THE UNIVERSITY OF CALGARY

# SEXUAL ACTIVITY IN RURAL ALBERTA YOUTH

BY

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## A THESIS

## SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

## IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

## DEGREE OF MASTER OF SCIENCE

## DEPARTMENT OF MEDICAL SCIENCE

## CALGARY, ALBERTA

## MAY, 1991

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ISBN 0-315-71091-8



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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled, "Sexual Activity in Rural Alberta Youth" submitted by J. Morag Macdonald-Dichmann in partial fulfillment of the requirements for the degree of Master of Science (Medical Science).

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## ABSTRACT

Sexually transmitted diseases (STD) are a serious and escalating problem among adolescents in Alberta. The behavior that places adolescents at risk for STD is sexual intercourse. However, little is known about sexual activity among adolescents in Alberta, particularly those living in rural areas. The purpose of this study was to describe the prevalence of specific sexual behaviors in a sample of south-central Alberta high school students and to explore the prevalence of factors associated with increased risk for STD. The information collected will be useful in developing strategies for the reduction of STD in this population.

The study was a cross-sectional survey of students' sexual behavior, knowledge of STD prevention, and attitudes, social pressures and perceived behavioral control regarding condom use. Data were collected using a self-administered questionnaire, which students filled out in school in the presence of the investigator. A random sample of 1300 students was selected from the 1700 students in Grades 9-12 of the seven schools in the Foothills School Division. Parental consent was sought, and was given for 29.3% of students. Two hundred and eighty students (representing 17% of students in Grades 9-12 in the school division) participated.

Students were found to be engaging in sexual behaviors that increase the risk of STD. Forty-six percent had ever enagaged in sexual intercourse. Of those who were sexually active, 29% were having regular sex, 84% had engaged in sex in the six months preceding the study, and 33% had had multiple sexual partners in the six months preceding the study. The median age at first intercourse was 14 years. This study represents the first examination of the frequency of condom use among Canadian high

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school students. Only 46% of students who had ever had sexual intercourse reported always using condoms, 19% reported using condoms most of the time, and 35% reported using condoms some of the time or never.

Compared to students in the Calgary Public School Division in 1980, a larger proportion of students in 1990 had ever engaged in sexual intercourse, and were having sexual intercourse regularly. There was no evidence to suggest that students in 1990 were initiating sexual activity at an earlier age than students in 1980.

Parents' educational level, students' drug and alcohol use and knowledge of STD prevention were found to be associated with sexual behavior.

## ACKNOWLEDGEMENTS

The success of this study was ensured by the support and cooperation of numerous individuals and agencies.

I gratefully acknowledge the support of the National Health Research and Development Program through a National Health Fellowship, which provided me with personal and research support for the duration of the project.

I would like to thank my supervisor and friend DR. MARGARET L. RUSSELL, whose guidance and support were invaluable to me during all aspects of this study. My supervisory committee included DR. E.J. LOVE and DR. J. BAUMBER, both of whom I thank for their contribution.

I would like to extend my gratitude to MR. J. BRANDON and the Foothills School Division Board of Trustees for allowing access to the students and for their continued support throughout the study. I would also like to thank the students who generously agreed to participate. Without them this study would not have been possible.

I am also grateful to the staff of the Foothills Health Unit for their assistance in data collection. In particular, I would like to thank MS. BRENDA GEIB for her continued encouragement and enthusiasm for the project.

I need also thank my friends, colleagues and the faculty and support staff of the Department of Community Health Sciences who were always willing to lend a hand or an ear as needed.

Finally, I would like to thank my family and my husband Bob, who never tired of my topic, even at ungodly hours of the night.

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## DEDICATION

To my father, who always said that the only thing that could ever limit me was myself.

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## CHAPTER 1

## Problem, Purpose and Background

#### The Problem

Sexually transmitted disease (STD) is a serious and escalating problem among adolescents in Alberta (Calgary Health Services, 1987; Alberta Health, 1990). Health professionals developing STD intervention programs are challenged with the task of designing strategies to reduce the risk for STD without a clear picture of the prevalence of sexual intercourse, the key behavioral risk factor for STD. An understanding of the prevalence and factors associated with sexual activity among adolescents is crucial for the development of effective strategies to reduce the morbidity due to STD in this age group. The impetus for the current study was the observation that the published information for Canadian adolescents, necessary to come to such an understanding, is limited. Furthermore, existing research has focussed on populations living in urban centers; perhaps because urban adolescents are perceived to be at greater risk of STD than those living in rural settings. Little is known about sexual activity among adolescents living in rural areas, a group that may actually be at a greater risk for STD as the result of limited access to services, including sex education.

In the absence of direct information, estimates of the proportion of Alberta adolescents having sexual intercourse could be made by extrapolating from current rates of STD, pelvic inflammatory disease, livebirth, pregnancy and induced abortion. Unfortunately, the inaccuracy of these rates would lead to underestimates. For example, it is recognized that current STD rates do not reflect the true incidence of STDs as a result of incomplete reporting (Canada Diseases Weekly Report, 1988; Alberta Health, 1989). Projections based on STD rates would also be biased as only those persons who are having sex are at risk for STD. Rates should be reported "per 100,000 age specific sexually active individuals" and not "per 100,000 age specific population".

The many possible interpretations of temporal trends in STD rates also limit the usefulness of estimates of the proportion of adolescents having sexual intercourse extrapolated from secondary data sources. For example, the observation that the rate of gonorrhoea for females aged 15-19 was twice as high in 1988 as it was in 1986 (Alberta Health, 1989; Canada Diseases Weekly Report, 1988; 1989), could be interpreted as more adolescents being infected due to increased sexual activity within this population. Other possible explanations exist, however. For example, the same proportion of adolescents may be exposed to STD through sexual intercourse, but may be incurring an increased risk by failing to use condoms, having multiple partners, or having sex more frequently.

Consequently, there is need for a study exploring the current prevalence of sexual intercourse among adolescents. Furthermore, because the frequency of sexual intercourse, the number of sexual partners, and the use of contraceptive barriers bear directly on the risk of acquiring a STD, it is also appropriate to examine the frequency of these behaviors.

#### Purpose

The purpose of this study is to describe the prevalence of specific sexual behaviors in south central Alberta high school students and to explore the prevalence of factors associated with increased risk for STD. The data will be useful in developing strategies for the reduction of STD in this population.

#### Background

The background consists of a review of the literature in two areas. The first covers the current state of knowledge about adolescent sexual behavior, and the second reviews the factors associated with adolescent sexual intercourse and condom use.

### Sexual Activity in Adolescents

## United States (U.S.A.) Data

Reports of the proportion of adolescents who are sexually active have varied greatly between U.S.A. studies, ranging from 29% to 85% (Alexander et al., 1989; Centers for Disease Control, 1988; 1990; DiClemente, Boyer & Morales, 1988; DiClemente, Zorn & Temoshok, 1986; Hingson, Strunin, Berlin & Heeren, 1990; Kegeles, Adler & Irwin, 1989; Kegeles, Adler & Irwin, 1988; Moberg & Piper, 1990; National Center for Health Statistics, 1991). The majority of these studies have reported crude proportions of 60% or more, but have failed to report age adjusted proportions, or to describe the underlying age distribution of the sample. Although the differences in crude proportions between the U.S.A. and Canadian studies range up to 30% (Drumheller Health Unit, 1990; Peace River Health Unit, 1990; King et al. 1988; Meikle, Peitchinis & Pearce, 1985), it is impossible to ascertain whether the observed differences are genuine or the result of differences in the age distributions of the samples studied.

If the differences between the Canadian and U.S.A. studies are genuine, then they may be due in part to ethnic differences in the composition of U.S.A. and Canadian study samples. Hispanics and blacks, who have been found to exhibit a higher prevalence of sexual activity than whites, make up a disproportionate fraction of most U.S.A. samples (DiClemente et al. 1988; 1986; Hingson et al., 1990). Additionally, while Canadian studies have used school-based sampling frames, many of the U.S.A. studies have been conducted in family planning and STD clinics where one would expect to find a higher proportion of sexually active adolescents due to the nature of the services provided. Finally, the Canadian data are old. The largest proportions of sexual active adolescents in the U.S.A. have been reported in the last three years, while the most recent study specifically addressing adolescent sexual behavior in Alberta was done in 1980 (Meikle et al., 1985). As a result of these differences, generalizations of the results of U.S.A. studies to Canadian adolescents must be done with great caution. For the purposes of this literature review, the focus will be primarily on Canadian studies.

### Canadian Data

Only two Canadian studies (King et al., 1988; Meikle et al., 1985) have specifically addressed patterns of adolescent sexual activity. Meikle et al. (1985) surveyed a sample of 809 junior and senior high school students in Calgary, Alberta in 1980. The investigators solicited information about students' sexual attitudes, knowledge and behavior using a self-administered questionnaire. The participating students were randomly selected from a convenience sample of schools representing areas of low, medium and high socio-economic status within the city. Questions included information on 'frequency of sex', 'age at first sexual intercourse', and 'use of contraception'.

In 1987, King et al. conducted a cross sectional survey of knowledge, attitudes and behavior with respect to Acquired Immunodeficiency Syndrome and other STDs of 38,002 Canadian youths, aged 12-21 years. Included in the overall sample were 9,597 Grade 11 and 9,860 Grade 9 students, selected in a two-stage cluster sampling procedure using school jurisdictions and school classes. A self-administered

questionnaire format was used and self-reported information on sexual activity included 'ever having sexual intercourse', 'frequency of sexual intercourse' and 'number of sexual partners'. Participants were assumed to be representative of all students in these age groups attending Canadian public schools. It is not known how representative this sample was of Alberta youth however, because Calgary and many of the rural school divisions in Alberta did not participate.

Three other Western Canadian studies have addressed adolescent sexuality as part of larger health needs surveys of this age group (Russell & Weston, 1982; Drumheller Health Unit, 1990; Peace River Health Unit, 1990). Russell and Weston surveyed a purportedly representative sample of over 700 male and female never-married urban and rural Saskatchewan youth between the ages of 15 and 19 in 1978, as to their dating and sexual behavior. Unfortunately, the published report of the survey did not describe the sampling frame and sampling methods used or the study response rates, therefore making the generalizability of the results difficult.

Within Alberta, the Drumheller Health Unit (1990) conducted a survey of health needs amongst a sample of 370 Grade 10 students in three rural school divisions in central Alberta in 1989. As part of a larger assessment of health needs, students were asked how frequently they had sexual intercourse. Similarly, rural adolescents in Grades 7-12 in the Peace River Health Unit in northern Alberta in 1989, were asked what 'sexually active ' meant to them, and if they were 'sexually active' (Peace River Health Unit, 1990). It is difficult to assess the generalizability of the results of these studies, as both failed to report response rates.

Although Russell and Weston (1982) reported no statistical differences between the proportions of rural and urban adolescents having sexual intercourse, their data are now over ten years old. Furthermore their results represent Saskatchewan adolescents

whose patterns of sexual behavior may be different from their Alberta counterparts. King et al. (1988) included rural students in their sample, however no comparisons were done to examine rural/urban differences. Consequently, no recent data exist that specifically address the sexual practices of rural adolescents, other than the proportion ever having sexual intercourse.

Five behaviors that increase the risk of STD have been identified. They are ever having sexual intercourse, having frequent sexual intercourse, a young age at first intercourse, multiple sexual partners, and failure to use condoms during sexual intercourse (Kegeles et al., 1989; National Center for Health Statistics, 1991). Canadian data on these behaviors will be discussed below.

## Ever Having Sexual Intercourse

The proportion of adolescents who are engaging in sexual intercourse has been measured in various ways in different studies. The most common measurement has been to determine the proportion of adolescents ever engaging in 'full sexual intercourse'. King et al. (1988) found that 49% of male and 46% of female Grade 11 students and 31% of male and 21% of female Grade 9 students reported having sexual intercourse at least once. The 33.4% of Grade 10 students ever engaging in sexual intercourse in the Drumheller Health Unit Teen Survey (Drumheller Health Unit, 1990), falls between the proportions for Grade 9 and 11 students reported by King et al. The Peace River Teen Health Survey (1990) found that 27.6% of students in Grades 9-12 had ever had sexual intercourse. The grade specific proportions were: 12% of Grade 9 students, 21% of Grade 10 students, 41% of Grade 11 students and 48% of Grade 12 students. The highest proportion occurred in Grade 12 females, where 57% reported being sexually active. Meikle et al. (1985) found that 262/809 (32.4%) of the Calgary junior and senior high school students surveyed in 1980 had engaged in sexual intercourse at least once. Meikle et al. also found that the proportion of adolescents who were sexually active increased with age: 23.8% of 14 year olds, 26.4% of 15 year olds, 40% of 16 year olds, 48.9% of 17 year olds and 66.7% of 18 year olds had experienced sexual intercourse. Russell and Weston (1982) found slightly lower proportions of adolescents having sexual intercourse in 1978. In their sample, 24.4% of 15 year olds, 30.5% of 16 year olds, 47.1% of 17 year olds and 54.3% of 18 year olds reported ever having sex.

The age distributions of the samples may differ between the five studies, which were conducted over a period of ten years, making comparisons of the crude proportions pointless. The age-specific results reported by Russell and Weston (1982), Meikle et al. (1985) and King et al. (1988) suggest a slight increase in the age-specific proportions of sexually active adolescents over the years between these three studies.

### Frequency of Sexual Intercourse

Meikle et al. (1985), King et al. (1988) and the Drumheller survey (1990) all reported information on students' frequency of sexual intercourse. Meikle et al. found that 22.1% of female and 14.1% of male students reported engaging in sexual intercourse once a week or more frequently. When compared to King et al., these proportions are very close to the 21% of male and 16% of female Grade 11 students having sex 'often', but much higher than the 7% of male and 6% of female Grade 9 students having sex 'often'. Only 8.2% of the Grade 10 students in the Drumheller survey reported having sex 'often'. Comparing the proportions between the studies may

be of little merit, because having sexual intercourse 'often' may not have the same meaning for all students.

As a result of weaknesses in the data in these studies, it is unclear what proportion of adolescents are participating in regular sexual intercourse. Furthermore, it is unclear whether a trend towards higher proportions having regular sex exists over time.

#### Age at First Sexual Intercourse

Meikle et al. (1985) reported that 20.5% of students who had ever engaged in sexual intercourse had done so by age 14, and 91.0% had done so by age 16. Thus a large proportion of adolescents in this sample initiated sexual intercourse in Grades 9 and 10. These proportions are two or more times higher than the proportions found by Russell and Weston (1982) and Barrett (1980). Only 10% of Saskatchewan adolescents reported having sexual intercourse prior to age 15 (Russell & Weston, 1983). In a survey of 2985 first year Canadian university students in 1978, Barrett (1980) found that 9.0% of females and 12.1% of males reported their age at first intercourse to be 15 years or younger. Given that the data for these three studies was collected within a two year period, the differences in age at first intercourse suggest that there had been a decrease in the age of adolescents at first sexual intercourse. A similar trend toward decreasing age at first intercourse has also been observed in population based surveys in the United States (Zelnik & Shah, 1983; National Center for Health Statistics, 1991).

## Multiple Sexual Partners

An association has been found between early age of onset of sexual intercourse and greater numbers of lifetime sex partners (National Center for Health Statistics, 1991). Adolescents having multiple sex partners over a specified period of time (e.g., several months) are at increased risk for most STD (Aral & Holmes, 1990). Furthermore, increased numbers of sexual partners over a lifetime is associated with a greater cumulative risk for acquiring AIDS (Aral & Holmes, 1990). Fourteen percent of male and 8.0% of female Grade 11 students in the Canada Youth and AIDS Study, reported having five or more lifetime sex partners (King et al., 1988). These proportions were significantly less than the 58% of male and 41% of female same-aged high school dropouts who reported five or more lifetime sex partners in the same study. No other Canadian study has addressed the issue of multiple partners in a population of students attending high school.

## Sexual Intercourse Unprotected Against STD

While it is recognized that methods of birth control other than condoms may provide some protection against STD, condoms with spermicide are still the recommended method (Bowie et al., 1990). Furthermore, there is evidence that the use of oral contraceptives may indirectly promote the spread of STDs. The Canada Youth and AIDS Study found that as college students increasingly used birth control pills, their number of sexual partners increased, their use of condoms decreased, and their reported rates of STD rose (Macdonald et al., 1990).

Very little recent data on condom use amongst Canadian adolescents exists, despite the recent promotion of condom use to prevent AIDS. The most recent data for students attending high school comes from Meikle et al. (1985). They found that 90/139 of adolescents (64.8%) who reported the use of any method of contraception at first sexual intercourse used condoms; and 101/198 (51%) of those who reported the use of any method of contraception at most recent sexual intercourse used condoms. The latter proportion is considerably higher than the 24% of Saskatchewan adolescents using condoms at most recent intercourse in the study done a year earlier (Russell & Weston, 1983). The Canada Youth and AIDS Study asked high school dropouts about condom use, however, the same information was not elicited from high school attenders. Thirty percent of male and 25% of female high school dropouts reported using condoms "most of the time" or "always" (King et al. 1988; Bowie et al. 1990), however, school dropouts may behave differently from school attenders. This is certainly plausible given the large difference in the proportion shaving multiple partners between these two groups. No information exists on the proportion of sexually active rural adolescents using condoms.

## Factors Associated With Adolescent Sexual Activity and Exposure to Unprotected Sex

Several factors have been associated with adolescent sexual intercourse and condom use and deserve mention.

#### Socioeconomic status

U.S.A. studies identify substantial differences in the proportions of white and nonwhite adolescents at risk for STD and pregnancy through sexual intercourse (DiClemente et al., 1988; Durant, Pendergrast & Seymore, 1990; Sonenstein, Pleck & Ku, 1989; Zelnik & Shah, 1983). For example, Sonenstein et al. found that while 81% of black males aged 15-19 reported having sexual intercourse, the proportions were lower among hispanics (60%) and whites (57%).

