihood of premarital sexual initiation increases due to increased exposure to the opposite sex and pressure associated with biological and social maturity (Mensch et al. 1998). Hence, age has been found to be a significant predictor of young people's sexual behaviour in sub-Saharan Africa (Gage-Brandon & Meekers 1993; Meeker 1994; Slap et al. 2003; Kiragu & Zabin 1993 cited in Mberu 2008; Uthman 2008). Early puberty and physical maturity for girls has been identified as the social context predisposing girls to early sexual activities and sexual mixing with older sexual partners, compared to boys (Konde-Lule 1997 in Mberu 2008; Mensch et al. 1998).

Education in terms of levels, enrolment, and number of years spent in school including the type of school has been investigated in relation to adolescents' sexual behaviours. For example, Guiella and Madise (2007) found that the odds of using condoms increased with

years of schooling and self-efficacy in their use. There are two dominant schools of thought on the effect of education on young people's sexual debut, namely the *increased exposure hypothesis* and *human capital and role incompatibility hypothesis*. The increased exposure hypothesis suggests that being enrolled in school and experiencing prolonged years of schooling increases the risk of premarital sexual engagements (Nishimura et al. 2007). The argument by those who believe in this hypothesis says increasing education is associated with decreasing family control of young people and exposure to peer influence on sexual behaviour (Kaufman 2002 cited in Mberu 2008).

On the other hand, the human capital and role incompatibility hypothesis argues that women who are enrolled in school are at a lower risk of initiating first sex due to not only the opportunity cost associated with potential unplanned pregnancy, but also the role conflict associated with early motherhood and studentship (Blanc et al. 2005 cited in Mensch et al. 2005). The belief is that the school environment provides supervised time, thereby offering students, especially girls, an alternative to high-risk activities available outside the school environment. In addition, education may also impart knowledge about disease transmission and risks such as HIV and this knowledge may lead to the adoption of safer behaviours (Mberu 2008). It has been argued, however, that knowledge does not necessarily bring about positive behavioural change (WHO 1998), and there is a body of literature that has found school as an institution to be unsafe, especially for girls, because sexual harassment and violence are commonplace (Human Rights Watch 2001, Bhana 2005, Leach & Mitchell 2006 in Bhana & Pattman 2009).

The major limitations found in studies that have adopted these models is the neglect of out-of-school adolescents and, in some cases, the neglect of male adolescents, as the focus of

such research endeavours has been directed at female adolescents and young people (Mberu 2008). Understanding how these hypotheses apply to young people in whether they are at school or out of school; male or female, will be advantageous to the design of effective intervention programmes. This work seeks to fill the gap identified above because the CAPS dataset has information on both sexes and covers both in-school and out-of-school adolescents and young adults.

Another factor closely related to education is the availability of jobs and the work status of adolescents, which may offer independence and greater sexual access in places where the supervision of older family or community members is minimal or non-existent. This has been thought to provide opportunity for sexual experimentation among young people. For instance, Nishimura et al. (2007) found that work experience significantly associated with men's sexual experience. Unemployment, on the other hand, has been linked to risky sexual expression among youths in the African context (Bledsoe & Cohen 1993 in Mberu 2008; Bhana & Pattman 2009).

2.3.2 Socio-contextual studies in African adolescents' and young adults' sexuality and sexual behaviours

Families' social and economic situations have been linked to the sexual behaviour of adolescents in Africa (Odimegwu et al. 2002). The global economic recession and the need to survive have led many young people to adopt sex as an important coping strategy. This has been linked to weakened moral values that moderate sexual behaviour and increased risky sexual involvements among young people (Isiugo-Abanihe & Oyediran 2004; Kaufman & Stavrou 2002). For instance, in a study conducted in the Bida Local Government area of Niger State, Nigeria, Odimegwu et al. (2002) investigated how parental attributes influence adolescent sexual activity. From data gathered through

structured interviews with 400 adolescents aged 12-24 years using a three-stage random sampling procedure, they found that more than one-third of the adolescents interviewed had sexual intercourse in the month preceding the survey, and that less than one-fifth of the sexually active adolescents were using a method of contraception either to prevent infections or avoid unwanted pregnancy.

The results of further analysis by Odimegwu et al. (2002) confirmed the fact that adolescents with whom parents had discussed family life issues were less likely to be sexually active than those with whom parents had never discussed family life issues. Also, that family instability exerts a negative effect on adolescent sexuality. This study brings to light the importance of family structure and community level variables of family instability on the sexual behaviour of the adolescents in a northern-central location in Nigeria.

Urban and rural environments have been linked to adolescent sexual and reproductive behaviour in sub-Saharan Africa, although the direction of relationship is not very clear-cut (Makatjane 2002; Adeboyejo & Onyeonoru 2003; Buseh 2004). It is believed that urban environments impact adolescents and young people negatively as far as sexuality is concerned. This is because urban settings are characterised with loose network ties, and high population density as a result of urbanisation together with its attendant problems. Makatjane (2002) in a study investigating the prevalence of premarital sex and childbearing in Lesotho using Lesotho's 1991/1992 Demographic and Health Survey data found that never-married women living in urban areas are more likely to be sexually experienced than their counterparts residing in rural areas. He concluded that societal norms that discourage sex before marriage have eroded more in the urban areas than in the rural areas, and that the urban environment provides a supportive environment for

experimenting with sex before marriage. The findings from this study still point to the fact that context matters in sexual and reproductive decision-making.

In agreement with the above findings on rural and urban inter-linkages and their effect on young people's sexuality, Adeboyejo and Onyeonoru (2003) investigated the components of adolescent reproductive health problems, the incidence, prevalence rates and intra-urban variations within the framework of the home environment which adolescents live. The study, using analysis of hospital records of diagnosed cases of common STIs, found that the three most common STIs among adolescents in Ibadan, Oyo State, Nigeria were gonorrhoea, Candidiasis, and non-specific Urethritis. The authors noted that the incidence is highest among adolescents in the high-density but low class residential areas than their counterparts in the medium and low-density areas. The study concluded that the trend in incidence between 1974 and 2000 is a fluctuation that tends more towards increase than decline.

For any prevention and intervention programme to be effective it must take into consideration the context of the problem in the study area, and must also address the community-level factors predisposing the youths in the various strata of the community to STIs. The behaviour of most individuals is set within a neighbourhood context and, even if life involves association with actors from outside the immediate locale, neighbours remain a constraint to be reckoned with (Timms 1976 cited in Adeboyejo & Onyeonoru 2003). The authors noted that while adolescents' reproductive health issues particularly within the context of urban living environment has not been given much research attention, there is a growing body of literature on adolescents' sexual expression in Nigeria.

It has been further observed, for instance, that youngsters not only live in separate residences within cities, but they increasingly practice pre-marital sex (Feyisetan et al. 1994; Orubuloye et al. 1991 in Adeboyejo & Onyeonoru 2003) at an early age, and with multiple sexual partners (Isiugo-Abanihe 1994; Makinwa-Adebusoye 1992 in Adeboyejo and Onyeonoru 2003). Guiella and Madise (2007) explained rural/urban differences in the use of condoms in Burkina Faso through differential access, and the difficulty of buying condoms due to fear of the news spreading to others. Also, they found an association between condom use at last sexual intercourse within a 12-months period and adolescents' self-efficacy (ability to get a partner to wear condoms) towards condoms, especially for females.

On the contrary, Buseh (2004) found no urban/rural differential with regard to young people's sexual risk behaviour in Swaziland. Although there may not have been a consistent and clear relationship as far as urban/rural environments and adolescent sexual and reproductive behaviours are concerned, childhood place of residence has been found to have significant effects (Gupta 2000).

Social capital, comprising elements such as social networks, community participation, information sharing, trust and reciprocity among community residents, has been linked to adolescents' sexual and reproductive behaviour (Mturi 2003). For instance, using national survey data from Nigeria, Agha et al. (2006) examined individual and community-level determinants of early sexual initiation. The study found that community-level factors exercise important effects on early sexual initiation, and that, consistent with the social capital hypothesis, young people living in communities that are more knowledgeable about HIV or AIDS transmission and prevention, communities that are open to receiving HIV or

AIDS information, and communities that support condom use as well as family planning are more likely to delay sexual initiation than others. They further noted that the disadvantages associated with living in a community that is less well-informed, less supportive of condom use and less open to receiving information on HIV or AIDS are significantly higher for women. The study concluded that women who live in communities where attitudes about reproductive health are not positive or where there is lack of social support for condom use are at a heightened risk of early sexual initiation.

Some studies have linked adolescent premarital or risky sex to other patterns of similar risky behaviours such as alcohol, substance and drug abuse (Nishimura et al. 2007; Fatusi and Blum 2008; Rakgoasi & Campbell 2004). The rationale behind this belief is that any youth abusing any of these substances will be less likely to take a rational decision to engage in health-enhancing actions. The psychoactive properties of alcohol are: it impairs cognition and attention, affects intention and judgement, leads to loss of inhibition, and causes delayed cognitive processing and coordination, which often results in non-use of condom during sexual intercourse or sometimes condom accidents. In accordance with this school of thought, Rakgoasi and Campbell (2004) in a study of adolescents' sexual behaviour in Botswana found that while female adolescents were more sexually active than male adolescents; the latter were more likely than female adolescents to engage in risky behaviours such as early initiation of sexual intercourse; alcohol use and multiple sexual partnerships. Among male adolescents, early initiation of sexual intercourse was associated with increased likelihood of non-condom use, which increased the risk of STIs, including HIV. The study further found that while a high percentage of adolescents considered themselves at minimum or no risk of contracting STIs including HIV, this proportion is higher among males than among female adolescents.

Fatusi and Blum (2008) also found among Nigerian adolescents that alcohol use among males was associated with increased likelihood of adolescent sexual initiation compared to their female counterparts. Nishimura et al. (2007) found among young adults from Mauritius that work experience and marijuana use were significantly associated with men's sexual experience, whereas among females being out of school and drinking experience were significantly associated with having ever had sexual intercourse.

Cultural values regarding sexuality and gender roles exert powerful influences on the decision-making process of any individual. The cultural norms governing sexual activity among young people, and the availability of social and economic support networks to unmarried mothers, as well as the consequences of unsanctioned premarital pregnancy and childbearing, often strongly influence adolescents' likelihood of engaging in premarital intercourse (Preston-Whyte & Zondi 1992 cited in Nicholas et al. (n.d.); Gage 1998 in Mberu 2008). Community as an intervention point for behavioural change was supported in a recent study focusing on three African countries although the mechanisms through which the community environment shapes sexual behaviour of young people in the study areas vary for male and female. This underscores the need to understand the dynamics of sexual behaviours among both sexes. The prevailing economic conditions, behaviours and attitudes of older people in the community were a strong influence on young people's sexual behaviour (Stephenson 2009).

Relationship between religious affiliation and premarital sexual initiation is mixed and highly inconclusive. Some studies found Muslims to be less likely to engage in premarital sexual activities than Christians and others found the reverse. Some studies even found no

significant difference between the two groups (Feyisetan & Pebley 1989; Fatusi & Blum 2008; Meekers 1994 and Slap et al. 2003 cited in Mberu 2008). Rather than mere religious affiliation, it was found that the extent or degree of religiosity is inversely related to premarital sexual initiation (Gupta 2000; Fatusi & Blum 2008). However, interpretation of results with respect to the relationship between religion and sexuality must be done with caution, taking into consideration the various limitations observed in past studies, such as limited coverage and the exclusion of some categories of youth (Mberu 2008).

Lastly, it is noteworthy that not using a condom (as a method of contraception) at first sexual intercourse and lack of exposure to a non-governmental organisation (NGO) dealing with HIV or AIDS have been found to be significantly associated with non-use of condom at the most-recent sexual encounter (Nishimura et al. 2007).

2.4 South African Studies

There is a great and increasing interest in the study of adolescents' and young adults' sexual and reproductive behaviour in South Africa as there is in other parts of the world. While it is true that there are studies from different parts of South Africa on adolescents' and young adults' sexual and contraceptive behaviour, it is also noteworthy more such studies emanate from KwaZulu-Natal than from any other province in South Africa. The reason is not hard to determine: it is one of the poorest provinces, the province with the highest HIV prevalence, and the province with the highest population in South Africa.

With the collection of longitudinal data emanating from the Cape Area come some bodies of literature investigating the sexuality and sexual behaviour of young people in the area. Scientists and researchers are trying to make sense of the data which addresses so many

research questions, and this has led to quite a substantial amount of literature coming from the area. Some of the articles that have been published in this area are included in the body of literature addressing adolescents' and young people's sexual and contraceptive behaviour in South Africa reviewed for this work.

2.4.1 Adolescents' and young people's sexuality and sexual behaviours: Review of empirical research in South Africa

Studies from around South Africa reveal a high level of risky sexual behaviour among adolescents and young people; little wonder that the prevalence of HIV infection within this sub-group of the population is so high (MacPhail & Campbell 2001; Eaton et al. 2003; Hartell 2005; Harrison et al. 2005; Mpofu 2006; Mathews et al. 2009; Simbayi et al. 2005; UNAIDS 2006). For example, a review of 75 published works, unpublished reports and dissertation/theses by Eaton and colleagues (2003) found that at least 50% of young people aged 14-35 are sexually active by the age of sixteen years; with sexually active school students reporting one sexual partner in the previous year; more males reported having more than four sexual partners per year than their female counterparts; while between 50% and 60% of sexually active youth reported never using condoms.

Eaton et al. (2003) suggested that proximal (interpersonal relationships, physical and organisational environment) and distal (cultural and structural factors) contexts, and in particular, the pervasive effect of poverty and social norms that perpetuate women's subordination within sexual relationships predispose young people to unsafe sexual behaviour in South Africa. They suggested that personal factors, proximal and distal contexts interact to encourage HIV risk behaviour in ways that are not fully captured by social cognitive models (psycho-social theories). However, of all the studies reviewed and upon which that suggestion was based, only a few studies had applied Social Cognitive

Theory (Aarø et al. 2008). This study, however, provides a platform to test social cognitive theory in a South African setting with the intent of investigating its applicability to research in a middle-income country such as South Africa. Also, many of the studies if not all used cross-sectional design; hence no causal inference can be made based on the findings of such studies.

Even though contextual data are necessary to understanding the circumstances under which sexual intercourse is taking place (Mensch et al. 1998), such data are scarce in South Africa and only very few of the reviewed studies consider the social contexts in which sexual intercourse occurs among young people. The majority of the studies on this subject in South Africa are descriptive in nature and only reported adolescents' knowledge, attitude and practice of sex in relation to HIV/AIDS. However, sexual relations, sexual behaviour and sexuality in general is not only about HIV/AIDS, although preventing the spread of HIV is a priority area since there is no known cure up till now for the pandemic.

Simbayi and colleagues in their study in Cape Town in 2005 noted that South African youth report high rates of risky behaviours, multiple sex partners, and infrequent condom use, and these are risk factors for HIV infection. The authors concluded that there is an urgent need for behavioural interventions targeted at young South Africans living in the most economically disadvantaged areas. According to Cubbin (2005), an ecological framework suggests that within a neighbourhood, defined as a shared local environment, a variety of factors may independently influence the sexuality and sexual behaviour of its residents, including the availability of goods and services (otherwise referred to as social capital), norms (e.g. values and behaviours) and opportunity structures (e.g. employment and education options). Studies of this nature are very few in the study area. Hence, this

study is needed to capture the effect of neighbourhood characteristics on the sexual behaviour of young people. For example, until now, higher rates of HIV infection in South Africa especially among indigenous Africans has been explained largely through the apartheid legacy of differences in economic and social conditions among racial groups, and that the legacy predisposes youth to be vulnerable to a host of health and social risks (Hallman 2004; Abdi 2001 cited in Tenkorang et al. 2009).

The implication of this legacy is that Africans/Blacks in comparison to other racial groups are doomed to risky sexual behaviour. However, it will be interesting to see how the negative legacies of apartheid are playing out through the neighbourhood arrangement in which the young people are residing. This study therefore intends to investigate the neighbourhood effect on young people's sexuality as such information will be useful in addressing the negative legacy of apartheid which has perpetuated itself in the day-to-day life of South Africans many years after its demise. Such information is currently scant or non-existent with respect to sexuality in South African literature to the best of my knowledge. I therefore propose that a community's racial composition (concentration of population group) is expected to influence adolescents and young adults' sexual and contraceptive behaviours. This factor will be captured at the magisterial level, which is the smallest lowest level of data collection in South Africa.

Perceptions about the seriousness of a health threat, perceptions about one's personal vulnerability to a health threat and one's perceived ability to reduce one's risk have been stressed as the key determinants of any health behaviour, especially in the Health Belief Model and Social-Cognitive Learning Theory (Eaton et al. 2003). Intervention research linking risk perception and sexual behaviour has produced mixed and highly inconclusive

results (Tenkorang et al. 2009). A study among Xhosa-speaking secondary school students in the Western Cape indicated that relatively few students believed that AIDS could affect them, and their attitudes toward condoms were largely negative (Kuhn et al. 1994 in Hartell 2005).

On the other hand, evidence from empirical research indicates that high perceived vulnerability and anxiety about personal risks are linked to greater intended and actual (positive) sexual behaviour change (Strebel & Perkel 1991; Van Aswegen 1995; Van Wijck 1994 cited in Aarø et al. 2008; Anderson et al. 2007; Tenkorang et al. 2009). Other studies found a high level of risk perception triggering high level risk-taking behaviours (Akwara et al. 2003; Maharaj 2001; Najjumba et al. 2005; Prata et al. 2006 cited in Tenkorang et al. 2009). Toroitich-Ruto's (1997) study cited in Tenkorang et al. 2009 found no association between risk perception and sexual risk-taking behaviour. Perception of risk of HIV/AIDS has been found to be very low in some groups with high rates of sexual activity and low condom use, especially in South Africa (Blecher et al. 1995 cited in Eaton et al. 2003); some of the factors that reduced perceived vulnerability to HIV/AIDS were denial of its presence in one's own community especially in the rural areas and denial of personal responsibility, which is more prevalent among men than women (MacPhail & Campbell 2000 cited in Eaton et al. 2003).

Some South African studies have shown that people perceived abstinence and use of condoms to be linked to illnesses (Meyer-Weitz et al. 1998; Preston-Whyte & Zondi 1991; Wood et al. 1997 cited in Eaton et al. 2003). Studies linking the perceived costs and benefits of condoms found condoms use is disadvantaged in South Africa on the count that it wastes sperm and hinders the demonstration of the ability to give birth to a child or to

father a child for those under strong cultural pressure to do so (Reddy et al. 1999 cited in Eaton et al. 2003), and the fact that it could fail as a method of contraception for those who are afraid of getting pregnant (Wood & Foster 1995 in Eaton et al. 2003). Other reasons for low level of condom use in South Africa are loss of pleasure (MacPhail & Campbell 2001), the need to keep obtaining condoms every time they have sexual intercourse; and fear of failure and shame associated with accessing condoms (Madu & Peltzer 1999; Nicholas 1998 in Eaton et al. 2003).

With regards to how intention to abstain from sex till marriage affects behaviour, primary abstinence is not a commonly reported thing except among women with conservative Christian backgrounds (Venter 1995 in Eaton et al. 2003), while it is rarely reported by young men. A high proportion of women subscribed to monogamy while most men consider it undesirable, although reducing the number of sexual partners is more desirable to men than using condoms (Blecher et al. 1995; Strebel & Perkel 1991 cited in Eaton et al. 2003).

Also, studies have shown that self-efficacy (defined as having confidence in one's ability to perform a particular behaviour for example, condom use) is linked to higher self-reported condom use (Peltzer 1999; Reddy et al. 2000 cited in Aarø et al. 2008; Eaton 2003; Baele et al. 2001; Mashegoane et al. 2004; Giles et al. 2005 cited in Sayles et al. 2006). Closely related to self-efficacy is the issue of self-esteem and sexual/contraceptive risk behaviours. Few studies in South Africa have linked low self-esteem to poor sexual and contraceptive behaviours such as the inability to practice abstinence, be faithful to one sexual partner and use condoms (Goliath 1995; Perkel et al. 1991 cited in Eaton et al. 2003), because according to those studies low self-esteem can result in poor sexual self-

concept and over-reliance on others for affirmation, with the negative consequence of not being able to negotiate safe sexual relations.

To further corroborate the importance of age, individual socioeconomic characteristics in terms of education, gender and sex differences in young people's sexual behaviour, Mathews and colleagues (2009) investigated the effect of a school-based HIV prevention programme among Grade 8 students in Cape Town. Of the 1,440 students who were virgins at baseline, 79.4% (1,144) remained virgins 15 months later, while 20.6% (296) reported having had their first sexual intercourse. Transition to first sex was more likely among males, among older students, and among students with a lower socio-economic status. This transition was significantly associated with three factors namely: intention to have sexual intercourse, poor self-efficacy to negotiate delayed sex and intimate partner violence. Although, the study is biased towards those in school and neglects out-of-school adolescents, it is encouraging to know that the construct of self-efficacy found in social cognitive theory was used in this study, and was found to be significantly associated with early first sexual debut among the study population.

According to the LoveLife survey (2001) conducted among a random sample of 2000 young people aged 12 to 17 years and cited in Pithey & Morojele (2002), the proportion transiting into sexual activity overall (defined as having had penetrative sexual intercourse) increases with biological age (24% at 15 years and 31% at 17 years). Boys were more likely to be sexually experienced than girls (33% versus 28%). Of sexually-experienced youth, 32% were sexually experienced by age 13 years or younger, and 78% by the age of 15 years. Among sexually-experienced youth, multiple sexual partnerships were relatively

common, with 22% having had more than two sexual partners in their life. Eighteen percent of the respondents reported two or more current partners.

With regard to the effect on sexual behaviour of urban or rural place of residence, rural teenagers were found to be more likely to be sexually experienced than those living in an urban area (34% versus 26%) (LoveLife 2001 cited in Pithey & Morojele 2002). The findings are supported by a study conducted at two schools in KwaZulu-Natal (one urban, the other rural), in which youth from the rural site were more likely to be involved in love relationships and initiate sex at a younger age than their urban counterparts (Hlongwa et al. 2001 in Pithey & Morojele 2002). In spite of reasons that could be adduced for the unexpected results (e.g. economic reasons/poverty, having less to do etc.), the findings conflict with studies in other countries, where it was found that urban youths are more likely to be sexually active and initiate sexual intercourse earlier than their rural counterparts (Makatjane 2002; Adeboyejo & Onyeonoru 2003; Buseh 2004). McGrath et al. (2009) found gender differences with respect to the predictors of age at first sex (AFS), as those in peri-urban residence were likely to sexually debut earlier than their rural counterparts. However, childhood place of residence has been found to be a better and more consistent indicator when examining adolescents' and young adults' sexuality (Gupta 2000). The variable of childhood place of residence is available in the CAPS dataset, and was included in the analysis.

Teenagers with early sexual experience tended to have multiple sexual partners (Harrison et al. 2005; Mpofu et al. 2006). Factors that could be responsible for such findings are complex and probably include high rates of poverty, as young women sometimes enter into relationships with older, rich and influential men, otherwise known as the "sugar daddies",

where such men pay their school fees, buy gifts, and offer other inducements in exchange for sexual intercourse. Such a relationship could also be entered into with younger men in exchange for favours, gifts, and cash (MacPhail & Campbell 2001; Leclerc-Madlala 2001 cited in Pithey & Morojele 2002). This kind of relationships has been shown to exist in South Africa, as about two-fifth of the young respondents said they knew people their age who have sex for money, drinks, food or other gifts while 20% of sexually-experienced boys said they had given money or gifts for sex and 16% of sexually-experienced girls said they had received money or gifts for sex (LoveLife 2001 in Pithey & Morojele 2002).

Further evidence from the Lovelife's (2001) study cited in Pithey & Morojele (2002) showed that there is almost a universal knowledge about HIV/AIDS, and the power of condoms to prevent HIV transmission is known to majority of the respondents. Even at that, thirty-nine percent of sexually-experienced boys said they try to have sex without a condom, and for both sexes, 41% still did not use condoms consistently. The majority of sexually-experienced boys (68%) and about half of the girls (54%) believed that having sex without a condom is more sexually enjoyable, indicating that a high level of knowledge does not necessarily translate to positive behaviour (Anderson & Beutel 2007; Hartell 2005).

In a review by Hartell (2005) titled "HIV/AIDS in South Africa: a review of sexual behaviour among adolescents", the author documented various sexual-behaviour studies that were conducted in South Africa prior 2005. The following few paragraphs report some of the findings from this review: The first is the UNICEF (1995) study, which investigated adolescents' knowledge and experience of sexuality through focus groups in five provinces. The study found that adolescents receive conflicting messages about sex and sexuality and

that they lack the knowledge, confidence and skills to discuss sexual issues, including contraception and prevention of infection. The study also found that widely believed myths reinforce negative attitudes about safer sex and contraceptive use, and that most adolescents make decisions about sex in the absence of accurate information and access to support services. Students' feedback indicated that their need for accurate information could be satisfied through AIDS education in schools.

Moreover, Kuhn et al. (1994) and Harvey (1997) cited in Hartell (2005), in their research on knowledge, attitudes, and sexual behaviour related to AIDS, found that while knowledge of HIV and AIDS among adolescents is generally good, many engage in high-risk sexual behaviour. Harvey (1997) showed that, among Zulu-speaking Standard 8 (Grade 10) students (N = 519), more than a third (34.9%) reported being sexually active, with some having more than one sexual partner. Less than half of all students (42%) acknowledged that having one uninfected sexual partner was an effective preventive measure. Almost a quarter of the students (23.8%) reported having been treated for a sexually transmitted infection (STI) in the past. The study further revealed that more than 50% of the sexually active students had never used a condom. No more than 10% had used a condom regularly during sexual intercourse because a variety of misconceptions about condoms resulted in their non-use.

Studies on adolescent sexual behaviour in South Africa and the environment in which it is taking place show that early sexual initiation is common and that many young people indulge in risky sexual behaviour in spite of high knowledge about HIV and AIDS (Naidoo 1994; Kelly 2001; Harvey 1996; Goliath 1995; Matthews et al. 1990; CASE 1995 cited in Hartell 2005). In an extensive survey and follow-up among urban black youths aged 16 to

20 years in Soweto (Johannesburg), Khayelitsha (Cape Town) and Umlazi (Durban), it was found that 40% of young women and 60% of young men had had more than one sexual partner in the previous six months and that condom use was relatively low (Richter 1996 in Hartell 2005). Examining the high levels of risk that young people are exposed to because of their behaviour, Carelse (1994) illustrates that the environment in which high-risk behaviour occurs needs to be examined because it may contribute to the incidence of high-risk behaviour and may prevent the successful implementation of AIDS prevention programmes. It was postulated that the institutional environment contributed to the incidence of AIDS-related, high-risk sexual behaviour and made effective AIDS intervention programmes difficult (Carelse 1994 in Hartell 2005).

Drawing on the findings from the various South African studies he reviewed, Hartell (2005) concluded that much research still needs to be done on the effectiveness (or lack thereof) of educational programmes on adolescents' sexual behaviour. Another important conclusion from the same study is that a general strategy would not be feasible, since the norms, values, cultures, and traditions of the various communities in South Africa are too different, since it is a rainbow nation. Thus, the focus of any prevention programme for students would have to be based on the particular needs and beliefs of each community. The most important conclusion of the review by Hartell (2005) was that, despite the efforts of researchers, there has been no significant change in the rate of HIV infection among adolescents in South Africa. This finding and conclusion is in line with the 2006 report on the global AIDS epidemic (UNAIDS 2006). He therefore recommended a new generation of behavioural interventions which provide both factual knowledge and life skills which can promote behavioural risk reduction.

The inter-linkages between some biological/social factors and adolescent sexual behaviour have been investigated in South Africa. A study in Transkei by Buga et al. (1996) revealed that of the 1,072 adolescents interviewed, 74.6% (76% of the girls and 90.1% of the boys) were already sexually experienced and 21.0% were not. The mean ages of the girls and boys surveyed were 15 and 16 years respectively. Boys started sexual intercourse earlier than girls (13.43 years versus 14.86 years), and had more sexual partners, and nearly twice as many had a history of sexually transmitted diseases. The age of sexually-experienced girls (SEGs) at first coitus correlated positively with the age of menarche, with the age at the first date suggesting that sexual maturation and onset of dating were possible risk factors for initiation of sexual activity.

Moreover, Buga et al. (1996) found that contraceptive usage was low in the study area, and a third of SEGs had been pregnant at least once. The knowledge of reproductive biology was reported generally poor, although SEGs were significantly more knowledgeable than sexually inexperienced girls. It was also reported that nearly a third of the respondents in both groups did not wish to get married in future. The study concludes that there is a high level of unprotected sexual activity among school girls in Transkei and that the risk factors for this include early sexual maturation, early onset of dating, and poor knowledge of reproductive biology and contraceptives. This study tends to be a descriptive one and did not show any evidence of causal relationships. Although the issue of the presence of both parents was investigated the influence both parents wielded on whether an adolescent will choose to be sexually active or not was not reported in the study.

A study linking schooling factors to sexual behaviour using longitudinal data has found that male and female students who performed well on a literacy and numeracy examination

administered in 2002 were less likely than those who performed more poorly to become sexually active and less likely to drop out of school by 2005. This shows that intervention programmes that raise the performance of young people in their school work could be protective against engaging in sexual activity in the study area. Moreover, 14-16-year-olds who had completed more grades in school in 2002, conditional on their age, were more likely than those who had completed fewer grades to have become sexually active by 2005, a potential indicator of peer effects resulting from the wide dispersion in age per grade in South Africa (Marteleto et al. 2008). This finding validates the increased exposure hypothesis. However, school attendance was found to be significantly protective against earlier age at sexual debut in KwaZulu-Natal (McGrath et al. 2009).

In spite of the linkages described above, there are still gaps as far as schooling factors are concerned. It will be interesting to investigate whether type of school the young people are attending, the school environment, school attendance, school aspiration or attitudes to school have anything to do with their sexuality and sexual behaviour. Therefore, I propose that adolescents and young adults with negative aspirations and attitudes toward education are more likely to initiate sex earlier and have multiple sexual partners; and less likely to use contraceptive at first and last sexual intercourse and consistently have used a condom with last sexual partners.

2.4.2 Socio-contextual studies in adolescents' and young adults' sexuality and sexual behaviours: South African perspective

Data on prevailing sexual risk behaviours shows that complex socio-cultural factors shape sexual relationships in South Africa (Pithey & Morojele 2002; Burgard & Lee-Rife 2008), and as noted earlier, such factors have often been neglected in past research investigating adolescents' and young people's sexuality and contraceptive behaviours. Reiterating the

importance of the social and contextual factors in the design of effective intervention programmes, Rutenberg and colleagues (2001) in their own study of "transitions to adulthood in the context of AIDS in South Africa…Wave 1" noted that research findings on the effectiveness of programmes or interventions the U.S. aimed at reducing the prevalence of adverse adolescent reproductive health outcomes strongly suggest that programmes that attempt to influence the context in which youth live in addition to addressing reproductive health needs tend to be more effective than those that focus more narrowly on reproductive health knowledge and/or access to reproductive health services.

They also noted that most studies in South Africa lack a systematic assessment of community context. The study reported levels of adolescents' connectedness to family, household and communities among the various population groups aged 14-22 in KwaZulu-Natal. Wave 2 results (collected in 2004), showed that youth exposed to life skills education were more likely to use condoms, but that there was no effect on other key behaviours such as delaying sexual initiation or reducing the number of partners in the 12 months to the time of the survey.

Low socioeconomic conditions have been linked to sexual risk behaviour in South Africa. In a KwaZulu-Natal transition study, low socioeconomic status increased the odds for both sexes of having multiple sexual partners in the year before the survey. Also, low socioeconomic status was associated with lower female and male age at sexual debut, with lower rates of condom use at last sexual activity and with lower likelihood of secondary abstinence (Hallman 2004, 2005). In a similar vein, Harrison et al. (2001) found that common stereotypes of adolescent sexual behaviour point to multiple sexual partners, relationship with older men, sexual intercourse for money or other benefits, and coercive

sex. Gender has been found to interact significantly with peer norms to predict sexual behaviour (sexual activity and lifetime multiple sexual partnerships), and peer norms and the experience of intimate partner violence were significantly associated with sexual risk behaviour among girls who participated in a study in a poor urban community in South Africa (Rogan et al. 2010).

In another study, more males than females reported multiple and/or concurrent sexual partnerships and another 25% of females had partners who were five years older than they were, reinforcing past findings around transactional sex. Non-participation in civic organisations or school was correlated with higher-risk partnerships for women. On average, serious relationships lasted more than a year for both sexes. Qualitative findings from the same study showed fluid partnership patterns: the sequential and overlapping nature of relationships with distance and mobility being important influences (Harrison et al. 2008).

The major reasons given by some South African young people for not using a modern contraceptive method at the first sexual intercourse were: that the first sexual encounter was unplanned and that no thought was given to contraception at the time of the first sexual intercourse (Nicholas et al. (n.d.); Harrison et al. 2005). Nicholas et al. (n.d.) however noted that the erroneous belief that having sexual intercourse only once or a few times protect one from the risks associated with unsafe sex may significantly influence young people to make the transition from virginity to non-virginity without using contraceptives. In the same vein, condoms have been linked to reduced sexual pleasure and condom use indicated lack of trust in one's partner's faithfulness, challenged male ego, and/or may indicate that one has an STI (Abdool Karim et al. 1992 cited in Nicholas et al.

(n.d.); MacPhail & Campbell 2001). Research in KwaZulu-Natal found that condom use is much less likely in long-term, established relationships with trusted partners (Maharaj & Cleland 2004 cited in Harrison et al. 2008).

The imbalance of power between male and female partners in heterosexual relationships reduces the ability of young women to either refuse sex or negotiate the use of condoms. Notions of masculinity that include the ideal of "flesh to flesh" sex with numerous partners are particularly well developed in South Africa, and prevent young women from adequately protecting their health (MacPhail & Campbell 2001 cited in Pithey & Morojele 2002; Morojele et al. 2006). While females can be punished for perceived unfaithfulness (MacPhail & Campbell 2001; Meyer-Weitz et al. 1998; Reddy & Meyer-Weitz 1997; Whitefield 1999 cited in Eaton et al. 2003), their male counterparts claim the right to have multiple sexual partners thereby reinforcing the idea of the double standard (Meyer-Weitz et al. 1998; Reddy & Meyer-Weitz 1997; Richter 1996 cited in Eaton et al. 2003). This idea also exposes young men to STIs including HIV/AIDS. Other factors hindering condom usage are lack of perceived risk; peer norms; condom availability; adult attitudes to condoms and sex; gendered power relations and the economic context of adolescent sexuality (MacPhail & Campbell 2001).

A substantial number of studies have focused particular attention to the gender aspect of adolescents' sexuality; many of the findings of the studies examined are sample-specific and not generalisable, while very few of the studies use longitudinal study designs despite the advantages of such designs over cross-sectional ones (Anderson et al. 2007; Dinkelman et al. 2007). Using one wave of panel data makes it equivalent to a cross-sectional study with its limitations. In addition, many of the findings from the various studies are limited

and inconclusive due to limitations of either data or methodology. Therefore, using Cape Area Panel Study datasets to test past findings relating to adolescents' sexuality in South Africa makes a lot of sense because it will shed considerably more light on the various determinants and the impact of intervention programmes.

The fact that violence within sexual relationship is a normal phenomenon has been documented in South Africa (Wood & Jewkes 1997; Hoffman et al. 2006). For instance, Wood and Jewkes found widespread male coercion and violence within sexual relationships in Cape Town. In their discussions, they found that few were in relationships that did not involve physical violence. In fact, coercion and violence were so common that many of the young women who participated in the study understood it as an expression of love. The researchers found that sex among adolescents often involved very little negotiation or communication. Condom use is a particularly difficult topic among youth in South Africa since it connotes unfaithfulness and uncleanliness, and many girls reported a fear of retribution for initiating a conversation on the topic (Varga & Makubalo 1996; Varga 1997 cited in Kaufman & Stavrou 2002). Intervention programmes must strive to increase negotiation skills and communication about sexual relations among young people.

Investigation of the experiences of young people in South Africa about sexual coercion, HIV or AIDS, and use of protection (LoveLife 2001 cited in Pithey & Morojele 2002) revealed a disturbingly widespread incidence of sexual coercion as more girls than boys have been forced to have sex (39% versus 7%). One-third of sexually-experienced girls and 15% of boys reported they were afraid of saying no to sex probably because it could trigger conflict. This agrees with findings from Swaziland and Kenya where being a male is protective against sexual coercion (Buseh 2004; Erulkar 2004).

Closely related to the point above is the role of communication and gender role ideals among sexual partners, Varga (1997) in KwaZulu-Natal reported that communication between partners was poor, and that young women appeared powerless to enforce their preferences in sexual situations. It was also reported that AIDS was not a significant factor in any aspect of sexual decision-making, but that socio-cultural factors and the state of the HIV pandemic in South Africa do matter. The low level of communication between partners may be the result of the kind of socialisation given to both sexes during the process of development to adulthood. Men are socialised to be in control especially when it comes to sexual matters and women are brought up to be submissive and quiet. As a result, females are expected to leave all decision to their male counterparts, who take all the decisions regarding sexual relationships. This kind of finding agrees with what was found in the south-eastern part of Nigeria (Izugbara 2005).

The low level of communications among sexual partners due to gender role ideals which are basically patriarchal in nature has implication for the transmission of HIV and AIDS among young people in the study area; prevention and intervention programmes that will be effective in that kind of setting must therefore weaken and eliminate gender roles that could predispose young women to high-risk sexual activity and its attendant negative consequences (Varga 1997). Varga, (2003) in another study of adolescent childbearing and parenthood in KwaZulu-Natal found that gender ideals are grounded in traits that reinforce poor sexual negotiation dynamics and behavioural double standards and that such ideals place adolescents at risk for early pregnancy and other sexual and reproductive health complications. This evidence was based on a triangulated research methodology that combined focus group discussions, narrative role-playing, discussions, and the use of

questionnaire and in-depth interviews. The study concludes that, overall, adolescent parenthood is viewed negatively by participants of both sexes because it compromises personal, professional and financial aspirations of the victims, especially females. In spite of the negative attitude toward adolescent parenthood, it has been found to be a serious problem generally in South Africa. However, teen pregnancy is not entirely inconsistent with continued schooling; especially for African (black) women, as more than half of African women who were pregnant at age 16 or 17 were enrolled in school the following year (Marteleto et al. 2008).

The above-mentioned study reveals a discrepancy between attitude to and practice of the behaviour of the adolescents, contrary to what social psychological theories posit. Some social psychological theories such as the Theory of Reasoned Action or the Theory of Planned Behaviour assert that attitudes influence behaviours while distinguishing between volitional and non-volitional behaviours, but this has been proved otherwise here. This study, although very important and relevant, tells us little about the larger and broader contexts of sexual behaviour in the study area. Having information about the contextual factors and the reasons why young people do what they do will help in designing effective intervention programmes.

Kaufman et al. (2002, 2004) noted a high level of unprotected sex and risky sexual behaviour even in the midst of high levels of knowledge about the consequences of such actions in South Africa, and that research has focused on the dynamics of individuals' and partners' sexual decision-making to the detriment of the larger context in which those decisions are made, especially in South Africa. As a result, in a study employing time-use data and data on education, work, and activities of adolescents collected from a

representative sample of 2,992 young people aged 14 to 22 living in KwaZulu-Natal, Kaufman and colleagues explored adolescents' everyday experiences that influence risk-taking; whether young people with little to do are more likely to engage in risky behaviour; and whether community opportunities of schooling, work, and other activities make a difference. They found that levels of education in the community were positively associated with not having had sexual intercourse in the last 12 months.

Levels of wages in communities were positively associated with condom use for both boys and girls. Levels of sports activity in communities had a positive association with risk-taking among boys and a negative one among girls, and finally, within the household, education of adults had a positive effect on condom use for both boys and girls. This finding reveals to some extent the importance of understanding the context of sexual and reproductive behaviour as this understanding will reveal which institutional and community factors are most influential so that they can then be the target of intervention programmes (Kaufman et al. 2002, 2004).

Buga et al. (1996) found no significant relationship between the presence of parents and initiation of sexual activity as the majority of the sexually-experienced and sexually-inexperienced girls were living with both parents. This is, however, contrary to findings elsewhere which show that the presence of parents is an important factor; the conflict in result findings may be due to research design and sampling bias. McGrath et al. (2009) found mother's membership of the same household to significantly delay transition to first sex. In line with the presence of parents, poor communication between young people and significant others such as parents and public health practitioners such as nurses had been reported in South African studies (Kelly 2000; Kelly & Parker 2000 cited in Eaton et al.

2003), and this often led to poor sexual outcomes such as having sexual intercourse without condoms (Wood et al. 1997b; MacPhail & Campbell 2001 cited in Eaton et al. 2003).

It has been found in other settings that living in a two-parent family and having peers who are not indulging in risky sexual behaviours is protective against risky sexual and contraceptive behaviours (Billy et al. 1994). However, much remains to be known and learnt with regard to how family structure affects the sexuality of young people considering the high level of marital disruptions in South Africa. This study is therefore interested in investigating how living as an orphan, in a one-parent family or in a two-parent family impacts on the sexual and contraceptive behaviours of adolescents and young adults in the study area using a longitudinal design.

The unclear nature of the relationships that exist between alcohol or drug use/abuse and young people's sexual behaviour has been documented in South Africa. While some studies indicate significant association (McGrath et al. 2009), others did not (Flisher et al. 1996a, b; Morojele et al. 2000; Parry et al. 2001 cited in Pithey & Morojele 2002). For instance, a study examining the relationship between alcohol and other drug use and respondents' HIV status in three major South African cities found no age differences with regard to HIV status; racial and gender differences in alcohol and other drug use and respondents' HIV status were confirmed; unexpectedly, HIV prevalence rates were higher among non-drinkers during the past year than they were among drinkers and the same trend emerged with respect to the correlation between use of various illicit drugs and the arrestees' HIV status (Parry et al. 2001 cited in Pithey & Morojele 2002). Under-reporting of alcohol/drug use by the respondents was pointed to as the likely reason for the

unexpected result. McGrath et al. (2009) found that "ever having used alcohol" significantly predicted earlier age at first sexual intercourse.

Another study in Grahamstown, Eastern Cape found significant associations between alcohol/drug use and number of sexual partners (alcohol/drug users have more sexual partners) and knowledge of HIV transmission (alcohol/drug users have better knowledge). However, alcohol/drug use was not significantly related to frequency of condom use or respondents' perceived risk of HIV infection. Also, a high level of knowledge regarding safe sex practices among the surveyed students did not translate to practice as only 15% of the sexually active respondents used condoms regularly (Simpson 1996 cited in Pithey & Morojele 2002). In Limpopo, teenagers with a history of substance-use tended to have multiple sexual partners (Mpofu et al. 2006).

Few studies have examined or made allusion to the context in which sexual intercourse is taking place among adolescents and young people in South Africa, as noted in the reviews of past studies (Eaton et al. 2003; Hartell 2005). However, there is evidence that social capital acts as a mediating factor in HIV prevention among youth, including girls, residing in rural, developing country settings (Morrison et al. 2005). In a study with young people in rural South Africa, it was found that young women living in a rural, poor Black township were less likely to be infected with HIV if they belonged to and participated in a community sports club or youth group. They were also less likely to participate in unprotected sex with casual partners (Campbell et al. 2002 cited in Morrison et al. 2005). This social capital enhances sexual health and promotes healthy well-being as it reduces the likelihood of HIV exposure and infection.

The social capital hypothesis links parental investment and club membership to youth sexual behaviour. Participation in clubs and community groups was also found to be associated with safer behaviours in the Cape Area of South Africa (Camlin & Snow 2008). The findings from that study emanated from cross-sectional data and it will be interesting to investigate this result using longitudinal survey data. I therefore propose that adolescents and young adults' participation in various institutional activities referred to as pro-social activities will be found to be negatively associated with the risk of early sexual initiation, multiple sexual partnerships; and positively associated with the likelihood of contraceptive use at first and last sexual intercourse, and consistency of condom use with sexual partners. However, no significant association was found between belonging to a religious group and initiation of sexual intercourse in Transkei, South Africa (Buga et al. 1996).

However, a mother's financial support (for clothing, school fees, uniforms, and pocket money) was found to be negatively associated with condom use, particularly among young women, suggesting that material need impels vulnerability to higher risk behaviours (Camlin & Snow 2008). From a study seeking to understand the inter-linkages between household and community income (as a form of social capital), economic shocks and risky sexual behaviour among 2,993 African and Coloured youth in Cape Town, there was evidence of increase in condom use and decrease in the incidence of multiple partners between 2002 and 2005 for females aged 17-22. Females in households with 10% higher income were 0.53 percentage points less likely to have experienced sexual debut by 2005; males in communities with a 10% higher poverty rate were 5 percentage points less likely to report condom use at last sex. Negative economic shocks are associated with a 0.04 percentage point increase in the probability of multiple partnerships for females. Lastly,

education is positively correlated with sexual debut for females and with multiple partnerships for both sexes (Dinkelman et al. 2007).

Further studies are needed to fully understand how social capital within the household and neighbourhood affects the sexual and contraceptive behaviour of young people in the study area in particular and South Africa in general. This study therefore seeks to empirically test the hypothesis that adolescents and young adults with external monetary support are less likely to initiate sexual intercourse early or have multiple sexual partners, and are more likely to use contraceptive at first and most-recent sexual intercourse, and consistently use condoms with last sexual partners.

Peer pressure in relation to sexual and contraceptive behaviours in South Africa encourages boys to adopt risky behaviours, while for girls, the sexually-inexperienced ones are often discriminated against by their sexually-experienced counterparts (Wood et al. 1997a cited in Eaton et al. 2003). However, with regard to negative peer pressure, young men are often more affected than young women (MacPhail & Campbell 2001). Studies of this nature in South Africa are biased toward Black/African adolescents and young people. It would be enlightening to investigate how peer pressure and other contextual factors affect the other race groups in South Africa.

Evidences linking physical and organisational environment to sexual and contraceptive behaviours have shown that access is never a big problem with regard to obtaining condoms because there are different sources through which young people can access them; but the negative attitude of health practitioners, the fact that condoms are not always available and the lack of condoms when needed none of which necessarily prevents the

young people from having sexual intercourse were indicted in low use of condoms (Disler 1990 cited in Eaton et al. 2003; MacPhail & Campbell 2001). In terms of access to media, the young people in urban areas were found to be more knowledgeable about HIV/AIDS than their rural counterparts (Kelly 2000 cited in Eaton et al. 2003).

Also, living in areas with high unemployment and without recreational facilities has been linked to youth experiment with sex (Kelly & Parker in Eaton et al. 2003). Moreover, living on the street has been linked to high risk sexual behaviour among young people as they tend to have more concurrent sexual partners and tend not to use condoms (Kruger & Richter 1996 in Eaton et al. 2003). In addition, being in prison as an awaiting trial prisoner is a risk factor for HIV infection, especially in the context of gang violence and rape by those boys who had been raped (De Ridder 1997 cited in Eaton et al. 2003). One of the few contextual studies in South Africa, although cross-sectional in design and biased towards young Black South Africans, found that net of individual and household characteristics, higher levels of community-concentrated disadvantage are associated with increased risk of unprotected sex among young men, while higher levels of social disorder are associated with lower risk among women. Also, higher levels of social cohesion delay sexual initiation among young men while social disorder remains associated with the hazard of sexual initiation among young women, after adjustment for individual and household characteristics (Burgard & Lee-Rife 2008).

A study that examined consistent use of condoms among South African youths during their most-recent sexual relationship found partner communication to be protective against inconsistent condom use, while longer duration of sexual relationship and higher frequency

of sexual activity were found to be factors exposing young South Africans to the risk of sexual activity without consistent use of condoms (Moyo et al. 2008).

2.5 Evidence from Qualitative Studies addressing Young People's Sexuality and Sexual Behaviours

Qualitative research has been found to be very useful in the assessment of complex processes, and in describing and finding reasons for any kind of behaviour and its social context (Williamson et al. 2009; Marston & King 2006). The findings from a systematic review on factors shaping the sexual behaviours of young people around the world between 1990 and 2004 show that young people have an unreliable way of assessing potential sexual partners as "clean" or "unclean"; sexual partners are forces to be reckoned with when it comes to sexual behaviour; condoms as a method of protection against disease or pregnancy are stigmatising and often associated with lack of trust and infidelity; gender stereotypes are important factors in determining social expectation and behaviour; there are punishment and benefits for sex from society; reputations and social displays of sexual activity or inactivity are important; and social expectations hinder communication about sex and the use of protection during sexual encounters (Marston and King 2006).

Williamson et al. (2009), in their review study focusing on developing countries (sub-Saharan Africa and South-East Asia) between 1970 and 2006, found that despite a rural/urban differential, condom use was limited generally in the developing countries due to its association with disease and promiscuity, together with greater male control. Although the review covered five developing countries with heterogeneous conditions, the findings were common across different settings and contexts.

A qualitative study investigating the relationship between drug use and risky sexual behaviour found that such behaviour resulted from girls' powerlessness in sexual relationships, and boys' perceived invulnerability to HIV infection and the positive status associated with having multiple partners. Drug use was found to increase young people's vulnerability to risky sexual behaviour because of its effect on adolescents' inhibition, rational thinking, and safer sex negotiation skills (Morojele et al. 2006).

One community study in South Africa found that lack of perceived risk of HIV and AIDS, peer social norms and pressure, condom availability at the time of sexual intercourse, negative adult attitude to condom and sex, gendered power relations and economic disadvantage (poverty) to be factors hindering condom use among young people; and that male masculinity demands that they have sexual intercourse with many sexual partners without protection (MacPhail & Campbell 2001).

To wrap up this section, lack of information about the theoretical basis for data collection and analysis, as is the case in many of the South African studies, is disturbing, especially when one considers that data related to the effectiveness of school-based (and even out-of-school) programmes aimed at reducing risky sexual behaviours emphasise the use of theory in programme development as an important characteristic of effective education programmes (Brooks-Gunn & Furstenberg 1989; Kirby et al. 1991; Kirby 1992; Firestone 1994; Kirby 1992/1993 and Howard & McCabe 1990 cited in Goodson et al. 1997).

Studies attempting a systematic analysis of urban/rural differences with regard to adolescents' and young adults' sexual behaviour have been found to be very scarce in South Africa (Eaton et al. 2003). This is an indication of the need for such research. This

study will examine the salient dimensions of difference between childhood place of residence (urban versus rural) and sexual risk behaviour.

This study therefore challenges the existing paradigms of adolescent prevention and intervention programmes in South Africa in that it will contribute to designing and refining policies and programmes to improve the opportunities and capacities of young people and may contribute to changing behaviours and choices because of the particular focus on the important contextual factors measured in the study. Availability of longitudinal data (CAPS Wave 1-3) for this study is advantageous to the various questions, objectives and proposed hypotheses of this research, as they provide the opportunity to describe patterns of change, and to establish the direction and magnitude of causal relationships between peer, family, institutional and neighbourhood/community-level variables and the sexual/contraceptive behaviours of the young adults in the study area, while at the same time not neglecting the personal or individual-level factors.

The primary advantage of longitudinal data is that they can measure change and they allow for sophisticated analytic strategies to measure the impact of various covariates (non-time-varying like gender or race and time-varying like age, weight, income, exposure; metric and non-metric etc.) on the outcome variable with reasonable precision (Guo & Zhao 2000; Larsen et al. 2000). This is advantageous since the outcome variable can be measured in changes instead of levels, and in this way, other confounding factors can be eliminated from the estimates (Diggle et al., 2002; CALDER n.d.). Also, the benefits of a longitudinal analysis over a repeated cross-sectional study include increased statistical power and the capability to estimate a greater range of conditional probabilities (Yee & Niemeier 1996)

because certain conditional probabilities can only be estimated with longitudinal data (Solon 1989 in Yee & Niemeier 1996).

Finally, through the use of longitudinal data and the panel data model, unobserved heterogeneity that would typically doom a study to biased estimates and incorrect statistical tests can be eliminated in fixed effects models. These models can offer huge advantages over cross-sectional models; they can substantially reduce biases arising from non-random distribution and can separate the cohort and age effects in population studies (Pahwa & Blair 2002).

2.6 Synopsis of what had changed in South Africa between 2006 and 2012

Available evidence regarding adolescents' and young people's sexuality and sexual behaviour reveals that between 2005 and 2008 the changes in the percentage of South Africans 15-24 years old having sex before age 15 years were such that there was increasing risk behaviour (not statistically significant) among women and decreasing risk behaviour (not statistically significant) among men. Moreover, current data on sexual risks in relation to multiple sexual partners in the past twelve months among 15- to 49-year-olds and condom use at last high-risk sex among 15- to 49-year-olds for both sexes were not available or based on fewer than 50 respondents (UNAIDS 2012); this shows the paucity of recent data in this area in South Africa.

A recent cross-sectional study by Harrison et al. (2012) in rural KwaZulu-Natal among 14-17 year-old boys and girls shows that boys were significantly more likely to report lifetime sexual activity than girls. Less than half of the adolescent respondents reported condom use

at last sex, with discussion of condom use with a partner emerging as the strongest predictor of condom use. Age was independently associated with sexual activity for both genders and when sex of the respondents was controlled for, perceptions of male peer behaviour were associated with both ever having participated in sexual activity and condom use at last sex. Among girls, those who equated condom use with having numerous partners were more likely to use them. Also, expected gender beliefs are changing among boys, according to findings that suggest their support for girls' initiative in relationship formation and refusal of sex, which were significant predictors of sexual activity. Among girls, higher pregnancy risk perception and knowledge were associated with sexual activity.

Generally among youth in South Africa, the age at sexual debut has not changed in seven years (2002-2008), intergenerational sexual activity has increased especially among females, while multiple sexual partners has increased especially among young males. Condom use in general has been on the increase in all the provinces during the study period (Shisana et al. 2009). Ndinda et al. (2011) in their qualitative study among the Zulus in KwaZulu-Natal found that sex is still a taboo subject and discussion around it is concealed in the use of polite language, euphemisms and gestures. There are also gender and generational dimensions to the discussion of sex.

2.7 Theoretical Framework

Various theories and theoretical models have been proposed for predicting and understanding behaviour related to the sexual and reproductive health of the adolescents and young people. These theories are products of research in certain cultural contexts, especially from the English-language industrialised countries as well as countries in

Northern and Western Europe. The fact that the theories have not been sufficiently challenged by research in other cultural contexts such as in sub-Saharan Africa makes it imperative for more empirical research to be conducted to question their validity and usefulness (Aarø 1998).

Some of the relevant theories and theoretical models that have been used in other settings range from Socio-Psychological theories, Sociological theories/Family and Social Environmental theories, to Life Course Perspective. However, I chose to focus on Bandura's Social Cognitive Theory (SCT) as the basis of my analysis in this thesis because its applicability or otherwise to a developing country such as South Africa has not been exhaustively tested empirically, and because the type of questions asked during the Cape Area Panel Study, conducted between 2002 and 2005, are relevant for such empirical testing exercise. Also, in the absence of a universally, well-accepted model or theory of adolescent sexual behaviour, SCT has been applied across several prevention domains, such as cigarette smoking and substance abuse, with positive results, including behaviour change (Bandura 1994; Adolescent Reproductive Health Network (ARHNe) 1998; Goodson et al. 1997; Guiella & Madise 2007; Fatusi & Blum 2008; Sayles et al. 2006).

According to Bandura (1998), efforts that will significantly contribute to the betterment of adolescents and young adults' sexual and reproductive health must go beyond an individualistic perspective on health promotion and disease prevention; and health habits are rooted in familial practices, with schools having a vital role to play in promoting the health of the nation. It has also been noted that comprehensive approaches that bring together school- and out-of-school health programmes with peer, familial and community

efforts are more successful in promoting health than if a single institution tries to do it alone (Perry et al. 1992 cited in Bandura 1998).

2.7.1 Social Cognitive Theory (SCT)

The theoretical model used for this study as noted earlier is Social Cognitive Theory (SCT), developed by Bandura (1977a; 1986; 1989 cited in Pajares 2002). This theory is the most influential of at least three social learning theories and the most widely applied in health behaviour research (Glantz & Olderburg 1997). Specifically, SCT is a model of interpersonal behaviour that emphasises the influence of social norms and social support, and explains human behaviour in terms of a dynamic, triadic and reciprocal model in which behavioural factor, personal factors (such as affect, self-efficacy, beliefs), and environmental influences interact (Bandura 1986; Perry et al. 1990; Parcel & Baranowski 1981 cited in Goodson et al. 1997). Since sexual activity is essentially an interpersonal behaviour, which can be most adequately understood within a context of dynamic interactions among multiple and complex factors, SCT was judged appropriate for this study. Moreover, there is compelling evidence supporting the hypothesis that the most effective sexual risk reduction programmes for adolescents are the ones developed within the theoretical framework of SCT (Kirby et al. 1991, 1994; Kirby 1992 cited in Goodson et al. 1997). This theory explains how people acquire and maintain certain behavioural patterns and can be used for providing the basis for intervention strategies or to bring about a behavioural change (Bandura 1998).

2.7.2 Overview of Social Cognitive Theory

2.7.2.1 Core assumptions and statements

Social Cognitive Theory explains how people acquire and maintain certain behavioural patterns (Bandura 1997 in Pajares 2002). Evaluating behavioural change depends on environment, people and behaviour. *Environment* refers to the factors that can affect a person's behaviour such as social and physical environments; social environment includes family members, neighbours, friends and colleagues or peers, while physical environment can be the size of a room, the district of residence, childhood place of residence, the ambient temperature or the availability of certain foods. It had been argued that environment and *situation* provide the framework for understanding any kind of behaviour (Parraga 1990 cited in Pajares 2002). Situation refers to the cognitive or mental representations of the environment that may affect a person's behaviour. The situation is a person's perception of the place, time, physical features and activity (Glantz et al. 2002). The three factors environment, people and behaviour are constantly influencing each other, meaning that behaviour is not simply the result of the environment and the person, just as the environment is not simply the result of the person and behaviour (Glantz et al. 2002). The environment has been found to provide models for behaviour. *Observational learning* occurs when a person watches the actions of another person and the reinforcements that the person receives (Bandura 1997 in Pajares 2002). Hence, the concept of behaviour can be viewed in many ways. *Behavioural capability* means that if a person is to perform certain behaviour, he must know what the behaviour is and have the skills to perform it (Bandura 1998).

This theory has been applied in many research settings including developing countries (Guiella and Madise 2007; Sayles et al. 2006; Harrison et al. 2012). For example,

perceived self-efficacy to negotiate condom use predicts safer sex practices in adolescents (Basen-Engquist & Parcel 1992; Jemmott, Jemmott & Fong 1992; Jemmott et al. 1991; Kasen et al. 1992 cited in Bandura 1994). The influential role played by perceived self-efficacy in the management of sexual activities is documented in studies of contraceptive use by teenage women at high risk, which show that perceived self-efficacy in managing sexual relationships is associated with more effective use of contraceptives (Bandura 1998). SCT had been used to enhance perceived self-efficacy and skill in managing sexuality in various school-based and out-of-school preventive and intervention programmes (Gilchrist & Schinke 1983; Botvin & Dusenbury 1992; Jemmott & Jemmott 1992; Jemmott et al. 1991, 1992 cited in Bandura 1994; Sayles et al. 2006). In a study by Guiella and Madise (2007), about one-tenth of adolescent males had had sexual intercourse in the last twelve months with more than two partners but had not used condoms. Multivariate results show that the odds of using condoms increased with years of schooling and increased self-efficacy. Females who were very confident of getting a male partner to wear a condom (a measure of self-efficacy) were six times more likely to have used a condom at last sex than those who were not confident at all. Sayles et al. (2006), in their study predicting self-efficacy for condom use and sexual negotiation, successfully used the SCT.

Using Social Cognitive Theory as a framework for classification in a review, it was found in the U.S. that 61% and 47% of the forty-nine reviewed studies reported environmental and biological correlates respectively to be significantly associated with early initiation of sexual intercourse. Religious affiliation, a factor negatively associated with early onset of sexual intercourse, was a common environmental finding. One study reported that the church as a source of information about contraception was negatively associated with the

onset of sexual activity. Among biological factors, age was the most common variable positively associated with onset of sexual intercourse among girls. Also, race was a frequent finding, with being black associated with earlier ages of onset of sexual activity. Among factors classified under reciprocal determinism, church attendance was the most commonly reported finding (with a negative association). Other behaviours generally classified as risk behaviours such as drug use, cigarette smoking, and alcohol use were found to be positively associated with early sex for females (Goodson et al. 1997).

2.7.2.2 Commonly identified limitations of the Social Cognitive Theory

One of the commonly identified limitations of the Social Cognitive Theory is its comprehensiveness and complexity which makes its entire construct difficult to operationalise. Many applications of the theory focus on one or two constructs, such as self-efficacy, while ignoring the others. For example, none of the authors of the forty-nine reviewed articles reported by Goodson et al. (1997) referred to in the preceding paragraph, used all the constructs within the SCT. Alexander et al. (1989) included the environment, biological factors, and reciprocal determinism; Baker et al. (1988) included only the environment; Banks and Wilson (1989) included the environment, situation and expectations; Billy and Udry (1985) included only observational learning; while Pete and DeSantis (1990) included only behavioural capability.

However, this practice is contrary to the wishes of the proponent of the Social Cognitive Theory (Bandura 1998). Bryan and colleagues (2006) noted that despite the increase in research on condom use among young people in developing countries, the use of theory to guide research efforts is lacking, and that the findings appear more as a list rather than a coherent guiding framework upon which to base intervention programmes. This study tries

to overcome these limitations by including all the various construct of the SCT as shown in the original model, with some modifications in the analysis.

Also, a theoretical model such as Social Cognitive Theory is easily dismissed as being irrelevant to the situation in African and other developing countries. This claim is debatable. The fact that this theory has not been sufficiently challenged by research in other cultural contexts such as in sub-Saharan Africa makes it relevant until proven otherwise. Since it has worked elsewhere, I believe it can work in a middle-income, developing country such as South Africa. The need for research which can shed more light on the relevance of this model to a place such as South Africa has been identified (Aarø et al. 2008; Bandura 1998). In fact, SCT has been tested through pockets of studies on young people's sexual behaviours in non-western settings with success (Gallant & Maticka-Tyndale 2004; Bryan et al. 2006; Sayles et al. 2006; Fatusi and Blum 2008).

Moreover, contrary to what some researchers think, SCT recognises the importance of the environment, people and behaviour since it is a model of interpersonal behaviour that emphasises the influence of social norms and social support, and explains human behaviour in terms of a dynamic, triadic, and reciprocal model in which behavioural, personal factors and environmental influences interact (Bandura 1986; Perry et al. 1990; Parcel & Baranowski 1981 cited in Goodson et al. 1997; Bandura 1998) as I highlighted earlier.

Lastly, one area of strength of the SCT compared with other psychological models in explaining health behaviour is its ability to go beyond predicting health behaviours/habits to offering guidance on how to change such habits. Also, SCT is notable for the provision

of a unified conceptual framework, with its determinants embedded in a large body of knowledge that specifies the mechanisms through which they operate, and how to structure goals and incentive systems to heighten motivation for personal behavioural change (Bandura 1998).

