

DETERMINANTS OF ADOLESCENT REPRODUCTIVE RISK BEHAVIOUR IN  
ZAMBIA

BY

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**Determinants of Adolescent Reproductive Risk Behaviour in Zambia**

**BY**

**Charlotte Kunda Lwanga**

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University  
of Manitoba in partial fulfillment of the requirements of the degree**

**of**

**MASTER OF SCIENCE**

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## Abstract

To develop effective strategies to reduce adolescent reproductive risk behaviour, it is critical to understand the factors that influence adolescents to engage in this risky behaviour. A sample of 794 unmarried female adolescents aged 15-23 years was studied using the 2001-2002 Zambia Demographic and Health Survey. Descriptive analysis and logistic regression analysis were used to investigate the relationship between adolescent reproductive risk behaviour and the variables age at first sexual intercourse, access to health services, number of household members, family structure, discussing family planning with someone, and drinking alcohol. The results of the multivariate analysis indicated that family structure and discussing family planning with someone were statistically significant predictors of adolescent reproductive risk behaviour. The results of this study provide professional practitioners and researchers with information to develop effective prevention and intervention programs to reduce adolescent reproductive risk behaviour in Zambia. Female-centred programs that integrate supportive family networks for adolescents may help reduce this risky behaviour. In addition, better measures of the predictor variables of adolescent reproductive risk behaviour are suggested.

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## Dedication

This thesis is dedicated to my husband, Kennedy MAKONDO, and our two wonderful children, Muleya and Chanda. For all the support and encouragement, this is for you.

*Reproductive Risk Behaviour- An Adolescent's Perspective*

*"In this day and age, it's not wise to be having babies too young. And let's face it, adolescents are engaging in premarital sex ...If I am going steady (a serious relationship) with a guy and I'm sleeping with him, I'd take all the precautions possible. However, the thought of going to a clinic scares me "half to death" ... They treated me so horribly and asked me nasty questions ... As adolescents we feel kind of intimidated by older people ... There is always a problem of lack of privacy; in clinics the staff always seem to be discussing patients and their problems. The term Family Planning itself scares me, it sounds like I'm already married, at 20!! All I want to know is how not to get pregnant or not get an STD!!"*

*By Cathy Phiri, Youth Media,*

*Publishers of Trendsetters, project supported by JHU/PCS.*

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## Chapter 1: Introduction

Adolescent reproductive risk behaviour has become an increasingly important topic because of the growth in the number of adolescents and because adolescents are at high risk for negative reproductive health outcomes. Adolescence is a period of development during which most young people become more aware of their sexuality and begin to explore it (Kowaleski-Jones & Mott, 1998). According to Makinson (1985), some adolescents make this transition without negative health outcomes, but others do not, raising the question of what determines reproductive risk behaviour among adolescents.

Adolescents in the age group 15 to 24 years of age make up 21% of the female household population in Zambia (Central Statistical Office, Central Board of Health, & ORC Macro [CSO et al.], 2003). They are of particular importance with respect to the use of contraceptive devices, number of sexual partners, sexually transmitted infections (STIs), cancers of the genital tract, unplanned pregnancies, and access to skilled obstetric care, as well as complications from unsafe abortions.

According to a recent report by Population Action International, almost 75% of the countries in Sub-Saharan Africa are at the greatest risk for poor sexual and reproductive health in women (Nation's Health, 2001). Zambia is not exceptional. There is a growing disparity regarding sexual and reproductive health status of women in developing and developed countries (Nation's Health, 2001).

Developed countries experienced dramatic improvements in reproductive health in the past century (Women's International Network News, 2001). Improvements included near universal access to high quality care in pregnancy and childbirth, life-

saving drugs and safe surgical procedures – including safe abortion – and high levels of contraceptive use and low fertility (Women's International Network News, 2001). All these made a significant contribution to good reproductive health in women. "The situation is quite different in the developing world where a woman's 'lifetime risk' of death from maternal causes is 1 in 65, fully 33 times that of her developed country counterpart" (Women's International Network News, 2001, p. 6).

Scientists and clinicians are concerned with a wide range of sexual and reproductive health behaviours including sexually transmitted diseases (STDs) and human immunodeficiency virus (HIV) prevention, contraceptive utilization and reproductive cancer screening (Fisher & Fisher, 1998). As the HIV epidemic evolves, more and more infections are occurring in young people. Therefore, "given the median length of time between HIV infection and the onset of AIDS (10 years or more), many individuals in older age groups would have been infected with HIV during their youth" (Health Canada, 2001, p.1). Zambia has been affected by HIV/AIDS. According to the 2001-2002 ZDHS, 16% of the respondents tested HIV positive. Women were more likely to be HIV positive than men, 18% and 13% respectively. The proportion found to be HIV positive among women increased with age, reaching its peak in the age group 30-34 (CSO et al., 2003).

The passage from childhood to adulthood for adolescents in Sub-Saharan Africa, and Zambia in particular, is usually complex and full of dangers. Throughout the region, adolescents are exposed to major threats such as sexual exploitation, violence, substance abuse, crime, poverty, and unemployment (Women's International Network News, 2001). These dangerous, desperate situations make adolescents vulnerable to poor reproductive

health outcomes such as early child bearing, unintended pregnancies, unsafe abortion, sexually transmitted diseases, and HIV/AIDS (Women's International Network News, 2001).

Another situation that makes adolescents even more vulnerable to negative reproductive health outcomes is the age difference between themselves and their partners. In their study of adolescent sexuality and sexual behaviour, Feldmann and Middleman (2002) revealed that there was an age difference between partners, and one quarter of first or most recent partners among female adolescents were 4 years or more older compared to adolescent males who generally report having partners the same age or no more than 3 years older. This situation is not different in Zambia. Adolescents in Zambia are engaging in pre-marital sex mainly with men older than themselves. For economic reasons, this situation is not surprising because these older men are providing financial support to these adolescents. According to the Population Reference Bureau (1994), young women involved in exchange relationships with older men are disadvantaged in terms of gender, age, and economic status. As a result of the age difference between unmarried adolescents and their partners, there is a power imbalance in the relationship, and female adolescents are at a disadvantage and unable to refuse sex or negotiate contraceptive use (Population Reference Bureau, 1994). The 2001-2002 ZDHS revealed that more than 50% of men who have ever had sex between the age 15 and 59 had been involved in sex for money, gifts, or favours in the 12 months preceding the survey (CSO et al., 2003).

Adolescents are at risk of becoming pregnant when they engage in reproductive risk behaviour. Based on my experience as a Zambian, when unmarried adolescents get pregnant, they are traumatized because of the way they are treated by society as a whole

and by their own families in particular. These adolescents are not usually supported by their families and in the worst cases they are thrown out of the house and sometimes end up, or are forced to live, with the families of the men who made them pregnant. The worst cases are those in which the adolescents are left to raise their children as single mothers. Usually, the partner's family looks down upon these adolescents and they are left to feel like they are intruders.

In Zambia, adolescents can get contraceptives from pharmacies, supermarkets, health centres and hospitals. Also, there are agencies that distribute contraceptives in communities and schools. For example, in institutions of higher learning, like the University of Zambia, there are counseling centers that distribute contraceptives to students. However, due to the cultural stigma associated with pre-marital sex, I would speculate that only a few adolescents have the courage to ask for contraceptives.

Although adolescents are engaging in pre-marital sex, they do not want this behaviour to be obvious to everybody. As a result, they shy away and it is not surprising that the majority of adolescents are not using contraceptives (CSO et al., 2003). The situation is similar to Ghana where pre-marital sex among unmarried adolescents is prohibited or frowned upon and as such adolescents are denied appropriate reproductive and sexual health services (Stanback & Twum-Baah, 2001).

Although non-contraceptive use is an ultimate factor that would bring about adverse reproductive health outcomes among adolescents in Zambia, there are other behaviours that would influence non-contraceptive use such as the use of alcohol. Adolescents in Zambia are often discouraged from drinking alcoholic beverages. However, they do have access to alcoholic beverages particularly when they have parties

and go out to bars and dancing clubs. Adolescents are usually not supervised when they attend such functions. In addition, there is also a tendency of keeping alcoholic beverages in homes. This situation makes it even easier for adolescents to access alcoholic beverages.

#### Statement of the Research Problem

Factors contributing to adolescent reproductive risk behaviour in Zambia have not been identified and are hence poorly understood. The data on reproductive risk behaviour among adolescents in Zambia show potential for unintended pregnancies, HIV transmission and other sexually transmitted diseases. According to the Zambia Demographic and Health Survey (ZDHS), from 2001-2002 the percentage of adolescents who reported that they were not currently using any contraceptive method was 89.9% and 75.0% respectively among 15-19 year olds and 20-24 year olds (CSO et al., 2003). Therefore, contraceptive neglect and inconsistent use among adolescents who do not wish to conceive remain surprisingly common.

The age at which adolescents begin to engage in risky behaviours is equally alarming. Several studies in Zambia indicate that adolescents are sexually experienced at an early age. According to the 2001-2002 ZDHS, nearly 50% of adolescents have had sexual intercourse by age 19 (CSO et al., 2003). The 1996 ZDHS revealed that the age of women at first sexual intercourse did not change significantly between 1992 and 1996, when it was 16.3 years and 16.4 years respectively (Central Statistical Office, Ministry of Health, & Macro International [CSO et al.], 1997). Similarly, the median age at first sexual intercourse was not significantly different in 1996 and in 2001-2002, 16.4 years and 16.8 years respectively (CSO et al., 2003). Because sexual intercourse during

adolescence is usually unplanned, it is often unprotected by regular contraceptive use (Kirby, 2003). All too often, this behaviour results in sexually transmitted diseases, unwanted pregnancies, abortion, or unmarried youth parenthood. In addition, adolescents who have engaged in early sexual intercourse are more likely to have more sexual partners and more frequent intercourse than adolescents who have not engaged in early sexual intercourse (Koyle, Larry, Joseph & Bert, 1989).

Sexually transmitted infections (STIs) are common in adolescents because of their reproductive risk behaviours. Often STIs are asymptomatic, and may cause pelvic inflammatory diseases, infertility, and ectopic pregnancy (Laugille, 2000). Syphilis is an important infection that is most commonly reported in younger women. According to the 2001-2002 ZDHS, the syphilis prevalence rate increased with age from 3% among 15-19 year olds to a high of 11% among 25-29 year olds (CSO et al., 2003). Sub-Saharan Africa has the highest percentage of HIV infection in women with the highest percentage in Zimbabwe (27.5%) followed by Lesotho (25.7%), then South Africa (21.9%), and Zambia (21.5%) (Women's International Network News, 2001). In the 2001-2002 ZDHS, the HIV prevalence rate among women increased with age from 7% among 15-19 year olds to 16% among 20-24 year olds (CSO et al., 2003).

Adolescents who engage in reproductive risk behaviours are at high risk of early childbearing. Early childbearing can bring about complications during pregnancy. According to Hamlin and Hamlin's study conducted in Addis Ababa (as cited in Women's International Network News, 2001), "not being fully matured, pregnancy by young girls often results in obstructed labour, causing a tear in the vaginal wall connecting to the bladder or the rectum or both" (p.9). Adolescent pregnancy can also

result in low birth weight infants, preterm delivery, and higher infant mortality (Fraser, Brockert & Ward, 1995).

Most adolescents who become pregnant are now choosing to be mothers (Laugille, 2000). Teen pregnancy has social consequences, particularly for the mother. There are several social consequences for those experiencing adolescent pregnancy, which include a decreased potential with respect to educational, employment, and economic opportunities (Laugille, 2000).

In many sub-Saharan countries including Zambia, few sources of reproductive health information and counseling are available to adolescents. According to the Ministry of Health (1997), adolescents in Zambia are often marginalized from the current service delivery system due to restrictive national policies and traditional barriers. The Zambian Population Policy was restrictive in the sense that it targeted only adults in need of family planning services and it aimed at making such services available, accessible, and affordable by at least 30% of all adults by the year 2000 (Ministry of Health, 1997). Hence, adolescents were excluded from formal services (Ministry of Health, 1997). Traditionally, issues pertaining to sexuality are not discussed with adolescents in homes. Thus, adolescents remain excluded from guidance on sexuality and relationships within their homes (Ministry of Health, 1997). Opportunities to discuss reproductive health issues in safe, nurturing environments are often limited for adolescents still in school (Women's International Network News, 2001).

Despite increased knowledge and awareness among adolescents of the various consequences of adolescent reproductive risk behaviour, many adolescents continue to engage in risky behaviours. It is critical, therefore, to investigate the factors that

determine adolescent reproductive risk behaviour if undesirable reproductive health outcomes among adolescents are to be eliminated in Zambia.