As racial status is often used as an indicator of social class in the U.S.A. (with blacks and hispanics representing the lower classes), the differences in proportions observed by Sonestein et al. (1989) could be interpreted to mean that adolescents of lower socioeconomic status are more likely to have experienced sexual intercourse than those in higher socioeconomic classes. However, such interpretations should be made with a degree of caution, as these differences might also be due to cultural variation.

Some Canadian data support the existence of an association between parents' socioeconomic status and the prevalence of adolescent sexual intercourse. Russell and Weston (1982) found that adolescents with parents who had a university education were less likely to have engaged in sexual intercourse, and more likely to have used effective contraception at first sexual intercourse, than students whose parents had lower levels of education. Meikle et al. (1985) also found an association between social class and the proportion of students engaging in sexual intercourse. Social class was defined as the average educational level of adults in the district of the city of Calgary in which each of the participating schools was located. Average educational level in a given district was based on 1978 census data. Meikle et al. found that as educational level decreased, the proportion of adolescents who had engaged in sexual intercourse increased. The association was more evident in males than in females, with 23.6% of males from schools in high education districts, 32.3% of males from schools in medium education districts, and 48.4% of males from low education districts, engaging in sexual intercourse. A similar pattern of risk was seen for contraceptive use in females. In contrast, frequency of sexual intercourse was not associated with education.

Although the differences in adolescent sexual behavior in these two studies could be attributed to socio-economic status, the results should be viewed with caution. The ethnic background of the adolescents surveyed was not reported in either study, thus the

possibility exists that the observed differences were due, in part, to cultural differences. Furthermore, Meikle et al. (1985) applied aggregate education statistics to individuals. Thus, the observed differences in the proportion of students engaging in sexual intercourse between educational levels could be attributed to ecological fallacy. That is, the educational attainment of the parents of individual students is not necessarily the same as that of the aggregate data for the district.

### Alcohol and Drug Use

Although experimentation with sexual intercourse, drugs and alcohol may be concurrent behaviors that are characteristic of the identity struggle of adolescence (Murray & Zentner, 1985), the use of drugs and alcohol may also be causally associated with sexual intercourse. Alcohol and drug use impair the judgement necessary to take precautions such as using contraceptive protection, or refusing to engage in sexual intercourse. As a result, the use of alcohol and drugs contributes to adolescents engaging in sexual intercourse, and/or failing to protect themselves from STDs.

Russell and Weston (1982) reported that sexually active adolescents were more likely to drink alcohol and use drugs than adolescents who had never had sex. A similar relationship between alcohol and drug use and the prevalence of sexual activity was found in a sample of 758 rural adolescents in the northeastern U.S.A. (Alexander et al., 1989). The use of alcohol in the previous 30 days was associated with having sexual intercourse amongst white males, and the use of drugs was associated with having sexual intercourse among both males and females.

King et al. (1988) explored the relationship between the use of alcohol and drugs and frequency of sexual intercourse. Grade 11 students engaging in sexual intercourse "often" were more likely to drink alcohol at least once a week than students who had

never engaged in sexual intercourse (40% vs 13%). The difference in proportions between those engaging in sexual intercourse and those abstaining was even greater for marijuana use (41% vs 9%).

Although the results of these studies provide evidence of an association between having sex and the use of drugs and alcohol, it remains unclear whether alcohol and drugs lead to the onset of sexual intercourse and regular sexual intercourse, or whether they are concurrent behaviors.

Hingson, Strunin, & Berlin (1990) explored the relationship between condom use and drug and alcohol use in a telephone survey of 1,773 Massachusetts adolescents aged 16-19. Adolescents who consumed five or more drinks daily, and those who had used marijuana in the past month were 2.8 and 1.9 times, respectively, less likely to use condoms during sexual intercourse than students who did not drink or use drugs. Furthermore, 16% of adolescents who engaged in sex after drinking alcohol, used condoms less often than when not drinking. Twenty-five percent of adolescents who engaged in sex after drug use used condoms less often than when not having used drugs. The authors concluded that, "the rational cost-benefit beliefs used (by adolescents) in determining condom use may be greatly limited when an adolescent is intoxicated" (Hingson et al., 1990).

## Knowledge

Most Alberta school sex education curricula rely heavily on a knowledge component (Alberta Education, 1988). Unfortunately, the majority of these curricula concentrate on contraceptive counselling, and fail to specifically address the area of STD prevention (Bowie et al. 1990). No Canadian studies have addressed the association between knowledge regarding the prevention of STD and the proportion of adolescents using

condoms during sexual intercourse. King et al. (1988) examined students' knowledge related to AIDS and STD, but did not attempt to relate their knowledge to actual behavior.

Several studies from the U.S.A. have suggested that knowledge regarding STD and particularly AIDS does not necessarily translate into safe behavior (Strunin & Hingson, 1987; Kegeles et al., 1988; Rickert, Jay, Gottlieg & Bridges, 1989; Seltzer, Rabin & Benjamin, 1989; Sonenstein et al., 1989; Hingson et al., 1990). Rickert et al. found that although 61 of 99 sexually active female adolescents surveyed (62%) reported that a fear of AIDS had influenced their contraceptive behavior, only 17/99 (17%) reported purchasing or using condoms to prevent AIDS transmission. Although Kegeles et al. found an increase in knowledge of STD prevention over a period of one year amongst a sample of 325 sexually active adolescents, the increase in knowledge did not lead to any change in intentions to use condoms.

#### Attitudes and Beliefs

Several U.S.A. authors have suggested that adolescent contraceptive use is related to beliefs about, and attitudes towards, the various methods of birth control (Kegeles et al., 1988; 1989; Rickert et al., 1989; Hingson et al., 1990). No Canadian studies have specifically addressed this relationship. However, King et al. (1988) found an association between students' attitude toward condoms and engaging in sexual intercourse. Thirty-eight percent more of Grade 11 students engaging in sex "often" agreed that condoms interfere with sexual pleasure, as compared to Grade 11 students who had never had sex. If negative attitudes about the use of condoms affect the frequency of their use, then a large proportion of the adolescents with negative attitudes about condoms that have frequent sexual intercourse are inadequately protected from STD.

King et al. (1988) also explored adolescents' beliefs about potential outcomes of sexual intercourse. They found that while 50% of male and 64% of female Grade 11 students surveyed "worried most" about pregnancy, only 5% of males and 3% of females "worried most" about STD. Although a similar proportion of Calgary students in 1980 agreed that "fear of pregnancy would stop them from having sex" (58.5%), a comparable question was not asked about STD (Meikle et al., 1985). While pregnancy prevention appeared to be a priority among adolescents in these two studies, precautions taken to prevent pregnancy do not necessarily guarantee protection from STD. If STD prevention is not a concern among adolescents, then it may follow that measures to prevent STD are also a low priority with this group. In support of this view, Kegeles et al. (1988) reported that neither a perception that condoms prevented STD, nor the value and importance of avoiding STD, were significant predictors of adolescents' intentions to use condoms, or their actual use.

#### Social Pressure

Social pressure is widely recognized as an influence on adolescent sexual behavior (Billy & Udry, 1985a; 1985b; Billy, Rodgers & Udry, 1984; Shah & Zelnik, 1981). Although no Canadian study has examined the influence of social pressures on the frequency of unprotected sexual intercourse or condom use, several studies from the U.S.A. have. Shah and Zelnik explored parent and peer influence on adolescent sexual behavior and contraceptive use. They found that perceived peer and parental views about contraception were associated with the type of contraceptive used by the adolescent. Sexually active adolescents who perceived their views to be more akin to their peers, were more likely to use medically prescribed methods of contraception (contraceptive pill, diaphragm, contraceptive intrauterine device), and more likely to be inconsistent

in their use of contraception, than adolescents who perceived their views to be more like their parents. Adolescents with views more akin to their parents were more likely to use methods of contraception available in drugstores (i.e condoms, spermicide) or withdrawal and the rhythm method, than adolescents with views more like their peers. Jorgensen and Sonstegard's (1984) results concurred with these findings, in that perceived parental norms were associated with the regular effective use of contraception.

Several U.S.A. studies specifically addressing condom use have found an association with perceived social pressures to use condoms. DiClemente (1990) reported that the only significant predictor of condom use in a sample of 802 adolescents in San Francisco was the perception of 'normal' peer behavior regarding condom use. Adolescents who perceived that their peer group believed in using condoms were almost twice as likely to report using condoms during sexual intercourse as students who did not perceive that their peer group believed in using condoms. Adler, Kegeles, Irwin and Wibbelsman (1990) and Kegeles et al. (1988) also reported an association between adolescents' perceived social expectations to use condoms and condom use. Both of these studies found that adolescents' beliefs about social expectations to use condoms were significant predictors of condom use, at least among males. Interestingly, no association was found for females, suggesting the existence of gender differences in the influence of social pressure on condom use.

### Perceived Behavioral Control

Perceived behavioral control or an individual's perceived control over the internal and external factors that may interfere with a behavior, has also been proposed as an influence on behavior (Bandura, 1977). For example, a girl who knows where to buy

condoms and is comfortable asking her boyfriend to use them is more likely to successfully use a condom than a girl who doesn't. However, in addition to perceived behavioral control, actual physical access is also important. For example, even if a young boy or girl feels capable of procuring and using a condom, condoms must be readily available before the individual can successfully perform the behavior.

There is a perception amongst Albertan health professionals that adolescents, and in particular rural adolescents, have a lack of access to resources and services (e.g. condoms) regarding STD prevention, as compared to urban adolescents (D. Woodward, personal communication, May 14,1990; B. Morris and N. Connors, personal communications, May 24, 1990). No Canadian data exist, however, several U.S.A. authors have reported that adolescents express low perceived behavioral control over discussing sex with a partner, asking a partner to use a condom, buying condoms, and carrying condoms (Hingson et al., 1990; Lawrence, Levy & Rubinson, 1990; Ross, Caudle & Taylor, 1989).

#### Behavioral Framework For Exploring Unprotected Sexual Intercourse

To date no attempt has been made to examine the relationships between the use of condoms and attitudes, perceived social pressure, and perceived behavioral control, among Canadian adolescents. Results from studies in the U.S.A. suggest that a behavioral model, drawn from the work of Ajzen and Fishbein (1980), linking attitudes and perceived social pressure, provides useful insight into adolescents' decisions about unprotected sexual intercourse (Adler et al., 1990; Kegeles et al., 1988; Jorgensen & Sonstegard, 1984).

This model states that behavior is a direct function of an individual's intention to perform that behavior. The intention, in turn, is determined by the attitude toward the

behavior and perceived social pressure. According to the model, these two factors act separately upon intentions, so that different factors may exert more control over the same decision in different people. For example, the intention to abstain from sex may be attitudinal in a young boy, and the result of perceived social pressure in a young girl. As a result, a program aimed at increasing positive attitudes towards abstaining from unprotected sexual intercourse may affect the boy's intentions, but have little effect on the girl. Adler et al. (1990) found significant associations between adolescents' intentions to use contraceptive methods, their actual use, and attitudes and perceived social pressure toward using the methods.

A recent expansion of this model has seen the addition of the concept of an individual's perceived control over a behavior (Ajzen, 1985). In the revised model, attitude, perceived social pressure, and perceived behavioral control act independently on a individual's intentions (Figure 1.1). Given that the model has already been shown to provide valuable insight into adolescent use of contraceptives, the addition of perceived behavioral control may provide a model of condom use that would allow effective targeting of interventions designed to encourage adolescents to take sufficient precautions against STD.

#### Summary

There is a lack of current information on the proportion of Albertan adolescents ever having sexual intercourse, having regular intercourse, having multiple sexual partners, using condoms during sexual intercourse and on the age at onset of sexual intercourse. No data, other than crude proportions of adolescents ever having sexual intercourse, exist for rural Albertan adolescents. The determination of the current prevalence of these behaviors would allow a better estimate of the proportion of


Figure 1.1 Beliefs, attitudes, perceived behavioral control, social pressure and behavior (after Ajzen, 1985)

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adolescents at risk for STD. Furthermore, an exploration of factors associated with behavior would allow the development of strategies specifically targeted at this population.

### **Justification**

This is the first study to describe the frequency of sexual behaviors, and particularly factors associated with condom use, among rural Alberta youth. These data will aid in the task of targeting specific behaviors in sex education programs. The use of primary data in the form of self-reported behavior allows health professionals to avoid the problems associated with extrapolating such information from secondary data sources.

### Study Objectives

The specific objectives arising out of the purpose and literature review are:

- To determine the proportions of students ever having sexual intercourse, having regular sexual intercourse, having multiple sexual partners, and having sexual intercourse without the use of condoms.
- 2. To determine the age at onset of sexual intercourse.
- To compare the current prevalence of sexual intercourse, regular sexual intercourse, and the age at onset of sexual intercourse to the behavior reported by Meikle et al. (1985).
- 4. To explore factors related to sexual activity.
- 5. To explore the relationships between south-central Alberta high school students' use of condoms and attitudes, perceived behavioral control and perceived social pressure regarding the use of condoms.

# **CHAPTER 2**

# Methods

# <u>Design</u>

The study was a cross sectional survey of students in Grades 9-12 of the Foothills School Division, for whom parental and student consent were obtained, and who were present in school on the day of questionnaire administration.

### Population and Sample

## Sampling Frame

The Foothills School Division is located in south-central Alberta, and serves a population of 25,043. Two of the towns within the school division are within a 40 minute drive from Calgary, and serve as bedroom communities for the city. The school division has an annual enrollment of approximately 5400 students in Kindergarten to Grade 12. Seven schools serve the approximately 1700 students in Grades 9-12; three high schools, one junior high, and three smaller rural primary schools that include Grade 9. This rural school division was chosen as the location for the study because it agreed to participate. It is thought that the school division is representative of south-central Alberta excluding metropolitan Calgary (here after to be refered to as south-central Alberta).

# Access to Population

The Foothills Health Unit facilitated initiating contact with the Foothills School Division and provided nurses to assist in the data collection process. Permission to do the study was obtained from the Foothills School Division administration and Board of Trustees, with the following conditions: (a) a written consent requiring parents to actively "opt in" was required for students to participate, (b) parents were to be contacted by the investigator only once, (c) due to the small size of the school division i) no school specific data would be presented, and ii) any publication or presentation of the results other than the investigator's thesis would refer to the area of study as being in south-central Alberta, (d) the investigator would retain ownership of the data, with the understanding that the Foothills School Division would release the results to the public and to the Foothills Health Unit, and (e) the permission of the school principals was required. All of the school principals agreed to have their schools' participate in the study.

#### Sample Size

One of the objectives of the study was to determine if the proportion of students ever having sex in the current sample was different from the 32.3% cited by Meikle et al. (1985). A sample of 186 students was needed to detect a 10% difference between proportions with 95% certainty (Colton, 1974; Rosner, 1986). In order to make comparisons between grades and age groups, 186 students would be required in each age group and grade level. Assuming a 55% response to mailed consents as found by Meikle et al., in order to achieve a total sample of 744 students, approximately 325 students in each of the four grades would have to be contacted, for a total of 1300 students (76% of the Grade 9-12 students in the School Division).

#### Sampling Procedure

A list of the names and addresses of the 1682 students registered in the Foothills School Division in Grades 9-12 as of September 1990 was collected from the seven

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participating schools. The information was entered into a computer database, along with grade and school attended. The names were sorted alphabetically and numbered consecutively. A random list of 1300 numbers between 1 and 1682 was generated using the MINITAB random number generator (MINITAB, 1985), and the names of 1300 students corresponding to the random numbers were selected. Additionally, in order to ensure the anonymity of Grade 9 students in the three rural primary schools, all Grade 9 students in these schools were included. This added eleven Grade 9 students to the sample for a total of 1311 students.

#### The Instrument

A self-administered questionnaire, developed specifically for the purposes of the study, was used to collect the data (Appendix A). A self-administered questionnaire was selected over a mailed or telephone survey to provide an increased response rate (Dillman, 1978). The information collected was divided into three areas: demographic data, behavioral data, and data on knowledge, attitudes, perceived behavioral control and social pressure regarding the use of condoms during sexual intercourse. The questionnaire was reviewed by a reading comprehension specialist from the Department of Education at the University of Calgary, and was assessed to require Grade 8 level skills on the Fry Reading Comprehension Scale (Fry, 1968).

# Pretest

The questionnaire was pretested by a sample of researchers from the Department of Community Health Sciences at the University of Calgary, and on two samples of adolescents known to the investigator. The first pretest sample consisted of two male and two female adolescents aged 15-17 years. The students were instructed to time

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themselves as they completed the questionnaire, and following the completion of the questionnaire, to indicate any questions or instructions that presented difficulties. Following the initial pretest, the instructions preceding two sections of the questionnaire were expanded and two questions were reworded. The second pretest sample consisted of six adolescent females, aged 14-17 years. Because none of the subjects in the first pre-test had indicated that they were sexually active, three participants in the second pretest sample were asked to respond to the questionnaire as if they were sexually active. The investigator met with the subjects following the completion of the questionnaire and reviewed it with them. One set of instructions was clarified following the second pretest.

#### **Measurement**

The demographic data collected included age, gender and grade. Parental occupation and education were measured using scales derived from the Canada Youth and AIDS Study (King et al., 1988).

Behavioral data was self-reported, and included questions about students' past and current sexual practices. Yes/no responses were used to measure "ever had sexual intercourse", "had sexual intercourse in the past six months", "had more than one sexual partner in the past six months", "used contraception at first intercourse", and "used contraception at most recent intercourse". The frequencies of drug and alcohol use, sexual intercourse, contraceptive use, and condom use were measured using ordinal scales. Knowledge of STD prevention was measured by asking students to respond to an open ended question which asked them to list as many strategies to decrease the risk of STD as possible. Answers were categorized as acceptable or unacceptable based on a list of strategies taught to high school students during sex education classes in the Foothills

School Division (B. Geib, personal communication, March 31, 1990). Students giving three or more acceptable responses and no unacceptable responses were considered knowledgeable.