2.8 Conceptual Framework for this Study (based on Social Cognitive Theory)

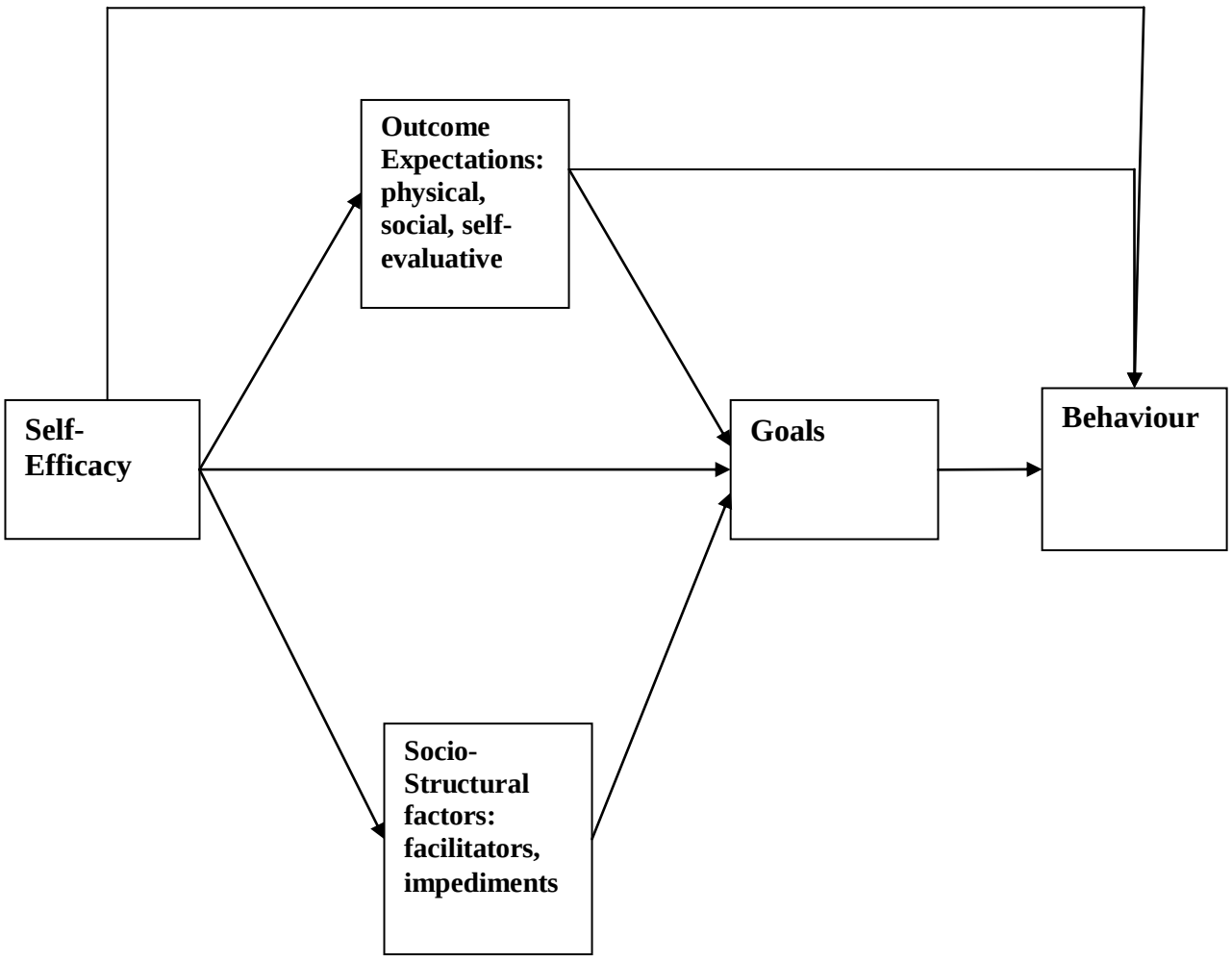
The conceptual framework adopted for this study is based on empirical research and the Social Cognitive Theory (SCT), having considered the constructs in the model and the nature of the questions asked in the Cape Area Panel Study. The framework was adapted from Bandura 1998 (p.7) cited in Adolescent Reproductive Health Network (ARHNe) (1998). The framework considers the outcome variables of interest (timing of sexual intercourse, using the age at first sexual intercourse); having sex with multiple sexual partners or not in the twelve months prior to the time of the survey; contraceptive use at first sexual activity and at the most-recent sexual intercourse; and consistency of condom use with last sexual partner on: (1) **Socio-economic/demographic/personal** factors; based on empirical evidences from past research on adolescents' sexuality; (2) **Self-Efficacy** in making decisions about the outcomes; (3) **Outcome Expectancies** (which are Physical, Social, or Self-evaluative); (4) **Goals** (which are either proximal or distal in nature); and (5) **Socio-Structural factors** serving as facilitators or impediments toward the sexual behaviour (which are personal or situational).

In the original model, constructs of self-efficacy, outcome expectations and goals are generally regarded as personal factors, while socio-structural factors serving as facilitators or impediments for any given behaviour are regarded as factors that could capture the environment in which the person subjected to such behaviour lives. The environment could

be physical or social and by extended application include the family, the school environment, peer characteristics and the immediate physical neighbourhood with its features.

Figure 1 below shows the original conceptual framework of relationship between the various operational variables/factors that correspond to the constructs within the SCT; and behaviours of interest in any population to be studied.

Figure 1: Social Cognitive Theory: Original model for prediction of behaviour



Adapted from Bandura 2004 cited in Aarø et al. 2008

Figure 1 shows the possible pathways through which the entire independent or intervening variables may impact behaviour. Self-efficacy can impact on behaviour directly or indirectly through outcome expectancies, or through outcome expectancies and goals. Also, self-efficacy factors can impact on behaviour through goals, or through goals and socio-structural factors serving as facilitators or impediments for such behaviour. Therefore, some of the constructs within the SCT that are testable with the type of questions asked during CAPS are distributed under the complete list of SCT, while personal and biological factors are added as a result of evidence from past empirical studies and because of their relevance to this study.

For example, age or educational background of the adolescents and young people can directly affect their decision on the timing of first sexual intercourse, whether to use protection and the consistency of condom use at subsequent sexual activities. I therefore propose that having relevant questions that can serve as proxies for all the constructs within the SCT will be of advantage in testing the validity of this theory especially in a "non-western" setting such as South Africa. Also, those family, peer, institutional, neighbourhood and community-level variables can be accommodated in the original model, especially under socio-structural factors serving as facilitators or impediments for young people's sexual and contraceptive behaviour.

2.8.1 Definition of the concepts used in this study based on the constructs in the Social Cognitive Theory

2.8.1.1 Socio-economic/demographic and personal factors

The background characteristics of the respondents in this study are established through the questions on socio-economic and demographic characteristics of the respondents such as age, educational level, sex, age at puberty (as a measure of pubertal development), race,

and work status. The selected socio-economic/demographic factors have been used in past studies investigating adolescents' sexuality within and outside South Africa and found relevant, as explained in the literature review.

2.8.1.2 Self-efficacy

Self-efficacy is the perceived ability or belief to perform a particular behaviour, and knowledge can impact this kind of ability (Bandura 1998). According to Bandura (1998), efficacy belief is a major basis for action, and exercise of control requires not only skills, but a strong sense of efficacy to use them effectively and consistently under difficult situations. Also, belief about one's capabilities will affect whether one makes good or poor use of the skills possessed, meaning that self-doubts can easily overrule the best of skills. Self-efficacy may be shaped by social norms, knowledge, outcome expectations and interaction with family, peer and community members (Sayles et al. 2006). With the type of questions asked during Cape Area Panel Study (2002-2005), and based on evidences from past studies; the self-efficacy construct will be operationalised using questions on self-control over one's life, self-esteem, and ability to use contraceptives and condoms at first sexual intercourse.

2.8.1.3 Goals (proximal or distal)

Goals relate to intentions about a specific behaviour. They can be proximal (relating to inter-personal relationships) or distal (cultural or structural) in nature. Goals serve an orienting function, regulating efforts and guiding actions. Long-range goals, opportunities in life and academic goals have been used in past research (Sayles et al. 2006). This construct is operationalised using questions such as expectation about success in matric

examination at the first attempt; and whether the respondents expected to live long, since there were no direct questions on sexual and contraceptive intention.

2.8.1.4 Outcome expectancies

This has been defined as the expected outcome of a specific behaviour, which could be physical, social or self-evaluative. For example, it relates to perceived severity of or susceptibility to disease, or the benefit of preventive action (Bandura 1998). It has been noted that the perceived benefits of abstinence, being faithful to one sexual partner or limiting the number of sexual partners, and the use of condoms are missing in literature addressing adolescents' and young adults' sexuality in South Africa (Eaton et al. 2003). This construct is operationalised using questions on beliefs about whether HIV and AIDS is preventable, as this is believed to be related to decisions about timing of first sexual intercourse, sexual partnerships and whether or not to use protection. Also included here are beliefs in condoms as a way of protection against HIV or AIDS, belief in abstinence as a way of protection against HIV or AIDS, and beliefs in keeping to one sexual partner and limiting the number of sexual partners as a way of protection against HIV or AIDS. Moreover, I include perceived vulnerability to HIV or AIDS and opinions about adolescents' and young people's premarital sexual activity.

2.8.1.5 Socio-structural factors (serving as facilitators or impediments)

Socio-structural factors are those factors that capture the elements of the broader society in which we live as humans. According to Bandura (1998), human agency operates within a broad network of social structural influences which could serve as facilitators or impediments for a particular behaviour, and health is conceived as the product of the

complex interplay of self-regulatory influence, biological endowment and socio-structural influences. Thus human agency captures a lot of other factors at the family, household, peer, school and neighbourhood levels. It is operationalised using questions about the religious affiliation of the respondents (in the absence of a variable on level of religiosity); childhood place of residence; use of alcohol/drugs; whether they were living in a no parent, single-parent or two-parents family structure; the type of school environment they were exposed to if they ever attended school; current school status; attitude to school or education; and circumstance of first sexual intercourse.

Other characteristics that were also captured under socio-structural factors include peer pressure to have sex; neighbourhood racial concentration; participation in prosocial activities; household external monetary support or social capital; neighbourhood poverty; childhood neighbourhood type and experience of early sexual debut. Some of these factors are composite in nature as groups of questions were used to generate the variable. The availability of data at the individual, household, peer, school and neighbourhood levels affords the opportunity to create such composite factors.

Some community-level variables were included in the CAPS dataset, which makes multi-level analysis possible. The community-level were generated based on the 2001 South African Census data at the main place, sub place, and voting ward level. There were 46 "main places" in Metropolitan Cape Town in the 2001 Census classification, which were broken up into 683 "sub places". The sub places were in turn broken up into 3,451 "small areas", which roughly correspond to the enumeration areas that were used as the Primary Sampling Unit (PSU) for CAPS (Lam et al. 2008). For the record, some of the socio-structural factors or variables generated and included in the CAPS dataset are mean years

of education for adults age 25-59; mean annual household income; the percentage of each sub-place in poverty; the percentage of female-headed households; household employment status. Others are percentage of households with have electricity for lighting and piped water inside the dwelling; the percentage of individuals from each population group (race); and the percentage of households in informal dwellings or shacks other than those in backyards. It is worthy of note that some institutional and community-level variables were generated from the responses of the adolescents and young adults interviewed because of their importance in this study.

Employing separate sources of macro- and micro-level data in a contextual analysis of individual-level dependent variable(s) has several important advantages, such as providing reliable and valid estimates of the structural parameters of the contextual units (Blalock 1985 in Brewster et al. 1993). Moreover, the possibility of correlated measurement error across levels of analysis is minimised (Mason & Entwisle 1983 in Brewster et al. 1993), as is the problem of multicollinearity (Tsui 1985 in Brewster et al. 1993). Therefore, including variables such as the magisterial districts and racial concentration of the respondents was very useful in capturing the type and characteristics of the neighbourhood when used in conjunction with past household surveys conducted in South Africa (see Adato & Haddad 2002 for the overview).

2.8.1.6 Sexual and contraceptive behaviours

The outcome variables for the study, otherwise referred to as the dependent variables, are: age at first sexual intercourse for those who had initiated sexual intercourse in 2002; sexual intercourse with multiple sexual partners within one year of the time of the survey (current multiple sexual partnerships); contraceptive use at first and most-recent sexual intercourse;

and consistency of condom use with the most-recent sexual partner. The question regarding age at first sexual intercourse for those who had initiated sex at the time of the study baseline was asked in the three waves of data collection, although the data for the second wave are few compared to the first and third waves; current number of sexual partners was asked in Waves 1 and 3; contraceptive use at first sexual intercourse was asked in Waves 1 and 3; while questions regarding contraceptive use at last sexual intercourse and consistency of condom were asked in all three waves of CAPS data collection.

Figure 2 below shows the multiple pathways through which the factors distributed and arranged in the complete list of Bandura's Social Cognitive Theory can affect the outcome variable(s) of interest as far as studies on adolescents' and young adults' sexuality are concerned. For example, socio-economic/demographic and personal factors can impact on any of the dependent variables of interest directly or indirectly through the construct of self-efficacy. Also, self-efficacy, which is an important variable in the model, can impact on the behaviour of interest directly or indirectly through goals, through outcome expectations and goals, or through socio-structural factors and goals. Goals can affect behaviour directly, as well as outcome expectations. Therefore, the models run and presented take into consideration the multiple pathways through which each of the variables can affect the sexual and contraceptive behaviours of the adolescents and young adults in the study.

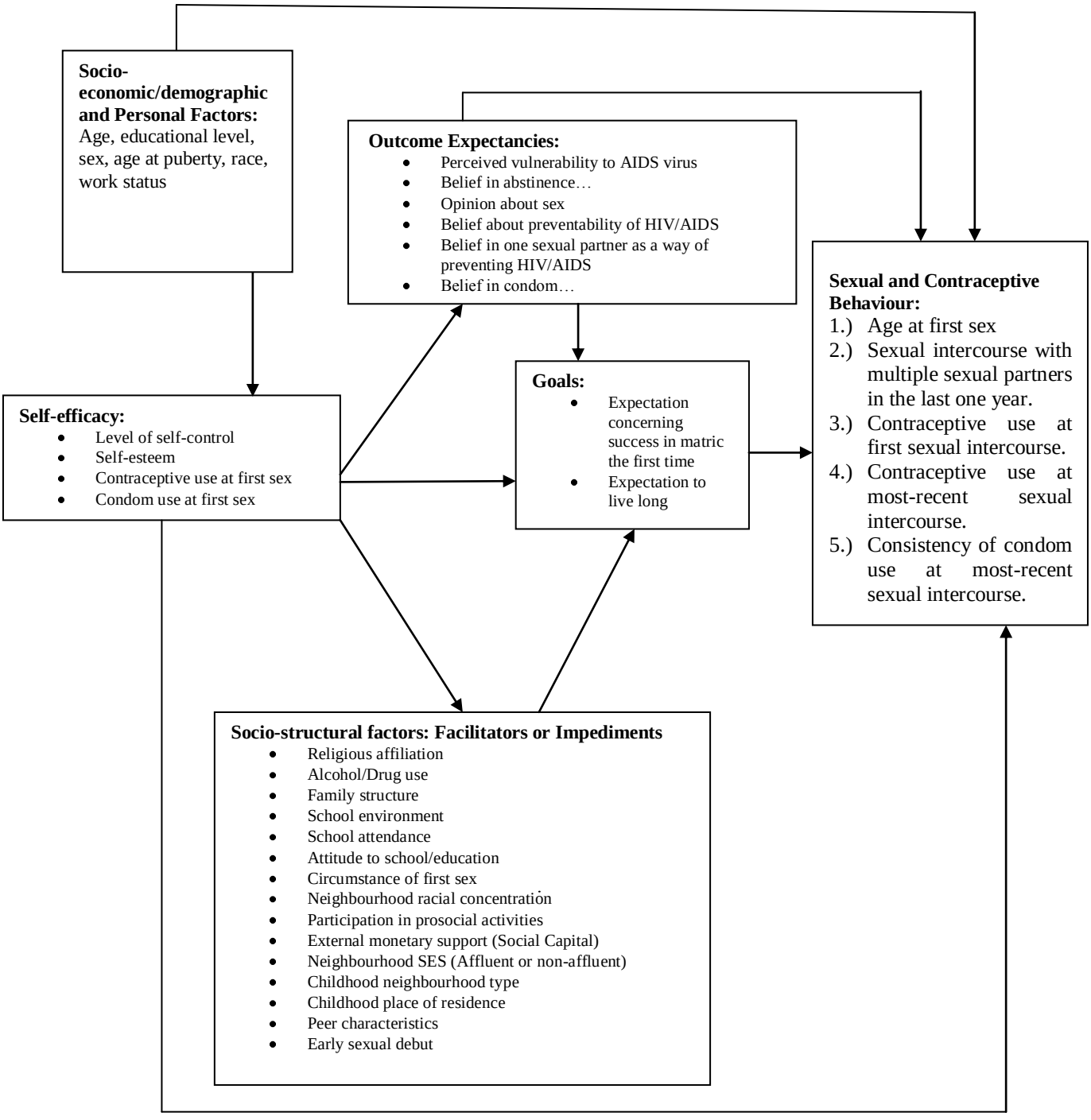
The socio-economic, demographic and personal factors are applicable to the five outcome variables, contraceptive use at first sexual intercourse as a measure of self-efficacy is applicable to the fourth outcome variable (contraceptive use at most-recent sexual

intercourse) while condom use at first sexual intercourse as a measure of self-efficacy is applicable to the fifth outcome variable (consistency of condom use). Expectation concerning success in matric (secondary/high school qualification) the first time and expectation to live long as measures of goals are applicable to all the outcome variables in the study, while perceived vulnerability to the AIDS virus and belief about the preventability of HIV/AIDS (a measure of outcome expectancies) are applicable to all the outcome variables in the study, while other outcome expectancies variables such as belief in abstinence as a way of preventing HIV/AIDS and opinions about sex are applicable to age at first sexual intercourse. Belief in one sexual partner as a way of preventing HIV/AIDS is applicable only to the second outcome variable: sexual intercourse with multiple sexual partners in the last one year, otherwise referred to as current multiple sexual partnerships (CMSPs), and belief in condoms as a way of preventing HIV/AIDS is applicable to the consistency of condom use with the last sexual partner.

Among the variables used as measures of socio-structural factors, most of them are applicable to all the outcome variables of interest in this study. The exceptions are the circumstance of first sexual intercourse, which is only applicable to age at first sexual intercourse contraceptive use at first sexual intercourse, and multiple sexual partnerships in the past twelve months; and early sexual debut, which is only applicable to current multiple sexual partnerships and contraceptive use at the event of first sexual intercourse.

The conceptual framework linking the constructs in the Social Cognitive Theory to the outcome variables of interest in this study is presented below:

Figure 2: Conceptual framework linking the SCT constructs and the sexual and contraceptive behaviours of young people in the study



Adapted from Bandura 1998, p.7 cited in Adolescent Reproductive Health Network (ARHNe) (1998), and Bandura (2004) cited in Aarø et al. (2008), but slightly modified by the author through the inclusion of socio-economic/demographic and personal factors.

2.9 Hypotheses for the Study

In accordance with the research questions, objectives, evidence from past empirical studies and theoretical framework employed for the analysis of this work, the main hypotheses tested in this study are:

(1a.) Adolescents and young adults with negative aspirations and attitudes toward education are more likely to initiate sexual intercourse earlier than their counterparts with positive educational aspirations.

(1b.) Adolescents and young adults with negative aspirations and attitudes toward education are more likely to have multiple sexual partners in the twelve months prior to the time of the survey than their counterparts with positive educational aspirations.

(1c.) Adolescents and young adults with negative aspirations and attitudes toward education are less likely to use contraceptive at first sexual intercourse than their counterparts with positive educational aspirations.

(1d.) Adolescents and young adults with negative aspirations and attitudes toward education are less likely to use contraceptives at the most-recent sexual intercourse than their counterparts with positive educational aspirations.

(1e.) Adolescents and young adults with negative aspirations and attitudes toward education are less likely to consistently use condoms with their last sexual partner than their counterparts with positive educational aspirations.

(2.) A community's racial composition (concentration of population group) is expected to influence adolescents' and young adults' sexual and contraceptive behaviours.

(3a.) Adolescents and young adults participating in various institutional activities (otherwise referred to as prosocial activities) are likely to have higher age at sexual debut.

(3b.) Adolescents and young adults' participating in various institutional activities (otherwise referred to as prosocial activities) are less likely to have multiple sexual partnerships in the twelve months prior to the time of the survey.

(3c.) Adolescents and young adults participating in various institutional activities (otherwise referred to as prosocial activities) are more likely to use contraceptives at their sexual debut.

(3d.) Adolescents and young adults participating in various institutional activities (otherwise referred to as prosocial activities) are more likely to use contraceptives at their most-recent sexual intercourse.

(3e.) Adolescents and young adults participating in various institutional activities (otherwise referred to as prosocial activities) are more likely to use condoms consistently with their most-recent sexual partners.

(4a) Adolescents and young adults with external monetary social support are less likely to initiate sexual intercourse early than their counterparts with non-monetary social capital.

(4b.) Adolescents and young adults with external monetary social support are more likely to have multiple sexual partners in the twelve months prior to the time of the survey than their counterparts with non-monetary social capital.

(4c.) Adolescents and young adults with external monetary social support are more likely to use contraceptives at first sexual intercourse than their counterparts with non-monetary social capital.

(4d.) Adolescents and young adults with external monetary social support are more likely to use contraceptives at the most-recent sexual intercourse than their counterparts with non-monetary social capital.

(4e.) Adolescents and young adults with external monetary social support are more

likely to consistently use condoms with their most recent sexual partners than their counterparts with non-monetary social capital.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the research design and methodology used in this study. It includes the description of the data used for analysis in this thesis and how it was collected, how the study was designed, information about the study site, the research participants, and method of data management, the study limitations and the ethical issues surrounding the collection of the data. The analyses rely on the secondary panel dataset collected during the study referred to as Cape Area Panel Study (CAPS) in Cape Town, South Africa; and this study uses the first three waves of data collected between 2002 and 2005 to answer the questions and objectives posed in this study, and to test the various hypotheses put forth.

The CAPS follows the lives of a large and representative sample of adolescents in Cape Town as they undergo the multiple transitions from adolescence to adulthood. The initial collaborating institutions on the CAPS were the University of Cape Town (UCT) and the University of Michigan, and researchers from these institutions work on the project. Other units involved in subsequent waves include UCT's Southern African Labour and Development Research Unit and the Research Program in Development Studies at Princeton University. Primary funding was provided by the National Institute of Child Health and Human Development of the U.S. National Institutes of Health (NIH). Additional funding was provided by the Office of AIDS Research, the Fogarty International Centre, and the National Institute of Aging of NIH, and by grants from the Andrew W. Mellon Foundation to the University of Michigan and the University of Cape Town (Lam et al. 2008).

3.2 Data

This study makes use of the first three waves of secondary data collected from the Cape Area Panel Study (CAPS) between 2002 and 2005 because Wave 4 data had not been collected when this study was proposed and approved in 2006. The Cape Area Panel Study (CAPS) is a longitudinal study of the lives of about 4,800 adolescents and young adults randomly selected in metropolitan Cape Town, South Africa. The first wave of the study collected complete information from 4,752 randomly selected young people aged 14-22 years between August and December, 2002. Wave 1 also collected information on all members of these young people's households, as well as a random sample of households that did not have members aged 14-22. A third of the youth sample was re-interviewed again around July 2003 (Wave 2a) while the remaining two-thirds were re-visited and interviewed before December 2004 (Wave 2b). The goal of Wave 2 was, first, to keep in contact with CAPS young adult respondents who had completed Wave 1 questionnaires during the three-year period before Wave 3, which was planned for 2005, and then to update areas of core panel data, such as employment, schooling and household rosters, as well as to introduce new modules to probe selected topics in further detail (Lam et al. 2008).

Wave 2a, in 2003, focused primarily on the topic of sex and AIDS, including AIDS stigma. The questionnaire included questions that updated data collected in Wave 1 together with new modules focusing primarily on attitudes toward HIV/AIDS. Wave 2b, in 2004, also included a mix of repeat questions to update data from 2002 and new questions focusing primarily on employment, unemployment and school choice (i.e. how and why students choose which school to attend, etc.). The new questionnaire included an expanded month-by-month calendar, on which was recorded on a monthly basis when the household was

affected by shocks (such as serious illness, death, job loss, or accessing a new grant), when the respondent was studying, when he or she was working or looking for work, and so on (Lam et al. 2008).

Between the months of April and December 2005, the full youth sample was then re-interviewed again (Wave 3) before the last wave in 2006. The primary focus of the Wave 3 young adult questionnaire was to update data on schooling, employment, pregnancies and births, and personal health. New components in Wave 3 included a detailed residential and schooling history, questions focusing on intergenerational transfers, time allocation, relationships with parents or guardians and a detailed history of all sexual partners. A total of 4,752 adolescents and young adults in Wave 1; 3,927 in Wave 2 (1,377 in Wave 2a in 2003; and 2,588 in Wave 2b in 2004); and 3,531 in Wave 3 completed the survey. Wave 3 also includes interviews with approximately 2000 co-resident parents of young adults and the study covers a wide range of outcomes, including schooling/education, youth employment and unemployment, health, sexual behaviour, fertility, HIV and AIDS, family formation, and intergenerational support systems (Lam et al. 2008).

The baseline wave of CAPS surveyed 4,752 young adults in 3,304 households representing 89,695 calendar years. As in most South African household surveys, response rates were high in African and Coloured areas and low in White areas, because Whites may perceive participation in the survey as having higher opportunity costs, hence reducing their likelihood of involvement. Also, Whites disproportionately live in gated communities, to which interviewers have limited access. Household response rates were 89% in African areas, 83% in Coloured areas, and 46% in White areas (Lam et al. 2006 in Marteleto et al. 2008). Young adult response rates, conditional on participation of the household, were

high, even in White areas. Given household participation, response rates for young adults were 93% in African areas, 88% in Coloured areas, and 86% in White areas (Lam et al. 2006 in Marteleto et al. 2008).

CAPS covers a range of aspects of adolescence, including especially schooling, entry into the labour market (i.e. employment, unemployment and job search), sexual and reproductive health including use and types of contraception, and experiences within families and households, to examine the extent to which opportunities facing South Africans have changed since the end of apartheid and to investigate how poverty and inequality are reproduced across generations. Most data were collected from the young people themselves, but data were also collected from parents and other older household members. The data on individuals and households were combined with community- and school-level data (Lam et al. 2006).

3.3 Study Design

CAPS used a two-stage probability sample of households and the first stage sample of census enumeration areas (EAs) was drawn using the 1996 census as a sampling frame because the 2001 census information was not yet available at that time. The EAs were divided into three strata according to whether the population of each was predominantly African, Coloured or White. A sample of primary sampling units (PSUs) was selected within each stratum with probability proportional to size (Lam et al. 2008). Due to the homogeneous nature of enumeration areas in South Africa with respect to race, African (Black) and White areas were over-sampled to obtain roughly equal numbers of Black, Coloured and White adolescents and young adults. The second stage randomly sampled households within each selected enumeration area. Within each recruited household, a

household survey was administered to one adult who was knowledgeable about the household and full-length youth questionnaires were given separately to up to three young people (Anderson et al. 2007).

The CAPS study was designed to represent all residents of Cape Town who were between the ages of 14 and 22 in late 2002. Ages 14-22 were included because it was observed that the patterns of inequality in society as a whole are rooted in the differentiation evident or generated in this age span. In order to select households, about 440 neighbourhoods were chosen from all parts of metropolitan Cape Town. Then about 25 households were randomly selected from each of these neighbourhoods. This was done by choosing, for example, every tenth house in a neighbourhood (systematic random sampling technique). As a result, the CAPS sample is representative of all geographic areas, population groups and income levels in Cape Town. Within the selected households, all young people between the ages of 14 and 22 years old were interviewed (Lam et al. 2006).

Completed interviews for 2,151 Blacks/Africans; 1,980 Coloureds and 621 Whites and other races were captured in 2002 (Wave 1). Once weights adjusting for survey design and Wave 1 non-response are applied, Blacks/Africans represent 15% of Wave 1 sample, Coloureds represent 59% and the remaining races constitute 26% of the sample. In 2003/2004, 3,927 were finally re-interviewed over two wave periods (1,377 in Wave 2a in 2003; and 2,588 in Wave 2b in 2004); while in the 2005 wave 3,531 of the initial 4,752 sample were re-interviewed, from 2,412 households of which 2,993 were Black/African or Coloured (25.6% attrition rate). Fifty-three percent of Whites were successfully followed in 2005, while attrition among Coloured and African sub-samples was substantially lower (21% and 36% respectively).

The reported results in this thesis are based on the analysis of unweighted sample of youths interviewed between 2002 and 2005. The data if weighted are representative of the entire cohort of adolescents and young adults in Cape Town because it has been found in earlier studies that weighting for attrition between 2002 and 2005 does not change any results substantially (Dinkelman et al. 2007). This is a confirmation of earlier findings using data from different settings including South Africa, that attrition is never a general problem for obtaining consistent estimates even though it has been intuitively believed by many analysts that attrition is likely to be selective on characteristics such as schooling, and thus that high attrition is likely to bias estimates (Alderman et al. 2001). The reasons for attrition among CAPS respondents include movement to other areas within South Africa or even abroad, sicknesses, crime leading to imprisonment, and death. The table below shows the summary of the response rate by race across the waves.

Table 1: Summary of the CAPS response rate by racial group in South Africa across Waves 2 and 3

	African	**Coloured**	**White**	**Total**
Wave 1 successful interviews	2151	2005	596	4752
Wave 2 successful interviews	1821	1693	413	3927
Wave 2 response rate	84.7%	84.4%	69.3%	82.6%
Wave 3 successful interviews	1515	1679	337	3531
Wave 3 response rate	70.4%	83.7%	56.5%	74.3%

Source: CAPS, 2002-2005 cited in Lam et al. 2008.

3.4 Study Area

The Western Cape is one of the nine provinces that make up the Republic of South Africa. It is located in the south-western part of the country and is the southernmost part of the continent of Africa. Before 1994, under the apartheid regime, it formed part of Cape Province but in 1994 it was divided into three new provinces, namely the Western Cape, Eastern Cape and Northern Cape. The current Western Cape province is now bordered by the Atlantic Ocean to the west and south-west, the Indian Ocean to the south and south-east, the Eastern Cape to the east, and the Northern Cape to the north. The province is divided into a single metropolitan area (the City of Cape Town) and five district municipalities of West Coast, Central Karoo, Overberg, Eden and Cape Winelands. The five district municipalities are in turn divided into 24 local municipalities (Groenewald 2008). In Cape Town, using the magisterial district data provided, the following magisterial districts were covered during the CAPS' interview: Bellville, Goodwood, Cape, Simon's Town, Wynberg, Mitchell's Plain, Kuils River, Somerset West, Strand and Malmesbury.

The study site is the Cape Area of South Africa (Metropolitan Cape Town) and it is the fifth most populous city in South Africa (Statistics South Africa 2011). It is the provincial capital of the Western Cape, as well as the legislative capital of South Africa, where the national parliament and many government offices are located. Cape Town is famous for its harbour as well as its natural setting in the Cape floral kingdom, including such well-known landmarks as Table Mountain and Cape Point. Often regarded as one of the world's most beautiful cities because of its geography, Cape Town is the most popular South African destination for tourism. According to the 2001 Census, the city had a population of 2.9 million (Cape Town Municipal Profile 2006); with a sex ratio of 92.36 (1,389,201

males and 1,504,045 females). The current population estimate projected to 2012 using the exponential growth formula ($P_t = P_o\mathbf{e}^{rt}$) with the growth rate of 1.06% (Statistics South Africa 2006) and time interval of eleven (11) years is approximately 3,258,642 an estimate that is significantly lower than the 2011 Statistics South Africa mid-year estimate of 5,287,863 (Statistics South Africa 2011). Cape Town's land area of 2,499 square kilometres (965 sq. miles) is larger than other South African cities, resulting in a comparatively lower population density of 1.158 people per square kilometre (2,999 sq. miles) (Cape Town Municipal Profile 2006).

Moreover, according to the South African National Census 2001, there were 759,767 formal households, of which 16.1% were headed by one person (Statistics South Africa 2001). Coloured people accounted for 48.13% of the population of Cape Town, followed by Blacks/Africans at 31%, Whites at 18.75% and Asians at 1.43%. Forty-seven percent (46.6%) of the population was under the age of 24, while 5% were over the age of 65. The median age in the city was 26 years old, and for every 100 females, there were 92.4 males. Nineteen percent (19.4%) of the city's residents were unemployed. Fifty-eight percent (58.3%) of the unemployed were Black/African, 38.1% Coloured, 3.1% White and 0.5% Asian (Statistics South Africa 2001). About 41% of Cape Town residents spoke Afrikaans at home, 28.7% spoke Xhosa, 27.9% spoke English, 0.7% spoke Sesotho, 0.3% spoke Zulu, 0.1% spoke Setswana and 0.7% of spoke a non-official language at home. Seventy-six percent of residents were Christian, 10.7% had no religion, 9.7% were Muslim, 0.5% Jewish and 0.2% Hindu, while 2.3% had other or undetermined beliefs (Statistics South Africa 2001).

About four percent of residents aged 20 and over had received no formal schooling; 11.8% had had some primary schooling; 7.1% had completed only primary school; 38.9% had had some high school education; 25.4% had finished only High School and 12.6% had an education higher than the High School level. Overall, 38.0% of the residents had completed High School. The median annual income of working adults aged 15-65 was ZAR 25,774. Males had a median annual income of ZAR 28,406 versus ZAR 22,265 for females (Statistics South Africa 2001). The Western Cape also generates a quarter of the South African agricultural sector's total gross income and more than half of South Africa's exports. The province is also a centre of energy development for the country.

The health indicators of Western Cape reveal slightly higher levels of malnutrition than nationally, despite the fact that the province is more affluent than most provinces. It also has the lowest fertility rate of all nine provinces in South Africa (TFR of 2.7 since 1991), while the prevalence of smoking in Western Cape was proportionally higher than South Africa as a whole. The HIV prevalence rate in Western Cape was estimated at 5.2% (Statistics South Africa 2004).

3.5 Questionnaire structure

The young adult questionnaire collected a mix of current and retrospective data on the lives of the respondents. Module A consists of questions on background characteristics. Much of the retrospective data was collected in the form of a life-history calendar (Module B), on which were recorded details of schooling, persons with whom the respondent had lived, pregnancies and births, year by year from birth to the present. Module C collected detailed data on schooling, including detailed results in the matriculation (school-leaving) examination, where appropriate. The schooling module asked about aspirations,

homework, transport to school and other issues. Module D on employment asked detailed questions about current work, the most recent work that a respondent had done if he or she was not working currently, and the first work that he or she ever did. The module also asked about job search and aspirations. Module E probed health and fertility, focusing primarily on past and present sexual behaviour, as well as pregnancy and birth histories and HIV and AIDS (Lam et al. 2006).

Again, this module included questions on aspirations and expectations. The questionnaire also included modules on kin and the young adults' relationships with them. Module F asked about biological parents who did not live in the same household (and who were therefore not included in the household roster in the household questionnaire). Module G asked about grandparents. Module H collected data on the young adults' relationships with parents, step-parents and others. Module I asked a range of other questions about the home and family environment in which young people had grown up. Finally, Module J collected limited data on what young people spent their time doing (Lam et al. 2006). Relevant questions from Modules A-E, I and J are used in this study.

The household questionnaire collected data on all members of the 'household', covering basic social and demographic variables, education, migration to Cape Town, work and income. The household questionnaire also collected data on the house and on household finances, including income, assets and debt. There was also a short module on shocks – including death, illness or injury, retrenchment and bankruptcy – and on how the household coped financially with these shocks. Questions from Module F of the household questionnaire will be of particular relevance in this study (Lam et al. 2006)

3.6 Statistical Methods, Models and Variables

The study employed the univariate method of analysis to generate the profile of the respondents (frequency tables), bivariate analysis (cross-tabulations using chi-square tests of associations as a measure of goodness of fit, correlation test for continuous variable such as age at first sexual intercourse and stepwise regression), and multivariate analysis using Generalised Linear Latent And Mixed Model (GLLAMM) (for multi-level logistic regression modelling) and Cox proportional hazards regression model.

Multi-level modelling was deemed appropriate for the sexual and contraceptive behaviours of adolescents and young adults in the study due to the potential advantage of such an analytical framework over other frameworks that solely concentrate on the individuals. Multi-level analysis has been found to encourage a systematic analysis of how explanatory variables measured at various levels of a hierarchical structure affect the outcome variable, including how the interactions among covariates measured at different levels affect the outcome variable; it also corrects for the biases in parameter estimates resulting from clustering (as a result of sample design), standard errors, confidence intervals and significance tests (Guo & Zhao 2000). Also, multi-level modelling is very helpful in the interpretation of possible fixed effects with respect to an outcome variable since it gives a more detailed description of sources and magnitudes of variation (Larsen et al. 2000).

Independent variables for this study are socio-economic/demographic and personal factors. The intermediate variables for the study, based on the SCT, are proxy questions for self-efficacy, outcome expectancies, goals and socio-structural factors acting as facilitators or impediments for the sexual and contraceptive behaviours of the young people in the study. Although some of the variables are intermediate or intervening variables, the effect of

some of these variables are examined to understand how they affect the outcome variables in the study.

As a result of the nature of the outcome variables used in this study and the hierarchical nature of the CAPS dataset (Guo & Zhao 2000; Larsen et al. 2000; Uthman 2008), multi-level logistic regression models were fitted to the data using GLLAMM, a Stata add-on program (Rabe-Hesketh et al. 2002) and Stata/SE version 12, to determine the predictors of the sexual and contraceptive behaviours among the adolescents and young adults studied, with particular emphasis on the contextual factors influencing the outcome variables, while the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used as a measure of how well the different models fitted the data. A lower value on AIC or BIC indicates a better fit of the model (Uthman 2008). The Cox proportional hazard regression model was used specifically for the modelling of age at first sexual intercourse since the data were supplied in single years (continuous variable) and the interest is in the survival of the adolescents and young adults with respect to sexual initiation. Sexual activity as used in this study refers to heterosexual sexual relations involving penetrative vaginal sexual intercourse between a boy or young man and a girl or young woman.

According to Guo and Zhao (2000), the two level model of the **multi-level logistic regression** can be written in the form shown below:

$$y_{ij} = \beta_0 + \beta_1 x_{ij} + U_j + e_{ij} \qquad (1)$$

where y_{ij} is the outcome variable for the ith unit at level one and the jth unit at level two, β_0 is the intercept, x_{ij} is the explanatory variable, β_1 is its effect, U_j is a random effect

accounting for the random variation at level two, and e_{ij} is the level-one random effect. The parameters for the random effects are $E[U_j] = E[e_{ij}] = 0$, $\text{var}(U_j) = \sigma^2_u$, $\text{var}(e_{ij}) = \sigma^2_e$, $\text{cov}(U_j, e_{ij}) = 0$, and $\text{cov}(U_j, U_{j'}) = 0$ for $j \neq j'$.

The within-cluster or intraclass correlation after controlling for the explanatory variable can be obtained from:

$$p = \sigma^2_u / (\sigma^2_u + \sigma^2_e)$$

Conceptually, equation 1 above can be re-written as:

$$\text{Log}[p_{ij} / (1-p_{ij})] = \beta_0 + \beta_1 x_{ij} + U_j \qquad (2)$$

where $\beta_0 + \beta_1 x_{ij}$ is the level 1 model fixed effect, $\beta_{0j} = \beta_0 + U_j$ is the level 2 model random effect, and U_j is the random effect at level two. Conditional on U_j, y_{ij} are assumed to be independent and as in the case of multi-level linear models, U_j is assumed to be normally distributed with the expected value of 0 and the variance σ^2_u. In this study, the outcome variables of interest with respect to the use of multi-level logistic regression behaviour are multiple sexual partnerships in the last twelve months to the time of the survey, contraceptive use at the first and most-recent sexual intercourse and consistency of condom use with the last sexual partner.

For the modelling of timing of first sexual intercourse (age at first sexual intercourse), the Cox proportional hazard regression model (also known as the Cox model) was used. This model is a multivariate technique for analysing the effect of two or more metric and/or non-metric variables on survival. It is the most general of the regression models because it is not based on any assumptions concerning the nature or shape of the underlying survival distribution. The model assumes that the underlying hazard rate (rather than survival time) is a function of the independent variables (otherwise called the covariates or risk factors); no assumptions are made about the nature or shape of the hazard function. Thus, in a sense, Cox's regression model may be considered to be a nonparametric method (StatSoft n.d.).

The **Cox Proportional Hazard Regression Model** is of the form below:

$$\lambda_i(t) = \lambda_0(t)e^{\Sigma\beta xi}$$

where $\boldsymbol{\lambda_i}$ is the rate at which individual i will transition to first sexual intercourse during the risk period, given that he or she was a virgin at time t. On the right-hand side of the equation, $\boldsymbol{\lambda_0}$ is the baseline hazard rate at time t for all individuals in the sample when all covariates are 0. In Cox models, $\boldsymbol{\lambda_0}$ is undefined. $\boldsymbol{\beta}$ is a vector of parameters associated with a vector of covariates, X_i, which contain the independent, intermediate and control variables. For a given covariate, the change in the baseline hazard is given by exp (β) (StatSoft n.d.). Cox's proportional hazards modelling has the advantages of being a robust semi-parametric method of calculating the probabilities of survival while simultaneously controlling for other possible confounding variables, and other attractive features include the relative risk type measure of association, no parametric assumptions, the use of the

partial likelihood function, and the creation of survival function estimates (Smith & Smith n.d.). The Cox proportional hazard model is based on the assumption that changes in the levels of the independent variables will produce proportionate changes in the hazard function, independent of time (Babalola 2004) although this may not always be the case (Walters 2009; Goodman et al. 2010). Hence, the analyses and risk estimates of the Cox model are biased when the interrelationships between the outcome variable and the time-varying variables are not well understood or when all the assumptions are not met (Goodman et al. 2010; Bellera et al. 2010).

The parameters of interest are variables ranging from individual levels to neighbourhood/community levels thought to influence adolescents' and young adults' transition into first sexual intercourse in the study area between 2002 and 2005. To understand the zero-order relationship between the independent/intermediate variables of interest and age at first sexual intercourse, survival analysis was carried out using the Cox model. Hazard ratios greater than 1 represent a positive effect on the rate of transition to first sexual intercourse (meaning that the independent variable is associated with decreased survival), and hazard ratios less than 1 signify a delaying effect on the rate of transition to first sexual intercourse (meaning that the independent variable is associated with increased survival) while hazard ratios equal to 1 means that the independent/intermediate variable does not have any effect on survival. The dependent variable for this model is age at first sexual intercourse supplied in single years by the adolescents and young adults in the study. Considering the physiological maturation of the body and the cognitive capacity for making a safe, informed, and voluntary decision, initiating and having sexual intercourse within the ages of 10 and 17 (a period categorised as early and middle adolescence) is considered risky and dangerous (Dixon-Mueller 2008).

The analysis of each of the four outcome variables using multi-level logistic regression was done in four steps. In Model 1 (empty model), no explanatory variable was included to allow the detection of a possible contextual effect in relation to the outcome variable because the model only contains a random intercept (Merlo et al. 2006). In Model 2, only the socio-structural factors were included because they are of particular interest in this study. Model 3 contains all the individual variables of the theoretical framework with the exception of the socio-structural variables, while Model 4 includes all the variables (personal/individual and socio-contextual) combined.

Table 2: Operational definition of variables as used in this thesis

Variable(s)	**Items**	**Measurement***
Dependent variables		
Age at first sexual intercourse	Age at first sexual intercourse measured in single years for those who were non-virgins as at the baseline in 2002 through 2005	Continuous variable ranging between 9 years to 26 years between 2002 and 2005.
Current multiple sexual partnerships (Sexual intercourse with multiple sexual partners in the past one year to the time of the survey)	How many sexual partners had in the 12 months prior to the time of the survey?	Given as a continuous variable: 0, 1, 2… (Recoded to 0 if no sexual partner/one sexual partner; and 1 if more than 1 sexual partners).
Contraceptive use at the first sexual intercourse	Use protection against pregnancy/disease at first sex	Yes = 1; No = 2 (Dichotomous); (Recoded to Yes = 1 and No = 0).
Contraceptive use at the last/most-recent sexual intercourse	Use protection against pregnancy/disease at last sex	Yes = 1; No = 2 (Dichotomous) (Recoded to Yes = 1 and No = 0).
Consistency of condom use	How often use condom as a method of protection with the last sexual partner	Always = 1; Usually = 2; Sometimes = 3; and Rarely = 4 **(Recoded to Yes = 1 if Always and No = 0 if others)

Socio-economic/demographic and personal factors		
Age	Age at last birthday	Given in single years 14, 15, 16…25 years (continuous variable) but categorized into <18 years=1; ≥ 18 years
Sex	Sex	Male = 1; Female = 2 (Dichotomous)
Race/ population group	The racial/population group according to traditional apartheid categories	Categorical (Black/African = 1; Coloured = 2; White = 4. (N.B: Indians/Asians (3) are very few in number (less than 1%) and are sometimes excluded by the system during the multivariate analysis).
Educational level	Highest educational level attained	Categorical from no formal education to others (Recoded to Primary = 1; Secondary = 2 and Tertiary = 3).
Work status	Do you currently have a job?	Dichotomous (Yes = 1; No = 2)
Pubertal development (using age at puberty (composite))	Age first noticed body maturing (Age at first menstrual period/age of puberty for boys merged)	Continuous variables (Age supplied in single years).
Self-efficacy		
Level of self-control	How much of self-control do you have over your life?	Categorical (Totally in control = 1; Control most things = 2 and Little or no control = 3)
Self-esteem	Self-rated life prospect	Categorical (Good life prospect = 1; Limited life prospect = 2 and Uncertain about life = 3)
	How happy are you about your life?	Categorical (Very happy = 1; Happy a little = 2 and Not happy = 3)
Contraceptive use at first sexual intercourse	Used protection against pregnancy/disease at first sex?	Yes = 1; No = 2 (Dichotomous); (Recoded to Yes = 1 and No = 0).
Condom use at first sexual intercourse	Used condom at first sexual intercourse?	Yes = 1; No = 2
Outcome expectations (physical, social, self-evaluative)		
Perceived vulnerability to AIDS virus	Assess your risk of HIV infection	Categorical (No risk = 1… Don't Know = 6) (No risk) recoded to Low risk = 1 and High risk = 2
Abstinence as a way of protection against HIV or AIDS	Is abstinence a way of protection against HIV or AIDS?	Dichotomous (No = 0; Yes = 1)

Sticking to one sexual partner as a way of protection against HIV or AIDS	Is sticking to one sexual partner a way of protection against HIV or AIDS?	Dichotomous (No = 0; Yes = 1)
Limiting sexual partner as a way of protection against HIV or AIDS	Is limiting sexual partners a way of protection against HIV or AIDS?	Dichotomous (No = 0; Yes = 1)
Condom as a way of protection against HIV or AIDS	Is condom use a way of protection against HIV or AIDS?	Dichotomous (No = 0; Yes = 1)
Attitude to sex (composite)	(i) Opinion: ok for boys to have sex before marriage? (ii) Opinion: ok for girls to have sex before marriage?	Categorical generated Liberals = 1; Conservatives = 0
Goals (proximal or distal)		
Expectation concerning success in matric	Do you expect to pass matric the first time?	Categorical (Yes = 1; No = 2; Don't plan to take = 3; Don't Know = 4)
Expectation to live long	Do you expect to live up to 80 years?	Categorised Yes = 1; No = 2 and Unsure = 3
Socio-structural factors: facilitators or impediments		
Religious affiliation	Faith group they belong to	Categorical (Christian = 1; Catholic = 2; Muslim = 3; None = 4 and Other = 5)
Type of place spent most of life (childhood place of residence)	Type of place where the young people spent most of their lives up to age 14 years	Categorical (Formal urban = 1; Informal urban = 2; Commercial farm = 3; Rural under chief = 4; Other rural = 5; and Others = 6). Recoded to Urban = 1 and Rural = 2
Neighbourhood racial concentration	Most numerous population group in the sub-place	Categorical (Africans = 1; Coloureds = 2 and Whites = 3)
Alcohol/drug use (Composite)	Consumed alcohol, cigarette, dagga/other drugs in the past month	Generated as Non-user=0; User=1
Circumstance of first sexual intercourse	Describe first sexual intercourse in terms of forced or not	Categorical (Willing = 1; Persuaded = 2; Tricked = 3; and Forced/raped = 4). Recoded as Willing=1 and Non-willing=2
Peers' sexual characteristics (activity)	How many of your friends have had sex?	Categorical (None = 1…most or all of them = 4; Unsure = 5).
Family structure (Composite)	Are your parents (mother; father) living with you in this household?	Generated No parent=1; Single parent=2 and Both parents=3
School attendance (Current school enrolment)	Are you currently in school?	Dichotomous (Yes = 1; No = 2)

Attitude to school attendance and punctuality (composite)	How often truant? How often refuse to do homework? How often come late to school?	Categorical (Always =1; Usually = 2; Often = 3; Seldom = 4; Never = 5; Don't Know = 6). Recoded as Negative attitude = 1 and Positive attitude = 2.
School environment (Composite)	How do you describe the type of school of school you are attending? 13 different types of problem in the school environment were highlighted.	Problematic school environment = 1 and Non-problematic school environment = 2.
Participation in pro-social activities (Composite)	Belong to? (i) sports group or team? (ii) a study group? (iii) a religious group? (iv) a music group? (v) some other youth group?	Generated from responses to five questions (Yes = 1; No = 2). Recoded to Participants in at least one= 1 and Non-participants in any = 2.
Neighbourhood SES/poverty	Using 1996 South African census classification. The magisterial districts were categorised into affluent or poor based on the 1995 October Household Survey (see Adato and Haddad 2002 for details).	Categorisation into 10 districts namely: Bellville = 101; Goodwood = 102; Cape = 103; Simon's Town = 104; Wynberg = 105; Mitchell's Plain = 106; Kuils River = 107; Somerset West = 110; Strand = 111; and Malmesbury = 132. Recoded to Affluent neighbourhood = 1 and Poor neighbourhood = 2
Childhood neighbourhood type	Growing up: Was there a problem drinker? Did someone use street drugs? Did someone spend time in jail?	Categorical (Yes = 1; No = 2) Recoded into problematic=1 and non-problematic=2).
External monetary support (Composite)	Do your parents give you money for non-school things? or Does anyone in the household receive grants?	Categorical (Yes = 1; No = 0)

*Measure as used in the analysis, and not necessarily the form in the original dataset. It has been found that in most developing countries, unemployment and poverty go hand in hand (Wilson & Ramphele 1989; Moller & Jackson 1997; May et al. 1998a, 1998b cited in Adato & Haddad 2002). The variable 'neighbourhood SES/poverty' was derived from the list of magisterial districts from which CAPS data was collected using census tract-level variables from the 1996 Census and 1995 October Household Survey,. Affluent neighbourhoods coincided with areas with low unemployment (employment rate of between 5.8%-9.8%) and a higher percentage of people with at least Standard 10 (completed High School) education) while poor neighbourhoods coincided with areas having higher unemployment rates (employment rate of between 10.6%-23.5%) and a lower percentage of people with at least Standard 10 education. According to this classification, the following neighbourhoods were deemed to be affluent: Cape, Strand, Somerset West, Bellville, Wynberg and Simon's Town; while the poor neighbourhoods are

Malmesbury, Kuils River, Goodwood and Mitchell's Plain. **Consistency of condom use was dichotomised for the purpose of multi-level logistic regression analysis.

3.7 Data Management and Analysis

The data for this study was analysed using Stata/SE 12 analytical package (StataCorp. 2011) with GLLAMM installed for the purpose of multi-level modellings (Rabe-Hesketh et al. 2002; Stata Journal n.d.). With particular emphasis on current multiple sexual partnerships at the third wave in 2005, xtmelogit command in Stata was used to model the log odds of such behaviour (StataCorp. 2011). Some of the variables of interest were recoded appropriately and other composite variables were generated based on a number of relevant questions asked during the study. This was done to generate responses deemed useful for the kind of analysis proposed. Also, the variable 'age at first sexual intercourse' based on the sexual activity status at the baseline through the third wave had to be cleaned because of inconsistent responses and the manner in which the variable was coded at the third wave in 2005. For instance, those adolescents and young adults who were asked about the status of their sexual experience in 2002 and 2003 were not asked during the third wave of data collection, which led to ambiguous categorisation such as 'already asked in the earlier wave', hence responses in the earlier waves were used to correct responses for the third wave. The data analysis in this thesis is restricted to the adolescents and young adults aged 14-22 years in 2002 who participated completely in the three waves of data collection between 2002 and 2005 (N=3,210). This was done to enable me to answer the research questions and meet the stated objectives of the study.

3.8 Addressing the Research Objectives

For the first objective, which is to identify the pattern/levels of sexual and contraceptive behaviours of young people in the Cape Area of South Africa, descriptive analysis was done using various statistics such as frequencies and percentages, chi-square and correlation tests. The chi-square test of association helps to ascertain the level of association between two categorical variables as a measure of the goodness of fit and the pairwise correlation coefficient is useful in testing association especially when the outcome variable of interest is continuous e.g. age at first sexual initiation supplied in single years.

To achieve the second objective in this study, which is the investigation of the changes in the reported sexual and HIV risk-related behaviours in the Cape Area of South Africa between 2002 and 2005, simple descriptive statistics and associations were carried out using chi-square and correlation tests. The outcome variables here are age at first sexual intercourse, current multiple sexual partnerships, contraceptive use at the first and the most-recent sexual intercourse, and consistency of condom use with the last sexual partner.

For the third objective, which is to determine the predictors of early sexual initiation, current multiple sexual partnerships and contraceptive behaviours among young people in the Cape Area of South Africa, survival analysis was carried out using Kaplan-Meier survival analysis, cumulative hazard function, hazard estimate, chi-square test and pairwise correlation coefficient. With the use of these statistical methods, the degree of association between the explanatory variables and the young people's sexual and contraceptive behaviours was identified.

Specifically, Kaplan-Meier survival analysis (also known as the product limit estimator), which is a univariate non-parametric technique for estimating time-related events, was used to understand the pattern of transition into first sexual intercourse as a whole, based on the characteristics of the respondents. It is applicable when length of follow-up varies from one person to the next, and the technique takes into consideration losses from the sample before the final outcome is observed (also referred to as censoring) (Kaplan & Meier 1958). This is the case, for example, in the variable 'age at first sexual intercourse' where the number of months and timing of experiencing the event varies from one respondent to another among those who have experienced the event, while some respondents were yet to experience the event (censored cases) at the time of measurement (that is, during the survey period). The Cox Proportional Hazard Model was used to estimate the risk of transition into first sexual activity. For multiple sexual partnerships, and contraceptive use at first and most-recent sexual activity, given the binary nature of the variables, a logistic regression model was used to unravel the factors impacting on the dependent variables in the study.

To examine the social contextual factors associated with the sexual and contraceptive behaviours of young people in the study area, as stated in the fourth objective, attention was focused on the socio-structural factors serving as facilitators or impediments for these behaviours throughout the multivariate-level analysis done in this study, in addition to other significant factors. GLLAMM was used here for multi-level modellings to investigate the social contextual factors influencing the sexual and contraceptive behaviours of the young people sampled. The statistical method used here was multi-level logistic regression (for current multiple sexual partnerships, contraceptive use at first and most-recent sexual activity, and consistency of condom with last sexual partner). The

relative importance of the socio-structural factors including the neighbourhood is captured through the estimation of the measures of variation or clustering such as the proportional change in variance (PCV) and intraclass correlation (ICC), otherwise known also as variance partition coefficient (VPC) and Median Odds Ratio (MOR) from the multi-level logistic regression models (Merlo et al. 2006; Uthman 2008). See Appendix E for the formulae for calculating the various parameters.

3.9 Study Limitations

This study is based on a secondary data analysis of Cape Area Panel Study and therefore has certain limitations, as outlined below:

One, there is no control whatsoever on the data that was used for the study. In other words, no manipulation of the data can be done beyond the questions that were originally asked, although some variables were either recoded or generated to suit the purpose of this study. Also, some variables were updated at the second wave based on the responses from the first and third wave. For instance, when age at first sexual intercourse supplied during Wave 2 was found to be inconsistent with the responses in the first and third wave, the responses during the second wave were corrected based on the consistency of the responses at the other two waves. The availability of responses at other waves helps to correct possible biases that could have been introduced into this analysis and the findings. Hence, this limitation may not be very serious in invalidating the findings in this study.

Two, the data is limited to the Cape Area of South Africa, and so the study is not representative of the entire population of adolescents and young adults living within the Republic of South Africa. Nevertheless, since it is a representative sample of adolescents

and young adults in the Cape Area, findings from this kind of study can inform policies and guide prevention programmes targeted at reducing risky sexual behaviours among the adolescents and young adults in the Cape Area, and by extended application, in the whole of South Africa. The implication of this is that a study such as CAPS should be carried out in other provinces so that we can fully understand the contextual factors significantly influencing the sexuality of South African youth as a whole. However, the objectives of this study were achieved within the bounds of the data available. Hence, the findings in this thesis should be interpreted in the context of Cape Area of South Africa.

Three, the validity or correctness of the responses given to the questions asked and used for the analysis in this thesis could not be ascertained. Racial group, for example, was self-assigned based on usual convention and traditional categorisation; whether the respondent had had sexual intercourse with one or multiple partners, numbers of sexual partners in the year prior to the time of survey, age at first sexual intercourse, condom use at most-recent sexual intercourse and consistency of condom use with the last sexual partner were self-reported. Hence, there is the possibility of response bias as far as the questions asked are concerned. Also, the correct use of condom as a method of protection could not be ascertained in this study, but this was not an objective of the study.

Four, some questions were asked during one wave and were not asked in the other waves, resulting in the utilisation of the lagged independent variables approach in which some independent variables measured for instance in Wave 1 (2002), for example age, sex and religious affiliation, were used to predict dependent variables measured in later waves (See Anderson et al. 2007). It would have been better if the same sets of questions were asked in all the waves although it is a known fact that they were the same kind of people followed

throughout the period of the survey. Also, the second wave of data collection concentrated on the sub-sample of adolescents and young adults who were interviewed at the baseline in 2002, hence, it is almost useless as far as trying to establish trends in sexual and contraceptive behaviours of young people is concerned. However, this study, for the first time to the best of my knowledge, has made use of the second wave to answer some research questions and the trends seem to be credible as far as data made available to me are concerned.

Five, it was clear that the CAPS was neither designed specifically to test the Bandura's Social Cognitive Theory, nor designed primarily to monitor the sexuality or sexual behaviour of the young people in the study area, hence, there were no direct questions related to the constructs embedded in that model. Also, the analyses in some instances suffered from lack of sufficient sample. This resulted in the switching of test statistics in the modelling of some of the variables. This study attempted to use only the questions thought to be relevant to the constructs within the theoretical model for the testing of the applicability of the theory. Clues regarding selection of important variables were however received from past published articles examining related and similar phenomena together with information on the constructs found in the original theoretical model used.

Six, this study is limited in the sense that some of the community-level variables were constructed from individual responses given, which could have been responsible for the lack of statistical significance observed during the multivariate analyses for some of the variables. It would have been better if diverse community-level variables had been included in the survey from the inception of the study in addition to those included in the

CAPS dataset. In spite of this, some important findings emerged which corroborate findings from earlier studies using different design or analytical/statistical techniques.

Seven, the data used were collected between 2002 and 2005 and so may not be reflective of the current situation with regards to adolescents' and young people's sexuality and sexual behaviour. However, much of the most recent literature available for the area with respect to young people's sexuality is still trying to make sense of the data used in this thesis, and so there is a need for new sets of data that build on the strength of CAPS.

3.10 Ethical Considerations

The responsible ethical review bodies at the University of Cape Town and University of Michigan approved the CAPS projects designs and Wave 1-3 instruments. This work uses the public dataset from CAPS. The appropriate authorities in charge of the distribution of data were contacted and due permission was obtained before the data were made available to me. The rules regarding proper referencing of the source of the data have been strictly adhered to. Whenever any paper is published using the data, it is expected that a copy of the publication be sent to Cape Town for proper documentation. In order to protect the confidentiality of CAPS respondents, public release data do not include identifying information such as names, contact details, names of schools, or names of employers. Information on the characteristics of schools and neighbourhoods is included in the data, although actual names are not provided (Lam et al. 2006).

CHAPTER 4: PROFILE OF THE ADOLESCENTS AND YOUNG ADULTS (CAPS 2002-2005)

4.1 Introduction

This section presents the descriptive statistics for the background characteristics of the adolescents and young people interviewed between 2002 and 2005, representing the first three waves of the Cape Area Panel Study (CAPS), including statistics revealing the patterns, levels and trends in sexual and contraceptive behaviours among the adolescents and young adults sampled. The selected variables include the socioeconomic, demographic and personal factors and all the other variables chosen to represent the constructs contained in Bandura's Social Cognitive Theory, which is the model of analysis for this study. Other variables included are measures of self-efficacy, outcome expectations, socio-structural factors serving as facilitators or impediments toward the behaviours of interest in this study, goals (which are either proximal or distal) and sexual behaviours of the respondents interviewed during the CAPS data collection exercise. The results describe the pattern of changes taking place in the adolescents' and young people's lives and the trends in their sexual and contraceptive behaviour between 2002 and 2005 in Cape Town.

4.2 Descriptive/univariate results

Table 3: Percentage distribution of the adolescents and young adults by socio-economic and demographic characteristics (CAPS 2002-2005)

Variable(s)	Wave 1 (2002)	Wave 2 (2003/04)	Wave 3 (2005)
Independent variables			
Age			
Less than 18 years	51.68 (1,659)	34.99 (381)	13.30 (402)
18 years and above	48.32 (1,551)	65.01 (708)	86.70 (2,621)
Total	100.00 (3,210)	100.00 (1,089)	100.00 (3,023)
Mean age of the respondents	17 years	19 years	20 years
Sex			
Male	46.14 (1,481)	45.59 (978)	46.17 (1,482)
Female	53.86 (1,729)	54.41 (1,167)	53.83 (1,728)
Total	100.00 (3,210)	100.00 (2,145)	100.00 (3,210)
Race/ population group			
Black/African	43.89 (1,409)	39.71 (851)	43.86 (1,407)
Coloured	47.26 (1,517)	49.93 (1,070)	46.91 (1,505)
White	8.85 (284)	9.61 (206)	8.82 (283)
Indian/Asian	-	0.75 (16)	0.41 (13)
Total	100.00 (3,210)	100.00 (2,143)	100.00 (3,208)
Educational level			
No formal education	-	-	-
Primary	21.48 (688)	4.48 (91)	-
Secondary	75.30 (2,412)	79.08 (1,607)	67.45 (833)
Tertiary	3.22 (103)	16.44 (334)	32.55 (402)
Total	100.00 (3,203)	100.00 (2,032)	100.00 (1,235)
Current work status			
Yes	52.07 (540)	27.85 (596)	39.41 (1,264)
No	47.93 (497)	72.15 (1,544)	60.59 (1,943)
Total	100.00 (1,037)	100.00 (2,140)	100.00 (3,207)
Age at puberty			
Mean age at puberty	13.59 years (N=3,027)	-	13.59 years (N=3,033)

Figures in parentheses are frequencies**.**

N.B: Some of the variables were limited to the first wave, especially the non-time-varying independent variables such as sex and racial group of the respondents. Others were limited to two waves, while others were asked during all the three waves. When the sex of the respondents was controlled for, the mean age at puberty was 14 years for both males and females with the range of 7 years to 20 years.

- means the question was not asked in that wave.

Table 3 presents the profile of the young respondents followed from Wave 1 in 2002 through to Wave 3 in 2005. The result shows that the age of the respondents ranged from 14 years to 22 years at the baseline, 14 years to 24 years in 2003/2004 and 16 years to 26 years in 2005. At the baseline, more than half of the respondents were less than 18 years of age, and about one-third at the second wave in 2003/2004, while about one-tenth were less than 18 years of age at the third wave in 2005.

Generally, observing the three waves between 2002 and 2005, more females than males were sampled, while the majority of the sample were Coloured, followed by Africans. Most of the adolescents and young adults interviewed had some secondary education at the three waves of data collection, while a little less than half were not working at the baseline survey in 2002; that proportion increased to 72% at the second wave in 2003/2004 and 61% at the third wave in 2005. The reported age at puberty for both boys and girls ranged from 7 years to 20 years with the mean age of puberty for the sampled respondents (males and females combined) of 13.59 years in 2002 and 2005. When the sex of the respondents was controlled for, the mean age at puberty was 14 years for both male and female respondents.

Table 4a: Percentage distribution of the respondents by self-efficacy factors (CAPS 2002-2005)

Variable(s)	**Wave 1 (2002)**	**Wave 2 (2003/04)**	**Wave 3 (2005)**
Independent/intervening variable			
Self-efficacy			
Level of self-control			
Totally in control	-	-	37.44 (1,200)
Control most things	-	-	50.42 (1,616)
Little or no control	-	-	12.14 (389)
Total	-	-	100.00 (3,205)
Self-esteem[1]			

[1] Self-rating of opportunity in life

Rating of life prospect			
Good life prospect	-	-	73.04 (2,341)
Limited life prospect	-	-	22.18 (711)
Uncertain about life	-	-	4.77 (153)
Total	-	-	100.00 (3,205)
Self-esteem[2]			
Degree of happiness			
Very happy	-	-	81.40 (2,609)
Happy a little	-	-	13.29 (426)
Not happy	-	-	5.30 (170)
Total	-	-	100.00 (3,205)
Condom used at first sexual intercourse			
No	3.77 (12)	-	66.76 (2,143)
Yes	96.23 (3,089)	-	33.24 (1,067)
Total	100.00 (3,210)	-	100.00 (3,210)

Figures in parentheses are frequencies. These questions were only asked at the third wave of data collection in 2005, with the exception of condom use at first sexual intercourse, which was also asked in Wave 1.

Table 4a reveals the distribution of the respondents by measures of self-efficacy in terms of level of self-control about life issues, self-rating of opportunity in life and the degree of happiness about life. It is clear from the table above that more than one-third of the respondents felt totally in control of their lives; about half felt they were in control of most things, while a little more than one-tenth felt they had little or no control of life issues. Also, almost three-quarters of the respondents rated themselves to have good life prospects, about one-fifth to have limited life prospects while only five percent rated themselves to be uncertain about life. Lastly, more than three-quarters were very happy about life, a little above one-tenth were somewhat happy, while only five per cent of the adolescents and young adults respondents were not happy at all about life. In 2002 the majority of the respondents reported using a condom at their first sexual intercourse while at the third wave in 2005 about one-third responded thus.

[2] how happy about life

Table 4b: Percentage distribution of the respondents by outcome expectancy factors (CAPS 2002-2005)

Variable(s)	Wave 1 (2002)	Wave 2 (2003/04)	Wave 3 (2005)
Outcome expectations			
HIV-risk assessment			
Low risk	94.04 (2,856)	88.32 (862)	92.36 (2,721)
High risk	5.96 (181)	11.68 (114)	7.64 (225)
Total	100.00 (3,037)	100.00 (976)	100.00 (2,946)
Belief in abstinence as a way of protecting against HIV?			
No	55.01 (1,674)	-	55.78 (1,704)
Yes	44.99 (1,369)	-	44.22 (1,351)
Total	100.00 (3,043)	-	100.00 (3,055)
Belief in one sexual partner as a way of protecting against HIV?			
No	82.47 (2,507)	-	79.80 (2,438)
Yes	17.53 (533)	-	20.20 (617)
Total	100.00 (3,040)	-	100.00 (3,055)
Belief in condoms as a way of protecting against HIV?			
No	10.78 (329)	-	16.24 (496)
Yes	89.22 (2,724)	-	83.76 (2,559)
Total	100.00 (3,053)	-	100.00 (3,055)
Opinion about sex[3]			
Liberal	-	22.33 (240)	-
Conservative	-	77.67 (835)	-
Total	-	100.00 (1,075)	-
Belief about preventability of HIV/AIDS			
Yes	94.79 (3,037)	-	95.41 (3,055)
No	5.21 (167)	-	4.59 (147)
Total	100.00 (3,204)	-	100.00 (3,202)

Figures in parentheses are frequencies. The questions about HIV-risk assessment were asked at all the waves; the other questions used here were asked at the first and third waves, except for opinion about sex, which was asked only at the second wave.