#### Purpose of the Study

The purpose of the study is to identify underlying factors that determine adolescent reproductive risk behaviour in Zambia.

#### *Specific Objectives*

1. To describe the characteristics of adolescents who are defined as having low reproductive risk behaviour (adolescents who are using contraception) and adolescents who are defined as having high reproductive risk behaviour (adolescents who are not using contraception).
2. To identify factors associated with adolescent reproductive risk behaviour in Zambia.

#### Justification of the Study

Adolescence is a period of exploration and discovery where many young people start to experiment with new roles (Kowaleski-Jones & Mott, 1998). One area of exploration that involves a certain amount of risk-taking is sexual activity (Kowaleski-Jones & Mott, 1998). According to Health Canada (2001), “many behaviour patterns are established during this period of life that will affect a young person’s risk of HIV infection, both within this life span and throughout his/her adult years” (p. 1).

In Zambia, although there is enough evidence that adolescents are aware of the risks involved in early initiation into sexual activities and knowledge about contraception is almost universal, there seems to be little indication that this awareness has much impact on their sexual practices. According to the 2001-2002 ZDHS, the majority of women

become mothers by the age of 20, with 60 to 70% of all women in all age groups having given birth by that age (CSO et al., 2003). Giving birth at an early age indicates that a good proportion of adolescents continue to engage in sexual activities at an early age.

Therefore, there is need to identify factors influencing adolescent reproductive risk behaviour if the rate of adolescent unwanted pregnancy and associated complications during delivery, low birth weight and infant mortality, prevalence of HIV/AIDS and other STDs, infertility and abortion rates are to be reduced in Zambia. By avoiding reproductive risk behaviours, the adolescents' sexual and reproductive health would improve. Early intervention is an important step in helping adolescents adopt and maintain protective behaviours. Contraceptive utilization would save female adolescents' lives and improve their health by allowing them to avoid unwanted pregnancies and sexually transmitted diseases (Ministry of Health, 1997).

Identification of factors influencing adolescent reproductive risk behaviours can also give insights into what kind of prevention and protective programs can be put in place to reduce reproductive risk behaviour among adolescents. Programs that reduce reproductive risk behaviour might also have an important benefit of reducing sexually transmitted diseases and unintended pregnancies, as well as the number of abortions. In addition, factors contributing to reproductive risk behaviour among adolescents may vary by the background characteristics of the adolescents. Therefore, interventions designed to reduce reproductive risk behaviour among adolescents would also vary considerably across the target population. Hence, the study can provide insights into which subset of adolescents should be targeted for intervention.

## Chapter 2: Review of the Literature

The majority of research on sexual and reproductive health behaviours – contraceptive use; age at first sexual initiation; number of sexual partners; drinking alcohol; access to safe, effective, affordable family planning methods; and appropriate health care – has demonstrated that these behaviours have many commonalities: antecedents, consequences, and therefore, intervention pathways for promotion of health behaviour change are similar (Fisher & Fisher, 1992). Reproductive health, according to the International Conference on Population and Development (ICDP) that took place in Cairo in 1994, is defined as “a state of complete physical, mental and social well-being and not merely the absence of infirmity, in all matters relating to the reproductive system and its functions and processes” (Ingwersen, 2001, p. 1). Reproductive health has now been generally recognized as an important component of overall health and adequate sexual functioning that makes a significant contribution to human well-being.

### Defining Reproductive Risk Behaviour

Although researchers have defined reproductive risk behaviour in different ways, most of the findings are in agreement. Macleod (1999) defined risk-taking behaviour as behaviour that increases the chances of conception. Macleod included three kinds of behaviours in his definition, namely engagement in sexual intercourse, an earlier age at first coitus, and the non-use of contraceptives. To define sexual risk taking behaviour, Luster and Small (1994) considered three groups with different levels of risk in terms of multiple sexual partners and non-contraceptive use (high risk – adolescents who had more than one sexual partner and did not use contraception, low risk – adolescents who had only one sexual partner and used contraception, and abstainers – adolescents who

practiced sexual abstinence). Carr-Gregg, Enderby, and Grover (2003) defined risk behaviour as “behaviours that increase the likelihood of adverse physical, social, or psychological consequences” (p. 601).

Evaluating the role of “nothing to lose” attitudes on risky behaviour in adolescence, Harris and Duncan (2002) focused on three aspects of risk behaviour – early sexual behaviour, drug dealing, and weapon carrying. According to Harris and Duncan, these three aspects of risk behaviour have long-term consequences compared to other risk behaviours such as fighting or using marijuana, which may not have long-term consequences. The long-term consequences are in terms of poorer health outcomes and lower educational attainment.

It is apparent from the above definitions that researchers in the area of adolescence and reproductive risk behaviour have not come up with a universal definition of reproductive risk behaviour. Yet, regardless of definition, adolescents who are sexually active and do not use contraception are exposed to the risk of negative reproductive health outcomes. Several studies on adolescent reproductive risk behaviour have revealed various factors affecting adolescent reproductive health behaviour. However, these factors tend to vary from country to country.

#### Previous Research on Adolescent Reproductive Risk Behaviour

Previous studies on adolescent reproductive risk behaviour have revealed that a number of demographic, socio-economic, family, behavioural, and socio-cultural factors influence adolescent reproductive risk behaviour. Demographic factors include age at first sexual intercourse. Socio-economic factors include access to health services and poverty. Family factors include family structure and discussing family planning with

someone. Behavioural factors include drinking alcohol and self-efficacy. Social-cultural factors include a breakdown of traditions and the cultural value placed on fertility.

#### *Age at First Sexual Intercourse*

One of the critical indicators of the risk of pregnancy and sexually transmitted diseases is age at first sexual intercourse (Harris & Duncan, 2002). As a result, age at first sexual intercourse is of particular interest to sexual health educators and public health professionals. According to Maticka-Tyndale (2000), adolescents are bound to have a longer period of sexual activity before forming permanent or semi-permanent partnerships when they engage in sexual activities at an early age. During adolescence, sexual activity at an early age is often unplanned and unprotected by contraception (Forest & Singh, 1990). Dryfoos's study (as cited in Harris & Duncan, 2002) demonstrated that early initiation of reproductive risk behaviours such as sexual intercourse and involvement with drugs was associated with longer periods of risk-taking in later adolescence and early adulthood.

Similarly, Wu, Cherlin, and Bumpass (1997) found a relationship between age at first sexual intercourse and reproductive risk behaviour. Wu et al. found that adolescents are exposed to reproductive risk behaviour such as risk of pregnancy and sexually transmitted diseases over a long period of time when they begin having sex at younger ages. In their study of 265 white females, Van Coeverden de Groot and Greathead (1987) also found an association between age at first sexual intercourse and reproductive risk behaviour. A higher prevalence of multiple sexual partners and a longer period of unprotected intercourse were found among those who were young at first coitus (under

17 years) than those who were older (17-19 years) (Van Coverden de Groot & Greathead, 1987).

#### *Access to Health Services*

Adolescents face multiple barriers to accessing reproductive health services. A number of studies have found a relationship between access to health services and reproductive risk behaviour. Factors that discourage adolescents from using health services include a lack of privacy, insensitive staff, threatening environments, inability to afford services, location of health centres, and the fact that some services such as contraceptives require parental consent (Ingwersen, 2001). Of these factors that discourage adolescents from accessing health services, the most common factors are confidentiality and threatening environment, distance to health facilities, and contraceptive service restriction.

*Confidentiality and threatening environment.* Seabela (as cited in Macleod, 1999) demonstrated that pregnant teenagers were exposed to reproductive risk behaviour because of fear of going to the clinic (“image factor”) and lack of trust in the nurses concerning confidentiality. In their review of the literature on adolescent sexual behaviour, Brooks-Gunn and Furstenberg (1989) noted that lack of access to free and confidential family planning services leads to irregular contraceptive use, which was associated with reproductive risk behaviour.

*Distance to health facilities.* Preston-Whyte and Setiloane (as cited in Macleod, 1999) revealed that teenagers do not have easy access to contraceptive clinics. Furthermore, Ingwersen (2001) reviewed a study conducted in South Africa, which

demonstrated that many adolescents lack access to health services due to distance from and operating times of the health facilities.

*Contraceptive service restriction.* According to Alan Guttmacher Institute case studies, American youths are exposed to mixed messages about contraception and birth control services are not effectively delivered to the teenage population (Jones et al., 1985). The situation is not different in developing countries. A study of family planning providers in Ghana revealed that adolescents lack access to reproductive health services due to service restrictions that were enforced if the client was unmarried or young (Stanback & Twum-Baah, 2001). Unmarried adolescents in Ghana were denied appropriate reproductive and sexual health services because pre-marital sex was prohibited or frowned upon.

#### *Poverty*

Socio-economic disadvantage (poverty) has been found to be one of the major factors related to adolescent reproductive risk behaviour. Different researchers have studied the relationship between poverty and adolescent reproductive risk behaviour using different constructs to measure poverty. These constructs include low socio-economic status, low income, and number of people per dwelling. Income levels are strongly correlated with overall reproductive health outcomes. On a broad scale, countries with very high reproductive risk have low average incomes whereas countries with high average incomes have very low reproductive risk (Women's International Network News, 2001). In a survey of 120 "non-white" pregnant adolescents in Paarl, De Villier and Clift (as cited in Macleod, 1999) found fewer pregnancies among adolescents whose parents had higher incomes. Furthermore, Craig and Richter-Strydom (1983)

found that pregnant girls were more likely to come from families of the lower socio-economic status group.

Harris and Marmer (1996) have also linked poverty to adolescent reproductive risk behaviour. In their study, adolescents from low-income families were more likely to engage in delinquent acts, have early and unprotected sexual intercourse, and were more likely to experience adolescent pregnancy. In a study conducted in South Africa using a sample of 145 black teen mothers, Boulton and Cunningham (1992) found an association between teenage pregnancy and poverty. In this study, poverty was defined in terms of the number of people per dwelling. The authors found that teenage mothers came from homes with many people in a dwelling. The average number of rooms per dwelling was 3.15 with the mean number of people per dwelling being 6.8.

#### *Family Structure*

Family structure is another factor that determines adolescent reproductive risk behaviour. According to Macleod, “the structure and organization of a family is seen as contributing firstly to early sexual initiation, and secondly to teenage pregnancy” (1999, p. 10). He further noted that the most problematic type of structure is the single-parent or female-headed household (Macleod, 1999). Harris and Duncan (2002) revealed that adolescents living in single-parent family structures have significantly higher risk of first sex at younger ages than adolescents living with both parents. The single-parent family structure provides a social environment for an adolescent that increases the risk for adolescent reproductive risk behaviour (Harris & Duncan, 2002). According to Dornbusch et al. (1985), the rise in single-parent families and the huge influx of mothers

into the labour market means that adolescents now spend less time with parents or adults, leaving greater time unsupervised and with peers.

I found little recent literature on the relationship between family structure and reproductive risk behaviour. In their earlier work, Van Coeverden de Groot and Greathead (1987) found the percentage of adolescents from single-parent family structures to decrease with increasing age at first coitus. They found that 37% of adolescents who had experienced coitus under the age of 17 years came from single-parent families compared to only 12% of adolescents who delayed coitus until over the age of 19 years. Dornbusch et al. (1985) reported similar findings. They noted that adolescents are more likely to engage in health compromising behaviours, including delinquency, violence and unprotected sex, when they are from single-parent families than two-parent families. Kirby (2003) also noted that adolescents who live with both parents are less likely to engage in unprotected sex and become pregnant. He further revealed that when adolescents live with both parents as opposed to one parent, they are more likely to use contraception if they have sex.

Contrary to most research findings on the relationship between adolescent reproductive risk behaviour and family structure, Buga, Amoko, and Ncayiyana (1996) found no difference between adolescents who engage in reproductive risk behaviour and those who do not engage in reproductive risk behaviour in terms of whether they were living with both parents or not. Hence, the findings on the relationship between family structure and reproductive risk behaviour are not unanimous.

*Discussing Family Planning with Someone*

Literature on adolescents discussing family planning with another person is scant. Although discussing family planning with someone can play a significant role in predicting adolescent reproductive risk behaviour, none of the studies I came across investigated this relationship. However, two studies found discussing family planning, specifically with parents, to play a significant role in determining reproductive risk behaviour. For example, using logistic regression analysis to identify predictors of sexual risk behaviour, Luster and Small (1994) found discussing birth control with the mother to be a significant predictor of sexual risk taking. Adolescents who discussed birth control with the mother were less likely to be sexual risk takers. In their review of the literature, Luster and Small noted that a lack of communication between mothers and daughters was one of the family factors associated with irregular contraceptive use.