Beliefs about condom use were measured using two 12-item scales adapted from a list compiled by Adler et al. (1990). The first scale asked students to indicate whether they agreed or disagreed with 12 beliefs about using condoms every time they had sexual intercourse. The second scale asked students to indicate the value (good/bad) of the 12 beliefs in the first scale. Attitude toward condom use was calculated by summing the products of the belief and value component of each scale item. The score was dichotomized using the median score as the cutoff.

Perceived social pressure to use condoms was measured on four 2-item scales assessing students' beliefs regarding four significant referents (girlfriend/boyfriend, close friends, parents and doctor) wishes about the use of condoms during sexual intercourse and the student's motivation to comply with those wishes, again adapted from Adler et al. (1990). For example, students were asked to indicate whether they agreed or disagreed with the statements, "my parents think condoms should be used during sexual intercourse", and "I want to do what my parents think I should do." Perceived social pressure for a particular referent group was calculated as the product of the belief and motivation scales, and then dichotomized using the median score as the cutoff. An aggregate social pressure score was calculated by dichotomizing the sum of the products of the four referent groups, using the median score as the cut point.

Perceived behavioral control was measured using two single item scales and one 8item scale designed to measure adolescents' perceived control over using condoms. The scales were developed by the investigator based on the findings of Hingson et al. (1990), Lawrence et al. (1990), and Ross et al. (1989). Students were asked to indicate whether they agreed or disagreed with two general statements about condom use, and whether they thought eight scenarios asking about the possibility of not using condoms were likely or unlikely. An overall score for perceived control over condom use was calculated by dichotomizing the sum of the responses on the three scales, using the median score as the cut point.

### **Operational Definitions**

# 'Ever' Having Sexual Intercourse

The proportions of students 'ever' having sexual intercourse were measured using the question, "Have you <u>ever</u> had full sexual intercourse (gone all the way)?" The crude and age-specific proportions of students ever having sexual intercourse were calculated using the methods of Hennekens and Buring (1987).

# 'Regular' Sexual Intercourse

The proportions of students having 'regular' sexual intercourse were measured as students responding once a week, or more frequently to the question, "How often do you have sexual intercourse?" The crude and age-specific proportions of students having regular sexual intercourse were calculated using the methods of Hennekens and Buring (1987).

#### Data Collection Procedure

Letters of introduction naming the student and soliciting permission for the child's participation in the study were mailed to the parents or legal guardian of each randomly selected student (Appendix B), along with a prepaid business reply envelope. If more than one child per family had been selected, a letter was sent for each individual student.

Responses were dated as they were returned. One to two weeks before data collection at each school, an information meeting was held to give parents the opportunity to meet the investigator and review a copy of the questionnaire. Attendance at the four meetings was minimal, ranging from 3-13, and totalling 35 parents, one student and three school principals. Parents expressed concerns regarding students being ostracized for participating, the validity and generalizability of the study results, and the value and proposed use of the information gained.

To aid in planning space allocation for data collection, each school was provided with a list of students for whom parental consent had been received one week before the day of data collection. On the day of data collection, students for whom parental permission had been received were notified to proceed to designated locations by various means at the individual schools (Table 2.1). Data collection was done in groups of 30 or fewer students to increase confidentiality, except in one high school where all eligible students were assembled in the school cafeteria. No teachers or other school personnel were present during the data collection process.

Table 2.1 School Principals' Strategies for Assembling Students

- A. Students notified individually, of date, time and location of data collection by a memo passed out personally by the school counsellor 4-5 days before data collection.
- B. Principals notified students collectively in the class immediately preceding data collection.
- C. Principals notified students collectively over the intercom, during the class immediately preceding data collection.
- D. Home room teachers notified students in class on the day of data collection, then the vice-principal used the intercom to request that all students taking part in the study proceed to the designated area.

The study was introduced by either the investigator or one of four public health nurses from the Foothills Health Unit who acted as research assistants. In addition to a brief overview of the purpose of the study, students were told that participation was voluntary and both confidential and anonymous. In order to maintain the assurance of confidentiality and anonymity, students were asked to seal the completed questionnaires in an envelope, and place them in a secured box in the room in which the data were collected. If students chose not to complete the questionnaire, they were asked to consider filling in the first six questions dealing with demographic data. The research assistant reviewed the questionnaire instructions and the examples provided before the students began, and remained in the room while the questionnaires were being filled out. Students were free to leave after the initial explanation, however, none chose to do so. When all students had completed the questionnaire, the boxes were collected by the investigator and taken to Calgary for data entry and analysis.

### **Data Handling and Analysis**

The completed questionnaires were coded and double entered on a microcomputer using SPSS Data Entry II<sup>™</sup> (1987). Initial data cleaning was done during data entry by setting boundaries on the acceptable range of responses for a given variable. The openended questions were reviewed and coded by hand. The final data file was transferred to EPI INFO (Dean, Dean, Burton & Dicker, 1990) for further analysis. The data were cleaned further using frequencies and cross-tabulations to look for outliers and possible errors in data entry. Where a discrepancy was found the original questionnaire was consulted.

The proportion of students participating was compared to the initial randomly selected sample and to the total school division population by grade level and school to

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assess the representativeness of the sample. Frequencies and histograms were employed to assess the distribution of responses for all variables. Cross-tabulations, bar graphs and line plots were used to further describe the data. P-values were reported for descriptive purposes. The cut point for a significant association was a p-value less than 0.05, except in the exploratory analysis, where p-values less than 0.10 were accepted. When numbers in the cells of tables were very small, variables were collapsed. The scales measuring intentions, attitude, social pressure and perceived behavioral control regarding condom use were coded to reflect continuity of direction, and collapsed into dichotomous variables of agree/disagree and likely/unlikely. The 'neither' option was included in the negative end of the scale.

# Comparisons With Calgary Adolescents in 1980

The crude and age specific proportions of students ever having sexual intercourse and having regular sexual intercourse were calculated according to the method of Hennekens and Buring (1987). Ninety-five percent confidence intervals were calculated using the methods of described by Colton (1974). The crude proportions of students ever having sexual intercourse and having regular sexual intercourse in the current study and in Meikle et al. (1985) were age-standardized to 1990 Alberta Population Statistics using the direct method of standardization (Hennekens & Buring, 1987), because of a concern that the age distribution of students in the two studies were different. The differences in age-standardized rates for the two studies were then compared. Similarity was assumed if the difference in proportions was within 10%. Differences in age specific proportions of students ever having sex and having regular sex between the current study and Meikle et al. were also examined. In order to clarify the differences in the age specific proportions between studies, logistic regression models were fitted using GLIM (Royal Statistical Society, 1977). Fitted proportions of students ever having sex and having regular sex for the two studies were calculated and plotted. Additionally the differences between the fitted age-specific proportions for 1980 and 1990 were calculated with 95% confidence intervals using the methods of Fleiss (1981).

# Correlates of Intended Intercourse and Current and Intended Use of Condoms

Two by two contingency tables were used to explore correlates of three independent variables: (1) intentions to abstain from sexual intercourse in next six months, (2) intentions to use condoms during sexual intercourse in the next six months, (3) current condom use. In addition, the individual belief sub-scales for social pressure, attitude, and perceived control were examined in order to provide more detailed lists of beliefs associated with intentions to use condoms and current condom use for male and female students. Associations with p-values less than 0.10 were reported for descriptive purposes.

#### Ethical Issues

The study was reviewed and approved by the Conjoint Ethics Committee of the University of Calgary and the Foothills Hospital. Consent to participate was obtained from the Foothills School Division, parents, and the students themselves.

Parents and students were reassured that participation was voluntary, that refusal to participate would not affect the students' academic standing, that all responses would be confidential and anonymous, and that results would be reported as aggregate data only. Additionally, in order to further protect anonymity, all students in the small rural schools were included in the initial sample.

# **CHAPTER 3**

### Results

#### Response Rates

Consent to participate was required from both parents and students. One thousand three hundred and eleven letters requesting consent were sent to parents. Of these, seven were returned "address unknown". Five hundred and forty-two consent forms were returned to the investigator, of which 383 (70.7%) granted permission for study participation. Of the 383 letters received from parents, seven indicated that the student did not wish to participate, five were received too late to accommodate students in the administration of the questionnaires in school, and five of the students were no longer attending school. Two hundred and eighty of the remaining 366 students (76.5%) completed questionnaires. These 280 students represent seventeen percent of all students in grades 9-12 registered in the Foothills School Division as of September 1990. The consent rate by parents was 29.3% (Table 3.1). The proportion of parents consenting varied by school, ranging from 11.4% to 50.0% (Table 3.2), but was not associated with level of school (i.e., junior vs senior high) (p = 0.15), or students' grade (p = 0.95). However, the proportion of parents granting permission was inversely related to school size, with the two smallest schools having the largest proportions of parents giving consent (p = 0.04).

The percentage of students completing questionnaires varied with school and grade. Student participation by school ranged from 9.1% to 50.0% of the total sample, and from 58.4% to 100% of students for whom parental permission had been received (Table 3.3).

# Table 3.1 Response Rate

Letters sent N = 1311Letters sent to a valid address N = 1304

Activity	n	% of letters sent to valid address	% of letters returned
letters returned	542	542/1304 = 41.6%	
permission refused by parents	159	159/1304 = 12.2%	159/542 = 29.3%
permission granted by parents	383	383/1304 = 29.3%	383/542 = 70.7%
students available for study	366	366/1304 = 28.1%	366/542 = 67.5%
questionnaires completed by			······
students	280	280/1304 = 21.5%	280/542 = 51.7%

Table 3.2 Consent Rates by School

School	Letters Sent to Valid Address	Parental Gra	Permission anted
	n	n	%
1	547	149	27.2
2	341	121	35.5
3	213	54	25.4
4	117	35	29.9
5	44	5	11.4
6	20	10	50.0
7	22	9	40.9
Total	1304	383	

In all but one school, all students attending the data collection sessions filled out questionnaires. At that particular school, data collection was in an open-area cafeteria, and 12-14 students milled around during the study explanation but did not stay to complete a questionnaire. The absolute number of absent students at each school is unknown, although it is known that some eligible students were absent at all but one of the schools on the day of data collection. A higher proportion of Grade 9 students participated (p = 0.04) (Table 3.4). Junior high school students were more likely to complete questionnaires than senior high school students (p = 0.01).

School	Completed Questionnaires	Proportion of Students With Permission to Participate	Proportion of Letters Sent to Valid Address
	n	%	%
1	87	58.4	15.9
2	101	83.5	29.6
3	41	75.9	19.2
4	29	82.9	24.8
5	4	80.0	9.1
6	10	100.0	50.0
7	8	88.9	36.4
Total	280		

Table 3.3 Student Participation by School

Table 3.4 Student Participation by Grade

Grade	Completed Questionnaires	Proportion of Students With Permission to Participate	Proportion of Letters Sent to Valid Address
	n	%	%
9	94	90.4	26.0
10	66	68.0	19.8
11	56	64.4	19.8
12	64	67.4	19.6
Total	280		

### Description of Students

Age

Data were available for 276 students (Table 3.5). The age distribution was left skewed, with a median age of 15, and a modal age of 14.

			Cumulative
Age	n	Percentage	Percentage
13	12	4.3	4.3
14	77	27.9	32.2
15	58	21.0	53.3
16	62	22.5	75.7
17	53	19.2	94.9
18	13	4.7	99. <del>6</del>
19	1	0.4	100.0
Total	276	100.0	100.0

Table 3.5 Age Distribution of Students

### <u>Gender</u>

Data on gender were available for 279 students. One hundred and thirty-three (47.7%) were male and 146 (52.3%) were female. Gender was not associated with age (p = 0.37). The median age for both genders was 15 years.

### **Grade**

A larger proportion of Grade 9 students than students in Grades 10-12 participated. However, this was expected as a result of over-sampling the Grade 9 students. The proportion of females participating was higher than the proportion of males in Grade 9 (55.3% vs. 44.7%) and Grade 11(58.9% vs. 39.3%). However, the differences were not statistically significant (p = 0.35). The numbers of males and females participating in Grades 10 and 12 were approximately equal.

### Parents' Occupation

Table 3.6 shows parents' occupation. Data on fathers' occupation were available for 279 students, and on mothers' occupation for 278 students. The most common occupation category for fathers was business-related jobs followed by skilled and professional occupations. The most common occupation category for mothers was professional, followed by clerical occupations and homemakers. Six fathers (2.2%) and five mothers (1.8%) were unemployed or disabled.

	Father		Mother	
Area of Occupation	n	%	n	%
Professional	53	19.0	86	30.9
Business	86	30.8	23	8.3
Sales	16	5.7	10	3.6
Skilled	60	21.5	3	1.1
Farm-related	29	10.4	4	1.4
Clerical	0	0.0	72	25.9
Unskilled	28	10.0	22	7.9
Homemaker	1	0.4	53	19.1
Other	6	2.2	5	1.8
Total	279	100.0	278	100.0

Table 3.6 Parents' Occupation

# Parents' Highest Level of Education

Information on fathers' education was available for 275 students, and on mothers' education for all 280 students. Table 3.7 summarizes the highest level of education attained by both fathers and mothers. The median level of education was high school graduation for both parents. Sixty-four percent of fathers and 76% of mothers had a minimum of a high school education. Twenty-six percent of fathers and 21% of mothers were university graduates. Ten percent of students did not know their father's highest level of education.

Highest Education	Fathers		Mothers	
Level Attained	n	%	n	%
Elementary or less	5	1.8	0	0.0
Some high school	65	23.6	43	15.4
Graduated high school	59	21.5	100	35.7
Graduated community college	46	16.7	55	19.6
Graduated university	72	26.2	60	21.4
Don't know	28	10.2	0	0.0
Total	275	100.0	280	100.0

Table 3.7 Parents' Highest Level of Education

### Alcohol Use

Data on alcohol use were available for 278 of the 280 students. One hundred and forty-five students (52.1%) reported drinking alcohol at least once a month. Forty-seven students (16.9%) reported never drinking alcohol, and 88 (31.7%) reported drinking alcohol only on special occasions. Forty-four students (15.8%) reported using alcohol once a week or more frequently, with six (2.2%) reporting daily use. Gender was associated with frequency of alcohol consumption (Table 3.8). Females were less likely than males to use alcohol at least once a week (10.9% vs. 21.2%, p = 0.02). Although a larger proportion of females than males had never tried alcohol (18.5% vs. 15.2%, p = 0.52), or had tried it only on special occasions (34.0% vs. 28.0%, p = 0.30), these differences were not statistically significant.

Frequency of alcohol use was also associated with age. The proportion of students using alcohol at least once a week consistently increased with age (Figure 3.1). Four of 89 students (4.5%) aged 14 years or younger reported using alcohol once a week or more frequently as compared to 15 of 67 students (22.4%) aged 17 years or older (p = 0.007).

	Males		Females	
Frequency of Alcohol Use	n	%	n	%
Never	20	15.2	27	18.5
On special occasions	37	28.0	50	34.0
Once a month	24	18.2	25	17.1
2-3 times a month	23	17.4	29	19.9
≥ Once a week	28	21.0	16	10.9
Total	132	100.0	147	100.0

Table 3.8 Frequency of Alcohol Use by Gender\*

\* data available for 278 students

# Drug Use

Information on frequency of drug use was available for 278 of the 280 students (Table 3.9). Two hundred and thirty-nine of the students (86.0%) had never used drugs. Another 15 (5.4%) had used drugs only on special occasions. Twenty-four students (8.6%) reported using drugs once a month or more frequently, and ten students (3.6%) reported using drugs once a week or more frequently. Because so few students reported drug use, comparisons of drug use by gender and age were done on a collapsed dichotomous 'ever/never' measure of drug use. No gender differences were observed (p = 0.30). However, drug use was associated with age (p = 0.004), with drug use peaking with the 16 year olds and then decreasing again for 17 year olds (Figure 3.2).

Frequency of Drug Use	n	%
Never	239	86.0
On special occasions	15	5.4
Once a month	5	1.8
2-3 times a month	9	3.2
Once a week	1	• 0.4
2-3 times a week	4	1.4
Everyday	5	1.8
Total	278	100.0

Table 3.9 Frequency o	Drug	Use
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Figure 3.1 Frequency of Alcohol Use by Age (n=275)



Figure 3.2 Frequency of Drug Use by Age (n=275)

# Knowledge Regarding the Prevention of STD

Students were asked to list as many ways of preventing STD as they could.

Responses were categorized as acceptable or unacceptable according to the sex education curriculum for the school division. Two hundred and sixty-nine students responded to this question. Table 3.10 lists the responses and the frequency with which they were given.

# Table 3.10 Knowledge of STD Prevention\*

Acceptable		
Use condoms	244	90.7%
Abstain from sexual intercourse	209	77.7%
Be monogamous	35	13.0%
Know your partner	77	28.6%
Avoid multiple partners	19	7.1%
<u>Unacceptable</u>		
Get tested	41	15.2%
Use birth control pills	24	8.9%
Use a diaphragm	47	17.4%
Use an intrauterine device (IUD)	3	1.1%
Use a contraceptive sponge	9	7.1%
Use a spermicide	56	20.8%
Use a cervical cap	1	0.4%
Use the rhythm method	1	0.4%
Use withdrawal	1	0.4%
Tubal ligation/Vasectomy	2	0.7%
Use a douche	1	0.4%
Exercise good hygiene	4	1.5%
Plan ahead for sexual intercourse	4	1.5%
Use protection (unspecified)	32	11.9%
Avoid drugs/sharing needles	12	4.5%

\* do not add up to 100% because of multiple responses

Two hundred and sixty-five students (98.5%) were able to give at least one acceptable response, however, 141 (52.4%) also gave at least one unacceptable

response (Table 3.11). Fifty-two students (19.3%) were able to give three acceptable and no unacceptable responses, i.e. were "knowledgeable". Gender was not associated with being knowledgeable (p = 0.50). Although age was associated with knowledge of STD prevention (p = 0.02), the pattern across age was not consistent. Seventeen year olds were the most knowledgeable, followed by 16 year olds; however, students fourteen years old or younger were more knowledgeable than 15 year olds (Figure 3.3).