Table 4b shows that both at the baseline in 2002, and at the third wave in 2005, the majority of the young people sampled rated themselves to be at a low risk of contracting HIV, while more than half did not believe in abstinence as a way of protecting against HIV. A high proportion of the respondents did not believe in limiting their sexual partners to one and remaining faithful to them, both at the baseline and at the third wave. However, the respondents seemed to be comfortable with condom use as a way of protecting against

[3] The variable 'opinion about' sex is derived from a question "Is it alright for boys and girls to engage in premarital sexual intercourse?"

HIV/AIDS. When asked about their opinion on premarital sexual intercourse, about one-fifth of the respondents did not see anything wrong with engaging in vaginal sexual intercourse prior marriage. Lastly, almost all the adolescents and young adults sampled believed that HIV/AIDS is preventable.

Table 4c: Percentage distribution of the respondents by goal factors (CAPS 2002-2005)

Variable(s)	**Wave 1 (2002)**	**Wave 2 (2003/04)**	**Wave 3 (2005)**
Goals			
Expectation of success in matric at first attempt			
High educational aspiration	75.15 (1,957)	-	73.68 (585)
Low educational aspiration	24.85 (647)	-	26.32 (209)
Total	100.00 (2,604)	-	100.00 (794)
Expectation of living long (up to 80 years)			
Yes	-	-	45.12 (1,446)
No	-	-	7.86 (252)
Unsure	-	-	47.02 (1,507)
Total	-	-	100.00 (3,205)

Figures in parentheses are frequencies.

Table 4c shows the distribution of the respondents by their response to goal questions. It is clear from the table that a high proportion of the adolescents and young adults interviewed had high educational aspiration in terms of passing the matric examinations at the first attempt both at the baseline and at the third wave of data collection in 2005. Almost half of the respondents expected to live long up to age 80 years while almost half of the respondents were not sure whether they will live long up to that age. Specifically, eight per cent of the young respondents do not expect to live up to age 80 years.

Table 4d: Percentage distribution of respondents by socio-structural/contextual factors (CAPS 2002-2005)

Variable(s)	Wave 1 (2002)	Wave 2 (2003/04)	Wave 3 (2005)
Socio-structural factors[4]			
Religious affiliation			
None	11.21 (357)	-	-
Christianity	56.33 (1,794)	-	-
Islam	10.11 (322)	-	-
Others	22.35 (712)	-	-
Total	100.00 (3,185)	-	-
Alcohol/drug use			
Non-users	65.85 (2,113)	-	48.88 (1,567)
Users	34.15 (1,096)	-	51.12 (1,639)
Total	100.00 (3,209)	-	100.00 (3,206)
Family structure			
No-parent family	20.26 (650)	-	19.91 (615)
Single-parent family	37.89 (1,216)	-	41.44 (1,280)
Both-parents family	41.85 (1,343)	-	38.65 (1,194)
Total	100.00 (3,209)	-	100.00 (3,089)
School environment			
Non-problematic	24.08 (773)	-	-
Problematic	75.92 (2,437)	-	-
Total	100.00 (3,210)	-	-
School attendance			
Yes	68.31 (2,192)	58.17 (616)	36.75 (1,176)
No	31.69 (1,017)	41.83 (443)	63.25 (2,024)
Total	100.00 (3,209)	100.00 (1,059)	100.00 (3,200)
Attitude to education/school			
Negative school attitude	14.69 (471)	-	-
Positive school attitude	85.31 (2,736)	-	-
Total	100.00 (3,207)	-	-
Circumstance of first sexual intercourse (forced?)			
Yes	10.73 (142)	35.40 (120)	11.65 (254)
No	89.27 (1,182)	64.60 (219)	88.35 (1,927)
Total	100.00 (1,324)	100.00 (339)	100.00 (2,181)
Neighbourhood racial concentration			
African	43.83 (1,407)	-	-
Coloured	45.14 (1,449)	-	-
White	11.03 (354)	-	-
Total	100.00 (3,210)	-	-
Participation in prosocial activities			
Non-participants	42.94 (1,378)	-	-
Participants	57.06 (1,831)	-	-
Total	100.00 (3,209)	-	-
External monetary support[5]			

[4] Socio-structural factors are factors serving as facilitators or impediments toward a particular behaviour.

No monetary support	17.23 (542)	81.84 (1,757)	28.21 (868)
Monetary support	82.77 (2,603)	18.16 (390)	71.79 (2,209)
Total	100.00 (3,145)	100.00 (2,147)	100.00 (3,077)
Neighbourhood SES[6]			
Affluent	30.12 (967)	-	-
Poor	69.88 (2,243)	-	-
Total	100.00 (3,210)	-	-
Childhood neighbourhood type[7]			
Non-problematic	74.07 (2,377)	-	-
Problematic	25.93 (832)	-	-
Total	100.00 (3,209)	-	-
Childhood place of residence			
Urban	81.96 (2,612)	-	-
Rural	18.04 (575)	-	-
Total	100.00 (3,187)	-	-
Peer sexual characteristics[8]			
None of them	-	-	8.05 (258)
A few/some of them	-	-	33.41 (1,071)
Most or all of them	-	-	43.36 (1,390)
Unsure	-	-	15.19 (487)
Total	-	-	100.00 (3,206)

Figures in parentheses are frequencies.
– indicates that the question was not asked during the wave in question.

Table 4d above presents the percentage distributions of the respondents according to the measures of socio-structural factors. The table reveals that at the baseline in 2002 more than half of the respondents were Christian; more than half did not use drugs or alcohol 2005while in the proportion of Christians was less than half and the proportion of alcohol/drug users increased from about a third at the baseline to more than half. About one-fifth of the young respondents had no parent in 2002 while more than one-third were from single-parent families at both the first and third waves of data collection. The majority of the respondents reported a problematic school environment while the proportion of young people attending school decreased consistently between Waves 1 and 2, and between Waves 2 and 3.

[5] Money from both parents for non-school things or grant in the household?
[6] Measure of poverty at the Magisterial district level
[7] Availability of problem drinkers, drug addict and criminals when growing up?
[8] How many of your friends have had sex?

The majority of the respondents had a positive attitude toward schooling with less than one-fifth a having negative attitude, and at the baseline, one-tenth of the respondents experienced forced first sexual intercourse. This proportion increased to thirty-five per cent in 2003/2004 and fell significantly to twelve per cent in 2005. A little below half of the respondents lived in predominantly Coloured neighbourhoods (45%) followed by 44% living in Black/African neighbourhoods in 2002, with more than half indicating that they participated in one prosocial activity or the other (57%). At both the baseline and the third wave of data collection, a high proportion of the respondents indicated that they had access to monetary support either from their parents or their households, while close to seventy percent lived in relatively poor neighbourhoods in 2002. In 2005, one-quarter of the respondents were exposed to problematic neighbourhoods when growing up, with the majority having grown up in an urban place of residence, while close to half reported that most or all of their friends were sexually active (43%).

Table 5: Percentage distribution of the respondents by age at first sexual intercourse, current multiple sexual partnerships, contraceptive use at the first and most-recent sexual intercourse and consistency of condom use with the last sexual partner (CAPS 2002-2005)

Variable(s)	**Wave 1 (2002)**	**Wave 2 (2003/04)**	**Wave 3 (2005)**
Outcome variables			
Age at first sexual intercourse			
9	-	0.07 (1)	0.05 (1)
10	0.15 (2)	0.13 (2)	0.18 (4)
11	0.23 (3)	0.20 (3)	0.14 (3)
12	1.53 (20)	1.48 (22)	1.14 (25)
13	4.04 (53)	4.05 (60)	3.60 (79)
14	9.61 (126)	9.78 (145)	8.20 (180)
15	18.61 (244)	18.56 (275)	16.21 (356)
16	26.54 (348)	26.52 (393)	25.18 (553)
17	18.69 (245)	18.42 (273)	18.44 (405)
18	12.20 (160)	12.01 (178)	13.71 (301)
19	4.96 (65)	4.79 (71)	6.24 (137)

20	2.75 (36)	2.70 (40)	4.37 (96)
21	0.61 (8)	0.88 (13)	1.46 (32)
22	0.08 (1)	0.27 (4)	0.55 (12)
23	-	0.13 (2)	0.36 (8)
24	-	-	0.14 (3)
26	-	-	0.05 (1)
Total	100.00 (1,311)	100.00 (1,482)	100.00 (2,196)
*Median age at first sexual intercourse	16 years	16 years	16 years
Current multiple sexual partnerships			
<=1 sexual partner	70.77 (915)	N.A.	83.68 (1,667)
2+ sexual partners	29.23 (378)	N.A.	16.32 (325)
Total	100.00 (1,293)	N.A.	100.00 (1,992)
Mean number of current sexual partners	1.58 (2.09 for males versus 1.13 for females)	N.A.	1.17 (1.35 for males versus 1.03 for females)
Contraceptive use at the first sexual intercourse			
Yes	52.50 (693)	N.A.	59.31 (1,233)
No	47.50 (627)	N.A.	40.69 (846)
Total	100.00 (1,320)	N.A.	100.00 (2,079)
Contraceptive use at the most-recent sexual intercourse			
Yes	71.18 (889)	73.87 (441)	73.64 (1,497)
No	28.82 (360)	26.13 (156)	26.36 (536)
Total	100.00 (1,249)	100.00 (597)	100.00 (2,033)
Consistency of condom use with last sexual partner			
Always	68.77 (535)	76.30 (309)	46.87 (997)
Usually	9.90 (77)	12.10 (49)	6.30 (134)
Sometimes	14.52 (113)	4.44 (18)	25.15 (535)
Rarely/Never	6.81 (53)	7.16 (29)	21.67 (461)
Total	100.00 (778)	100.00 (405)	100.00 (2,127)

Figures in parentheses are frequencies. Data at the second wave in 2003/2004 represents a subsection of the entire sampled population except for the age at first sexual intercourse where adjustment has been done. *When the sex of the respondents was controlled for, the female median age at first sexual intercourse was 17 years at the third wave in 2005 compared to 16 years for their male counterparts. N.A. means that the question was not asked during that wave. The current number of sexual partners range from 0 to 20 sexual partners in 2002 (N=1,293), and from 0 to 10 sexual partners in 2005 (N=1,992). N.B: The totals are not the same due to missing values.

Table 5 reveals the percentage distribution of the respondents by their responses to the questions standing as proxies for the outcome variables in this study. It can be seen in the table that the age at first sexual intercourse ranged from 10 years to 22 years in 2002, 9 years to 23 years in 2003/2004 and 9 years to 26 years in 2005, with a median age of 16 years at first sexual intercourse at all three waves. When controlling for the sex of the

respondents, the median age at first sexual intercourse for males was 16 years in all the waves while for males it was 17 years at the third wave of data collection.

The current number of sexual partners for the sampled respondents ranged from 0 to 7 in 2005 with 84% either abstaining or having only one sexual partner at the third wave, an increasing trend as the percentage in 2002 was 71%. Only 16% of the respondents had more than one current sexual partner in 2005, compared with 29% at the baseline (as clearly shown in Figure 3), with the mean number of current sexual partners 1.14. With regard to use of any contraceptive method at first sexual intercourse, 53% percent reportedly used a method of contraception at the baseline, increasing to 59% percent at the third wave in 2005 (see Figure 4). With regard to whether they used any method of contraception at the most-recent sexual encounter, 71% reportedly used one or other method of contraception to prevent pregnancy or disease in 2002; the proportion increased to 74% percent at the second and third waves of data collection (see Figure 5). Moreover, more than two-thirds of the respondents reported always using a condom with their most-recent sexual partners at the baseline (69%); this proportion increased to 76% percent at the second wave and then decline to 47% at the third wave in 2005. This fluctuating trend in condom use consistency can be seen in Figure 6.

Figure 3: Patterns of current multiple sexual partnerships (CAPS 2002-2005)

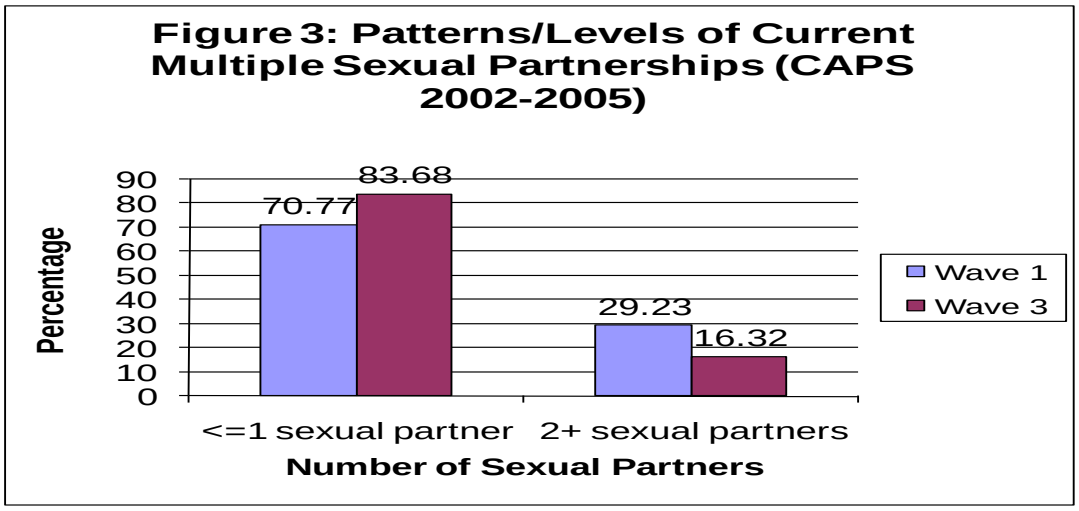


Figure 4: Levels and trends in contraceptive use at first sexual intercourse (CAPS 2002-2005)

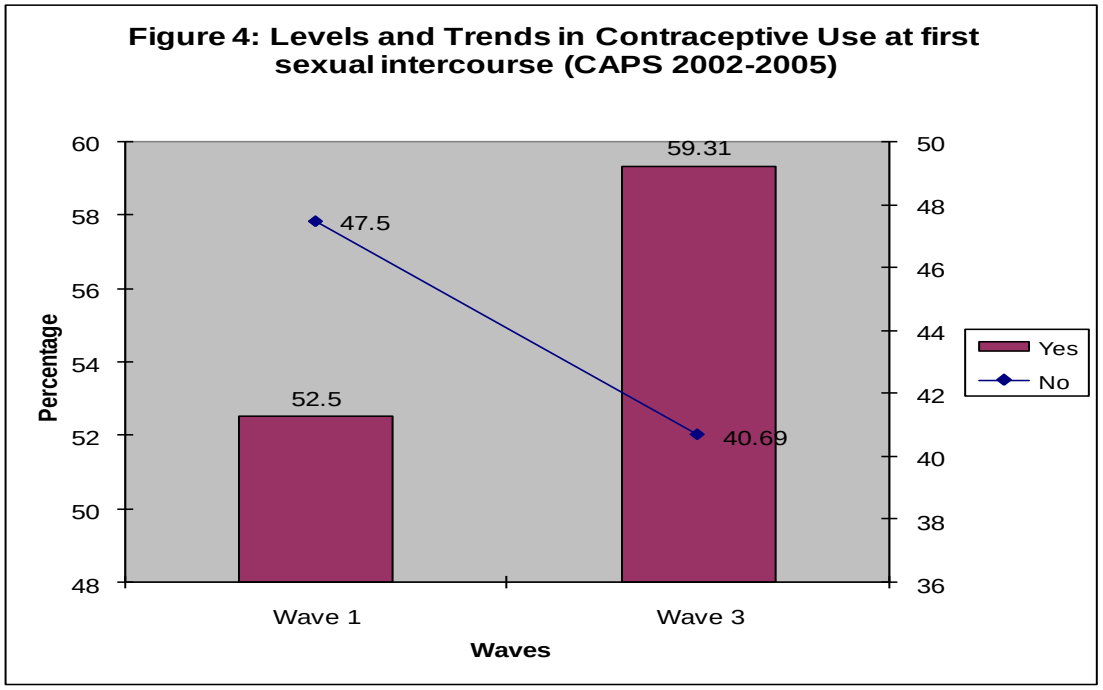


Figure 5: Levels and trends in contraceptive use at most-recent sexual intercourse (CAPS 2002-2005)

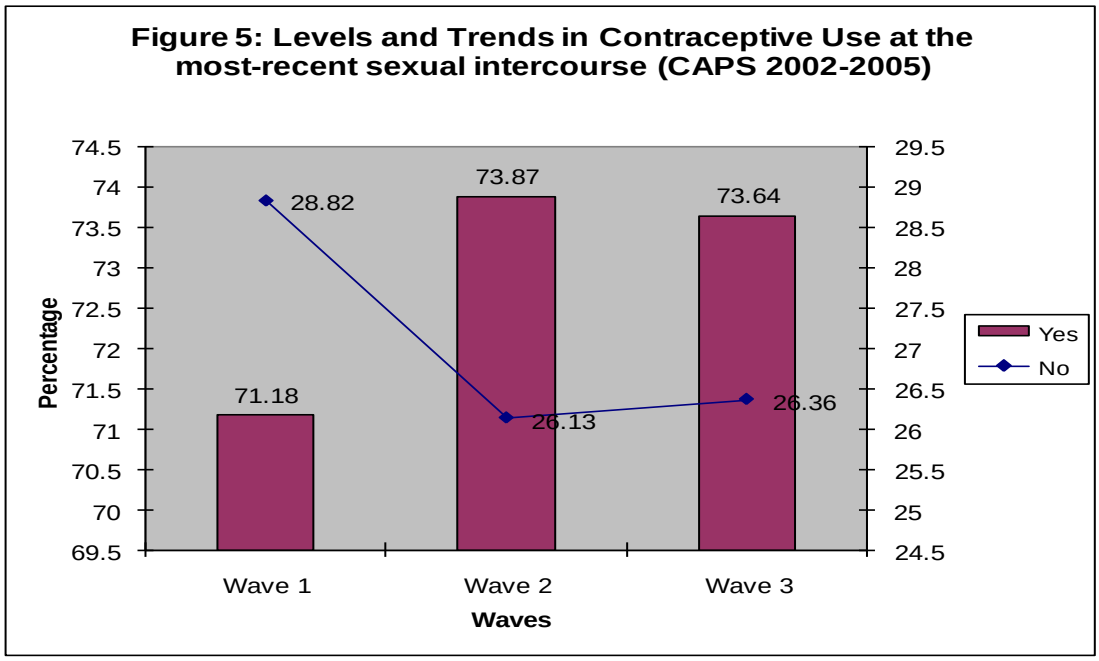
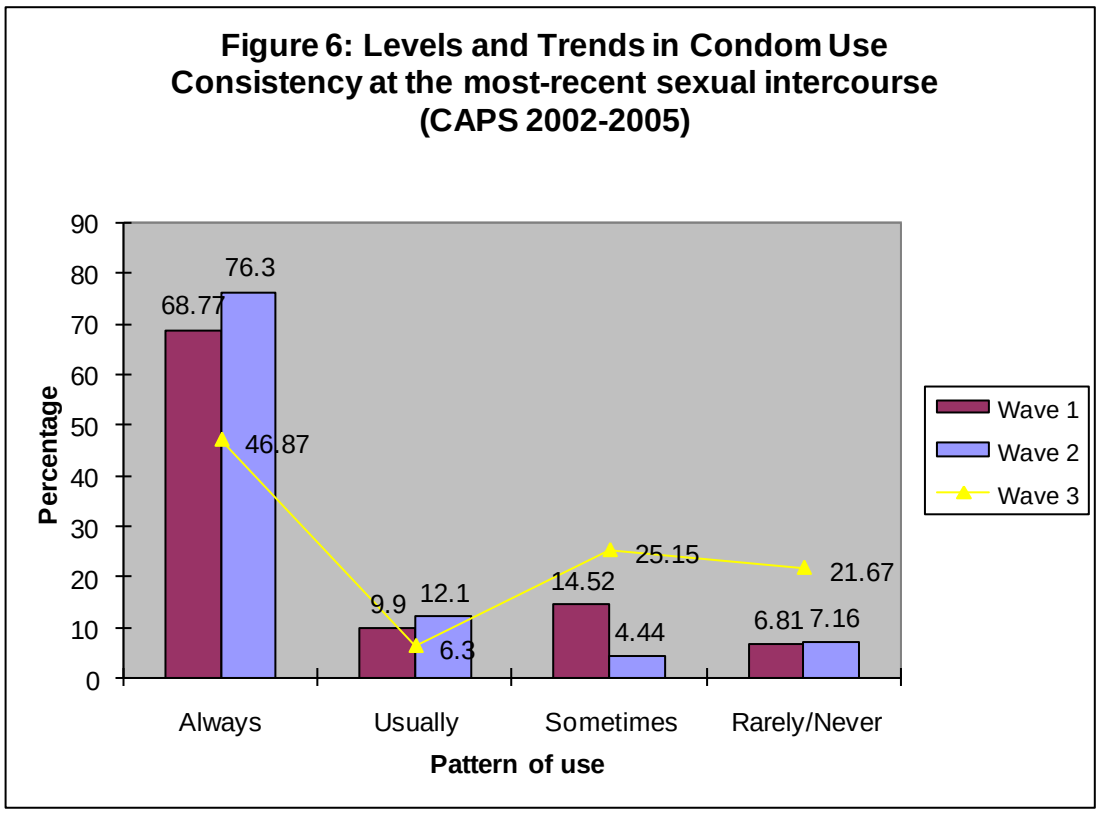


Figure 6: Levels and trends in consistency of condom use with most recent sexual partner (CAPS 2002-2005)



4.3 Conclusion

The mean age of the respondents ranged from 17 in 2002 to 20 in 2005; the sample comprised more females than males and more Coloured youth than of other races. A high proportion of the respondents had attained a level of secondary education at the three waves; with a high proportion losing jobs between 2002 and 2005. Generally, the respondents attained puberty around age 14 while a high proportion had high self-efficacy rating with low risk self-assessment of contracting HIV at the three waves of data collection. Although the majority believed that HIV is preventable, more than half of the respondents did not believe that abstinence could protect against HIV and the majority of the respondents are conservative about young people engaging in premarital sexual intercourse. The respondents had high educational aspirations; almost half of the respondents expected to live long (up to age 80) while the remainder either expected to die before age 80 or were not sure.

With regards to the socio-structural factors, in 2002 more than half of the respondents were Christian, and the proportion that did not use alcohol declined between 2002 and 2005. More than half of the respondents were either in no-parent or single-parent families in Waves 1 and 3, while in 2002 a high proportion of the respondents reported a problematic school environment. More than half were in school at Wave 1 and Wave 2, with a high proportion having positive school/educational attitude in 2002; the proportion in school dropped to a little above a third in Wave 3. A high proportion of the young people interviewed reported that their first sexual intercourse was consensual while close to half of the respondents lived in predominantly African or Coloured neighbourhoods at the baseline in 2002. More than half of the interviewees participated in prosocial activities at the baseline, had external monetary support, and lived in predominantly poor

neighbourhoods but in non-problematic neighbourhoods while growing up. In 2005, the majority of the respondents had lived in an urban place of residence while growing up, and close to half reported that most or all of their friends/peers were sexually active at the third wave of data collection in 2005.

The median age at first sexual intercourse for the total studied sample plateaued at 16 years with a slight difference of additional one year for females, with an increasing trend in the practice of abstinence (primary or secondary) and remaining faithful to one sexual partner (from seventy-one percent to eighty-four percent) from the baseline to 2005, with a concurrent decline in the level of current multiple sexual partnerships from twenty-nine percent to sixteen percent.

Contraceptive use at the first sexual intercourse showed an increase over time while contraceptive use at the most-recent sexual intercourse also increased slightly. The proportion of the adolescents and young adults that used a condom for protection with their most-recent partner (index of consistency) declined between the baseline and the third wave of data collection in 2005.

CHAPTER 5: TRANSITIONS IN REPORTED SEXUAL AND HIV RISK-RELATED BEHAVIOURS (CAPS 2002-2005)

5.1 Introduction

This chapter presents the changes taking place (dynamics) in the sexual lives of the adolescents and young adults sampled during the Cape Area Panel Survey between 2002 and 2005. Sexual intercourse, also referred to as sexual activity, as used in this thesis means full penetrative vaginal intercourse with a heterosexual partner. It is measured through a question: "Have you ever had sexual intercourse?" with a follow-up question on "Age at first sexual intercourse" where relevant. Young people in the study area were assumed to be experiencing the transition into adulthood in different ways and under different circumstances, hence, it is my goal to investigate the transitions into first sexual intercourse for those who were virgins at the baseline; and to determine whether some who had debuted sexually at the baseline were in any way practising secondary abstinence at the later waves, a group that has been largely neglected in adolescent sexuality research especially in South Africa (Chimere-Dan & Makiwane 2009).

Also, use of a contraceptive method at the earlier wave does not necessarily translate to current use, while conversely contraceptive non-users at the baseline could have become users at the later waves for whatever reason. Moreover, consistency of condom usage with most-recent sexual partners is an important factor in preventing the spread of HIV, bearing in mind the dual usefulness of condoms in preventing both pregnancy and the spread of STIs. The results presented below are based on the various assumptions highlighted above.

5.2 Results

Figure 7 shows that more than half of the respondents were virgins at the baseline and that the proportion declined with increasing years or at the subsequent waves of data collection. As expected, the proportion of sexually active youths increased from roughly two-fifths at the baseline to more than half at the second wave in 2003/2004, and to seventy-three percent at the third wave.

Figure 7: Distribution of respondents by sexual activity status between 2002 and 2005

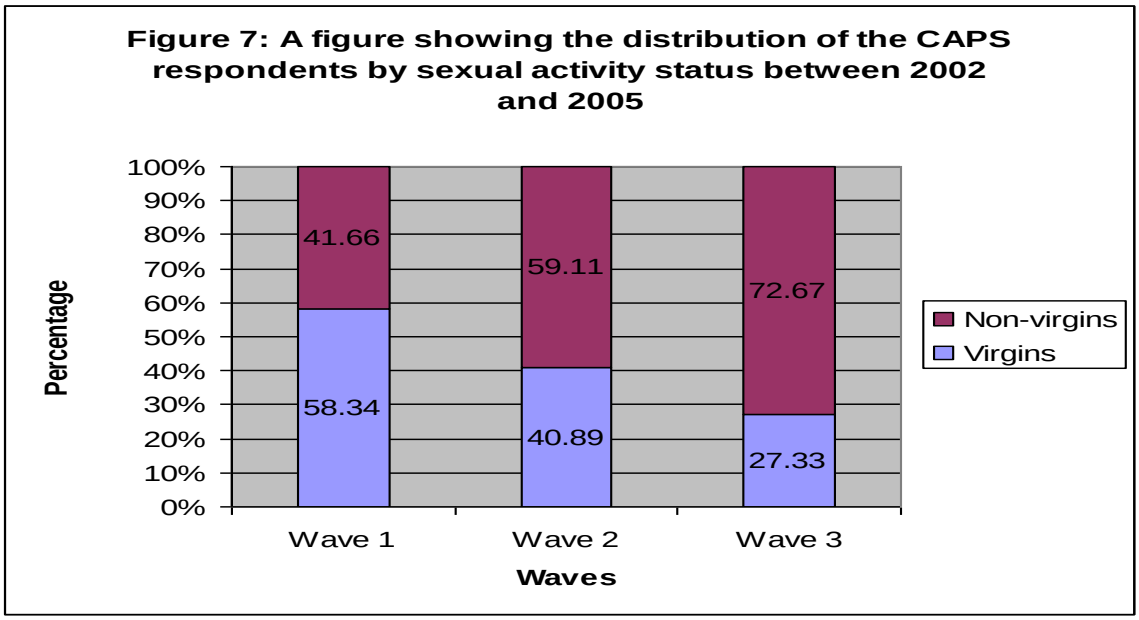


Table 6: Trends in sexual activity status of young South Africans living in Cape Town across waves (CAPS 2002-2005)

Sexual Status by wave	**Wave 2**			**Wave 3**		
	Virgins	Non-virgins	Total	Virgins	Non-virgins	Total
Wave 1						
Virgins	85.56 (1,043)	14.44 (176)	100.00 (1,219)	48.06 (854)	51.94 (923)	100.00 (1,777)
Non-virgins	0.00 (0)	100.00 (1,327)	100.00 (1,327)	0.00 (0)	100.00 (1,329)	100.00 (1,329)
Total	40.97	59.03	100.00	27.50	72.50	100.00

	(1,043)	(1,503)	(2,546)	(854)	(2,252)	(3,106)
Pearson χ^2 (p-value)	1.9e+03*** (0.000)			880.9038*** (0.000)		
Wave 2						
Virgins	-	-	-	82.91 (854)	17.09 (176)	100.00 (1,030)
Non-virgins	-	-	-	0.00 (0)	100.00 (1,508)	100.00 (1,508)
Total	-	-	-	33.65 (854)	66.35 (1,684)	100.00 (2,538)
Pearson χ^2 (p-value)				1.9e+03*** (0.000)		

Significant at *p<0.1; **p<0.05; ***p<0.01
The figures in parentheses are frequencies.

Out of the initial 3,210 young people who participated between 2002 and 2005, 3,190 responded to the question on sexual activity. This makes the overall sample size drop to 3,190, of which 1,329 (42%) were sexually active in 2002 while 1,861 (58%) were virgins. In 2003 at the second wave, only 2,551 young people gave any response to the question on penetrative sexual activity. This translated to only 2,551 respondents being captured at the second wave, of which 1,043 (41%) were virgins and 1,508 (59%) were sexually active. At the third wave in 2005, out of 3,125 who gave any response to the question on sexual activity, 2,271 (73%) responded that they were sexually active while the remaining 854 (27%) were still virgins (see Figure 7; table not shown).

When cross-tabulated as seen in Table 6, out of the 1,219 who were virgins at the baseline in 2002, 86% (1,043) remained virgins in 2003 while 14% (176) had debuted; by 2005 however, only 48% (854) were still virgins while 52% (n=923) had debuted (N=1,777). Comparing the status of the young people's sexual activity between 2003/2004 and 2005, of the 1,030 who were reportedly virgins at the second wave, 83% (n=854) remained virgins in 2005 while 17% (n=176) had debuted (see Figure 8 for the line graph showing the trends in transition to sexual activity between 2002 and 2005).

Figure 8: Trends in sexual activity status by waves

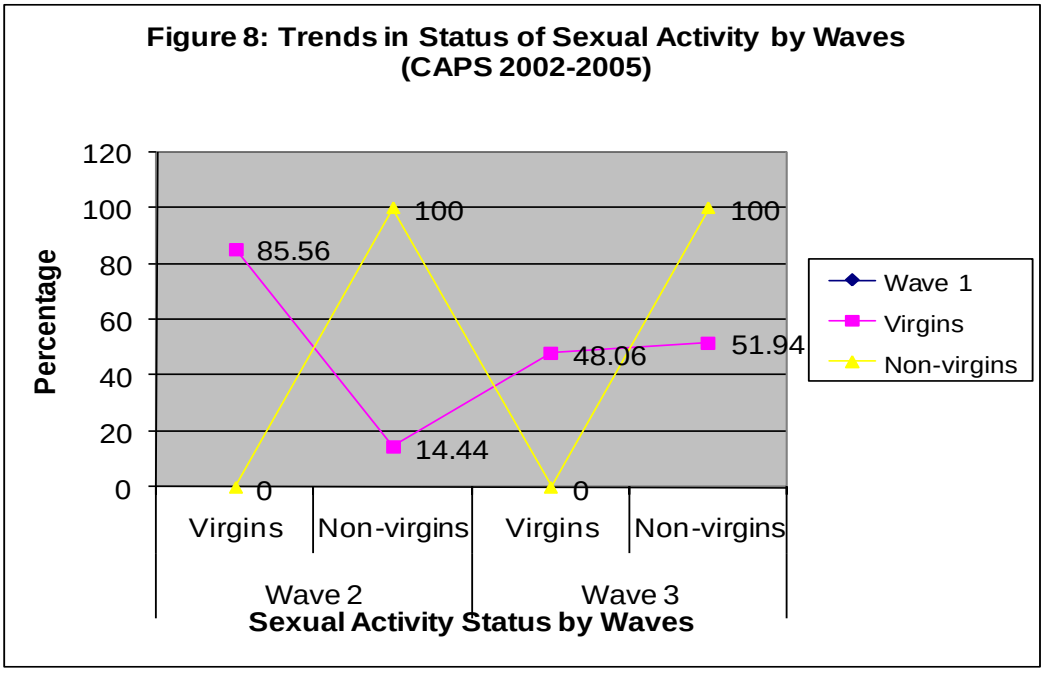


Table 7a: Profile of first sexual partners for those respondents who debuted between 2002 and 2005

Variables	Wave 1	Wave 2	Wave 3
Relationship to first sexual partner			
Casual acquaintance	5.03 (66)	14.81 (84)	-
Casual friend	6.25 (82)	13.40 (76)	-
Girlfriend/boyfriend	86.82 (1,140)	69.66 (395)	-
Engaged partner	0.15 (2)	-	-
Cohabiting partner	0.30 (4)	-	-
Married partner	0.91 (12)	1.06 (6)	-
Sex worker	-	0.18 (1)	
Relative	0.23 (3)	0.35 (2)	-
Other	0.30 (4)	0.53 (3)	-
Total	100.00 (1,313)	100.00 (567)	-
Median age of first sexual partners	17 years (15 for males and 19 for females)	17 years (16 for males and 19 for females)	-
Length of first sexual relationship			
Less than one month	-	-	7.79 (165)
1-12 months	31.01 (147)	-	23.03 (488)
Greater than one year	60.34 (286)	-	23.45 (497)
Still continuing	8.65 (41)	-	45.73 (969)
Total	100.00 (474)	-	100.00 (2,119)

The figures in parentheses are frequencies and are not the same due to missing values.

Table 7a reveals the characteristics of the respondents' sexual partners during the study period in. It is clear from the table that a high proportion of the respondents had their first sexual intercourse with their girlfriend/boyfriend, followed by a casual acquaintance or friend. At the second wave in 2003/2004, less than one percent of the respondents had their first sexual debut with a sex worker or relative. The overall median age of their sexual partners was 17 years, and when the sex of the respondents is controlled for, male respondents were more likely to be sexually involved with females who were at least a year younger than themselves while female respondents were more likely to be sexually involved with males who were at least two years older than themselves. The majority of the respondents had been in a sexual relationship with their sexual partners for more than a year, and at the third wave of data collection in 2005, close to half of the respondents were still in a sexual relationship with their first sexual partner.

Table 7b: Profile of the respondents who were still virgins in Waves 1 to 3 (CAPS 2002-2005)

Variable(s)	**Wave 1 (2002)**	**Wave 2 (2003/04)**	**Wave 3 (2005)**
Independent variables			
Age			
Less than 18 years	79.98 (683)	63.84 (143)	30.51 (249)
18 years and above	20.02 (171)	36.16 (81)	69.49 (567)
Total	100.00 (854)	100.00 (224)	100.00 (816)
Mean age of the respondents	15.94 years	17.16 years	18.86 years
Sex			
Male	44.96 (384)	44.99 (283)	44.96 (384)
Female	55.04 (470)	55.01 (346)	55.04 (470)
Total	100.00 (854)	100.00 (629)	100.00 (854)
Race/population group			
Black/African	20.02 (171)	17.52 (110)	20.02 (171)
Coloured	64.75 (553)	64.81 (407)	63.70 (544)
White	15.22 (130)	15.76 (99)	15.11 (129)
Indian/Asian	-	1.91 (12)	1.17 (10)
Total	100.00 (854)	100.00 (628)	100.00 (854)
Educational level			
No formal education	-	-	-
Primary	32.24 (274)	6.42 (47)	-

Secondary	65.53 (557)	81.69 (598)	71.32 (383)
Tertiary	2.24 (19)	11.89 (87)	28.68 (154)
Total	100.00 (850)	100.00 (732)	100.00 (537)
Current work status			
Yes	41.33 (93)	19.81 (125)	28.81 (246)
No	58.67 (132)	80.19 (506)	71.19 (608)
Total	100.00 (225)	100.00 (631)	100.00 (854)
Age at puberty			
Mean age at puberty	13 years	-	13 years

Figures in parentheses are frequencies. N.B: Some of the variables were limited to the first wave especially the non-time-varying independent variables such as sex and racial group. Others were limited to two waves, while others were asked in all three waves. When the sex of the respondents was controlled for, the mean age at puberty was 13 years for both males and females.

Table 7b reveals that the majority of the virgin respondents were less than 18 years of age at the baseline and at the second wave, with the mean age ranging from 16 years to 19 years between 2002 and 2005. There were higher proportions of females and of Coloured respondents and many of the virgin respondents had secondary educational level. The reported median age at puberty was 13 years and a higher proportion of them were not working at the time of the data collection.

Table 7c: Percentage distribution of the virgin respondents by self-efficacy factors (CAPS 2002-2005)

Variable(s)	**Wave 1 (2002)**	**Wave 2 (2003/04)**	**Wave 3 (2005)**
Independent/intervening variable: Self-efficacy			
Level of self-control			
Totally in control	-	-	29.16 (249)
Control most things	-	-	88.88 (510)
Little or no control	-	-	11.12 (95)
Total	-	-	100.00 (854)
Self-esteem[9]			
Rating of life prospect			
Good life prospect	-	-	78.92 (674)
Limited life prospect	-	-	17.68 (151)
Uncertain about life	-	-	3.40 (29)
Total	-	-	100.00 (854)
Self-esteem[10]			

[9] Self-rating of opportunity in life
[10] how happy about life

Degree of happiness			
Very happy	-	-	88.64 (757)
Happy a little	-	-	8.90 (76)
Not happy	-	-	2.46 (21)
Total	-	-	100.00 (854)

Figures in parentheses are frequencies**.** These questions were only asked at the third wave of data collection in 2005.

Table 7c shows that the majority of the virgin respondents believed that they were in control of most things in their lives, and rated themselves to have good life prospects and were very happy in life. Interestingly, a very low proportion had little or no control over their lives, was uncertain about their life prospects and were not happy with their lives in general.

Table 7d: Percentage distribution of virgin respondents by outcome expectancy factors (CAPS 2002-2005)

Variable(s)	**Wave 1 (2002)**	**Wave 2 (2003/04)**	**Wave 3 (2005)**
Outcome expectations			
HIV-risk assessment			
Low risk	94.61 (772)	88.38 (175)	95.71 (780)
High risk	5.39 (44)	11.62 (23)	4.29 (35)
Total	100.00 (816)	100.00 (198)	100.00 (815)
Belief in abstinence as a way of protecting against HIV			
No	44.86 (362)	-	37.79 (305)
Yes	55.14 (445)	-	62.21 (502)
Total	100.00 (807)	-	100.00 (807)
Opinion about sex[11]			
Liberals	-	14.03 (31)	-
Conservatives	-	85.97 (190)	-
Total	-	100.00 (221)	-
Belief about preventability of HIV/AIDS			
Yes	94.38 (806)	-	94.50 (807)
No	5.62 (48)	-	5.50 (47)
Total	100.00 (854)	-	100.00 (854)

Figures in parentheses are frequencies. Of the questions used here, HIV-risk assessment was asked at all the waves, opinion about sex at the second wave only, and the other two questions at the first and third waves but not at the second.

[11] The variable 'opinion about sex' is derived from a question "Is it alright for boys and girls to engage in premarital sexual intercourse?"

Table 7d shows that majority of the virgin respondents rated themselves to be at low risk of contracting HIV during the study period with more than half of them believing in abstinence as a way of protecting against HIV/AIDS. Also, the majority were conservative in their attitude to pre-marital sexual intercourse for both boys and girls and a high proportion believed that HIV is preventable.

Table 7e: Percentage distribution of virgin respondents by goal factors (CAPS 2002-2005)

Variable(s)	**Wave 1 (2002)**	**Wave 2 (2003/04)**	**Wave 3 (2005)**
Goals			
Expectation of success in matric at first attempt			
High educational aspiration	84.32 (640)	-	74.93 (278)
Low educational aspiration	15.68 (119)	-	25.07 (93)
Total	100.00 (759)	-	100.00 (371)
Expectation to live long (up to 80 years)			
Yes	-	-	39.93 (341)
No	-	-	7.96 (68)
Unsure	-	-	52.11 (445)
Total	-	-	100.00 (854)

Figures in parentheses are frequencies and do not always tally due to missing values.
– indicates lack of information.

Table 7e reveals that majority of the virgin respondents had high educational aspirations at the baseline and at the third wave while about half of them were unsure whether they would live to the age of 80, followed by those who expected to live to 80 years of age.

From Table 7f below, it is clear that at all three waves more than half of the virgin respondents were Christians and also more than half were non-users of alcohol or drugs at both baseline and the third wave of data collection. Also, more than half of them were from two-parent families although many of them were currently attending school and reported a problematic school environment between 2002 and 2005. Moreover, the majority of the respondents in question had a positive attitude towards school or education were

predominantly resident in Coloured neighbourhoods, participated in prosocial activities and had access to monetary social support. In addition, more than half of them lived in poor neighbourhoods and had grown up in non-problematic, urban neighbourhoods while less than one-tenth of them reported that most or all of their friends were sexually active.

Table 7f: Percentage distribution of virgin respondents by socio-structural/contextual factors (CAPS 2002-2005)

Variable(s)	Wave 1 (2002)	Wave 2 (2003/04)	Wave 3 (2005)
Socio-structural factors[12]			
Religious affiliation			
None	5.77 (49)	-	-
Christianity	58.42 (496)	-	-
Islam	17.08 (145)	-	-
Other	18.73 (159)	-	-
Total	100.00 (849)	-	-
Alcohol/drug use			
Non-users	79.37 (677)	-	59.60 (509)
Users	20.63 (176)	-	40.40 (345)
Total	100.00 (853)	-	100.00 (854)
Family structure			
No-parent family	11.61 (99)	-	10.27 (86)
Single-parent family	32.71 (279)	-	35.96 (301)
Both-parents family	55.69 (475)	-	53.76 (450)
Total	100.00 (853)	-	100.00 (837)
School environment			
Non-problematic	23.54 (201)	-	-
Problematic	76.46 (653)	-	-
Total	100.00 (854)	-	-
School attendance			
Yes	90.05 (769)	79.73 (177)	61.10 (520)
No	9.95 (85)	20.27 (45)	38.90 (331)
Total	100.00 (854)	100.00 (222)	100.00 (851)
Attitude to education/school			
Negative school attitude	11.25 (96)	-	-
Positive school attitude	88.75 (757)	-	-
Total	100.00 (853)	-	-
Neighbourhood racial concentration			
African	19.91 (170)	-	-
Coloured	61.83 (528)	-	-

[12] Socio-structural factors are factors serving as facilitators or impediments toward a particular behaviour.

White	18.27 (156)	-	-
Total	100.00 (854)	-	-
Participation in prosocial activities			
Non-participants	36.34 (310)	-	-
Participants	63.66 (543)	-	-
Total	100.00 (853)	-	-
External monetary support[13]			
No monetary support	6.42 (54)	11.43 (72)	11.83 (99)
Monetary support	93.58 (787)	88.57 (558)	88.17 (738)
Total	100.00 (841)	100.00 (630)	100.00 (837)
Neighbourhood SES[14]			
Affluent	44.03 (376)	-	-
Poor	55.97 (478)	-	-
Total	100.00 (854)	-	-
Childhood neighbourhood type[15]			
Non-problematic	76.67 (654)	-	-
Problematic	23.33 (199)	-	-
Total	100.00 (853)	-	-
Childhood place of residence			
Urban	92.94 (790)	-	-
Rural	7.06 (60)	-	-
Total	100.00 (850)	-	-
Peers sexually active?[16]			
None of them	-	-	23.19 (198)
A few/some of them	-	-	38.17 (326)
Most or all of them	-	-	8.08 (69)
Unsure	-	-	30.56 (261)
Total	-	-	100.00 (854)

Figures in parentheses are frequencies. – indicates that the question was not asked during the wave in question.

Table 8: Percentage distribution of the respondents by sexual activity and current multiple sexual partnerships (CAPS 2002-2005)

Sexual status	**Wave 1**			**Wave 3**		
	No. of current sexual partners			**No. of current sexual partners**		
	0	**1**	**2+**	**0**	**1**	**2+**
Wave 1						
Virgins	-	-	-	8.65 (70)	75.65 (612)	15.70 (127)
Non-virgins	13.53 (175)	57.23 (740)	29.24 (378)	6.09 (71)	77.00 (897)	16.91 (197)
Wave 2						

[13] Money from both parents for non-school things or grant in the household?
[14] Measure of poverty at the Magisterial district level
[15] Availability of problem drinkers, drug addict and criminals when growing up?
[16] How many of your friends have had sex?

Virgins	-	-	-	9.40 (14)	69.13 (103)	21.47 (32)
Non-virgins	-	-	-	6.38 (84)	76.39 (1,006)	17.23 (227)
Wave 3						
Virgins	-	-	-	-	-	-
Non-virgins	-	-	-	7.18 (143)	76.49 (1,523)	16.33 (325)

The figures in parentheses are frequencies. N.B: There was no question on current multiple sexual partnerships at the second wave.

From Table 8, it is clear that less than one-third of the adolescents and young adults who were sexually active at the baseline practiced multiple sexual partnerships within the twelve months to the time of the survey (29 percent), while a little above one-tenth of the sexually active respondents were abstaining (secondary abstainers - 14 percent) and more than half were keeping faithfully to one sexual partner. Also, in 2005, of those respondents who were virgins at the baseline, 8.65 percent were abstaining, 75.65 percent were keeping to one sexual partner and 15.70 percent had at least two sexual partners; while among those who were sexually active already in 2002, 6.09 percent were secondarily abstaining; 77.00 percent were keeping to one sexual partner and 16.91 percent had at least two current sexual partners.

Nine percent of those respondents who were virgins at the second wave of data collection in 2003/2004 practised abstinence when followed to the third wave in 2005; sixty-nine percent were keeping faithfully to one sexual partner and twenty-one percent had at least two sexual partners; while among those who had debuted sexually by the second wave, six percent were practising abstinence, seventy-six percent were keeping faithfully to one sexual partner and seventeen percent had at least two sexual partners when followed through to the third wave in 2005. Lastly, among those respondents who were or had been sexually active as at the third wave, seven percent were practising secondary abstinence,

seventy-six percent were keeping faithfully to one sexual partner and sixteen percent had at least two sexual partners.

Table 9: Percentage distribution of the respondents by contraceptive use at first sexual intercourse, Wave 1 compared to Wave 3 (CAPS 2002-2005)

Wave 1	**Wave 3**		
	No	Yes	Total
No	100.00 (627)	0.00 (0)	100.00 (627)
Yes	0.14 (1)	99.86 (692)	100.00 (693)
Total	47.58 (628)	52.42 (692)	100.00 (1,320)
Pearson χ^2 (p-value)	1.3e+03 (0.000)		

Significant at *p<0.1; **p<0.05; ***p<0.01
The figures in parentheses are frequencies.
N.B.: There was no question on contraceptive use at first sexual intercourse at the second wave.

Table 9 reveals that almost all the adolescents and young adult respondents who reported using a contraceptive at the event of their first sexual intercourse at the baseline reported in the same way at the third wave of data collection 2005. However, in 2002 less than one percent of the respondents reported using contraception at the first sexual intercourse; this figure was not identical in 2005. This could be as a result of a classification error by the data entry clerks or a response error from the respondents at the time of one of the interviews.

Table 10: Percentage distribution of the respondents by sexual status and contraceptive use at the first sexual intercourse (CAPS 2002-2005)

Sexual status	**Wave 1**			**Wave 3**		
	Contraceptive use at first sexual intercourse			**Contraceptive use at first sexual intercourse**		
	No	**Yes**	**Total**	**No**	**Yes**	**Total**
Wave 1						
Virgins	-	-	-	28.55 (213)	71.45 (533)	100.00 (746)
Non-virgins	47.54 (627)	52.46 (692)	100.00 (1,319)	47.54 (627)	52.46 (692)	100.00 (1,319)
Pearson χ^2 (p-value)				71.1626*** (0.000)		

Wave 2						
Virgins	-	-	-	25.00 (44)	75.00 (132)	100.00 (176)
Non-virgins	-	-	-	47.61 (627)	52.39 (690)	100.00 (1,317)
Pearson χ^2 (p-value)				32.0698*** (0.000)		
Wave 3						
Virgins	-	-	-	-	-	-
Non-virgins	-	-	-	40.69 (846)	59.31 (1,233)	100.00 (2,079)

Significant at *p<0.1; **p<0.05; ***p<0.01
The figures in parentheses are frequencies. N.B: There was no question on contraceptive use at the first sexual intercourse at the second wave. – Indicates missing value.

From Table 10, it can be seen that more than half of the sexually active adolescents and young adults used contraception at the event of their first sexual intercourse at the baseline in 2002; that proportion increased slightly from fifty-two percent to fifty-nine percent at the third wave of data collection in 2005.

Table 11: Percentage distribution of the sexually active respondents by contraceptive use at the most-recent sexual intercourse (CAPS 2002-2005)

Wave 1		**Wave 2**		**Wave 3**	
No	**Yes**	**No**	**Yes**	**No**	**Yes**
28.79 (359)	71.21 (888)	26.13 (156)	73.87 (441)	26.38 (536)	73.62 (1,496)

The figures in parentheses are frequencies.

From Table 11, it is clear that level of contraceptive use at the most-recent sexual intercourse ranges from between seventy-one percent to seventy-four percent across the three waves of data collection, with a slight increase at the second and third waves from the first wave.

Table 12: Percentage distribution of sexually active respondents by consistency of condom use with the most-recent sexual partner (CAPS 2002-2005)

Wave	Frequency of condom use			
	Always	Usually	Sometimes	Rarely/never
Wave 1	68.73 (534)	9.91 (77)	14.54 (113)	6.82 (53)
Wave 2	76.30 (309)	12.10 (49)	4.44 (18)	7.16 (29)
Wave 3	46.90 (997)	6.26 (133)	25.16 (535)	21.68 (461)

The figures in parentheses are frequencies.

Table 12 reveals a fluctuating pattern in the regular use of condoms with the most recent sexual partner. More than two-thirds (69%) of the sexually active respondents always used condoms, with a seemingly increasing trend at the second wave (although only a subset of the whole sample were re-interviewed here), while at the third wave the proportion of those who always used condoms with their last sexual partners declined to forty-seven percent.

5.3 Conclusion

Of the 3,190 adolescents and young adults who responded to the question on sexual activity, fifty-eight percent (58%) were virgins at the baseline, which declined to forty-one percent (41%) at the second wave and twenty-seven percent (27%) at the third wave in 2005. As expected, transition into sexual activity increased with additional years as fourteen percent (14%) of the virgins in 2002 debuted between Waves 1 and 2 (2002-2003), while fifty-two percent (52%) of those who were virgins at the baseline debuted between 2002 and 2005. Less than one-fifth of the virgin respondents debuted between Waves 2 and 3 (17%).

A high proportion of the respondents had their first sexual intercourse with their girlfriend/boyfriend, a term that has a sexual connotation in South Africa. Male respondents were more likely to be sexually involved with females at least a year younger than themselves while female respondents were more likely to be sexually involved with males at least two years older than themselves. The majority of the respondents' sexual relationships lasted more than one year, and at the third wave of data collection in 2005, close to half of the respondents had a first sexual relationship that was still ongoing. The characteristics of those respondents who were virgins in this study differ from those who are sexually active, based on the constructs within the Social Cognitive Theory.

There was also a decreasing trend in the practice of abstinence between Waves 1 and 3, and a concurrent increasing trend in the practice of keeping faithfully to one sexual partner, while practice of multiple sexual partnerships declined between 2002 and 2005. More than half of the sexually active adolescents and young adults reported using contraceptives at the event of their first sexual intercourse at the baseline with the proportion increasing slightly at the third wave of data collection in 2005 from fifty-two percent (52%) to fifty-nine percent (59%). This would imply that the respondents that debuted later were more likely to use a condom at the first event, possibly indicating a growing awareness of responsible behaviour.

Moreover, those respondents who used contraception at the most-recent sexual intercourse increased from seventy-one percent (71%) at the baseline to seventy-four percent (74%) at Waves 2 and 3. There seems to be a fluctuating pattern in the consistent use of condom with the most-recent sexual partners, with sixty-nine percent (69%) level at the baseline and forty-seven percent (47%) level at the third wave in 2005.

CHAPTER 6: DETERMINANTS OF AGE AT FIRST SEX (CAPS 2002 & 2005)

6.1 Introduction

This chapter presents the determinants of age at first sexual intercourse using the Cox Proportional Hazard Regression model - a survival analytical technique. This Cox model was used because it allows one to explore the effects of several variables simultaneously on survival (in this case, first sexual debut) and its estimator, called product limit or the Kaplan Meier method, allows the inclusion of individuals who did not sexually debut during the observation period, thereby comparing the number of individuals "at risk" (virgins) in each group at multiple points in time rather than excluding those who remained virgins (which would have produced a biased estimate) (McGrath et al. 2009; Walters 2009).

6.2 Results

6.2.1 Bivariate results

Table 13: Pearson coefficients for the bivariate association between age at first sexual intercourse and selected individual/socio-structural characteristics based on Social Cognitive Theory (CAPS 2002-2005)

Variable	Wave 1	Wave 2	Wave 3
Background characteristics			
Age of the respondents	0.380***	0.371***	0.175***
Sex of the respondents	0.224***	0.213***	0.210***
Race/ population group	0.200***	0.190***	0.247***
Educational level	0.233***	0.257***	0.340***
Current work status	-0.056	-0.053	-0.156***

Age at puberty	-0.023	-0.029	-0.054**
Self-efficacy			
Level of self-control	0.006	0.003	0.011
Self-rating of opportunity in life	-0.006	0.000	-0.021
Degree of happiness in life	-0.094***	-0.098***	-0.088***
Outcome expectations			
HIV-risk assessment	-0.045	-0.041	-0.015
Belief in abstinence as a way of protecting against HIV?	0.086***	0.076***	0.031
Opinion about sex	0.005	0.014	0.011
Belief about preventability of HIV/AIDS	-0.039	-0.053**	-0.001
Goals			
Expectation concerning success in matric first attempt	0.025	0.023	0.151***
Expectation to live long (up to 80 years)	0.009	0.015	0.035
Socio-structural factors			
Religious affiliation	0.049	0.031	0.036
Alcohol/drug use	0.009	0.014	-0.033
Family structure	-0.062**	-0.050	-0.016
School environment	0.011	0.019	-0.024
School attendance	0.193***	0.196***	0.120***
Attitude to education/school	0.038	0.037	0.026
First sexual intercourse forced?	-0.016	-0.020	0.008
Neighbourhood racial concentration	0.193***	0.185***	0.226***
Participation in prosocial activities	-0.105***	-0.112***	-0.068***
External monetary support	-0.043	-0.024	0.002
Neighbourhood socioeconomic status (SES)	-0.098***	-0.100***	-0.140***
Childhood neighbourhood type	-0.029	-0.023	-0.016
Childhood place of residence	-0.067**	-0.055**	-0.059***
Peer sexual characteristics	0.041	0.051**	0.012

Significant at *p<0.1; **p<0.05; ***p<0.01

Table 13 reveals the factors associated with age at first sexual intercourse in the study area between 2002 and 2005 using pairwise correlation coefficients. The significant factors

across the three waves of data collection are age, sex, population group/race, educational level, and degree of happiness in life, school attendance, and neighbourhood racial concentration, participation in prosocial activities, neighbourhood socioeconomic status (SES) and childhood place of residence of the young respondents. Other significant factors at the baseline include belief in abstinence as a way of protecting against HIV and type of family structure. At the second wave in 2003/2004, belief in abstinence as a way of protecting against HIV, belief about the preventability of HIV/AIDS, and peer sexual characteristics significantly associate with age at first sexual intercourse, while at the third wave, age at puberty, current work status, and expectation concerning success in matric at the first attempt significantly associate with age at first sexual intercourse among the adolescents and young adults sampled.

Hence, the aforementioned factors were included in the Cox model fitted to the data to determine the multivariate predictors of age at first sexual intercourse among the respondents. The results of the Kaplan Meier estimator and the estimated hazards are presented in Figures 9-24 for the baseline. The results of Cox (Time-to-event) analyses are presented in Tables 14 to 19 below.