Similarly, Newcomer and Udry (1985) revealed that sexually active adolescents who discuss sexual issues with their parents are more likely to use contraceptives than adolescents who do not discuss such issues with their parents. Hence, a gap in the literature is the lack of focus on other people that female adolescents can possibly discuss family planning with such as partners/boyfriends, sisters, friends, neighbours, and other relatives.

*Drinking Alcohol*

Drinking alcohol is another factor that has been associated with adolescent reproductive risk behaviour. Evidence suggests that drinking alcohol, using marijuana, having substance use problems, and having peers who drink are strongly associated with sexual activity (Kowaleski-Jones & Mott, 1998). Kowaleski-Jones and Mott further

demonstrated that drinking alcohol is associated with not using birth control among female adolescents. Similarly, Luster and Small (1994) found alcohol consumption to be a significant predictor of sexual risk taking behaviour. Consistent with these findings, earlier work by Metzler, Noell, and Biglan (1992) also found a correlation between sexual risk taking behaviour and use of alcohol.

Moon, Meyer, and Grau (as cited in Carr-Gregg et al., 2003) revealed an association between excessive use of alcohol and health risk behaviours such as unsafe sex. Kirby (2003) also revealed that the use of alcohol and drugs among female adolescents increased their chances of engaging in unprotected sex and becoming pregnant. Kasen, Vaughan, and Walter (as cited in Bandura, 1997) pointed out that alcohol and drug use diminishes rational decision-making thereby increasing the incidence of unprotected sex for both male and female adolescents. Kasen et al. further demonstrated that drugs and alcohol lower adolescents' perceived efficacy to adhere to safer sex practices. Hingson, Strunin, and Berlin's (1990) finding of an association between use of alcohol and increasing reproductive risk behaviour was later supported by Kasen et al.'s 1992 study.

In summary, age at first sexual intercourse, access to health services, poverty, family structure, discussing family planning with someone, and drinking alcohol have been strongly linked to adolescent reproductive risk behaviour. However, these are not the only factors that determine adolescent reproductive risk behaviour. Other factors that have been found to predict adolescent reproductive risk behaviour include self-efficacy, parental monitoring, grade point average, peer influence, religion, and cultural traditions.

*Self-efficacy*

Data on self-efficacy, the belief that one has the ability to successfully exercise personal control over sexual situations, is scarce. However, the few studies that have investigated the relationship between self-efficacy and reproductive risk behaviour have found self-efficacy to contribute to adolescent reproductive risk behaviour. Self-efficacy influences the adolescent's ability to decide whether to use contraception or not, which in the long run is one of the factors that determine reproductive risk behaviour.

Self-efficacy is a gender issue. Some adolescents may fail to exercise self-efficacy because of their gender. For example, the Population Reference Bureau (1994) revealed that some sexual relationships among young women in Sub-Saharan Africa involve exchange of money or gifts. Further, the power imbalance in a relationship involving young women receiving payment makes it difficult for them to refuse sex, or negotiate condom or contraceptive use. Gender issues are, therefore, of particular concern for the sexual health of adolescent women.

According to Laugille (2000) "constructs of masculinity and femininity have dramatic impacts on sexual relationships, determining to a significant extent, health outcomes" (p. 3). In the same study, it was demonstrated that women are subjected to both subtle and overt sexual pressure from men, and younger women in particular may defer decisions about sexual health to their male partners. The power structures of such relationships can play a significant role in reproductive risk taking and in negative outcomes such as pregnancy (Landry & Forrest, 1995).

According to Kowaleski-Jones and Mott (1998), self-efficacy is an important determinant of sexual activity. Bandura (1997) also argued that when the perceived self-

efficacy to exercise personal control is weak, social and affective factors such as desire for social acceptance, coercive pressures, situational constraints, fear of rejection, and personal embarrassment can increase the chances of early or risky sexual behaviour.

Early sexual behaviour is a more negative and problematic phenomenon for women than it is for men (Kowaleski-Jones & Mott, 1998). In my experience the chance that adolescents will jeopardize their future by engaging in reproductive risk behaviour at an early age is unquestionably higher for female adolescents than it is for male adolescents. In Zambia, the consequences of unwanted pregnancies are born by women. Some of the consequences female adolescents face include being kicked out of the home, dropping out of school, and being left alone to take care of their children. Bandura (1997) asserted “teenage parenthood imposes socioeconomic hardships and jeopardizes certain life courses for young mothers and their offspring” (p. 181). Hayes (1987) noted that young child bearers are more likely to drop out of school and find it harder to secure gainful employment.

### *Parental Monitoring*

Few studies have linked parental monitoring to adolescent risk taking behaviour. For example, Luster and Small (1994) found parental monitoring to be a significant predictor of adolescent sexual risk taking. Adolescents with low levels of parental monitoring were more likely to be sexual risk takers (Luster & Small, 1994). Similarly, DiClemente (2001) found a relationship between parental monitoring and adolescent sexual behaviour. The results of his survey of 522 black females from low income families aged 14-18 years old indicated that girls were less likely to use contraception during the most recent sexual encounter if they perceived less parental monitoring

(DiClemente, 2001). Kirby (2003) noted that adolescents are less likely to have unprotected sex if their parents monitor them.

#### *Grade Point Average*

Grade point average contributes to adolescent risk taking behaviour. In a study of factors associated with sexual risk taking behaviour among adolescents, Luster and Small (1994) found grade point average to be a significant predictor of adolescent sexual risk taking. Adolescents with low grade point averages were more likely to be sexual risk takers (Luster & Small, 1994). Similarly, Metzler et al. (1992) found a correlation between sexual risk taking behaviour and poor academic performance. Furthermore, Kirby (2003) also noted that good academic performance leads to later initiation of sexual activities among adolescents, and adolescents are more likely to use contraception effectively if they do engage in sexual activities.

#### *Peer Influence*

Peer influence is another factor that has been associated with adolescent reproductive risk behaviour. Kowaleski-Jones and Mott (1998) found a statistically significant relationship between spending time with peers and reproductive risk behaviour among female adolescents. Kirby (2003) noted that adolescents are more likely to engage to sexual activities when they believe that their peers are engaging in sexual activities. Buga et al. (1996) found that their sexually experienced sample of 20% indicated peer pressure as the reason for initiating sexual activity.

#### *Religion*

Religion has been somewhat linked to adolescent reproductive risk behaviour. Kirby (2003) revealed that adolescents' chance of engaging in sex might be reduced if

they are attached to faith communities. However, evidence supporting the relationship is not strong (Kirby, 2003). He further revealed that adolescents are less likely to initiate sex by any given age if they perceive themselves to be more religious, attend religious services more frequently, and have a strong religious affiliation. Kirby also pointed out that the direction of the relationship is not clear.

### *Cultural traditions*

Few studies have investigated the relationship between cultural traditions and adolescent reproductive risk behaviour. According to Macleod (1999), sexual behaviour among unmarried teenagers leading to pregnancy is as a result of the breakdown of traditional values and sexual control measures. Studies elsewhere such as in Africa (Kulin, 1988), and the United States (Reynoso, Felice, & Shragg, 1993), have pointed out that the process of acculturation has broken down the traditional culture that controlled sexual behaviour among adolescents.

From the review of the literature, it is evident that most of the work on adolescent reproductive risk behaviour has been conducted in developed countries such as the United States (Brooks-Gunn & Furstenberg, 1989; Harris & Duncan, 2002; Kirby, 2003; Kowaleski-Jones & Mott, 1998; Luster & Small, 1994), Australia (Carr-Gregg et al., 2003), and Canada (Maticka-Tyandale, 2000). Only a few studies have been conducted in developing countries such as South Africa (Macleod, 1999; Van Coeverden de Groot & Greathead, 1987; Women's International Network News, 2001) and Ghana (Stanback & Twun-Baah, 2001).

Although there are many factors that may influence adolescent reproductive risk behaviour, the present study is limited to six variables: age at first sexual intercourse,

access to health services, number of household members, family structure, discussing family planning with someone, and drinking alcohol. These variables were selected and used in the present study partly because previous studies have found them to be good predictors of adolescent reproductive risk behaviour and partly because data pertaining to the six variables was collected in the 2001-2002 ZDHS on which the present study is based. One potential variable, self-efficacy could not be used because the question on self-efficacy was not asked of unmarried adolescents in the 2001-2002 ZDHS. In addition, these variables capture demographic (age at first sexual intercourse), socio-economic (access to health services and number of household members), family (family structure and discussing family planning with someone), and behavioural factors (drinking alcohol) affecting adolescent reproductive risk behaviour.

#### Adolescent Contraceptive Use

According to the 2001-2002 ZDHS, family planning is defined as a way of regulating fertility to either limit family size or delay the next pregnancy (CSO et al., 2003). However, young women are adopting family planning even before they start having children. Contraceptive methods can be classified into two categories – modern and traditional methods. There are several modern contraceptive methods such as female or male sterilization, the pill, the IUD, injectables, implants, male and female condoms, vaginal methods (including foam tablets, diaphragms, and jelly), and emergency contraception. Traditional methods include the lactational amenorrhoea method (LAM), rhythm or natural family planning, withdrawal, and herbs, roots, strings and beads. Both modern and traditional methods regulate fertility. However, the effectiveness of these methods may not be the same.

In both developed and developing countries, not all adolescents are choosing to use contraception. The 2001-2002 ZDHS shows that the percentage of adolescents who were not using contraception was 87.1% (CSO et al., 2003). The reasons why adolescents are not choosing to use contraception are many and tend to vary across the country. In addition, the extent to which pre-marital sex among adolescents is acceptable also tends to vary.

In developed countries, some studies that have investigated factors affecting adolescent non-contraceptive use reveal that there are several reasons why adolescents do not use contraception. For example, in studying the resistance to contraceptive use in young Italian women, Dei et al. (2004) demonstrated that young age, poor knowledge of the partner, an older partner and living in an incomplete family nucleus or outside the family represents significant risk factors. Breheny and Stephens (2004) investigated the barriers to effective contraception among adolescent mothers in New Zealand. In their study, they found that adolescent mothers faced barriers to effective contraception use before they became pregnant. These barriers included indifference (lack of concern over the possibility of getting pregnant), invulnerability (belief that they could not get pregnant), and forgetting to use contraception.

In her study of failure of adolescents to use contraception, Walling (1996) demonstrated that adolescents have various reasons for not using contraceptives at the time of conception. The most reported reasons for not using contraception were lack of concern over the possibility of getting pregnant and wanting to become pregnant. Other reasons that were cited included contraceptive failure, partners wanting them to get

pregnant, fear of side effects, forgetting to use contraception, unplanned sex, and not getting around to using contraception.

In developing countries, adolescents experience more or less similar failures to contraceptive use as in developed countries. The 2001-2002 ZDHS revealed several factors influencing adolescents' non-contraceptive use (CSO et al., 2003). According to this survey, adolescents' reasons for not using contraceptives included not being married, fear of side effects, lack of contraception knowledge, subfecund (belief that the adolescent is infertile), infrequent sex, and respondent opposition (CSO et al., 2003). Other factors cited by a few adolescents included health concerns, interference with the body, lack of knowledge of the source, religious prohibition, lack of access, and inconvenience to use (CSO et al., 2003). A study conducted in Ghana revealed that reproductive health service restrictions imposed on unmarried female adolescents discouraged them from using contraceptives. As noted earlier, Ingwersen (2001) pointed out that factors such as a lack of privacy, insensitive staff, threatening environments, inability to afford services, location of health centres, and the fact that some services such as contraceptives require parental consent discourage adolescents from using health services.

Generally, moral issues particularly regarding pre-marital sex do exist in developing countries, Zambia in particular. Adolescents are not expected to engage in pre-marital sexual activities. However, this expectation does not stop them from engaging in pre-marital sexual activities. I would speculate that adolescents in urban areas are more likely to engage in pre-marital sexual activities than their peers in rural areas because of the environment factor. Some adolescents in urban areas have private spaces such as

rooms in colleges or universities that would promote pre-marital sexual activities. Data from the 2001-2002 ZDHS show that nearly half of the adolescents had experienced pre-marital sexual intercourse by age 19. On the other hand, adolescents in “serious” relationships that are likely to end up in a stable relationship may to some extent engage in pre-marital sex without being stigmatized by society.