Table 3.11 Proportion of Acceptable and Unacceptable Responses to Knowledge Question\*

			Acceptab	ble with one		
	Acceptab	le with no	or	more		
Number of	unaccept	able	unaco	ceptable	То	otal
Responses	n	%	l n	%	n	%
≥ 3	52	19.3	27	10.0	79	29.3
< 3	72	26.8	118	43.9	190	70.7
Total	124	46.1	145	53.9	269	100.0

# Current and Preferred Sources for Obtaining Condoms

Data on current sources for obtaining condoms were available for 273 students, and on preferred sources for obtaining condoms for 259 students (Table 3.12). In rank order, the five most frequently mentioned current sources for obtaining condoms were: 1) drugstore/pharmacy, 2) friends, 3) convenience stores, 4) grocery store/ supermarket, and 5) physicians. In rank order the five most frequently mentioned preferred sources for obtaining condoms were: 1)schools/school washrooms, 2) drugstores/ pharmacies, 3)public washrooms, 4) convenience stores, and 5) physicians.



Figure 3.3 Frequency of Acceptable Responses to Question Regarding Knowledge of STD Prevention by Age (n=124)

	Current Sources		Prefe	rred Sources	
	n	%	n	%	
Drugstore/Pharmacy	234	85.7%	63	24.3%	
School/School washrooms	0	0.0%	88	34.0%	
Grocery store/Supermarket	45	16.5%	0	0.0%	
Anywhere anonymous	0	0.0%	29	11.1%	
Convenience store	51	18.7%	27	10.4%	
Physician	44	16.1%	16	6.2%	
Friends	53	19.4%	16	6.2%	
Family members	23	8.4%	11	4.2%	
Girlfriend/Boyfriend	11	4.0%	10	3.9%	
Public washrooms	26	9.5%	55	21.2%	
Gas stations	19	7.0%	0	0.0%	
Arcade/Teen Hangouts	12	4.4%	0	0.0%	
Condom dispensers	17	6.2%	9	3.4%	
Bars	5	1.8%	0	0.0%	
Calgary	10	3.7%	2	1.3%	
Don't know	2	0.7%	4	1.5%	

## Table 3.12 Current and Preferred Sources for Obtaining Condoms\*

\* do not add up to 100% because of multiple responses.

# Current and Preferred Sources for Information About STD

Data on current sources for information on STD were available for 276 students, and on preferred sources for information on STD for 248 students (Table 3.13). The five most frequently mentioned current sources for information about STD were: 1) physicians, 2) school/school nurses, 3) printed sources, 4) family members, and 5) the local health unit. The five most frequently mentioned preferred sources for information about STD were: 1) school/school nurses, 2) physicians, 3) family members, 4) printed sources, and 5) "it doesn't matter".

	Current Sources		Preferred Sources	
	n	%	n	%
Dhevelstere				
Physician	206	74.6%	83	33.5%
School/School nurse	124	44.9%	94	37.9%
Printed sources	78	28.3%	36	14.5%
Information hotline	22	7.0%	17	6.9%
Family members	73	26.4%	44	17.7%
Friends	23	8.3%	5	2.0%
Foothills Health Unit	42	15.2%	19	7.3%
STD Clinic (Calgary)	3	1.1%	2	0.9%
Health clinics	35	12.7%	18	7.3%
Hospital	23	8.3%	12	4.8%
Drugstore/Pharmacy	16	5.8%	17	6.9%
By mail	3	1.1%	7	2.8%
Somewhere anonymous	0	0.0%	6	2.4%
Doesn't matter	0	0.0%	22	8.9%
Don't know	4	1.4%	10	4.0%

#### Table 3.13 Current and Preferred Sources for Information on STD\*

\*do not add up to 100% because of multiple responses.

# Sexually Transmitted Diseases Reported

Four of 280 students (1.4%) had been told by a doctor or nurse that they had a STD. Additionally, 14/280 students (5.0%) had ever suspected themselves of having a STD. No association was found between having a STD and gender (p = 0.93) or age (p = 0.40); or between suspecting a STD and gender (p = 0.78) or age (p = 0.39). Six of the 14 students who had suspected having a STD had never had sexual intercourse.

#### Prevalence of Sexual Intercourse

Data on the prevalence of sexual intercourse was available for 252 of the 280 students. Of the 252 respondents, 115 (46.0%) had ever had sexual intercourse. Significantly more males than females had ever had sexual intercourse (54.2% vs. 38.1%, p = 0.01) (Figure 3.4). The proportion of ever sexually active students

increased with age (p < 0.001), ranging from 23.8% for students aged 14 years or younger to 62.5% for students aged 17 years or older (Figure 3.4). The median age for both males and females who had ever engaged in sexual intercourse was 16 years. Grade was also positively associated with ever having sex (Figure 3.5). The proportion of students who had ever engaged in sex increased from 24.1% for Grade 9 students to 66.7% for Grade 12 students (p < 0.001).

Table 3.14 shows a comparison of the crude, age-standardized and age-specific proportions of students ever having sexual intercourse in the current study to the proportions of Calgary students in 1980 (Meikle et al., 1985).

	Current Study*		Meikle et al. (1985)**		
	Proporti	on 95% C.I.***	Proportio	on 95%	6 C.I.
Crude	0.463	(0.401, 0.525)	0.323	(0.291,	0.355)
Age-					·····
Standardized	0.462	(0.400, 0.523)	0.373	(0.339,	0.406)
Age-Specific			······································		
13	0.167	(0.000, 0.378)	0.166	(0.095,	0.237)
14	0.250	(0.147, 0.353)	0.238	(0.174,	0.302)
15	0.383	(0.244, 0.522)	0.264	(0.192,	0.336)
16	0.596	(0.469, 0.723)	0.400	(0.319,	0.481)
17	0.580	(0.443, 0.717)	0.489	(0.404,	0.574)
≥18	0.786	(0.571, 1.000)	0.667	(0.537,	0.797)

Table 3.14Comparison of Crude, Age-standardized and Age-specific Proportions of<br/>Students Ever Having Sex in the Current Study and in Meikle et al. (1985)

\* data available for 248 students

\* data available for 809 students

\*\* C.I. = confidence interval

The crude proportions differed between the studies, with a significantly higher proportion of students ever having sexual intercourse in 1990 than in 1980 (46.3% vs. 32.3%, p < 0.001). This difference was still significant after age-standardization of



Figure 3.4 Prevalence of Sexual Intercourse by Age and Gender (n=111)



Figure 3.5 Prevalence of Sexual Intercourse by Grade (n=115)

the crude rates (46.2% vs. 37.3%, p = 0.01). The age-specific rates of ever having sexual intercourse were also higher in the current study (Figure 3.6). However, with the exception of the 16 year olds, the individual age-specific differences were not statistically significant at the 0.05 level.

A logistic regression model was fitted to the data to simplify the description of the differences in this behavior by students' age and year of study because Figure 3.6 suggested that the age-specific percentages of adolescents engaging in sex had increased between 1980 and 1990. This model (Equation 3.1), suggests a consistent pattern of a higher percentage of students engaging in sexual intercourse in 1990 as compared to 1980, regardless of age (Figure 3.7).

Probability(ever having sex) =  $e^{-7.108 + 0.4459}$  (age) + 0.4228 (current study)

(Equation 3.1).

There was no evidence of a lack of fit for the model ( $\Delta = 5.933$  on 9 df, p = 0.75), or evidence for an interaction between age and year of study ( $\Delta = 1.032$  on 1 df, p = 0.31). There was significant evidence that year of study added to the model once the age effect was accounted for ( $\Delta = 7.377$  on 1 df, p = 0.007). Table 3.15 shows the coefficients and standard errors for the variables in the model. Table 3.16 gives the agespecific differences in fitted proportions between 1980 and 1990 and 95% confidence intervals for the differences.



Figure 3.6 Comparison Age-specific Percentages of Students Having Sex in the Current Study and in Meikle et al. (1985)



Figure 3.7 Comparison of Fitted Age-specific Percentages of Students Having Sex in the Current Study and in Meikle et al. (1985)

Table 3.15	Coefficients for Logistic Regression Model of Comparison of Students Even
	Having Sex in Current Study and in Meikle et al. (1985)

Variable	Estimate	Standard Error
Constant	- 7.108	0.735
Age	0.446	0.047
Current Study	0.423	0.155

Table 3.16 Comparison of Fitted Proportions of Students Ever Having Sex in the Current Study and in Meikle et al. (1985)

Age	Difference in Fitted Proportions	95% C.I.*
13	0.062	0.006, 0.119
14	0.080	0.017, 0.146
15	0.096	0.027, 0.164
16	0.104	0.034, 0.175
17	0.104	0.034, 0.175
≥18	0.094	0.028, 0.159

\* C.I. = confidence interval

# Factors Associated With Ever Having Sexual Intercourse

### Fathers' Education and Occupation

Data on paternal education, occupation and ever having sexual intercourse were available for 223 of 280 students. Paternal education was negatively associated with students' ever having sex (Figure 3.8). As paternal education decreased, the proportion of students ever having sex increased (p = 0.06). No relationship was observed between paternal occupation and students' ever having sex (p = 0.98).

#### Mothers' Education and Occupation

Data on maternal education, occupation and ever having sexual intercourse were available for 232 of the 280 students. Although the relationship was not as consistent as with fathers' education, a negative association was found between mothers' education and students' ever engaging in sex (p = 0.01) (Figure 3.9). No association was observed between maternal occupation and students' ever having sex (p = 0.44).

#### Alcohol Use

Data on ever having sexual intercourse and frequency of alcohol use were available for 251 of the 280 students. A significantly higher proportion of students using alcohol once a week or more often had ever engaged in sex, as compared to students using alcohol less than once a week (83.3% vs. 16.7%, p = 0.007). The association existed for both males (85.2% vs. 45.6%, p < 0.001) and females (80.0% vs. 32.8%, p < 0.001). The association also existed for all age groups (Figure 3.10). A higher proportion of  $z^{*}$ students ever having sexual intercourse used alcohol once a week or more often than students who had never had sexual intercourse in all age groups (p = 0.03).

#### Drug Use

Data on sexual intercourse and drug use were available for 251/280 students. Ever engaging in sex was positively associated with drug use. A higher proportion of students ever using drugs had ever engaged in sex, as compared to students never using drugs (89.5% vs. 37.7%, p < 0.001). The association was observed for both males (90.9% vs. 46.3%, p < 0.001), and females (87.5% vs. 31.4%, p < 0.001). The association between sexual intercourse and drug use also varied with age (Figure 3.11). A higher proportion of students aged 15 years and older ever using drugs had ever engaged in sex, as compared to students aged 15 years and older never using drugs (91.4% vs. 45.5%, p < 0.001).



Figure 3.8 Prevalence of Sexual Intercourse by Fathers' Highest Level of Education (n=223)



Figure 3.9 Prevalence of Sexual Intercourse by Mothers' Highest Level of Education (n=251)



Figure 3.10 Prevalence of Sexual Intercourse by Alcohol Use and Age (n=251)



Figure 3.11 Prevalence of Sexual Intercourse by Drug Use and Age (n=167)

#### Prevalence of Regular Sexual Intercourse

Data on frequency and recency of sexual intercourse were available for all 115 students ever having sex. Thirty-three of the 115 students (28.7%) reported having sex once a week or more frequently, i.e. having regular sex (Table 3.17). No association was found between frequency of regular sex and gender or grade. Although the proportion of adolescents having regular sex did vary with age, the association was not significant (p = 0.57). The largest proportion of students having regular sex occurred among the 15 year olds (Figure 3.12).

Ninety-seven students (84.3%) reported that they had sexual intercourse in the six months preceding the study (Figure 3.13). More males than females (90.6% vs 76.5%, p = 0.04) reported having sex in the six months preceding data collection. Sixteen year olds were the most likely to have had sex in the preceding six months (94.1%), while fifteen year olds were the least likely (72.2%), however, the differences were not statistically significant (p = 0.19).

Frequency of	M	ales	Fer	nales	Т	otal
Sexual	n	%	n -	%	n	%
Intercourse						
< once/month	28	43.8	23	45.1	51	44.3
1-2x/month	18	28.1	13	25.5	31	27.0
≥ once/week	18	28.1	15	29.4	33	28.7
Total	64	100.0	51	100.0	115	100.0

 Table 3.17
 Frequency of Sexual Intercourse by Gender

Table 3.18 shows a comparison of the crude, age-standardized, and age-specific proportions of students reporting having regular sexual intercourse in the current study to Calgary students in 1980 (Meikle et al., 1985). The crude rates were



Figure 3.12 Frequency of Sexual Intercourse by Age (n=111)



Figure 3.13 Prevalence of Sexual Intercourse in the Preceding Six Months by Age and Gender (n=111)

significantly different (28.7% vs. 18.6%, p = 0.02), however the significant difference was not maintained with the age-standardized rates (23.7% vs 17.0%, p = 0.19). Although the age-specific rates were not statistically different, Figure 3.14 suggests that proportion of students having regular intercourse has increased between 1980 and 1990.

	Current Study*	Meikle et al. (1985)**		
	Proportion 95% C.I.***	Proportion 95% C.I.		
Crude	0.287 (0.209, 0.371)	0.182 (0.133, 0.231)		
Age-				
standardized	0.237 (0.157, 0.316)	0.170 (0.122. 0.217)		
Age-specific				
. 13	0.000 (0.000, 0.000)	0.083 (0.000, 0.194)		
1,4	0.176 (0.000, 0.357)	0.100 (0.007, 0.193)		
15	0.333 (0.115, 0.551)	0.071 (0.000, 0.166)		
16	0.294 (0.141, 0.447)	0.185 (0.081, 0.289)		
17	0.345 (0.172, 0.518)	0.238 (0.133, 0.343)		
≥18	0.273 (0.010, 0.536)	0.333 (0.172, 0.494)		

Table 3.18 Comparison of Crude, Age-standardized and Age-specific Proportions of Regular Sexual Intercourse in the Current Study and in Meikle et al. (1985)

\* data available for 111 students

\*\* data available for 242 students

\* \* \* C.I. = confidence interval

A logistic regression model was fitted to the data to simplify the description of the proportions of this behavior by students' age and year of study, because Figure 3.14 suggested that the age-specific percentages of adolescents engaging in regular sex have increased between 1980 and 1990. The fitted model (Equation 3.2), indicates that larger proportions of students are engaging in regular sex in 1990 as compared to 1980, regardless of age (Figure 3.15).
Probability(having regular sex) = e -5.986 + 0.3168 (age) + 0.5952 (current study)

(Equation 3.2)

There was no significant evidence of a lack of fit for the model ( $\Delta = 4.380$  on 9 df, p = 0.88), or evidence of an interaction between age and year of study ( $\Delta = 1.085$  on 1 df, p = 0.30). There was significant evidence that year of study added to the model once the age effect was accounted for ( $\Delta = 4.704$  on 1 df, p = 0.03). Table 3.19 shows the coefficients and standard errors for the variables in the model. Table 3.20 gives the differences in the fitted age-specific proportions between 1980 and 1990, and 95% confidence intervals for the differences. The difference between studies appears to increase with age.

 

 Table 3.19
 Coefficients for Logistic Regression Model of Comparison of Students Having Regular Sex in Current Study and in Meikle et al. (1985)

Variable	Estimate	Standard Error
Constant	- 5.986	1.611
Age	0.317	0.098
Current study	0.595	0.272

 Table 3.20 Differences in Fitted, Age-specific Proportions of Students Having Regular

 Sex in the Current Study and in Meikle et al. (1985)

Age	Difference in Fitted Proportions	95% C.I.*
13	0.055	0.000, 0.127
14	0.070	0.000, 0.151
15	0.087	0.000, 0.176
16	0.105	0.008, 0.202
17	0.122	0.018, 0.225
≥18	0.136	0.028, 0.245

\* C.I. = confidence interval



Figure 3.14 Comparison of Age-specific Percentages of Students Having Regular Sex in the Current Study and in Meikle et al. (1985)



Figure 3.15 Comparison of Fitted Age-specific Percentages of Students Having Regular Sex in the Current Study and in Meikle et al. (1985)

#### Factors Associated With Regular Sexual Intercourse

No association was found between students engaging in regular sex and paternal education (p = 0.57), maternal education (p = 0.39), or students' frequency of alcohol use (p = 0.19).

Data on students having regular sex and drug use were available for all 115 students. There was evidence of an interaction between gender, use of drugs and having regular sex. A higher proportion of males ever using drugs engaged in regular sex, as compared to males who had never used drugs (45.0% vs. 20.5%, p = 0.04). No significant association was found for females (p = 0.44) or between age groups (p = 0.49).

#### Factors Associated With Recent Sexual Intercourse

No association was found between having sex in the past six months and maternal education (p = 0.75), or students' drug use (p = 0.19).

Data on fathers' education and students having sex in the past six months were available for 103 of the 115 students ever having sex. An association was found between fathers' education and having sex in the past six months (Figure 3.16). Students whose father had less than high school were the most likely to have had sex in the past six months, and students whose fathers' had a community college education were the least likely to have done so (p = 0.02).

Data on recent sexual intercourse and alcohol use were available for all 115 students who had ever engaged in sex. A positive association was found between alcohol use and recency of sexual intercourse. A higher proportion of students who had engaged in sex in the preceding six months used alcohol at least once a week, as compared to students abstaining from sex in the preceding sex months (34.0 vs. 11.1%, p = 0.05).