Figure 9: Single estimated hazard for age at first sexual intercourse in 2002

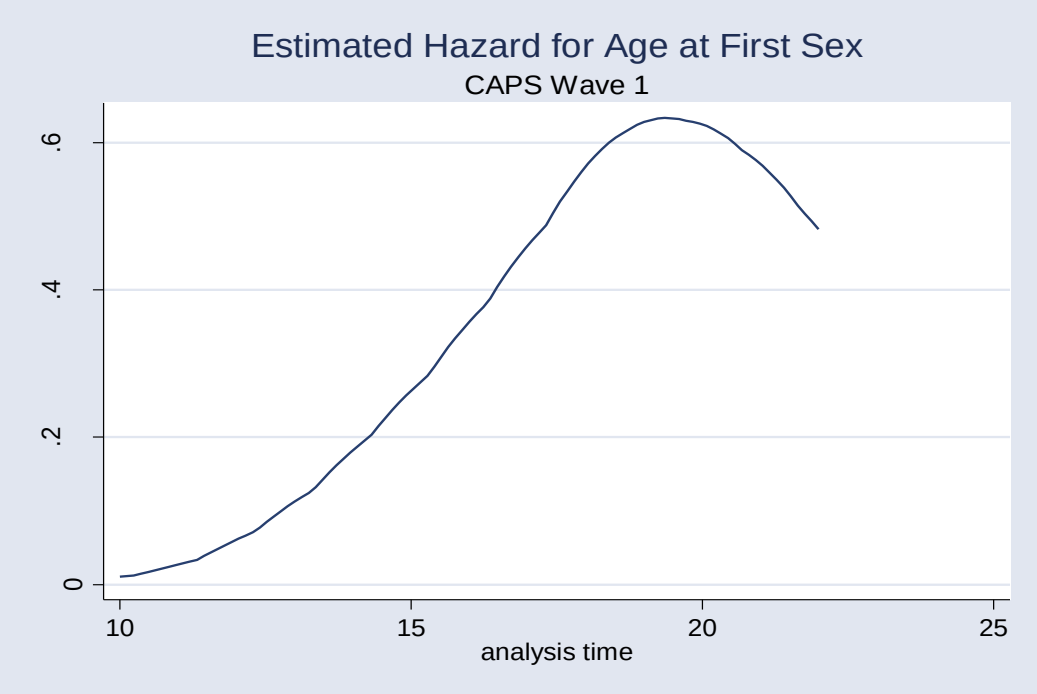


Figure 10: Kaplan Meier single survival estimate for age at first sexual intercourse in 2002

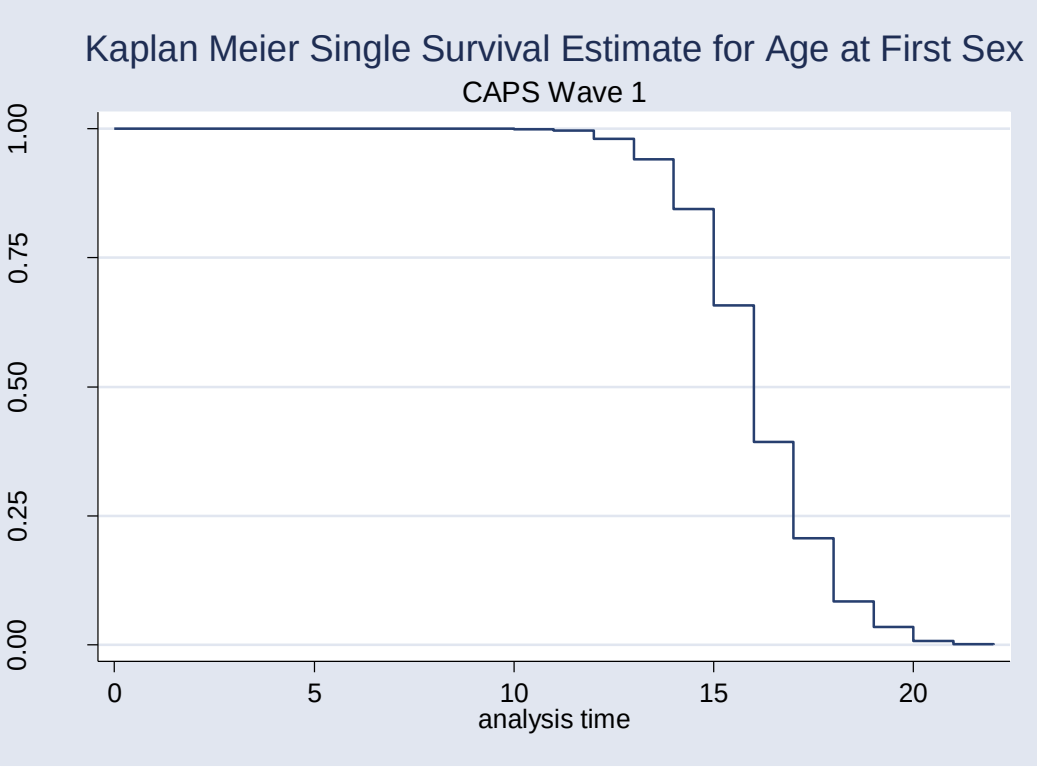
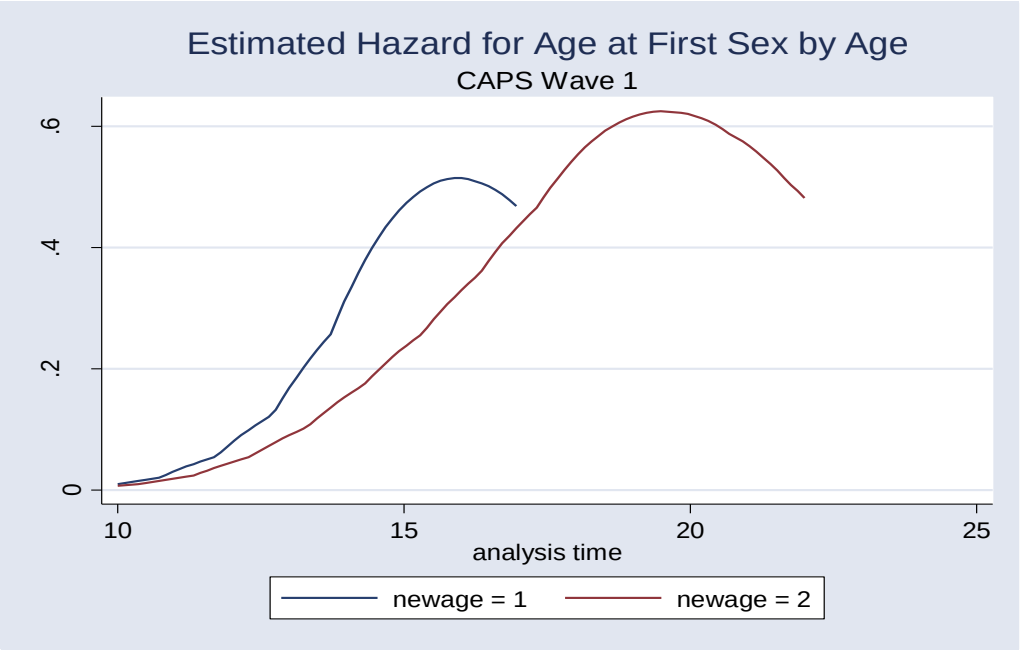


Figure 11: Estimated hazard for age at first sexual intercourse by age-groupings in 2002



Where newage = 1 represents those less than 18 years and newage = 2 is those 18 years and above

Figure 12: Kaplan Meier survival estimate for age at first sexual intercourse by age-grouping in 2002

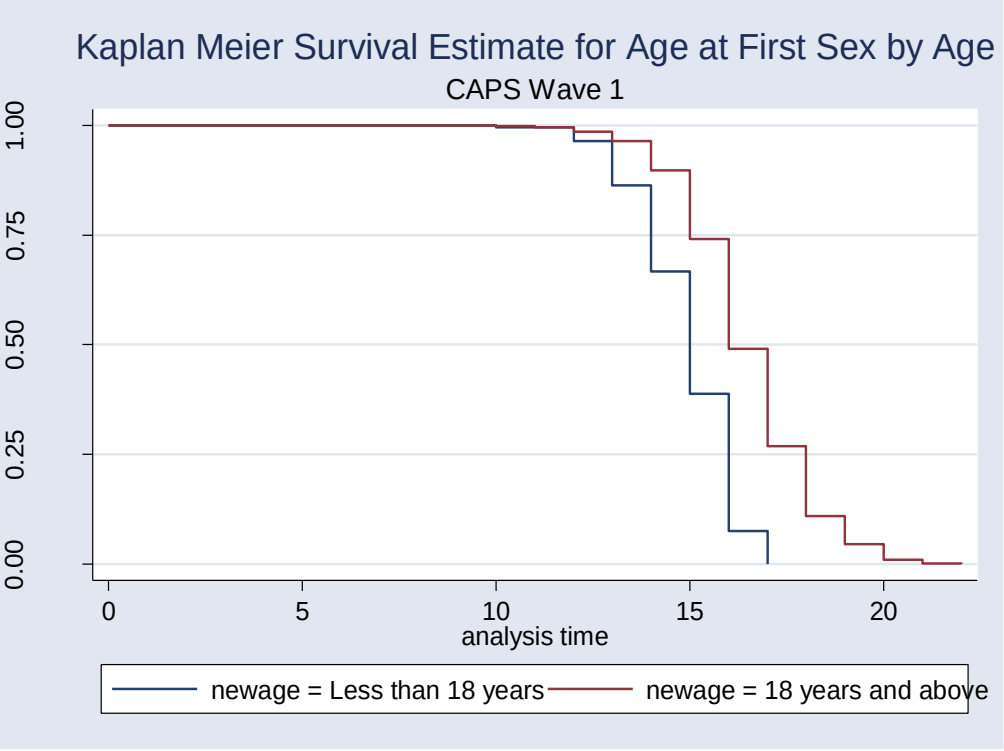
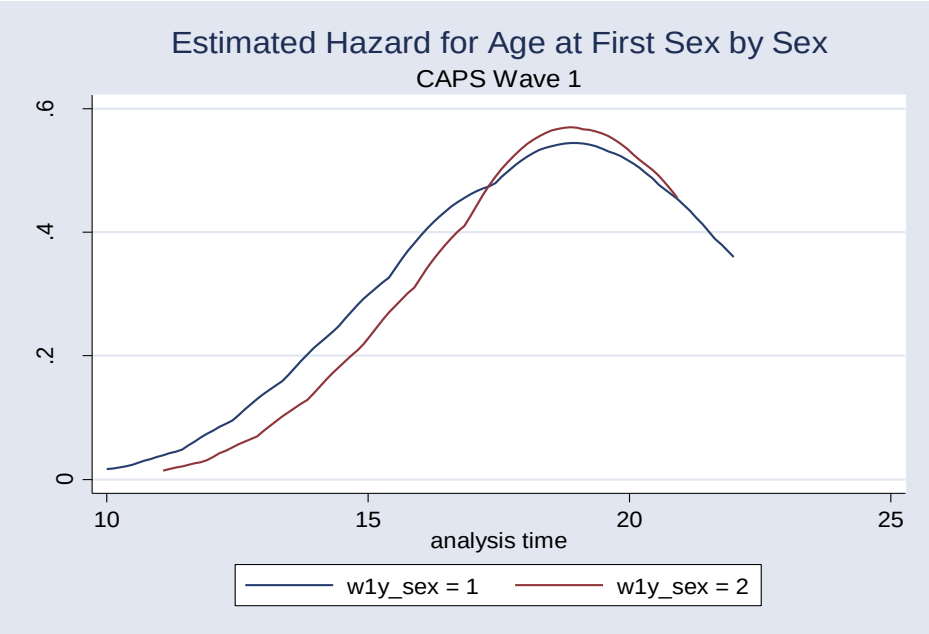


Figure 13: Estimated hazard for age at first sexual intercourse by sex of the respondents in 2002



Where w1y_sex = 1 stands for males and w1y_sex = 2 stands for females

Figure 14: Kaplan Meier survival estimate for age at first sexual intercourse by sex of the respondents in 2002

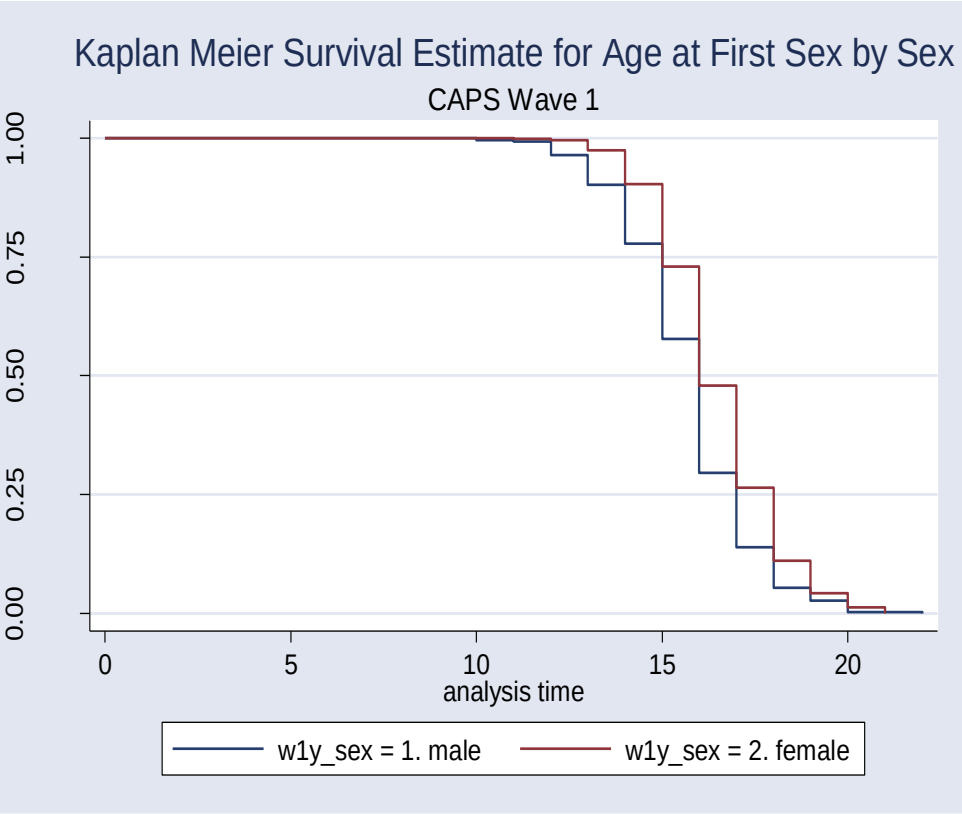
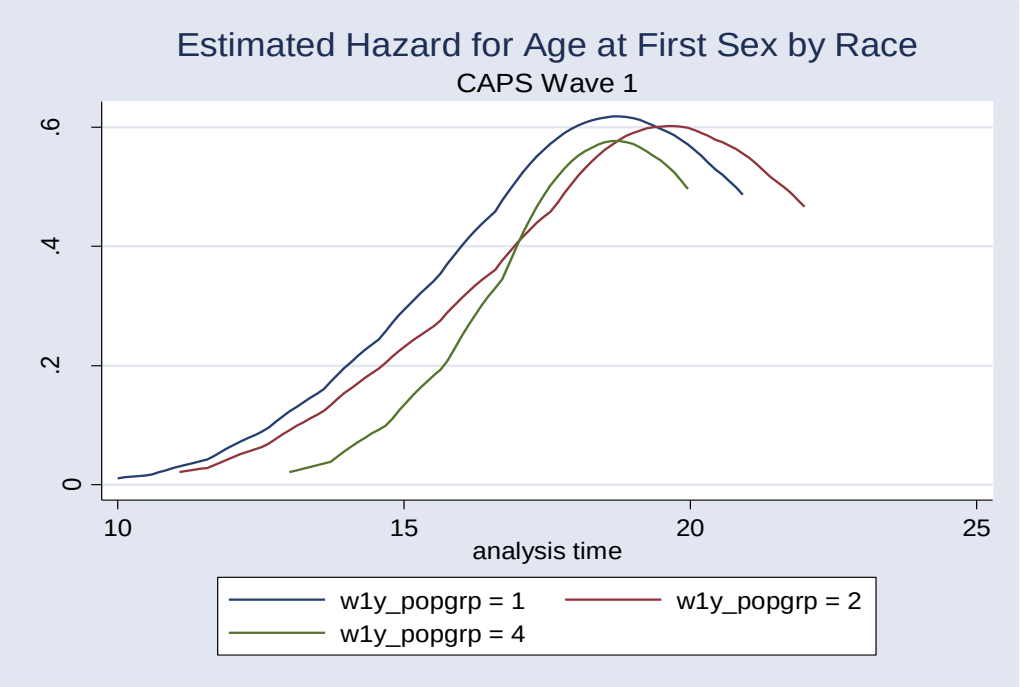


Figure 15: Estimated hazard for age at first sexual intercourse by racial group of the respondents in 2002



Where w1y_popgrp = 1 represents those of Black/African racial origin; w1y_popgrp = 2 represents those of Coloured racial origin and w1y_popgrp = 4 represents those of White racial origin

Figure 16: Kaplan Meier survival estimate for age at first sexual intercourse by racial group of the respondents in 2002

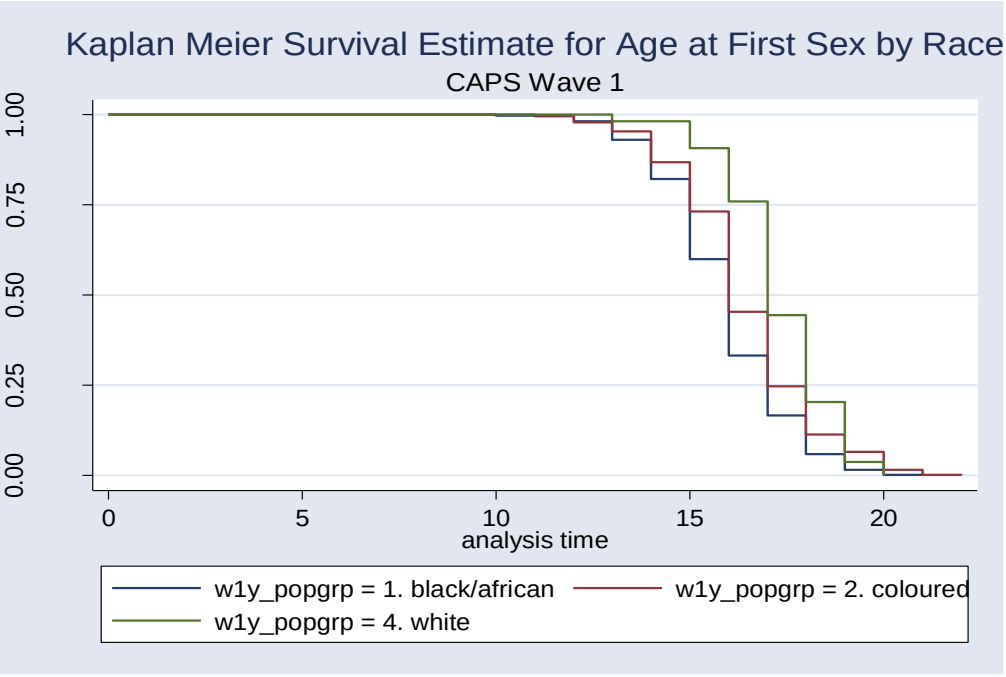
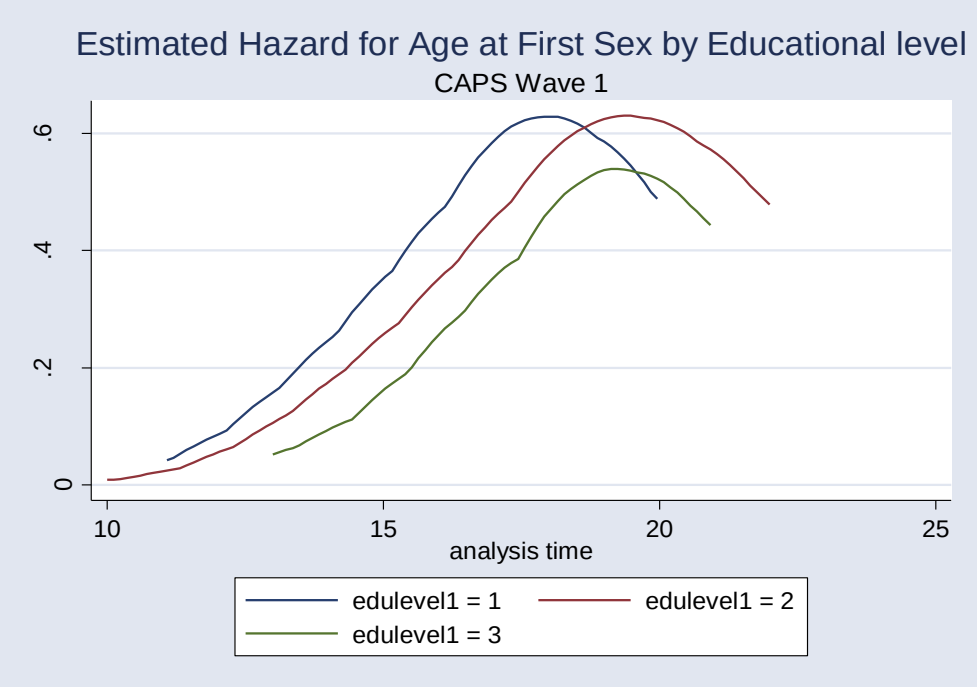


Figure 17: Estimated Hazard for age at first sexual intercourse by educational level of the respondents in 2002



Where edulevel1 = 1 stands for primary school level; edulevel1 = 2 stands for secondary school level and edulevel1 = 3 stands for tertiary school level

Figure 18: Kaplan Meier survival estimate for age at first sexual intercourse by educational level of the respondents in 2002

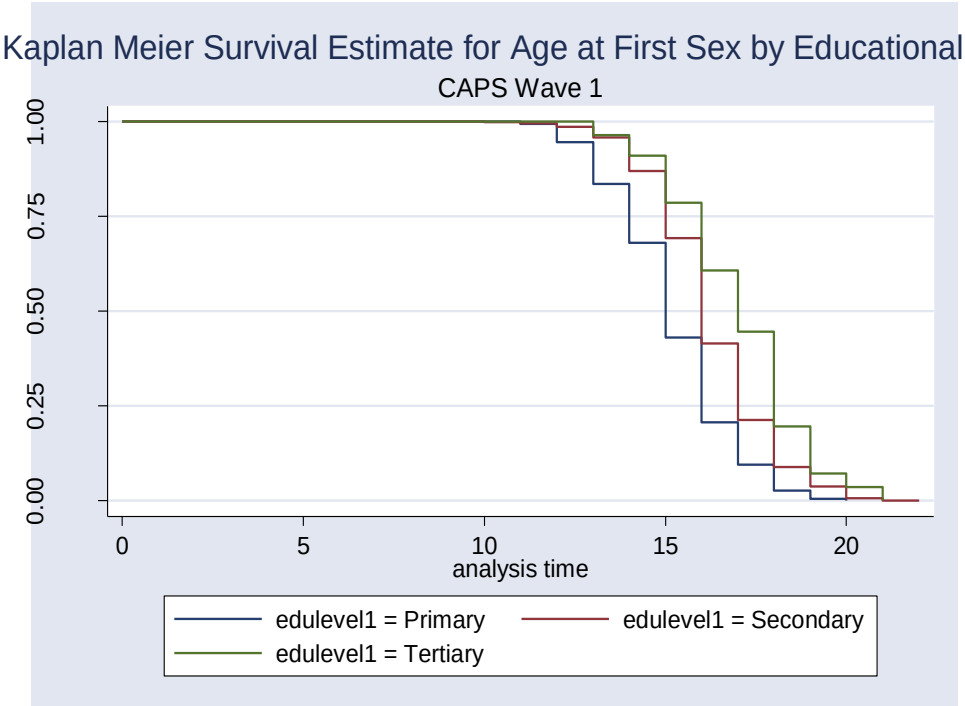
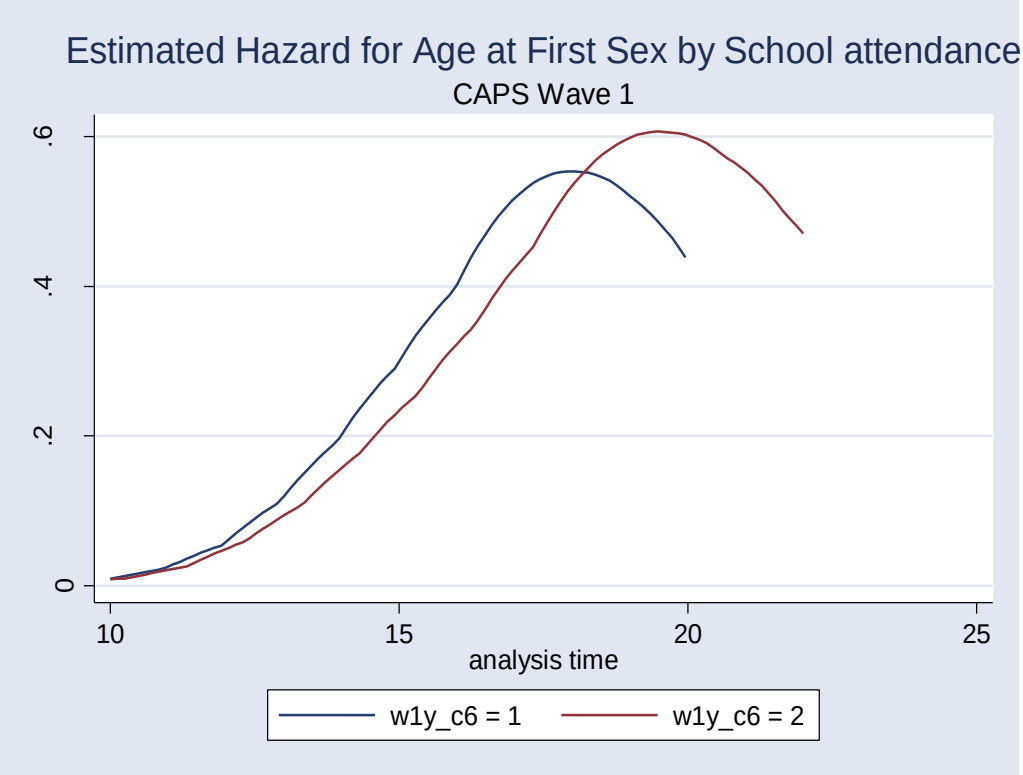


Figure 19: Estimated hazard for age at first sexual intercourse by school attendance in 2002



Where w1y_c6 = 1 means those in school and w1y_c6 = 2 means those not in school

Figure 20: Kaplan Meier survival estimate for age at first sexual intercourse by school attendance in 2002

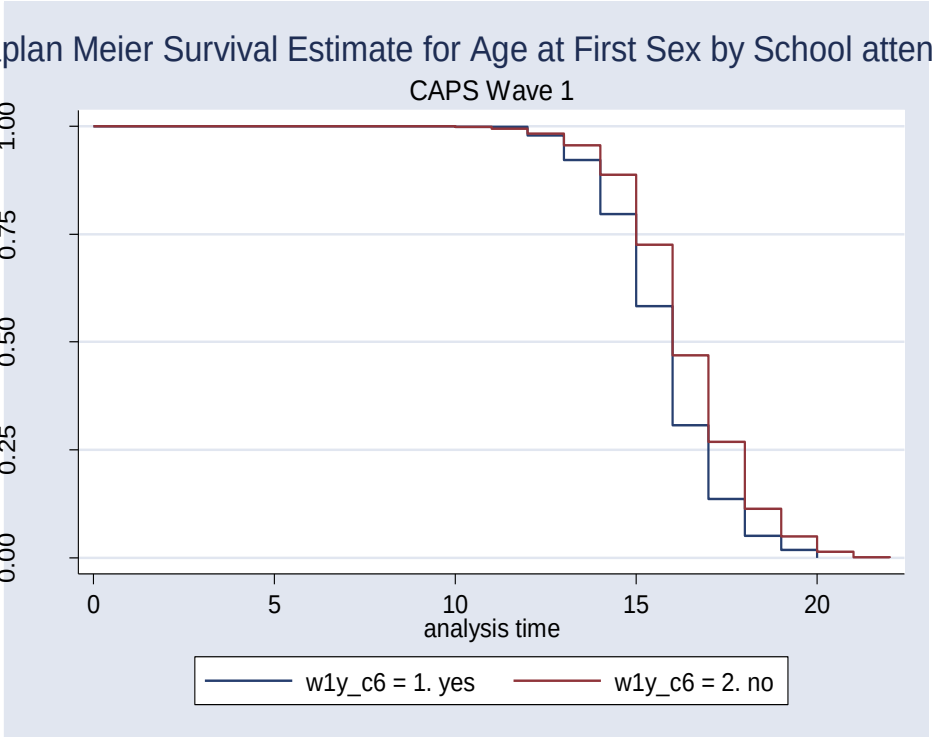
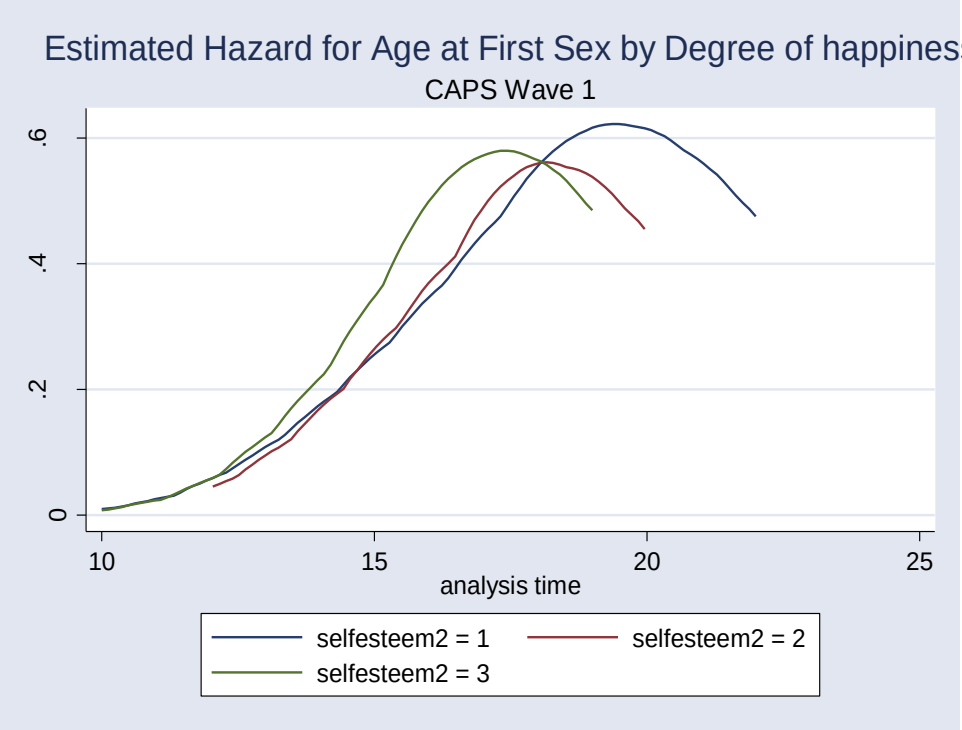


Figure 21: Estimated hazard for age at first sexual intercourse by degree of happiness in 2002



Where self-esteem =1 stands for very happy; self-esteem =2 stands for happy a little and self-esteem =3 stands for not happy

Figure 22: Kaplan Meier survival estimate for age at first sexual intercourse by degree of happiness in 2002

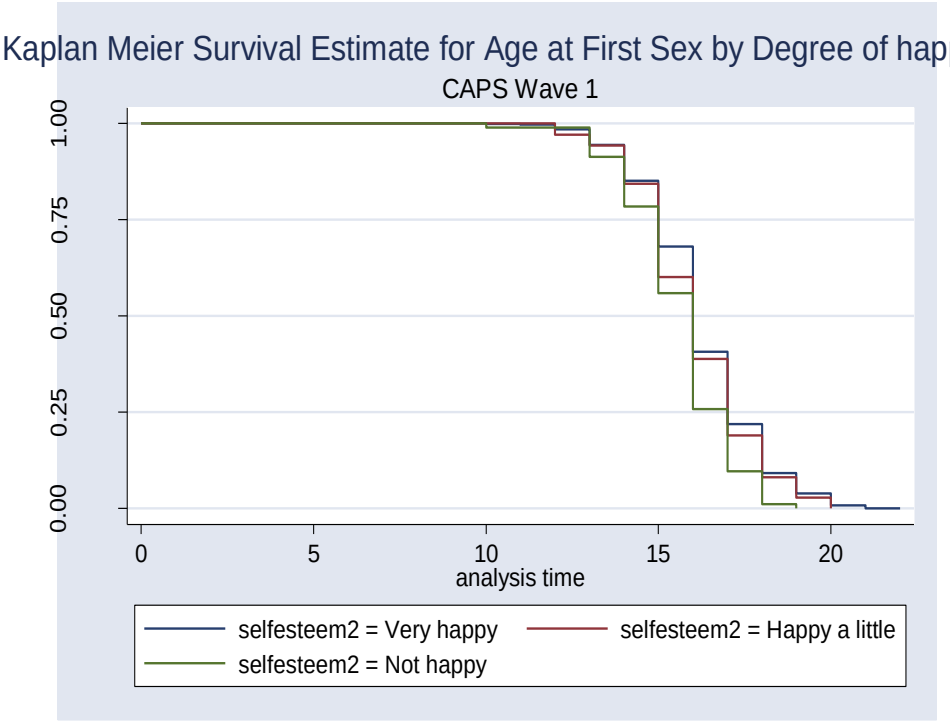
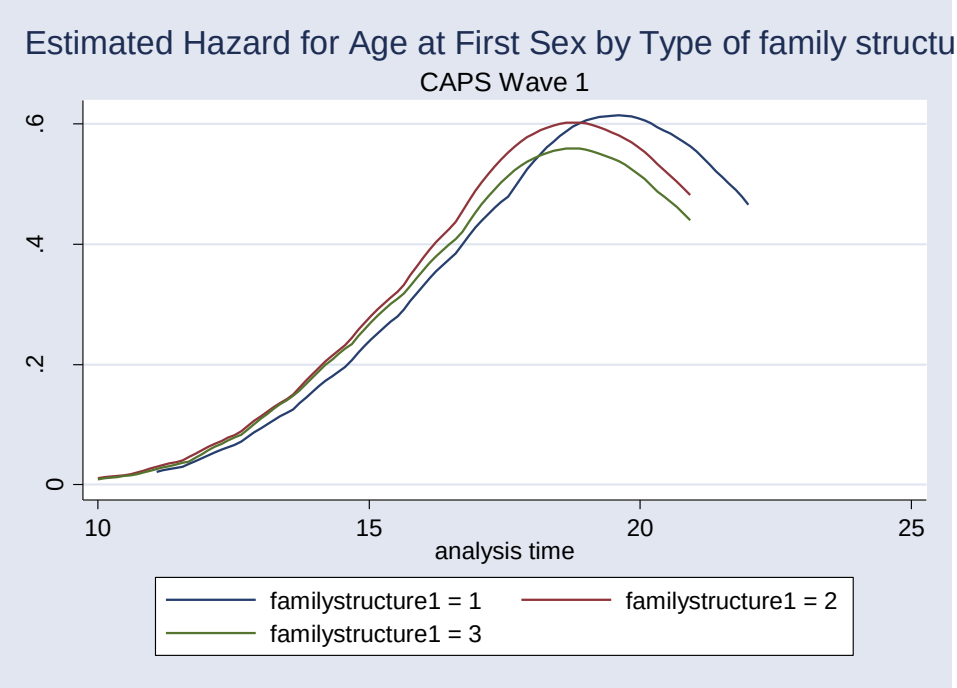
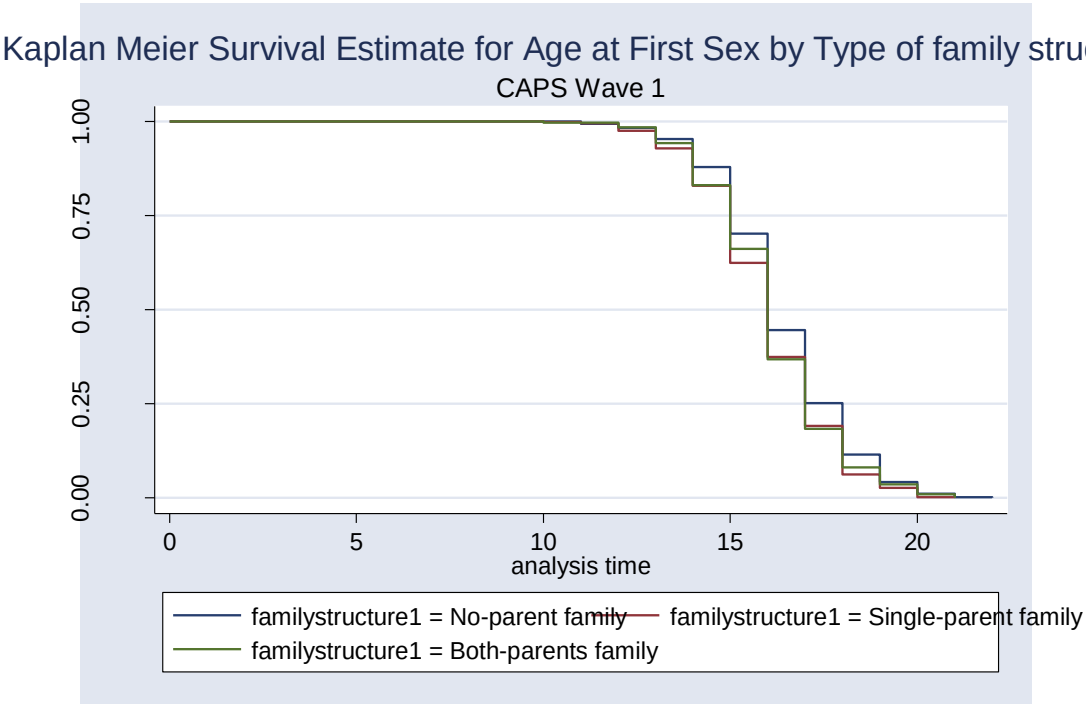


Figure 23: Estimated hazard for age at first sexual intercourse by type of family structure in 2002



Where family structure = 1 stands for no-parent family structure; family structure = 2 stands for one-parent family structure and family structure = 3 stands for both-parent family structure.

Figure 24: Kaplan Meier survival estimate for age at first sexual intercourse by type of family structure in 2002



6.2.2 Multivariate results

Table 14 presents the results of the Cox proportional hazard model, and shows the risk of transiting to first sexual intercourse among the adolescents and young adults studied at the baseline in 2002 for all combined, controlling for the sex of the respondents. Model 1 shows the direct effect of the socio-economic/demographic and personal factors on the age at first sexual intercourse in 2002. Model 2 shows the combined impact of socio-economic/demographic and personal factors, and self-efficacy factors on the age at first sexual intercourse. Model 3 added outcome expectancies variables into Model 2, while Model 4 added the socio-structural factors found to be significant at the bivariate level into Model 3.

Using the Breslow method for ties, the results indicated that the inclusion of socio-structural factors has a minimal effect, looking closely at Models 1 to 4. Generally, up to Model 3, being older, being a female, being of Coloured or White racial origin, having attained a secondary or tertiary educational level, and not attending school in 2002 wielded a delaying effect on the rate of transition to first sexual intercourse (that is, all the factors mentioned above were associated with increased survival from early first sexual intercourse in 2002). On the other hand, not being happy about life, being from a single-parent and to a lesser extent a two-parent family exerted a positive effect on the rate of transition into first sexual intercourse, meaning that those factors are associated with decreased survival.

After controlling for the sex of respondents at the baseline, being older, being of the Coloured or White racial group, having at least secondary education level and being out of school were the significant factors associated with increased survival from early first

sexual intercourse among males, while being older, of the Coloured racial group and having either secondary or tertiary education associated significantly with increased survival from early first sexual intercourse among females. On the other hand, in 2002, being 'happy a little' associated significantly with decreased survival from early first sexual intercourse among males while for females being totally unhappy about life, being from either a single-parent or two-parent family structure, and being resident in a rural area while growing up all associated significantly with decreased survival from early first sexual intercourse in the study area in 2002.

Table 15 presents the corresponding results of the Cox proportional hazard model for the second wave in 2003/2004. Using the Breslow method for ties, and looking closely at Models 1 to 4 reveals that the inclusion of socio-structural factors exerted a powerful influence although, some of the variables lost their predictive power at their inclusion into Model 3. Generally, being older, being a female, being of Coloured or White racial origin**,** having attained a secondary or tertiary educational level and being out of school had a delaying effect on the rate of transition to first sexual intercourse in 2003/2004. Being happy a little or not happy at all was significantly associated with first sexual intercourse during the reference period. After controlling for gender, being older was protective against early transition into first sexual intercourse for both sexes; having secondary level education was protective for males, while having a secondary or tertiary level education was protective for females.

Also, being out-of-school and from rural childhood place of residence was protective only among males, while peer effect was noted only among the female respondents. Moreover, being happy a little predisposed the male respondents to transiting early to their first sexual

intercourse, compared to the reference category. The Cox's and Kaplan Meier graphs shown below give a vivid picture of some of the significant covariates of age at first sexual intercourse at the second wave in 2003/2004.

Table 16 presents the results of the Cox proportional hazard model for Wave 3. Using the Breslow method for ties, close examination of the models indicates that the inclusion of socio-structural factors exerted a powerful influence on Models 1 to 4, and that some of the variables lost their predictive power at their inclusion in Model 3. Generally, being older, being a female, being of Coloured or White racial origin, having tertiary level education (especially in Models 1 and 2) and having low educational aspirations associated significantly with higher age at first sexual intercourse in 2005 (H.R. < 1).

When the sex of the respondents was controlled for, being older and of Coloured race help both sexes to delay transiting to first sexual intercourse, while being a White female unexpectedly increased the risk of transiting to first sexual intercourse in 2005 (H.R. = 2.36-3.60; $p<0.1$). For females, the higher the level of education, the later the age at first sexual intercourse, while low educational aspiration, living in predominantly Coloured neighbourhoods and participating in prosocial activities had a delaying effect on the age at first sexual intercourse for male respondents only. The Cox's and Kaplan Meier graphs shown below give a vivid picture of some of the significant covariates of age at first sexual intercourse at the third wave of data collection in 2005.

Table 14: Hazard ratios (95% CI) for age at first sexual intercourse, 2002 (males and females combined)

Variables	Wave 1 (Combined)				Wave 1 (Males)				Wave 1 (Females)			
	Model 1[17]	**Model 2[18]**	**Model 3[19]**	**Model 4[20]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Personal/Sociodemographic characteristics												
Age (groupings)												
Less than 18 years	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18 years above	0.41*** (0.36-0.47)	0.41*** (0.35-0.47)	0.41*** (0.36-0.47)	0.45*** (0.38-0.52)	0.45*** (0.37-0.55)	0.44*** (0.36-0.53)	0.43*** (0.35-0.53)	0.49**** (0.39-0.61)	0.37*** (0.30-0.45)	0.37*** (0.30-0.45)	0.38*** (0.31-0.46)	0.39*** (0.31-0.48)
Sex												
Male	1.00	1.00	1.00	1.00	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Female	0.71*** (0.64-0.80)	0.72*** (0.64-0.80)	0.73*** (0.65-0.81)	0.74*** (0.66-0.83)	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Race/ population group												
Black/African	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Coloured	0.77*** (0.69-0.87)	0.79*** (0.70-0.89)	0.79*** (0.70-0.89)	0.82 (0.44-1.52)	0.76*** (0.64-0.89)	0.76*** (0.65-0.90)	0.76*** (0.64-0.90)	0.80 (0.34-1.90)	0.80*** (0.67-0.94)	0.82** (0.69-0.97)	0.81** (0.68-0.97)	0.97 (0.40-2.36)
White	0.64*** (0.48-0.85)	0.66*** (0.50-0.87)	0.66*** (0.50-0.88)	0.64 (0.32-1.27)	0.46*** (0.28-0.75)	0.47*** (0.29-0.77)	0.48*** (0.29-0.78)	0.40* (0.16-1.00)	0.83 (0.59-1.17)	0.85 (0.60-1.20)	0.86 (0.60-1.22)	1.16 (0.40-3.38)
Other	-	-	-	-	-	-	-	-	-	-	-	-
Educational level												
No formal education	-	-	-	-	-	-	-	-	-	-	-	-
Primary	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Secondary	0.71*** (0.61-0.83)	0.72*** (0.61-0.84)	0.73*** (0.62-0.87)	0.70*** (0.59-0.83)	0.78** (0.62-0.97)	0.80** (0.64-0.99)	0.83 (0.66-1.05)	0.74** (0.58-0.95)	0.64*** (0.51-0.81)	0.65*** (0.51-0.81)	0.65*** (0.51-0.83)	0.63*** (0.49-0.80)
Tertiary	0.65*** (0.47-0.88)	0.66*** (0.48-0.90)	0.67** (0.49-0.93)	0.64*** (0.46-0.88)	0.85 (0.53-1.36)	0.87 (0.54-1.40)	0.94 (0.57-1.55)	0.85 (0.51-1.42)	0.51*** (0.34-0.77)	0.52*** (0.34-0.78)	0.52*** (0.34-0.79)	0.48*** (0.31-0.74)
Self-esteem												
Very happy about life		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Happy a little about life		1.08 (0.93-1.26)	1.10 (0.94-1.28)	1.12 (0.96-1.30)		1.25 (1.00-1.57)	1.27** (1.01-1.60)	1.27** (1.01-1.60)		0.94 (0.77-1.16)	0.97 (0.79-1.19)	1.00 (0.81-1.23)
Not happy about life		1.27** (1.02-1.58)	1.24* (0.99-1.56)	1.25* (1.00-1.57)		1.15 (0.84-1.57)	1.11 (0.81-1.53)	1.12 (0.81-1.55)		1.39** (1.03-1.88)	1.38** (1.00-1.90)	1.37* (0.99-1.90)
Outcome expectancies												
Belief in abstinence as a way of protecting against HIV												
No			1.00	1.00			1.00	1.00			1.00	1.00
Yes			0.94 (0.84-1.06)	0.94 (0.83-1.06)			0.95 (0.80-1.13)	0.96 (0.80-1.15)			0.94 (0.80-1.10)	0.93 (0.79-1.10)
Socio-structural												
Family structure												

[17] Model 1 indicates the effect of personal, socio-economic and demographic variables on age at first sexual intercourse in 2002
[18] Model 2 represents an addition of self-efficacy factor to Model 1
[19] Model 3 indicates an addition of outcome expectancies to Model 2
[20] Model 4 represents an addition of socio-structural/contextual variables to Model 3

Variables	Wave 1 (Combined)				Wave 1 (Males)				Wave 1 (Females)			
	Model 1[17]	**Model 2[18]**	**Model 3[19]**	**Model 4[20]**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
No-parent family				1.00				1.00				1.00
Single-parent family				1.19** (1.03-1.37)				1.11 (0.89-1.39)				1.29** (1.06-1.56)
Both-parents family				1.17* (1.00-1.36)				1.08 (0.86-1.36)				1.25** (1.01-1.54)
School attendance												
Yes				1.00				1.00				1.00
No				0.84** (0.73-0.96)				0.75*** (0.61-0.92)				0.97 (0.80-1.18)
Neighbourhood racial concentration												
African				1.00				1.00				1.00
Coloured				0.98 (0.52-1.82)				0.89 (0.37-2.14)				0.89 (0.37-2.18)
White				0.93 (0.50-1.75)				0.91 (0.41-2.02)				0.79 (0.29-2.18)
Participation in prosocial activities												
Non-participants				1.00				1.00				1.00
Participants				1.01 (0.90-1.14)				1.00 (0.84-1.20)				1.03 (0.87-1.22)
Neighbourhood SES												
Affluent				1.00				1.00				1.00
Poor				0.95 (0.81-1.12)				0.87 (0.69-1.10)				1.08 (0.85-1.37)
Childhood place of residence												
Urban				1.00				1.00				1.00
Rural				1.04 (0.90-1.20)				0.87 (0.70-1.10)				1.21* (1.00-1.46)
Statistical information												
No. of subjects	1,308	1,305	1,252	1,241	615	613	589	583	693	692	663	658
No. of observations	1,308	1,305	1,252	1,241	615	613	589	583	693	692	663	658
No. of failures	1,308	1,305	1,252	1,241	615	613	589	583	693	692	663	658
Time at risk	21120	21081	20241	20050	9,675	9,652	9,289	9,194	11,445	11,429	10,952	10,856
Log likelihood	-8260.79	-8236.29	-7853.06	-7767.79	-3436.41	-3421.02	-3264.64	-3218.11	-3944.63	-3935.41	-3743.05	-3705.44
LR chi2	242.76	247.95	231.23	242.68	91.14	96.16	90.61	103.79	123.37	128.10	120.69	130.83
Prob>chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations: CI – Confidence interval, N.A- Not Applicable, - Information dropped by the system

Figures in parentheses are confidence interval. “Other” racial group was too small and so was dropped during the analysis by the system. For educational level of the respondents, there was none in the “no formal education category”; hence, primary level of education becomes the reference category. Hazard ratios > 1 indicate that individual in the category is more likely to sexually debut earlier than an individual in the reference category (i.e. the age at first sex of that category is younger than the age at first sex for the reference category).

Table 15: Hazard ratios (95% CI) for age at first sexual intercourse among CAPS adolescents and young adult respondents, 2003/2004 (Males and females combined)

Variables	Wave 2 (Combined)				Wave 2 (Males)				Wave 2 (Females)			
	Model 1[21]	Model 2[22]	Model 3[23]	Model 4[24]	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Personal/Sociodemographic characteristics												
Age (groupings)												
Less than 18 years	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18 years above	0.44*** (0.39-0.50)	0.44*** (0.39-0.50)	0.44*** (0.39-0.50)	0.48*** (0.41-0.55)	0.48*** (0.41-0.58)	0.47*** (0.39-0.56)	0.47*** (0.39-0.56)	0.52*** (0.42-0.63)	0.40*** (0.34-0.48)	0.40*** (0.34-0.48)	0.41*** (0.35-0.50)	0.43*** (0.35-0.52)
Sex												
Male	1.00	1.00	1.00	1.00	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Female	0.73*** (0.66-0.81)	0.73*** (0.65-0.81)	0.74*** (0.66-0.82)	0.75*** (0.67-0.83)	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Race/ population group												
Black/African	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Coloured	0.74*** (0.66-0.82)	0.75*** (0.67-0.84)	0.74*** (0.66-0.83)	0.84 (0.48-1.49)	0.75*** (0.64-0.87)	0.76*** (0.65-0.88)	0.75*** (0.64-0.88)	0.84 (0.37-1.89)	0.71*** (0.61-0.83)	0.73*** (0.62-0.85)	0.72*** (0.61-0.85)	0.91 (0.41-2.01)
White	0.71*** (0.55-0.92)	0.73** (0.56-0.94)	0.74** (0.56-0.96)	0.74 (0.38-1.42)	0.53*** (0.34-0.82)	0.54*** (0.35-0.85)	0.55** (0.35-0.87)	0.48 (0.20-1.17)	0.88 (0.64-1.21)	0.89 (0.65-1.23)	0.90 (0.65-1.25)	1.16 (0.43-3.16)
Educational level	-	-	-	-	-	-	-					
Primary	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Secondary	0.68*** (0.59-0.79)	0.69*** (0.60-0.80)	0.71*** (0.61-0.83)	0.68*** (0.58-0.80)	0.76*** (0.62-0.92)	0.78** (0.63-0.95)	0.81** (0.65-1.00)	0.74** (0.59-0.93)	0.61*** (0.49-0.75)	0.61*** (0.49-0.76)	0.61*** (0.49-0.77)	0.62*** (0.49-0.77)
Tertiary	0.56*** (0.42-0.76)	0.57*** (0.42-0.77)	0.59*** (0.43-0.80)	0.56*** (0.41-0.76)	0.71 (0.44-1.12)	0.73 (0.46-1.16)	0.78 (0.48-1.27)	0.69 (0.42-1.13)	0.45*** (0.31-0.67)	0.46*** (0.31-0.68)	0.46*** (0.31-0.69)	0.46*** (0.31-0.70)
Self-esteem												
Very happy about life		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Happy a little about life		1.12 (0.97-1.29)	1.14* (0.99-1.31)	1.14* (0.99-1.32)		1.30** (1.05-1.60)	1.32** (1.07-1.63)	1.32** (1.06-1.63)		0.97 (0.80-1.17)	0.99 (0.81-1.21)	1.01 (0.82-1.23)
Not happy about life		1.22* (0.99-1.49)	1.18 (0.96-1.46)	1.18 (0.95-1.46)		1.14 (0.85-1.52)	1.10 (0.81-1.48)	1.09 (0.81-1.47)		1.28* (0.96-1.71)	1.26 (0.93-1.70)	1.19 (0.87-1.63)
Outcome expectancies												
Belief in abstinence as a way of protecting against HIV												
No			1.00	1.00			1.00	1.00			1.00	1.00
Yes			0.93 (0.83-	0.92 (0.82-			0.93 (0.79-	0.93 (0.79-			0.94 (0.80-	0.93 (0.80-

[21] Model 1 indicates the effect of personal, socio-economic and demographic variables on age at first sexual intercourse in 2003/2004
[22] Model 2 represents an addition of self-efficacy factor to Model 1
[23] Model 3 indicates an addition of outcome expectancies to Model 2
[24] Model 4 represents an addition of socio-structural/contextual variables to Model 3

Variables	Wave 2 (Combined)				Wave 2 (Males)				Wave 2 (Females)			
	Model 1[21]	Model 2[22]	Model 3[23]	Model 4[24]	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
			1.04)	1.03)			1.09)	1.10)			1.09)	1.08)
Belief about preventability of HIV/AIDS												
Yes			1.00	1.00			1.00	1.00			1.00	1.00
No			1.81 (0.25-12.97)	1.60 (0.21-12.07)			1.73 (0.24-12.40)	1.35 (0.17-10.74)			-	-
Socio-structural variables												
School attendance												
Yes				1.00				1.00				1.00
No				0.86** (0.76-0.97)				0.79** (0.66-0.95)				0.95 (0.80-1.14)
Neighbourhood racial concentration												
African				1.00				1.00				1.00
Coloured				0.90 (0.51-1.60)				0.82 (0.36-1.87)				0.90 (0.40-2.01)
White				0.91 (0.50-1.66)				0.89 (0.41-1.94)				0.87 (0.33-2.26)
Participation in prosocial activities												
Non-participants				1.00				1.00				1.00
Participants				1.02 (0.91-1.14)				0.99 (0.84-1.17)				1.03 (0.88-1.21)
Neighbourhood SES												
Affluent				1.00				1.00				1.00
Poor				0.93 (0.80-1.09)				0.84 (0.67-1.04)				1.09 (0.87-1.37)
Childhood place of residence												
Urban				1.00				1.00				1.00
Rural				0.97 (0.85-1.11)				0.83* (0.67-1.03)				1.13 (0.94-1.35)
Peers sexually active?												
None of them				1.00				1.00				1.00
A few/some of them				1.02 (0.71-1.45)				1.35 (0.78-2.35)				0.65* (0.41-1.03)
Most or all of them				1.05 (0.74-1.48)				1.36 (0.79-2.33)				0.68* (0.43-1.07)
Unsure				0.90 (0.60-1.33)				1.19 (0.64-2.22)				0.57** (0.34-0.95)
Statistical information												

Variables	**Wave 2 (Combined)**				**Wave 2 (Males)**				**Wave 2 (Females)**			
	Model 1[21]	Model 2[22]	Model 3[23]	Model 4[24]	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
No. of subjects	1,479	1,476	1,415	1,402	705	703	675	667	774	773	740	735
No. of observations	1,479	1,476	1,415	1,402	705	703	675	667	774	773	740	735
No. of failures	1,479	1,476	1,415	1,402	705	703	675	667	774	773	740	735
Time at risk	23,906	23,867	22,907	22,685	11,112	11,089	10,671	10,545	12,794	12,778	12,236	12,140
Log likelihood	-9508.25	-9483.33	-9035.93	-8937.11	-4031.07	-4014.49	-3829.05	-3767.69	-4475.57	-4467.26	-4245.14	-4208.93
LR Chi2	277.21	282.50	262.58	267.97	99.95	106.83	99.64	113.56	151.04	153.73	145.13	151.28
Prob>Chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations: CI – Confidence interval, N.A- Not Applicable, - Information dropped by the system; Figures in parentheses are confidence interval.

Figure 25: Single estimated hazard for age at first sexual intercourse in 2003/2004

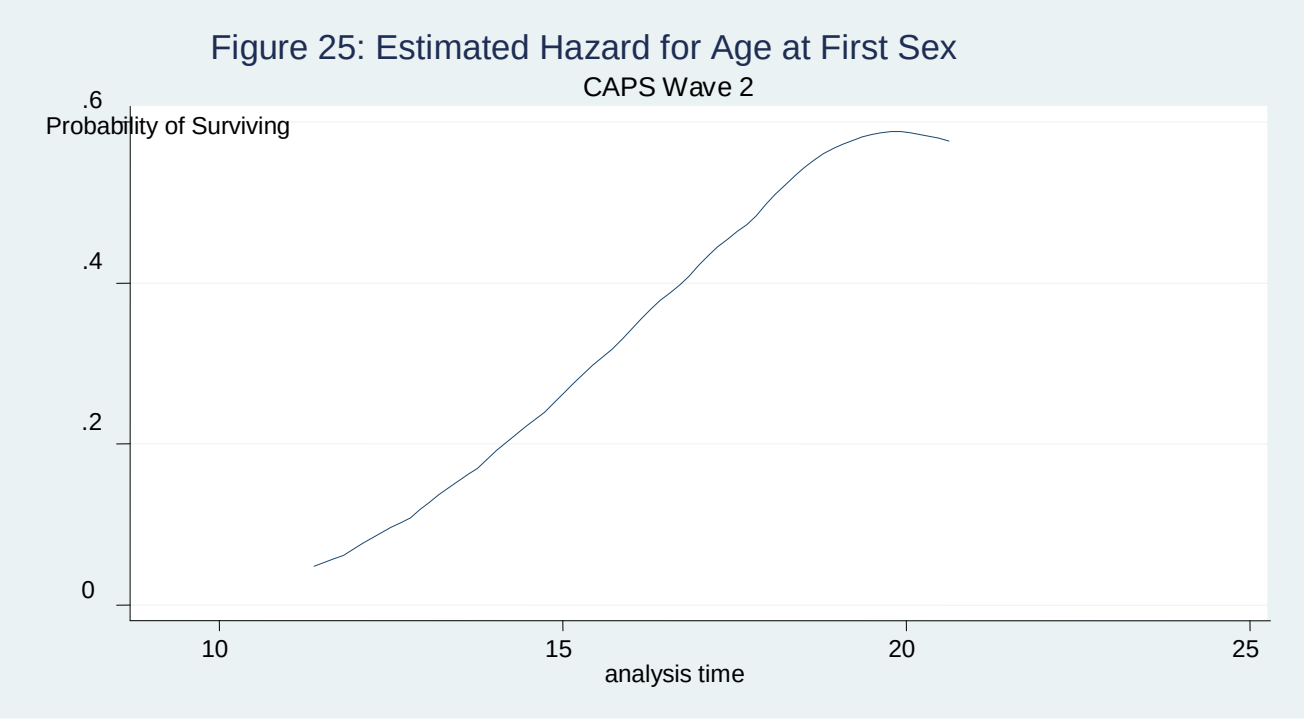


Figure 26: Estimated hazard for age at first sexual intercourse by age-groupings in 2003/2004

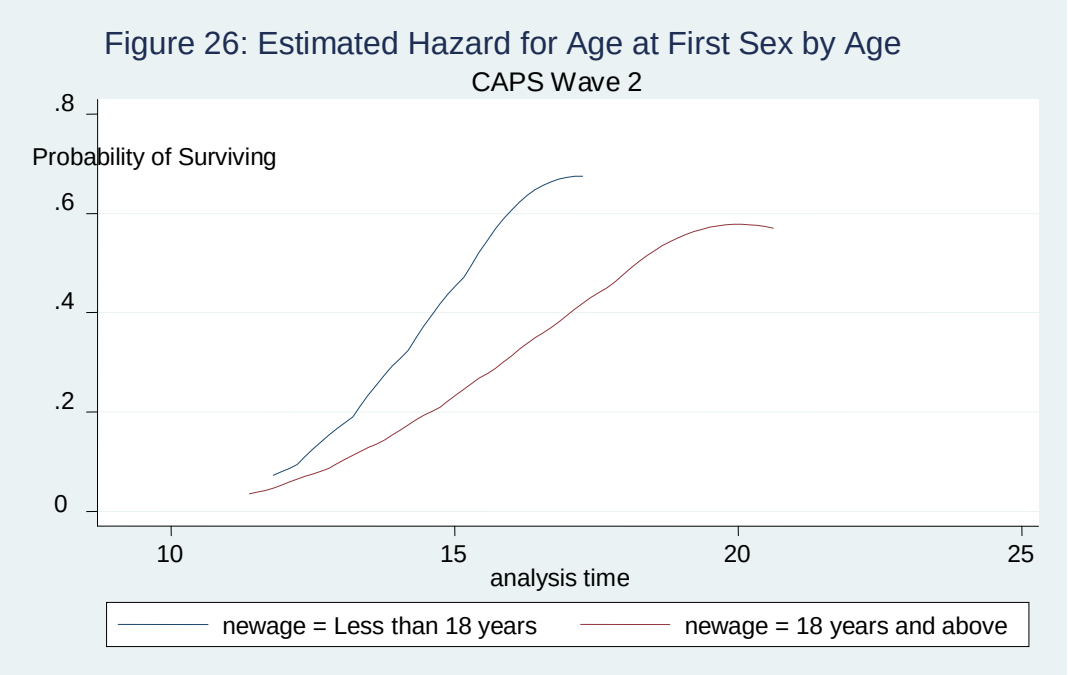


Figure 27: Estimated hazard for age at first sexual intercourse by sex in 2003/2004

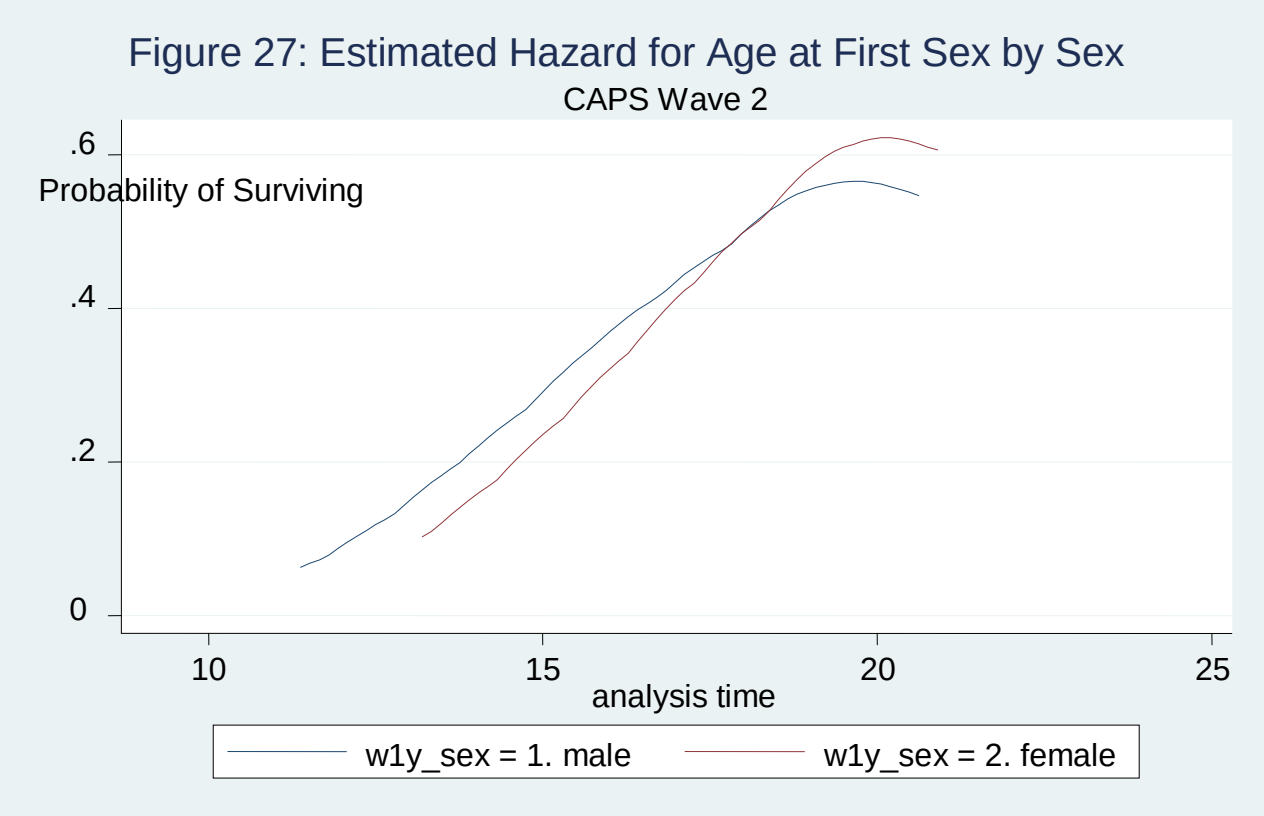


Figure 28: Estimated hazard for age at first sexual intercourse by educational level in 2003/2004

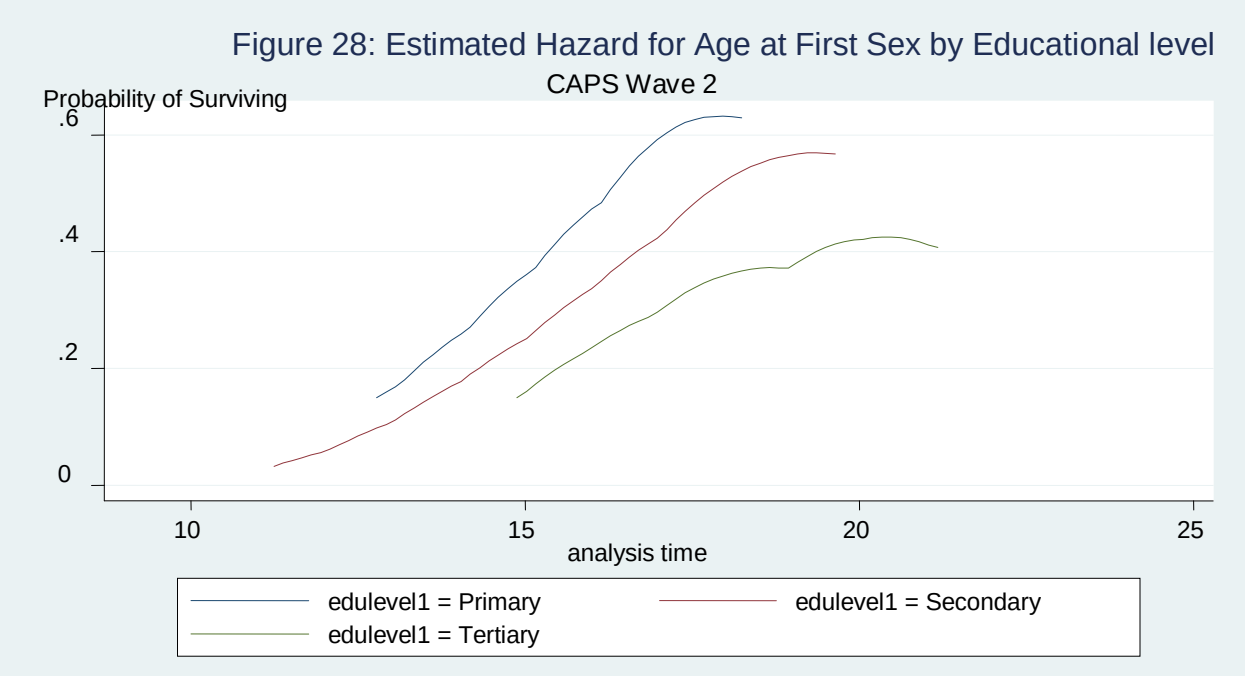


Figure 29: Estimated hazard for age at first sexual intercourse by degree of happiness in 2003/2004

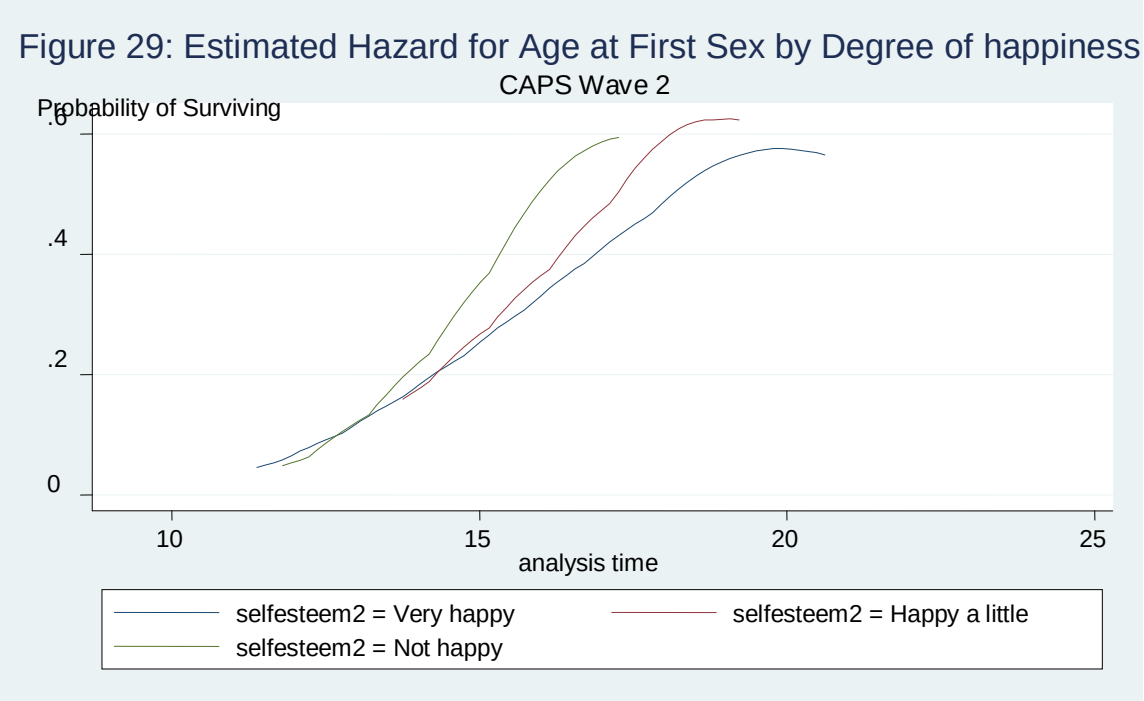


Figure 30: Estimated hazard for age at first sexual intercourse by school attendance in 2003/2004

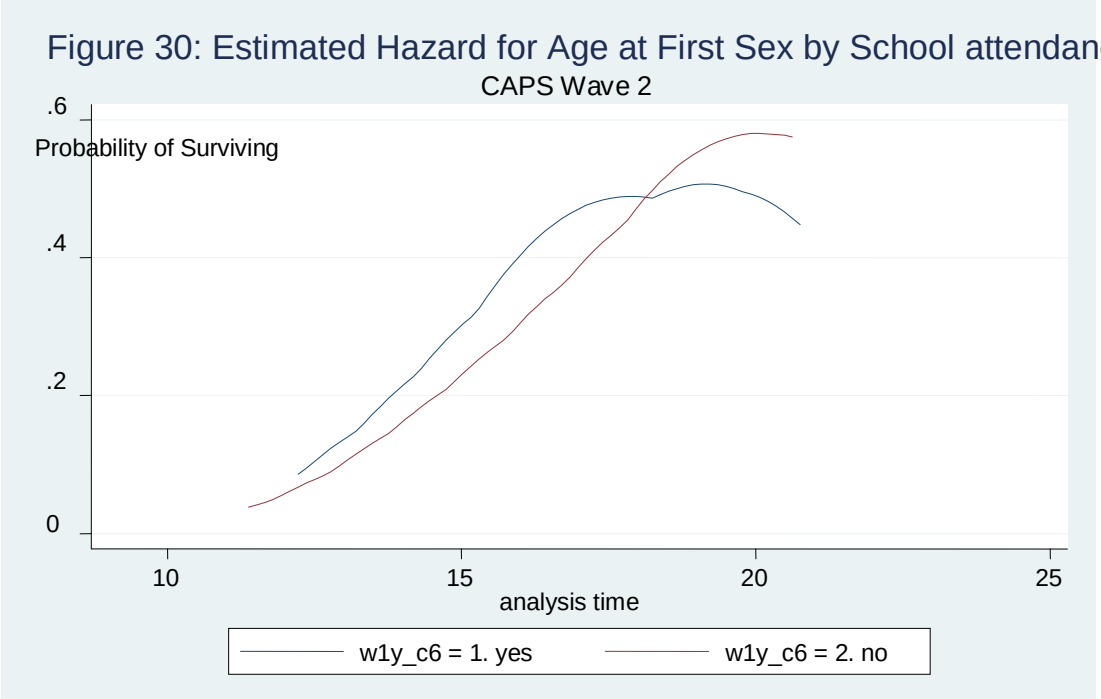


Figure 31: Kaplan Meier single survival estimate for age at first sexual intercourse in 2003/2004