As noted earlier, most of the studies that have been done on adolescent reproductive risk behaviour have been conducted in developed countries. In the next section, the theoretical framework that has been used to study adolescent reproductive risk behaviour is presented. This model originated in, and has been applied to, adolescent reproductive risk behaviour in more developed countries. Therefore, it is critical to investigate whether or not the selected variables, which have been significant in studies in more developed countries, produce similar findings in terms of predicting reproductive risk behaviour in a developing country like Zambia.

### Theoretical Framework

Adolescents’ risk-taking behaviour has been analyzed from several theoretical approaches such as Sexual Behaviour Sequence (Byrne, 1977), the AIDS Risk Reduction Model (Catania, Kegeles & Coates, 1990), and the Information-Motivation-Behavioural Skills Model (Fisher & Fisher, 1992). All these approaches have been developed and applied specifically within the area of sexual and reproductive health (Fisher & Fisher, 1998). In this study, the Information-Motivation-Behavioural (IMB) Skills Model proposed by Fisher and Fisher (1998) has been adopted and modified as the basis for understanding the determinants of adolescent reproductive risk behaviour. According to Fisher and Fisher (1998), the IMB Skills Model is specific, comprehensive, has

comparative parsimony, empirical support, and is relevant to sexual and reproductive health behaviour. On this basis, the IMB Skills approach has been preferred to many other approaches such as the Sexual Behaviour Sequence, the AIDS Risk reduction Model, and Social Cognitive Theory.

The IMB Skills model conceptualizes the psychological determinants of sexual and reproductive health behaviour (Byrne, Kelley & Fisher, 1993; Fisher, 1997). The theory focuses comprehensively on three factors: information, motivation, and behaviour skills. These factors are linked, conceptually and empirically, to the understanding of sexual and reproductive health behaviours (Fisher & Fisher, 1998).

The IMB model asserts that the fundamental determinants of initiation and maintenance of sexual and reproductive health behaviours are sexual and reproductive health information, motivation to act on this information, and behavioural skills for acting on it effectively (Fisher & Fisher, 1998). According to Fisher and Fisher, sexual and reproductive health behaviour affect an individual's sexual and reproductive health information and motivation primarily through his or her behavioural skills. The model also asserts that there may be direct links between sexual and reproductive health behaviour information or motivation and the performance of sexual and reproductive health behaviours in situations in which complicated or novel behavioural skills are not required for the performance of sexual and health behaviours (Fisher & Fisher, 1998).

Finally, the IMB model specifies that individuals who are well informed about these behaviours are not necessarily well motivated to practice them, and individuals who are well motivated are not necessarily well informed about how to do so and as such, sexual and reproductive behaviour information and motivation are relatively independent

constructs. Fisher and Fisher (1998) asserted, however, that these constructs would be relevant to specific sexual and reproductive health behaviours and to particular populations at risk as a result of their specific content. Furthermore, the IMB model assumes more or less powerful determinants of specific sexual and reproductive health behaviour within specific populations of interest will emerge due to the model's specific constructs and specific casual paths among them (Fisher & Fisher, 1998).

This framework proposed by Fisher and Fisher (1998) has been adopted and modified in the present study to analyze adolescent reproductive risk behaviour and to investigate the significant factors influencing adolescent reproductive risk behaviour in Zambia. Although the model has been utilized mostly in developed countries, it is expected to hold cross culturally. However, the application of the IMB Skills model to research being conducted in developing countries is still in its infancy. For example, as Macleod (1999) pointed out, research on risk-taking behaviour in South Africa is mainly descriptive in nature whereas in the United States, researchers have extended research on risk-taking behaviour to investigating the factors associated with risk-taking behaviour and to developing cognitively based theoretical models, which would be relevant to understanding adolescent risk behaviour.

The IMB Skills model has been developed and utilized in the area of sexual and reproductive health. Based on the review of the theoretical framework, an operational model for understanding the determinants of adolescent reproductive risk behaviour has been developed and presented in Figure 1.

*Operational Hypotheses*

The following hypotheses were tested in this study:

1. Age at first sexual intercourse is associated with adolescent reproductive risk behaviour. Adolescents who initiate sexual activities at an early age are more likely to engage in reproductive risk behaviour than adolescents who do not initiate sexual activities at an early age (age at first sexual intercourse hypothesis).
2. Access to health services is associated with adolescent reproductive risk behaviour. Adolescents who have access to health services are less likely to engage in reproductive risk behaviour than adolescents who do not have access to health services (access to health services hypothesis).
3. Number of household members is associated with adolescent reproductive risk behaviour. Adolescents are more likely to engage in reproductive risk behaviour when there are many people in the dwelling than when there are a few people in the dwelling (number of household members hypothesis).
4. Family structure is associated with adolescent reproductive risk behaviour. Adolescents in female-headed family structures are more likely to engage in reproductive risk behaviour than their peers from male-headed or two-parent family structures (family structure hypothesis).
5. Discussing family planning with someone is associated with reproductive risk behaviour among adolescents. Adolescents who discuss family planning with someone are less likely to engage in reproductive risk behaviour than adolescents who do not discuss family planning with anyone (discussing family planning with someone hypothesis).

6. Drinking alcohol is associated with adolescent reproductive risk behaviour. Adolescents who drink alcoholic beverages are more likely to engage in reproductive risk behaviour than adolescents who do not drink alcoholic beverages (drinking alcohol hypothesis).

Adolescent reproductive risk behaviour is an important health issue and a number of variables have been used to study this risky behaviour. Based on literature on adolescent reproductive risk behaviour and the IBM Skills model, six hypotheses were drawn. The present study used data from the 2001-2002 ZDHS and logistic regression analysis to test the hypotheses. The study explores whether or not these variables are useful in describing female Zambian adolescent's reproductive risk behaviour.

### Chapter 3: Methodology of Data Collection and Analysis

The following sections describe the source of data, the sample design, the method of data collection, and the quality of data. The variables of interest are defined, and variable measurement and the type of analysis that was used in the study is described.

#### *Source of Data*

This study is based on data from the 2001-2002 ZDHS, which was conducted by the Central Statistical Office and the Central Board of Health (CSO et al., 2003). Approximately 8,200 households in the nine provinces were selected for the survey. Surveyors successfully interviewed 7,658 women of reproductive age (15-49). The response rate for women was 96%. The response rate is high and it is quite rare in most surveys. Although the data does not provide specific information on how such a good response rate was achieved, a good response rate can be attributed in part to the extensive training in interviewing techniques the interviewers went through before the survey was implemented. In addition, the survey questionnaires were pre-tested and translated in seven dominant languages spoken in Zambia to ensure that the interviewees understood the questions.

Of the 7,658 women interviewed, 1,732 of them were unmarried female adolescents in the age group 15-24 years (CSO et al., 2003). Within the sample of 1,732 unmarried female adolescents, 871 (50.3%) had not had sexual experience and 861 (49.7%) of them had sexual experience. Of the 861 adolescents who had sexual experience, 744 (86.4%) were not using contraception and 110 (12.8%) were using contraception. The number and percentage of the missing cases was 7 (0.8%).

The purpose of the 2001-2002 ZDHS was to “provide information on fertility, family planning, child survival and health of children” (CSO, et al., 2003, p.5). The survey also provides information on marriage and sexual activity, and awareness and behaviour regarding AIDS and other sexually transmitted diseases (STDs). This information allows examination of reproductive risk behaviour. Information on socio-economic, socio-cultural, family, and demographic background characteristics of the respondents was also provided. This information makes it possible to identify factors influencing adolescent reproductive risk behaviour, on which the present study focuses.

### *Sample Design*

The survey was designed principally to provide current and reliable estimates for key population and health indicators for each of the nine provinces in Zambia (CSO et al., 2003). The design for the ZDHS called for a nationally representative probability sample of approximately 8,000 private households in the country. All women in the sampled households between the ages of 15 and 49 years completed individual interviews (CSO et al., 2003); therefore, a repeated measures problem exists because women in the same household may tend to give similar responses to the survey questions. Similar responses would be given due to the influence of the environment in which they live. The 2001-2002 ZDHS had no information that could be used to account for repeated measures.

The frame for the ZDHS sample selection was based on a list of Standard Enumeration Areas (SEAs) that was prepared for the 2000 Population Census. The 2001-2002 ZDHS sample consisted of 320 clusters: 100 from urban and 220 from rural areas. The technique used for selecting the clusters was a stratified two-stage cluster design

(CSO et al., 2003). Systematic sampling technique was used in the final stage to select households from each of the selected SEAs.

#### *Data Collection*

Data for the 2001-2002 ZDHS was collected using three types of questionnaires: the Household Questionnaire, the Women's Questionnaire and the Men's Questionnaire. The Demographic Health Survey Model Questionnaire, which was designed by technical institutions, local, and international organizations for use in countries with low levels of contraceptive use, was used in the construction of the questionnaires (CSO et al., 2003). The questionnaires were developed in English and then translated and printed in the seven most widely spoken languages: Bemba, Lozi, Lunda, Luvale, Nyanja, Kaonde, and Tonga (CSO et al., 2003).

The Household Questionnaire was used to collect information on the background characteristics of each person listed in the SEA, which included sex, age, level of education, access to health services, and sex of the head of the household (family structure). The ZDHS also collected information on individuals' attitudes and behaviours regarding substance use such as drinking alcohol and smoking cigarettes or tobacco (CSO et al., 2003).

The Women's Questionnaire was used to collect information on knowledge and use of family planning methods, marriage and sexual activity, and fertility preferences (CSO et al., 2003). Information on awareness and behaviour regarding AIDS and other sexually transmitted infections (STIs) was also collected (CSO et al., 2003). The majority of the questions asked in the Women's Questionnaire were also asked in the Men's

Questionnaire except men were not asked questions pertaining to their reproductive history, maternal and child health, nutrition, or maternal mortality (CSO et al., 2003).

### *The Quality of ZDHS Data*

The main problem with survey data in Africa is that of quality; hence its effectiveness is not as high as in vital registration systems and well-planned censuses, and as a result obtaining reliable estimates of demographic information has become increasingly difficult (Kpedekpo, 1982). Despite the general ineffectiveness of survey data, measures were put in place during the implementation of the 2001-2002 ZDHS to maximize the quality of the survey data. For example, the 2001-2002 ZDHS had a very high response rate of about 96%.

There are two types of errors that arise as a result of using sample surveys. These are non-sampling errors and sampling errors. Non-sampling errors occur when data collection and data processing are not carried out properly. For example, some errors occur when interviewers cannot find the sampled household, misconstrue the questions or make mistakes during data entry (CSO et al., 2003). Generally, non-sampling errors are inevitable and not easy to evaluate statistically (CSO et al., 2003). Hence, they reduce the quality of the data.

However, a number of measures were undertaken to minimize non-sampling errors. The sample for the 2001-2002 ZDHS was selected from a recently updated SEA frame. The sample for the ZDHS was made as representative as possible by the use of a stratified two-stage cluster design and systematic sampling of the households. All questionnaires were translated into seven dominant languages spoken in Zambia to ensure that both the interviewer and the interviewee understood the questions and the

questions were pre-tested. Interviewers were trained and mock interviews were conducted among the trainees to ensure high quality data collection (CSO et al., 2003).

Sampling errors are the other type of errors that reduce the quality of survey data. These errors are due to sampling bias arising from the survey or failure to carry out the sampling design precisely. "The sample of respondents selected in the 2001-2002 ZDHS is only one of many samples that could have been selected from the same population, using the same design and expected size" (CSO, et al., 2003, p. 259). However, unlike non-sampling errors, sampling errors can be evaluated statistically, usually by means of the standard error. For the majority of the estimates, the standard error for the entire country is small with an exception of very small proportion estimates (CSO et al., 2003).

Despite the above limitations, the 2001-2002 ZDHS data is of high quality in the sense that measures were put in place to try and minimize both sampling and non-sampling errors. In addition, a representative sample was obtained and it is the most current data available at the national level in the country. Therefore, the survey data is expected to provide current information on the determinants of adolescent reproductive risk behaviour in Zambia.

## Measures

### *Reproductive Risk Behaviour*

Reproductive risk behaviour was measured using the variable current contraceptive use. Current contraceptive use was determined in the survey by asking adolescents their use of contraceptive method within the 12 months preceding the survey. Nine responses were recorded: not using any contraceptive method, pill, injections, condoms, periodic abstinence, withdrawal, lactational amenorrhea, female condom, and

herbs, roots, strings and beads. It should be noted that the variable current contraceptive use does not necessarily imply that adolescents were using contraception reliably.

Furthermore, it does not also imply that all the methods of contraception adolescents were using were equally effective. Rather the variable current contraceptive use focuses on adolescents who are more likely users of contraception.