Figure 3.16 Prevalence of Sex In the Preceding Six Months by Fathers' Highest Level of Education (n=103)

#### Prevalence of Multiple Sexual Partners

Data on the number of students having multiple partners in the preceding six months were available for all 115 students ever having sex. Thirty-eight of the 115 students (33%) had more than one partner in the preceding six months (Table 3.21). More males than females had multiple partners (37.5% vs 27.5%), however, the difference was not statistically significant (p = 0.26). The proportion of students with multiple partners peaked with the sixteen year olds and then declined for the 17 year olds (Figure 3.17), however, the age differences were not statistically significant (p = 0.24).

Table 3.21 Students Having Multiple Sexual Partners by Gender

Multiple Partners	Males		Fem	ales	Total		
in past 6 months	n	%	n	%	'n	%	
Yes	24	37.5	14	27.5	38	33.0	
No	40	62.5	37	72.5	77	67.0	
Total	64	100.0	51	100.0	115	100.0	

#### Age at First Sexual Intercourse

Data on age at first sexual intercourse were available for 113 of the 115 students who had ever engaged in sex. Age at first intercourse was right skewed, ranging from 9-17 years. No association was found between gender and age at first intercourse (p = 0.87). The median age at first sexual intercourse was 14 years. Fourteen students (12.4%) reported commencing sexual relations at age 12 or younger. Two of these students commented that their first sexual intercourse was rape. By age 13, 28.3% of the students had engaged in sex; this proportion increased to 55.7% by age 14, to 74.3% by age 15, and to 92.9% by age 16. An association was found between age at first



Figure 3.17 Prevalence of Multiple Sexual Partners by Age (n=111)



Figure 3.18 Prevalence of Multiple Sexual Partners by Age at First Sexual Intercourse (n=113)

sexual intercourse and having multiple partners in the preceding six months (p = 0.03). The proportion of students having multiple partners decreased as age at onset of intercourse increased (Figure 3.18).

Figure 3.19 shows a comparison of the cumulative proportions of students not yet sexually active by age at onset of sexual activity between the current study and Meikle et al. (1985). No evidence exists to suggest that students in the Foothills school division in 1990 differ in age at onset at first sexual intercourse from students in Calgary in 1980.

#### Prevalence of Unprotected Sexual Intercourse

Data on frequency of birth control use were available for 113 of the 115 students who had ever engaged in sex (Table 3.22). Nine students (8.0%) reported never using birth control. Seventy-one students (62.8%) reported always using birth control. No association was found between birth control use and gender (p = 0.99). Fifteen year olds were most likely to use birth control never or infrequently, and students 17 years or older were most likely to use birth control most of the time or always (Figure 3.20); however the differences were not statistically significant (p = 0.26).

Frequency of Birth	Males		Fei	nales	Total		
Control Use	n %		n	n %		%	
Most of the time/ Always	54	85.7	42	84.0	96	85.0	
Some of the time/Never	9	14.3	8	16.0	17	15.0	
Total	63	100.0	50	100.0	113	100.0	

Table 3.22 Frequency of Birth Control Use by Gender



Figure 3.19 Age at First Intercourse -- Cumulative Proportions of Students Not Yet Sexually Active by Age at First Sexual Intercourse in Current Study (n=113) and in Meikle et al. (1985) (n=234)

#### Use of Birth Control During First Sexual Intercourse

Data on use of birth control during first sexual intercourse were available for 111 of the 115 students who had ever had sex. Twenty-six of the students (23.4%) used no form of birth control at first sexual intercourse. No association was found between use of birth control during first intercourse and gender (p = 0.49), or current age (p = 0.34).

An association was found between age at first sexual intercourse and use of birth control at first sexual intercourse. As Figure 3.21 illustrates, the proportion of students using birth control at first sexual intercourse increased as age at first sexual intercourse increased (p = 0.002). The proportion of students 12 years of age or younger at first sexual intercourse who used birth control at first sexual intercourse was significantly lower than the proportion of students aged 13 years or older (69.2% vs. 16.7%, p < 0.001).

Data on the method of birth control used at first sexual intercourse were available for 81 students (Table 3.23) . Fifty-one students (71.6%) used only one method of birth control, and 23 (28.4%) used a combination of methods. All but two of the students using a single method used a method considered to be effective if used properly (e.g. birth control pills). Only one student used a combination considered to be ineffective (i.e. withdrawal and the rhythm method). Thus, only 74 of 111 students (73.9%) used an effective method of birth control at first sexual intercourse. The most common method of birth control used alone or in combination with other methods was condoms (69%), followed by the birth control pill (21.2%). No association was found between method of birth control used and current age or gender.



Figure 3.20 Frequency of Birth Control Use by Age (n=110)



Figure 3.21 Use of Birth Control at First Sexual Intercourse by Age at First Sexual Intercourse (n=109)

Type of Birth Control	Used Alone n %		Use Comb n	Used in Combination n %		al** %
Condom	50	61.7	19	46.3	69	69.7
Birth Control Pill	6	7.4	15	36.6	21	21.2
Foam	0	0.0	2	4.9	2	2.0
Rhythm	0	0.0	1	2.4	1	1.0
Withdrawal	2	2.5	2	4.9	4	4.0
Other	0	0.0	2	4.9	2	2.0
Total	58	100.0	41	100.0	99	100.0

Table 3.23 Type of Birth Control Used at First Sexual Intercourse

\* data available for 81 students

\* \* total greater than 81 because of multiple method use

#### Use of Birth Control During Most Recent Sexual Intercourse

Data on use of birth control during most recent sexual intercourse were available for 109 of the 115 students who had ever engaged in sex. Sixteen of the students (14.7%) did not use birth control during their most recent sexual intercourse. Although more males than females had used birth control during their most recent sexual intercourse (90.2% vs 79.2%, p = 0.11), the difference was not statistically significant. No significant association was found between use of birth control at most recent sex and age (p = 0.26).

Data on the method of birth control used at most recent sexual intercourse were available for 89 students. Sixty-nine (77.5%) reported using one method of birth control, and 20 (22.5%) reported using a combination of methods (Table 3.24). Four students using one method, and one student using multiple methods used methods considered to be ineffective (i.e. withdrawal). As a result, only 88 of 109 students (80.7%) were using effective methods of birth control at most recent sexual intercourse. Condoms were the most frequently used method of birth control (54.5%), followed by birth control pills (24.7%). No association was found between method of birth control used at most recent sexual intercourse and age or gender.

Type of Birth Control	Used Alone		Us Comt n	Used in Combination n %		tal**
Condom	43	62.3	18	41.9	61	54,5
Birth Control Pill	22	31.9	13	30.2	35	31.3
Foam	1	1.4	5	11.6	6	5.4
Rhythm	1	1.4	2	4.7	3	2.7
Withdrawal	2	2.9	5	11.6	7	6.3
Total	69	100.0	43	100.0	112	100.0

Table 3.24 Type of Birth Control Used at Most Recent Sexual Intercourse

\* data available for 89 students

\* \* total greater than 89 because of multiple method use

## Condom Use

As the investigator was especially interested in students' use of condoms, a more detailed question was asked about condom use. Data were available for 112 of the 115 students who had ever had sex (Table 3.25). Forty-six of the 112 students (41.1%) reported always using condoms, and 14/112 (12.5%) reported never using condoms during intercourse. Males were more likely than females to report using condoms the majority of the time (74.2% vs. 54.0%, p = 0.03), and less likely than females to report using condom use was also associated with age (Figure 3.22). Students aged 14 years or younger were more likely than students aged 15 years or older, to report using condoms the majority of the time (84.2% vs. 60.4%, p = 0.05).





Frequency of Condom Use	Males n%		Females n%		Total n%	
Most of the time/Always	46	74.2	27	54.0	73	65.2
Some of the time/Never	16	25.8	23	46.0	39	34.8
Total	62	100.0	50	100.0	112	100.0

# Table 3.25 Frequency of Condom Use by Gender

#### Factors Associated with Failure to Use Condoms

No association was found between frequency of condom use and paternal education (p = 0.75) or maternal education (p = 0.59).

Data on frequency of condom use and alcohol use were available for 112 of the 115 students who had ever engaged in sex. There was evidence of an interaction between gender, alcohol use, and frequency of condom use. Males who drank alcohol at least once a week were significantly more likely to have intercourse unprotected by condoms than males who drank alcohol less frequently (73.9% vs. 43.6%, p = 0.02). However, this association was not found for females (p = 0.64). No association was found between frequency of condom use and age (p = 0.37).

Data on frequency of condom use and drug use were available for 112 of the 115 students who had ever had sex. The relationship between drug use and frequency of condom use was dependent on gender. Males who had ever used drugs were almost four times less likely to always use condoms during sexual intercourse than males who had never used drugs (15.7% vs. 58.1%, p = 0.002). However, this association was not found for females (p = 0.26). The proportion of students always using condoms was smaller for drug users as compared to drug non-users in all age groups (p = 0.01).

Condom use was positively associated with knowledge of STD prevention. Students who always use condoms provided three or more acceptable ways of preventing STD more

often than students who do not always use condoms. (32.4% vs. 7.9%, p = 0.004).

# Intentions Regarding Future Sexual Intercourse

# Intentions to Abstain from Sex in the Next Six Months

Data on students' intentions to abstain from sex were available for 278 of the 280 students (Table 3.26). One hundred and twenty eight of 278 respondents (46.0%), indicated that they were likely to abstain from sexual intercourse in the next six months. Gender was associated with intentions to abstain. Females were twice as likely as males to intend to abstain in the next six months (59.3% vs. 31.6%, p < 0.001). Figure 3.23 shows the distribution of student intentions to abstain by age. The proportion of students intending to abstain in the next six months consistently declined with age (p = 0.001); ranging from 65.9% of 14 year old to 32.8% of students age 17 years or older.

Table 3.26	Intentions to	Abstain From	Sexual	Intercourse	in Next	Six	Months	by	Gender
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	Ma	ales	Fer	males	Total		
Intend to Abstain	n	%	n	%	n	%	
Likely	42	31.6	86	59.3	128	46.0	
Unlikely	91	68.4	59	40.7	150	54.0	
Total	133	100.0	145	100.0	278	100.0	

## Intentions to Use Condoms During Sex in the Next Six Months

Data on intentions to use condoms during sex were available for 270 of the 280 students (Table 3.27). One hundred and seventy-two students (64.4%) indicated that they intended to use condoms in the next six months. A larger proportion of males than females intended to use condoms (72.5% vs. 56.8%, p = 0.007). Figure 3.24 shows



Figure 3.23 Intentions to Abstain From Sexual Intercourse in Next Six Months By Age (n=275)



Figure 3.24 Intentions to Use Condoms During Sexual Intercourse in Next Six Months by Age(n=266)

intentions to use condoms by age. The proportion increased with age, ranging from 57.6% for students age 14 years or younger to 72.3% for students aged 17 years or older, but was not statistically significant (p = 0.29).

Table 3.27	Intentions to Use Condoms During Sexual Intercourse in Next Six Months by
	Gender

Intend to Use	Intend to Use Males Condoms n %		Fei	males	Total		
Condoms			<u>n %</u> n %		n	%	
Likely	95	72.5	79	56.8	174	64.4	
Unlikely	36	27.5	60	43.2	96	33.6	
Total	131	100.0	139	100.0	270	100.0	

#### Factors Associated With Intention to Abstain From Sex in the Next Six Months

The relationships between intention to abstain from sexual intercourse in the next six months and ever having sexual intercourse, recent sexual intercourse, alcohol and drug use, knowledge of STD prevention, parental education and intentions to use condoms were explored. As expected, students who had ever engaged in sexual intercourse were less likely to intend to abstain than students who had never had sex (12.1% vs. 74.5%, p < 0.001). Although, 5/64 males (7.8%) and 9/54 females (17.6%) who had ever engaged in sexual intercourse intended to abstain in the next six months, the difference was not statistically significant (p = 0.16). Recency of last intercourse was not associated with intentions to abstain (p = 0.94). Students intending to abstain were less likely to drink alcohol at least once a week than students who did not intend to abstain (3.1% vs 26.8%, p < 0.001). Students intending to abstain from sex were also less likely to have ever used drugs than students not intending to abstain (4.7% vs. 22.1%, p < 0.001). Students who intended to abstain were less

knowledgeable of STD prevention than students who did not intend to abstain(13.6% vs. 24.5%, p = 0.03). Parental education was associated with intentions to abstain. Female students who intended to abstain were more likely to have a mother with an university or college education (p = 0.03) or a father with a university or college education (p = 0.03) or a father with a university or college education (p = 0.03) or a father with a university or college education (p = 0.01), than female students who did not intend to abstain. However, these associations were not found for males (p = 0.79 and p = 0.65, respectively). The relationship between intentions to use condoms and intentions to abstain was also dependent on gender. Male students who intended to use condoms in the next six months were less likely to intend to abstain than male students who did not intend to use condoms (25.3% vs. 44.4%, p = 0.03). However, this association was not found for females (p = 0.87).

## Factors Associated With Intentions to Use Condoms in the Next Six Months

The relationships between intention to use condoms during sexual intercourse in the next six months and previous condom use, knowledge of STD prevention, perceived social pressure (aggregate score and by referent), attitude and perceived control were explored. Additionally the beliefs associated with attitudes and perceived control were explored for possible associations with intentions to use condoms.

No association was found between students' intention to use condoms and knowledge of STD prevention (p = 0.24). Students usually using condoms were more likely to intend to use condoms than students who used condoms less frequently (84.9% vs. 46.2%, p < 0.001). Students who intended to use condoms were more likely to have a positive attitude toward condoms than those students who did not intend to use condoms (75.4% vs. 40.6%, p < 0.001). Students who intended to use condoms were more likely to feel social pressure to use condoms than those students who did not intend to use condoms (81.1% vs. 43.4%, p = 0.007). Those who intended to use condoms had more perceived control over condom use than students who did not intend to use condoms (67.5% vs. 42.5%, p < 0.001).

When perceived social pressure to use condoms was partitioned by referent group (girlfriend/boyfriend, close friends, parents and doctor), significant associations were found between condom use and all referents except close friends. A higher proportion of students intending to use condoms believed that their boyfriend/ girlfriend believes condoms should be used during intercourse, and were motivated to comply with that belief, as compared to students not intending to use condoms (63.4% vs. 50.0%, p < 0.001). Gender specific associations were found between intentions to use condoms and social pressure from parents and doctors. A higher proportion of male students intending to use condoms agreed that their parents believe that condoms should be used during intercourse, and were more likely to feel motivated to comply with that belief, than male students not intending to use condoms (52.6% vs. 33.3%, p = 0.02). Female students intending to use condoms were more likely to agree that their doctors believe that condoms should be used, and more likely to feel motivated to comply than female students not intending to use condoms (60.3% vs. 50.8%, p = 0.03).

The attitudinal beliefs regarding condom use that were associated with students' intentions to use condoms at  $p \le 0.10$  are displayed for males and females in Tables 3.28 and 3.29, respectively. Both male and female students intending to use condoms were more likely than students not intending to use condoms to agree that using condoms makes it easier to have spontaneous sex. Several of the associations were dependent on gender. Male students intending to use condoms were more likely to believe that condoms are expensive and that they prevent against pregnancy than male students who did not intend to use condoms. Similar associations were not found for females. However, female students who intended to use condoms were more likely to believe that condoms protect against STD, that condom use allowed them to avoid going to the doctor than students who did not intend to use condoms; and less likely to believe that decreased sexual pleasure and planning to have sex are bad than students who did not intend to use condoms.

The beliefs regarding perceived control over condom use associated with intentions to use condoms at  $p \le 0.10$  are displayed for males and females in Tables 3.30 and 3.31, respectively. Both male and female students who intended to use condoms were more likely than students who did not intend to use condoms to agree that always using condoms is easy. Males and females not intending to use condoms were more likely than students to believe that they would fail to use a condom because they did not want to or their partner did not want to. However, in contrast to male students intending to use condoms, males who did not intend to do so thought that they would they would fail to use a condom because of beliefs that condoms decrease sexual pleasure and they were afraid to ask their partner if it was okay if they used a condom.

## Factors From Behavioral Framework Associated With Failure to Use Condoms

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The relationship between actual condom use and perceived social pressure (aggregate and by referent), attitudes and perceived control were explored. Additionally the beliefs associated with attitudes and perceived control were explored for possible associations with condom use.