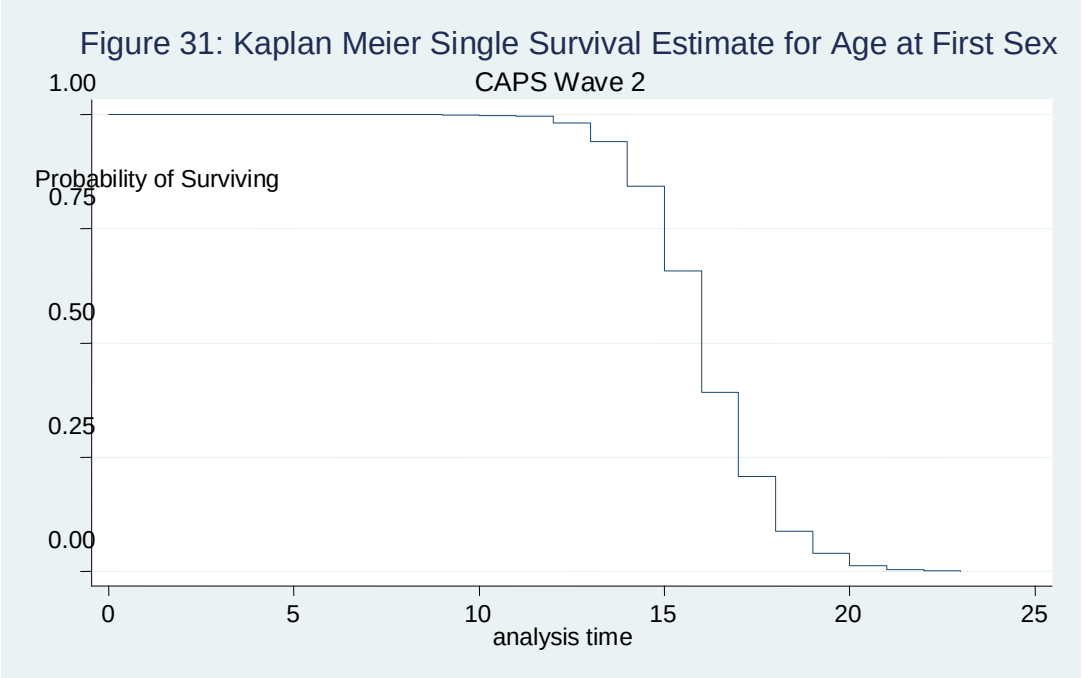


Figure 32: Kaplan Meier survival estimate for age at first sexual intercourse by age-groupings in 2003/2004

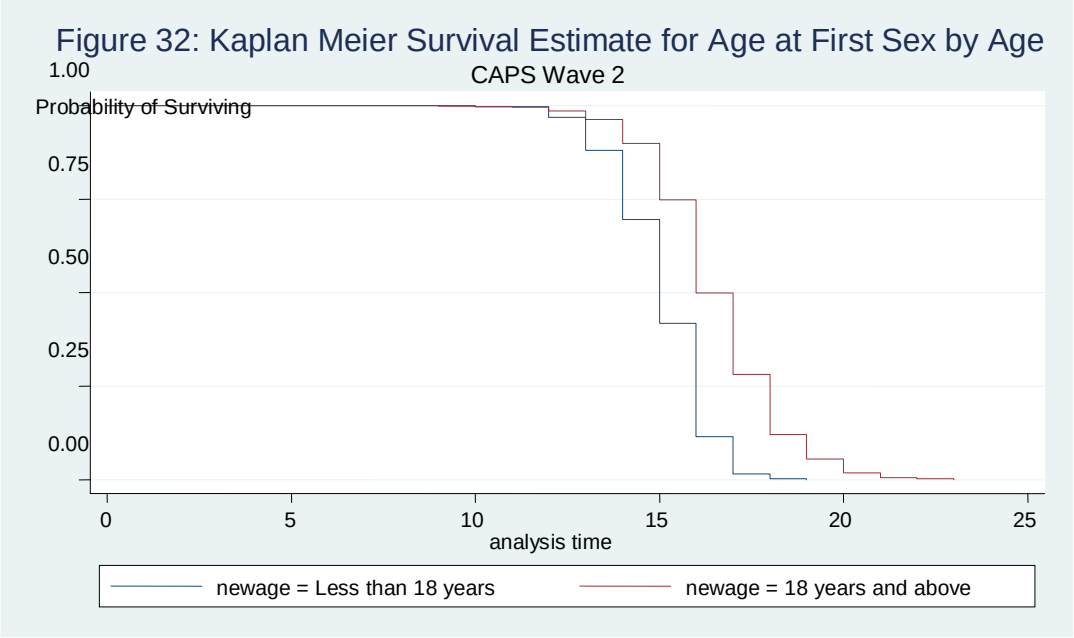


Figure 33: Kaplan Meier survival estimate for age at first sexual intercourse by sex in 2003/2004

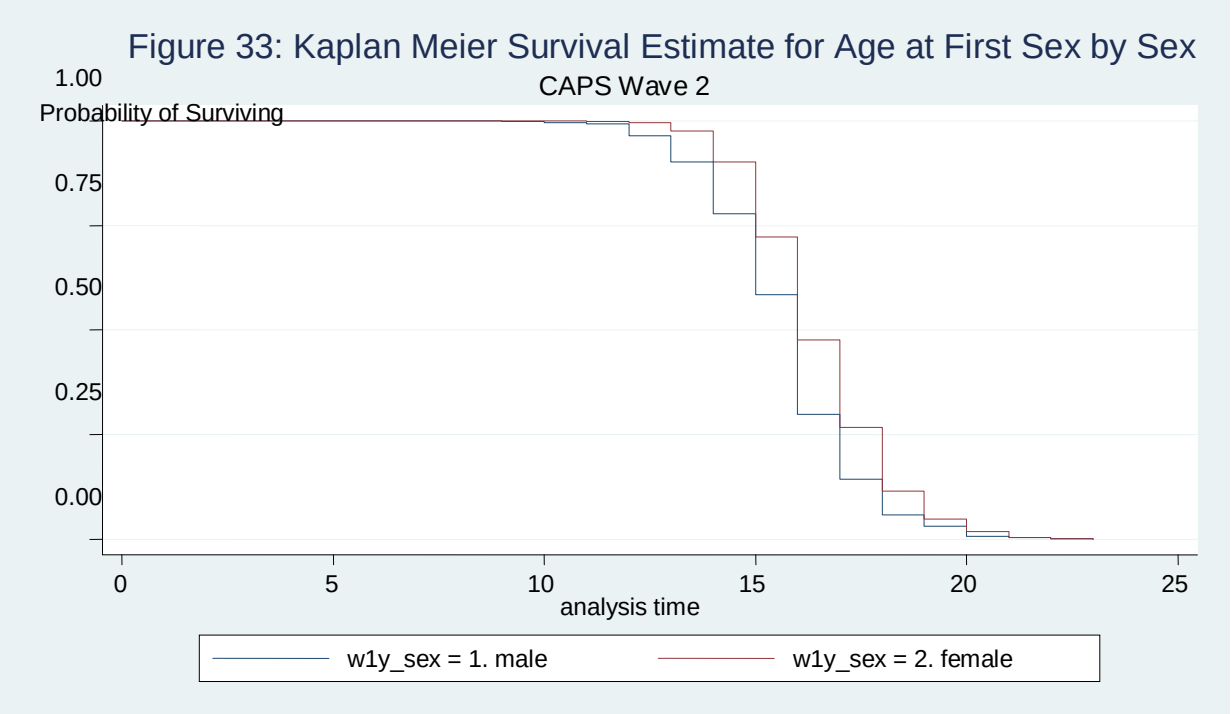


Figure 34: Kaplan Meier survival estimate for age at first sexual intercourse by educational level in 2003/2004

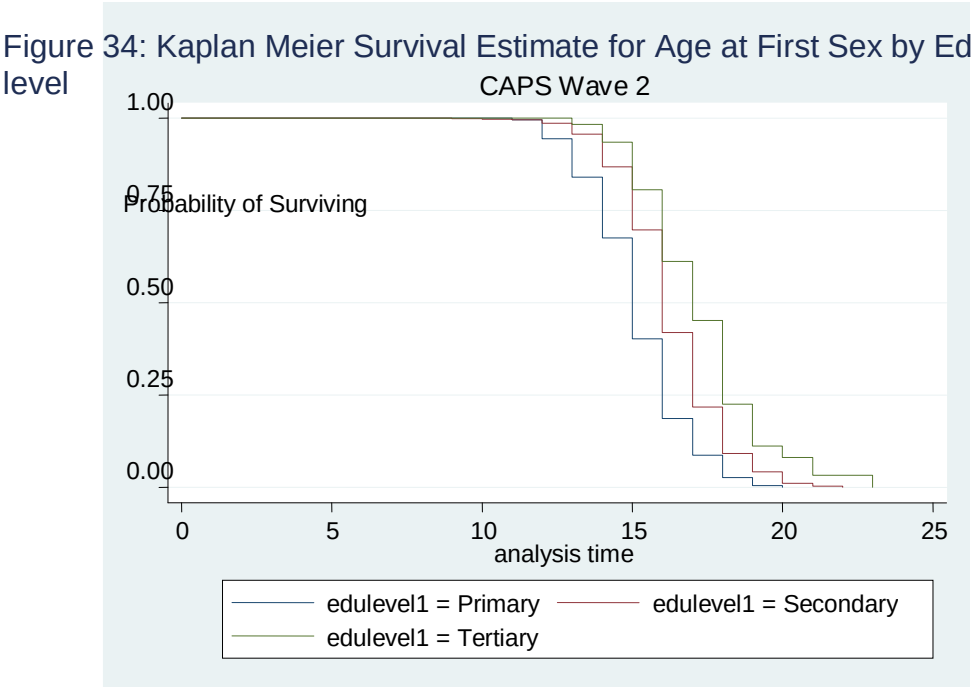


Figure 35: Kaplan Meier survival estimate for age at first sexual intercourse by degree of happiness in 2003/2004

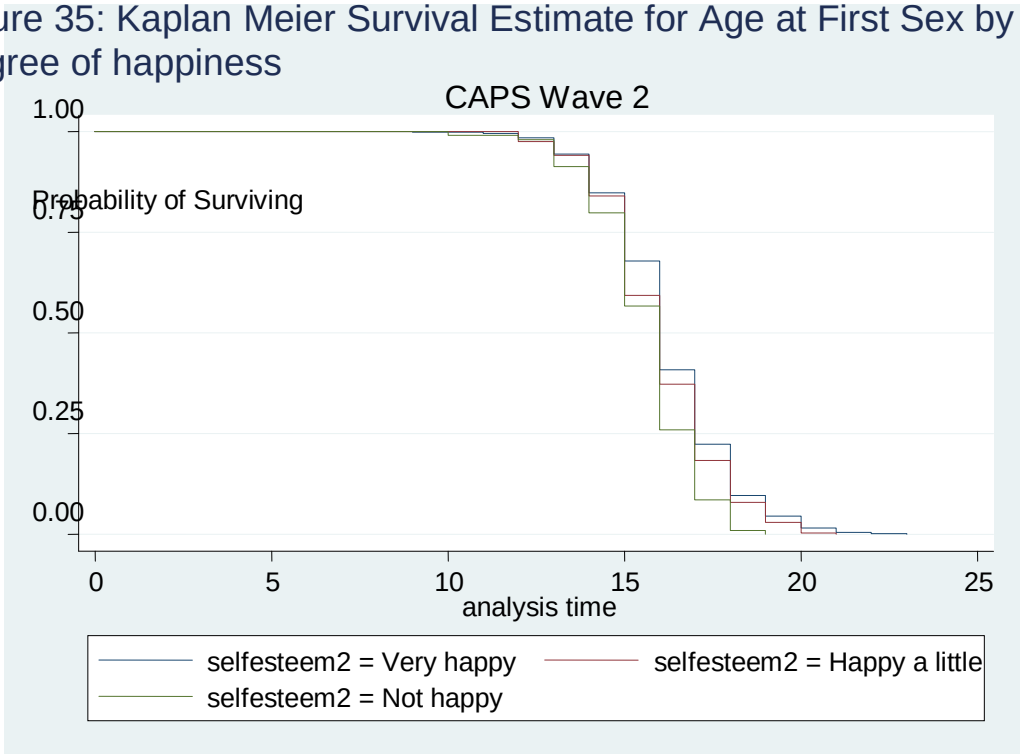


Figure 36: Kaplan Meier survival estimate for age at first sexual intercourse by school attendance in 2003/2004

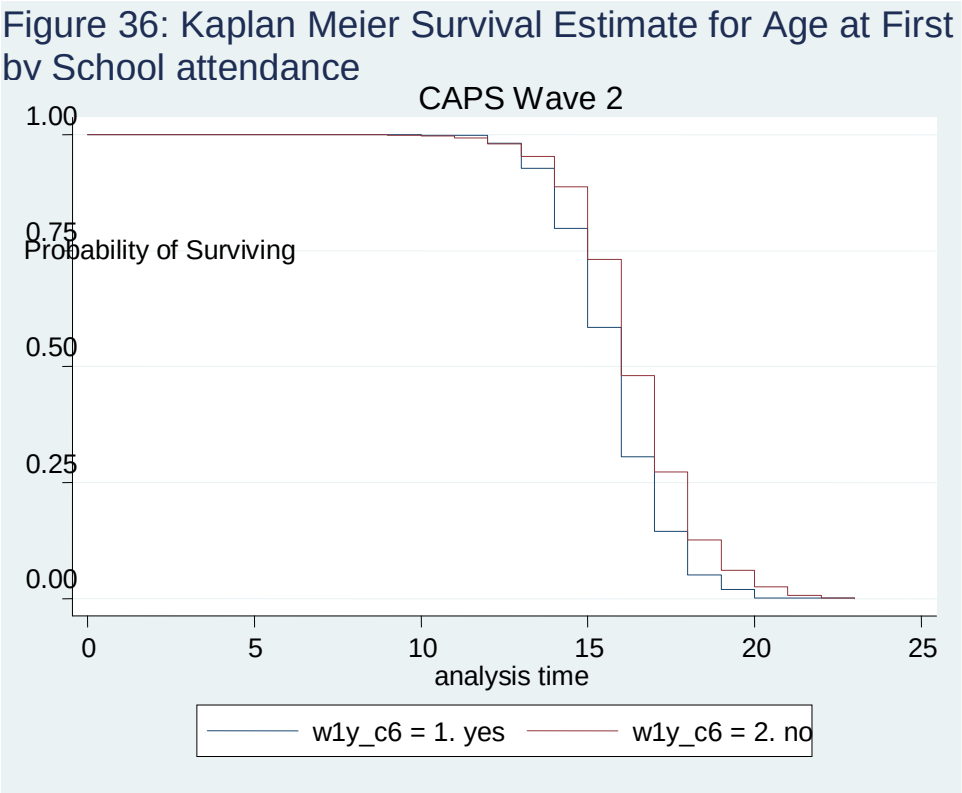


Table 16: Hazard ratios (95% CI) for age at first sexual intercourse among CAPS adolescents and young adult' respondents, 2005 (males and females combined)

Variables	Wave 3 (Combined)				Wave 3 (Males)				Wave 3 (Females)			
	Model 1[25]	Model 2[26]	Model 3[27]	Model 4[28]	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Personal/sociodemographic characteristics												
Age (groupings)												
Less than 18 years	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18 years above	0.65*** (0.51-0.82)	0.64*** (0.50-0.81)	0.70*** (0.54-0.90)	0.70*** (0.54-0.91)	0.65** (0.46-0.90)	0.64*** (0.45-0.89)	0.69** (0.48-0.99)	0.70* (0.48-1.01)	0.65** (0.46-0.92)	0.64** (0.45-0.92)	0.70* (0.48-1.02)	0.70* (0.48-1.02)
Sex												
Male	1.00	1.00	1.00	1.00	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Female	0.67*** (0.56-0.80)	0.67*** (0.57-0.81)	0.67*** (0.54-0.84)	0.68*** (0.54-0.85)	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Race/ population group												
Black/African	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Coloured	0.58*** (0.45-0.74)	0.59*** (0.47-0.76)	0.63*** (0.45-0.88)	1.36 (0.18-10.28)	0.50*** (0.36-0.69)	0.52*** (0.37-0.73)	0.53*** (0.35-0.81)	-	0.66** (0.46-0.95)	0.66** (0.46-0.95)	0.75 (0.43-1.31)	1.41 (0.17-11.65)
White	0.46*** (0.32-0.64)	0.47*** (0.33-0.67)	0.87 (0.44-1.72)	1.08 (0.37-3.12)	0.28*** (0.17-0.47)	0.30*** (0.18-0.50)	0.35* (0.12-1.01)	0.26 (0.05-1.31)	0.86 (0.54-1.37)	0.87 (0.55-1.40)	2.36** (1.01-5.50)	3.60* (0.85-15.22)
Other	0.62 (0.09-4.46)	0.67 (0.09-4.81)	-	-	0.49 (0.07-3.56)	0.54 (0.07-3.94)	-	-	-	-		
Educational level												
Secondary	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Tertiary	0.76** (0.61-0.94)	0.75*** (0.60-0.93)	0.59 (0.08-4.27)	0.56 (0.08-4.05)	0.95 (0.69-1.30)	0.90 (0.65-1.26)	-	-	0.61*** (0.45-0.83)	0.62*** (0.46-0.84)	0.56 (0.08-1.07)	0.58 (0.08-4.28)
Age at puberty	0.97 (0.91-1.03)	0.97 (0.91-1.03)	0.96 (0.89-1.03)	0.95 (0.88-1.03)	0.97 (0.88-1.06)	0.98 (0.89-1.07)	0.93 (0.83-1.04)	0.94 (0.83-1.06)	0.96 (0.89-1.03)	0.96 (0.89-1.04)	0.97 (0.88-1.08)	0.97 (0.87-1.07)
Current work status												
Yes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No	1.06 (0.82-1.38)	1.05 (0.81-1.36)	1.09 (0.65-1.86)	1.09 (0.62-1.89)	1.12 (0.75-1.67)	1.11 (0.74-1.65)	0.85 (0.42-1.72)	0.79 (0.39-1.62)	0.98 (0.70-1.39)	0.97 (0.69-1.37)	1.09 (0.51-2.34)	1.04 (0.46-2.38)
Self-esteem												
Very happy about life		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Happy a little about life		1.22 (0.94-1.57)	1.28 (0.92-1.79)	1.30 (0.92-1.83)		1.17 (0.82-1.67)	1.35 (0.84-2.17)	1.46 (0.88-2.40)		1.20 (0.83-1.75)	1.27 (0.78-2.06)	1.28 (0.77-2.14)
Not happy about life		1.34 (0.92-1.95)	1.23 (0.81-1.87)	1.20 (0.79-1.84)		1.33 (0.69-2.55)	0.99 (0.45-2.17	1.06 (0.47-2.37)		1.35 (0.84-2.15)	1.34 (0.81-2.22)	1.35 (0.81-2.27)
Goal												
Expectation concerning success in matric at first attempt												
High educational aspiration			1.00	1.00			1.00	1.00			1.00	1.00
Low educational aspiration			0.81* (0.63-1.04)	0.79* (0.62-1.02)			0.70* (0.48-1.01)	0.66** (0.45-0.97)			0.88 (0.63-1.23)	0.87 (0.61-1.23)

[25] Model 1 indicates the effect of personal, socio-economic and demographic variables on age at first sexual intercourse in 2005
[26] Model 2 represents an addition of self-efficacy factor to Model 1
[27] Model 3 indicates an addition of goal variable to Model 2
[28] Model 4 represents an addition of socio-structural/contextual variables to Model 3

Socio-structural variables												
School attendance												
Yes				1.00				1.00				1.00
No				0.86 (0.11-7.06)				-				0.74 (0.08-7.01)
Neighbourhood racial concentration												
African				1.00				1.00				1.00
Coloured				0.45 (0.06-3.46)				0.49*** (0.30-0.81)				0.59 (0.07-4.92)
White				0.82 (0.34-2.00)				1.21 (0.32-4.52)				0.73 (0.21-2.56)
Participation in prosocial activities												
Non-participants				1.00				1.00				1.00
Participants				0.91 (0.71-1.17)				0.72* (0.50-1.05)				1.05 (0.75-1.49)
Neighbourhood SES												
Affluent				1.00				1.00				1.00
Poor				1.03 (0.64-1.67)				0.96 (0.52-1.79)				1.32 (0.60-2.90)
Childhood place of residence												
Urban				1.00				1.00				1.00
Rural				1.02 (0.78-1.32)				1.04 (0.68-1.58)				1.03 (0.73-1.45)
Statistical information												
No. of Subjects	545	544	332	330	257	256	160	158	288	288	172	172
No. of observations	545	544	332	330	257	256	160	158	288	288	172	172
No. of failures	545	544	332	330	257	256	160	158	288	288	172	172
Time at risk	8,781	8,769	5,207	5,179	4,049	4,037	2,450	2,422	4,732	4,732	2,757	2,757
Log likelihood	-2959.39	-2951.20	-1668.55	-1656.02	-1195.18	-1189.10	-688.25	-676.38	-1390.66	-1389.59	-754.90	-753.82
LR Chi2	96.60	100.37	30.00	31.20	60.16	61.18	17.65	20.34	36.40	38.54	12.46	14.62
Prob>Chi2	0.0000	0.0000	0.0009	0.0127	0.0000	0.0000	0.0240	0.0610	0.0000	0.0000	0.1885	0.4793

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations: CI – Confidence interval, N.A- Not Applicable, - Information dropped by the system; Figures in parentheses are confidence interval.

Figure 37: Estimated Hazard for Age at First Sexual Intercourse in 2005

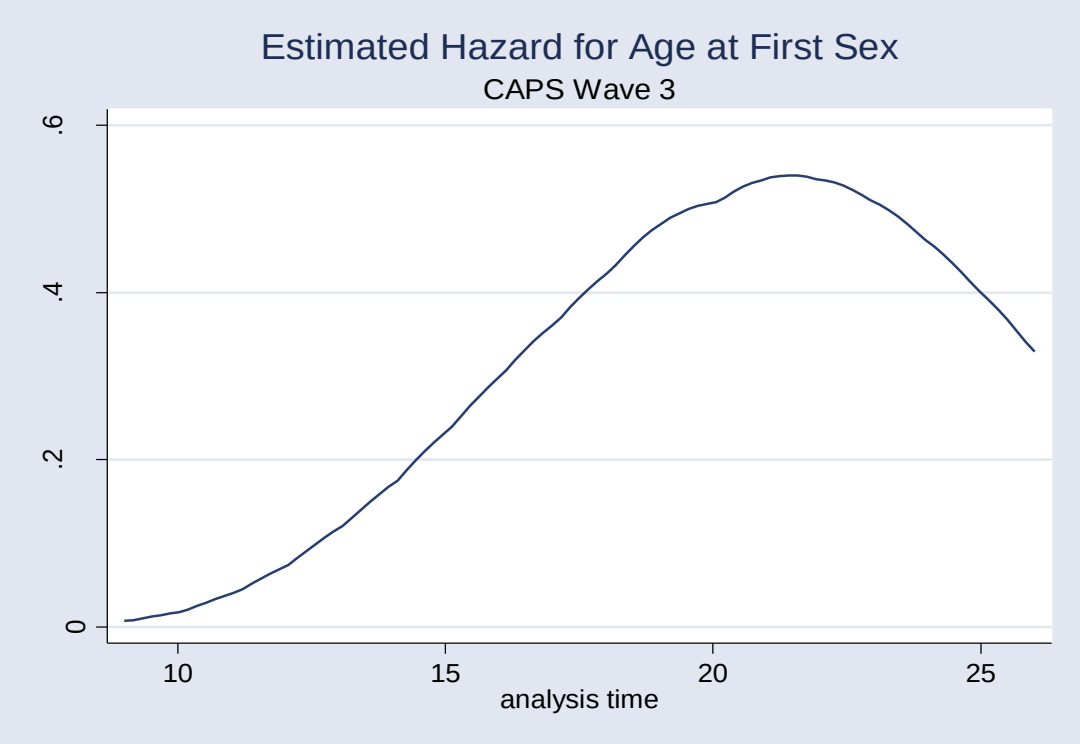
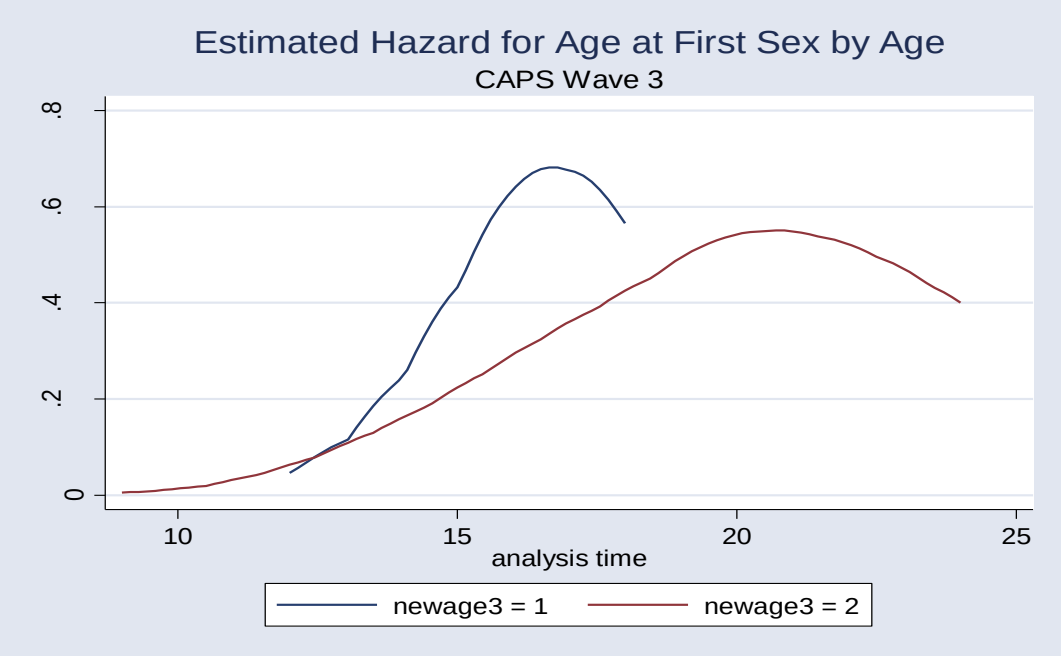
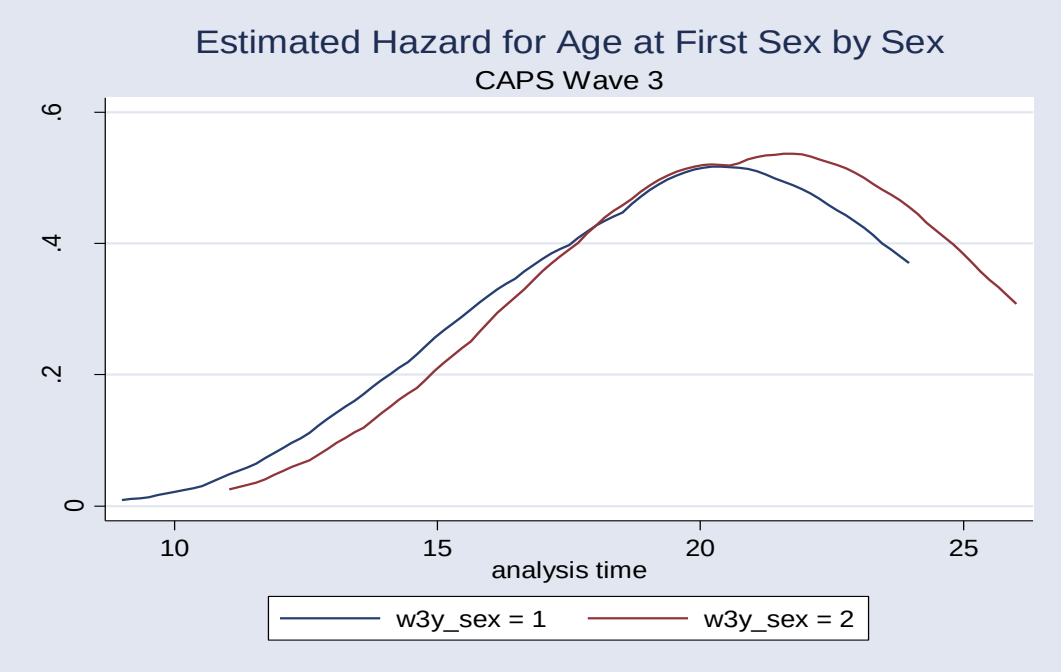


Figure 38: Estimated hazard for age at first sex by age (in groups) in 2005



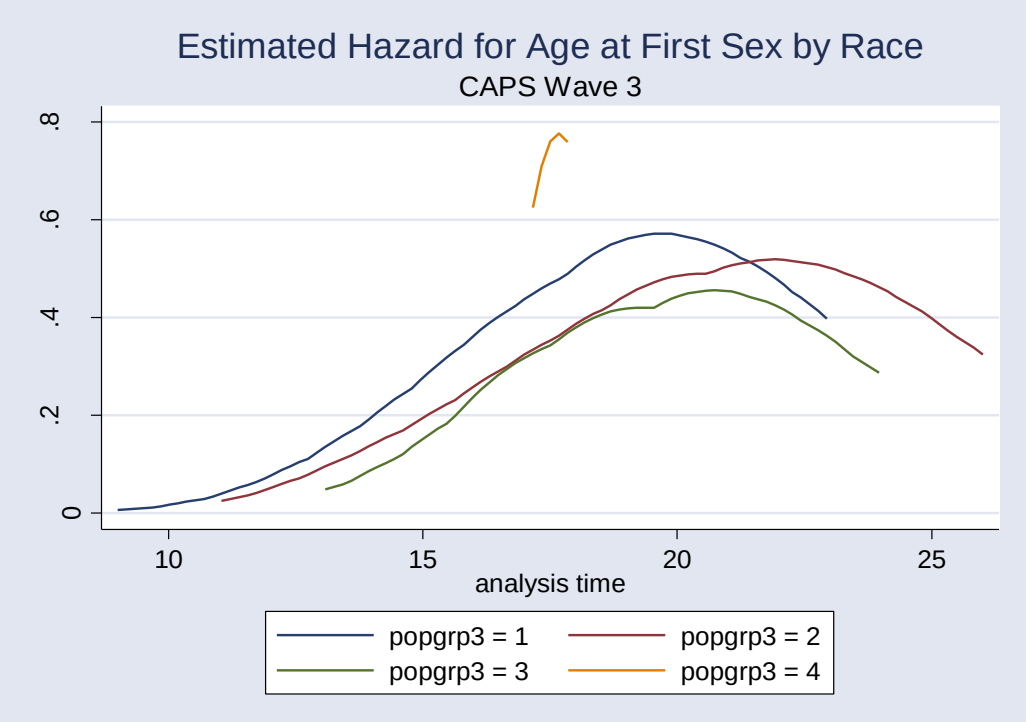
newage3=1 represents those less than 18 years while newage=2 represents those 18 years and above

Figure 39: Estimated hazard for age at first sex by sex of the respondents in 2005



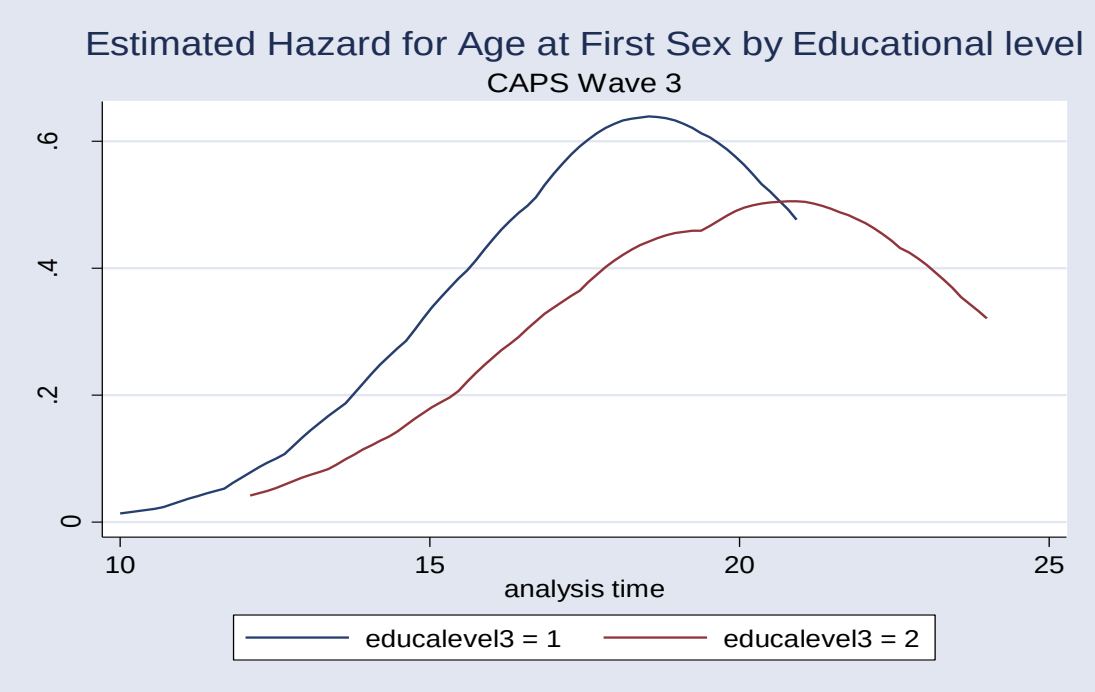
w3y_sex=1 represents males while w3y_sex=2 represents females

Figure 40: Estimated hazard for age at first sex by race/population group of the respondents in 2005



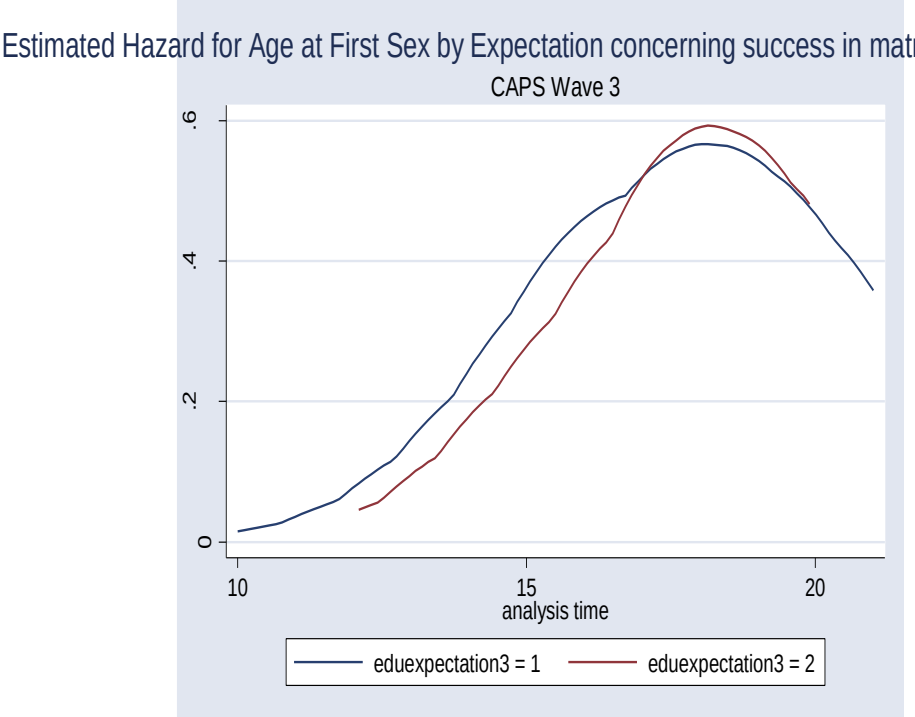
popgrp3=1 represents Blacks/Africans; popgrp3=2 represents Coloureds; popgrp3=3 represents Whites and popgrp3=4 represents Indians/Asians.

Figure 41: Estimated hazard for age at first sex by educational level of the respondents in 2005



educalevel3=1 represents those in secondary school while educalevel3=2 represents those in tertiary level

Figure 42: Estimated hazard for age at first sex by expectation of success in matric at first attempt in 2005



eduexpectation3=1 represents those with high educational aspiration while eduexpectation3=2 represents those with low aspiration.

Figure 43: Kaplan Meier single survival estimate for age at first sex in 2005

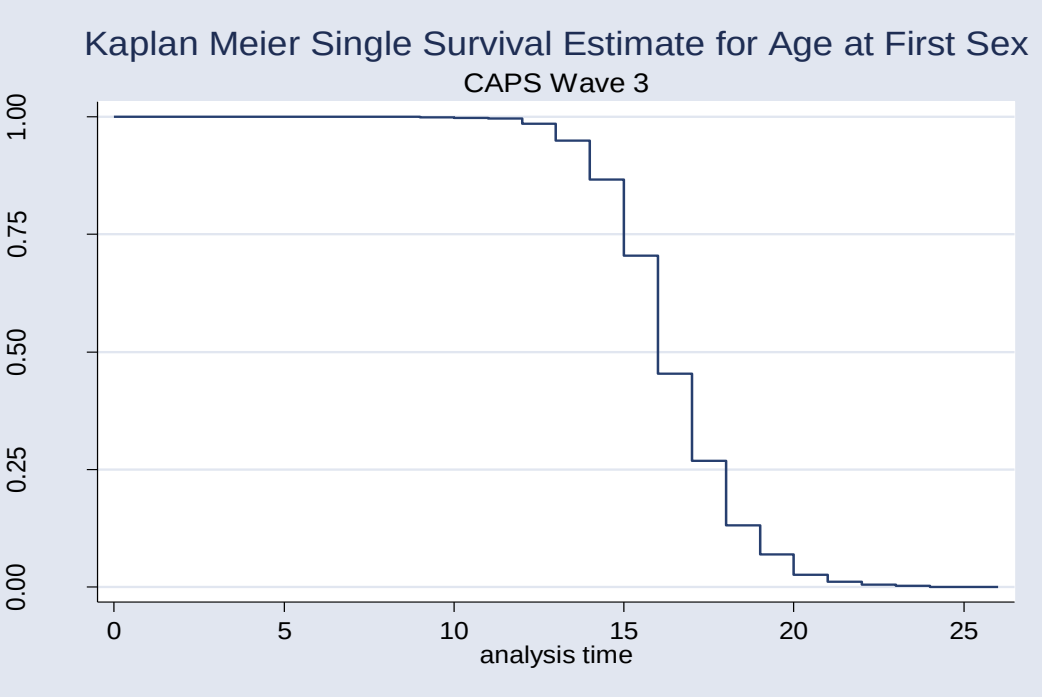


Figure 44: Kaplan Meier survival estimate for age at first sex by age (in groups) in 2005

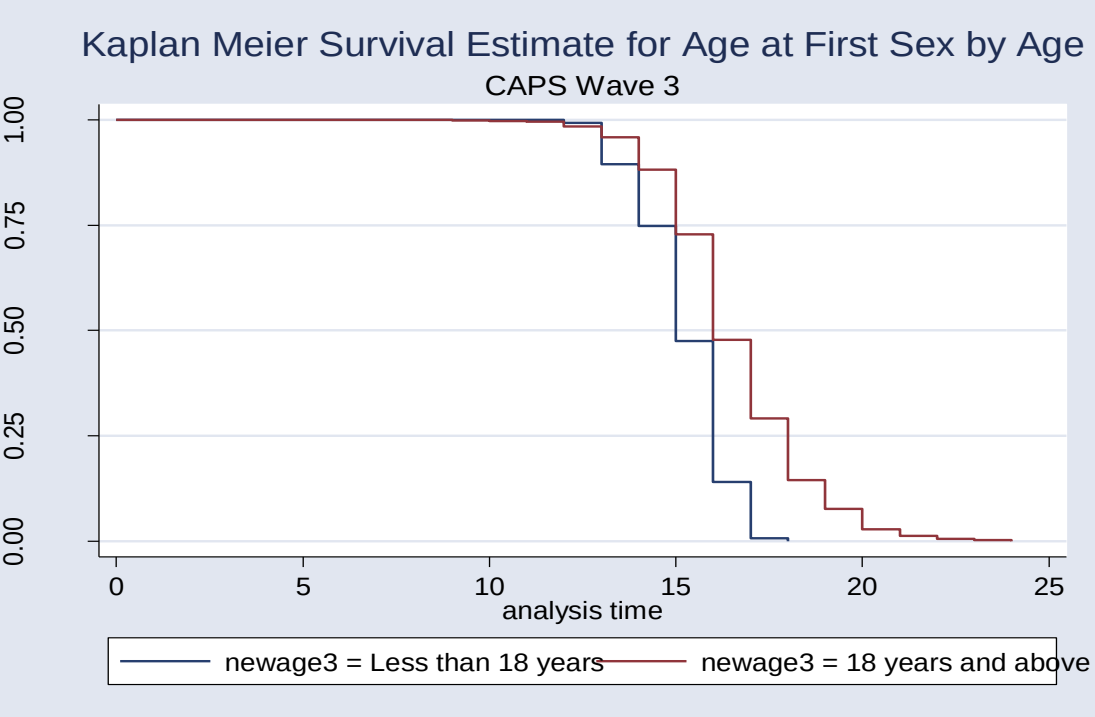


Figure 45: Kaplan Meier survival estimate for age at first sex by sex of the respondents in 2005

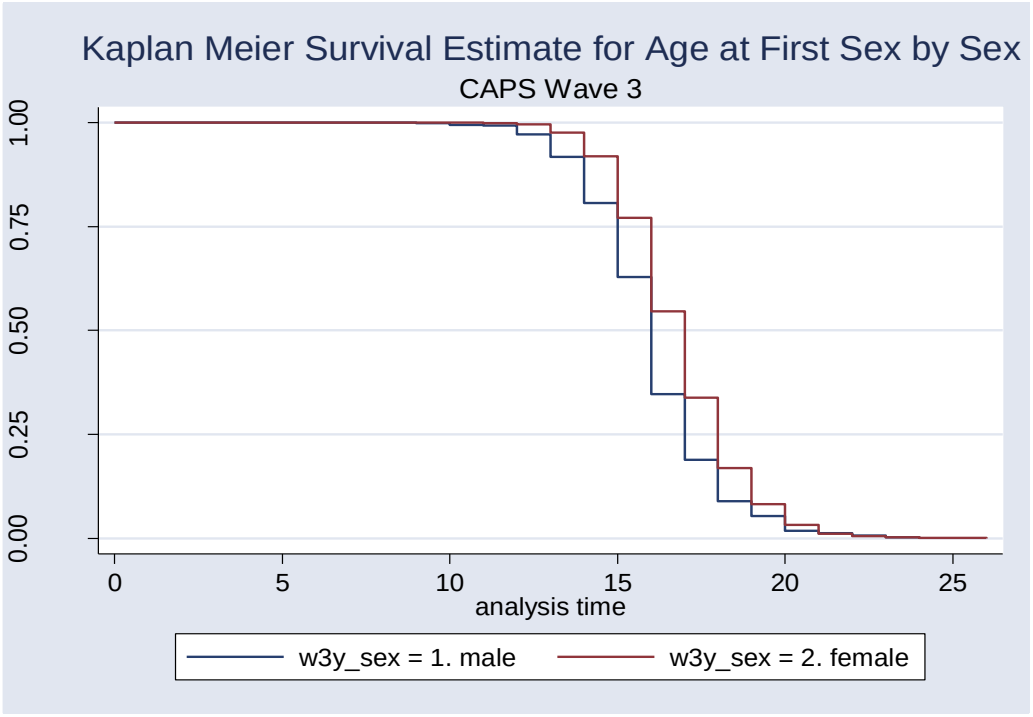


Figure 46: Kaplan Meier survival estimate for age at first sex by race of the respondents in 2005

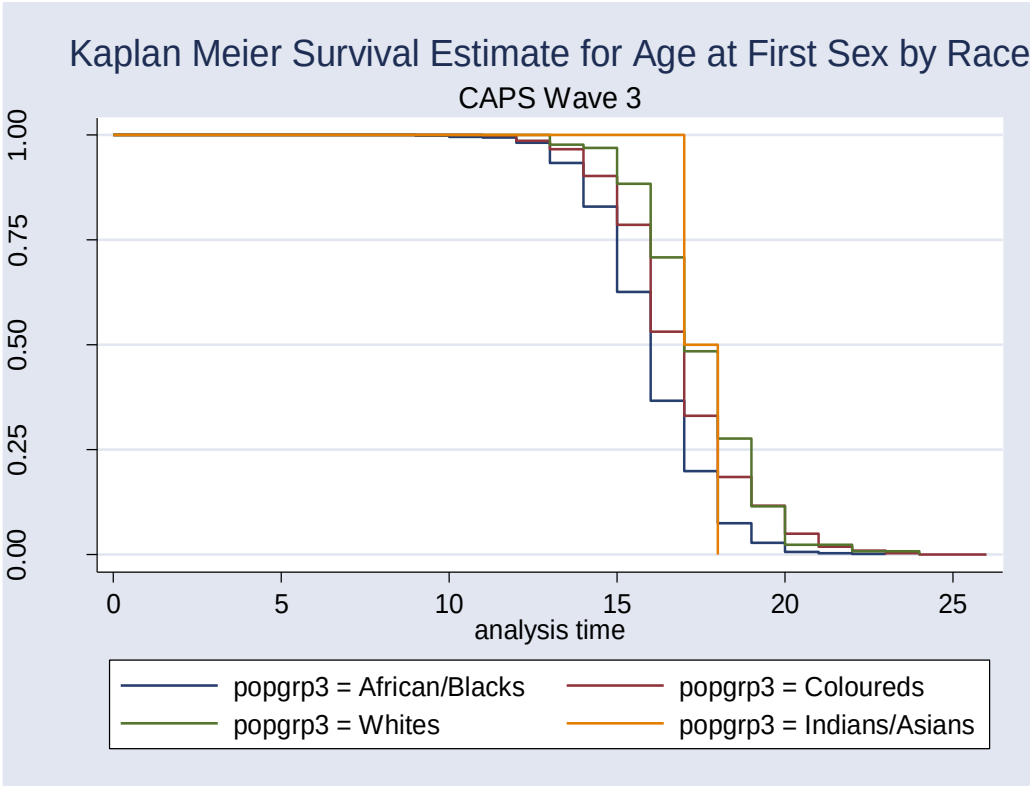


Figure 47: Kaplan Meier survival estimate for age at first sex by educational level of the respondents in 2005

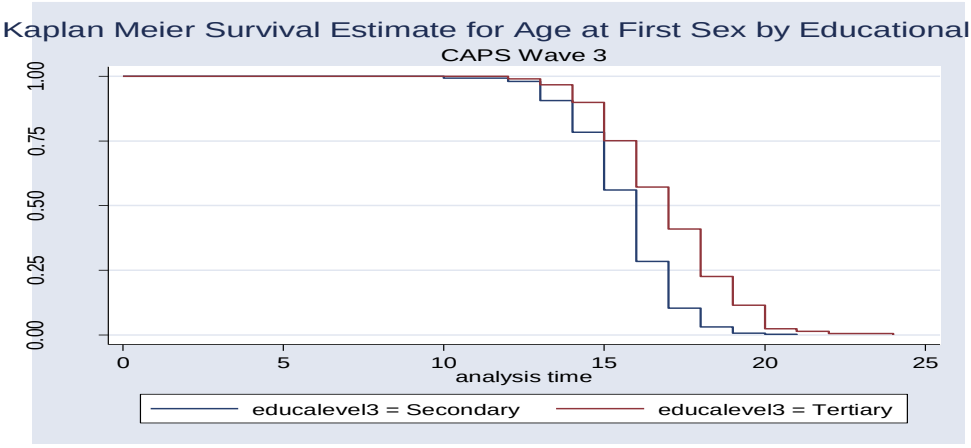
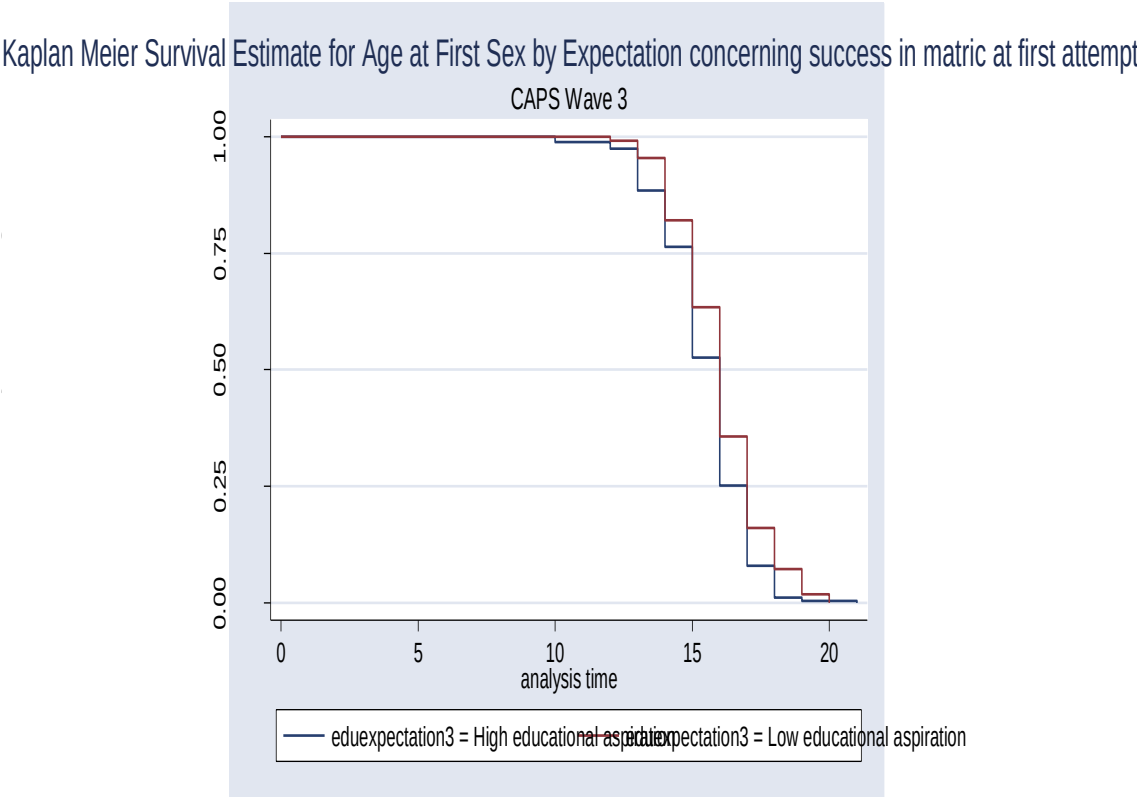


Figure 48: Kaplan Meier survival estimate for age at first sex by expectation of success in matric at first attempt in 2005



6.3 Conclusion

The results of the analyses in relation to the timing of first sexual intercourse among adolescents and young adults in Cape Town between 2002 and 2005 indicate the

importance of personal, socio-economic/demographic and contextual factors in the study area. Consistently, being older, being a female, being of Coloured or White racial origin and having a secondary or tertiary level education demonstrated a delaying effect (protective) on the timing of first sexual intercourse, with gender differentials in relation to some of the other covariates. However, some of the socio-structural factors were found to be relevant to all the respondents or to one gender only, and wielded minimal influence on the timing of first sexual intercourse.

Based on the results of the analyses in this thesis, Hypothesis 1a., that adolescents and young adults with negative aspirations and attitudes toward education are more likely to initiate sexual intercourse earlier than their counterparts with positive educational aspirations, was not confirmed; the contrary was the case. High educational aspiration seems to associate significantly with early transition to first sexual intercourse in the study area. Also, Hypothesis 2 that the community's racial composition (concentration of population group) is expected to influence sexual and contraceptive behaviours is not confirmed with respect to the timing of first sexual intercourse. Moreover, Hypothesis 3a., that adolescents and young adults participating in various institutional activities (otherwise referred to as prosocial activities) will likely have higher age at first sexual debut, was confirmed only among males as seen in Model 4, Wave 3 and Table 16. Finally, Hypothesis 4a., that adolescents and young adults with external monetary social support are less likely to initiate sexual intercourse early than their counterparts with non-monetary social capital, was not confirmed; this variable does not associate at all with the timing of first sexual intercourse in this study.

CHAPTER 7: RESULTS OF MULTI-LEVEL ANALYSIS (CAPS 2002-2005)

7.1 Introduction

This chapter presents the results of the multi-level data analyses in relation to the practice of multiple sexual partnerships in the past twelve months to the time of the survey, contraceptive use at the first and most-recent sexual intercourse, and consistency of condom with the most-recent sexual partner in the study area during the study period. The analyses were carried out using GLLAMM, add-on statistical software installed on Stata/SE version 12 for multi-level modelling. This kind of analysis enables one to explain the contributions of the various independent and intervening variables (both at the individual and neighbourhood levels) to the outcome variable of interest (Guo & Zhao 2000), aiding the interpretation of possible fixed effects and giving more detailed description of sources and magnitudes of variation (Larsen et al. 2000). CAPS dataset is a hierarchical one with information collected among 4,752 adolescents and young adults, from 358 clusters representing the areas where the respondents were sampled.

Based on the various constructs within Bandura's Social Cognitive Theory and the variables that show significance at the bivariate level, six models at most were run for each of the outcome variables, starting with the empty model to the full model where all the significant variables of interest were included. However, four models for each of the outcome variables are reported namely: the empty model having no explanatory variable but having a random intercept which allows one to detect the existence of a possible contextual dimension for the outcome variables in this study (Merlo et al. 2006) (Model 1),

the model consisting of individual factors (Model 2), the model consisting of socio-structural (contextual) factors because of its importance to this study (Model 3), and the full model consisting of all the significant variables (both individual and social structural) at the bivariate level, based on the Social Cognitive Theory (Model 4). The only exceptions are Tables 22a and 24a where three models are reported.

7.2 Results

7.2.1 Bivariate results

The results of the Chi-square test of association shown in Table 17 reveal that at the baseline in 2002, males, Blacks/Africans, those who reported age at puberty of 14 years, those who reported that they were totally in control of most things in their lives, those with good life prospects, those very happy in life, those who believed that HIV/AIDS is preventable, those who were Christian, those who used alcohol/drugs, those with a positive school attitude, and those whose first sexual experience was willing were more associated with the practice of current multiple sexual partnerships in the study area. Also, those young people residing in predominantly African/Black neighbourhoods, those participating in prosocial activities and living in poor neighbourhoods, those who reported residing in non-problematic neighbourhoods during childhood, those having friends most or all of whom were sexually experienced, and those had started sexual intercourse early (before age 18) were significantly more associated with the practice of multiple sexual partnerships within the twelve months prior to the time of the 2002 survey.

Almost the same pattern of relationship was noted in 2005 where males, Blacks/Africans, those with secondary level education, those who reported that they were totally in control of most things in their lives, those very happy about life, those who did not believe that

being faithful to one sexual partner can protect against HIV, those with high educational aspirations, those who were Christian, those who used alcohol/drugs, those from single-parent families, those who were out of school, and those whose first sexual experience was willing were more associated with the practice of current multiple sexual partnerships. Moreover, those young people residing in predominantly African/Black neighbourhoods, those participating in prosocial activities and living in poor neighbourhoods, those having friends most or all of whom were sexually experienced, and those who had started sexual intercourse before age 18 were significantly more associated with the practice of multiple sexual partnerships within the twelve months prior to the 2005 survey.

Table 17: Bivariate association between current multiple sexual partnerships (CMSPs) and selected individual compositional and socio-structural characteristics of South African adolescents and young adults living in Cape Town (CAPS 2002 and 2005)

Variables	**Current Multiple Sexual Partnerships**					
	Wave 1 (2002)			**Wave 3 (2005)**		
	No [%(n)]	Yes[%(n)]	p-value	No[%(n)]	Yes[%(n)]	p-value
Independent variables						
Age			0.247			0.245
Less than 18 years	24.15(221)	21.16(80)		5.63(88)	7.36(22)	
18 years and above	75.85(694)	78.84(298)		94.37(1,476)	92.64(277)	
Sex			0.000			0.000
Male	36.94(338)	70.37(266)		38.87(648)	75.38(245)	
Female	63.06(577)	29.63(112)		61.13(1,019)	24.62(80)	
Race/population group			0.004			0.000
Black/African	58.03(531)	67.72(256)		52.70(878)	66.36(215)	
Coloured	37.38(342)	29.63(112)		40.76(679)	29.01(94)	
White	4.59(42)	2.65(10)		6.48(108)	4.63(15)	
Indian/Asian	-	-		0.06(1)	0.00(0)	
Educational level			0.224			0.069
No formal education	-	-		-	-	
Primary	13.55(124)	16.27(61)		-	-	
Secondary	81.97(750)	80.80(303)		63.60(283)	72.90(78)	
Tertiary	4.48(41)	2.93(11)		36.40(162)	27.10(29)	
Pubertal development (years)			0.099			0.712
7	0.00(0)	0.29(1)		0.06(1)	0.00(0)	

8	0.12(1)	0.00(0)		0.13(2)	0.00(0)	
9	0.35(3)	0.29(1)		0.58(9)	0.00(0)	
10	1.40(12)	2.87(10)		2.12(33)	1.31(4)	
11	5.02(43)	2.59(9)		4.62(72)	3.27(10)	
12	14.37(123)	14.66(51)		14.42(225)	15.36(47)	
13	25.70(220)	20.69(72)		23.91(373)	25.49(78)	
14	25.47(218)	26.72(93)		26.03(406)	24.18(74)	
15	16.12(138)	16.67(58)		16.03(250)	19.28(59)	
16	6.89(59)	8.05(28)		7.63(119)	7.52(23)	
17	3.15(27)	3.45(12)		2.95(46)	1.96(6)	
18	1.17(10)	2.59(9)		1.28(20)	1.31(4)	
19	0.12(1)	0.57(2)		0.06(1)	0.33(1)	
20	0.12(1)	0.57(2)		0.19(3)	0.00(0)	
Current work status			0.245			0.391
Yes	55.40(200)	61.15(85)		41.81(729)	41.23(134)	
No	44.60(161)	38.85(54)		56.19(935)	58.77(191)	
Self-efficacy						
Level of self-control			0.041			0.088
Totally in control	41.07(375)	46.15(174)		39.82(663)	46.15(150)	
Control most things	47.65(435)	40.05(151)		46.91(781)	43.08(140)	
Little or no control	11.28(103)	13.79(52)		13.27(221)	10.77(35)	
Self-rating of opportunity in life			0.031			0.412
Good life prospect	69.66(636)	66.84(252)		70.21(1,169)	73.85(240)	
Limited life prospect	25.63(234)	24.67(93)		24.62(410)	21.85(70)	
Uncertain about life	4.71(43)	8.49(32)		5.17(86)	4.31(14)	
How happy about life?			0.074			0.051
Very happy	78.20(714)	73.47(277)		78.80(1,312)	74.77(243)	
Happy a little	15.77(144)	17.24(65)		15.02(250)	15.38(50)	
Not happy	6.02(55)	9.28(35)		6.19(103)	9.85(32)	
Outcome expectations						
HIV-risk assessment			0.522			0.683
Low risk	92.89(797)	91.83(326)		91.16(1,372)	90.43(274)	
High risk	7.11(61)	8.17(29)		8.84(133)	9.57(29)	
Belief in one sexual partner as a way of protecting against HIV?			0.196			0.000
No	79.13(690)	82.34(303)		80.13(1,278)	89.10(278)	
Yes	20.87(182)	17.66(65)		19.87(317)	10.90(34)	
Belief about preventability of HIV/AIDS			0.077			0.629
Yes	95.19(871)	97.35(368)		96.03(1,595)	96.59(312)	
No	4.81(44)	2.65(10)		3.97(66)	3.41(11)	
Goals						
Expectation of success in			0.180			0.029

matric first attempt						
High educational aspiration	67.02(441)	62.54(182)		68.05(181)	81.08(60)	
Low educational aspiration	32.98(217)	37.46(109)		31.95(85)	18.92(14)	
Expectation to live long (up to 80 years)			0.137			0.343
Yes	46.99(429)	51.99(196)		48.83(813)	47.08(153)	
No	7.45(68)	8.49(32)		7.21(120)	9.54(31)	
Unsure	45.56(416)	39.52(149)		43.96(732)	43.38(141)	
Socio-structural variables						
Religious affiliation			0.000			0.001
None	13.58(123)	22.55(85)		12.58(208)	20.31(65)	
Christianity	55.08(499)	48.01(181)		55.08(911)	52.50(168)	
Islam	7.28(66)	4.51(17)		7.62(126)	4.06(13)	
Other	24.06(218)	24.93(94)		24.73(409)	23.13(74)	
Alcohol/drug use			0.000			0.000
Non-users	59.34(543)	46.03(174)		47.90(798)	33.23(108)	
Users	40.66(372)	53.97(204)		52.10(868)	66.77(217)	
Family structure			0.976			0.033
No-parent family	28.09(257)	28.04(106)		25.86(414)	18.79(56)	
Single-parent family	39.89(365)	40.48(153)		43.04(689)	47.99(143)	
Both-parents family	32.02(293)	31.48(119)		31.11(498)	33.22(99)	
School environment			0.528			0.407
Non-problematic	24.26(222)	25.93(98)		23.70(395)	25.85(84)	
Problematic	75.74 (693)	74.07(280)		76.30(1,272)	74.15(241)	
School attendance			0.487			0.006
Yes	46.56(426)	48.68(184)		25.09(417)	32.41(105)	
No	53.44(489)	51.32(194)		74.91(1,245)	67.59(219)	
Attitude to education/school			0.031			0.276
Negative school attitude	16.17(148)	21.22(80)		15.73(262)	18.15(59)	
Positive school attitude	83.83(767)	78.78(297)		84.27(1,404)	81.85(266)	
Circumstance of first sex (forced?)			0.026			0.096
Yes	11.88(108)	7.67(29)		11.93(192)	8.61(26)	
No	88.12(801)	92.33(349)		88.07(1,418)	91.39(276)	
Neighbourhood racial concentration			0.002			0.000
African	57.92(530)	68.28(258)		52.79(880)	66.46(216)	
Coloured	35.52(325)	28.04(106)		38.81(647)	26.46(86)	
White	6.56(60)	3.70(14)		8.40(140)	7.08(23)	

Participation in prosocial activities			0.001			0.004
Non-participants	53.33(488)	42.86(162)		46.85(781)	38.15(124)	
Participants	46.67(427)	57.14(216)		53.15(886)	61.85(201)	
External monetary support			0.635			0.701
No monetary support	25.92(233)	27.22(98)		35.74(569)	34.58(102)	
Monetary support	74.08(666)	72.78(262)		64.26(1,023)	65.42(193)	
Neighbourhood SES			0.016			0.009
Affluent	22.95(210)	16.93(64)		25.25(421)	18.46(60)	
Poor	77.05(705)	83.07(314)		74.75(1,246)	81.54(265)	
Childhood neighbourhood type			0.031			0.971
Non-problematic	73.66(674)	67.72(256)		72.83(1,214)	72.92(237)	
Problematic	26.34(241)	32.28(122)		27.17(453)	27.08(88)	
Childhood place of residence			0.139			0.477
Urban	74.42(675)	70.40(264)		77.15(1,276)	75.31(241)	
Rural	25.58(232)	29.60(111)		22.85(378)	24.69(79)	
Peers sexually active			0.008			0.000
None of them	2.52(23)	1.59(6)		2.22(37)	1.23(4)	
A few/some of them	29.98(274)	25.99(98)		32.11(535)	22.15(72)	
Most or all of them	59.30(542)	68.17(257)		57.20(953)	74.15(241)	
Unsure	8.21(75)	4.24(16)		8.46(141)	2.46(8)	
Age at first sexual intercourse (early or not)			0.000			0.000
Not early	25.77(233)	9.07(34)		30.01(488)	15.34(48)	
Early	74.23(671)	90.93(341)		69.99(1,138)	84.66(265)	

Significant at *p<0.1; **p<0.05; ***p<0.01

N.B: The significant variables from the stepwise regression models used to predict the practice of current multiple sexual partnerships at the third wave are: alcohol/drug use, participation in prosocial activities, expectation concerning success in matric at the first attempt, degree of happiness about life, sex and population group of the respondents.

7.2.2 Multivariate multi-level logistic regression results

Table 18 presents the results of the multi-level logistic regression models for the practice of current multiple sexual partnerships in the study area between 2002 and 2005. The result of the random effects model is shown in Tables 18 (Empty Model 1, Wave 1). The variation in the log odds of practising current multiple sexual partnerships across the

communities (clusters) within the twelve prior to the the time of the survey at the baseline in 2002 is very small at 0.005. According to the intra-cluster correlation coefficient implied by the estimated intercept component variance (VPC), 0.152% of the variance in the practice of current multiple sexual partnerships could be attributed to community/cluster-level variables. The variation remained very small even after controlling for the individual and contextual variables and for all the variables combined.

As judged by the proportional change in variance (PCV), zero percent of the variance in log odds of practicing current multiple sexual partnerships variance across the community clusters was explained by individual compositional factors (Model 2) and all the variables combined (Model 4). The Median odds ratio (MOR) of 1.07 (Wave 1, Model 2) shows that in the median case, the residual heterogeneity between areas increased by 1.07 times the individual odds of practicing multiple sexual partnerships within the twelve months prior to the time of the survey when randomly picking out two persons in different areas, meaning that, if a person moves to another area (cluster) with a higher probability of practising current multiple sexual partnerships, their risk of practising multiple sexual partnerships will (in median) increase 1.07 times. The residual heterogeneity between areas (MOR=1.07) was not of greater relevance than the impact of the person's individual characteristics such as degree of uncertainty about life, which is a measure of self-efficacy. The MOR of 1.00 at Model 3 showed that there was no difference between areas/clusters in the probability of practicing current multiple sexual partnerships in 2002.