For the purpose of the present study, current contraceptive use was collapsed to create a dichotomous variable (reproductive risk behaviour) with the categories of “not using contraceptives” or “using contraceptives.” Adolescents with high reproductive risk behaviour are defined as not using contraception. Adolescents with low reproductive risk behaviour are defined as using contraception. Adolescents who have had no sexual experience are defined as abstainers. Abstainers are excluded from the analyses.

#### *Age at First Sexual Intercourse*

Unlike previous ZDHS surveys where age at first marriage was used as a proxy for first exposure to intercourse, the 2001-2002 ZDHS asked women how old they were when they first had sexual intercourse. The response was either actual age in years or never had sexual intercourse. For descriptive analysis, the original variable age at first sexual intercourse was recoded into five categories: 8-11 years, 12-14 years, 15-17 years, 18-20 years, and 21-23 years. This categorization was selected to ensure that the age of adolescents who initiate sexual activities at an early age could be differentiated from the age of adolescents who initiate sexual activities later. For the multiple logistic regression analysis, the variable age at first sexual intercourse was recoded into three categories: 8-14 years, 15-17 years, and 18-23 years.

*Access to Health Services*

To assess whether or not adolescents had access to health services, adolescents were asked whether or not they had problems getting medical help for themselves in regard to distance to health facility. Although adolescents were asked about distance to health facility, only two categories were defined for this variable: had distance problem (no access to health services) and none (no distance problem, therefore, had access to health services). The variable access to health services was treated as a dummy variable and no changes were made to the variable.

*Number of Household Members*

The number of household members in the present study was assessed using the variable the number of household members per dwelling. In the survey, adolescents were asked the number of people in the household. Responses ranged from 1 to 26 household members. For both descriptive and multivariate analyses, the variable was recoded into three categories: 1 to 5 household members, 6 to 10 household members, and 11+ household members. The variable was recoded into three categories to represent household composition because the mean household size for the 2001-2002 ZDHS was 5.2 persons (CSO et al., 2003). The implication is that a household size of about 5 people is considered average in Zambia and hence does not represent many people in the household. The second category, 6-10 household members, represents many people in the household and the last category, 11+ household members, would represent too many people in the household. In Zambia, a household with 11+ household members would be considered to have too many people in the household.

*Family Structure*

To determine family structure, adolescents were asked the sex of the head of the household. There were two responses for this question: male or female. Macleod (1999), Coeverden de Groot and Greathead (1987), Dornbusch et. al (1985) and Dornbusch and Gray (1988) also defined family structure in terms of male or female-headed households. For the purpose of this study, female-headed households can also be referred to as single-parent family structures and male-headed households as two-parent family structures. It is important to note, however, that the ZDHS data does not provide enough information to be able to identify whether female-headed and male-headed households had partners present or not. Generally in the Zambian context, a female is the head of household only when the male is absent due to various reasons such as divorce, separation, death, or if the female is unmarried. A male, on the other hand, is the head of the household whether the wife is absent or not.

According to the implementers of the 2001-2002 ZDHS, collection of information on the characteristics of household composition is vital, particularly the sex of the head of the household because female-headed households are typically poorer than male-headed households (CSO et al., 2003). This fact might imply that a male-headed household is considered to be a two-parent household and possibly dual-earner whereas a female-headed household is likely a single-earner household. Alternatively, males in the labour force generally occupy better positions than females implying higher salaries for men than women, which make the female-headed household poorer. The variable family structure was treated as a dummy variable. No changes were made to the variable.

*Discussing Family Planning with Someone*

Adolescents were asked whether they discussed family planning with someone or not. A dummy variable was created for the variable discussing family planning with someone. Five variables were used in computing the dummy variable discussing family planning with someone. The five variables include discussing family planning with the partner/boyfriend, mother, sister, friends or neighbours, and other relatives. This variable was measured as follows: yes or no.

*Drinking Alcohol*

As part of the 2001-2002 ZDHS survey, adolescents were asked the number of days they drank alcohol in the last 3 months. The responses were never drank alcoholic beverages, did not drink alcoholic beverages in the last 3 months, and actual number of times drunk alcoholic beverages, which ranged from 1 to 30. For both descriptive and multiple logistic regression analyses, the original variable drinking alcohol was recoded into two categories: does not drink alcoholic beverages and drinks alcoholic beverages. It is important to note that adolescents who reported that they did not drink alcoholic beverages in the last 3 months were included in the category of adolescents who drink alcoholic beverages. This is because in spite of the fact that this group of adolescents did not drink alcoholic beverages in the last 3 months, they did drink alcoholic beverages at one point or the other more than 3 months preceding the survey.

*Coding the Categorical Variables*

The Statistical Package for the Social Sciences (SPSS) program code was used to create the new variables for variables declared as categorical. However, some values of the independent variables in this study were recoded by creating new sets of variables.

For instance, age at first sexual intercourse, number of household members, and drinking alcohol are variables that could have been assessed on a continuous scale. However, the three variables age at first sexual intercourse, number of household members, and drinking alcohol could not be treated as continuous variables in this study. As hypothesized, the study focuses on specific categories of adolescents' characteristics such as adolescents who engage in reproductive risk behaviour at an early age or later age, having a few or many household members, and drinking alcohol or not.

To create dummy variables for independent variables with more than two categories, the number of new variables required to represent the variable is one less than the number of categories (Norušis, 1994). Two dummy variables were derived from the variable age at first sexual intercourse. Also, two dummy variables were derived from the variable number of household members. The method of creating dummy variables for categorical variables involved setting a single categorical variable equal to 1 for each of the groups of interest, 0 otherwise.

The dichotomous predictor variables were access to health services, family structure, discussing family planning with someone, and drinking alcohol. For these variables, the reference category were having access to health services, male-headed family structure, discussing family planning with someone, and does not drink alcoholic beverages, respectively.

The full model with all of the predictor variables was used in this study to test the significance of each variable. For both the age at first sexual intercourse dummy variables (2) and the number of household members dummy variables (2), the likelihood ratio test was used to determine the overall statistical significance of these variables. A test of the

difference in the deviance for regression models with and without the variable in question was used to test for the significance of a single variable (Pampel, 2000).

In the first step, the difference between -2 log likelihood for the reduced model (the model without the variable) and the full model (the model with all the variables) was calculated. This difference is distributed as a  $\chi^2$  statistic.

In the second step, the calculated  $\chi^2$  statistic was compared to the chi-square table with degrees of freedom determined by the difference in the number of regression parameters in the two models (Pampel, 2000). The chi-square value tests the null hypothesis that all coefficients other than the constant equal 0. The alternative hypothesis states that all coefficients are not equal to 0.

#### Method of Data Analysis

SPSS was used for data analysis (Norušis, 1999). Data analysis was carried out in two stages – descriptive analysis in the first stage and multiple logistic regression analysis in the second stage. Correlation analysis was also used.

#### *Descriptive Analysis*

Descriptive techniques were used to characterize the sample, the predictor variables, and the dependent variable (Dowdy, Wearden & Chilko, 2004). The predictor variables used in the analysis were age at first sexual intercourse, access to health services, number of household members, family structure, discussing family planning with someone, and drinking alcohol. The dependent variable was reproductive risk behaviour. Reproductive risk behaviour had two categories: high reproductive risk behaviour (not using contraception) and low reproductive risk behaviour (using

contraception). Univariate techniques were used to test the relationship between the dependent variable and each of the predictor variables using cross tabulations.

#### *Correlation Analysis*

To assess whether or not there was multicollinearity among the predictor variables, correlation analysis was conducted. Correlation analysis is a procedure that describes the direction and magnitude of a relationship between two variables (Polit, 1996). Correlation coefficients range in value from -1 (a perfect negative relationship) to +1 (a perfect positive relationship); a value of 0 indicates no relationship. In the present study, correlation coefficients were computed using the non-parametric Kendall's tau b. Kendall's tau b was an appropriate correlation technique to use because the variables are categorical. Furthermore, variables such as age at first sexual intercourse, number of household members, and drinking alcohol have ordered categories.

#### *Logistic Regression Analysis*

To test the hypotheses, multiple logistic regression was conducted on the outcome variable (the high reproductive risk group and the low reproductive risk group). Logistic regression is a suitable technique for analyzing the relationship between a dichotomous outcome and a number of explanatory variables (Rice, 1994). It is therefore an appropriate technique to use in this study. Logistic regression analysis can identify significant factors that determine adolescent reproductive risk behaviour in Zambia. It is important to note that adolescents who had no sexual experience were not included in the analyses.

Logistic regression technique was also used to classify cases with respect to the categorical dependent variable. Each subject's probability of being a positive case is

computed based on the logistic regression equation (Polit, 1996). The dependent variable was dichotomized to be coded 1 for adolescents having high reproductive risk behaviour scores (above 50) and 0 otherwise. Therefore, if the probability of an adolescent having high reproductive risk behaviour is greater than .50, the case is classified as a positive case. Using .50 as the cutoff value for classification, adolescents who had probabilities greater than .50 were classified as having high reproductive risk behaviour in the present study.

### Interpreting the Regression Coefficients

Logistic regression translates the probability that an outcome will occur into its odds, and the odds of an event is defined as the ratio of the probability that it will occur to the probability that it will not (Polit, 1996). Logistic regression coefficients are interpreted by exponentiating the regression coefficient ( $e^{\beta}$ ) to obtain the odds ratio. The odds ratio is the factor by which the odds of an event or condition change when the independent variable increases by one unit. In a multiple logistic regression model the odds ratio means the factor by which the odds will be multiplied for a unit increase in the independent variable (Dowdy et al., 2004).

For the exponentiated coefficients, a coefficient of 1 leaves the odds unchanged, a coefficient greater than 1 increases the odds, and a coefficient smaller than 1 decreases the odds (Pampel, 2000). Interpretation, therefore, involved determining what factor, as shown in the odds ratio, the odds are increased or decreased by when the predictor variables increase by one unit.

To identify the determinants of adolescent reproductive risk behaviour, the logistic multiple regression model was fitted to the demographic, socio-economic, family

and behavioural factors specified in the theoretical framework. All the variables were entered into the model. The criterion for removing variables from the model was set at  $\alpha = 0.05$ .

Because the ZDHS is not self-weighting at the national level (CSO et al., 2003), each observation was weighted using a sample survey weight so that the results could be generalized to the entire population of female adolescents in Zambia. The mean of the sample weight was found and then the average weight of the variable was computed to create the new weight variable (sample weight divided by the mean of the sample weight). The new weight variable was used to weight the whole data using the weight cases command in SPSS. To confirm whether the calculations were accurate, frequencies were run. Even though there was little difference in the estimates of the regression parameters in the logistic regression model when the weighted and unweighted analyses were compared, only the weighted results are reported.

## Chapter 4: Results

## Descriptive Analysis

This section describes the characteristics of adolescents with high and low reproductive risk behaviour. Table 1 gives the percentage distribution of female adolescents' reproductive risk behaviour status by the determinants of reproductive risk behaviour: age at first sexual intercourse, access to health services, number of household members, family structure, discussing family planning with someone, and drinking alcohol. Also presented in this section is the correlation analysis of the predictor variables. The results of the correlation analysis are presented in Table 2.

*Age at First Sexual Intercourse*

In both low and high reproductive risk groups, most adolescents were in the 15-17 years old age group. The percentage of adolescents aged 15-17 years was slightly higher in the low reproductive risk group (53.9%) than the high reproductive risk group (51.8%). The median for age at first sexual intercourse for the sample was 16 years. The smallest proportions of adolescents in the high reproductive risk group were aged 21-23 years (Table 1).

For the multiple logistic regression analysis, the categories of adolescents aged 8-11 years and those aged 12-14 years were combined. These two categories were combined because there were no individuals in the low reproductive risk group who were 8-11 years old. Also, the categories of adolescents aged 18-20 years and 21-23 years were combined. These two categories were combined because there were only 4 adolescents aged 21-23 years in the low reproductive risk group.

*Access to Health Services*

More than half of the adolescents in both reproductive risk groups had access to health services. A higher percentage of low-risk adolescents (68.7%) had access to health services compared to high-risk adolescents (60.5%) (Table 1).

*Number of Household Members*

As depicted in Table 1, the majority of adolescents in both reproductive risk groups were from households with 6-10 household members. The percentage of adolescents from households with 6-10 household members was lower in the low reproductive risk group (49.6%) compared to the high reproductive risk group (60.2%). The median value for number of household members per dwelling for the sample was 7 people. Almost one-third of adolescents at low reproductive risk lived in small households (1-5 household members), compared to one-quarter of adolescents at high risk.

*Family Structure*

The majority of adolescents in both reproductive risk groups were from male-headed families (Table 1). The percentage of adolescents from male-headed families was higher in the high reproductive risk group (69.3%) than the low reproductive risk group (60.9%).