No association was found between aggregate scores for social pressure toward condom use, attitude toward condom use or perceived control over condom use and frequency of condom use. When perceived social pressure to use condoms was examined by referent pressure from girlfriend/boyfriend, a higher proportion of students who always use condoms believed that their boyfriend/girlfriend believe condoms should be

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	Students	5	Students	Not	
	Intendin	g to	Intendin	P-	
Belief Regarding Condom Use	Use Con	doms	Use Con	value	
	n	%	n	%	
Using condoms every time you have sex makes it easier to have sex on the spur of the moment.	54/95	56.8	13/34	38.2	0.06
Using condoms every time you have sex is expensive.	29/95	30:5	5/35	14.3	0.06
Using condoms every time you have sex protects your partner from getting pregnant.	90/95	94.7	29/36	80.6	0. 01
Being protected against sexually transmitted diseases is 'good'.	93/95	97.9	33/36	91.2	0.10
Your partner being protected against pregnancy is 'good'.	91/95	95.6	28/35	80.0	0.004
Being embarrassed is 'bad'.	4/95	4.2	6/35	20.7	0.01

Table 3.28	Attitudinal Beliefs Regarding Condom Use Associated With Male Students'
	Intentions to Use Condoms

Belief Begarding Condom Use	Students Intending to		Students Not Intending to		P -
	n	%	n		
Using condoms every time you have sex makes it easier to have sex on the spur of the moment.	33/79	41.8		20.0	0.007
Using condoms every time you have sex protects against sexually transmitted diseases.	78/79	98.7	56/60	93.3	0.09
Using condoms every time you have sexual intercourse means that you avoid having see a doctor.	45/79	57.0	25/60	41.7	0.07
Decreased sexual pleasure is 'bad'.	73/78	93.6	59/59	100	0.05
Planning to have sex is 'bad'.	25/78	32.1	29/59	49.2	0.04

# Table 3.29 Attitudinal Beliefs Regarding Condom Use Associated With Female Students' Intentions to Use Condoms

	Students	nts Students Not		Not	
	Intending to		Intending to		P -
Belief Regarding Condom Use	Use Condoms		Use Condoms		value
	n	%	n	%	
It is easy to always use a condom during sexual intercourse.	57/94	60.6	16/36	44.4	0.10
You would not use a condom during sex because you/your partner feels it decreases sexual pleasure.	27/94	28.7	17/35	48.6	0.03
You would not use a condom during sex because you don't want to.	10/93	10.8	14/35	40.0	0.003
You would not use a condom because your partner did not want you to use one.	18/94	19.1	14/35	40.0	0.01
You would not use a condom because you are afraid to ask your partner if it was okay.	19/94	20.2	14/35	40.0	0.002

# Table 3.30 Beliefs Regarding Perceived Control Over Condom Use Associated With Male Students' Intentions to Use Condoms

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# Table 3.31 Beliefs Regarding Perceived Control Over Condom Use Associated With Female Students' Intentions to Use Condoms

Belief Regarding Condom Use	Students Intending to Use Condoms		Students Not Intending to Use Condoms		P - value
	n	%	n	%	
It is easy to always use a condom during sexual intercourse	52/79	65.8	21/59	35.6	0.001
You would not use a condom because you don't want to.	9/79	11.5	18/55	32.7	0.003
You would not use a condom because your partner did not want to.	19/.79	24.1	22/55	40.0	0.05

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used and are motivated to comply, as compared to students who fail to always use condoms (46.6% vs. 23.7%, p = 0.04).

Attitudinal beliefs regarding condom use associated with actual condom use at  $p \leq 0.10$  are displayed for males and females in Tables 3.32 and 3.33, respectively. Both males and females who do not always use condoms were more likely than students who always use condoms to believe that condoms decrease sexual pleasure. Again, several of the relationships are dependent on gender. Males who fail to always use condoms were more likely to believe that using condoms is embarrassing, inconvenient and would make them feel guilty than males who always use condoms. Although these associations were not found for females, females who fail to always use condoms were more likely than females who always use condoms to believe that using condoms.

Beliefs regarding perceived control over condom use associated with actual condom use at  $p \le 0.10$  are displayed for males and females in Tables 3.34 and 3.35, respectively. A larger proportion of both male and female students failing to always use condoms shared the beliefs that they would fail to use a condom because condoms decrease sexual pleasure or they didn't want to, than students always using condoms. Males students failing to always use condoms because condoms are difficult to obtain, and they would be afraid to ask their partner if it was okay, than males who always use condoms. Although similar associations were not found among female students; female students who fail to always use condoms were more likely to believe that they serve their partner did not want to use one, than female students who always use condoms.

Belief Regarding Condom Use	Students Always Using Condoms		Students Failing to Always Use Condoms		P - value
	n	%	n	%	
Using a condom every time you have sex is embarrassing.	3/28	10.7	10/34	29.4	0.07
Using a condom every time you have sex gives you guilt feelings.	1/28	3.6	8/33	24.2	0.03
Using a condom every time you have sex decreases sexual pleasure.	8/28	28.6	22/34	64.7	0.005
Using a condom every time you have sex is inconvenient.	10/27	37.0	21/34	61.8	0.06
Using something painful or uncomfortable is 'bad'.	0/0	0.0	5/34	14.7	0.06

# Table 3.32 Attitudinal Beliefs Regarding Condom Use Associated With Male Students' Actual Condom Use

# Table 3.33 Attitudinal Beliefs Regarding Condom Use Associated With Female Students' Actual Condom Use

Belief Regarding Condom Use	Students Always Using Condoms		Students Failing to Always Use Condoms		P - value
	n	%	n	%	
Using condoms every time you have sex makes it easier to have sex on the spur of the moment.	9/18	50.0	5/32	12.8	0.009
Using a condom every time you have sex decreases sexual pleasure.	2/18	11.1	16/32	50.0	
Using a condom every time you have sexual intercourse is expensive.	3/18	16.7	14/32	50.0	0.05

Belief Regarding Condom Use	Students Always Using Condoms		ts Students Failing to Using Always Use ns Condoms		P - value
	n	%	n	%	
It is easy to always use a condom during sexual intercourse.	22/28	78.6	17/34	50.0	0.02
You would not use a condom because they are difficult to obtain.	1/28	3.7	6/33	18.2	0.07
You would not use a condom because they decrease sexual pleasure.	6/28	21.4	21/34	61.8	0.001
You would not use a condom because you don't want to use one.	1/27	3.7	11/33	33.3	0.004
You would not use a condom because you are afraid to ask your partner if it is okay.	3/27	11.1	11/34	32.4	0.05

# Table 3.34 Beliefs Regarding Perceived Control Over Condom Use Associated With Male Students' Actual Condom Use

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Belief Regarding Condom Use	Students Always Using Condoms		Students Failing to Always Use Condoms		P - value
	n	%	n	%	
It is easy to always use condoms during sexual intercourse.	15/18	83.3	12/32	37.5	0.002
You would not use a condom because they decrease sexual pleasure.	3/18	16.7	16/32	50.0	0.02
You would not use a condom because you don't want to use one.	2/18	11.1	14/31	45.2	0.01
You would not use a condom because your partner doesn't want to use one.	3/18	16.7	16/32	50.0	0.02

 
 Table 3.35
 Beliefs Regarding Perceived Control Over Condom Use Associated With Female Students' Actual Condom Use

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# **CHAPTER 4**

# Discussion

The contents of this chapter include a summary of the results with interpretations of the findings, limitations of the study, and recommendations for current practice and future research.

#### Response and Participation

The conditions of access to the study population imposed by the Foothills School Division included the requirement to obtain written permission from parents for students to be studied. The parental consent rate of 28.9% was lower than the 55% response rate reported by Meikle et al. (1985). However, Meikle et al.'s 55% was actually a "forms returned" rate. Close scrutiny of Meikle et al.'s data showed that for a single mail out with no follow up, parental consent rate was only 34.4%, a proportion similar to that found in the present study.

Sexual education in the schools was mandated by the Province of Alberta in 1989, and some of the elementary and junior high school educational modules were only launched in September 1990, a few months before data collection for this study. At the time of the study there were still some highly charged emotional response to the idea of sexual education in the schools. Such emotion was evident in written comments received from a few of the parents who refused permission, and in discussion with a few of the parents at the information meetings. This may have affected parents' responses to the request for permission to have their child participate. The School Board members' awareness of these feelings was the impetus behind the two conditions of an 'opt in' consent and no follow up, placed on the investigator by the Foothills School Division. If an 'opt in' consent had not been required, it would have been assumed that nonresponse indicated permission, and children of parents who did not reply would have been invited to participate. It is likely that this would have greatly increased the response rate. Two of the seven school principals produced consents on the day of data collection, from parents who had forgotten to mail their response by the deadline. Although these students were allowed to participate, there may have been more parents who were not against having their child participate, but did not mail their response by the deadline. A follow up telephone call to parents before the deadlines imposed could have increased the response. Meikle et al. (1985) increased their response over 7% by making one follow up telephone call. Even with these limitations, a larger number of students might have been obtained for study by including the entire population of the Foothills School Division in the initial sample. However, financial resources for the study were limited, and no more than 1300 letters could be sent.

The student participation rate of 76.5% is reasonable given that the average absentee rate is estimated by the School Division to be between 10-15%. The participation rates for the individual schools ranged from 58.4% to 100%. This may reflect the type and size of the school, as well as the principals' attitude toward the study. The School Division's usual protocol regarding proposed studies is to involve principals from the outset. In the case of the current study, the administration felt that due to the sensitivity of the topic, an initial decision should be made at Board level. Despite the fact that all of the principals agreed to have their schools participate, it was evident by the extra negotiation necessary at one of the schools, that at least one principal was unhappy at being excluded from the initial negotiation process. As a result, some schools may have done more than others to ensure that data collection went as smoothly as possible. For example, although the investigator had been given

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assurance by the principals that all teachers had previous warning of when the data collection would be taking place and were willing to cooperate, several teachers at the school with the worst response rate held a test at the time of data collection and refused to excuse students involved in the study.

The way in which students were informed of the date and time of data collection may also have affected the participation rate in the larger schools. The high school with the best response rate notified students individually with a memo hand delivered by the school counselor several days in advance of data collection. The methods used at the other two high schools (teachers notifying students in homeroom on the day of data collection, and students' names being announced over the intercom), did not appear to be as effective.

The low response rate and the differences in students participation between schools have implications for future studies of this nature among this population. The initial negotiations with a school division are very important. A prospective investigator should make a strong case for an 'opt-out' consent or some form of follow up, such as a phone call, or reminder card. Future researchers should also involve the school principals as early as possible in the negotiation process. The use of a standardized protocol for assembling students within schools should also be negotiated.

# Representativeness of the Sample

The respondents represent 17% of students registered in Grades 9-12 in the Foothills School Division as of September 1990. The original random sample was representative of the seven schools. However, students from the southern high school were over-represented by 9.6%, while students from the high school in the north were under-represented by 11.8%. Grade 9 students were over-represented by at least 10% versus the other grades. Although this is likely to be partially due to the initial 2% over-sampling of this grade, it was easier to ensure that all Grade 9 students for whom parental consent had been obtained were at data collection, than in the other grades, and this too may have contributed to the over-representation.

A comparison of parental education and occupation in the current study with 1986 census data for the area indicates that the current sample is skewed towards parents who are professionals and have college or university education (Census Canada, 1988). This is not surprising given that two of the towns within the school division serve as bedroom communities for the city of Calgary. However, the slant toward highly educated professionals suggests that current sample is not a truly rural sample, and as such may be more representative of south central Alberta as a whole, than rural south central Alberta.

Forty-eight percent of the responding students were male and 52% were female. These proportions were not significantly different from the overall gender distribution of students Grade 1-12 in the Foothills School Division (52.9% males and 47.1% females). They were also similar to proportions responding in other studies of adolescent sexual behavior (King et al., 1988, Meikle et al., 1985, Peace River Health Unit, 1990).

Over 80% of students in the current study had ever consumed alcohol, and nearly 16% drank alcohol at least once a week. Fourteen percent of students had ever used drugs. The frequency of drug and alcohol use in the current study was similar to King et al. (1988). Although the frequency of drug use was also similar in the Peace River survey, over 10% more adolescents drank alcohol in the current study as compared to adolescents in the Peace River Health Unit (1990). The apparent differences suggest that either a response bias was working in both the current study and King et al., or in

the Peace River survey, or that there may be pronounced regional differences in these behaviors within Alberta.

Even with the bias introduced by the method used to gain access to the students in the study, generalizing the present results to the population of students of the Foothills School Division may be reasonable because of the similarities in age and alcohol and drug use in the current study to previous studies (King et al., 1988; Meikle et al, 1985). Nonetheless, generalizing the study results beyond the immediate population of the Foothills School Division should be done with caution because of the differences in the proportions of students ever having sex between the other studies among rural Alberta adolescents (Drumheller Health Unit, 1990; Peace River Health Unit, 1990).

Even if the information is not generalizable, the study provides information that will be useful to both the School Division and the Foothills Health Unit when planning the sex education curricula, because before this survey no information on adolescent sexual behavior existed; and even if biased, the present results indicate that adolescents in the School Division are participating in sexual behavior that increases their risk for STD.

#### Sexual Behavior

Forty-six percent of students in the current study had ever engaged in sexual intercourse. This proportion is higher than the 32.4% reported by Meikle et al. (1985) and the 27.6% reported by the Peace River Health Unit (1990). An analysis of the age distribution of Grade 9 and Grade 11 students who had ever had sex in King et al.'s study (1988) allowed the calculation of a crude proportion of students ever having sex. The crude proportion of sexually active students in the present study is higher than the proportion of high school students in King et al. (46.0% vs. 36.9%).

As in previous studies (Meikle et al, 1985; King et al., 1988; Drumheller Health

Unit, 1990; Peace River Health Unit, 1990), males were more likely than females to have ever engaged in sexual intercourse. Age was associated with ever having sex. As age increased, the proportion of adolescents ever engaging in sex also increased, again in agreement with previous findings (Meikle et al., 1985; King et al., 1988; Peace River Health Unit, 1990).

Grade level was also positively associated with ever having sex. The grade specific proportions of students ever having sex in the current study were smaller than King et al. for Grade 9 students (24.1% vs. 26%) and larger than King et al. for Grade 11 students (53.1% vs. 47.5%). When compared to grade specific proportions from Peace River, all of the proportions in the current study were higher, with grade specific differences between the two studies ranging from 5.1% to 28.1%. Beside the possibility of local area differences, the age distribution by grade may have differed between studies, confounding the grade specific proportions by age. Furthermore, because the response rate for the Peace River survey was not reported, it is not known whether the difference represents a response bias.

There was a significant difference between the crude and age standardized proportions of students ever engaging in sexual intercourse in the Foothills School Division in 1990 and in the Calgary Public School Division in 1980, with 14% more students in the current study engaging in sexual intercourse. The age-specific proportions of students ever engaging in sex also differed between 1990 and 1980, with the largest difference occurring between the 15 year olds, and the smallest difference occurring between the 13 year olds. The logistic regression model fitted to the data suggests that the proportion of students ever having sex was consistently larger in 1990 than in 1980, regardless of age. The prevalence of sexually activity in the current study indicates an increase in sexual activity since 1980, if it is assumed that students in the Foothills and Calgary School Divisions were equally as sexually active in 1980.

Approximately 29% of the sexually active students were having regular sex. In contrast to previous studies, no difference was found in the proportion of males and females engaging in regular sex (Meikle et al., 1985; King et al., 1988). Although the proportion of students engaging in regular sex did vary with age, the association was not significant. A post-hoc power analysis revealed a 48% power to detect an association if it existed. One might have expected to see the largest proportions amongst the students 16 years and older as they may be more likely than younger adolescents to be in a stable relationship, and to have increased access to resources such as cars and money, that might present increased opportunities for having sex more frequently. However, this was not what was observed. Fifteen year olds were the most likely to be engaging in regular sex compared to other age groups. One explanation of this might be that the older students in the sample represent a selection bias toward students who have stayed in school, (i.e. those students who stay in school may have very different patterns of sexual behavior than same-aged students who have dropped out of school). Given the differences in patterns of sexual activity between school attenders and school drop-outs in the Canada Youth and AIDS study, this is likely to be the case. An alternate explanation might be that younger adolescents are more likely to be experimenting with sexual intercourse, and as such, to be having sexual intercourse more often.

The crude proportion of students having regular sex also differed significantly between 1990 and 1980, with over 10% more students in the current sample engaging in regular sex. The proportion of students having regular sex in the current study was still 6.7% higher than the proportion in 1980 after the crude rates were age standardized, however, the difference was no longer statistically significant. Lack of significance may have been due to power as a post-hoc power analysis indicated that the current study had less than an 80% power to detect a significant difference. If the proportion of students in the Foothills Health Unit engaging in regular sex in 1980 was similar to the proportion of Calgary students reported by Meikle et al. (1985), then the results of the current study suggest that there has been a clinically significant increase in the proportion of adolescents having regular sex between 1980 and 1990, though not statistically significant.

The age-specific proportions indicate differences in the proportions of students engaging in regular sex, especially between the 15 year olds. The logistic regression model fitted to this data helped clarify the apparent differences, and demonstrated a consistent difference between 1980 and 1990, regardless of age. Furthermore, the difference in the age-specific proportions between studies appeared to be increasing as age increased.

Aral and Cates (1989) have suggested that in order to calculate an accurate estimate of risk for STD from sexual behavior, a distinction must be made between sexually active adolescents and "experimenters" who try sexual intercourse once or twice. One method of distinguishing these groups is to examine the recency of sexual intercourse. Only 84.3% of students who had ever had sex, had had sex in the six months preceding the current study. The proportion of sexually active students engaging in sex in the six months preceding data collection did vary with age (although not significantly), peaking with the 16 year olds, and then declining again with the 17 year olds. Thus although the largest proportion of students having regular sex occurred amongst the 15 year olds, this age group was not the most likely to be having sex in the six months preceding data collection. Aral and Cates have labelled adolescents who have engaged in sexual intercourse, but have an inconsistent pattern of sexual activity as "experienced abstainers". Thirty three percent of students who had ever engaged in sex reported having more than one partner in the six months preceding data collection. No significant association was found between number of sexual partners and gender. The proportion of students having multiple partners peaked with the 16 year olds and then declined again for students aged 17 years or older. Although not significant, the apparent trend may again reflect a selection bias toward students less likely to be engaging in risky sexual behavior in the 17 years and older group as the result of school drop-outs. Additionally, the difference might also be due to experimentation among the younger adolescents aged 15 and 16, and then a decrease in number of partners as students mature and become involved in more stable relationships.

Sixty-three percent of students in the current study reported always using birth control. No significant gender or age associations were found. This proportion is almost twice as high as that reported by Meikle et al. (1985), and may reflect an increased sense of responsibility toward contraception, an increased access to knowledge and service among students having sex, or students' desire to give socially acceptable responses. However, there is no reason to suspect that students in the current study were any more likely than students in the study by Meikle et al. to give socially acceptable responses.