Examining the predictors of current multiple sexual partnerships at the baseline in Model 2, the log odds of practising current multiple sexual partnerships significantly decreased with being a female and a Coloured in comparison to the reference category, while the log

odds of practising current multiple sexual partnerships increased marginally with being uncertain about life opportunities. Independent of all individual factors, Christians, and to a lesser extent Moslems and those with other religious affiliations, were at least 10 percent less likely to practice multiple sexual partnerships than those who identified themselves as having no religion. Also, those with a positive attitude toward education/school, and those residing in predominantly Coloured or White neighbourhoods were less likely to practise multiple sexual partnerships in 2002. However, alcohol/drug users (OR- 1.21; $p<0.001$); those who reportedly had willing first sexual intercourse (OR- 1.09; $p<0.05$); counter-intuitively, those participating in prosocial activities (OR- 1.08; $p<0.001$); and those who had their first sexual intercourse before age 18 (OR- 1.17; $p<0.001$) were all more likely to practise multiple sexual partnerships at the baseline in 2002.

The inclusion of the contextual variables had some serious effects on the predictive power of some of the individual-level variables and of the contextual variables themselves. As evident in Model 4 (Table 18, Wave 1), being a female reduces the odds of practising multiple sexual partnerships as compared to males, while having a feeling of limited and uncertain life opportunities ($p<0.1$), using alcohol/drug and starting sexual relationships early increases the risk of practising multiple sexual partnerships in the study area in 2002 ($p<0.01$).

At the third wave of data collection in 2005, the result of the random effects model as shown in Tables 18 (Empty Model 1, Wave 3) revealed that variation in the log odds of practicing current multiple sexual partnerships across the communities (clusters) within the twelve months to the time of the survey at the baseline in 2005 is also small at 0.114. According to the intra-cluster correlation coefficient implied by the estimated intercept

component variance (VPC), 3.349% of the variance in the practice of current multiple sexual partnerships could be attributed to community/cluster-level variables. The variation dropped slightly after controlling for individual variables, increased slightly after controlling for the contextual variables, and dropped again after including all the variables. As judged by the proportional change in variance (PCV), 18.4% and 56.9% of the variance in log odds of practising current multiple sexual partnerships variance across the community clusters was explained by individual compositional factors (Model 2, Wave 3) and all the variables combined (Model 4, Wave) respectively.

The Median odds ratio (MOR) of 1.34 (Model 2, Wave 3) shows that in the median case, the residual heterogeneity between areas increased by 1.34 times the individual odds of practising multiple sexual partnerships within the twelve months prior to the time of the survey when randomly picking out two persons in different areas, meaning that, if a person moves to another area (cluster) that has a higher probability of practising current multiple sexual partnerships, their risk of doing the same will (in median) increase 1.34 times. The residual heterogeneity between areas (MOR=1.34) was not of greater relevance than the impact of the person's individual characteristics such as the degree of happiness in life, which is a measure of self-efficacy (OR- 2.55; $p<0.1$). The MOR of more than 1.00 in all the models showed that there were some differences between areas/clusters in the probability of practising current multiple sexual partnerships in 2005 even though the differences may not be large.

Examining the predictors of current multiple sexual partnerships in 2005 (Model 2, Wave 3), the log odds of practising current multiple sexual partnerships significantly decreased with being a female (OR- 0.22; $p<0.001$) and having low educational aspiration (OR- 0.50;

p<0.05) in comparison to the reference category, while the log odds of practising current multiple sexual partnerships marginally increased with being unhappy about life (OR- 2.55; p<0.1). Independent of all individual factors, alcohol/drug users were twice more likely to practise multiple sexual partnerships than those not using alcohol or drugs. Also, those participating in prosocial activities (OR- 1.55; p<0.001) were more likely to practise multiple sexual partnerships in 2005.

The inclusion of the contextual variables had minimal and moderating effects on the predictive power of some of the individual-level variables. As evident in Model 4 (Table 18, Wave 3), being a female, Coloured, having low educational aspiration and, marginally, participating in prosocial activities reduced the odds of practising multiple sexual partnerships, while having a feeling of unhappiness about life (p<0.1), and using alcohol/drug increased the risk of practising multiple sexual partnerships in the study area at the third wave in 2005.

Table 18a showed the results of the multi-level logistic regression models for male and female separately. The table reveals that the parameters vary for male and female, with individual and contextual variables increasing the multivariable multi-level model's ability to explain variation in the log odds of practising multiple sexual partnerships. In 2002, after controlling for both individual and socio-structural or contextual factors, unexpectedly, not believing that HIV is preventable and being a Moslem was protective against the practice of multiple sexual partnerships within the twelve months prior to the time of the survey for males, while having little or no self-control, use of alcohol or drug, experiencing forced sex at the event of first sexual experience, living in poor neighbourhoods and having the first sexual intercourse early increased the odds of male

respondents engaging in multiple sexual partnerships in 2002. For their female counterparts, however, having self-control over most things in their lives significantly reduced the odds of engaging in multiple sexual partnerships while having limited life prospects and being uncertain about life opportunities exposed them to the practice of multiple sexual partnerships in 2002.

At the third wave of data collection in 2005, being Coloured, having low educational aspirations and participating in prosocial activities was protective against multiple sexual partnerships for males, while being unhappy about life exposed young males to the practice of multiple sexual partnerships.

Table 18: Individual compositional and community contextual factors associated with current multiple sexual partnerships (CMSPs) among South African adolescents and young adults living in Cape Town (CAPS 2002 and 2005)

Variables	Wave 1 (2002)				Wave 3 (2005)			
	Empty model	**Individual variables**	**Contextual variables**	**Individual and contextual variables**	**Empty model**	**Individual variables**	**Contextual variables**	**Individual and contextual variables**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Independent variables								
Sex								
Male		1.00		1.00		1.00		1.00
Female		0.75*** (0.71-0.79)		0.79*** (0.75-0.84)		0.22*** (0.12-0.41)		0.26*** (0.14-0.49)
Race/ population group								
Black/African		1.00		1.00		1.00		1.00
Coloured		0.90*** (0.86-0.96)		1.02 (0.80-1.29)		0.52 (0.20-1.30)		0.34** (0.13-0.92)
White		0.95 (0.83-1.09)		1.09 (0.82-1.45)		0.26 (0.03-2.17)		0.18 (0.02-1.55)
Indian/Asian		-		-		-		-
Pubertal Development[29]		1.01 (0.99-1.02)		1.01 (0.99-1.03)				
Self-efficacy								
Level of self-control								
Totally in control		1.00		1.00				
Control most things		0.96 (0.91-1.01)		0.96 (0.91-1.02)				
Little or no control		1.01 (0.93-1.10)		1.01 (0.93-1.10)				
Self-rating of opportunity in life								
Good life prospect		1.00		1.00				
Limited life prospect		1.05 (0.99-1.11)		1.05* (0.99-1.12)				
Uncertain about life		1.11* (1.00-1.24)		1.10* (0.99-1.23)				
How happy about life?								
Very happy		1.00		1.00		1.00		1.00
Happy a little		1.00 (0.94-1.08)		0.99 (0.92-1.06)		0.87 (0.36-2.11)		0.93 (0.37-2.30)
Not happy		1.06 (0.96-1.17)		1.03 (0.93-1.14)		2.55* (0.91-7.18)		2.47* (0.86-7.08)
Outcome expectations								
Belief about preventability of HIV/AIDS								
Yes		1.00		1.00				
No		0.92 (0.81-1.03)		0.90 (0.79-1.02)				
Goals								
Expectation concerning success in matric first attempt								
High educational aspiration						1.00		1.00
Low educational aspiration						0.50** (0.25-0.99)		0.46** (0.23-0.91)

[29] Pubertal Development uses age at puberty supplied by the respondents in single years for the multi-level modelling

Socio-structural/contextual variables								
Religious affiliation								
None			1.00	1.00				
Christianity			0.91*** (0.85-0.98)	0.95 (0.89-1.02)				
Islam			0.90* (0.80-1.02)	0.91 (0.81-1.03)				
Other			0.93* (0.86-1.00)	0.97 (0.90-1.05)				
Alcohol/drug use								
Non-users			1.00	1.00			1.00	1.00
Users			1.21*** (1.14-1.28)	1.13*** (1.06-1.20)			2.11*** (1.61-2.77)	1.98** (1.04-3.77)
Attitude to education/school								
Negative school attitude			1.00	1.00				
Positive school attitude			0.95* (0.88-1.01)	0.95 (0.89-1.02)				
Circumstance of first sex (forced?)								
Yes			1.00	1.00				
No			1.09** (1.01-1.18)	1.02 (0.94-1.11)				
Neighbourhood racial concentration								
African			1.00	1.00				
Coloured			0.88*** (0.82-0.95)	0.87 (0.68-1.11)				
White			0.83*** (0.73-0.94)	0.84 (0.66-1.08)				
Participation in prosocial activities								
Non-participants			1.00	1.00			1.00	1.00
Participants			1.08*** (1.02-1.13)	1.03 (0.97-1.08)			1.55*** (1.20-2.00)	0.56* (0.31-1.03)
Neighbourhood SES								
Affluent			1.00	1.00				
Poor			1.01 (0.94-1.08)	1.03 (0.96-1.11)				
Childhood neighbourhood type								
Non-problematic			1.00	1.00				
Problematic			1.05 (0.99-1.10)	1.04 (0.98-1.09)				
Peers sexually active?								
None of them			1.00	1.00				
A few/some of them			1.04 (0.88-1.22)	1.00 (0.85-1.18)				
Most or all of them			1.08 (0.92-1.27)	1.04 (0.88-1.22)				
Unsure			1.00 (0.83-1.20)	1.00 (0.83-1.20)				
Age at first sexual intercourse – early or not?								
Not early			1.00	1.00				
Early			1.17*** (1.10-1.24)	1.14*** (1.07-1.21)				
Constant	1.34***(1.30-1.37)	1.43*** (1.15-1.79)	1.07 (0.87-1.33)	1.18 (0.87-1.60)	0.19*** (0.16-0.21)	0.66* (0.42-1.03)	0.09*** (0.07-0.12)	0.76 (0.38-1.53)
Measures of variation or clustering								
Random effects								

Area/community-level variance (SE)	0.005 (0.004)	0.005 (0.004)	0.000 (0.003)	0.001 (0.003)	0.114 (0.087)	0.093 (0.308)	0.181 (0.103)	0.078 (0.309)
PCV (Explained variation) (%)	Reference	0.0	100.0	0.0	Reference	18.4	-58.8	56.9
MOR	1.07	1.07	1.00	1.03	1.38	1.34	1.50	1.30
ICC/VPC (%)	0.152	0.152	0.000	0.030	3.349	2.749	5.215	2.316
Model fit statistics								
AIC	1635.68	1383.29	1503.51	1331.90	1774.01	335.43	1738.41	331.22
BIC	1651.17	1454.56	1596.01	1478.77	1785.20	366.06	1760.79	369.51
Sample size								
Community-level	272	263	270	261	316	143	316	143
Individual-level	1,293	1,201	1,260	1,170	1,992	340	1,991	340

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations- OR- Odds ratio, CI- Confidence interval, ICC- Intra-cluster Correlation Coefficient, VPC- Variance Partition Coefficient, PCV- Proportional Change in Variance, AIC-Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard Error, MOR- Median Odds Ratio. N.B: The full model at the third wave could not be run using GLLAMM due to data issue; hence, CMSPs in wave 3 was run using xtmelogit command in Stata/SE 12. Also, the significant variables using stepwise regression was used to predict the model.

Table 18a: Individual compositional and community contextual factors associated with current multiple sexual partnerships (CMSPs) among South African adolescents and young adults living in Cape Town controlling for the sex of the respondents (CAPS 2002 and 2005)

Variables	**Wave 1 (2002)**								**Wave 3 (2005)**							
	Male				**Female**				**Male**				**Female**			
	Empty model	**Individ. variables**	**Context. variables**	**Ind. & context. variables**	**Empty model**	**Individ. variables**	**Context. variables**	**Ind. & context. variables**	**Empty model**	**Individ. Variables**	**Context. variables**	**Ind. & context. variables**	**Empty model**	**Individ. variables**	**Context. variables**	**Ind. & context. variables**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Independent variables																
Race/ population group																
Black/African		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
Coloured		0.91* (0.83-1.00)		1.00 (0.66-1.53)		0.91** (0.85-0.98)		1.00 (0.77-1.31)		0.31* (0.09-1.20)		0.21** (0.05-0.81)		1.82 (0.36-9.13)		1.25 (0.21-7.56)
White		0.74** (0.57-0.96)		0.95 (0.59-1.53)		1.07 (0.94-1.23)		1.24 (0.88-1.74)		1.26e-07		7.49e-08		1.15 (1.13-10.04)		0.85 (0.08-9.52)
Indian/Asian		-		-		-		-		-		-		-		-
Pubertal development[30]		1.01 (0.98-1.04)		1.02 (0.99-1.04)		1.00 (0.99-1.02)		1.00 (0.99-1.02)								
Self-efficacy																
Level of self-control																
Totally in control		1.00		1.00		1.00		1.00								
Control most things		0.99 (0.90-1.08)		1.03 (0.94-1.12)		0.93** (0.87-0.99)		0.92** (0.86-0.98)								
Little or no control		1.14* (0.99-1.32)		1.16** (1.01-1.33)		0.92* (0.84-1.01)		0.92* (0.83-1.01)								
Self-rating of opportunity in life																
Good life prospect		1.00		1.00		1.00		1.00								
Limited life prospect		1.03 (0.93-		1.03 (0.93-		1.07* (1.00-		1.07** (1.00-								

[30] Pubertal Development uses age at puberty supplied by the respondents in single years for the multi-level modelling

		1.15)		1.14)		1.14)		1.15)								
Uncertain about life		1.00 (0.84-1.19)		0.95 (0.80-1.12)		1.24*** (1.09-1.41)		1.24*** (1.08-1.41)								
How happy about life?																
Very happy		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
Happy a little		1.03 (0.91-1.15)		1.00 (0.89-1.12)		0.99 (0.91-1.07)		0.98 (0.91-1.07)		0.82 (0.23-2.88)		0.90 (0.26-3.12)		0.88 (0.18-4.23)		0.95 (0.19-4.64)
Not happy		1.12 (0.95-1.32)		0.07 (0.91-1.26)		1.00 (0.89-1.12)		0.98 (0.87-1.10)		22.63** (1.42-361.06)		18.18** (1.27-259.96)		1.03 (0.21-4.96)		1.05 (0.22-5.11)
Outcome expectations																
Belief about preventability of HIV/AIDS																
Yes		1.00		1.00		1.00		1.00								
No		0.90 (0.73-1.11)		0.84* (0.67-1.03)		0.96 (0.83-1.10)		0.91 (0.78-1.06)								
Goals																
Expectation concerning success in matric at first attempt																
High educational aspiration										1.00		1.00		1.00		1.00
Low educational aspiration										0.19*** (0.06-0.65)		0.18*** (0.05-0.62)		1.04 (0.40-2.77)		0.94 (0.35-2.55)
Socio-structural/contextual variables																
Religious affiliation																
None			1.00	1.00			1.00	1.00								
Christianity			0.91* (0.82-1.01)	0.91 (0.82-1.02)			0.98 (0.90-1.08)	1.00 (0.91-1.10)								
Islam			0.86 (0.72-1.04)	0.84* (0.69-1.02)			0.95 (0.82-1.11)	0.95 (0.82-1.11)								
Other			0.96 (0.85-1.08)	0.96 (0.85-1.09)			0.99 (0.90-1.10)	1.00 (0.91-1.11)								
Alcohol/drug use																

Non-users			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Users			1.23*** (1.12-1.34)	1.24*** (1.13-1.36)			1.02 (0.95-1.11)	1.03 (0.95-1.11)			1.17 (0.83-1.65)	1.90 (0.78-4.61)			1.21 (0.75-1.97)	1.68 (0.89-5.81)
Attitude to education/school																
Negative school attitude			1.00	1.00			1.00	1.00								
Positive school attitude			0.96 (0.87-1.06)	0.97 (0.87-1.07)			0.99 (0.91-1.07)	0.97 (0.89-1.06)								
Circumstance of first sex (forced?)																
Yes			1.00	1.00			1.00	1.00								
No			1.19* (0.97-1.45)	1.21* (0.98-1.49)			0.97 (0.90-1.04)	0.96 (0.89-1.04)								
Neighbourhood racial concentration																
African			1.00	1.00			1.00	1.00								
Coloured			0.92 (0.82-1.03)	0.92 (0.59-1.41)			0.89** (0.80-0.97)	0.90 (0.69-1.18)								
White			0.82** (0.67-1.00)	0.85 (0.57-1.26)			0.92 (0.79-1.08)	0.84 (0.62-1.16)								
Participation in prosocial activities																
Non-participants			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Participants			1.06 (0.98-1.16)	1.06 (0.97-1.15)			1.02 (0.97-1.08)	1.01 (0.95-1.07)			1.24 (0.92-1.69)	0.44* (0.18-1.06)			1.53 (0.95-2.46)	0.67 (0.25-1.79)
Neighbourhood SES																
Affluent			1.00	1.00			1.00	1.00								
Poor			1.07 (0.96-1.19)	1.10* (0.98-1.23)			0.94 (0.86-1.03)	0.96 (0.88-1.06)								
Childhood neighbourhood type																
Non-problematic			1.00	1.00			1.00	1.00								
Problematic			1.05 (0.97-1.15)	1.05 (0.96-1.14)			1.03 (0.97-1.10)	1.02 (0.95-1.09)								
Peers sexually active?																

None of them			1.00	1.00			1.00	1.00								
A few/some of them			1.00 (0.74-1.36)	0.98 (0.72-1.33)			0.99 (0.84-1.18)	0.94 (0.78-1.12)								
Most or all of them			1.00 (0.74-1.35)	0.98 (0.73-1.32)			1.04 (0.88-1.23)	0.99 (0.83-1.18)								
Unsure			0.91 (0.65-1.28)	0.89 (0.64-1.25)			1.01 (0.83-1.23)	0.96 (0.79-1.17)								
Age at first sexual intercourse – early or not?																
Not early			1.00	1.00			1.00	1.00								
Early			1.36*** (1.21-1.52)	1.36*** (1.21-1.53)			1.03 (0.97-1.10)	1.04 (0.98-1.12)								
Constant	1.54*** (1.48-1.61)	1.40* (0.96-2.03)	0.94 (0.64-1.39)	0.72 (0.43-1.23)	1.17*** (1.12-1.21)	1.17 (0.91-1.50)	1.26* (1.10-1.60)	1.26 (0.89-1.78)	0.38*** (0.32-0.45)	0.74 (0.42-1.32)	0.30*** (0.20-0.43)	1.07 (0.41-2.79)	0.07*** (0.05-0.10)	0.22*** (0.06-0.23)	0.06*** (0.03-0.09)	0.15*** (0.06-0.39)
Measures of variation or clustering																
Random effects																
Area/Community-level Variance (SE)	0.017 (0.010)	0.014 (0.010)	0.009 (0.009)	0.005 (0.009)	0.012 (0.005)	0.008 (0.005)	0.008 (0.005)	0.007 (0.005)	0.002 (0.113)	0.855 (1.036)	0.003 (0.114)	0.593 (0.949)	0.095 (0.229)	2.36e-12 (2.54e-06)	0.080 (0.233)	8.10e-20 (4.79e-10)
PCV (Explained variation) (%)	Reference	17.6	47.1	44.4	Reference	33.3	33.3	12.5	Reference	-42,650	50.0	-19,666.7	Reference	100.0	15.8	100.0
MOR	1.13	1.12	1.09	1.07	1.11	1.09	1.09	1.08	1.04	2.41	1.05	2.08	1.34	1.00	1.31	1.00
ICC/VPC (%)	0.514	0.424	0.273	0.152	0.363	0.243	0.243	0.212	0.061	20.627	0.091	15.272	2.806	0.000	2.374	0.000
Model fit statistics																
AIC	870.10	810.64	798.50	755.28	580.01	515.60	584.12	529.57	1,053.35	188.67	1,054.91	186.73	577.07	143.91	577.61	146.64
BIC	883.31	867.02	877.18	875.85	593.61	573.52	665.38	653.69	1,062.94	210.06	1,074.09	214.23	587.07	166.38	597.61	175.53
Sample size																
Community-level	220	215	218	213	227	219	223	215	260	100	260	100	282	95	282	95
Individual-level	604	565	585	548	689	636	675	622	893	157	893	157	1,099	183	1,098	183

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations- OR- Odds ratio, CI- Confidence interval, ICC- Intra-cluster Correlation Coefficient, VPC- Variance Partition Coefficient, PCV- Proportional Change in Variance, AIC-Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard Error, MOR- Median Odds Ratio

N.B: The full model at the third wave could not be run using GLLAMM due to data issue; hence, CMSPs in wave 3 was run using xtmelogit command in Stata/SE 12. Also, the significant variables using stepwise regression was used to predict the model.

7.3 Results of the multi-level analysis for contraceptive use at the first sexual intercourse

7.3.1 Bivariate results

From Table 19, it is clear that age, population group, educational level, level of self control, self-rating of life opportunity, degree of happiness, HIV-risk assessment, belief that HIV/AIDS is preventable, educational expectation, religious affiliation, use of alcohol/drug, type of family structure, school attendance, whether first sexual intercourse was willing or forced, predominant population group at the place of residence, participation in prosocial activities, external monetary support, neighbourhood socio-economic status, childhood place of residence, peer sexual characteristics and whether their first sexual intercourse was early were all factors associated with the use of contraceptives at the event of first sexual intercourse.

At the third wave of data collection in 2005, population group, educational level, level of self control, self-rating of life opportunity, degree of happiness, religious affiliation, type of family structure, school attendance, attitude to education/schooling, whether first sexual intercourse was willing or forced, predominant population group at the place of residence, participation in prosocial activities, external monetary support, neighbourhood socio-economic status, childhood place of residence and whether the first sexual intercourse was early were factors associated with the use of contraceptives at the event of first sexual intercourse.

Table 19: Bivariate association between contraceptive use at first sexual intercourse and selected individual compositional and socio-structural characteristics of South African adolescents and young adults living in Cape Town (CAPS 2002 and 2005)

Variables	Wave 1 (2002)			Wave 3 (2005)		
	No[%(n)]	Yes[%(n)]	p-value	No[%(n)]	Yes[%(n)]	p-value
Independent variables						
Age			0.062			0.182
Less than 18 years	21.05 (132)	25.40 (176)		5.67 (44)	7.20 (84)	
18 years and above	78.95 (495)	74.60 (517)		94.33 (732)	92.80 (1,082)	
Sex			0.200			0.277
Male	49.12 (308)	45.60 (316)		47.75 (404)	45.34 (559)	
Female	50.88 (319)	54.40 (377)		52.25 (442)	54.66 (674)	
Race/ population group			0.000			0.000
Black/African	69.22 (434)	52.67 (365)		61.70 (522)	49.11 (605)	
Coloured	30.14 (189)	39.83 (276)		37.12 (314)	41.64 (513)	
White	0.64 (4)	7.50 (52)		1.18 (10)	9.09 (112)	
Indian/Asian	-	-		0.00 (0)	0.16 (2)	
Educational level			0.000			0.010
No formal education	-	-		-	-	
Primary	18.24 (114)	10.69 (74)		-	-	
Secondary	78.88 (493)	83.67 (579)		72.07 (129)	60.93 (248)	
Tertiary	2.88 (18)	5.64 (39)		27.93 (50)	39.07 (159)	
Pubertal development (years)			0.249			0.103
7	0.00 (0)	0.15 (1)		0.00 (0)	0.09 (1)	
8	0.00 (0)	0.15 (1)		0.13 (1)	0.09 (1)	
9	0.17 (1)	0.62 (4)		0.38 (3)	0.06 (7)	
10	1.88 (11)	2.01 (13)		2.16 (17)	1.81 (24)	
11	4.11 (24)	4.64 (30)		4.82 (39)	4.66 (54)	
12	14.21 (83)	14.68 (95)		15.61 (123)	15.20 (176)	
13	22.77 (133)	26.28 (170)		22.21 (175)	26.60 (308)	
14	26.71	24.27		25.76	24.78	

	(156)	(157)		(203)	(287)	
15	17.12 (100)	15.30 (99)		15.99 (126)	15.20 (176)	
16	6.16 (36)	8.04 (52)		6.73 (53)	7.43 (86)	
17	3.77 (22)	2.78 (18)		3.43 (27)	2.76 (32)	
18	2.23 (13)	0.93 (6)		2.16 (17)	0.69 (8)	
19	0.51 (3)	0.00 (0)		0.38 (3)	0.00 (0)	
20	0.34 (2)	0.15 (1)		0.25 (20)	0.09 (1)	
Current work status			0.542			0.150
Yes	59.02 (121)	56.31 (174)		41.66 (352)	44.84 (252)	
No	40.98 (84)	43.69 (135)		58.34 (493)	55.16 (679)	
Self-efficacy						
Level of self-control			0.064			0.000
Totally in control	42.72 (267)	42.63 (295)		41.28 (348)	40.67 (501)	
Control most things	43.36 (271)	47.40 (328)		42.94 (362)	49.35 (608)	
Little or no control	13.92 (87)	9.97 (69)		15.78 (133)	9.98 (123)	
Self-rating of opportunity in life			0.098			0.004
Good life prospect	66.72 (417)	71.39 (494)		66.43 (560)	73.13 (901)	
Limited life prospect	27.84 (174)	22.69 (157)		27.88 (235)	22.00 (271)	
Uncertain about life	5.44 (34)	5.92 (41)		5.69 (48)	5.87 (60)	
How happy about life?			0.005			0.000
Very happy	73.44 (459)	79.34 (549)		73.31 (618)	81.98 (1,010)	
Happy a little	17.12 (107)	15.61 (108)		17.32 (146)	13.47 (166)	
Not happy	9.44 (59)	5.06 (35)		9.37 (79)	4.55 (56)	
Outcome expectations						
HIV-risk assessment			0.063			0.546
Low risk	90.92 (531)	93.73 (613)		91.07 (683)	91.86 (1,038)	
High risk	9.08 (53)	6.29 (41)		8.93 (67)	8.14 (92)	
Belief about preventability of HIV/AIDS			0.001			0.106
Yes	93.62 (587)	97.26 (674)		94.89 (798)	96.34 (1,186)	

No	6.38 (40)	2.74 (19)		5.11 (43)	3.66 (45)	
Goals						
Expectation concerning success in matric at first attempt			0.048			0.400
High educational aspiration	62.58 (306)	68.61 (330)		69.57 (80)	73.84 (175)	
Low educational aspiration	37.42 (183)	31.39 (151)		30.43 (35)	26.16 (62)	
Expectation to live long (up to 80 years)			0.589			0.825
Yes	49.92 (312)	47.25 (327)		47.21 (398)	47.40 (584)	
No	7.20 (45)	8.09 (56)		7.83 (66)	8.52 (105)	
Unsure	42.88 (268)	44.65 (309)		44.96 (379)	44.07 (543)	
Socio-structural variables						
Religious affiliation			0.000			0.000
None	22.79 (142)	10.92 (75)		19.76 (166)	9.98 (122)	
Christianity	46.23 (288)	59.10 (406)		49.40 (415)	59.08 (722)	
Islam	5.78 (36)	6.99 (48)		6.43 (54)	7.28 (89)	
Other	25.20 (157)	23.00 (158)		24.40 (205)	23.65 (289)	
Alcohol/drug use			0.057			0.538
Non-users	57.89 (363)	52.67 (365)		44.13 (372)	45.50 (561)	
Users	42.11 (264)	47.33 (328)		55.87 (471)	54.50 (672)	
Family structure			0.013			0.000
No-parent family	30.30 (190)	25.54 (177)		28.84 (231)	20.98 (249)	
Single-parent family	41.47 (260)	38.96 (270)		42.95 (344)	44.14 (524)	
Both-parents family	28.23 (177)	35.50 (246)		28.21 (226)	34.88 (414)	
School environment			0.671			0.193
Non-problematic	24.24 (152)	25.25 (175)		23.05 (195)	25.55 (315)	
Problematic	75.76 (475)	74.75 (518)		76.95 (651)	74.45 (918)	
School attendance			0.027			0.000
Yes	43.86	49.93		18.51	31.87	

	(275)	(346)		(156)	(392)	
No	56.14 (352)	50.07 (347)		81.49 (687)	68.13 (838)	
Attitude to education/school			0.827			0.044
Negative school attitude	18.21 (144)	17.75 (123)		18.25 (154)	14.92 (184)	
Positive school attitude	81.79 (512)	82.25 (570)		81.75 (690)	85.08 (1,049)	
Circumstance of first sex (forced?)			0.010			0.004
Yes	12.94 (81)	8.59 (59)		13.01 (109)	9.02 (111)	
No	87.06 (545)	91.42 (629)		86.99 (729)	90.98 (1,119)	
Neighbourhood racial concentration			0.000			0.000
African	69.54 (436)	52.53 (364)		62.06 (525)	48.58 (599)	
Coloured	28.71 (180)	37.81 (262)		35.70 (302)	39.66 (489)	
White	1.75 (11)	9.67 (67)		2.25 (19)	11.76 (145)	
Participation in prosocial activities			0.030			0.000
Non-participants	53.59 (336)	47.62 (330)		51.42 (435)	42.42 (523)	
Participants	46.41 (291)	52.38 (363)		48.58 (411)	57.58 (710)	
External monetary support			0.002			0.000
No monetary support	30.58 (185)	22.79 (155)		40.73 (325)	31.69 (374)	
Monetary support	69.42 (420)	77.21 (525)		59.27 (473)	68.31 (806)	
Neighbourhood SES			0.000			0.000
Affluent	16.27 (102)	26.12 (181)		19.62 (166)	28.95 (357)	
Poor	83.73 (525)	73.88 (512)		80.38 (680)	71.05 (876)	
Childhood neighbourhood type			0.309			0.495
Non-problematic	70.49 (442)	73.02 (506)		71.66 (606)	72.99 (900)	
Problematic	29.51 (185)	26.98 (187)		28.37 (240)	27.01 (333)	

Childhood place of residence			0.000			0.000
Urban	66.13 (412)	80.32 (531)		70.07 (590)	81.82 (999)	
Rural	33.87 (211)	19.68 (135)		29.93 (252)	18.18 (222)	
Peers sexually active?			0.026			0.237
None of them	2.40 (15)	2.16 (15)		2.02 (17)	2.51 (31)	
A few/some of them	30.24 (189)	27.27 (189)		31.20 (263)	31.95 (394)	
Most or all of them	62.24 (389)	61.18 (424)		59.79 (504)	56.45 (696)	
Unsure	5.12 (32)	9.38 (65)		7.00 (59)	9.08 (112)	
Age at first sexual intercourse – early or not?			0.013			0.000
Not early	17.55 (109)	23.09 (157)		21.82 (180)	30.98 (368)	
Early	82.45 (512)	76.91 (523)		78.18 (645)	69.02 (820)	

Significant at *p<0.1; **p<0.05; ***p<0.01

7.3.2 Multivariate multi-level logistic regression results

Table 20 presents the results of the multi-level logistic regression models for the use of contraceptives at the event of first sexual intercourse in the study area between 2002 and 2005. The result of the random effects model for the baseline is shown in Table 20 (Empty Model 1, Wave 1). The variation in the log odds of using contraceptives at first sexual intercourse across the communities (clusters) within the twelve months prior to the time of the survey at the baseline in 2002 is small at 0.014. According to the intra-cluster correlation coefficient implied by the estimated intercept component variance (VPC), 0.4% of the variance in the use of contraceptive at first sexual intercourse could be attributed to community/cluster-level variables. The variation remained the same even after controlling for individual variables and all the variables combined, and almost the same when contextual variables were controlled for.

As judged by the proportional change in variance (PCV), 14 percent of the variance in log odds of using contraceptive at the first sexual intercourse variance across the community clusters was explained by individual compositional factors (Model 2, Wave 1, Table 20); and 36 percent by contextual factors ((Model 3, Wave 1, Table 20). This shows the importance of contextual variables. The Median odds ratio (MOR) of 1.11 (Model 2, Wave 1) shows that in the median case, the residual heterogeneity between areas increased by 1.11 times the individual odds of using contraceptive at the first sexual intercourse when randomly picking out two persons in different areas, meaning that, if a person moved to another area (cluster) with a higher probability of using contraceptives at the first sexual intercourse, their risk (likelihood) of using contraceptives at the first sexual intercourse will (in median) increase 1.11 times. The residual heterogeneity between areas (MOR=1.11) was not of greater relevance than the impact of the person's individual characteristics such as being Coloured or White, having secondary education level, and being uncertain about life. The MOR of more than 1.00 in all the models in Table 20 showed that there were differences between areas/clusters in the probability of using contraceptives at the first sexual intercourse in 2002, albeit minimal.

Examining the predictors of use of contraceptives at the event of first sexual intercourse at the baseline in Models 2 and 3, the log odds of using contraceptives at the first sexual intercourse significantly decreased with being 18 years and older, not believing that HIV/AIDS is preventable and having low educational aspirations in comparison to the reference category, while the log odds of using contraceptives at the first sexual intercourse increased with being Coloured or White, having secondary level education and being uncertain about life opportunities. Independent of all individual factors, Christians and those with other religious affiliations, those whose first sexual intercourse was done

willingly, and those who participated in prosocial activities were significantly more likely to use contraceptives at the first sexual intercourse than their reference categories. However, those out of school and those whose childhood place of residence was rural were significantly less likely to use contraceptives at the event of first sexual intercourse in 2002.

The inclusion of the contextual variables had some serious effects on the predictive power of some of the individual-level variables and of the contextual variables themselves at the baseline. As evident in Model 4 (Table 20, Wave 1), older adolescents, those who rated themselves to be at high risk of contracting HIV, those who did not believe that HIV/AIDS is preventable, alcohol/drug users ($p<0.1$) and those who grew up in a rural setting were all significantly less likely to use contraceptives at the event of their first sexual intercourse in the study area in 2002. On the other hand, having secondary level education, being uncertain about life ($p<0.1$), being Christian, Muslim or of another religious group, those whose first sexual intercourse was willing, participants in prosocial activities and marginally, being unsure about their peers sexual status ($p<0.1$) increased the likelihood of using contraceptive's at the first sexual intercourse.

At the third wave of data collection in 2005, the result of the random effects model as shown in Tables 20 (Empty Model 1, Wave 3) revealed that variation in the log odds of using contraceptives at the first sexual intercourse across the communities (clusters) in 2005 is also small at 0.013. According to the intra-cluster correlation coefficient implied by the estimated intercept component variance (VPC), 0.4% of the variance in the use of contraceptive at first sexual intercourse could be attributed to community/cluster-level variables. The variation dropped slightly after controlling for individual and contextual

variables and for all the variables combined. As judged by the proportional change in variance (PCV), 77%, 62% and 33% of the variance in log odds of using contraceptives at the first sexual intercourse variance across the community clusters was explained by individual compositional factors (Model 2, Wave 3), contextual factors (Model 3, Wave 3) and all the variables combined (Model 4, Wave 3).

Examining the predictors of using contraceptives at the first sexual intercourse in 2005 (Model 2, Wave 3), the log odds of using contraceptives at the first sexual intercourse significantly decreased with being happy a little and/or not being happy at all, while Coloured and White adolescents were significantly more likely to use contraceptives at the first sexual intercourse. Independent of all individual factors, those young people affiliated to one or other religious group, those from single-parent or both-parents families, those with a positive school attitude, those whose first sexual experience was willing, those living in predominantly Coloured or White neighbourhoods and those participating in prosocial activities were all more likely to use contraceptives at the first sexual intercourse in 2005. On the contrary, those out of school, those who grew up in rural settings and those who started sexual activity early (before age 18) were all less likely to use contraceptives at the first sexual intercourse.

When all the variables are controlled for in 2005, those adolescents and young adults who were happy a little or not happy at all, those out of school, and those who grew up in rural settings were all less likely to use contraceptives at the first sexual intercourse, while those with religious affiliation other than those listed to choose from, those from single-parent families (in comparison to none) ($p<0.10$), and those whose first sexual intercourse was

willing (OR: 1.17; $p<0.01$) were all more likely to use contraceptives at the first sexual intercourse than their reference group.

Table 20a shows the results of the multi-level logistic regression models for male and female separately. The table reveals that the parameters vary for male and female with individual and contextual variables increasing the model's ability to explain variation in the log odds of using contraceptives at the first sexual intercourse. In 2002, after controlling for both individual and socio-structural or contextual factors, age, population group, uncertainty about life, belief about the preventability of HIV/AIDS, religious affiliation, participation in prosocial activities and age at first sexual intercourse were important for males, while educational level, self-rating of opportunities in life, HIV-risk assessment, religious affiliation, type of family structure, circumstance of first sexual intercourse, participation in prosocial activities, childhood place of residence and peer sexual status were very relevant to females as far as using contraceptives at the first sexual intercourse is concerned.

At the third wave of data collection in 2005 (Model 4, Table 20a), for both sexes, being out of school and circumstance of first sexual intercourse significantly predict use of contraceptives at first sexual intercourse, as did being happy a little or not being happy at all and being a Christian for females and being from a single-parent family, having monetary support, and growing up in rural setting for males.

Table 20: Individual compositional and community contextual factors associated with contraceptive use at the first sexual intercourse among South African adolescents and young adults living in Cape Town (CAPS 2002 and 2005)

Variables	Wave 1 (2002)				Wave 3 (2005)			
	Empty model	**Individual variables**	**Contextual variables**	**Individual & contextual variables**	**Empty model**	**Individual variables**	**Contextual variables**	**Individual & contextual variables**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Independent variables								
Age (groups)								
Less than 18 years		1.00		1.00				
18 years and above		0.88*** (0.82-0.94)		0.89*** (0.82-0.96)				
Race/ population group								
Black/African		1.00		1.00		1.00		1.00
Coloured		1.17*** (1.08-1.27)		1.09 (0.80-1.49)		1.16*** (1.05-1.29)		1.00 (0.67-1.49)
White		1.53*** (1.18-1.98)		1.36 (0.89-2.07)		1.26*** (1.10-1.44)		0.97 (0.68-1.38)
Indian/Asian		-		-		1.35 (0.56-3.24)		1.11 (0.44-2.80)
Educational level								
Primary		1.00		1.00		-		
Secondary		1.15*** (1.06-1.26)		1.13*** (1.03-1.23)		1.00		1.00
Tertiary		1.15 (0.83-1.60)		1.18 (0.85-1.63)		1.02 (0.93-1.11)		1.05 (0.96-1.15)
Self-efficacy								
Level of self-control								
Totally in control		1.00		1.00		1.00		1.00
Control most things		0.97 (0.91-1.04)		0.97 (0.91-1.04)		1.01 (0.93-1.09)		1.02 (0.94-1.10)
Little or no control		0.92 (0.83-1.02)		0.92 (0.83-1.03)		0.92 (0.81-1.05)		0.90 (0.78-1.02)
Self-rating of opportunity in life								
Good life prospect		1.00		1.00		1.00		1.00
Limited life prospect		0.95 (0.88-1.02)		0.94 (0.87-1.01)		0.92 (0.82-1.02)		0.91 (0.82-1.02)
Uncertain about life		1.16** (0.02-1.32)		1.13* (0.99-1.28)		1.08 (0.88-1.34)		1.19 (0.95-1.48)
How happy about life?								
Very happy		1.00		1.00		1.00		1.00
Happy a little		1.04 (0.95-1.13)		1.04 (0.95-1.14)		0.90* (0.81-1.01)		0.90* (0.80-1.01)
Not happy		0.93 (0.83-1.05))		0.95 (0.84-1.08)		0.83** (0.70-0.98)		0.84** (0.71-0.99)

Outcome expectations								
HIV-risk Assessment								
Low risk		1.00		1.00				
High risk		0.91 (0.81-1.02)		0.86** (0.76-0.97)				
Belief about preventability of HIV/AIDS								
Yes		1.00		1.00				
No		0.80*** (0.69-0.94)		0.81** (0.68-0.95)				
Goal								
Expectation concerning success in matric first attempt								
High educational aspiration		1.00		1.00				
Low educational aspiration		0.94* (0.87-1.01)		0.96 (0.90-1.05)				
Socio-structural/contextual variables								
Religious affiliation								
None			1.00	1.00			1.00	1.00
Christianity			1.16*** (1.07-1.26)	1.17*** (1.07-1.29)			1.14*** (1.07-1.22)	1.07 (0.95-1.21)
Islam			1.11 (0.97-1.27)	1.24*** (1.06-1.45)			1.14** (1.02-1.27)	1.24 (0.93-1.64)
Other			1.12** (1.02-1.22)	1.11** (1.00-1.23)			1.13*** (1.05-1.21)	1.13* (1.00-1.28)
Alcohol/drug use								
Non-users			1.00	1.00				
Users			0.97 (0.91-1.03)	0.94* (0.86-1.01)				
Family structure								
No-parent			1.00	1.00			1.00	1.00
Single-parent			0.98 (0.91-1.06)	0.98 (0.89-1.07)			1.08*** (1.03-1.15)	1.10* (0.99-1.23)
Both-parents			0.99 (0.92-1.07)	0.97 (0.88-1.06)			1.08*** (1.02-1.15)	1.04 (0.92-1.16)
School attendance								
Yes			1.00	1.00			1.00	1.00
No			0.94* (0.89-1.00)	0.97 (0.89-1.06)			0.84*** (0.80-0.89)	0.76*** (0.66-0.87)
Attitude to education/school								
Negative school attitude							1.00	1.00
Positive school attitude							1.08** (1.02-1.14)	1.02 (0.90-1.16)
Circumstance of first sex (forced?)								
Yes			1.00	1.00			1.00	1.00

No			1.11** (1.02-1.21)	1.16*** (1.05-1.29)			1.12*** (1.04-1.20)	1.17*** (1.04-1.31)
Neighbourhood racial concentration								
African			1.00	1.00			1.00	1.00
Coloured			1.11** (1.01-1.22)	1.02 (0.75-1.38)			1.07** (1.00-1.14)	1.13 (0.75-1.70)
White			1.35*** (1.17-1.57)	1.05 (0.75-1.46)			1.29*** (1.17-1.43)	1.26 (0.89-1.78)
Participation in prosocial activities								
Non-participants			1.00	1.00			1.00	1.00
Participants			1.07** (1.01-1.14)	1.10*** (1.03-1.18)			1.06** (1.01-1.11)	1.04 (0.96-1.12)
External monetary support								
No monetary support			1.00	1.00			1.00	1.00
Monetary support			1.05 (0.98-1.13)	1.01 (0.93-1.10)			1.00 (0.95-1.05)	0.97 (0.86-1.08)
Neighbourhood SES								
Affluent			1.00	1.00			1.00	1.00
Poor			0.95 (0.88-1.04)	0.95 (0.86-1.05)			0.97 (0.91-1.04)	1.05 (0.92-1.19)
Childhood place of residence								
Urban			1.00	1.00			1.00	1.00
Rural			0.90*** (0.84-0.96)	0.90** (0.83-0.98)			0.92*** (0.87-0.98)	0.91* (0.83-1.00)
Peers sexually active?								
None of them			1.00	1.00				
A few/some of them			0.97 (0.81-1.16)	1.09 (0.87-1.37)				
Most or all of them			1.02 (0.86-1.22)	1.18 (0.94-1.48)				
Unsure			1.09 (0.89-1.33)	1.24* (0.96-1.61)				
Age at first sexual intercourse – early or not								
Not early			1.00	1.00			1.00	1.00
Early			0.98 (0.91-1.05)	0.98 (0.88-1.08)			0.94*** (0.89-0.98)	0.93 (0.85-1.02)
Constant	1.70*** (1.65-1.76)	1.60*** (1.45-1.78)	1.38*** (1.08-1.75)	1.22 (0.89-1.68)	1.82*** (1.78-1.87)	1.96*** (1.83-2.09)	1.48*** (1.28-1.72)	1.56*** (1.17-2.08)
Measures of variation or clustering								
Random effects								
Area/community-level Variance (SE)	0.014 (0.006)	0.012 (0.006)	0.009 (0.004)	0.012 (0.006)	0.013 (0.004)	0.003 (0.007)	0.005 (0.003)	0.002 (0.007)
PCV (Explained variation) (%)	Reference	14.3	35.7	0.0	Reference	76.9	61.5	33.3
MOR	1.12	1.11	1.09	1.11	1.11	1.05	1.07	1.04

ICC/VPC (%)	0.4	0.4	0.3	0.4	0.4	0.1	0.2	0.1
Model fit statistics								
AIC	1909.00	1263.92	1717.45	1166.67	2932.90	734.77	2476.76	639.70
BIC	1924.56	1345.58	1825.03	1332.43	2949.82	791.60	2576.34	759.13
Sample size								
Community-level	276	237	272	231	314	225	308	215
Individual-level	1320	901	1240	842	2079	585	1867	526

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations- OR- Odds ratio, CI- Confidence interval, ICC- Intra-cluster Correlation Coefficient, VPC- Variance Partition Coefficient, PCV- Proportional Change in Variance, AIC-Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard Error, MOR- Median Odds Ratio. N.B: PCV for Model 4 uses Model 2 area/community-level variance as base variance.

Table 20a: Individual compositional and community contextual factors associated with contraceptive use at the first sexual intercourse among South African adolescents and young adults living in Cape Town – males and females separately (CAPS 2002 and 2005)

Variables	Wave 1 (2002)								Wave 3 (2005)							
	Male				Female				Male				Female			
	Empty model	Indiv. variables	Context. variables	Indiv. & context. variables	Empty model	Indiv. variables	Context. variables	Indiv. & context. variables	Empty model	Indiv. variables	Context. variables	Indiv. & context. variables	Empty model	Indiv. variables	Context. variables	Indiv. & context. variables
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Independent variables																
Age (groups)																
Less than 18 years		1.00		1.00		1.00		1.00								
18 years and above		0.91* (0.82-1.00)		0.87** (0.78-0.97)		0.89** (0.80-0.98)		0.92 (0.82-1.02)								
Race/ population group																
Black/African		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
Coloured		1.38*** (1.25-1.53)		1.44 (0.80-2.57)		0.96 (0.86-1.07)		0.94 (0.65-1.36)		1.46*** (1.27-1.67)		1.42 (0.64-3.15)		0.88 (0.39-1.95)		0.43 (0.02-11.16)
White		1.93*** (1.28-2.92)		1.96* (0.95-4.03)		1.31 (0.94-1.82)		0.96 (0.56-1.66)		1.51*** (1.24-1.83)		1.48 (0.78-2.82)		2.70 (0.72-10.15)		0.18 (0.00-12.51)
Indian/Asian		-		-		-		-		1.62 (0.67-3.92)		1.38 (0.42-4.49)		-		-
Educational level																
Primary		1.00		1.00		1.00		1.00		-		-		-		-
Secondary		1.06 (0.95-1.20)		1.07 (0.95-1.21)		1.23*** (1.09-1.40)		1.17** (1.04-1.32)		1.00		1.00		1.00		1.00
Tertiary		1.03 (0.71-1.48)		1.15 (0.79-1.66)		1.17 (0.58-2.36)		1.31 (0.65-2.66)		0.99 (0.87-1.12)		1.04 (0.90-1.20)		1.15 (0.60-2.20)		1.60 (0.70-3.64)
Self-efficacy																
Level of self-control																
Totally in control		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00

Control most things		0.97 (0.88-1.06)		0.96 (0.88-1.06)		0.98 (0.89-1.09)		0.99 (0.89-1.09)		1.04 (0.93-1.17)		1.06 (0.93-1.19)		0.83 (0.46-1.52)		0.93 (0.45-1.91)
Little or no control		0.88* (0.77-1.02)		0.89 (0.77-1.03)		0.94 (0.81-1.09)		0.95 (0.83-1.11)		1.01 (0.83-1.24)		0.94 (0.76-1.16)		0.51 (0.22-1.21)		0.48 (0.17-1.40)
Self-rating of opportunity in life																
Good life prospect		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
Limited life prospect		0.96 (0.87-1.07)		0.96 (0.86-1.08)		0.93 (0.84-1.03)		0.91* (0.82-1.01)		0.94 (0.80-1.10)		0.91 (0.77-1.08)		0.59 (0.29-1.23)		0.63 (0.26-1.55)
Uncertain about life		1.18* (1.00-1.39)		1.16* (0.96-1.38)		1.06 (0.86-1.30)		1.04 (0.86-1.27)		0.99 (0.74-1.32)		1.17 (0.86-1.58)		3.86 (0.42-35.88)		9.95 (0.58-171.43)
How happy about life?																
Very happy		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
Happy a little		0.98 (0.87-1.11)		0.99 (0.87-1.13)		1.09 (0.96-1.24)		1.10 (0.97-1.25)		0.96 (0.82-1.13)		0.97 (0.82-1.15)		0.55 (0.24-1.28)		0.29** (0.09-0.92)
Not happy		0.94 (0.79-1.12)		0.98 (0.83-1.17)		0.93 (0.78-1.10)		0.96 (0.81-1.15)		0.96 (0.70-1.30)		0.98 (0.71-1.35)		0.28*** (0.11-0.71)		0.22** (0.06-0.77)
Outcome expectations																
HIV-risk assessment																
Low risk		1.00		1.00		1.00		1.00								
High risk		0.96 (0.81-1.12)		0.91 (0.77-1.07)		0.85* (0.71-1.00)		0.79*** (0.66-0.94)								
Belief about preventability of HIV/AIDS																
Yes		1.00		1.00		1.00		1.00								
No		0.76** (0.61-0.95)		0.75** (0.59-0.94)		0.84 (0.67-1.05)		0.90 (0.72-1.13)								
Goals																
Expectation of success in matric at first attempt																
High educational aspiration		1.00		1.00		1.00		1.00								
Low educational aspiration		0.93 (0.84-		0.94 (0.84-		0.95 (0.86-		0.99 (0.90-								

		1.03)		1.04)		1.05)		1.11)								
Socio-structural/contextual variables																
Religious affiliation																
None			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Christianity			1.11* (1.00-1.23)	1.09 (0.97-1.23)			1.13** (1.01-1.28)	1.16** (1.00-1.34)			1.09* (1.00-1.19)	0.93 (0.79-1.09)			1.11** (1.00-1.22)	2.73* (0.83-8.93)
Islam			1.23** (1.03-1.48)	1.32** (1.07-1.62)			0.99 (0.82-1.21)	1.16 (0.92-1.47)			1.21*** (1.05-1.40)	1.16 (0.78-1.73)			0.98 (0.84-1.15)	3.81 (0.31-47.11)
Other			1.11* (0.98-1.24)	1.09 (0.95-1.25)			0.06 (0.93-1.21)	1.05 (0.90-1.22)			1.15*** (1.04-1.27)	1.04 (0.88-1.24)			1.05 (0.94-1.16)	2.56 (0.77-8.51)
Alcohol/drug use																
Non-users			1.00	1.00			1.00	1.00								
Users			0.98 (0.90-1.07)	0.93 (0.84-1.03)			0.99 (0.90-1.10)	0.97 (0.85-1.10)								
Family structure																
No-parent			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Single-parent			1.05 (0.94-1.17)	1.06 (0.94-1.21)			0.93 (0.84-1.02)	0.88** (0.78-0.99)			1.13*** (1.04-1.23)	1.22** (1.02-1.46)			1.04 (0.96-1.12)	1.47 (0.58-3.67)
Both-parents			0.99 (0.88-1.10)	0.95 (0.83-1.09)			1.01 (0.91-1.12)	0.95 (0.83-1.09)			1.10* (1.00-1.20)	1.19* (0.99-1.43)			1.07* (0.99-1.16)	0.84 (0.32-2.19)
School attendance																
Yes			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
No			0.95 (0.87-1.03)	1.03 (0.91-1.16)			0.95 (0.88-1.04)	0.95 (0.84-1.08)			0.88*** (0.81-0.95)	0.74*** (0.60-0.93)			0.83*** (0.77-0.89)	0.20*** (0.06-0.66)
Attitude to education/school																
Negative school attitude											1.00	1.00			1.00	1.00
Positive school attitude											1.09** (1.01-1.18)	0.98 (0.82-1.18)			1.08* (0.99-1.18)	1.66 (0.52-5.27)
Circumstance of first sex (forced?)																
Yes			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00

No			1.16 (0.96-1.41)	1.10 (0.90-1.35)			1.13** (1.03-1.25)	1.22*** (1.08-1.38)			1.19** (1.02-1.38)	1.40*** (1.09-1.79)			1.13*** (1.05-1.22)	2.82** (1.23-6.50)
Neighbourhood racial concentration																
African			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Coloured			1.35*** (1.20-1.52)	0.93 (0.52-1.65)			0.88* (0.78-1.00)	0.92 (0.64-1.33)			1.32*** (1.20-1.45)	0.98 (0.44-2.19)			0.89*** (0.82-0.97)	2.48 (0.08-72.17)
White			1.48*** (1.21-1.81)	0.90 (0.53-1.55)			1.17 (0.95-1.44)	1.16 (0.73-1.82)			1.49*** (1.30-1.71)	1.00 (0.54-1.85)			1.17** (1.03-1.33)	16.06 (0.23-1106.10)
Participation in prosocial activities																
Non-participants			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Participants			1.11** (1.02-1.20)	1.09* (0.99-1.20)			1.07 (0.98-1.15)	1.13** (1.02-1.25)			1.09** (1.02-1.16)	1.06 (0.94-1.20)			1.04 (0.98-1.11)	1.53 (0.77-3.05)
External monetary support																
No monetary support			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Monetary support			1.02 (0.92-1.13)	0.95 (0.84-1.06)			1.09* (0.99-1.19)	1.07 (0.95-1.20)			0.97 (0.90-1.04)	0.83* (0.69-1.01)			1.04 (0.97-1.11)	1.38 (0.58-3.27)
Neighbourhood SES																
Affluent			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Poor			1.01 (0.91-1.13)	1.01 (0.89-1.15)			0.90* (0.80-1.01)	0.91 (0.78-1.05)			1.00 (0.92-1.08)	1.03 (0.87-1.23)			0.95 (0.87-1.03)	1.48 (0.38-5.80)
Childhood place of residence																
Urban			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Rural			0.91* (0.82-1.01)	0.94 (0.84-1.06)			0.90** (0.82-0.98)	0.88** (0.78-0.98)			0.94 (0.86-1.03)	0.85** (0.73-0.99)			0.91** (0.85-0.98)	0.63 (0.30-1.33)
Peers sexually active?																
None of them			1.00	1.00			1.00	1.00								
A few/some of them			0.72** (0.53-0.97)	0.81 (0.57-1.15)			1.15 (0.91-1.44)	1.40** (1.04-1.88)								
Most or all of them			0.77* (0.57-1.03)	0.91 (0.64-1.28)			1.17 (0.94-1.46)	1.40** (1.05-1.88)								

Unsure			0.86 (0.62-1.19)	0.96 (0.65-1.42)			1.30** (1.01-1.67)	1.60*** (1.15-2.23)								
Age at first sexual intercourse – early or not?																
Not early			1.00	1.00			1.00	1.00			1.00	1.00			1.00	1.00
Early			0.95 (0.85-1.06)	0.87* (0.75-1.02)			0.98 (0.90-1.07)	1.06 (0.93-1.20)			0.96 (0.89-1.04)	0.98 (0.83-1.16)			0.91*** (0.86-0.97)	0.75 (0.33-1.68)
Constant	1.68*** (1.60-1.76)	1.57*** (1.37-1.79)	1.53** (1.03-2.27)	1.78** (1.10-2.89)	1.72*** (1.66-1.78)	1.63*** (1.41-1.89)	1.38** (1.02-1.87)	0.99 (0.65-1.50)	1.81*** (1.74-1.87)	1.63*** (1.48-1.80)	1.14 (0.89-1.46)	1.24 (0.76-2.04)	1.83*** (1.77-1.89)	4.19*** (2.54-6.93)	1.77*** (1.46-2.15)	0.30 (0.02-3.78)
Measures of variation or clustering																
Random effects																
Area/community-level Variance (SE)	0.036 (0.011)	0.016 (0.011)	0.007 (0.008)	0.016 (0.011)	1.010e-08 (0.000)	0.008 (0.011)	6.630e-09 (0.000)	0.015 (0.011)	0.027 (0.008)	5.526e-10 (4.865e-06)	0.005 (0.005)	1.411e-09 (0.000)	0.007 (0.006)	1.32e-14 (9.98e-08)	3.266e-11 (1.013e-06)	0.191 (0.568)
PCV (Explained variation) (%)	Reference	55.6	80.6	0.0	Reference	0.0	0.0	-87.5	Reference	100.0	81.5	0.0	Reference	100.0	1.00	0.0
MOR	1.20	1.13	1.08	1.13	1.0	1.09	1.0	1.12	1.17	1.0	1.07	1.0	1.08	1.0	1.0	1.51
ICC/VPC (%)	1.1	0.5	0.2	0.5	0.0	0.2	0.0	0.5	0.8	0.0	0.2	0.0	0.2	0.0	0.0	5.5
Model fit statistics																
AIC	896.13	627.42	775.80	590.33	1011.45	633.34	925.67	583.71	1357.76	349.79	1103.02	310.24	1574.71	352.76	1330.05	315.96
BIC	909.44	697.61	867.50	732.31	1025.09	702.90	1019.95	724.70	1372.37	396.43	1188.56	407.23	1589.76	394.15	1418.59	411.38
Sample size																
Community-level	224	196	219	188	229	177	223	173	268	163	260	153	280	160	272	151
Individual-level	624	459	582	427	696	442	658	415	963	267	856	236	1116	318	1011	290

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations- OR- Odds ratio, CI- Confidence interval, ICC- Intra-cluster Correlation Coefficient, VPC- Variance Partition Coefficient, PCV- Proportional Change in Variance, AIC-Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard Error, MOR- Median Odds Ratio. N.B: PCV for Model 4 uses Model 2 area/community-level variance as base variance.

7.4 Results of the multi-level analysis for contraceptive use at the most-recent sexual intercourse

7.4.1 Bivariate results

Table 21 shows the results of the Chi-square test of association between contraceptive use at the most-recent sexual intercourse and some selected individual and contextual variables. It is clear that sex of the respondents, population group, educational level, level of self control, self-rating of life opportunity, contraceptive use at the event of first sexual intercourse, belief that HIV/AIDS is preventable, educational expectation, religious affiliation, school attendance, predominant population group at the place of residence, participation in prosocial activities and external monetary support were associated with the use of contraceptives at the most-recent sexual intercourse at the baseline in 2002.

At the second wave of data collection in 2003/2004, contraceptive use at the event of first sexual intercourse (a measure of self-efficacy), educational expectations, the expectation of living long, religious affiliation, school attendance, predominant population group at the place of residence, participation in prosocial activities, childhood place of residence and peer sexual characteristics were the significant factors associated with the use of contraceptives at the most-recent sexual intercourse. The Wave 2 data must however be used with caution because of its quality. At the third wave of data collection in 2005, sex of the respondents, population group, educational level, level of self control, self-rating of life opportunity, contraceptive use at the event of first sexual intercourse, HIV-risk assessment, belief about the preventability of HIV, expectation of living long, religious affiliation, type of family structure, school attendance, attitude to education/schooling, predominant population group at the place of residence, participation in prosocial activities, external monetary support, type of child neighbourhood, childhood place of

residence and peer sexual characteristics were the factors associated with the use of contraceptives at the most-recent sexual intercourse.