*Discussing Family Planning with Someone*

The majority of adolescents did not discuss family planning with anyone. However, the percentage of adolescents who did not discuss family planning with anyone was lower in the low reproductive risk group (56.5%) than the high reproductive risk group (76.5%) (Table 1).

### *Drinking Alcohol*

As shown in Table 1, the majority of adolescents in both reproductive risk groups did not drink alcoholic beverages. The percentage of adolescents who did not drink alcoholic beverages is 86.0% in the low reproductive risk group and 84.3% in the high reproductive risk group. The variable drinking alcohol had the highest percentage of the missing cases, 61 (7.1%).

### Correlation Analysis

Multicollinearity, the correlation between predictor variables, was assessed using correlation analysis. Based on the results, some predictor variables were correlated. There were statistically significant correlations between access to health services and discussing family planning with someone ( $\tau = 0.161, p < 0.05$ ), and number of household members and family structure ( $\tau = -0.318, p < 0.05$ ). Discussing family planning with someone and drinking alcohol ( $\tau = -0.089, p < 0.05$ ), and age at first sexual intercourse and discussing family planning with someone ( $\tau = -0.101, p < 0.05$ ), were also significantly correlated. According to Polit (1996), the results of a regression analysis when multicollinearity is present tend to be unstable and, as a result, the regression coefficients can be misleading and render interpretation of the results problematic. Although these correlations were statistically significant, it should be noted that the correlation coefficients were low. Overall, the results of the correlation analysis revealed that the predictor variables were not highly correlated with one another.

### Logistic Regression Analysis

The results obtained from multivariate logistic regression analysis of the determinants of adolescent reproductive risk behaviour are presented in Table 3. Logistic

regression analysis was carried out to identify variables that determine adolescent reproductive risk behaviour between the two groups of adolescents: the high risk group (not using contraception) and the low risk group (using contraception). All the predictor variables were entered into the model simultaneously. Multiple logistic regression makes it possible to identify variables that are related to adolescent reproductive risk behaviour, controlling for all other factors. Furthermore, logistic regression gives information on how well group status can be predicted from independent variables.

In the classification analysis of the present study, a total of 694 adolescents were correctly classified and 100 were incorrectly classified. Overall, 87.4% of adolescents were correctly classified. It is also worthwhile to note that the discriminating power between the two groups of adolescents (high risk group and low risk group) is very low. None of the adolescents correctly classified were in the low reproductive risk group. The variables that are analyzed in this study do not have high discriminating power. The proportion of explained variation for this model was very low. Only 4% of the observed variability in adolescent reproductive risk behaviour was explained by the six independent variables, which indicates that the model did not fit the data very well.

The significance of the predictor variables was assessed in terms of the corresponding probability level ( $p$  value) of each variable. However, for both age at first sexual intercourse and number of household members, the likelihood ratio test (Pampel, 2000) was used to determine the statistical significance of the variables because these two variables were not dichotomous. Out of the six variables examined in the analysis, two variables were significantly related to adolescent reproductive risk behaviour. These variables are family structure and discussing family planning with someone.

*Age at First Sexual Intercourse*

The odds of engaging in high reproductive risk behaviour were significantly greater (Odds Ratio [OR] = 1.765; 95% Confidence Interval [CI] = 1.069 – 2.461) for adolescents aged 8-14 years compared to those aged 18-23 years, after holding other variables constant in the model. The result that adolescents who initiate sexual activities at an early age were more likely than adolescents who do not initiate sexual activities at an early age to engage in reproductive risk behaviour was in the expected direction. However, age at first sexual intercourse was not a statistically significant predictor of adolescent reproductive risk behaviour in a likelihood ratio test. The calculated chi-square value does not exceed the critical chi-square value (Table 4). Adolescents aged 15-17 years showed slightly lower odds of engaging in high reproductive risk behaviour (OR = 0.989; 95% CI = 0.477 – 1.501) compared to adolescents aged 18-23 years, suggesting a possible similar reproductive risk behavioural pattern among adolescents aged 15-17 years and those aged 18-23 years.

*Access to Health Services*

Although the relationship between access to health services and reproductive risk behaviour ( $p = .419$ ) was not statistically significant, the relationship was in the hypothesized direction: adolescents who have access to health services were less likely to engage in reproductive risk behaviour than adolescents who do not have access to health services. The odds ratio (OR) was 1.209 (95% CI = 0.737 – 1.681) for adolescents who have no access to health services compared to those who have access to health services.

*Number of Household Members*

There was no statistically significant relationship between number of household members and adolescent reproductive risk behaviour using the likelihood ratio test (Pampel, 2000) (see Table 4). The pattern was inconsistent. The odds of engaging in high reproductive risk behaviour were greater (OR = 1.444; 95% CI = 0.924 – 1.964) for adolescents from a household with 6-10 members than those from 1-5 member households. Contrary to the hypothesis that adolescents are more likely to engage in reproductive risk behaviour when there are more people in the dwelling than when there are fewer people in the dwelling, the results also indicate that the odds of adolescents engaging in high reproductive risk behaviour were slightly lower (OR = 0.912; 95% CI = 0.212 – 1.612) for adolescents from a household with more than 11 members compared to those from a household with between 1-5 household members.

*Family Structure*

The results indicate that the odds of an adolescent engaging in high reproductive risk behaviour were significantly lower (OR = 0.596; 95% CI = 0.108 – 1.084) when an adolescent is from a female-headed family structure compared to a male-headed family structure. Although the finding was statistically significant, the direction of the relationship was opposite to that which was expected. The hypothesis that adolescents in female-headed family structures are more likely to engage in reproductive risk behaviour than their peers from male-headed family structures was not supported.

*Discussing Family Planning with Someone*

As hypothesized, adolescents who discuss family planning with someone are less likely to engage in reproductive risk behaviour than adolescents who do not discuss

family planning with anyone. The results indicate that the odds of engaging in reproductive risk behaviour were significantly greater (OR = 2.409; 95% CI = 1.953 – 2.865) for adolescents who do not discuss family planning with anyone compared to those who discuss family planning with someone.

#### *Drinking Alcohol*

There is no statistically significant relationship between consumption of alcoholic beverages and reproductive risk behaviour ( $p = 0.523$ ). The odds ratio was 1.223 (95% CI = 0.527 – 1.919) for adolescents who drink alcoholic beverages compared to those who do not drink alcoholic beverages. However, the relationship was in the hypothesized direction: adolescents who drink alcoholic beverages are more likely to engage in reproductive risk behaviour than adolescents who do not drink alcoholic beverages.

The results of the multiple logistic regression analysis of adolescent reproductive risk behaviour demonstrate that out of the six variables examined in the analysis, only two were significantly associated with adolescent reproductive risk behaviour. The two variables are family structure and discussing family planning with someone. The variables found to have no significant relative effects on adolescent reproductive risk behaviour are age at first sexual intercourse, access to health services, number of household members, and drinking alcohol.

## Chapter 5: Discussion and Conclusions

Previous research conducted mainly in developed countries like the United States, Canada, and Australia, and in developing countries like South Africa and Ghana, shows that there are a number of factors affecting adolescent reproductive risk behaviour. The purpose of this study was to identify significant factors affecting adolescent reproductive risk behaviour in Zambia. The present study anticipated that age at first sexual intercourse, access to health services, number of household members, family structure, discussing family planning with someone, and drinking alcohol, would affect adolescent reproductive risk behaviour. In this chapter the logistic regression results of adolescent reproductive risk behaviour are discussed, and the limitations of the study, implications of the study, directions for future research, and conclusions are presented.

### Logistic Regression Results

#### *Age at First Sexual Intercourse*

Past research demonstrates that age at first sexual intercourse influences adolescent reproductive risk behaviour (Forest & Singh, 1990; Harris & Duncan, 2002; Maticka-Tyndale, 2000; Van Coeverden de Groot & Greathead, 1987; Wu et al., 1997). Based on past research, it was hypothesized that adolescents who initiate sexual activities at an early age are more likely to engage in reproductive risk behaviour than adolescents who do not initiate sexual activities at an early age. Although the effect was in the expected direction, the results were not statistically significant. The statistically insignificant result may be attributed to the small sample size among adolescents in the low reproductive risk group (115) compared to the high reproductive risk group (746). For example, only 31 adolescents were aged 18 to 23 years in the low reproductive risk

group compared to 177 in the high reproductive risk group. As Pampel (2000) pointed out, a statistical significance test largely depends on sample size. Therefore, despite the association between age at first sexual intercourse and adolescent reproductive risk behaviour not being statistically significant in the present study, the relationship is consistent with previous research and the finding should not be disregarded.

#### *Access to Health Services*

Previous research reveals that there is an association between access to health services and adolescent reproductive risk behaviour (Brooks-Gunn & Furstenberg, 1989; Ingwersen, 2001; Stanback & Twum-Baah, 2001). This study hypothesized that adolescents who have access to health services are less likely to engage in reproductive risk behaviour than adolescents who do not have access to health services. Although the effect was in the hypothesized direction, the association between access to health services and adolescent reproductive risk behaviour was not statistically significant. Failure to find a statistically significant relationship may be attributed partly to the measurement of the variable. Only one factor, distance to health facilities, was used in the present study to assess the variable access to health services. According to Ingwersen (2001), adolescents face multiple barriers to service utilization. Therefore, it would have been better to have an index to measure access to health services if the data permitted. In addition to the measure used in this study, other measures that might make up an index are lack of privacy, insensitive staff, inability to afford services, and contraceptive service restrictions.

*Number of Household Members*

It was hypothesized that adolescents are more likely to engage in reproductive risk behaviour when there are many people in the dwelling than when there are a few people in the dwelling. Previous research conducted in South Africa revealed an association between adolescent reproductive risk behaviour and number of people per dwelling (Boult & Cunningham, 1992). In this study, the variable number of household members was used as an indicator of poverty. Although different researchers have studied the association between poverty and adolescent reproductive risk behaviour, different constructs have been used to measure poverty, including low socio-economic status (Craig & Richter-Strydom, 1983) and low income [Harris & Marmer, 1996; Women's International Network News, 2001; Villier & Clift (as cited in Macleod, 1999)]. The findings are in agreement: Low socio-economic status, low income, and having many people in a household were associated with high adolescent reproductive risk behaviour.

In the present study, number of household members is not a statistically significant predictor of adolescent reproductive risk behaviour. One reason for the statistically insignificant effect may be the measure used. A better measure of poverty would probably be one that looks at household income levels.

*Family Structure*

The present research demonstrates that adolescents in female-headed family structures are less likely to engage in reproductive risk behaviour than their peers from male-headed family structures. In spite of the result being significant, it contradicts past research that has found that adolescents in female-headed family structures are more

likely to engage in reproductive risk behaviour than their peers from male-headed family structures (Dornbusch et al., 1985; Harris & Duncan, 2002; Kirby, 2003; Van Coeverden de Groot & Greathead, 1987).

The hypothesis was not supported and this result may be attributable to failure of the survey data to provide information on whether or not male-headed and female-headed family structures had spouses present. Although male-headed family structures are typically considered to be two-parent family structures and female-headed family structures are typically single-parent in the Zambian context, a check to see if all the male-headed and female-headed family structures in the sample were indeed two-parent and single-parent family structures, respectively, was needed. As pointed out by Harris and Duncan (2002), single-parent family structures provide a social environment for an adolescent that increases the risk for adolescent reproductive risk behaviour.

On the other hand, there is a possibility that adolescents in female-headed family structures are less likely to engage in reproductive risk behaviour than their peers from male-headed family structures. This result could be due to the environment to which these adolescents are exposed. Perhaps adolescents in female-headed family structures are exposed to an environment that is conducive for them to learn and talk about contraception that later increase the chances for them to use contraception.

#### *Discussing Family Planning with Someone*

Past research demonstrates that discussing family planning with someone influences adolescent reproductive risk behaviour (Luster & Small, 1994; Newcomer & Urdy, 1985). The present finding is consistent with past research findings: As anticipated, adolescents who discuss family planning with someone are significantly less likely to

engage in reproductive risk behaviour than adolescents who do not discuss family planning with anyone. Moreover, the increase by 2.41 in the odds of engaging in high reproductive risk behaviour among adolescents who do not discuss family planning with anyone is striking. The odds ratio of 2.41 is very large; however, the standard error of this measure is not large (0.228), suggesting little multicollinearity with other variables in the model.