Seventy-four percent of the students surveyed in the present study used effective methods of birth control (e.g. birth control pills) at first coitus. This proportion is much larger than the 38% reported by Russell and Weston (1983) and the 53% reported by Meikle et al. (1985). Again the differences may be the result of the explanations mentioned above. Similar to the findings of Russell and Weston, the current study found a positive association between age at first intercourse and use of birth control at first intercourse. Older students have received more sex education and

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may be more likely to plan ahead, or to feel enough in control to ensure that some form of contraception is used. A similar proportion of students in the current study reported using condoms at first intercourse (69.7%), as compared to Meikle et al. (1985). However, nearly twice as many students in the current study (21.2%), used birth control pills at first intercourse. The increased use of birth control pills at first coitus suggests an increase in advanced planning for sexual intercourse among adolescents. Although it is encouraging to see any form of birth control used at first intercourse, a reliance on birth control pills without the concurrent use of condoms is of concern because birth control pill use has been associated with having greater numbers of sexual partners and an increased risk for STD (Macdonald et al, 1990).

Eighty-five percent the sexually active students in the current study had used birth control at most recent coitus. Again this is higher than the percentages reported in the literature (Meikle et al., 1985; Russell & Weston, 1983). However, the proportions using condoms (54.5%), and birth control pills(31.3%), were similar to Meikle et al. The increase in the proportion of students using birth control pills from first to most recent intercourse found in the current study (21.2% vs. 31.3%) has been described by others (Meikle et al., 1985). That a similar trend was found between the current study and Meikle et al., provides support for the other observed differences being more likely to be genuine, and less likely to be the result of response bias.

This study was the first in Alberta to ask school attending secondary students about frequency of condom use. Forty-one percent of the sexually active students reported always using condoms. Males were more likely to always use condoms than females. This is not surprising given that the condom is the one method of male birth control. Students aged 14 years or younger were also more likely to always use condoms than students 15 years or older. This may be because condoms do not require a prescription,

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and require less planning ahead than methods such as the birth control pill. These findings will be of great value to health educators, who up until now have had no information on the proportion of high school students using condoms.

The median age at first intercourse in the present study was 14 years. Over 12% of the sexually active students had engaged in first coitus before the age of 13 years and 55% were sexually active by 14 years of age. There was a significant association between age at first intercourse and having multiple sexual partners. As the age at first intercourse increased, the proportion of students with more than one sexual partner in the preceding six months decreased. The young age at first intercourse among this sample is alarming given that early age at first coitus has been associated with an increased risk of STD due to increased numbers of sexual partners and inconsistent use of condoms.

A comparison of students in the Foothills Health Unit in 1990 and students in the Calgary Public School Division in 1980 (Meikle et al., 1985) provided no evidence to suggest that students in the current sample were younger at first sexual intercourse than students in 1980. This result does not support the existence of the trend toward earlier onset of sexual activity among adolescents observed in the U.S.A. (Shah & Zelnik, 1983; National Center for Health Statistics, 1991).

In summary, students in the Foothills School Division are participating in sexual behavior that places them at increased risk for STD. Additionally, a comparison of students in the Foothills School Division in 1990 to students in the Calgary Public School Division in 1980 shows that a larger proportion of students in 1990 are sexually active, and that a larger proportion of adolescents may be having regular sex in 1990 as compared to 1980. There is no evidence that students in 1990 are initiating sexual activity at an earlier age than students in 1980.

# Factors Associated With Sexual Behavior

## Parental Education

Parental education and occupation were measured as indicators of socio-economic status. Parental occupation was not associated with any of the measures of sexual behavior. However, both paternal and maternal education were associated with ever having sex and having sex in the six months preceding data collection. As paternal and maternal education decreased, the proportion of students who had ever had sex increased, and students whose fathers' had a college or university education were the least likely to have had recent sex. These findings provide further evidence for a relationship between socio-economic status and ever engaging in intercourse, suggested by Meikle et al. (1985) and Russell and Weston (1983). The current study does not allow the determination of a causal relationship between these behaviors. It is unclear whether these associations reflect the passing on of a set of beliefs and values from parent to child that lead to sexual activity during adolescence (perhaps relating to goal setting or expectations of the future), or whether students are following an example set by their parents or peers of similar socio-economic background. As with previous studies, the current study failed to look at ethnic background, thus the current study does not add to information in this area.

#### Alcohol Use

The frequency of alcohol use was associated with the prevalence of ever having sex, having recent sex and condom use. The proportion of students who had ever engaged in sex was larger for those drinking alcohol at least once a week than for those drinking less often, similar to the finding of King et al (1988). Of particular interest was the pattern of this behavior by age. The peak occurred with 16 year olds and then decreased

again for 17 year olds. Again, the decrease observed in the 17 year olds may represent a selection bias toward students who have stayed in school. Alternately, this finding could be interpreted as a maturation effect, (i.e. students younger than 17 years are in a stage of experimentation, but become more responsible and mature by age 17 years).

Frequency of alcohol use was positively associated with recency of sexual intercourse for male students only. A larger proportion of male students drinking alcohol at least once a week reported having sex in the six months preceding data collection, than male students drinking alcohol less often. Frequency of alcohol use was also negatively associated with condom use in male students, similar to the results of King et al. (1988) and Hingson et al. (1990). King et al. and Hingson et al. found a similar association for females. That an association for females was not found in the current study may reflect the wording of the question, given that females do not actually 'use' condoms. Although the current study links frequency of alcohol use to sexual behavior, association does not mean causation and the exact nature of the relationship is unknown.

## Drug Use

Drug use was associated with the prevalence of ever having sex, having regular sex, having recent sex and using condoms. Similar to the findings of King et al (1988), the proportion of students who had ever engaged in sex was larger amongst those who had ever used drugs, as compared to those who had never used drugs. The only factor significantly associated with regular sex was drug use. Students who had ever used drugs were more likely to report having regular sex than students who never used drugs. Given that students have been found to be less likely to use condoms during sex when under the influence of drugs or alcohol, they may also be more likely to ever have sex or

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have sex more frequently when under the influence (Hingson et al., 1990). Further, students ever having sex or having regular sex may be concurrently more likely to use drugs (Murray & Zentner, 1985; Hankins, 1990; Brookman, 1990).

Drug use was negatively associated with the use of condoms for males. Males students who had ever tried drugs were less likely to always use condoms than students who had never used drugs. Again due to the cross sectional study design, it is impossible to draw any conclusions regarding causation. However, as found previously (Hingson et al., 1990), one possible explanation for the observed association is that students using drugs may have limited decision making skills regarding condom use when intoxicated.

## Knowledge of STD Prevention

Only 19.3% of students were categorized as knowledgeable. The acceptable response 'know your partner' was given by 28.6% of the students. This response was categorized as acceptable because it is taught as a strategy for preventing STD during sex education. However, it is not clear what 'know your partner' means to these students. Even if students were to attempt to get to know their partners better, the risk of STD might be only minimally decreased, since partners are unlikely to disclose a previous history of STD (Bowie et al., 1990).

The frequency and nature of the unacceptable responses to the knowledge question were also disturbing. Although it is recognized that barrier methods such as the diaphragm, contraceptive sponge, cervical cap and spermicide provide some protection against STD, they are not recommended as methods of preventing STD (Bowie et al, 1990). Further, responses such as using birth control pills, the rhythm method, I.U.D.s, withdrawal, sterilization, douching and practicing good hygiene, suggest an insufficient understanding of the nature and transmission of STD. The almost 9% of students who listed using birth control pills as a method of STD prevention are of particular concern, as the use of birth control pills has been associated with an increased risk for both multiple sexual partners and STD (Macdonald et al, 1990). The 15.2% of students that mentioned testing for STD as a method of prevention are also a concern. Although screening or testing for STD will prevent further spread of STD if the tested individuals are infected, the time lag between suspicion of infection and examination is a problem. By the time an individual is tested for STD, any sexual contacts of the individual who were exposed in the time between suspicion and examination are at risk of being infected; and particularly in females, a prolonged infection without treatment may result in irreversible damage to the reproductive tract.

Knowledge regarding the prevention of STD was associated with condom use. A larger proportion of students who always use condoms were knowledgeable as compared to students who fail to always use condoms.

#### Current and Preferred Sources of Condoms

Although 85.7% of students stated that drugstores were a current source of condoms, only 24.3% listed drugstores as a preferred source. Thirty-four percent of students mentioned school or school washrooms as a preferred sources of condoms, and another 37% mentioned other anonymous sources such as public washrooms, condom dispensers and locations in Calgary. Thus the two common themes among the students' preferred sources of condoms were accessibility and anonymity. These findings are particularly important because there may be few places in rural areas where condoms are available. For example, three of the communities served by the School Division have no drug store, and one has only one drug store. Additionally, anonymity in convenience stores and drugstores is impossible in small communities.

## Current and Preferred Sources of Information on STD

Approximately 75% of students listed physicians as a current source of information on STD. This could be interpreted in several ways, including that students are receiving information on STD from physicians during regular checkups, that students are receiving information on STD from physicians when they come in to be tested for STD, or that students believe that they can get information from their physician if they need it. In an ideal situation, students would receive information about STD before they actually need it.

Only 33.5% of the students listed physicians as a preferred source of information. School/school nurse was the number one preferred choice, mentioned by 37.9% of the students. Family members were mentioned as a current source by 26.4% of the students and as a preferred source by only 17.7%, suggesting that most students prefer to get this information outside of the home. Approximately 24% of students listed preferred sources that can be considered anonymous (e.g. printed sources, information hotlines).

#### **Behavioral Framework**

#### Intentions to Abstain from Sex in the Next Six Months

Forty-six percent of the students surveyed intended to abstain from sex in the six months following data collection. A higher proportion of females than males intended to abstain from sex. This is most likely a real difference, however, one wonders if the difference could reflect gender differences in socially acceptable response. For example, the socially acceptable response for males might be to intend to have sexual intercourse and thus appear 'macho', whereas the socially acceptable response for females might be to intend to abstain. Almost 8% of males and 18% of females who had ever engaged in sex intended to abstain. Age was also associated with intentions to abstain. The proportion intending to abstain consistently declined with age. Of students who had ever engaged in sex, those students who had engaged in sex in the preceding 6 months were less likely to intend to abstain than students who were already abstaining in the six months preceding data collection.

The factors associated with intentions to abstain from intercourse were similar to the factors found to be associated with ever having sex. Students intending to abstain were less likely to drink alcohol at least once a week and less likely to ever use drugs than students not intending to abstain. These associations may provide support for the hypothesis that students engaging in one risky behavior are also more likely to be exploring other risky behaviors (Hankins, 1990; Brookman, 1990; Brooks-Gunn, Boyer & Hein, 1988). The results suggest that students intending to abstain may have different attitudes, beliefs, or social norms regarding 'risky' behavior (including sexual intercourse and alcohol and drug use), than students not intending to abstain. Female students who intended to abstain were also more likely to have parents with an university or college degree than students not intending to abstain, again suggesting common underlying attitudes, beliefs, peer norms or self-efficacy regarding having sexual intercourse.

A smaller proportion of students who intended to abstain were knowledgeable regarding STD prevention, than students not intending to abstain. This might be because some students are restrained by fear of consequences of sexual intercourse, that knowledge follows engaging in sexual intercourse, or that students who do have sexual intercourse or intend to have sexual intercourse actively seek out information on STD protection.

Finally, male students intending to have sex in the next six months were more likely than male students who intended to abstain, to plan to use condoms. Thus, male

students who intend to have sex are more likely to be knowledgeable and to plan to act appropriately than male students who do not intend to have sex. However, concerns regarding the validity of the responses regarding intentions to use condoms by those intending to abstain makes the interpretation of these data difficult. The two questions asking about intentions were placed sequentially, thus students were asked if they intended to have sex, and then if they intended to use condoms. The results suggest that students intending to abstain may have interpreted this question in two ways. Some clearly interpreted it as "if you were to have sex in the next six months, you would intend to use condoms", and responded that they would intend to use condoms. Others appeared to interpret it as "given that you intend to abstain, do you intend to use condoms", and responded that either they did not intend to use condoms, or that they were neither likely nor unlikely to use condoms.

# Intentions to Use Condoms in the Next Six Months

Over 64% of students indicated that they intended to use condoms in the next six months. Males were more likely to intend to use condoms than females. This difference might be the result of the wording of the question. The wording could have been improved if females had been asked, "do you intend to have your partner use condoms?" As expected, students already using condoms were more likely to intend to use condoms. The intention to use condoms consistently increased with age, however, actual use of condoms decreased with age, although not consistently. This suggests that either students responded with what they considered to be the socially desirable response (i.e. that they intended to use condoms); or that for some students, intentions to use condoms do not lead to actual condom use.

When the factors contained in the proposed framework were explored, all three,

social pressure, attitude and perceived behavioral control, were significantly associated with intentions to use condoms. A higher proportion of students who believed that their girlfriend/boyfriend, parents and doctors felt condoms should be used and felt motivated to comply, intended to use condoms, than students who did not hold these beliefs. The only referent group not associated with intentions to use condoms was close friends. This is interesting as peer pressure has been previously associated with students use of condoms (DiClemente, 1990).

Compared to those who did not intend to use condoms, a larger proportion of students who intended to use condoms had a positive attitude toward condom use. When the attitude scale was explored by belief sub-scales, beliefs regarding ease of sex on the spur of the moment, prevention of pregnancy and STD, and the expense of condoms were significantly associated with intentions to use condoms for males. Beliefs regarding ease of sex on the doctor were significantly associated with intentions to use condoms in females. A belief that condoms make it easy to have sex on the spur of the moment has previously been found to be associated with students' intentions to use condoms (Kegeles et al., 1989). That there were gender specific beliefs associated with intentions to use condoms use condoms suggests that messages encouraging condom use should address these differences (i.e. different messages should be aimed at males and females).

Students who intended to use condoms perceived themselves to have more control over condom use than students not intending to use condoms. Both males and females who intended to use condoms indicated that it was easy to always use a condom. Male and female students not intending to use condoms were more likely to believe that they would not use a condom because they did not want to use one, or their partner did not want to use one. Additionally, male students who did not intend to use condoms felt that they

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would fail to use a condom because they/their partner felt it decreased sexual pleasure, or because they were afraid to ask their partner if it was okay. Beliefs regarding decreased sexual pleasure as the result of using condoms have previously been found to be a significant barrier to condom use (Hingson et al., 1990). It is interesting that it was the males who were afraid to ask their partner if it was okay if they used a condom. Females have typically been the group that has been viewed as having difficulties addressing the issue of condom use with their partner; thus it may be that the current findings represent the socially desirable response, especially as females tend to view themselves as responsible for contraception. However, if males do find it more difficult than females to discuss condom use with their partner, then there may be a need to devise strategies targeted specifically at males. One possible example would be to have male students role play, with each other, the process of asking a girlfriend if it is okay if he uses a condom during intercourse.

## Factors From Behavioral Framework Associated With Failure to Use Condoms

Although neither attitude, nor perceived behavioral control, nor aggregate social pressure were associated with actual use of condoms, when social pressure was broken down into the four referents, girlfriend/boyfriend was significantly associated with condom use. Further, an examination of belief sub-scales for attitude toward condom use revealed that some of the beliefs contributing to attitude were associated with condom use. Male students failing to always use condoms were more likely than males who always use condoms to have negative beliefs about condoms, including that the use of condoms is embarrassing, gives them guilt feelings, decreases sexual pleasure and is inconvenient. Females failing to always use condoms were also more likely than females always using condoms to have negative beliefs. These included that condoms are painful

to use, that they decrease sexual pleasure and that they are expensive. The sub-scales beliefs for perceived control over condom use associated with failure to use condoms were similar to the associations found for intentions to use condoms.

These results suggest that if one goal of sex education is to increase the use of condoms among sexually active adolescents, then the messages sent to these students must focus on the beliefs that are related to the use of condoms. Further the use of role playing to increase perceived behavioral control, as well as social marketing strategies may be useful to increase the prevalence of this behavior.

#### Limitations of the Study

The present study has several limitations, including aspects of measurement and design that should be considered. The validity of some of the results may be questionable as the result of socially desirable responses. This is a potential danger in any survey that depends on self-report for its data, and all previous studies addressing adolescent sexual behavior have had the same problem. However, the investigator did attempt to reduce this by assuring students that their responses were confidential and by increasing confidentiality and anonymity through the use of anonymous questionnaires sealed in envelopes, and where possible, studying small groups of students spread out as much as possible within a classroom.

The design of the study, a cross sectional survey, makes it impossible to establish temporal relationships when examining the factors associated with sexual behavior. The associations found cannot be interpreted as causation. However, this limitation does suggest directions for future research which will be discussed in the following section. Furthermore, given the sensitivity of the subject and the population being studied, it is unlikely that a study design providing greater evidence of causation would be feasible. Finally, the reliability of the questionnaire was not tested. Despite the pre-testing, some students apparently had difficulty interpreting a few of the questions related to condom use. This could have been addressed by a larger pre-test.

#### **Recommendations**

# Implications for Sex Education

The information on students' knowledge regarding the prevention of STD suggests that many students are not getting a clear message as to effective ways of preventing STD. If contraceptive and STD prevention are taught together, a greater emphasis should be placed on delineating those contraceptive methods that give effective protection against STD. Additionally, it should be stressed to students that birth control pills should be used in conjunction with condoms, that STD testing should not be a first line defense against STD, and that 'knowing your partner' is not an acceptable method of prevention.

In addition to providing students with information, sex education should also involve the teaching of communication skills. Students should be encouraged to role play scenarios regarding obtaining condoms, talking to partners about using condoms, and properly using condoms. Other risky behaviors such as alcohol and drug use should also be discussed in the context of STD prevention. These messages should also be targeted at adolescents more broadly, through the use of social marketing techniques. Finally, health professionals and educators teaching sex education should explore the issue of accessibility of condoms with students.

## Implications for Future Research

This study demonstrates that adolescents in south central Alberta are involved in a number of sexual behaviors that increase their risk for STD. The results of this study

provide a baseline of sexual behavior for adolescents in the Foothills School Division against which the effectiveness of the sex education programs designed to decrease the risk of STD can be evaluated. Furthermore, the results provide some evidence of temporal trends in adolescent sexual behavior. Surveys of this type should be repeated periodically to investigate the possible continuation of the suggested trends, which in turn will have implications on future educational strategies.