Table 21: Bivariate association between contraceptive use at the most-recent sexual intercourse and selected individual compositional and socio-structural characteristics of South African adolescents and young adults living in Cape Town (CAPS 2002 and 2005)

Variables	**Wave 1 (2002)**			**Wave 2 (2003/2004)**			**Wave 3 (2005)**		
	No %(n)	Yes %(n)	p-value	No %(n)	Yes %(n)	p-value	No %(n)	Yes %(n)	p-value
Independent variables									
Age (groups)			0.561			0.640			0.783
Less than 18 years	23.33 (84)	21.82 (194)		15.38 (24)	17.01 (75)		6.09 (31)	5.76 (80)	
18 years and above	76.67 (276)	78.18 (695)		84.62 (132)	82.99 (366)		93.91 (478)	94.24 (1,310)	
Sex			0.001			0.924			0.007
Male	39.72 (143)	49.72 (442)		50.00 (2)	47.37 (9)		40.30 (216)	47.09 (705)	
Female	60.28 (217)	50.28 (447)		50.00 (2)	52.63 (10)		59.70 (320)	52.91 (792)	
Race/ population group			0.000			0.695			0.000
Black/African	55.56 (200)	62.65 (557)		100.00 (4)	84.21 (16)		41.20 (220)	59.39 (889)	
Coloured	43.61 (157)	31.50 (280)		0.00 (0)	5.26 (1)		57.12 (305)	32.87 (492)	
White	0.83 (3)	5.85 (52)		0.00 (0)	10.53 (2)		1.69 (9)	7.68 (115)	
Indian/Asian	-	-					0.00 (0)	0.07 (1)	
Educational level			0.001			0.858			0.042
No formal education	-	-		-	-		-	-	
Primary	18.44 (66)	12.61 (112)		3.08 (2)	1.98 (5)		-	-	
Secondary	79.89 (286)	82.09 (729)		73.85 (48)	73.81 (186)		74.68 (59)	62.91 (307)	
Tertiary	1.68 (6)	5.29 (47)		23.08 (15)	24.21 (61)		25.32 (20)	37.09 (181)	
Pubertal development (years)			0.418			0.100			0.136
7	0.00 (0)	0.12 (1)		-	-		0.00 (0)	0.07 (1)	
8	0.00 (0)	0.12 (1)		-	-		0.20 (1)	0.07 (1)	
9	0.58	0.37		-	-		0.40	0.50	

	(2)	(3)					(2)	(7)	
10	2.34 (8)	1.95 (16)		0.00 (0)	2.92 (12)		2.60 (13)	1.78 (25)	
11	3.22 (11)	4.63 (38)		6.76 (10)	4.14 (17)		7.40 (37)	3.56 (50)	
12	16.08 (55)	14.25 (117)		14.19 (21)	13.14 (54)		15.20 (76)	14.31 (201)	
13	27.78 (95)	23.14 (190)		21.62 (32)	19.71 (81)		24.00 (120)	24.41 (343)	
14	23.39 (80)	26.19 (215)		25.68 (38)	25.79 (106)		23.40 (117)	26.48 (372)	
15	14.04 (48)	17.17 (141)		14.86 (22)	20.92 (86)		16.00 (80)	16.65 (234)	
16	5.85 (20)	7.43 (61)		11.49 (17)	8.76 (36)		6.40 (32)	7.83 (110)	
17	3.51 (12)	3.17 (26)		2.03 (3)	3.16 (13)		2.40 (12)	2.99 (42)	
18	2.05 (7)	1.22 (10)		2.03 (3)	1.22 (5)		1.60 (8)	1.14 (16)	
19	0.58 (2)	0.12 (1)		1.35 (2)	0.00 (0)		0.20 (1)	0.07 (1)	
20	0.58 (2)	0.12 (1)		0.00 (0)	0.24 (1)		0.20 (1)	0.14 (2)	
Current work status			0.965			0.214			0.803
Yes	57.25 (79)	57.46 (204)		0.00 (0)	29.41 (5)		42.99 (230)	43.61 (652)	
No	42.75 (59)	42.54 (151)		100.0 0 (4)	70.59 (12)		57.01 (305)	56.39 (843)	
Self-efficacy									
Level of self-control			0.021			0.402			0.000
Totally in control	38.06 (137)	44.13 (391)		43.51 (67)	46.49 (205)		33.33 (178)	43.45 (650)	
Control most things	46.11 (166)	45.15 (400)		46.10 (71)	40.36 (178)		51.69 (276)	44.65 (668)	
Little or no control	15.83 (57)	10.72 (95)		10.39 (16)	13.15 (58)		14.98 (80)	11.90 (178)	
Self-rating of opportunity in life			0.014			0.387			0.036
Good life prospect	62.78 (226)	71.22 (631)		64.94 (100)	70.52 (311)		67.60 (361)	72.06 (1,078)	
Limited life prospect	30.28 (109)	23.36 (207)		27.27 (42)	23.81 (105)		25.47 (136)	23.53 (352)	
Uncertain about life	6.94 (25)	5.42 (48)		7.79 (12)	5.67 (25)		6.93 (37)	4.41 (66)	
How happy about life?			0.439			0.920			0.202
Very happy	76.11 (274)	76.30 (676)		76.62 (118)	76.87 (339)		76.40 (408)	78.94 (1,181)	
Happy a little	18.06	16.14		16.88	15.87		17.42	14.24	

	(65)	(143)		(26)	(70)		(93)	(213)	
Not happy	5.83 (21)	7.56 (67)		6.49 (10)	7.26 (32)		6.18 (33)	6.82 (102)	
Contraceptive use at first sexual intercourse			0.000			0.011			0.000
No	75.49 (268)	36.68 (325)		57.01 (61)	42.81 (131)		57.55 (286)	34.18 (469)	
Yes	24.51 (87)	63.32 (561)		42.99 (46)	57.19 (175)		42.45 (211)	65.82 (903)	
Outcome expectations									
HIV-risk assessment			0.621			0.222			0.010
Low risk	91.79 (302)	92.65 (781)		83.97 (110)	88.09 (355)		87.98 (410)	91.96 (1,270)	
High risk	8.21 (27)	7.35 (62)		16.03 (21)	11.91 (48)		12.02 (56)	8.04 (111)	
Belief about preventability of HIV/AIDS			0.017			0.251			0.004
Yes	93.61 (337)	96.63 (859)		94.23 (147)	96.37 (425)		93.83 (502)	96.71 (1,441)	
No	6.39 (23)	3.37 (30)		5.77 (9)	3.63 (16)		6.17 (33)	3.29 (49)	
Goals									
Expectation of success in matric at first attempt			0.000			0.055			0.695
High educational aspiration	56.23 (158)	68.94 (435)		62.52 (75)	71.95 (236)		68.63 (35)	71.33 (209)	
Low educational aspiration	43.77 (123)	31.06 (196)		37.50 (45)	28.05 (92)		31.37 (16)	28.67 (84)	
Expectation to live long (up to 80 years)			0.451			0.075			0.000
Yes	46.67 (168)	49.89 (442)		39.61 (61)	48.30 (213)		38.95 (208)	51.14 (765)	
No	7.22 (26)	7.90 (70)		6.49 (10)	8.39 (37)		8.24 (44)	7.55 (113)	
Unsure	46.11 (166)	42.21 (374)		53.90 (83)	43.31 (191)		52.81 (282)	41.31 (618)	
Socio-structural variables									
Religious affiliation			0.019			0.052			0.000
None	19.55 (70)	15.53 (137)		12.99 (20)	14.68 (64)		13.91 (74)	14.09 (209)	
Christianity	48.04 (172)	54.88 (484)		57.14 (88)	51.15 (223)		51.88 (276)	55.97 (830)	
Islam	9.22 (33)	5.56 (49)		11.04 (17)	6.42 (28)		13.53 (72)	4.72 (70)	
Other	23.18 (83)	24.04 (212)		18.83 (29)	27.75 (121)		20.68 (110)	25.22 (374)	
Alcohol/drug use			0.986			0.546			0.223

Non-users	54.72 (197)	54.67 (486)		56.41 (88)	59.18 (261)		42.80 (229)	45.86 (686)	
Users	45.28 (163)	45.33 (403)		43.59 (68)	40.82 (180)		57.20 (306)	54.14 (810)	
Family structure			0.109			0.614			0.015
No-parent family	31.39 (113)	26.66 (237)		28.21 (44)	26.08 (115)		28.57 (146)	23.23 (332)	
Single-parent family	40.00 (144)	39.26 (349)		36.54 (57)	41.04 (181)		38.94 (199)	45.63 (652)	
Both-parents family	28.61 (103)	34.08 (303)		35.26 (55)	32.88 (145)		32.49 (166)	31.14 (445)	
School environment			0.943			0.542			0.509
Non-problematic	25.28 (91)	25.08 (223)		19.23 (30)	21.54 (95)		25.00 (134)	23.58 (353)	
Problematic	74.72 (269)	74.92 (666)		80.77 (126)	78.46 (346)		75.00 (402)	76.42 (1,144)	
School attendance			0.000			0.000			0.00
Yes	33.06 (119)	51.29 (456)		30.46 (46)	48.61 (210)		13.06 (70)	31.12 (464)	
No	66.94 (241)	48.71 (433)		49.54 (105)	51.39 (222)		86.94 (466)	68.88 (1,027)	
Attitude to education/school			0.307			0.915			0.000
Negative school attitude	19.78 (71)	17.32 (154)		17.31 (27)	17.69 (78)		21.31 (114)	14.09 (211)	
Positive school attitude	80.22 (288)	82.68 (735)		82.69 (129)	82.31 (363)		78.69 (421)	85.91 (1,286)	
Circumstance of first sex (forced?)			0.606			0.590			0.797
Yes	10.92 (39)	9.94 (88)		33.68 (32)	36.82 (88)		11.58 (60)	11.17 (160)	
No	89.08 (318)	90.06 (797)		66.32 (63)	63.18 (151)		88.42 (458)	88.83 (1,273)	
Neighbourhood racial concentration			0.000			0.000			0.000
African	55.83 (201)	62.77 (558)		51.28 (80)	64.63 (285)		42.16 (226)	59.19 (886)	
Coloured	41.39 (149)	29.81 (265)		46.79 (73)	29.02 (128)		53.92 (289)	31.20 (467)	
White	2.78 (10)	7.42 (66)		1.92 (3)	6.35 (28)		3.92 (21)	9.62 (144)	
Participation in prosocial activities			0.001			0.001			0.000
Non-participants	58.33 (210)	48.14 (428)		56.41 (88)	41.50 (183)		55.60 (298)	41.75 (625)	
Participants	41.67 (150)	51.86 (461)		43.59 (68)	58.50 (258)		44.40 (238)	58.25 (872)	
External monetary support			0.054			0.950			0.004

No monetary support	31.03 (108)	25.61 (222)		25.00 (1)	23.53 (4)		40.78 (208)	33.64 (477)	
Monetary support	68.97 (240)	74.39 (645)		75.00 (3)	76.47 (13)		59.22 (302)	66.36 (941)	
Neighbourhood SES			0.518			0.804			0.812
Affluent	20.28 (73)	21.93 (195)		16.03 (25)	15.19 (67)		24.63 (132)	24.11 (361)	
Poor	79.72 (287)	78.07 (694)		83.97 (131)	84.81 (374)		75.37 (404)	75.89 (1,136)	
Childhood neighbourhood type			0.272			0.854			0.016
Non-problematic	69.72 (251)	72.78 (647)		75.00 (117)	75.74 (334)		69.03 (370)	74.42 (1,114)	
Problematic	30.28 (109)	27.22 (242)		25.00 (39)	24.26 (107)		30.97 (166)	25.58 (383)	
Childhood place of residence			0.435			0.075			0.001
Urban	74.51 (266)	72.34 (638)		79.87 (123)	72.60 (318)		82.13 (432)	75.35 (1,122)	
Rural	25.49 (91)	27.66 (244)		20.13 (31)	27.40 (120)		17.87 (94)	24.65 (367)	
Peers sexually active?			0.367			0.066			0.005
None of them	1.94 (7)	2.48 (22)		1.94 (3)	2.04 (9)		2.24 (12)	2.01 (30)	
A few/some of them	28.33 (102)	28.64 (254)		36.13 (56)	26.98 (119)		28.04 (150)	31.22 (467)	
Most or all of them	60.28 (217)	62.23 (552)		52.26 (81)	64.17 (283)		58.88 (315)	60.56 (906)	
Unsure	9.44 (34)	6.65 (59)		9.68 (15)	6.80 (30)		10.84 (58)	6.22 (93)	

Significant at *p<0.1; **p<0.05; ***p<0.01

7.4.2 Multivariate multi-level logistic regression results

Table 22 presents the results of the multi-level logistic regression models for the use of contraceptives at the event of most-recent sexual intercourse in the study area between 2002 and 2005. This is an index of current contraceptive use among the adolescents and young adults studied. The result of the random effects model for the baseline is shown in Table 22 (Empty Model 1, Wave 1). The variation in the log odds of using contraceptives at the most-recent sexual intercourse across the communities (clusters) at the baseline in 2002 is small at 0.007. According to the intra-cluster correlation coefficient implied by the

estimated intercept component variance (VPC), 0.2% of the variance in the use of contraceptive at the most-recent sexual intercourse could be attributed to community/cluster-level variables. The variation declined after controlling for individual and contextual variables and for all the variables combined.

As judged by the proportional change in variance (PCV) at the baseline, 100 percent of the variance in log odds of using contraceptives at the most-recent sexual intercourse variance across the community clusters was explained by individual compositional factors (Model 2, Wave 1, Table 22), and 43 percent by contextual factors independent of individual variables (Model 3, Wave 1, Table 22). This shows the importance of individual variables. The Median odds ratio (MOR) of 1.00 (Model 2, Wave 1) shows that in the median case, there is no difference between areas/clusters in the probability of using contraceptives at the most-recent sexual intercourse when randomly picking out two persons in different areas, meaning that if a person moves to another area (cluster) with a higher probability of using contraceptives at the most-recent sexual intercourse, their likelihood of using contraceptives at the most-recent sexual intercourse will (in median) remain the same. A similar scenario is observed at the second and third waves.

Examining the predictors of use of contraceptives at the event of most-recent sexual intercourse at the baseline in Model 2, females, Coloureds and those with low educational aspiration were significantly less likely to report use of contraceptives at the most-recent sexual intercourse than the reference category, while those with tertiary education level and those who used contraceptives at first sexual intercourse were significantly more likely to report contraceptive use at the most-recent sexual intercourse. Independent of all individual factors, those out of school adolescents in 2002 were less likely to report use of

contraceptives at the most-recent sexual intercourse, while Christians and those living in predominantly White areas were significantly more likely to report use of contraceptives at the most-recent sexual intercourse.

With the inclusion of all the variables in 2002, females, those out of school and those living in predominantly Coloured and White areas were significantly less likely to use contraceptives at the most-recent sexual intercourse than their reference categories. Those of White racial origin ($p<0.1$), those who used contraceptive at their first sexual activity and those who were Christian or of a religious affiliation other than the choices listed were significantly more likely to use contraceptive at the event of most-recent sexual intercourse in 2002.

At the second wave of data collection in 2003/2004, when controlling for all the variables (Model 4, Wave 2, Table 22), those who used contraceptives at first sexual intercourse were significantly more likely to use contraceptives at the most-recent sexual intercourse while those out of school were significantly less likely to do so (OR: 0.86; $p<0.05$).

At the third wave of data collection in 2005, the result of the random effects model as shown in Tables 22 (Empty Model 1, Wave 3) revealed that variation in the log odds of using contraceptives at the most-recent sexual intercourse across the communities (clusters) in 2005 is also small at 0.012. According to the intra-cluster correlation coefficient implied by the estimated intercept component variance (VPC), 0.4% of the variance in the use of contraceptives at the most-recent sexual intercourse could be attributed to community/cluster-level variables. The variation dropped to zero after controlling for individual and contextual variables and for all the variables combined. As

judged by the proportional change in variance (PCV), 100% of the variance in log odds of using contraceptive at the most-recent sexual intercourse variance across the community clusters was explained by individual compositional factors and contextual factors independently of each other (Model 2, Wave 3 and Model 3, Wave 3).

Examining the predictors of using contraceptives at the most-recent sexual intercourse in 2005, when all the variables are controlled for, the log odds of using contraceptive at the most-recent sexual intercourse significantly decreased with lack of expectation of living long and increased significantly with the self-efficacy of using contraceptives at the event of first sexual intercourse

When the sex of the respondents was controlled for in 2002 (Model 3, Wave 1, Table 22a); White females, those with the self-efficacy of using contraceptives at the first sexual intercourse (both male and female), Christian females and those females with 'other' religious affiliation were significantly more likely to report use of contraceptives at the most-recent sexual intercourse. On the other hand, females who were out of school, females living in predominantly Coloured or White neighbourhoods, and counter-intuitively, those with monetary support were all less likely to have used contraceptives at the most-recent sexual intercourse at the baseline. At the third wave of data collection in 2005 (Model 3, Wave 3, Table 22a), both males and females who used contraceptives at the first sexual intercourse had higher odds of reporting use of contraceptives at the most-recent sexual intercourse. However, females who did not expect to live long or who are not sure of living long, females who practised Islam and, unexpectedly, females participating in prosocial activities were all significantly less likely to report use of contraceptives at the most-recent sexual intercourse.

Table 22: Individual compositional and community contextual factors associated with contraceptive use at the most-recent sexual intercourse among South African adolescents and young adults living in Cape Town (CAPS 2002 and 2005)

Variables	Wave 1 (2002)				Wave 2 (2003/04)				Wave 3 (2005)			
	Empty model	**Individual variables**	**Contextual variables**	**Indiv. & contextual variables**	**Empty model**	**Individual variables**	**Contextual variables**	**Indiv. & contextual variables**	**Empty model**	**Individual variables**	**Contextual variables**	**Indiv. & contextual variables**
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Independent variables												
Male		1.00		1.00						1.00		1.00
Female		0.90*** (0.85-0.95)		0.88*** (0.82-0.94)						0.82 (0.46-1.46)		0.73 (0.38-1.40)
Race/ population group												
Black/African		1.00		1.00						1.00		1.00
Coloured		0.87*** (0.82-0.93)		1.17 (0.89-1.54)						0.48* (0.22-1.08)		9.76 (0.15-647.79)
White		1.03 (0.82-1.29)		1.40* (0.96-2.03)						0.63 (0.19-2.05)		2.59 (0.25-27.16)
Educational level												
Primary		1.00		1.00						-		-
Secondary		1.00 (0.93-1.08)		1.03 (0.95-1.11)						1.00		1.00
Tertiary		1.28* (0.96-1.70)		1.27 (0.95-1.69)						1.50 (0.73-3.07)		1.79 (0.77-4.16)
Self-efficacy variables												
Level of self-control												
Totally in control		1.00		1.00						1.00		1.00
Control most things		1.00 (0.94-1.06)		0.99 (0.94-1.06)						0.88 (0.46-1.67)		0.94 (0.45-1.95)
Little or no control		0.96 (0.88-1.05)		0.96 (0.87-1.04)						0.91 (0.36-2.31)		1.07 (0.36-3.23)
Self-rating of opportunity in life												
Good life prospect		1.00		1.00						1.00		1.00
Limited life prospect		0.98 (0.92-1.05)		0.98 (0.91-1.05)						1.01 (0.44-2.30)		0.84 (0.34-2.04)
Uncertain about life		0.97 (0.87-1.08)		0.98 (0.88-1.09)						0.69 (0.13-3.62)		0.76 (0.11-5.17)
Contraceptive use at first sexual intercourse												
No		1.00		1.00		1.00		1.00		1.00		1.00
Yes		1.38*** (1.31-1.46)		1.37*** (1.29-1.45)		1.21*** (1.09-1.34)		1.18*** (1.06-1.32)		6.70*** (3.59-12.54)		8.50*** (4.15-17.38)
Outcome expectations												
HIV-risk assessment												
Low risk										1.00		1.00
High risk										0.62 (0.25-1.55)		0.58 (0.21-1.59)

Belief about preventability of HIV/AIDS												
Yes		1.00		1.00						1.00		1.00
No		0.91 (0.80-1.05)		0.94 (0.81-1.09)						0.27** (0.07-0.98)		0.52 (0.10-2.80)
Goals												
Expectation of success in matric at first attempt												
High educational aspiration		1.00		1.00		1.00		1.00				
Low educational aspiration		0.96* (0.88-1.00)		0.98 (0.91-1.04)		0.95 (0.86-1.06)		1.01 (0.90-1.13)				
Expectation to live long (up to 80 years)												
Yes						1.00		1.00		1.00		1.00
No						1.04 (0.85-1.28)		1.03 (0.84-1.27)		0.33** (0.13-0.86)		0.25** (0.09-0.71)
Unsure						0.97 (0.87-1.08)		1.02 (0.91-1.14)		0.68 (0.37-1.27)		0.59 (0.30-1.18)
Socio-structural/ contextual variables												
Religious affiliation												
None			1.00	1.00			1.00	1.00			1.00	1.00
Christianity			1.09** (1.01-1.17)	1.08* (1.00-1.18)			0.97 (0.87-1.09)	0.93 (0.80-1.08)			1.06* (0.99-1.12)	1.87 (0.73-4.78)
Islam			1.01 (0.89-1.14)	1.02 (0.89-1.17)			0.96 (0.81-1.15)	0.85 (0.66-1.10)			0.91* (0.83-1.01)	0.30 (0.05-1.99)
Other			1.05 (0.97-1.14)	1.08* (0.99-1.18)			1.03 (0.92-1.16)	1.07 (0.91-1.24)			1.04 (0.97-1.11)	1.31 (0.48-3.54)
Family structure												
No-parent family											1.00	1.00
Single-parent family											1.07** (1.02-1.12)	1.28 (0.50-3.26)
Both-parents family											1.04 (0.98-1.10)	1.14 (0.43-3.04))
School attendance												
Yes			1.00	1.00			1.00	1.00			1.00	1.00
No			0.89*** (0.84-0.95)	0.93** (0.87-1.00)			0.90*** (0.83-0.97)	0.86** (0.76-0.97)			0.90*** (0.86-0.94)	0.55 (0.19-1.64)
Attitude to education/school												
Negative school attitude											1.00	1.00
Positive school attitude											1.06** (1.01-1.12)	1.10 (0.39-3.11)
Neighbourhood racial concentration												
African			1.00	1.00			1.00	1.00			1.00	1.00
Coloured			0.95 (0.89-1.02)	0.76* (0.58-1.01)			0.96 (0.87-1.06)	1.05 (0.90-1.21)			0.89*** (0.84-0.94)	0.06 (0.00-3.98)
White			1.13** (1.01-1.26)	0.72** (0.53-0.98)			1.18* (1.00-1.40)	1.12 (0.49-2.57)			1.05 (0.98-1.13)	0.18 (0.02-1.51)
Participation in prosocial activities												
Non-participants			1.00	1.00			1.00	1.00			1.00	1.00
Participants			1.03 (0.98-	1.01 (0.95-			1.07*	1.08 (0.97-			1.05** (1.01-	0.90 (0.45-

			1.09)	1.07)			(0.99-1.15)	1.21)			1.10)	1.80)
External monetary support												
No monetary support			1.00	1.00							1.00	1.00
Monetary support			1.00 (0.94-1.06)	0.96 (0.90-1.02)							1.02 (0.97-1.06)	0.57 (0.19-1.68)
Childhood neighbourhood type												
Non-problematic											1.00	1.00
Problematic											0.98 (0.93-1.02)	0.83 (0.41-1.70)
Childhood place of residence												
Urban							1.00	1.00			1.00	1.00
Rural							1.04 (0.95-1.14)	1.04 (0.92-1.19)			1.01 (0.96-1.07)	1.38 (0.61-3.16)
Peers sexually active?												
None of them							1.00	1.00			1.00	1.00
A few/some of them							0.95 (0.74-1.22)	0.75 (0.33-1.72)			1.09 (0.95-1.24)	2.93 (0.46-18.69)
Most or all of them							1.04 (0.82-1.33)	0.77 (0.34-1.76)			1.05 (0.92-1.20)	1.95 (0.33-11.59)
Unsure							0.97 (0.74-1.27)	0.64 (0.27-1.51)			1.00 (0.87-1.16)	3.87 (0.30-49.43)
Constant	2.03*** (1.98-2.09)	1.96*** (1.79-2.14)	2.04*** (1.86-2.23)	1.91*** (1.68-2.16)	2.09*** (2.01-2.17)	1.95*** (1.77-2.14)	2.15*** (1.65-2.82)	2.62** (1.11-6.18)	2.09*** (2.04-2.14)	4.09*** (2.10-7.95)	1.91*** (1.63-2.24)	1.79 (0.14-22.73)
Measures of variation or clustering												
Random effects												
Area/community-level Variance (SE)	0.007 (0.005)	2.286e-10 (3.274e-06)	0.004 (0.004)	0.002 (0.004)	0.003 (0.004)	0.003 (0.008)	1.089e-10 (3.295e-06)	0.006 (0.009)	0.012 (0.003)	4.11e-10 (0.000)	2.060e-10 (1.778e-06)	2.01e-09 (0.000)
PCV (Explained variation) (%)	Reference	100.0	42.9	0.0	Reference	0.0	100.0	-100.0	Reference	100.0	100.0	0.0
MOR	1.08	1.00	1.06	1.04	1.05	1.05	1.00	1.08	1.11	1.00	1.00	1.00
ICC/VPC (%)	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.4	0.0	0.0	0.0
Model fit statistics												
AIC	1568.96	1025.99	1479.17	986.18	717.63	345.57	661.34	333.43	2418.57	349.08	2125.74	337.23
BIC	1584.35	1098.03	1535.22	1095.75	730.80	371.19	722.18	398.60	2435.42	411.34	2231.05	463.70
Sample size												
Community-level	272	236	269	234	106	77	105	77	317	201	314	195
Individual-level	1249	900	1206	866	597	287	570	276	2033	469	1886	437

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations- OR- Odds ratio, CI- Confidence interval, ICC- Intra-cluster Correlation Coefficient, VPC- Variance Partition Coefficient, PCV- Proportional Change in Variance, AIC-Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard Error, MOR- Median Odds Ratio. N.B: The base area variance for Model 4 is area variance for Model 2.

Table 22a: Individual compositional and community contextual factors associated with contraceptive use at the most-recent sexual intercourse, males and females separately (CAPS 2002 and 2005)

Variables	Contraceptive use at the most-recent sexual intercourse																	
	Wave 1 (2002)						Wave 2 (2003/04)						Wave 3 (2005)					
	Male			Female			Male			Female			Male			Female		
	Empty model	Indiv. variables	Indiv. & context. variables	Empty model	Indiv. variables	Indiv. & context. variables	Empty model	Indiv. variables	Indiv. & context. variables	Empty model	Indiv. variables	Indiv. & context. variables	Empty model	Indiv. variables	Indiv. & context. variables	Empty model	Indiv. variables	Indiv. & context. variables
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Independent variables																		
Race/ population group																		
Black/African		1.00	1.00		1.00	1.00								1.00	1.00		1.00	1.00
Coloured		0.90** (0.82-0.98)	0.95 (0.53-1.68)		0.83*** (0.76-0.91)	1.28 (0.92-1.78)								0.38 (0.07-1.91)	4.36e+07		0.61 (0.20-1.91)	3.93 (0.01-1116.69)
White		0.86 (0.60-1.23)	0.84 (0.42-1.68)		1.10 (0.82-1.49)	1.63** (1.01-2.64)								0.13* (0.01-1.23)	0.14 (6.40e-06-2951.68)		2.52 (0.28-22.80)	7.28 (0.17-317.06)
Educational level																		
Primary		1.00	1.00		1.00	1.00								-	-		-	-
Secondary		1.04 (0.94-1.15)	1.05 (0.95-1.16)		0.98 (0.88-1.09)	1.03 (0.92-1.14)								1.00	1.00		1.00	1.00
Tertiary		1.21 (0.89-1.66)	1.16 (0.84-1.59)		1.43 (0.76-2.69)	1.48 (0.78-2.80)								2.52 (0.62-10.22)	2.16 (0.10-47.05)		1.07 (0.40-2.88)	1.36 (0.37-4.98)
Self-efficacy																		
Level of self-control																		
Totally in control		1.00	1.00		1.00	1.00								1.00	1.00		1.00	1.00
Control most things		0.99 (0.92-1.08)	1.00 (0.92-1.08)		1.01 (0.92-1.10)	0.99 (0.91-1.09)								0.81 (0.27-2.42)	0.42 (0.03-6.87)		0.97 (0.39-2.42)	0.79 (0.25-2.50)
Little or no		0.99	0.99		0.95	0.92								1.06	0.57		1.01	1.62

control		(0.87-1.11)	(0.87-1.12)		(0.84-1.07)	(0.82-1.04)								(0.17-6.50)	(0.01-23.41)		(0.28-3.62)	(0.21-12.23)
Self-rating of opportunity in life																		
Good life prospect		1.00	1.00		1.00	1.00								1.00	1.00		1.00	1.00
Limited life prospect		0.99 (0.90-1.08)	0.96 (0.87-1.06)		0.98 (0.89-1.07)	0.99 (0.90-1.08)								1.81 (0.34-9.73)	2.73 (0.08-90.59)		0.84 (0.29-2.44)	0.95 (0.23-3.64)
Uncertain about life		0.95 (0.82-1.10)	0.93 (0.81-1.08)		0.98 (0.84-1.16)	1.02 (0.86-1.20)								0.91 (0.06-13.60)	0.04 (0.00-52.72)		0.58 (0.04-8.10)	0.96 (0.05-16.87)
Contraceptive use at first sexual intercourse																		
No		1.00	1.00		1.00	1.00								1.00	1.00		1.00	1.00
Yes		1.41*** (1.31-1.53)	1.40*** (1.29-1.52)		1.34*** (1.23-1.45)	1.31*** (1.21-1.42)								11.51*** (1.93-68.78)	912.64*** (1.53-543342.5)		6.66*** (2.87-15.49)	11.04*** (2.63-46.33)
Outcome expectations																		
HIV-risk assessment																		
Low risk														1.00	1.00		1.00	1.00
High risk														0.57 (0.12-2.75)	0.43 (0.02-11.65)		0.59 (0.15-2.24)	0.32 (0.05-1.91)
Belief about preventability of HIV/AIDS																		
Yes		1.00	1.00		1.00	1.00								1.00	1.00		1.00	1.00
No		0.89 (0.73-1.08)	0.86 (0.70-1.06)		0.97 (0.79-1.18)	1.00 (0.82-1.23)								0.06* (0.00-1.26)	0.02 (0.00-35.03)		0.46 (0.08-2.57)	1.63 (0.13-20.82)
Goals																		
Expectation of success in matric at first attempt																		
High educational aspiration		1.00	1.00		1.00	1.00												
Low educational aspiration		0.98 (0.90-1.07)	0.98 (0.90-1.08)		0.91** (0.83-0.99)	0.95 (0.87-1.04)												
Expectation to live long (up to 80 years)																		
Yes														1.00	1.00		1.00	1.00
No														0.34	0.08		0.24**	0.13**

														(0.06-1.86)	(0.00-4.36)		(0.06-0.93)	(0.02-0.82)
Unsure														1.83 (0.58-5.76)	1.87 (0.16-22.44)		0.32** (0.13-0.79)	0.24** (0.06-0.98)
Socio-structural/contextual variables																		
Religious affiliation																		
None			1.00			1.00									1.00			1.00
Christianity			1.03 (0.93-1.14)			1.17** (1.03-1.34)									6.76 (0.37-123.59)			0.49 (0.08-3.03)
Islam			0.95 (0.79-1.13)			1.16 (0.94-1.42)									0.43 (0.00-239.95)			0.01** (0.00-0.73)
Other			1.07 (0.95-1.20)			1.13* (0.98-1.31)									0.24 (0.01-9.10)			0.97 (0.14-6.73)
Family structure																		
No-parent family															1.00			1.00
Single-parent family															1.69 (0.04-64.98)			0.83 (0.19-3.54)
Both-parents family															0.53 (0.01-20.76)			1.28 (0.27-5.98)
School attendance																		
Yes			1.00			1.00									1.00			1.00
No			1.06 (0.96-1.17)			0.82*** (0.74-0.90)									26.15 (0.07-9855.51)			0.31 (0.05-1.85)
Attitude to education/ school																		
Negative school attitude															1.00			1.00
Positive school attitude															3.00 (0.11-81.85)			0.99 (0.17-5.80)
Neighbourhood racial concentration																		
African			1.00			1.00									1.00			1.00

Coloured			0.96 (0.54-1.71)			0.68** (0.49-0.95)								4.62e-10			0.37 (0.00-103.99)
White			0.93 (0.53-1.65)			0.68* (0.46-1.01)								0.03 (1.13e-06-855.50)			0.56 (0.03-10.17)
Participation in prosocial activities																	
Non-participants			1.00			1.00								1.00			1.00
Participants			1.01 (0.93-1.10)			1.01 (0.92-1.10)								4.83 (0.30-78.12)			0.33* (0.96-1.14)
External monetary support																	
No monetary support			1.00			1.00								1.00			1.00
Monetary support			1.04 (0.95-1.14)			0.89** (0.81-0.98)								3.21 (0.06-176.76)			0.27 (0.05-1.57)
Childhood neighbourhood type																	
Non-problematic														1.00			1.00
Problematic														1.18 (0.11-12.78)			0.43 (0.13-1.47)
Childhood place of residence																	
Urban														1.00			1.00
Rural														1.07 (0.05-22.55)			0.99 (0.29-3.41)
Peers sexually active?																	
None of them														1.00			1.00
A few/some of them														19.97 (0.03-11940.55)			0.70 (0.05-10.36)
Most or all of them														6.72 (0.02-2375.02)			0.85 (0.07-10.79)

Unsure															138.30 (0.01-1548267)			4.78 (0.05-476.20)
Constant	2.13*** (2.05-2.21)	1.84*** (1.63-2.07)	1.69*** (1.43-2.00)	1.96*** (1.88-2.03)	1.86*** (1.64-2.10)	1.83*** (1.52-2.20)	2.12*** (2.12-2.12)	-	-	2.30*** (1.86-2.84)	-	-	2.16*** (2.09-2.22)	3.27* (0.96-11.18)	0.04 (9.81e-06-169.32)	2.03*** (1.97-2.10)	4.49*** (1.77-11.42)	69.35* (0.95-5073.95)
Measures of variation or clustering																		
Random effects																		
Area/Community-level Variance (SE)	0.005 (0.008)	1.738e-09 (8.400e-06)	2.851e-10 (9.030e-06)	0.008 (0.008)	1.641e-14 (1.292e-08)	1.533e-13 (3.904e-08)	0.188 (1.010e-07)	-	-	5.038e-10 (0.000)	-	-	0.010 (0.005)	0.937 (2.593)	11.586 (12.776)	0.018 (0.006)	2.89e-12 (4.82e-06)	0.170 (1.303)
PCV (Explained variation) (%)	Reference	100.0	0.0	Reference	100.0	0.0	Reference	-	-	Reference	-	-	Reference	-9,270.0	-1,136.5	Reference	100.0	0.0
MOR	1.07	1.00	1.00	1.09	1.00	1.00	1.00	-	-	1.00	-	-	1.10	2.51	25.37	1.14	1.00	1.48
ICC/VPC (%)	0.2	0.0	0.0	0.2	0.0	0.0	0.0	-	-	0.0	-	-	0.3	22.2	0.8	0.5	0.0	4.9
Model fit statistics								-	-		-	-						
AIC	677.65	475.04	465.38	883.80	566.10	532.53	-88.46	-	-	16.37	-	-	1031.68	168.74	169.62	1386.54	192.82	192.55
BIC	690.77	532.35	554.68	897.30	623.85	622.33	-87.26	-	-	17.82	-	-	1046.15	215.54	267.50	1401.58	242.67	297.46
Sample size																		
Community-level	218	189	186	225	182	180	8	-	-	10	-	-	264	145	135	283	141	137
Individual-level	585	443	428	664	457	438	11	-	-	12	-	-	921	209	193	1112	260	244

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations- OR- Odds ratio, CI- Confidence interval, ICC- Intra-cluster Correlation Coefficient, VPC- Variance Partition Coefficient, PCV- Proportional Change in Variance, AIC-Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard Error, MOR- Median Odds Ratio. N.B: This table presents three models for each sex in each Wave and Wave 2 statistics could not be run because of small sample size.

7.5 Results of the multi-level analysis on consistency of condom use with most-recent sexual partner

7.5.1 Bivariate results

Table 23 shows the results of the chi-square test of association between the condom use at the most-recent sexual intercourse and individual/contextual variables at the three waves of data collection between 2002 and 2005. It is clear from the table that condom use at the event of first sex, school attendance, attitude to education/schooling, participation in prosocial activities, external monetary support, type of childhood neighbourhood and childhood place of residence were the relevant factors associated with condom use at the most recent sexual intercourse at the baseline in 2002, while at the second wave, school attendance and peer sexual characteristics stood out as important covariates.

At the third wave of data collection, age of the respondents, sex, population group, level of self control, self-rating of life opportunity, degree of happiness, condom use at the event of first sexual intercourse, belief in condoms as a way of preventing HIV/AIDS, expectation of living long, religious affiliation, type of family structure, school attendance, attitude to education/schooling, predominant population group at the place of residence, participation in prosocial activities, external monetary support and type of child neighbourhood were the significant factors associated with condom use consistency at the most-recent sexual intercourse.

Table 23: Bivariate association between consistency of condom use at the most-recent sexual intercourse and selected individual compositional and socio-structural characteristics of South African adolescents and young adults living in Cape Town (CAPS 2002 and 2005)

Variables	**Condom use at the most-recent sexual intercourse**								
	Wave 1 (2002)			Wave 2 (2003/2004)			Wave 3 (2005)		
	No [%(n)]	Yes [%(n)]	p-value	No [%(n)]	Yes [%(n)]	p-value	No [%(n)]	Yes [%(n)]	p-value
Independent variables									
Age			0.367			0.855			0.000
Less than 18 years	20.99 (51)	23.93 (128)		16.67 (16)	17.48 (54)		4.60 (49)	9.61 (89)	
18 years and above	79.01 (192)	76.07 (408)		83.33 (80)	82.52 (255)		95.40 (1,016)	90.39 (837)	
Sex			0.103			0.822			0.000
Male	49.79 (121)	56.07 (300)		50.00 (2)	43.75 (7)		36.73 (415)	55.57 (554)	
Female	50.21 (122)	43.93 (235)		50.00 (2)	56.25 (9)		63.27 (715)	44.43 (443)	
Race/ population group			0.208			0.643			0.000
Black/African	65.43 (159)	64.30 (344)		100.00 (4)	81.25 (13)		51.06 (576)	58.88 (587)	
Coloured	31.28 (76)	29.35 (157)		0.00 (0)	6.25 (1)		44.59 (503)	33.20 (331)	
White	3.29 (8)	6.36 (34)		0.00 (0)	12.50 (2)		4.34 (49)	7.82 (78)	
Indian/Asian	-	-					0.00 (0)	0.10 (1)	
Educational level			0.838			0.354			0.776
No formal education	-	-		-	-		-	-	
Primary	13.58 (33)	12.17 (65)		0.00 (0)	2.67 (5)		-	-	
Secondary	81.48 (198)	82.40 (440)		81.25 (39)	73.26 (137)		66.67 (150)	65.54 (251)	
Tertiary	4.94 (12)	5.43 (29)		18.75 (9)	24.06 (45)		33.33 (75)	34.46 (132)	
Pubertal development (years)			0.541			0.329			0.595
7	0.44 (1)	0.00 (0)		-	-		0.00 (0)	0.11 (1)	
8	0.44 (1)	0.00 (0)		-	-		0.09 (1)	0.11 (1)	
9	0.00 (0)	0.40 (2)		-	-		0.47 (5)	0.43 (4)	
10	2.22 (5)	1.62 (8)		4.40 (4)	2.82 (8)		1.80 (19)	2.14 (20)	
11	4.44	4.05		3.30	4.58		5.20	4.07	

	(10)	(20)		(3)	(13)		(55)	(38)	
12	13.33 (30)	14.78 (73)		17.58 (16)	11.62 (33)		14.57 (154)	14.45 (135)	
13	26.22 (59)	22.06 (109)		18.68 (17)	18.66 (53)		22.89 (242)	26.23 (245)	
14	22.22 (50)	27.33 (135)		27.47 (25)	25.00 (71)		25.92 (274)	25.16 (235)	
15	17.33 (39)	17.41 (86)		13.19 (12)	22.89 (65)		16.56 (175)	16.38 (153)	
16	8.44 (19)	7.49 (37)		9.89 (9)	9.15 (26)		7.19 (76)	7.60 (71)	
17	3.56 (8)	3.04 (15)		4.40 (4)	3.17 (9)		3.50 (37)	2.25 (21)	
18	0.89 (2)	1.62 (8)		0.00 (0)	1.76 (5)		1.51 (16)	0.75 (7)	
19	0.00 (0)	0.20 (1)		1.10 (1)	0.00 (0)		0.19 (2)	0.11 (1)	
20	0.44 (1)	0.00 (0)		0.00 (0)	0.35 (1)		0.09 (1)	0.21 (2)	
Current work status			0.475			0.888			0.128
Yes	61.11 (55)	56.65 (115)		25.00 (1)	28.57 (4)		44.24 (499)	40.96 (408)	
No	38.89 (35)	43.35 (88)		75.00 (3)	71.43 (10)		55.76 (629)	59.04 (588)	
Self-efficacy									
Level of self-control			0.111			0.549			0.004
Totally in control	42.39 (103)	54.97 (245)		42.71 (41)	48.87 (151)		38.18 (431)	44.68 (445)	
Control most things	43.21 (105)	44.65 (238)		41.67 (40)	38.19 (118)		47.56 (537)	44.28 (441)	
Little or no control	14.40 (35)	9.38 (50)		15.63 (15)	12.94 (40)		14.26 (161)	11.04 (110)	
Self-rating of opportunity in life			0.615			0.150			0.001
Good life prospect	69.96 (170)	73.36 (391)		62.50 (60)	71.84 (222)		67.14 (758)	74.40 (741)	
Limited life prospect	23.87 (58)	21.01 (112)		30.21 (29)	20.71 (64)		27.64 (312)	20.58 (205)	
Uncertain about life	6.17 (15)	5.63 (30)		7.29 (7)	7.44 (23)		5.23 (59)	5.02 (50)	
How happy about life?			0.320			0.634			0.000
Very happy	74.07 (180)	76.55 (408)		78.13 (75)	76.38 (236)		74.22 (838)	81.83 (815)	
Happy a little	16.05 (39)	16.70 (89)		16.67 (16)	15.53 (48)		18.07 (204)	12.95 (129)	
Not happy	9.88 (24)	6.75 (36)		5.21 (5)	8.09 (25)		7.71 (87)	5.22 (52)	
Condom use at first sexual intercourse			0.000			0.109			0.000
No	13.17	5.42		11.46	6.47		67.17	36.31	

	(32)	(29)		(11)	(20)		(759)	(362)	
Yes	86.83 (211)	94.58 (506)		88.54 (85)	93.53 (289)		32.83 (371)	63.69 (635)	
Outcome expectations									
HIV-risk assessment			0.304			0.175			0.574
Low risk	91.52 (205)	93.62 (484)		84.09 (74)	89.44 (254)		90.78 (916)	91.51 (841)	
High risk	8.48 (19)	6.38 (33)		15.91 (14)	10.56 (30)		9.22 (93)	8.49 (78)	
Belief about preventability of HIV/AIDS			0.361			0.986			0.546
Yes	97.53 (237)	96.26 (515)		95.83 (92)	95.79 (296)		95.65 (1,078)	96.17 (955)	
No	2.47 (6)	3.74 (20)		4.17 (4)	4.21 (13)		4.35 (49)	3.83 (38)	
Belief in condom as a way of protecting against HIV/AIDS			0.189			0.774			0.001
No	2.94 (7)	5.05 (26)		6.52 (6)	7.41 (22)		13.54 (146)	8.90 (85)	
Yes	97.06 (231)	94.95 (489)		93.48 (86)	92.59 (275)		86.46 (932)	91.10 (870)	
Goals									
Expectation of success in matric at first attempt			0.284			0.268			0.203
High educational aspiration	65.95 (122)	70.40 (264)		66.67 (48)	73.39 (171)		68.31 (97)	74.37 (117)	
Low educational aspiration	34.05 (63)	29.60 (111)		33.33 (24)	26.61 (62)		31.69 (45)	25.63 (61)	
Expectation to live long (up to 80 years)			0.859		0.355				0.003
Yes	48.79 (119)	49.91 (266)		42.71 (41)	48.22 (149)		44.38 (501)	51.81 (516)	
No	7.41 (18)	8.26 (44)		6.25 (6)	8.74 (27)		8.06 (91)	7.43 (74)	
Unsure	43.62 (106)	41.84 (223)		51.04 (49)	43.04 (133)		47.56 (537)	40.76 (406)	
Socio-structural variables									
Religious affiliation			0.135			0.661			0.021
None	18.93 (46)	16.26 (86)		14.74 (14)	15.36 (47)		14.37 (161)	13.35 (132)	
Christianity	49.79 (121)	56.52 (299)		47.37 (45)	50.98 (156)		52.77 (591)	57.13 (565)	
Islam	3.70 (9)	5.48 (29)		5.26 (5)	7.19 (22)		8.39 (94)	5.26 (52)	
Other	27.57 (67)	21.74 (115)		32.63 (31)	26.47 (81)		24.46 (274)	24.27 (240)	
Alcohol/drug use			0.318			0.228			0.227
Non-users	51.85	55.70		56.25	63.11		44.07	46.69	

	(126)	(298)		(54)	(195)		(498)	(465)	
Users	48.15 (117)	44.30 (237)		43.75 (42)	36.89 (114)		55.93 (632)	53.31 (531)	
Family structure			0.515			0.432			0.002
No-parent family	27.98 (68)	24.11 (129)		30.21 (29)	24.92 (77)		27.85 (298)	21.04 (202)	
Single-parent family	39.09 (95)	41.31 (221)		36.46 (35)	43.37 (134)		41.40 (443)	45.21 (434)	
Both-parents family	32.92 (80)	34.58 (185)		33.33 (32)	31.72 (98)		30.75 (329)	33.75 (324)	
School environment			0.662			0.241			0.181
Non-problematic	24.69 (60)	26.17 (140)		26.04 (25)	20.39 (63)		25.04 (283)	22.57 (225)	
Problematic	75.31 (183)	73.83 (395)		73.96 (71)	79.61 (246)		74.96 (847)	77.43 (772)	
School attendance			0.064			0.012			0.000
Yes	48.56 (118)	55.70 (298)		36.96 (34)	51.82 (157)		18.62 (210)	37.02 (368)	
No	51.44 (125)	44.30 (237)		63.04 (58)	48.18 (146)		81.38 (918)	62.98 (626)	
Attitude to education/school			0.094			0.229			0.027
Negative school attitude	19.34 (47)	14.58 (78)		21.88 (21)	16.50 (51)		17.55 (198)	14.04 (140)	
Positive school attitude	80.66 (196)	85.42 (457)		78.13 (75)	83.50 (258)		82.45 (930)	85.96 (857)	
Neighbourhood racial concentration			0.202			0.586			0.000
African	66.67 (162)	63.93 (342)		64.58 (62)	69.58 (215)		51.77 (585)	58.07 (579)	
Coloured	28.81 (70)	28.04 (150)		30.21 (29)	26.86 (83)		42.48 (480)	31.59 (315)	
White	4.53 (11)	8.04 (43)		5.21 (5)	3.56 (11)		5.75 (65)	10.33 (103)	
Participation in prosocial activities			0.018			0.833			0.000
Non-participants	53.09 (129)	43.93 (235)		41.67 (40)	40.45 (125)		51.06 (577)	38.82 (387)	
Participants	46.91 (114)	56.07 (300)		58.33 (56)	59.55 (184)		48.94 (553)	61.18 (610)	
External monetary support			0.016			0.880			0.000
No monetary support	30.51 (72)	22.35 (118)		25.00 (1)	21.43 (3)		40.24 (429)	29.52 (281)	
Monetary support	69.49 (164)	77.65 (410)		75.00 (3)	78.57 (11)		59.76 (637)	70.48 (671)	
Neighbourhood SES			0.862			0.701			0.665
Affluent	20.58 (50)	21.12 (113)		11.46 (11)	12.94 (40)		24.78 (280)	23.97 (239)	
Poor	79.42 (193)	78.88 (422)		88.54 (85)	87.06 (269)		75.22 (850)	76.03 (758)	

Childhood neighbourhood type			0.079			0.772			0.088
Non-problematic	69.14 (168)	75.14 (402)		78.13 (75)	76.70 (237)		71.33 (806)	74.62 (744)	
Problematic	30.86 (75)	24.86 (133)		21.88 (21)	23.30 (72)		28.67 (324)	25.38 (253)	
Childhood place of residence			0.069			0.963			0.156
Urban	68.33 (164)	74.62 (397)		71.58 (68)	71.34 (219)		75.78 (848)	78.38 (776)	
Rural	31.67 (76)	25.38 (135)		28.42 (27)	28.66 (88)		24.22 (271)	21.62 (214)	
Peers sexually active?			0.921			0.091			0.580
None of them	2.06 (5)	2.44 (13)		2.08 (2)	1.94 (6)		2.21 (25)	2.31 (23)	
A few/some of them	27.57 (67)	27.95 (149)		35.42 (34)	24.27 (75)		30.00 (339)	32.03 (319)	
Most or all of them	65.02 (158)	63.23 (337)		59.38 (57)	65.70 (203)		59.56 (673)	58.73 (585)	
Unsure	5.35 (13)	6.38 (34)		3.13 (3)	8.09 (25)		8.23 (93)	6.93 (69)	

Significant at *p<0.1; **p<0.05; ***p<0.01

7.5.2 Multivariate multi-level logistic regression results

In Tables 24, the results of the multi-level logistic regression models for consistency of condom use at the event of most-recent sexual intercourse in the study area between 2002 and 2005 are presented. They show that the variation in the log odds of consistently using a condom at the event of most-recent sexual intercourse across the communities (clusters) at the baseline in 2002 is small at 0.020. According to the intra-cluster correlation coefficient implied by the estimated intercept component variance (VPC), 0.6% of the variance in consistent use of condom at the event of most-recent sexual intercourse could be attributed to community/cluster-level variables. The variation fluctuates after controlling for individual and contextual variable and for all the variables combined, with the highest being 0.7%.

As judged by the proportional change in variance (PCV) at the baseline, -10% of the variance in log odds of consistently using condom at the event of most-recent sexual

intercourse variance across the community clusters is explained by individual compositional factors (Model 2, Wave 1, Table 24). At the third wave, 64% and 36% of the variance in log odds of condom use consistency at the event of most-recent sexual intercourse variance across the community clusters is explained by individual compositional factors and contextual factors respectively. This shows the importance of both individual and contextual factors independently. The Median odds ratio (MOR) of more than 1.00 in all the models except at the second wave shows that in the median case, there are slight differences between areas/clusters in the probability of condom use consistency at the event of most-recent sexual intercourse when randomly picking out two persons in different areas, meaning that, if a person moved to another area (cluster) with a higher probability of having used a condom consistently at the event of most-recent sexual intercourse, their risk (likelihood) of having used a condom consistently at the most-recent sexual intercourse would have (in median) increased for example by 1.15 (MOR=1.15 in Model 2, Wave 1, Table 24).

Examining the predictors of condom use consistency at the event of most-recent sexual intercourse at the baseline in Model 4, Wave 1, self-efficacy of using condom at the first sexual intercourse, positive school attitude and participation in prosocial activities increased the odds of condom use consistency at the event of most-recent sexual intercourse, while childhood place of residence being rural marginally reduces the odds. However, condom use at first sexual intercourse was more important for males (Model 3, Wave 1, and Table 24a-Male), while positive school attitude and monetary support was relevant for females (Model 3, Wave 1, Table 24a-Female).

At the second wave of data collection in 2003/2004, those out of school were significantly less likely to have used a condom at the most-recent sexual intercourse (OR: 0.90; $p<0.05$). At the third wave of data collection in 2005, older adolescents ($p<0.1$), females, Coloureds ($p<0.1$), those happy a little, those not happy at all, those who were not sure about their chance of surviving for a long time ($p<0.1$) and those out of school were significantly less likely to have used a condom at the most-recent sexual intercourse. On the hand, those who used a condom at their first sexual intercourse, those who believed in condoms as a way of protecting against HIV/AIDS, Christians and those with external monetary support were significantly more likely to have used a condom at their last sexual intercourse in 2005. When controlling for the sex of the respondents, condom use at the event of first sexual intercourse was relevant for males in 2002 and both sexes in 2005. Also, older females, those female who were happy a little ($p<0.01$) and those females who were out of school were significantly less likely to have used a condom at their most-recent sexual intercourse at the third wave ($p<0.10$), while White males, males in control of most things in their lives, males not happy about their lot in life and males that were out of school were significantly less likely to have used a condom at the event of most-recent sexual activity in 2005.

Belief in condoms as a way of protecting against HIV/AIDS, being a Christian and living in a single-parent family structure as opposed to with no-parents at all was protective against not using a condom among males while having monetary support was protective for females adolescents, both at the baseline and in 2005 (Model 3, Waves 1 and 3, Table 24a).

Table 24: Individual compositional and community contextual factors associated with condom use at the most-recent sexual intercourse among South African adolescents and young adults living in Cape Town (CAPS 2002 and 2005)

Variables	Condom use consistency at the most-recent sexual intercourse											
	Wave 1 (2002)				Wave 2 (2003/04)				Wave 3 (2005)			
	Empty model	Individual variables	Contextual variables	Individ. & contextual variables	Empty model	Individual variables	Contextual variables	Individ. & contextual variables	Empty model	Individual variables	Contextual variables	Individ. & contextual variables
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Independent variables												
Age of the respondents												
Less than 18 years										1.00		1.00
18 years and above										0.87*** (0.80-0.94)		0.92* (0.85-1.01)
Sex of the respondents												
Male										1.00		1.00
Female										0.84*** (0.81-0.86)		0.84*** (0.80-0.87)
Race/population group												
Black/African										1.00		1.00
Coloured										0.87*** (0.83-0.91)		0.84* (0.70-1.01)
White										1.02 (0.93-1.11)		0.86 (0.69-1.06)
Indian/Asian										1.46 (0.60-3.57)		1.30 (0.52-3.21)
Self-efficacy												
Level of self-control												
Totally in control										1.00		1.00
Control most things										0.96* (0.92-1.00)		0.97 (0.92-1.01)
Little or no control										1.01 (0.94-1.08)		1.01 (0.94-1.09)
Self-rating of opportunity in life												
Good life prospect										1.00		1.00
Limited life prospect										0.97 (0.93-1.02)		0.99 (0.94-1.04)
Uncertain about life										1.03 (0.93-1.13)		1.04 (0.94-1.16)
How happy about life?												
Very happy										1.00		1.00
Happy a little										0.92*** (0.86-0.97)		0.91*** (0.86-0.97)
Not happy										0.88*** (0.80-0.96)		0.88*** (0.81-0.97)
Condom use at first sexual intercourse												
No		1.00		1.00						1.00		1.00
Yes		1.27***		1.23***						1.34***		1.31***

		(1.13-1.43)		(1.09-1.39)						(1.28-1.40)		(1.26-1.34)
Outcome expectations												
Belief in condom as a way of protecting against HIV/AIDS												
No										1.00		1.00
Yes										1.09** (1.02-1.16)		1.09** (1.02-1.17)
Goal												
Expectation to live long (up to 80 years)												
Yes										1.00		1.00
No										0.99 (0.91-1.07)		0.98 (0.90-1.06)
Unsure										0.96 (0.92-1.01)		0.96* (0.91-1.00)
Socio-structural variables												
Religious affiliation												
None											1.00	1.00
Christianity											1.05 (0.98-1.13)	1.09** (1.02-1.17)
Islam											1.00 (0.90-1.12)	1.04 (0.93-1.15)
Other											1.01 (0.93-1.08)	1.06 (0.98-1.14)
Family structure												
No-parent family											1.00	1.00
Single-parent family											1.07** (1.01-1.13)	1.03 (0.97-1.09)
Both-parents family											1.06* (1.00-1.13)	1.02 (0.96-1.08)
School attendance												
Yes			1.00	1.00			1.00				1.00	1.00
No			0.97 (0.90-1.04)	0.97 (0.91-1.04)			0.90** (0.83-0.97)				0.84*** (0.79-0.88)	0.90*** (0.85-0.95)
Attitude to education/school												
Negative school attitude			1.00	1.00							1.00	1.00
Positive school attitude			1.07 (0.98-1.18)	1.08* (0.99-1.18)							1.02 (0.96-1.08)	1.04 (0.98-1.10)
Neighbourhood racial concentration												
African											1.00	1.00
Coloured											0.94* (0.89-1.00)	1.05 (0.87-1.27)
White											1.07 (0.98-1.17)	1.15 (0.94-1.40)
Participation in prosocial activities												
Non-participants			1.00	1.00							1.00	1.00
Participants			1.06* (0.99-1.14)	1.06* (0.99-1.14)							1.07*** (1.02-1.12)	1.01 (0.97-1.06)
External monetary support												
No monetary support			1.00	1.00							1.00	1.00

Monetary support			1.05 (0.97-1.14)	1.04 (0.96-1.13)							1.05* (1.00-1.10)	1.05** (1.00-1.10)
Childhood neighbourhood type												
Non-problematic			1.00	1.00							1.00	1.00
Problematic			0.95 (0.89-1.03)	0.97 (0.90-1.04)							0.98 (0.94-1.03)	1.00 (0.95-1.05)
Childhood place of residence												
Urban			1.00	1.00								
Rural			0.92 (0.85-0.99)	0.93* (0.86-1.00)								
Peers sexually active?												
None of them							1.00					
A few/some of them							0.93 (0.69-1.26)					
Most or all of them							1.02 (0.76-1.37)					
Unsure							1.15 (0.83-1.60)					
Constant	1.98*** (1.91-2.06)	1.58*** (1.41-1.78)	1.84*** (1.62-2.09)	1.51*** (1.27-1.79)	2.14*** (2.06-2.24)	-	2.27*** (1.69-3.04)	-	1.60*** (1.56-1.64)	1.82*** (1.63-2.03)	1.58*** (1.42-1.76)	1.59*** (1.37-1.84)
Measures of variation or clustering												
Random effects												
Area/Community-level Variance (SE)	0.020 (0.008)	0.022 (0.008)	0.020 (0.008)	0.022 (0.008)	8.059e-10 (4.299e-06)	-	8.501e-11 (1.229e-06)	-	0.011 (0.004)	0.004 (0.003)	0.007 (0.003)	0.004 (0.003)
PCV (Explained variation) (%)	Reference	-10.0	0.0	0.0	Reference	-	0.0	-	Reference	63.6	36.4	0.0
MOR	1.14	1.15	1.14	1.15	1.00	-	1.00	-	1.10	1.06	1.08	1.06
ICC/VPC (%)	0.6	0.7	0.6	0.7	0.0	-	0.0	-	0.3	0.1	0.2	0.1
Model fit statistics						-		-				
AIC	1006.21	992.21	970.10	960.94	462.76	-	441.98	-	3070.83	2452.24	2781.40	2436.30
BIC	1020.18	1010.84	1011.78	1007.26	474.77	-	469.83	-	3087.82	2552.20	2865.37	2271.62
Sample size												
Community-level	241	241	239	239	92	-	92	-	319	317	316	314
Individual-level	778	778	759	759	405	-	395	-	2127	1907	1994	1789

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations- OR- Odds ratio, CI- Confidence interval, ICC- Intra-cluster Correlation Coefficient, VPC- Variance Partition Coefficient, PCV- Proportional Change in Variance, AIC-Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard Error, MOR- Median Odds Ratio. N.B: For Wave 2, only two contextual variables were found to be significant with the outcome at the bivariate level. N.B: The base area variance for Model 4 is area variance for Model 2.

Table 24a: Individual compositional and community contextual factors associated with condom use consistency at the most-recent sexual intercourse among South African adolescents and young adults living in Cape Town, males and females separately (CAPS 2002 and 2005)

Variables	**Consistency of condom use at the most-recent sexual intercourse**																	
	Wave 1 (2002)						Wave 2 (2003/04)						Wave 3 (2005)					
	Male			Female			Male			Female			Male			Female		
	Empty model	**Individual variables**	**Individ. & Contextual variables**	**Empty model**	**Individual variables**	**Individ. & Contextual variables**	**Empty model**	**Individual variables**	**Individ. & Contextual variables**	**Empty model**	**Individual variables**	**Individ. & Contextual variables**	**Empty model**	**Individual variables**	**Individ. & Contextual variables**	**Empty model**	**Individual variables**	**Individ. & Contextual variables**
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Independent Variables																		
Age																		
Less than 18 years														1.00	1.00		1.00	1.00
18 years and above														0.56** (0.32-0.99)	0.73 (0.39-1.39)		0.85*** (0.76-0.95)	0.90* (0.80-1.02)
Race/population Group																		
Black/African														1.00	1.00		1.00	1.00
Coloured														0.74* (0.54-1.03)	0.45 (0.10-2.02)		0.81*** (0.76-0.86)	0.83 (0.66-1.05)
White														0.67 (0.35-1.26)	0.15** (0.02-0.87)		1.09 (0.98-1.22)	1.00 (0.76-1.31)
Indian/Asian														_	-		1.46 (0.61-3.47)	1.42 (0.58-3.45)
Self-Efficacy																		
Level of self-control																		

Totally in control														1.00	1.00		1.00	1.00
Control most things														0.73** (0.53-0.99)	0.74* (0.53-1.03)		0.98 (0.92-1.04)	0.98 (0.92-1.04)
Little or no control														0.96 (0.58-1.59)	1.03 (0.59-1.78)		1.03 (0.94-1.12)	1.02 (0.93-1.12)
Self-rating of opportunity in life																		
Good life prospect														1.00	1.00		1.00	1.00
Limited life prospect														0.88 (0.61-1.26)	0.93 (0.64-1.37)		0.98 (0.92-1.04)	0.99 (0.93-1.06)
Uncertain about life														0.83 (0.44-1.59)	0.85 (0.43-1.69)		1.08 (0.95-1.24)	1.12 (0.98-1.30)
How happy about life?																		
Very happy														1.00	1.00		1.00	1.00
Happy a little														0.80 (0.53-1.20)	0.76 (0.49-1.18)		0.89*** (0.83-0.97)	0.89*** (0.82-0.97)
Not happy														0.54** (0.30-0.98)	0.50** (0.26-0.95)		0.88** (0.79-0.99)	0.90 (0.80-1.02)
Condom use at first sexual intercourse																		
No		1.00	1.00		1.00	1.00								1.00	1.00		1.00	1.00
Yes		1.36*** (1.13-1.63)	1.32*** (1.10-1.60)		1.20** (1.03-1.41)	1.11 (0.94-1.30)								3.49*** (2.57-4.73)	3.31*** (2.39-4.59)		1.33*** (1.26-1.41)	1.31*** (1.24-1.39)
Outcome Expectations																		
Belief in condom as a way of protecting																		

against HIV/AIDS																		
No														1.00	1.00		1.00	1.00
Yes														1.80** (1.10-2.94)	2.05*** (1.22-3.43)		1.05 (0.97-1.13)	1.04 (0.96-1.13)
Goals																		
Expectation concerning success in matric first attempt																		
High educational aspiration																		
Low educational aspiration																		
Expectation to live long (up to 80 years)																		
Yes														1.00	1.00		1.00	1.00
No														0.92 (0.52-1.61)	0.82 (0.45-1.49)		1.00 (0.91-1.11)	0.99 (0.89-1.10)
Unsure														0.85 (0.63-1.15)	0.78 (0.56-1.07)		0.97 (0.91-1.02)	0.96 (0.91-1.02)
Socio-structural/Contextual variables																		
Religious affiliation																		
None															1.00			1.00
Christianity															1.63** (1.05-2.54)			1.05 (0.95-1.16)
Islam															0.96 (0.47-1.96)			1.06 (0.91-1.23)
Other															1.23 (0.74-			1.02 (0.93-1.15)

															2.03)			
Alcohol/drug use																		
Non-users																		
Users																		
Family structure																		
No-parent family															1.00			1.00
Single-parent family															1.53* (1.00-2.35)			0.99 (0.92-1.06)
Both-parents family															1.22 (0.78-1.92)			1.00 (0.93-1.08)
School attendance																		
Yes			1.00			1.00									1.00			1.00
No			1.00 (0.91-1.10)			0.93 (0.84-1.04)									0.67** (0.45-1.00)			0.88*** (0.82-0.95)
Attitude to education/school																		
Negative school attitude			1.00			1.00									1.00			1.00
Positive school attitude			1.05 (0.94-1.17)			1.19** (1.02-1.39)									1.39 (0.94-2.07)			1.03 (0.95-1.12)
Circumstance of first sex (forced?)																		
Yes																		
No																		
Neighbourhood racial concentration																		
African															1.00			1.00
Coloured															1.08 (0.41-7.95)			0.98 (0.78-1.24)
White															3.98			1.04 (0.80-

														(0.74-21.49)			1.35)
Participation in prosocial activities																	
Non-participants			1.00			1.00								1.00			1.00
Participants			1.06 (0.96-1.16)			1.08 (0.98-1.20)								1.10 (0.81-1.51)			1.01 (0.95-1.07)
External monetary support																	
No monetary support			1.00			1.00								1.00			1.00
Monetary support			0.99 (0.89-1.11)			1.12* (1.00-1.27)								1.12 (0.79-1.57)			1.09** (1.02-1.06)
Neighbourhood SES																	
Affluent																	
Poor																	
Childhood neighbourhood type																	
Non-problematic			1.00			1.00								1.00			1.00
Problematic			1.00 (0.91-1.10)			0.91 (0.81-1.02)								0.95 (0.67-1.33)			1.02 (0.96-1.08)
Childhood place of residence																	
Urban			1.00			1.00											
Rural			0.94 (0.84-1.04)			0.93 (0.83-1.04)											
Constant	2.04*** (1.95-2.14)	1.53*** (1.28-1.84)	1.51*** (1.17-1.93)	1.91*** (1.81-2.02)	1.62*** (1.39-1.88)	1.43*** (1.11-1.34)	2.18*** (1.66-2.86)	-	-	2.27*** (1.80-2.85)	-	-	1.77*** (1.72-1.83)	1.19 (0.56-2.56)	0.44 (0.15-1.26)	1.46*** (1.41-1.51)	1.63*** (1.42-1.87)	1.50*** (1.23-1.84)
Measures of																	

Variation or Clustering																		
Random effects																		
Area/Community-level Variance (SE)	0.017 (0.011)	0.021 (0.011)	0.021 (0.011)	0.016 (0.014)	0.019 (0.015)	0.013 (0.013)	4.674e-14 (1.064e-07)	-	-	1.463e-10 (7.481e-06)	-	-	0.005 (0.006)	1.82e-12 (8.64e-07)	4.53e-25 (4.34e-13)	0.015 (0.006)	7.474e-12 (3.835e-07)	4.260e-11 (1.105e-06)
PCV (Explained variation) (%)	Reference	-23.5	0.0	Reference	-18.8	31.6	Reference	-	-	Reference	-	-	Reference	100.0	0.0	Reference	100.0	0.0
MOR	1.13	1.15	1.15	1.13	1.14	1.11	1.00	-	-	1.00	-	-	1.07	1.00	1.00	1.12	1.00	1.00
ICC/VPC (%)	0.5	0.6	0.6	0.5	0.6	0.4	0.0	-	-	0.0	-	-	0.2	0.0	0.0	0.5	0.0	0.0
Model fit Statistics								-	-		-	-						
AIC	529.97	521.80	515.73	484.82	481.53	458.24	15.74	-	-	16.26	-	-	1391.79	1124.50	1042.16	1610.69	1277.07	1195.82
BIC	542.10	537.97	555.96	496.46	497.04	496.70	16.33	-	-	17.45	-	-	1406.42	1196.01	1168.98	1625.85	1361.14	1337.53
Sample size																		
Community-level	190	190	187	171	171	168	6	-	-	9	-	-	267	262	257	285	281	278
Individual-level	421	421	413	357	357	346	9	-	-	11	-	-	969	869	810	1158	1038	979

Significant at *p<0.1; **p<0.05; ***p<0.01

Abbreviations- OR- Odds ratio, CI- Confidence interval, ICC- Intra-cluster Correlation Coefficient, VPC- Variance Partition Coefficient, PCV- Proportional Change in Variance, AIC-Akaike Information Criterion, BIC- Bayesian Information Criterion, SE- Standard Error, MOR- Median Odds Ratio. Wave 2 models suffered from small sample size problem.

7.6 Conclusion

Generally, observing the multivariate multi-level logistic regression tables above, the lower Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) revealed that the individual and contextual (socio-structural) factors increased the ability of the multivariate multi-level model to explain variation in the log odds of various outcome variables relating to the sexual and contraceptive behaviours of the sample,: practice of multiple sexual partnerships (current), contraceptive use at first sexual intercourse, contraceptive use at the most-recent sexual intercourse and consistent use of condom with the most-recent sexual partner in the study area between 2002 and 2005.

Specifically, at the third wave of data collection contextual factors were more associated the practice of multiple sexual partnerships (current) than at the baseline in 2002. At the baseline wave, individual factors of sex, population group and self-rating of opportunities in life, which is a measure of self-efficacy, significantly predict the practice of multiple sexual partnerships within the previous twelve months. With the inclusion of all the variables, being a female expectedly reduces the odds of practising multiple sexual partnerships, while having a feeling of limited and uncertain life opportunities, using alcohol or drugs and starting sexual relationships early in life significantly predict the practice of multiple sexual partnerships in the study area in 2002.

In 2005, at the third wave of data collection, being a female, Coloured, having low educational aspirations and participating in prosocial activities reduces the odds of practising multiple sexual partnerships, while having a feeling of unhappiness about life and using alcohol/drugs increases the risk of practising multiple sexual partnerships.

Hypothesis (1b.), that adolescents and young adults with negative aspirations and attitudes toward education are more likely to have multiple sexual partners in the last twelve months than their counterparts with positive educational aspirations, was confirmed independent of individual-level factors (Model 1, Wave 1 and Table 18). Hypothesis 2, that the community's racial composition (concentration of population group) is expected to influence adolescents' and young adults' sexual and contraceptive behaviours, is confirmed for current multiple sexual partnerships (Model 3, Wave 1 and Table 18). Hypothesis (3b.), that adolescents and young adults participating in prosocial activities will be less likely to have multiple sexual partnerships last twelve months than their counterparts, was not confirmed; the opposite was the case (Model 3, Waves 1 and 3, Table 18). Hypothesis (4b.), that adolescents and young adults with external monetary social support are more likely to have multiple sexual partners in the past twelve months than their counterparts with non-monetary social capital, was not confirmed.

Hypothesis (1c.), that adolescents and young adults with negative aspirations and attitudes toward education are less likely to use contraceptives at first sexual intercourse than their counterparts with positive educational aspirations, is confirmed independent of individual-level factors as shown in Model 3, Wave 3 and Table 20. Hypothesis 2, that a community's racial composition (concentration of population group) is expected to influence adolescents' and young adults' sexual and contraceptive behaviours, is confirmed for use of contraceptives at the first sexual intercourse, as evident in Model 3, Waves 1 and 3, Table 20. Hypothesis (3c.), that adolescents and young adults participating in prosocial activities will more likely use contraceptive at the event of their sexual debut than their counterparts, is confirmed as evident in Models 3 and 4, Wave 1 and Model 3, Wave 3, Table 20. Hypothesis (4c.), that adolescents and young adults with external monetary

social support are more likely to use contraceptives at first sexual intercourse than their counterparts with non-monetary social capital, was not confirmed.