A possible explanation as to why adolescents who discuss family planning with someone are less likely to engage in reproductive risk behaviour can be drawn from the IMB Skills Model. According to the model, the fundamental determinants of initiation and maintenance of sexual and reproductive health behaviours are sexual and reproductive health information, motivation to act on this information, and behavioural skills for acting on it effectively (Fisher & Fisher, 1998). Hence, adolescents who discuss family planning with someone are more likely to have information on reproductive risk behaviour and could possibly have the motivation to avoid such behaviour than adolescents who do not discuss family planning with anyone. This finding suggests that adolescents could possibly change their reproductive risk behavioural pattern if they have an opportunity to discuss family planning with someone.

### *Drinking Alcohol*

According to past research, alcohol consumption among adolescents is associated with reproductive risk behaviour (Hingson et al., 1990; Kirby, 2003; Kowaleski-Jones & Mott, 1998; Luster & Small, 1994; Metzler et al., 1992). The present study predicted that adolescents who drink alcoholic beverages are more likely to engage in reproductive risk behaviour than adolescents who do not drink alcoholic beverages. The relationship found

in this study is in agreement with past research findings despite the finding not being statistically significant.

Failure to find a statistically significant result can partly be explained by the measurement of the variable, drinking alcohol. The variable was measured using the number of days the adolescent drank alcohol in the last three months. It is quite difficult to make a link between alcohol consumption over a period of three months and reproductive risk behaviour. This is because alcohol consumption is a behavioural issue that requires a longer period of time over which to observe the patterns and trends. Furthermore, the variable, drinking alcohol, does not take into account whether or not drinking alcohol immediately preceded sex.

In summary, family structure and discussing family planning with someone are the only statistically significant predictors of adolescent reproductive risk behaviour among the variables examined in this study. Although family structure was a statistically significant predictor of adolescent reproductive risk behaviour, the direction of the association was not as predicted. The findings also indicate that the direction of the effects of age at first sexual intercourse, access to health services, and drinking alcohol on adolescent reproductive risk behaviour are as hypothesized. However, the associations between these independent variables and adolescent reproductive risk behaviour were not statistically significant. The association between number of household members and adolescent reproductive risk behaviour, on the other hand, was opposite to the predicted direction and was not a statistically significant predictor of adolescent reproductive risk behaviour.

*Limitations of the Study*

The first limitation of the study is that the ZDHS used a cluster-randomized design to sample the households. The cluster-randomized design does not account for correlations on measurements of women living in the same households. There is a limitation regarding the ZDHS design in the sense that information on the number of women interviewed in each household in the 2001-2002 ZDHS was not provided and hence repeated measures were not taken into account and they could not be accounted for in the present study.

Second, the present study was limited to the variables that were in the data set. The study examined six explanatory variables: age at first sexual intercourse, access to health services, number of household members, family structure, discussing family planning with someone, and drinking alcohol. These six explanatory variables are not the only variables that have been found to explain adolescent reproductive risk behaviour. Furthermore, the six explanatory variables in the present study do not account for much variance in adolescent reproductive risk behaviour (low and high reproductive risk behaviour).

Third, the dependent variable, reproductive risk behaviour, has been measured using only one reproductive risk behavioural pattern – non-contraceptive use. It should be noted again that contraceptive use does not imply reliable use or use of an effective method. In previous studies, reproductive risk behaviour has been measured using several different reproductive risk behavioural patterns each encompassing a unique combination of risk behaviours. Although attempts were made in the present study to include other risk behaviours, such as having multiple partners and using the variable recent sexual

activities to filter out the adolescents at greater risk, there were limitations in the data set. These variables would not have reflected the true picture of adolescents at risk because of the distribution of responses on these variables. Therefore, it is difficult to compare the findings of the present study with previous research. Although non-contraceptive use provides a good measure of adolescent reproductive risk behaviour, ideally this risk behaviour should be studied with a standardized measure for comparative purposes. A standardized measure of adolescent reproductive risk behaviour would include risk behaviours such as engagement in sexual intercourse, an earlier age at first coitus, non-contraceptive use, multiple sexual partners, drug dealing, and weapons carrying.

Fourth, there were limitations in the measurement of some variables in the present study, such as access to health services, family structure, number of household members, and drinking alcohol. As pointed out earlier, the variable access to health services was measured by asking adolescents whether or not they had problems getting medical help for themselves in regard to distance to health facilities. This measure of access to health services does not encompass other possible barriers that adolescents might face in accessing health services.

Family structure was determined by asking adolescents who the sex of the head of the household was. As indicated earlier, there were two responses to this question - male or female. In the Zambian context, usually a male-headed household can be referred to as a two-parent family structure and a female-headed household can also be referred to as a one-parent or single-parent family structure. The limitation of this variable is that the data does not distinguish whether or not all male-headed households were indeed two-parent

households or whether or not all female-headed households were single-parent households.

Poverty was assessed using number of household members. Number of household members was not a good indirect measure of poverty in this study. There could be other better measures or variables that should be used. Hence, the limitation of this variable is that a direct measure of poverty using income was not used because data pertaining to household income was not collected in the survey.

Drinking alcohol was determined by asking adolescents the number of days they drank alcohol in the last 3 months. The limitation of this variable is that it does not exactly capture the effect of drinking alcohol on reproductive risk behaviour. The variable does not clearly show whether or not alcohol consumption immediately precedes sexual activities.

Despite these limitations, the ZDHS is of good quality and it used a national sample that is representative of the national population. The ZDHS is the most recent data available in the country. Therefore, the present study is important because it has identified some of the current factors affecting adolescent reproductive risk behaviour in Zambia. Furthermore, although several of the hypothesized relationships were not significant, they showed some consistency with past research findings.

#### *Implications of the Research Study*

The high level of reproductive risk behaviour found implies that there is need for the Zambian government to develop policies and programs that would help reduce this risky behaviour among adolescents. The findings of the present study suggest that there are factors affecting adolescent reproductive risk behaviour in Zambia. For example, the

present study has identified several factors associated with adolescent reproductive risk behaviour. However, only two variables, family structure and discussing family planning with someone, were statistically significant predictors of adolescent reproductive risk behaviour. Although some of the factors were not statistically significant, they should not be overlooked because they are in agreement with the results of previous research. These factors include age at first sexual intercourse, access to health services, and drinking alcoholic beverages.

The finding that adolescents in female-headed family structures are less likely to engage in reproductive risk behaviour than their counterparts in male-headed family structures should be explored further. The result runs counter to the literature, thus more research is needed to confirm that the result is correct for Zambia. On the other hand, the result could also imply that women in female-headed families have better strategies to influence adolescents away from engaging in reproductive risk behaviour. Hence, identifying these strategies and using them to develop programs could indirectly help reduce adolescent reproductive risk behaviour. Women in male-headed family structures should be targeted so that they incorporate these strategies as well. Perhaps the women in male-headed family structures should consider taking a leading role in ensuring that adolescents do not engage in reproductive risk behaviour.

The finding that adolescents who discuss family planning with someone have decreased odds of engaging in reproductive risk behaviour implies that there is need to develop programs that would target the benefits of discussing family planning with another person such as a partner or boyfriend, sister, friend, neighbour, or other relatives. First, adolescents who discuss family planning with someone should be targeted so that

the benefits of discussing family planning with other people are reinforced and maintained. These adolescents should be targeted using information sessions particularly in schools and communities. Adolescents should be encouraged to discuss family planning with someone because so much information is likely to be shared with others that would benefit the adolescents and possibly change their perspective on engaging in reproductive risk behaviour.

Second, programs that would target people who discuss family planning with adolescents such as partners or boyfriends, sisters, friends, neighbours, and relatives should also be put in place. This group of people can be targeted particularly by promotion campaigns using the media so that they are reminded of the way adolescents benefit from discussing family planning with someone and these “someones” should be encouraged to continue to have such discussions with the adolescents in their lives.

Third, and most importantly, programs that target adolescents who do not discuss family planning with someone should also be developed. These adolescents should be sensitized to the importance of discussing family planning with someone. This program should be implemented at the family and community level.

The present findings suggest that the odds of adolescent reproductive risk behaviour increase when adolescents engage in sexual intercourse at an early age. This finding implies that programs that would sensitize adolescents’ on issues regarding the dangers of engaging in reproductive risk behaviour at an early age should be put in place. If these programs were successful, it is likely that the odds of adolescents engaging in reproductive risk behaviour would be dramatically reduced.

Similarly, programs that encourage adolescents to access health services would help reduce the odds of adolescent reproductive risk behaviour. Although the present study examined only one barrier to service utilization, there is need to target the multiple barriers adolescents face to service utilization and make health services accessible to them. The benefits of accessing health services should be made clear to adolescents through education, communication, and awareness campaigns.

The finding that the odds of adolescents engaging in reproductive risk behaviour increase when adolescents drink alcoholic beverages implies that there is need to develop programs that would consistently remind adolescents of the dangers of drinking alcoholic beverages at their age. The program should include exposing some of the consequences of this risky behaviour such as dropping out of school as a result of unplanned pregnancies and unsafe abortions, contracting STDs and HIV/AIDS.

This study has identified some of the adolescent issues that need to be addressed in Zambia's National Population Policy. In 1989, an explicit National Population Policy was adopted by the Government of the Republic of Zambia as an integral component of its fourth National Development Plan (1989-1993) (Ministry of Health, 1997). Although one of the main objectives of this policy was to make sure that individuals have the basic right to freely and responsibly decide the number and spacing of their children and to have the information, education, and the means to do so, female adolescents need specialized programs because they are at high risk for negative reproductive health outcomes. Also, there is need to improve the ZDHS particularly in terms of the measurement of some variables and inclusion of more variables because its the only nationwide survey in the country that would capture rapid changes not only in adolescent

reproductive risk behavioural patterns, but also in many other areas. In addition, the ZDHS takes place more frequently, after every 4 years, compared to the census that takes place after every 10 years. Hence, there is need to improve the ZDHS so that the information collected can be used to assess if policies are working and to make changes where they are needed.

#### *Directions for Future Research*

The ZDHS data collection methodology is an aspect that is worth considering for future research. Because all women aged 15 to 49 years were eligible for interviews in the 2001–2002 ZDHS, there could have been correlated measures among women within the same household. Future research should either eliminate the repeated measure problem by using a data collection methodology that accounts for the correlation of measurements of women in the same household or survey implementers should ensure that enough information on the number of individuals interviewed in each household is provided in future waves of the Zambia Demographic Health Surveys so that the data users can account for repeated measures.

Apparently, no current similar studies have been done in other African nations. However, it is interesting to note that similar Demographic Health Surveys are conducted in Sub Saharan Africa. Thus, future researchers should also strive to conduct similar studies on adolescent reproductive risk behaviour so that proportions of adolescents with high and low reproductive risk behaviour can be compared in the region and also see if the numbers for Zambia are similar to those in other countries. By doing so, this will facilitate the identification of the countries in which adolescents are at more risk of reproductive risk behaviour.

The six explanatory variables examined from the 2001-2002 ZDHS dataset do not account for much variance in adolescent reproductive risk behaviour. This result suggests that there are other factors not included in the survey that account for the remaining variance in adolescent reproductive risk behaviour. Hence, future survey implementers should incorporate in the survey variables that have been found in past research to affect adolescent reproductive risk behaviour. For instance, self-efficacy (Bandura, 1997; Kowaleski-Jones & Mott, 1998; Landry & Forrest, 1995; Laugille, 2000; Population Reference Bureau, 1994), parental monitoring (DiClemente, 2001; Kirby, 2003; Luster & Small, 1994), grade point average (Kirby, 2003; Luster & Small, 1994; Metzler et al., 1992), peer pressure (Buga et al., 1996; Kirby, 2003; Kowaleski-Jones & Mott, 1998), religion (Kirby, 2003), and cultural traditions (Kulin, 1988; Macleod, 1999; Reynoso et al., 1993) are some of the variables that have been found in previous studies to affect adolescent reproductive risk behaviour. It is probable that these variables might account for some of the variance in adolescent reproductive risk behaviour in Zambia.

The use of several different reproductive risk behavioural patterns, each encompassing a unique combination of risk behaviours, to measure adolescent reproductive risk behaviour in both previous studies and the present study raises some questions that need further exploration. Because reproductive risk behaviour has been measured using several different combinations of behavioural patterns it poses difficulties in comparing the findings of the present study with previous studies. Therefore, future research should focus on standardizing the measure of reproductive risk behaviour. Only with a standardized measure of reproductive risk behavioural patterns can we comfortably compare the results of different studies and draw meaningful conclusions.