In addition to describing the sexual behavior, this study also identified several factors associated with sexual behavior in this population. The results suggest that strategies aimed at decreasing the use of alcohol and drugs among adolescents might also decrease the prevalence of risky behaviors. Future research should attempt to further delineate the temporal relationships between sexual behavior and drug and alcohol use.

Finally, the exploratory analysis provides some evidence that the behavioral framework employed in this study is useful in explaining students' decision making about condom use. Future research could test the framework's ability to predict adolescents' condom use. Additionally, future surveys could examine the usefulness of the framework in exploring students decision making regarding ever having sex.

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# **APPENDIX A -- QUESTIONNAIRE**

FOR	NVESTIGATOR	S USE ONLY
Code		
Date		<u></u>
Study	Centre	121

ADOLESCENT SEXUAL BEHAVIOR SURVEY

THANK YOU FOR PARTICIPATING IN THIS SURVEY !!

The questionnaire you are being asked to complete today is both anonymous and confidential. This means that no one will be able to identify which questionnaire you filled out. PLEASE <u>DO NOT</u> WRITE YOUR NAME ANYWHERE ON THIS QUESTIONNAIRE. The questionnaire you complete WILL NOT be looked at by teachers or Health Unit staff. This is not an exam or a test. It is a request for your answers to some health related questions. The information obtained from this study will be used by educators and health care professionals to plan health programs for teenagers.

When you have completed the questionnaire, please replace it in the envelope, seal the envelope and place it in the sealed box at the front of the class.

YOU WILL BE ASKED TO CIRCLE A NUMBER OR FILL IN A BLANK SPACE WITH YOUR RESPONSE; FOR EXAMPLE:

1. Your grade in school. (Circle number) - You are in Grade 9...

$\bigcirc$	GRADE	9
2	GRADE	10
3	GRADE	11
4	GRADE	12

2. It will be a sunny weekend. (Circle number)

3

1 2 VERY SLIGHTLY NEITHER LIKELY

(1) 5 SLIGHTLY VERY UNLIKELY UNLIKELY

3. Generally speaking ...



PLEASE CIRCLE A NUMBER OR FILL IN THE BLANK SPACE WITH YOUR RESPONSE.

THE FIRST FEW QUESTIONS ASK ABOUT SOME PERSONAL INFORMATION.

Q-1 Your date of birth. |\_\_| |\_\_| |\_\_| |\_\_| |\_\_| |\_\_| |\_\_|. (Fill in blanks) DAY HONTH YEAR

Q-2 Your sex. (Circle number)

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1 MALE 2 FEMALE

Q-3 Your grade in school. (Circle number)

1	GRADE	9
2	GRADE	10
3	GRADE	11

4 GRADE 12

- Q-4 Your <u>father's</u> usual occupation, if retired describe the usual occupation before retirement. (Circle number)
  - 1 PROFESSIONAL (EG. ACCOUNTANT, DOCTOR, LAWYER, TEACHER, NURSE, MILITARY OFFICER)
  - 2 BUSINESS (EG. OWNER, EXECUTIVE OFFICER, MANAGER)
  - 3 FACTORY WORKER, MINER, LABOURER, WAITER, COOK, TRUCK DRIVER
  - 4 CLERICAL (EG. SALES CLERK, SECRETARY)
  - 5 SALES (EG. REAL ESTATE, INSURANCE)
  - 6 FARMER/FARM RELATED OCCUPATION
  - 7 SKILLED WORKER (EG. CARPENTER, ELECTRICIAN, PLUMBER, POLICEMAN, CHEF)
  - 8 HOMEMAKER
  - 9 OTHER (EG. UNEMPLOYED, DISABLED) (please specify) \_\_\_\_\_\_
- Q-5 Your mother's usual occupation, if retired describe the usual occupation before retirement. (Circle number)
  - 1 PROFESSIONAL (EG. ACCOUNTANT, DOCTOR, LAWYER, TEACHER, NURSE, MILITARY OFFICER)
  - 2 BUSINESS (EG. OWNER, EXECUTIVE OFFICER, MANAGER)
  - 3 FACTORY WORKER, MINER, LABOURER, WAITRESS, COOK, TRUCK DRIVER
  - 4 CLERICAL (EG. SALES CLERK, SECRETARY)
  - 5 SALES (EG. REAL ESTATE, INSURANCE)
  - 6 FARMER/FARM RELATED OCCUPATION
  - 7 SKILLED WORKER (EG. CARPENTER, ELECTRICIAN, PLUMBER, POLICEWOMAN, CHEF)
  - 8 HOMEMAKER
  - 9 OTHER (UNEMPLOYED, DISABLED) (please specify) \_\_\_\_\_

# Q-6 Highest level of education completed by your <u>parents</u>. (Circle number of one choice in each column)

FATHER	MOTHER	
1	1	ELEMENTARY SCHOOL OR LESS
2	2	SOME HIGH SCHOOL
3	3	GRADUATED FROM HTGH SCHOOL
4	4	GRADUATED FROM COMMUNITY COLLEGE/TRADE COUCOL
5	5	GRADUATED FROM INTVERSITY
6	6	OTHER (please specify)
7.	7	DON'T KNOW

THE NEXT FEW SECTIONS ASK YOU TO THINK ABOUT USING CONDOMS DURING SEXUAL INTERCOURSE. I AM INTERESTED IN YOUR OPINIONS EVEN IF YOU ARE NOT SEXUALLY ACTIVE AT THIS TIME.

PLEASE INDICATE THE DEGREE TO WHICH YOU AGREE/DISAGREE WITH THE FOLLOWING STATEMENTS. (Circle number)

£

Q-7 Generally speaking...

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	1	(Circle number)				
	AGREE STRONGLY	AGREE SLIGHTLY	NEITHER	DISAGREE SLIGHTLY	DISAGREE STRONGLY	
<ul> <li>a) Hy girlfriend/boyfriend thinks condoms should be used during sexual intercourse.</li> </ul>	1	2	3	4	5	
<ul> <li>b) My close friends think condoms should be used during sexual intercourse.</li> </ul>	t	2	3	4	5	
c) My parents think condoms should be used during sexual intercourse.	1	2	3	4	5	
d) My doctor thinks condoms should be used during sexual intercourse.	1	2	3	4	5	
<ul> <li>e) I want to do what my girlfriend/boyfriend thinks I should do.</li> </ul>	1	2	3	4	5	
f) I want to do what my close friends think I should do.	t	2	3	4	5	
g) I want to do what my parants think I should do.	1	2	3	4	5	
<ul> <li>h) I want to do what my doctor thinks I should do.</li> </ul>	1	2	3	4	5	

Q-8	Using a	condom every ti	me I have
	sexual	intercourse	

	(Circle number)				
	AGREE STRONGLY	AGREE SLIGHTLY	NEITHER	DISAGREE SLIGHTLY	DISAGREE
a) makes it easier to have sex on the spur of the moment.	1	2	3	4	5
b) is embarrassing.	1	2	3	4	5
c) protects against sexually transmitted disease.	1	2	3	4	5
d) is painful or uncomfortable.	1	2	3	4	5
e) gives me guilt feelings.	1	2	3	4	5
f) decreases sexual pleasure (sensation).	1	2	3	4	5
g) is expensive.	1	2	8	4	5
h) is inconventent.	t	2	3	4	5
t) is messy.	1	2	3	4	5
j) means that I/my partner avoid a trip to the doctor.	1	2	3	4	5
<ul> <li>k) protects me/my partner from getting pregnant.</li> </ul>	1	2	3	4	5
<ol> <li>makes it seem that I am planning to have sex.</li> </ol>	1	2	3	4	5
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NOW INDICATE YOUR FEELINGS ... (Circle number)

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Q-9 Ge	nerally, I feel that	<b></b>		ircle ou	ber)	1
		VERV GOOD	SLIGHTLY GOOD	NEITHER	SLIGHTLY BAD	VERY BAD
a)	having sex on the spur of the moment is	1	2	3	•	5
b)	being embarrassed is	t	2	3	4	5
c)	being protected against sexually transmitted disease is	1	2	3	4	5
d)	using something painful or uncomfortable is	1	2	3	4	5
e) i	having guilt feelings is	1	2	3	4	5
f) (	decreased sexual pleasure (sensation) is	t	2	3	4	5
g) (	having to spend money is	1	2	3	4	5
h) i	being inconvenienced is	1	2	3	4	5
1)	being messy is	1	2	3	4	5
1) r	me/my partner avoiding having to go to a doctor is	1	2	3	4	5
k) 1	ne/my partner avoiding getting pregnant is	1	2	3	4	5
1) p	planning to have sex is	t	2	3	4	5

THINKING NOW ABOUT HOW MUCH CONTROL YOU WOULD HAVE OVER THE USE OF CONDOMS IF YOU AND YOUR PARTNER WERE SEXUALLY ACTIVE .... (Circle number)

Q-10 I have complete control over whether or not I use condoms during sexual Intercourse.

1	2	3	4	5	
AGREE STRONGLY	AGREE SLIGHTLY	HEITHER	DISAGREE SLIGHTLY	DISAGREE	

Q-11 It is easy to always use a condom during sexual intercourse.

1	2	3	4	5
AGREE STRONGLY	AGREE SLIGHTLY	NEITHER	DISAGREE SLIGHTLY	DISAGREE

IF YOU AND YOUR PARTNER WERE SEXUALLY ACTIVE, INDICATE HOW LIKELY/UNLIKELY THE FOLLOWING SITUATIONS WOULD BE. (Circle number)

Q-12 You/your partner do not use a	·			<del></del>	a
condom pecause	I	(C1	incle numb	mr)	I
	VERY LIKELY	SLIGHTLY LIKELY	NEITHER	SLIGHTLY UNLIKELY	VERY UNLIKELY
a) they are difficult to obtain.	1	2	3	4	5
b) they are too expensive.	1	2	3	4	5
<ul> <li>c) you/your partner feel it decreases sexual pleasure.</li> </ul>	1	2	3	4	5
d) you don't want to.	t	2	3	4	5
e) your partner doesn't want to.	1	2	3	4	5
f) you are afraid to ask if it is okay.	1	2	3	4	5
g) you don't know where to get one.	1	2	3	4	5
h) you don't know how to use one.	1	2	3	4	5

THE FINAL FEW QUESTIONS ARE ABOUT BEHAVIOUR ....

Q-13 How often do you drink alcohol (eg. beer, wine, or liquor)? (Circle number)

> NEVER 1

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- ONLY ON SPECIAL OCCASIONS 2
- ABOUT ONCE A MONTH 3
- 4 2-3 TIMES A MONTH
- 5 ONCE A WEEK
- 2-3 TIMES A WEEK 6
- 7 EVERY DAY
- Q-14 How often do you use drugs (eg. marijuana, pot, hashish, hash or other)? (Circle number)
  - 1 NEVER
  - ONLY ON SPECIAL OCCASIONS ABOUT ONCE A MONTH 2-3 TIMES A MONTH 2
  - 3
  - 4
  - 5
  - ONCE A WEEK 2-3 TIMES A WEEK 6
  - 7 EVERY DAY

Q-15 Have you ever suspected that you had a sexually transmitted disease (eg. gonorrhoea, VD, clap, AIDS, chlamydia, STD)? (Circle number)

- 1 NO 2 YES
- Q-16 Have you ever been told by a doctor or nurse that you had a sexually transmitted disease (eg. gonorrhoea, VD, clap, AIDS, chlamydia, STD)? (Circle number)
  - 1 NO 2 YES

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Q-17 List as many ways of decreasing the risk of getting a sexually transmitted disease (eg. gonorrhoea, VD, clap, AIDS, chlamydia, STD) as you can.

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THINKING ABOUT THE FUTURE, INDICATE YOUR AGREEMENT/DISAGREEMENT WITH THE FOLLOWING STATEMENTS. (Circle number)

Q-18 I intend to <u>abstain</u> from sexual intercourse (not have sex) in the next six months. (Circle number)

1	2	3	4	5
VERY	SLIGHTLY	NEITHER	SLIGHTLY	VERY
LIKELY	LIKELY		UKLIKELY	UNLIKELY

Q-19 I intend to use condoms during sexual intercourse in the next six months. (Circle number)

1	2	3	4	5
VERY	SLIGHTLY	NEITHER	SLIGHTLY	VERY
LIKELY	LIKELY		UNLIKELY	UNLIKELY

Q-20 If you needed a condom, where could you get one? (Fill in blanks)

Q-21 Where would you like to be able to get a condom? (Fill in blanks)

Q-2:	If you needed information about sexually transmitted disease (STD), where could you get it? (Fill in blanks)
Q-23	Where would you like to be able to get information on sexually transmitted disease (STD)? (Fill in blanks)
Q-24	Have you <u>ever</u> had full sexual intercourse (gone all the way)? (Circle number)
	1 NO
0-25	How often do you have served determined data
	1 LESS THAN ONCE A MONTH 2 ONCE A MONTH 3 EVERY TWO WEEKS 4 ONCE A WEEK 5 MORE THAN ONCE A WEEK
Q-26	Have you had sexual intercourse <u>in the past six months</u> ? (Circle number)
	1 NO 2 YES
Q-27	Have you had sexual intercourse with more than one person in the last six months? (Circle number)
	1 NO 2 YES
Q-28	What was your age at first sexual intercourse? :
Q-29	When having sexual intercourse, how frequently do you use birth control? (eg. birth control pill, diaphragm, condom, sponge) (Circle number)

- 2 MOST OF THE TIME 3 SOME OF THE TIME 4 NEVER

Q-30 When having sexual intercourse, how frequently do you use condoms? (Circle number)

1	ALWAY	/S		
2	MOST	0F	THE	TIME
3	SOME	OF	THE	TIME

NEVER 4

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Q-31 Did you use birth control for your <u>first</u> experience with intercourse? (Circle number)

1 NO	
(If yes)->Q-32 What methods of birth control did you use at your first intercourse?	(If no)>Q-33 Why didn't you use a method of birth control?
(Circle all that apply)	(List reasons)
1 CONDOM (rubber, safe) 2 FOAM, CREAM or JELLY 3 DIAPHRAGM 4 SPONGE 5 I.U.D. (co11) 6 BIRTH CONTROL PILL 7 RHYTHM METHOD 8 WITHDRAWAL (pulling out in time) 9 OTHER (please specify)	
_	

Q-34 Did you use birth control the <u>last time</u> you had sexual intercourse? (Circle number)

1 NO	
(If yes)>Q-35 What methods of birth control did you use at your most recent intercourse?	(If no)>Q-36 Why didn't you use a method of birth control?
(Circle all that apply)	(List reasons)
1 CONDOH (rubber, safe)	
2 FOAM, CREAM or JELLY	
3 DIAPHRAGM	
4 SPONGE	
5 I.U.D. (coil)	
6 BIRTH CONTROL PILL	
7 RHYTHM METHOD	
8 WITHDRAWAL (pulling out in time)	·
9 OTHER (please specify)	

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# THANK YOU FOR PARTICIPATING IN THIS SURVEY!

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# **APPENDIX B -- LETTER TO PARENTS**



Faculty of MEDICINE Department of COMMUNITY HEALTH SCIENCES

Telephone (403)

#### DEAR PARENT OR GUARDIAN:

My name is Morag Macdonald-Dichmann. I am a nurse currently working towards a Masters of Science degree in the Department of Community Health Sciences, Faculty of Medicine at the University of Calgary. Dr. Margaret Russell MD, PhD, FRCPC, Assistant Professor in the Department of Community Health Sciences, Faculty of Medicine at the University of Calgary is my thesis supervisor.

The Foothills School Division has given approval for a study to look into the current patterns of sexual behaviour amongst rural adolescents. A random sample of students in Grades 9-12 from all schools in the Division will be invited to participate.

Participation in this study will involve the students filling out an anonymous questionnaire in school on a designated day. The questionnaire will take approximately 30 minutes to complete and will be administered in the presence of only the research team. Questions to be asked include explicit questions about sexual behaviour, including whether students have ever had sexual intercourse, have had sexual intercourse in the last six months, age at onset of sexual intercourse, and use of contraception during sexual intercourse. The questionnaire does not cover any material that is not covered by the Theme V Sexuality Unit offered by the school.

Only students for whom parental consent has been obtained will be asked to participate in the study. Students will be free to refrain from answering any questions. All responses will be kept confidential and the students' names will at no time appear on the questionnaire. Only general data will be reported, and the community, schools, and students will not be identified in any published report.

A final report of the study will be released to the Foothills School Division by the investigator. Although students participating may not directly benefit from the study, the information provided may benefit future students and assist the school board in planning future evaluations of the provincially mandated Theme V Human Sexuality Unit.

However, before the study can proceed, the permission of parent or guardian is needed. Please complete and return the attached form, a stamped addressed envelope is enclosed. I would appreciate hearing from you no later than \_\_\_\_\_\_. In addition, a parental information meeting will be held at

\_\_\_ on \_

which time parents will be given the opportunity to meet the investigator, air concerns and examine a full copy of the questionnaire.

Thank you for your assistance. If you have any further questions or concerns, a message may be left for Dr. Russell or myself at 220-4286 (between the hours of 8:30 a.m. and 4:00 p.m.), or Dr. Russell may be reached through the Foothills Hospital switchboard at 270-1110, ask for pager 538.

Yours sincerely,

Usliged onald - Dicense

Morag Macdonald BScN, RN

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M. L. Russell, MD, PhD, FRCPC Assistant Professor

(detach form and return in envelope provided)

PARENT OR GUARDIAN

Please indicate whether you wish your son/daughter to participate by checking off the appropriate box.

I DO |\_\_\_ / DO NOT |\_\_ | consent to have my son/daughter

\_\_\_\_\_ take part in this questionnaire survey.

(please print)

Signature of Parent or Guardian

Please print your name

Date

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\_, at