Hypothesis (1d.), that adolescents and young adults with negative aspirations and attitudes toward education are less likely to have used contraceptives at the most-recent sexual intercourse than their counterparts with positive educational aspirations, is confirmed independent of individual-level factors as shown in Model 3, Wave 3 and Table 22. Hypothesis 2, that a community's racial composition (concentration of population group) is expected to influence adolescents and young adults' sexual and contraceptive behaviours, is confirmed for use of contraceptive's at the most-recent sexual intercourse as evident in (Models 3 and 4, Wave 1; Model 3, Wave 2; Model 3, Wave 3 and Table 22). Hypothesis (3d.), that adolescents and young adults participating in prosocial activities will more likely have use contraceptives at the event of their most-recent sexual intercourse than their counterparts, is confirmed as evident in Model 3, Waves 2 and 3 and Table 22. Hypothesis (4d.), that adolescents and young adults with external monetary social support are more likely to use contraceptive at the most-recent sexual intercourse than their counterparts with non-monetary social capital, is not confirmed.

Hypothesis (1e.), that adolescents and young adults with negative aspirations and attitudes toward education are less likely to consistently use condoms with their last sexual partner than their counterparts with positive educational aspirations, was confirmed as evident in Model 4, Wave 1 and Table 24. Hypothesis 2, that a community's racial composition (concentration of population group) is expected to influence adolescents' and young adults' sexual and contraceptive behaviours, is confirmed for consistency of condom use with the last sexual partner as evident in Model 3, Wave 3 in Table 24. Hypothesis (3e.),

that adolescents and young adults' participating in prosocial activities are more likely to use condoms consistently with their most-recent sexual partners than their counterparts, was confirmed by evidence from Models 3 and 4, Wave 1 and Model 3 in Wave 3 and Table 24. Hypothesis (4e.), that adolescents and young adults with external monetary social support are more likely to consistently use condoms with last sexual partners than their counterparts without non-monetary social capital was confirmed as evident in Models 3 and 4, Wave 3 in Table 24.

This study found that various individual-level and neighbourhood contextual factors were independently associated with the outcome variables of interest and that intervention programmes and policies must target those identified variables for there to be a reduction in the adoption of risky sexual behaviour in the study area, and in South Africa at large.

CHAPTER 8: GENERAL DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

This chapter summarises the overall findings for this study, discusses the significant findings relating to the dynamics (changes taking place between 2002 and 2005) and contexts (circumstances or forces shaping behaviours) of sexual and contraceptive behaviours using the first three waves of the Cape Area Panel Study data collected in the Cape Area of South Africa between 2002 and 2005. Conclusions are drawn based on the results of the analyses and appropriate recommendations made for addressing adolescents' and young people's sexuality in the study area. Reiterating the focus of this study, the outcome variables of interest are age at first sexual intercourse as a measure of timing of first sexual intercourse, multiple sexual partnerships (current), contraceptive use at the first sexual intercourse and at the most-recent sexual intercourse, and consistency of condom use with the last sexual partner. The data were analysed using Stata/SE version 12 and Microsoft Excel 2003 analytical packages and various statistical methods such as simple descriptive statistics, chi-square test of association, correlation analysis, stepwise regression, multi-level logistic regression and Cox proportional hazard regression models with its estimators such as the Kaplan-Meier estimate.

8.2 General Discussion

This sexuality and sexual-behavioural study using panel data is crucial to the achievement of the Millennium Development Goal (MDG) 6, which aims at disease reduction with particular reference to HIV/AIDS. Of particular interest is the fact that the estimated overall median age at first sexual intercourse remains 16 years during the study period (2002-2005) and it is slightly lower than the estimate found by McGrath et al. (2009) in KwaZulu-Natal, but aligned with the estimate earlier found in South Africa using a nationally-representative sample of adolescents in South Africa (Pettifor et al. 2005; Shisana et al. 2009) and also with that found using cross-sectional data from a sub-sample of South African youths (Buga et al. 1996; Eaton et al. 2003). In agreement with past studies, age at first sexual intercourse is slightly higher for females than males (16 years versus 17 years respectively) especially at the third wave of data collection (Mathews et al. 2009; Eaton et al. 2003; LoveLife 2001 cited in Pithey & Morojele 2002). This suggests that males in the study area generally start sexual intercourse about one year earlier than their female counterparts.

Also, older respondents were significantly less likely to transit early into their first sexual intercourse in 2002 (51% for males and 61% for females); an indication that there could be an age advantage in negotiating about when to have sexual intercourse; female respondents were less likely than males to transit early to first sexual intercourse. This result is in line with past studies that found males to be more risk-takers (more sexually active than females) especially in a typical patriarchal society (Buga et al. 1996; Lovelife Survey 2001 cited in Pithey & Morojele 2002; Mathews et al. 2009).

Moreover, the respondents with secondary or tertiary level education were significantly less likely to transit early to first sexual intercourse than those with only a primary level education. The relationship holds even after controlling for the sex of the respondents. This is an indication that a higher educational level has a delaying effect on the rate of transition to early sexual activity, in line with findings of earlier studies (Kaufman et al. 2002, 2004). In addition, those who were not happy at all with their lot in life were significantly more likely to transit to their first sexual intercourse earlier than their counterparts who were very happy. This makes sense in the context of experimenting with sexual activity in search of happiness and fulfilment. The relationship is true for females, while males who were even happy a little were significantly more likely to transit early into first sexual intercourse than those who were very happy. This is a measure of self-esteem and corroborates the earlier findings that low self-esteem can lead to the adoption of risky sexual behaviour (Goliath 1995; Perkel et al. 1991 cited in Eaton et al. 2003).

Living in a single-parent family structure and to a lesser extent a two-parents family structure unexpectedly had a positive effect on the rate of transition to first sexual intercourse (meaning that being from such a family structure is associated with decreased survival) in the study area. This is understood within the context of control and influence that the family as an institution has on young people in South Africa; for so many young people, parents are permissive superintendents at best. An earlier study found that presence of parents does not really affect initiation of sexual activity (Buga et al. 1996). Type of family structure significantly affects females but not males. Hence, provision of positive role models could be a viable alternative, in addition to empowering parents to be able to deal with sexuality issues among young people.

Those respondents who were out of school were found to be surprisingly less likely to have experienced first sexual intercourse. This seems to be suggesting that the school environment in South Africa is not protective against sexual experimentation, but rather that it provides an environment for young people to start socialising early, which in turn may lead to early sexual activity. This finding seems to support South African researchers who believed that schooling and education is not protective against sexual experimentation (Human Right Watch 2001; Bhana 2005; Leach & Mitchell 2006 cited in Bhana & Pattman 2009).

Finally, being a female who grew up in a rural childhood place of residence exposes one to transiting to first sexual intercourse earlier than those who grew up in an urban area. This is in line with earlier studies that associated risky sexual behaviour with rural areas in South Africa (Hlongwa et al. 2001, Lovelife 2001 cited in Pithey & Morojele 2002). Childhood place of residence, as used in this study, had been identified as a better and more consistent indicator of sexual behaviour (Gupta 2000).

Examining the profile of first sexual partners where applicable sexually activebetween 2002 and 2005, girlfriends/boyfriends (concepts that have a sexual connotation in South Africa) topped the list although a few of the respondents reported that their first sexual intercourse took place with a casual acquaintance, a casual friend, a relative or a sex worker. There is an indication that males are prone to be sexually involved with females at least one year younger than themselves, while female respondents are prone to getting sexually involved with males at least two years older than themselves; this may be connected with the perception of female youths that older males will be better able to provide for their needs than younger males or males of the same age, as echoed in an

earlier study in South Africa (Eaton et al. 2003). This is in line with what Harrison et al. (2001) found in KwaZulu-Natal. It is commendable, however, that in 2002 the majority of the respondents reported having had a sexual relationship with their first sexual partners that lasted more than one year , and at the third wave of data collection in 2005, close to half of the respondents had a first sexual relationship that was still ongoing, an indication that some of the young respondents are staying long with their first sexual partners.

Although, there is a general belief among some researchers that adolescents and young adults are reckless sexual beings, it is worthy of note that in this study among those who were virgins at the baseline (N=1,219), close to half were still virgins at the third wave of data collection in 2005 (N=854). This speaks volumes about the potential ability in South African youths to abstain from sexual intercourse, and this group is often neglected because of the overemphasis on those engaging in risky sexual activity. Understanding the profile of this group of youth as in this study can be beneficial to the design of policies and intervention programmes aimed at protecting the next generation in the study area in particular and South Africa in general (see comments on Tables 7b-7f).

In summary, it is noteworthy to say that with regard to the timing of first sexual intercourse, the socio-demographic factors of being older, being a female, being of the Coloured or White racial group, having at least secondary level education and the contextual factors of not attending school and having low educational aspiration seem to significantly associate with increased survival in the study area between 2002 and 2005. These findings seem to suggest that an important contextual factor is current school attendance, which may not be very protective against early transition to first sexual intercourse in Cape Town, contrary to what McGrath et al. (2009) found in KwaZulu-

Natal. Also, having low educational aspirations seems to create a situation where young people are unpopular and therefore are not able to win a sexual partner early. There are however gender differentials as far as transition to first sexual intercourse is concerned, hence the need to factor this into intervention programmes.

With regard to the practice of multiple sexual partnerships (current) which had been identified as a major driver of HIV transmission in South Africa (UNAIDS 2006, Shisana et al. 2009), the rate declined from 29 percent in 2002 to 16 percent in 2005, with a concomitant increase in the adoption and practice of safe sexual relations from 71 percent at the baseline to 84 percent in 2005. Also, those who used contraceptives at the first sexual intercourse increased from 53 percent in 2002 to 59 percent at the third wave in 2005, while the proportion of those who used one at the most-recent sexual intercourse increased from 71 percent at the baseline to 74 percent at the third wave in 2005. Those adolescents and young adults who consistently use a with their most-recent sexual partner decreased from a high of 69 percent at the baseline in 2002 to 47 percent at the third wave in 2005, while inconsistent users of condoms increased from 31 percent at the baseline to 53 percent in 2005.

These findings are crucial because they seem to indicate that although condom distribution campaigns have been very successful in South Africa with the particular emphasis on the Western Cape Area, intervention campaigns must target the area of condom use consistency because inconsistency in the use of condoms could defeat the whole purpose of making them accessible. There seems to have been some behavioural change among young people in the Cape Peninsula during the study period in favour of primary or

secondary abstinence and keeping faithfully to one sexual partner, although this was not captured in a national study (Shisana et al. 2009).

Using a multi-level analytic framework and based on the Social Cognitive Theory, females were significantly less likely to practise current multiple sexual partnerships (CMSPs), across the waves than males; this finding is in agreement with the findings of an earlier study of South African adolescents (Harrison et al. 2008), and Coloureds were significantly less likely to engage in CMSPs than Blacks/Africans, while the self-efficacy measure of not being happy was found to encourage sexual risk-taking by way of CMSPs in the study area, which is in accordance with past findings in South Africa (Giles et al. 2005 cited in Sayles et al. 2006; Aarø et al. 2008). However, alcohol/drug users, those who reportedly had willing first sexual intercourse, and, counter-intuitively, those participating in prosocial activities had higher odds of practising multiple sexual partnerships in the study area in 2002, while those who had their first sexual intercourse early were more likely to practise CMSPs in 2002. This finding is in line with earlier evidence in South Africa that states that early first sex can be a precursor to the practice of CMSPs (Harrison et al. 2005; Mpofu et al. 2006).

In 2005, the log odds of practising current multiple sexual partnerships significantly decreased with being a female (OR- 0.22; $p<0.001$) and having low educational aspirations (OR- 0.50; $p<0.05$) in comparison to the reference category. This underscores the need for interventions that take into consideration the sex of the respondents as males are more likely to have more than one sexual partners in the study area, and the educational environment seems not to be protective, as highlighted earlier. Also, the log odds of practising current multiple sexual partnerships increased marginally with being unhappy

about life (OR- 2.55; $p<0.1$), which again stresses the need for intervention programmes that will raise the overall welfare package of young people as this may contribute to their sexual health. Independent of all individual factors, alcohol/drug users were twice more likely to practise multiple sexual partnerships as non-users; this finding is in line with Mpofu et al. (2006) although other findings have contradicted this. Also, those participating in prosocial activities (OR- 1.55; $p<0.001$) were more likely to practise multiple sexual partnerships in 2005. This is a possible pointer to the lack of supervision and lack of goals in such activities, which appear not to be run to the best advantage of young people in South Africa.

Overall, the inclusion of the contextual variables had some serious effects on the predictive power of some of the individual-level variables and of the contextual variables themselves. As evident in Model 4 (Table 18, Wave 1), being a female reduces the odds of practicing CMSPs, while having a feeling of limited and uncertain life opportunities, using alcohol or drugs and starting sexual relationships early in life increased the risk of practicing CMSPs in the study area in 2002;, in 2005, being a female, Coloured, having low educational aspiration and participating in prosocial activities reduced the odds of practicing CMSPs, while having a feeling of unhappiness about life, and using alcohol or drugs increased the risk of practising multiple sexual partnerships as evident in Model 4 (Table 18, Wave 3). Programmes that increase the level of self-control among young people are urgently needed in the study area as they may contribute significantly to a reduction in the practice of multiple sexual partnerships.

With respect to the predictors of contraceptive use at the event of first sexual intercourse in the study area between 2002 and 2005, the log odds of using contraceptive at the first

sexual intercourse significantly decreased with being 18 years and older, not believing that HIV/AIDS is preventable and having low educational aspiration in comparison to the reference category, while the log odds of using contraceptive at the first sexual intercourse increased with being Coloured or White, having secondary level education and being uncertain about life opportunities. Those of 18 years and older may understandably not use contraceptives if their reproductive goal is at variance with using them, while those who do not believe that HIV/AIDS is preventable can also rationalise the non-use of contraceptives, and not using contraceptives may be done intentionally by those with low educational aspirations to gain in sexual relationships what they lack in educational attainment.

On the other hand, adolescents and young adults of the Coloured and White population groups are expected to be more open to the use of condoms due to their cultural background and social circumstances (Preston-Whyte 1988), while a higher educational level is expected to increase the uptake of contraception because it is a marker of more knowledge and skill with respect to its use. Uncertainty in life opportunities may raise fears that are at variance with impregnating someone, getting pregnant or producing children, with the consequent implication of having to care for others when they are still struggling to make ends meet, and that may increase the odds to use contraceptives.

With regard to contextual factors, Christians and those with other religious affiliations, those whose first sexual intercourse was done willingly, and those participating in prosocial activities were significantly more likely to use contraceptives at the first sexual intercourse than their reference categories. It is taken for granted that those whose first sexual intercourse was done willingly would have prepared for it, unlike those who were

coerced, which often lead to risky sexual outcomes, as found in past studies (Varga 1997, 2003; Wood & Jewkes 1997; Hoffman et al. 2006). Also, participation in prosocial activities is expected to impart to young people the skills needed to negotiate issues around use of contraceptives. However, in 2002 those out of school and those whose childhood place of residence was rural were significantly less likely to use contraceptives at the event of first sexual intercourse. The likely explanation may be that being out of school deprives young people of the necessary knowledge about the use of contraceptives, with the result that any knowledge about contraceptive use may be obtained from unreliable sources such as peers, while being raised in a rural setting may negatively affect the uptake of contraceptive methods as it is expected that rural youth will be more traditional in outlook. Also, access to contraceptive is expected to be low in comparison to the urban areas. Intervention programmes that will work here must be inclusive of in- and out-of school youths and must take care of possible disparity in accessibility between the urban and the rural areas.

The inclusion of the contextual variables had some strong effects on the predictive power of some of the individual-level variables and the contextual variables themselves at the baseline. As evident in Model 4 (Table 20, Wave 1), older adolescents, those who rated themselves to be at high risk of contracting HIV, those who did not believe that HIV/AIDS is preventable, alcohol/drug users and those who grew up in a rural setting were all significantly less likely to use contraceptives at the event of their first sexual intercourse in the study area in 2002. The finding with regards to risk perception and non-use of contraception is in line with other studies that have found high levels of risk perception triggering high levels of risk-taking behaviours (Akwara et al. 2003; Maharaj 2001; Najjumba et al. 2005; Prata et al. 2006 cited in Tenkorang et al. 2009), while not believing

in the preventability of HIV/AIDS may lead to rationalising that using a contraceptive is useless. Alcohol/drug use as a deviant behaviour has been found to be closely linked with risky sexual behaviour in this study, despite the inconclusive findings of past studies in South Africa.

The predictors of use of contraceptives at the event of most-recent sexual intercourse at the baseline were being females, being Coloured and having low educational aspirations, as respondents in these categories were significantly less likely than their reference group to report use of contraceptive at the most-recent sexual intercourse. A possible reason here is that the condom (in this case male condom), which is the most-popular contraceptive method in the study area, is a male method, so females may be less likely to report it than males. At all three waves a significant relationship was found between tertiary education level and having used contraceptives at first sexual intercourse, and using contraceptives at the most-recent sexual intercourse. This is an indication that the self-efficacy of using contraceptives at the event of first sexual intercourse may be beneficial to current use of contraceptives. Imparting skills to the youth on how to negotiate sexual relationships earlier, before starting sexual activity, may help to increase the adoption and use of contraception.

Independent of all individual factors, out-of-school adolescents in 2002 were less likely to report use of contraceptive at the most-recent sexual intercourse, while those who are Christian and those living in a predominantly White area were significantly more likely to report use of contraceptives at the most-recent sexual intercourse. As shown consistently in this study, religious institutions cannot be neglected in campaigns and programmes targeting young people as their religious beliefs could affect their behaviours, including

their sexual and contraceptive ideals. Also, living in predominantly White neighbourhoods is expected to be correlated with positive behaviours such as current use of contraceptives, possible because of the presence of more positive role models who have achieved in different areas of life. At the third wave of data collection in 2005, the log odds of using contraceptives at the most-recent sexual intercourse significantly decreased with lack of expectation of living long but increased significantly with the self-efficacy of using contraceptives at the event of first sexual intercourse. There is the need to give the young people reasons to live fulfilled lives, as that may impact positively on their sexual behaviour.

The results of the analysis regarding consistency of condom use at the event of most-recent sexual intercourse showed that the variation in the log odds of consistently using condom at the event of most-recent sexual intercourse across the communities (clusters) at the baseline in 2002 is small at 0.020. Regarding the predictors of consistency of using condom at the event of most-recent sexual intercourse at the baseline, self-efficacy of using condom at the first sexual intercourse, and marginally, a positive school attitude and participation in prosocial activities increased the odds of condom use consistently at the event of most-recent sexual intercourse in the study area, while childhood place of residence being rural reduces the odds of consistently using condom at the event of most-recent sexual intercourse ($p<0.1$). However, condom use at first sexual intercourse was more important for males in particular (Model 3, Wave 1, and Table 24a-Male), while positive school attitude and monetary support was relevant for the female adolescents and young adults (Model 3, Wave 1, Table 24a-Female). This is a clear indication that intervention programmes that empower young people both male and female will be beneficial to their sexual health. Also appropriate information, education and

communication (IEC) programmes are necessary to encourage young people to use condoms consistently.

At the second wave of data collection in 2003/2004, those out of school were significantly less likely to consistently use condom at the most-recent sexual intercourse (OR: 0.90; $p<0.05$). At the third wave of data collection in 2005, marginally, older adolescents, Coloureds, those who were not sure about their chance of surviving for a long time, females, those happy a little, those not happy at all, and those out of school were significantly less likely to consistently use condom at the most-recent sexual intercourse. On the other hand, those adolescents who used a condom at their first sexual intercourse, those who believed in condoms as a way of protecting against HIV/AIDS, Christians and those with external monetary support were significantly more likely to consistently use condom at their last sexual intercourse in 2005. This suggests that self-efficacy of using a condom at first sexual intercourse and the outcome expectancy of believing in condom as a protection against HIV is beneficial for any campaign for consistent condom use. Also, Christian teaching and monetary support can improve youths' sexual health. Continual dialogue and campaigns using various institutions must address the knowledge and beliefs of the young people, with the aim of influencing them to adopt safe sexual behaviour.

Generally, according to the results of the analyses in this thesis, adolescents and young adults with negative aspirations and attitudes toward education are more likely to have had multiple sexual partners in the twelve months prior to the time of the survey than their counterparts with positive educational aspirations. Also, adolescents and young adults with negative aspirations and attitudes toward education are less likely to have used contraceptives at first sexual intercourse than their counterparts with positive educational

aspirations, while those with negative aspirations and attitudes toward education are less likely to have uses contraceptives at the most-recent sexual intercourse than their counterparts with positive educational aspirations.

And again, respondents with negative aspirations and attitudes toward education are less likely to consistently use condom with last sexual partner than their counterparts with positive educational aspirations. In addition, a community's racial composition (concentration of population group) has been shown to influence the practice of multiple sexual partnerships, contraceptive use at the first and most-recent sexual intercourse and consistency of condom use with the last sexual partner. Furthermore, adolescents and young adults participating in prosocial activities had higher age at sexual debut, used contraceptives at their sexual debut, used contraceptives at the event of their most-recent sexual intercourse and used condoms consistently with their most-recent sexual partners in this study. Access to external monetary social support affected only frequency of condom use.

Finally, the potential of multi-level modelling for investigating contextual influences on individual adolescents and young adults' sexual and contraceptive behaviours is clearly established in this work, as it shows that this is a better alternative to the more traditional way of focusing only on the individual characteristics of respondents, as has been done in many studies of adolescent sexuality especially in South Africa. Moreover, this study is an attempt, for the first time, to use the three waves of CAPS data collected in Cape Town to answer the set research questions and objectives, unlike previous studies that have ignored Wave 2 data and drawn conclusions from the evidence from Waves 1 and 3 only. This study also attempted to overcome the limitations identified in the literature with regard to

SCT in the sense that all the constructs in the theory were operationalised while the socio-structural factors, sometimes capturing aspects of the environment, were included. The significant findings in this thesis can be used to plan behavioural change interventions.

8.3 Conclusions

The contributions of this work to the existing pool of literature on adolescent sexuality and sexual behaviour in South Africa flow from the use of the panel dataset and longitudinal analytical methods. The formulation of appropriate policies including the design of effective intervention programmes in the study area in particular and South Africa as a whole is crucial to the achievement of MDG 6, which deals broadly with disease reduction.

This first known multi-level study of adolescent and young adults' sexual and contraceptive behaviour using the CAPS dataset, a longitudinal study that followed the lives of about 4,800 adolescents and young adults in the Cape Peninsula between 2002 and 2005, and based on the theoretical framework of Social Cognitive Theory, has found strong evidence that intervention programmes in the study area have not succeeded in raising the median age at first sexual intercourse.

Also, during the study period, there is evidence of both primary and secondary abstinence, a concept that is prone to neglect with respect to both policies and intervention programmes in South Africa, increase in the use of contraceptives at the event of first and most-recent sexual intercourse and a concurrent decline in the practice of multiple sexual partnerships in the last twelve months. This may not be unconnected with the successful distribution of male condoms around South Africa. However, consistent use of condoms at the most-recent sexual intercourse declined between 2002 and 2005, an indication that

preventative behaviour is still inconsistent in South Africa and this can cause a major setback for the gains already made with regard to HIV incidence among the 15-20 year olds in South Africa.

The study concluded that an array of individual-level and neighbourhood contextual factors are independently influencing the sexual and contraceptive behaviours of young people in the Cape Area of South Africa. Bandura's Social Cognitive Theory is relevant to adolescent sexuality and sexual behavioural research in South Africa, as also shown in this study, and the SCT framework has much to offer with regard to designing and implementing programmes to address young people's sexual behaviour.

For instance, with respect to the timing of first sex, the socio-demographic factors of being older, being a female, being of the Coloured or White racial group and having at least secondary level education, and the contextual factors of not attending school and having low educational aspirations significantly associated with increased survival in the study area between 2002 and 2005, while the degree of happiness (a measure of self-esteem/self-efficacy) and the contextual factors of living in a single-parent family rather than being complete orphans seem to be associated with decreased survival. This raises the question of a positive role model in the family since the presence of parents is becoming irrelevant in South Africa as far as transition to sexual activity among youths is concerned. Interventions that restore sanity and positive influence to the family would not be out of place. With respect to MSPs, sex, racial group, self-efficacy of ratings of opportunity in life (marginally), socio-structural factors of using alcohol/drugs, academic aspirations and early age at first sex are all associated with the practice.

For contraceptive use at first sexual intercourse, the individual factors of age and educational level; self-efficacy of degree of happiness in life; outcome expectancies of HIV-risk assessment and belief in the preventability of HIV/AIDS; the socio-structural factors of religious affiliation, current school attendance, circumstances of first sexual intercourse, participation in prosocial activities, and to a lesser extent type of family structure and childhood place of residence were the significant factors to be reckoned with. With respect to contraceptive use at the most-recent sexual intercourse, the individual factors of sex and to a lesser extent racial group; the goal factor of not being sure whether they would live to an old age; and the socio-structural factors of use of contraceptives at first sexual intercourse, current school status and to a lesser extent religious affiliation of being Christian or of other religious persuasions and living in predominantly Coloured or White neighbourhoods were found to exert significant influence.

Lastly, with respect to condom use consistency at the most-recent sexual intercourse, the individual factors of age, to a lesser extent racial group, and being female; the self-efficacy factors of degree of happiness and use of a condom at the event of first sexual activity; the outcome expectancy of believing in condoms as a way of protecting against HIV; the goal factor of being unsure about living to an old age (marginally); and the socio-structural factors of being out of school, being Christian, having external monetary support and, marginally, childhood rural place of residence, having a positive attitude toward school/education and participation in prosocial activities significantly influence condom use at the most-recent sexual intercourse.

Specifically, significant factors identified in this study must be the focus of intervention programmes if risky sexual and contraceptive behaviours are to be prevented and the next

generation protected. Scholars investigating similar phenomena in South Africa or in the study area in the future should pay attention to both individual-level and neighbourhood contextual factors, and policy-makers should come up with policies and intervention programmes that take into consideration the individual-level and neighbourhood contextual factors found to be significant in this study.

8.4 Recommendations

Based on the findings from this study, the following recommendations are hereby put forth as worthy of note in the guiding of policies and intervention programmes aimed at improving the adoption of safe sexual practices in the study area in particular, and in South Africa in general:

1.) Policies and intervention programmes that will encourage the youth in the study area to practice abstinence (primary or secondary), be faithful through remaining with their chosen sexual partners and use male condoms consistently are crucial in the study area.

2.) Intervention programmes that will improve the self-esteem and mental and psychological well-being of South African youths must be put in place urgently because of their potentials in reducing risky sexual behaviours in the study area in particular, and in South Africa in general.

3.) There is a need to give the youths in the study area reasons for living, as that could help improve the adoption of safe sex practices. The results indicate that young South Africans are rationalising the threat associated with indulging in risky sexual behaviours as they will die anyway even if not by HIV/AIDS.

4.) Policies and programmes that will work in South Africa must take into account that South African youths have minds of their own and so, such programmes should seek to appeal to their reasoning in order for them to be effective and efficient in tackling risky sexual behaviour.

5.) There are gender differences with respect to adolescents and young adults' sexuality in the study area and policies and programmes must take such differences into consideration in order to be effective in discouraging young people from risky sexual behaviours. Closely associated with this is a rural/urban differential in sexual behaviour, and this must also be factored into interventions.

6.) Intervention programmes that will work among South African youths must start early enough, preferably before early adolescence, because South African youths commence sexual activity early, and many of the skills they need in negotiating safe sex must be acquired before they begin experimenting with sex, bearing in mind that the average age at puberty is 13.5 years.

7.) Equipping South African young people with the necessary skills to use modern contraceptives or specifically male condoms at their first sexual debut is crucial for their subsequent use, according to findings in this study. Self-efficacy skills development should be prioritised among young South African as they have been found to be important with respect to adoption of safe sex.

8.) Schools, sports and religious places present an opportunity to educate young people in South Africa about safe sexuality and equip them with skills that will help them to negotiate the rough terrain of adolescence. Mainstreaming sexuality education in all institutional places will not be out of place, just as there are HIV/AIDS policies in so many corporate places today. There should be proper supervision of young people when they come together for prosocial activities.

9.) There is an indication that the influence of peers is strong still in South Africa, hence, adequately empowered peers can serve as gatekeepers and can help to improve the health of young people in South Africa.

10.) Policies that will reduce racial segregation between people of White origin and other racial groups could contribute significantly to improving the sexual health of young people in that such residential arrangements could make positive role models available to young people from groups that are prone to engage in risky in sexual behaviours.

11.) Disruption in the family as evident in South Africa is not good for the sexual health of young South Africans and policy-makers including the government must work toward bringing stability back to the family as being an important locus of control for the children and youth in any society.

8.5 Areas for Further Research

The following areas have been identified for future further research in the area of adolescents and young adults' sexuality and sexual behaviour in South Africa:

1.) It would be interesting for future researchers to investigate the correct use of condoms among the adolescents and young adults; the current study is limited in this respect.

2.) Population-based studies on the levels, patterns and prevalence of sexually-transmitted infections among young people in South Africa are also important.

3.) The current study reveals the level of male condom usage; it would be interesting to embark on elaborate studies in relation to wide varieties of contraceptive methods the young people are using in the study area and in South Africa in general.

4.) Embarking on a longitudinal national survey to monitor the sexuality and sexual behaviour of young people in South Africa would not be out of place as such research endeavours are important in the context of the high levels of HIV prevalence and incidence in the country. So much information is needed in South Africa to protect the next generation and future South Africans.

5.) Studies evaluating and monitoring possible intervention programmes are scarce; these are essential to assess the effective of such programmes.

6.) It may be of interest to researchers to investigate the predictors of using protection (particularly condoms) against pregnancy and disease, with the aim of knowing the characteristics of adolescents and young adults that take such a step, how they do so and their reasons for taking such measures.

7.) The influence that alcohol and drug use wields on risky sexual behaviour is still worthy of further research because the relationship is not very clear from the analyses in this study.

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Appendix A: Definition of Terms

Term	Meaning as used in the thesis
Adolescents	Adolescents have been variously defined by different people and bodies. They have been defined by World Health Organisation (WHO) to mean persons between the ages of 10 and 24. As far as this study is concerned, they are persons in the life period between puberty and adulthood especially those between the ages of 14 and 18 years.
Young adults	These are people between the ages of 19 and 25 years followed during the study period.
Dynamics	This relates to forces producing change in the sexual and reproductive behaviours of young people in the study area between 2002 and 2005.
Contexts	These are the circumstances in which an event occurs; a setting; conditions that predispose people to doing what they do.
Trends	This relates to a general direction in which something tends to move. It tells us whether a particular phenomenon is increasing or decreasing.
Risky sexual behaviour	Sexual behaviour that increases the likelihood of adverse sexual and reproductive health consequences such as unwanted pregnancies, unsafe abortion, sexually transmitted infections including HIV or AIDS, and includes sexual activity under the influence of substances, sexual intercourse with drug users, unprotected sexual intercourse, commercial sex and unprotected sex with a same-sex partner (WHO 2000 cited in Menda 2006).
Prosocial activities	This is defined as activities that provide youth with opportunities to develop social and practical skills, a sense of competence and worth, and a sense of environmental mastery (e.g., participation in church or other religious programmes, youth programmes, community organisations, sports groups, and other school-related activities).
Sexual intercourse	Penetrative vaginal intercourse with heterosexual partners.
Outcome expectancies	Expected outcome of a specific behaviour. It includes perceived severity or susceptibility to diseases related to a particular behaviour or the benefit of a preventive action.
Self-efficacy	Perceived ability to perform a behaviour which could be acquired through knowledge or a particular training.
Proximal factors	Factors related to interpersonal relationships, physical and organisational environment
Distal factors	Factors related to culture and structural issues
Neighbourhood/Community	Shared local environment with variety of characteristics such as availability of goods and services (e.g. social network resources or social capital), norms (e.g. values and behaviours), and opportunity structures (e.g. employment and education options). In other words, a neighbourhood has physical and social dimensions.
Institutional factors	These are factors within the institutional structures of school, family, religion and friends/peers.

Appendix B: List of Literature Reviewed for this study

Global studies with the exception of Africa as a continent

S/N (Location and year)	Author (s)	Dependent Variable	Findings	Method	Status (Published or Unpublished)
1. Los Angeles, U.S- 1999	Upchurch et al.	Transition to first sex (risk of having sex)	The risk of sex is not solely due to neighbourhood socio-economic status and race, but rather, that it is the social conditions that co-vary with the structural attributes that are important. They found sex and racial differences with respect to the outcome variable.	Quantitative study using community-based sample of 870 adolescents	Published
2. Andros Island, Rural Caribbean Community- 2005	Morrison, S.D., Howard, R., Hardy, C. & Stinson, B.	Health and HIV Awareness	They found a close-knit community in which girls were social as well as economic participants. Girls felt safe, trusted their elders and had an awareness of health and HIV related issues.	Exploratory Case study using Focus Group Discussion	Published
3. United States- 1994	Billy et al.	Likelihood of first intercourse and subsequent sexual behaviour	The likelihood of first intercourse and subsequent sexual behaviour among black and non-black female teens were shaped by a number of community characteristics such as social disorganization, socio-economic status, religiousity, female labour force participation, population composition, and family planning service availability	Quantitative method using multi-level strategy to incorporate aggregate-and individual-level data	Published
4. United States- 1993	Brewster et al.	Adolescent non-marital sexual activity: the timing of first intercourse and contraceptive use at that event	Local opportunity structure and normative environment shape the behaviours of adolescents. Social disintegration, socio-economic status, and the availability of employment opportunity for women emerged as particularly important influences on young women's reproductive choices.	Exploratory, qualitative method	Published
5. United States- 1998	Ramirez-Valles, et al.	Sexual Risk Behaviour among youth: age at first intercourse, lifetime number of sexual partners and frequency of condom use in sexual intercourse	Family structure (living with two or single parents) indirectly predicts sexual risk behaviour through neighbourhood poverty, parental involvement, and prosocial activities. In addition, family class position indirectly predicts sexual risk behaviour through neighbourhood poverty and prosocial activities.	Quantitative method using Structural Equation Modelling (SEM)	Published in Journal of Health and Social Behaviour
6. United States- 2006	Bozick, R.	Transition to first sexual intercourse: Engaging in sexual intercourse	Working more than 4 hours a week and holding an adult-type job is associated with an increased risk of engaging in sexual intercourse in early adolescence. These effects remain after controlling for socio-demographic variables, family and academic factors, and measures of age-graded development. The findings therefore lend support to the precocious development hypothesis, which posits that taking on adult roles at an early age may speed up the onset of other adult behaviours such as having sex.	Quantitative Methodology	Published in the Journal of Early Adolescence
7. Brazil- 2005	Juarez and LeGrand	Age at First Intercourse and Condom Use	The boys become sexually active at early ages and rarely use condoms especially at ages younger than 15. Sustained family involvement in guiding boys is associated with later first intercourse and an increased use of condoms; and being shy with girls helped to defer first sexual intercourse. Higher socioeconomic status leads to earlier sexual activity for boys in Brazil although with the greater likelihood of using condoms during first intercourse.	Quantitative Method	Published in Studies in Family Planning

S/N (Location and year)	Author (s)	Dependent Variable	Findings	Method	Status (Published or Unpublished)
8. United States- 2005	Cubbin,C.	Ever had sex; Age at first sex and contraceptive use at first and most-recent sexual encounter	At the individual and household levels, parental education is more important than income in influencing teenagers' sexual behaviours. Socio-economic associations were weaker for contraceptive use than for initiation of sex. The relationship between neighbourhood context and sexual initiation among adolescents may depend on gender while findings do not strongly support a role for neighbourhood influence on contraceptive use, suggesting that other contexts such as partner dynamics; peer, family or school influences; state-based policies and laws were more important.	Quantitative Methods	Published in Perspectives on Sexual and Reproductive Health
9. World over; developed e.g. U.K., Australia, Sweden and developing e.g. Mexico, South Africa, Thailand, Uganda)- 2006	Marston and King	Sexual Activity and Contraceptive use (condom use)	Seven key themes emerged from this qualitative systematic review; five in relation to sexual behaviour and two in relation to condom use particularly. Generally, across every culture worldwide, findings point to the fact that young people assess potential sexual partners as "clean" or "unclean" based on their social standing, appearance, or other unreliable indicators; sexual partners have an important influence on behaviour; condoms are stigmatizing and associated with lack of trust; gender stereotypes are crucial in determining social expectations and behaviour; there are penalties and rewards for sex from society; reputations and social displays of sexual activity or inactivity are important; and social expectations hinder communication about sex.	Qualitative Methods	Published in Lancet
10.U.S.- 2004	Harper, G.W.	Dating and Sexual Activity/Sexual Behaviour	Findings suggest that close friends play a very important role in the dating and sexual behaviours of inner-city African-American adolescents. Close friends communicate about dating and sex; social status is associated with increased sexual exploits for males although females were not labelled negatively either. Males and Females tend to enter relationship with different and sometimes competing role construction and expectations about sex and relationships and there is gender convergence when it comes to sexual fidelity and condom use. Close friends are helpful in the acquisition and maintenance of dating or sexual partners in the study area.	Qualitative method	Published in Journal of Sex Research
11. U.S.- 2005	Roche et al.	Early Sexual Initiation	Greater parental involvement was related to a lower likelihood of sex initiation only when youth lived in socio-economically advantaged neighbourhoods. Parental decision making centred on the child's activities within (e.g. watching television) and outside (e.g. hanging out with friends) of the home was associated with a lower likelihood of sex initiation for adolescents in disadvantaged neighbourhoods but to a greater likelihood of sex initiation for youth in advantaged neighbourhoods. The study concluded that neighbourhood context matters in designing preventive interventions aimed at discouraging adolescent involvement in sexual intercourse.	Quantitative Method	Published in Journal of Family Issues

S/N (Location and year)	Author (s)	Dependent Variable	Findings	Method	Status (Published or Unpublished)
12. U.S.- 2005	Browning et al.	Sexual Initiation (Age at first sexual intercourse)	Neighbourhood collective efficacy delays sexual onset only for adolescents who experience lower levels of parental monitoring. Although parental monitoring exerts significantly greater influence on girls' timing of first intercourse, the moderate effect of parental monitoring on collective efficacy holds for both boys and girls.	Quantitative Method	Published in American Sociological Review
13. Chicago, U.S.- 2004	Browning et al.	Age at first sexual intercourse	Demographic background, family processes, peer influences, and development risk factors account for about 30% of the baseline increased likelihood of early onset for African American youths compared with European American youths. After controlling for a host of other individual-level factors, there remained a significant residual racial difference. Neighbourhood-level concentrated poverty largely explained this residual racial difference. Collective efficacy also independently contributed to the delay of sexual onset, and no significant baseline difference in age of sexual initiation was found between Latino and European American youths.	Quantitative Method	Published in Demography

African studies

S/N (Location and year)	Author (s)	Dependent Variable	Findings	Method	Status (Published or Unpublished)
1. Kenya- 1991	Ajayi et al.	Adolescents' sexual/reproductive health knowledge, attitudes, perception and practices	The quality of information given to the vast majority of adolescents was low. More than half of the respondents are sexually active and that between the age of 13 and 14 on the average. Also, the level of contraceptive use is low even among the sexually active.	Quantitative method through the use of questionnaire among 3000 unmarried Kenyan youth aged 12-19 both student and non-student.	Published
2. Ibadan, Nigeria- 1994	Asuzu, M.C.	Sexual beliefs, attitudes and knowledge of adolescent youths concerning AIDS	There was high level of awareness about AIDS although very few could name the disease agent. Majority could identify sexual intercourse as the principal route of transmitting the HIV infection. Less than half believe that chastity is the surest means of controlling the AIDS epidemic and more than half actually plan to be chaste until marriage	Quantitative, descriptive cross-sectional study using questionnaire among 266 secondary school students	Published
3. Burkina Faso, Ghana & Zambia- 2009	Stephenson, R.	Sexual behaviours measured in terms of sex without condom use with more than one partner in the past 12 months.	Community as an intervention point for behavioural change was supported although the mechanisms through which the community environment shapes sexual behaviour vary for male and female. The prevailing economic conditions, behaviour and attitudes of older people in the community are a strong influence on young people's sexual behaviour.	Quantitative, multi-level modelling techniques	Published

S/N (Location and year)	Author (s)	Dependent Variable	Findings	Method	Status (Published or Unpublished)
4. Nigeria- 2008	Mberu, B.U	Premarital Reproductive Behaviour: early premarital sexual debut, Condom use at first premarital intercourse, risk perception for sexually transmitted infections, and being sexually active before marriage	Rural-urban migrants was linked with the strongest independent association to early premarital sexual initiation, while the other significant covariates were adolescent age, gender, religious affiliation, ethnic origin, independent living arrangement, and employment in the formal sector. Condom use at first sexual initiation was low (15.8%) although about two-third (64%) are sexually active and about half deny any risk to STIs (45%)	Quantitative method using NDHS 1999 and 2003 data	Unpublished Dissertation
5. Bida, North Central Nigeria- 2002	Odimegwu et al.	Adolescent Sexual Activity: Being sexually active	More than one third of the adolescents interviewed had sexual intercourse in the month preceding the survey, and that less than one fifth of the sexually active adolescents were using a method of contraception to either prevent infections or avoid unwanted pregnancy. The results of the further analysis confirmed the fact that adolescents with whom parents had discussed family life issues were less likely to be sexually active than those with whom parents had never discussed family life issues. Also, that family instability exerts a negative effect on adolescent sexuality. This study brings to the limelight the importance of family structure and community level variable of family instability on the sexual behaviour of the adolescents.	Quantitative Method using structured interview	Published in African Journal of Reproductive Health
6. Ibadan, Nigeria- 2003	Adeboyejo and Onyeonoru	Adolescent Reproductive Health Problems: Incidence, Prevalence rate and intra-urban variations of STIs	The three most common STIs among adolescents in Ibadan, Oyo State, Nigeria were Gonorrhoea, Candidiasis, and Non-Specific Urethritis. The authors noted that the incidence is highest among adolescents in the high-density but low class residential areas than their counterparts in the medium and low-density areas. The study concluded that the trend in incidence between 1974 and 2000 is a fluctuation that tends more towards increase than decline. Any prevention and intervention programme that will be effective must take into consideration the context of the problem in the study area, and must also address the community-level factors predisposing the youths in the various strata of the community to infection.	Quantitative Method using structured questionnaire after reviews of hospital case notes	Published in African Population Studies

S/N (Location and year)	Author (s)	Dependent Variable	Findings	Method	Status (Published or Unpublished)
7. Nigeria- 2006	Agha et al.	Early sexual initiation: Sexual debut before age 18	Community-level factors exercise important effects on the early onset of sexual initiation, and that consistent with social capital hypothesis, young people living in communities that are more knowledgeable about HIV or AIDS transmission and prevention, communities that are open to receiving HIV or AIDS information, and communities that support condom use as well as family planning are more likely to delay sexual initiation than others. They further noted that the disadvantages associated with living in a community that is less well-informed, less supportive of condom use and less open to receiving information on HIV or AIDS are significantly higher for women. The study concluded that women who live in communities where attitude about reproductive health are not positive or where there is lack of social support for condom use are at a heightened risk of early sexual initiation.	Quantitative Method	Published as a working paper
8. Botswana- 2004	Rakgoasi et al.	Adolescent Sexual Behaviours: Early initiation of sexual intercourse, alcohol use, and multiple sexual partnerships	While female adolescents were more sexually active than male adolescents; the latter were more likely to engage in risky behaviour such as early initiation of sexual intercourse; alcohol use; multiple sexual partnerships than female adolescents. Among male adolescents, early initiation of sexual intercourse was associated with increased likelihood of non-condom use, which increased the risk of STIs, including HIV. The study further found that while a high percentage of adolescents considered themselves at minimum or no risk of STIs or HIV, this proportion is higher among males than female adolescents.	Quantitative Method	Unpublished Study Report
9. Nigeria- 2008	Fatusi and Blum	Early sexual initiation	Sex of the respondents and region was significantly associated with adolescent sexual initiation among both males and females. Educational attainment and age were particularly significant for males. Psychosocial factors of more positive attitudes regarding condom efficacy and family planning use; greater perception of condom access and alcohol use among males; positive gender-related attitudes among females were also associated with increased likelihood of adolescent sexual initiation. In addition, personal attitudes in favour of delayed sexual debut were associated with lower sexual debut rates among both males and females. Moreover, Higher level of religiousity was associated with lower sexual debut rates only among females.	Quantitative Method using interviews among adolescents aged 15-19	Published in BMC Public Health
10. Mauritius, Indian ocean region- 2007	Nishimura et al.	Sexual Behaviors: Sexual activity and condom use at the last sexual encounter.	There was gender difference in the history of sexual intercourse among the 1,200 participants aged 15-24 years studied. More women than men did not use condom at the last sexual encounter. Multivariate results show that work experience and Marijuana use were significantly associated with men's sexual experience, whereas being out of school and drinking experience were significantly associated with having ever had sexual intercourse for females. Not using condom at the first sexual encounter and lack of exposure to a nongovernmental organization dealing with HIV or AIDS were associated with the non-use of condoms at the last sexual encounter.	Quantitative Methodology	Published in BMC International Health and Human Rights

S/N (Location and year)	Author (s)	Dependent Variable	Findings	Method	Status (Published or Unpublished)
11. Burkina Faso- 2007	Guiella and Madise	Adolescent Risky and Protective sexual behaviour: Sexual activity and condom use	About one-tenth of adolescent males had sexual intercourse in last twelve months with more than two partners but did not use condoms. Multivariate results show that the odds of using condoms increased with years of schooling and self-efficacy in use of condoms. Females who were very confident of getting a male partner to wear a condom were six times more likely to have used a condom at last sex than those who were not confident at all.	Quantitative Method	Published in African Journal of Reproductive Health
12. Sub-Saharan African countries including one country from South-East Asia- 2009	Williamson et al.	Contraceptive Uptake	Despite rural/urban differential, condom use was limited in the developing countries reviewed due to its association with disease and promiscuity, together with greater male control. Although the review covered five developing countries with heterogeneous conditions, the findings were common across different settings and contexts.	Qualitative method (A systematic review covering 1970-2006)	Published in Reproductive Health
13. Uganda- 1997	Twa-Twa, J.M.	Sexual Activity	More male (65%) than female (32%) unmarried secondary school students were sexually active, with more male (49%) than female (25%) having multiple sexual partners. Parental care, peer influence, economic factors and AIDS education significantly shape the sexual activity of the study respondents.	Mixed Method- structured questionnaire and FGDs	Published in Health Transition Review
14. Developing world- 1998	Mensch et al.	Sexual Activity and Sexuality	Empirical research on premarital sex had been on the increase based on the assumption that sexual activity is increasing among unmarried adolescents. The reasons for the trend include increase in school enrolment which intensified contact between boys and girls; weakened parental authority; lower age at menarche for girls; global youth culture reflective of American pattern rather than the European type where abstinence is preferred to other methods of protection against pregnancy and disease and variable local concepts of sexual behaviour. Pre-marital sexual activity had been evident in sub-Saharan Africa, while age-mixing in favour of men predisposes adolescent girls to higher risk of contracting STIs including HIV. High levels of involuntary first sexual activity had been reported in many parts of the developing world.	Review of published and unpublished articles.	Population Council Report
15. Kenya- 2004	Erulkar, A.S.	Experience of Sexual Coercion	More sexually active females experienced sexual coercion when compared to their male counterparts with perpetrators being intimate partners. Females who had ever been married and those who did not live with a parent or spouse had significantly higher odds of sexual coercion. Sexual coercion was associated with experience of multiple sexual partnerships and with having had a reproductive tract infection. Males with older first sexual partners were more likely to experience coerced sex.	Quantitative methods	Published in International Family Planning Perspectives

South African Studies

S/N (Location and year)	Author (s)	Dependent Variable	Findings	Method	Status (Published or Unpublished)
1. KZN-2001	Harrison et al.	Young women's risk for HIV and AIDS	In South Africa, over one-third of teenage women attending public antenatal clinics are HIV-infected. Also, common stereotypes of adolescent sexual behaviour point to multiple partners, relationship with older men, sex for money and coercive sex	Qualitative- Repeated group discussions with 14-15 year old girls	Published in Society in Transition
2. Transkei- 1996	Buga, et al.	Adolescent sexual behaviour, knowledge and attitudes to sexuality (Associated risk factors of sexual activity)	The majority of the sexually-experienced and inexperienced girls were living with both parents and that there were no religious differences between the two groups of girls. There was a high level of unprotected sexual activity among school girls in Transkei and that the risk factors for this include early sexual maturation, early onset of dating, and poor knowledge of reproductive biology and contraceptives	Quantitative- Self-administered questionnaire among 1072 adolescent girls	Published
3. KZN- 1997	Varga, C.A.	Sexual decision-making and negotiation (Choices made about sexual activity)	Communication between partners was poor, and young women appeared powerless to enforce their preferences in sexual situations. AIDS was not a significant factor in any aspect of sexual decision-making. Socio-cultural factors and the state of the HIV pandemic in South Africa were offered as explanations for the findings.	Mixed method- Interviews and use of structured and open-ended questions	Published
4. KZN- 2003	Varga, C.A.	Adolescent Childbearing & parenthood	Gender ideals are grounded in traits that reinforce poor sexual negotiation dynamics and behavioural double standards, and that place adolescents at risk for early pregnancy and other sexual and reproductive health complications.	A triangulated research methodology/Mixed method (FGDs, narrative role playing & discussions, questionnaire and in-depth interviews	Published
5. South African urban Zulu communities in the 80s	Preston-Whyte	Adolescent Pregnancy	Fertility was an integral part of "the cultural construction of the female self" (1988:19), regardless of age or marital status. With regard to Zulu male adolescents, early fatherhood is a welcome affirmation of masculine maturity and strength	Anthropological method	Published
6. South African studies (2003)	Eaton, L., Flisher, A.J. & Aarø, L.E.	Unsafe sexual behaviour/ HIV risk behaviour (being sexually active, multiple sexual partnership and practice of unprotected sex)	The review found that at least 50% of young people aged 14-35 are sexually active by the age of sixteen years; reporting of one partner in the previous year among the sexually active school students; more males reported having more than four sexual partners per year; between 50% and 60% of sexually active youth reported never using condoms. Proximal and distal contexts, and in particular, the pervasive effect of poverty and social norms that perpetuate women's subordination within sexual relationships predispose young people to unsafe sexual behaviour. Personal factors, proximal and distal contexts interact to encourage HIV risk behaviour in ways that are not fully captured by social-cognitive models.	Review of published and unpublished materials between 1990 and 2000	Published (Social Science & Medicine)

7. Khutsong near Carletonville (South West of Johannesburg)- 2001	MacPhail, C. & Campbell, C.	Condom use among youth	Informants are diverse in their understanding of sexuality and six thematic factors were identified as hindering condom use in the study area namely lack of perceived risk of HIV and AIDS; peer norms; condom availability; adult attitude to condom and sex; gendered power relations and the economic context of adolescent sexuality. Also, there was the existence of dominant social norms which place young people's sexual health at risk of STIs including HIV and AIDS. Moreover, young people were found to be self-consciously critical of the norms that govern their sexual behaviour although they go along with them while they are aware of the way in which peer and gender pressures place their health at risk. Lastly, minority of youth actively challenge dominant norms and behave in counter-normative and health-enhancing ways.	Qualitative study using focus group discussion among 44 young men and women in the age group 13-25 years	Published in Social Science & Medicine
8. Mankweng District, Limpopo Province of South Africa- 2006	Mpofu et al.	Number of sexual partners	Teenagers with early sexual experience and a history of substance-use tended to have multiple sexual partners.	Quantitative methodology	Published in AIDS and Behavior
9. Rural KwaZulu-Natal- 2005	Harrison et al.	Early sexual debut and multiple sexual partnership	Less than a fifth of 15-24 year old men had their first sexual experience before the age of 15 years, and those who initiated sex before age 15 were less likely to use condoms at first sexual intercourse, more likely to have had a sexual encounter with a casual partner, and more likely to have reported "not feeling they had been ready and wanted to have sex". Multivariate results showed that early sexual debut was strongly associated with ≥ 3 partners in the past three years (O.R=10.26, $p<0.01$)	Quantitative Methods	Published in Sex Transm Infect
10. Cape Town- 1997	Wood and Jewkes	Violence, Rape and sexual coercion	There was widespread male coercion and violence within sexual relationships	Anthropological method of informant s' narratives, in-depth, semi-structured interviews with 24 pregnant adolescents aged 14-18 years, attending antenatal clinic	Published
11. Cape Town- 2007	Anderson, K.G., Beutel, A.M. & Maughan-Brown, B.	First sexual intercourse	It was found that most youth viewed themselves as being at no or small risk of HIV infection. A reciprocal relationship in which higher perceived HIV risk was associated with a delay in sexual debut and sexual experience was associated with higher perceived risk for females but not for males. Also, knowing someone who had died of AIDS was associated with sexual debut and with an elevated perceived HIV risk among females. Moreover, the association between race and perceived risk of HIV infection varied by gender.	Quantitative studies using Wave 1 & 3 of CAPS data collected in 2002 and 2005	Published in IFPP

12. Cape Town-2009	Mathews et al.	Early first sexual intercourse	This study investigated the effect of a school-based HIV prevention programme among Grade 8 students in Cape Town. Of the 1440 students who were virgins at baseline, 79.4% (1144) remained virgins 15 months later and 20.6% (296) reported having had their first sexual intercourse. Transition to first sex was more likely among males, among older students, and among students with a lower socio-economic status. This transition was significantly associated with three factors namely: intention to have sexual intercourse, poor self-efficacy to negotiate delayed sex and intimate partner violence.	Quantitative Method using Structural Equation Modelling (SEM) on a longitudinal study of 2360 students in the school allocated to the control arm of a cluster-randomised controlled trial.	Published in Health Education Research
13. Cape Town-2007	Dinkelman et al.	Sexual Behaviour of young adults: Sexual debut, multiple partners in past year, and condom use at last sex	There was evidence of increase in condom use and decrease in the incidence of multiple partners between 2002 and 2005 for females aged 17-22. Females in households with 10% higher income are 0.53 percentage points less likely to sexually debut by 2005; males in communities with a 10% higher poverty rate are 5 percentage points less likely to report condom use at last sex. Negative economic shocks are associated with a 0.04 percentage point increase in the probability of multiple partnerships for females. Lastly, education is positively correlated with sexual debut for females and with multiple partnerships for both sexes.	Quantitative Methodology using CAPS data Wave 1 and 3.	Published in AIDS
14. Cape Town-2008	Marteleto et al.	Sexual debut, pregnancy or school dropout	Teen pregnancy is not entirely inconsistent with continued schooling; especially for African (black) women as more than half of African women who were pregnant at age 16 or 17 were enrolled in school the following year. Also, male and female students who performed well on a literacy and numeracy exam administered in 2002 were less likely than those who performed more poorly to become sexually active and less likely to drop out of school by 2005. Moreover, 14-16-year-olds who had completed more grades in school in 2002, conditional on their age, were more likely than those who had completed fewer grades to have become sexually active by 2005, a potential indicator of peer effects resulting from the wide dispersion in age per grade in South Africa	Quantitative Method	Published in Studies in Family Planning
15. Cape Town-2008	Camlin and Snow	Condom use at first and at most recent sexual intercourse	Participation in clubs and community groups is associated with safer behaviours. A mother's financial support (for clothing, school fees and uniforms, and pocket money) is negatively associated with condom use, particularly among young women, suggesting that material need impels vulnerability to higher risk behaviours. Social resources in households and communities mediate HIV-risk behaviours among youth in Cape Town.	Quantitative Method using Wave 1 of CAPS	Published in Health Education & Behaviour

16. South Africa- 2005	Hartell, C.G.	Sexual behaviours (sexual activity, multiple partnership and use of protection) in relation to HIV/AIDS	This review found that early sexual initiation is common and that many young people indulge in risky sexual behaviour in spite of high knowledge about HIV and AIDS. Based on the findings from the various South African studies reviewed, the author concludes that much research still needs to be done on the effectiveness (or lack thereof) of educational programmes on adolescents' sexual behaviour. Also, that a general strategy would not be feasible, since the norms, values, cultures, and traditions of the various communities in South Africa are too different. Thus, the focus of a prevention programme for students would have to be based on the particular needs and beliefs of each community. The most important conclusion from this review was that, despite the efforts of researchers, there has been no significant change in the rate of HIV infection among adolescents in South Africa. He therefore recommended a new generation of behavioural interventions which provide both factual knowledge and life skills which can promote behavioural risk reduction.	Review of literatures	Published in Adolescence
17. KwaZulu-Natal, South Africa- 2008	Harrison et al.	Sexual partnerships	More males (33%) than females (25%) reported multiple and /or concurrent partnering and another 25% of females had partners who were five years older than they were. Non-participation in civic organizations or school was correlated with higher-risk partnerships only for women. On average, serious relationships lasted more than a year for both sexes. Qualitative result showed fluid partnership patterns: the sequential and overlapping nature of relationships, however, with distance and mobility being important influences.	Quantitative and Qualitative methods (Mixed)	Published in Studies in Family Planning
18. Cape Town, South Africa- 2006	Morojele et al. 2006	Sexual risk behaviours: Sexual activity and multiple partnership	A study linking relationship between drug use and sexual risk behaviour found that sexual risk behaviours resulted from girl's powerlessness in sexual relationships and boy's perceived invulnerability to HIV infection and the positive status associated with having multiple partners. Drug use was found to increase young people's vulnerability to risky sexual behaviour because of its effect on adolescents' inhibition, rational thinking, and safer sex negotiation skills.	Qualitative method	Published in AIDS Care
19. South Africa- 2006	Sayles et al.	Always use condoms and condom use at last sex	For females, knowing how to avoid HIV, having spoken to someone other than parent/guardian, having life goals were associated with high self-efficacy for condom use and sexual negotiation; while for males, taking HIV seriously, believing in no risk for HIV, reporting easy access to condoms and having life goals predicted high self-efficacy for condom use and sexual negotiation. On the other hand, not using condoms at first sexual intercourse, history of unwanted sex and believing that condom use implies distrust for one's partner were associated with low self-efficacy for condom use and sexual negotiation for both sexes and refusing to be friends with HIV-infected persons particularly predicted low self-efficacy for condom use for males.	Quantitative Method	Published in Acquir Immune Defic Syndr

20. Cape Town, South Africa- 2009	Tenkorang et al.	Sexual debut (age at first sexual intercourse)	Using Health Belief Model (HBM), female youth who perceive their risk as 'very small' and males with higher knowledge, experience their sexual debut later than the comparison groups, net of other influences. For both males and females, socio-economic and familial factors also influence timing of sexual debut, confirming the need to consider the social embeddedness of this sexual behaviour as well as the rational components of decision making when designing prevention programmes.	Quantitative Method	Published in AIDS Behaviour
21. KwaZulu-Natal, South Africa- 2005	Hallman, K.	Early sexual debut; multiple partnerships; condom use at last sexual intercourse; non-consensual first sex for females…	Socio-economic disadvantage associated significantly with earlier sexual debut, having had multiple sexual partners in the year preceding the survey and lower chance of condom use at last sex. Also, low wealth was associated with increased chances that first female sexual experience is non-consensual and with higher odds of females having had transactional sex and having experienced physically-forced sex. For females and males, low wealth (poverty) reduces the chances of discussing safe-sex practices with the most-recent sexual partner	Quantitative methods	Published in African Journal of AIDS Research
22. Rural KwaZulu-Natal, South Africa- 2009	McGrath et al.	Age at first sex	The median age at first sex (AFS) for women aged 12-25 years (18.5 years) was lower than that of their male counterparts (19.2 years). Factors associated with AFS across gender were peri-urban residence, ever use of alcohol and knowing at least one person who had HIV; while school attendance had a significant protective effect. With regards to gender differences in AFS, maternal death was significantly associated with earlier AFS for women while paternal death was significantly associated with earlier AFS for young men. However, mother's membership of the same household significantly delayed AFS of young men.	Quantitative method	Published in Sex Transm Infect
23. Poor urban community, South Africa- 2010	Rogan et al.	Sexual behaviour- sexual activity and lifetime multiple sexual partnerships	Gender interacts significantly with peer norms to predict sexual behaviour, and peer norms and the experience of intimate partner violence were significantly associated with sexual risk behaviour among girls participating in the study.	Quantitative methods	Published in African Journal of AIDS Research
24. Cape Town, South Africa- 2007	Anderson and Beutel	HIV/AIDS Prevention knowledge and the total number of prevention methods	Having ever had sex, highest grade completed, and race was the most commonly significant correlates across models. Also, significance of HIV/AID knowledge correlates varies across racial group.	Quantitative methods	Published in Journal of Social Sciences
25. South Africa- 2008	Moyo et al.	Consistent Condom Use	Partner communication was protective against inconsistent use of condom at the most recent sexual relationships, while longer duration of sexual relationships and higher frequency of sexual activity increase the risk of condom use inconsistency at the most recent sexual relationships in South Africa.	Quantitative methods	Published in AIDS Behaviour

26. South Africa (Johannesburg)-2006	Noorbhai, N.Y.	Coercive Practice and Sexual Choice	Adolescence is a time of inconsistency and turmoil, self-worth was closely linked and related to socially-desirable characteristics. Gendered behaviour was widely endorsed with romantic relationships being an important component of the girls' lives. Many described their relationships as being less sexual and more emotional in nature. Practicing of safe sex was generally agreed to be delayed until 18 years or older with feminine stereotyped behaviour being protective only outside of heterosexual relationships. There was a general fear of sexual coercion although only a small proportion reported experience.	Mixed Methods	Unpublished M.Sc. Thesis
27. South Africa-2008	Burgard and Lee-Rife	Sexual Initiation and Condom Use	Net of individual and household characteristics, higher levels of community concentrated disadvantage are associated with increased risk of unprotected sex among young men, while higher levels of social disorder are associated with lower risk. Also, higher levels of social cohesion delay sexual initiation among young men while social disorder remains associated with the hazard of sexual initiation among young women after adjustment for individual and household characteristics	Quantitative method	Unpublished Report

Appendix C: Map of Western Cape Province and its District Municipalities



Source: Map of Western Cape, South Africa accessed at http://en.wikipedia.org/wiki/Western_Cape on 15/06/2009



Source: Map of Western Cape District Municipalities, South Africa accessed at http://en.wikipedia.org/wiki/Western_Cape on 15/06/2009

Appendix D: Table showing the profile of magisterial districts in Cape Town with some socio-economic indicators

District name	No. of projects	Population (1996 Census)	Per capita income	CV of income	Head-count poverty rate	Unemployment rate	Unemployment days	Infrastructure score 1	Infrastructure score 2	% with at least standard 10 education
Bellville	3	274,081	2,855	15.7	0.06	7.9	5,005,205	126	65	45.9
Cape	1	184,700	3,183	9.5	0.03	5.8	2,465,623	202	98	53.3
SimonsTown	4	76,025	2,371	10.7	0.06	9.8	1,702,977	130	58	44.3
Somerset West	2	65,433	1,027	14.7	0.12	6.9	983,268	224	98	45.8
Strand	4	56,487	857	17.2	0.12	5.9	753,689	176	43	42.8
Wynberg	4	543,322	2,141	13.6	0.05	9.7	12,077,808	100	44	53.9
Goodwood	3	314,196	1,171	13.6	0.12	10.6	7,577,052	189	84	24.9
Kuils River	0	253,512	1,046	12.3	0.15	11.7	6,555,079	290	123	33.3
Malmesbury	2	120,910	1,193	18.8	0.19	15.0	3,985,387	153	58	34.1
Mitchell's Plain	8	728,914	466	25.9	0.28	23.5	37,826,185	288	107	20.9

Source: Adapted from Adato, M. & Haddad, L. (2002): "Targeting Poverty through Community-Based Public Works Programmes: Experience from South Africa", Journal of Development Studies, 38: 3, pp. 1-36 (Table 2).

Appendix E: Notes and Calculation of Multi-level Logistic Model Parameters

According to Merlo et al. (2006), the **Proportional Change in Variance** (PCV) expresses the change in the area level variance between the empty model and the individual level model, and between the individual level model and the model further including the area level covariate. It is calculated thus:

$$PCV = (V_A - V_B)/ V_A \times 100$$

where V_A = variance of the initial model, and V_B = variance of the model with more terms.

Intra-cluster Correlation Coefficient (ICC) otherwise known as Variance Partition Coefficient (VPC) is a parameter which informs us on the proportion of total variance in the outcome that is attributable to the area level. It is calculated thus:

$$ICC = V_A / (V_A + V_I)$$

where V_A represents the area level variance, and V_I the individual level variance.

Using linear threshold model method or latent variable method which converts the individual level variance from the probability scale to the logistic scale on which the area level variance is expressed (Merlo et al. 2006), the unobserved individual variable follows a logistic distribution with individual level variance V_I equal to $\pi^2/3$ (that is, 3.29); hence ICC can be calculated thus:

$$ICC = V_A / (V_A + 3.29)$$

Median Odds Ratio (MOR) is the median value of the odds ratio between the area at highest risk and the area at lowest risk when randomly selecting two areas. It shows the extent to which the individual probability of experiencing the outcome variable of interest is predicted by neighbourhood, and so it is appropriate for quantifying contextual phenomena. It is calculated thus:

$$MOR = \exp [\sqrt{(2 \times V_A)} \times 0.6745]$$

$$MOR \approx \exp (0.95\sqrt{V_A})$$

where V_A is the area level variance and 0.6745 is the 75th centile of the cumulative distribution function of the normal distribution with mean 0 and variance 1 (Merlo et al. 2006).