Another way the present results can help build a strong foundation for future adolescent reproductive risk behaviour research would be to standardize the measure of access to health services. Access to health services can be measured using different barriers to service utilization. In the present study, the measure of access to health services was limited. Because adolescents face multiple barriers to health services (Ingwersen, 2001), future research should, therefore, come up with an index that would capture most frequently reported barriers that adolescents encounter in accessing health services. Future studies need to use a more comprehensive measure of access to health services to determine whether or not access to health services is statistically related to adolescent reproductive risk behaviour.

Furthermore, the present study required the use of a direct measure of two-parent and single-parent family structures. Although in the Zambian context the use of male-headed and female-headed family structures represent a two-parent and single-parent family structure, respectively, there was no way the data could be investigated to distinguish whether in fact this assumption holds. Future survey implementers should refine the measure of family structure by collecting detailed information on the structure of the family to enable researchers to determine precisely the direction of the relationship and whether family structure has an impact on adolescent reproductive risk behaviour in Zambia.

Another direction for future research is the exploration of the variable drinking alcohol and how it relates to reproductive risk behaviour. A variable that measures alcohol consumption immediately prior to sexual activity is needed to link alcohol consumption and risky sexual behaviour. Precisely, future research should use a refined

measure of drinking alcohol. The ZDHS survey implementers should help refine the measure of drinking alcohol by collecting information on the use of alcohol preceding sexual activities among adolescents. Such a variable would be a better measure of the influence of alcohol on reproductive risk behaviour. As Kirby (2003) pointed out, drinking alcohol fosters reproductive risk behaviour among adolescents.

As adolescents continue to engage in reproductive risk behaviour, there is need to further explore this area. Exploration of this area is important because adolescents are more vulnerable to poor reproductive health outcomes. Also, issues dealing with reproductive risk behaviour could be embedded in the attitudes and behaviours of the adolescents. It would be interesting if the quantitative data were supplemented with a qualitative survey using in-depth interviews or focus group discussions. As Rowan and Huston (1997) state “qualitative research, designed to observe social interaction and understand the individual perspective, provides insight into what people’s experiences are, why they do what they do, and what they need in order to change” (p. 1442). Qualitative research, hence, can be used to probe for information that is more detailed and might raise issues that may not have been included in quantitative surveys.

### *Conclusions*

Female adolescents in Zambia continue to engage in reproductive risk behaviour and hence, are more likely to experience negative reproductive health outcomes such as HIV/AIDS, and other sexually transmitted diseases. According to a recent United Nations Summit that took place in West Africa (United Nations Chronicles, 2004), HIV/AIDS is increasing in sub-Saharan Africa particularly among young women, and Zambia is no

exceptional. HIV/AIDS was referred to at the summit as the greatest catastrophe in modern history.

The present study has contributed to our understanding and knowledge of adolescent reproductive risk behaviour by demonstrating some of the factors associated with this risky behaviour. Family structure and discussing family planning with someone were found to contribute to adolescent reproductive risk behaviour. Identification of these factors would help program implementers focus on ways to make adolescents feel comfortable about discussing family planning with others. For example, efforts should concentrate in putting in place drop-in centres where adolescents can be free to talk about family planning with others. As well, more research is needed to determine whether the relationship between family structure and adolescent reproductive risk behaviour, that is, that adolescents in female-headed family structures are less likely to engage in reproductive risk behaviour than their peers from male-headed family structures, holds for Zambia. If the relationship holds for Zambia then strategies that female-headed family structures use to discourage adolescents from engaging in reproductive risk behaviour should be incorporated in the programs to help reduce this risky behaviour at both the family and community level. Successful strategies to reduce reproductive risk behaviour would include community programs to improve social development, responsible sexual behaviour education, and improve contraception counseling and delivery. It should be noted that the most effective policies and programs would be the female-centred strategies because female adolescent needs may be different from male adolescent needs. Because of the sex role orientation in Zambia, women tend to be more submissive than men and this puts women, particularly young women, at a greater risk of poor

reproductive health outcomes. As noted earlier, the power imbalance in relationships involving young women makes it hard for them to negotiate condom or contraceptive use (Population Reference Bureau, 1994).

Although some of the factors examined in this study such as age at first sexual intercourse, access to health services, number of household members and drinking alcohol were not statistically significant, there may be measurement problems with some of these variables. As noted earlier, future research should investigate adolescent reproductive risk behaviour using refined measures and use not only quantitative methods, but also qualitative. Although reproductive risk behaviour has been examined from a broader perspective using the ZDHS, maybe it can be more thoroughly examined from an individual perspective.

As female adolescents continue to engage in reproductive risk behaviour, this area of study is increasingly important. Therefore, identification of most of the possible factors that could contribute to this risky behaviour and their effects remains a challenge for future researchers. Identification of most of the factors contributing to risky behaviour will assist policymakers in the development and maintenance of a comprehensive policy that could save female adolescents' lives.

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Proximate Determinants of  
Reproductive Risk Behaviour

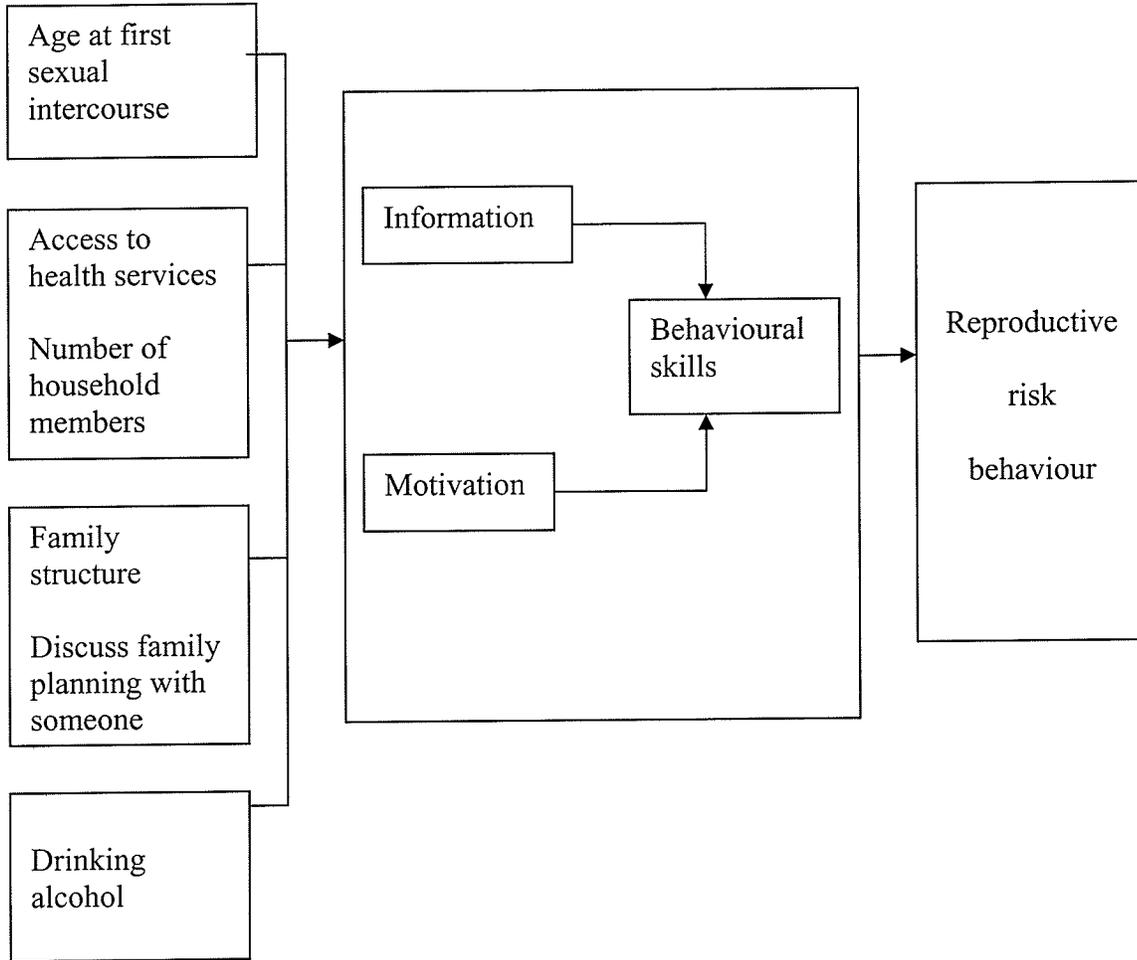


Figure 1. Operational Model for Understanding the Determinants of Adolescent Reproductive Risk Behaviour.

Source. Adopted and Modified from Fisher and Fisher (1998).

Table 1  
*Determinants of Female Adolescent Reproductive Risk Behaviour by Reproductive Risk Behaviour Status.*

Variables	Reproductive Risk Behaviour			
	Low		High	
	Number	Percent	Number	Percent
Adolescents	115	100.0	746	100.0
Age at first sexual intercourse				
8 – 11 years	0	00.0	23	2.8
12 – 14 years	20	17.4	164	23.2
15 – 17 years	62	53.9	375	51.8
18 – 20 years	29	25.2	163	20.3
21 – 23 years	4	3.5	14	1.9
Total	115	100.0	739	100.0
Missing cases (6)	0		6	
Access to health services				
No	36	31.3	294	39.5
Yes	79	68.7	451	60.5
Total	115	100.0	745	100.0
Missing cases (1)	0		1	
Number of household members				
1 – 5 members	38	33.0	185	24.8
6 – 10 members	57	49.6	449	60.2
11+ members	20	17.4	112	15.0
Total	115	100.0	746	100.0
Missing cases (0)				
Family structure				
Male-headed	70	60.9	527	69.3
Female-headed	45	39.1	219	30.7
Total	115	100.0	746	100.0
Missing cases (0)				

Table 1 (continued).

Variables	Reproductive Risk Behaviour			
	Low		High	
	Number	Percent	Number	Percent
Discussing family planning with someone				
No	65	56.5	571	76.5
Yes	50	43.5	175	23.5
Total	115	100.0	746	100.0
Missing cases (0)				
Drinking alcohol				
No	86	86.0	590	84.3
Yes	14	14.0	110	15.7
Total	100	100.0	700	100.0
Missing cases (61)	15		46	

N = 861.

Table 2  
*Bivariate Correlations for Predictor Variables*

Variables	Age at first sexual intercourse	Access to health services	Number of household members	Family structure	Discussing family planning with someone	Drinking alcohol
Age at first sexual intercourse	1	0.011	-0.038	0.006	-0.101	0.050
Access to health services		1	-0.031	0.045	0.161	-0.020
Number of household members			1	-0.318	-0.038	0.007
Family structure				1	-0.028	-0.046
Discussing family planning with someone					1	-0.089*
Drinking alcohol						1

N = 861.

\*  $p < 0.05$ , two-tailed test.

Table 3  
*Logistic Regression Results of the Determinants of Adolescent Reproductive Risk Behaviour.*

Variable Category	$\beta$ Log Odds	SE	Wald	p Value	$e^{\beta}$ Odds Ratio	Odds Ratio 95% CI
Age at first sexual intercourse						
8 – 14 years	0.568	0.348	2.666	0.103	1.765	1.069–2.461
15 – 17 years	-0.011	0.256	0.002	0.966	0.989	0.477–1.501
18 – 23 years	0.000				1.000	
Access to health services						
No	0.190	0.236	0.652	0.419	1.209	0.737–1.681
Yes	0.000				1.000	
Number of household members						
11+ members	-0.092	0.350	0.069	0.792	0.912	0.212–1.612
6 – 10 members	0.368	0.260	1.994	0.158	1.444	0.924–1.964
1 – 5 members	0.000				1.000	
Family structure						
Female-headed	-0.518	0.244	4.509	0.034	0.596	0.108–1.084
Male-headed	0.000				1.000	
Discussing family planning with someone						
No	0.879	0.228	14.827	0.000	2.409	1.953–2.865
Yes	0.000				1.000	
Drinking alcohol						
Yes	0.201	0.314	0.408	0.523	1.223	0.527–1.919
No	0.000				1.000	
Intercept	1.145	0.348	10.814	0.001	3.144	
-2 Log-likelihood	569.426					
$\chi^2$	32.685					
Number of Cases	794					

Table 4  
*Likelihood Ratio Test Results for the Variables Age at First Sexual Intercourse and Number of Household Members.*

Variables	-2 Log Likelihood		$\chi^2$ value <sup>a</sup>
	Full Model	Reduced Model	
Age at first sexual intercourse	574.663	569.426	5.24
Number of household members	572.780	569.426	3.35

Note. Using 95% CI, the critical  $\chi^2$  value with two degrees of freedom = 5.99.

<sup>a</sup> The difference between -2 log likelihood for the full model and -2 log likelihood for the reduced model.