CONDOM USE AMONG FIRST NATIONS PEOPLE LIVING ON-RESERVE IN ONTARIO

by

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ABSTRACT

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by Ann Natalie Burchell, for the Degree of Master of Science, 1997

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OBJECTIVE: To describe patterns of condom use among First Nations people living on-reserve in Ontario.

METHODS: Analysis of secondary data from the *Ontario First Nations AIDS and Healthy Lifestyle Survey*, a cross-sectional survey of 658 men and women living in eleven reserve communities. Individuals who had sexual intercourse in the last twelve months were included (n = 400). Descriptive statistics and multiple logistic regression were used to analyze condom use in the last twelve months.

RESULTS: Eight percent always, 31% sometimes, and 61% never used condoms. Of those who used condoms, 8% used them for sexually transmitted disease (STD) prevention only, 10% used them for birth control only, and 82% used them for both purposes. Multiple logistic regression revealed that age, gender, familiarity with the traditional way of life, having a steady sex partner, number of sex partners, worry about pregnancy, knowledge about HIV, knowing someone with AIDS, and embarrassment obtaining condoms had significant effects on condom use.

CONCLUSIONS: The results have implications for the promotion of condoms for HIV/STD prevention among First Nations people living on-reserve in Ontario.

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INTRODUCTION

Since the arrival of European colonists centuries ago, First Nations people in Canada have had a lower health status than the general population (Health and Welfare Canada, 1992). Infectious diseases brought over by the Europeans, such as smallpox, resulted in the deaths of many Aboriginal people (Health and Welfare Canada, 1992). To this day First Nations people experience higher mortality rates (Mao et al., 1992), reduced life expectancy (Health and Welfare Canada, 1992), and high rates of diabetes, injuries, violence, suicide, depression, alcoholism, substance abuse, respiratory diseases (Health and Welfare Canada, 1992) and disability (Statistics Canada, 1993c) in comparison to the general population in Canada.

It is also known that rates of sexually transmitted diseases (STDs) are higher in some First Nations populations than in the general Canadian population (Lee et al., 1987; Orr et al., 1994; Romanowski et al., 1991; Toomey et al., 1989). The most serious STD threat is the human immunodeficiency virus (HIV) that causes the disease AIDS. This disease has no cure at the present time, and predominantly affects young adults in their prime. If the history of the introduction of communicable diseases to the Aboriginal population were to repeat itself, HIV could have a drastic impact on First Nations communities. Various factors increase the vulnerability of First Nations peoples to HIV/AIDS through their effects on sexual behaviour, access to health information and prevention programs, and the likelihood of infection upon exposure. Higher STD rates, lower overall health status (Health and Welfare Canada, 1992), poverty, unemployment, lower education (Statistics Canada, 1993b), and travel between reserves and on and off the reserves (Health and Welfare Canada, 1990) all contribute to the vulnerability of First Nations people to HIV/AIDS, either directly or indirectly.

Despite the knowledge that STD rates are higher among Aboriginal people, there has been little research of sexual and STD preventive behaviour in this population. Although the majority of STDs are treatable, many infections are asymptomatic, especially among women, and may cause serious health problems if left untreated (Jones and Wasserheit, 1991). Since an HIV vaccine will not be available in the near future, the only currently available means of preventing HIV infection is the avoidance of high risk activities, including using condoms for sexual

intercourse. Even if a vaccine were to become available, the promotion of condom use will still be important since vaccines are rarely 100% effective in preventing disease. Previous research of condom use in non-Aboriginal populations may not be applicable, due to differences between Aboriginal culture and the predominant white European culture in Canada, as well as extensive cultural diversity within the Aboriginal community itself. Given the lack of information on the prevalence of condom use, there are several reasons for the study of condom use in the First Nations population. Condom use, or the absence of condom use, is one measure of the potential for the spread of HIV/STD in a community through unprotected intercourse. In this way condom use is an indicator of the vulnerability of a community to HIV/STD outbreaks. Secondly, an estimate of the prevalence of condom use will provide a baseline measure for future evaluation studies of condom promotion efforts. Thirdly, an understanding of the factors associated with condom use will improve the targeting of HIV/STD prevention activities in First Nations communities. Efforts can be directed at groups who do not use condoms consistently or at all and who participate in potentially risky behaviour. Furthermore, it will provide insight into the reasons for condom use and non-use so that this knowledge can be integrated into prevention messages.

To address this issue, an analysis of secondary data from the *Ontario First Nations AIDS and Healthy Lifestyle Survey (OFNAHLS)* was undertaken. The OFNAHLS was a cross-sectional, face-to-face survey of 658 First Nations men and women that was conducted in the summer and fall of 1991. Stratified random sampling by age group and sex was used to select subjects aged fifteen and older from band membership lists of eleven First Nations communities in Ontario. The analysis of condom use was restricted to 400 individuals who had sexual intercourse in the twelve months preceding the interview. Data from this survey provided information on rates of condom use, as well as sociodemographic factors, familiarity with First Nations culture, general health status, alcohol and drug use, sexual behaviour, and knowledge, attitudes and beliefs about AIDS.

RESEARCH OBJECTIVES

General Purpose

The general purpose of this analysis was to describe patterns of condom use among First Nations people living on-reserve in Ontario.

Specific Objectives

1. To describe the prevalence of condom use in the last 12 months among the First Nations on-reserve population in Ontario:
   a) measured as the frequency of condom use according to i) sociodemographic characteristics (i.e. age, gender, marital status, education) and ii) sexual behaviour that affects the risk of HIV/STD infection (i.e. number of sex partners, having a steady sex partner, participation in anal intercourse, whether sex partners are located within or outside the reserve community); and
   b) measured as the proportion reporting condom use specifically for STD prevention versus birth control.

2. To determine whether condom use in the last 12 months (i.e. ever, consistent use among condom users, use for the purpose of STD prevention) is associated with:
   a) sociodemographic factors;
   b) cultural factors specific to First Nations populations;
   c) sexual behaviour;
   d) contraceptive behaviour and attitudes;
   e) HIV/STD risk awareness;
   f) condom knowledge and attitudes; and
   g) attitudes towards sexual communication.

LITERATURE REVIEW

The First Nations Population in Canada and Ontario

The terminology used to describe the indigenous peoples of North America varies according to the period in history and whether the people described are living within the borders of Canada or the United States (Young, 1994). In Canada, the term "Aboriginal" is preferred, whereas in the United States the use of "Native American" is widely accepted. Individuals with Aboriginal origins in Canada may be North American Indian, Inuit, or Metis. Although the term "Indian" is still used in Canada today, it is being replaced by the term "First Nation". First Nations people are further distinguished as either "status" or "non-status" Indians. According to federal legislation dating back to 1876, status Indians are registered as Indians with the Department of Indian Affairs and Northern Development (DIAND) under the Indian Act. Status Indians are allowed various benefits not available to non-status Indians, and are also entitled to live on federally designated land called "reserves" (in the United States the equivalent is called a "reservation"). Many reserves are located in rural areas, and some only have access roads at certain times of the year. A few are remote in that they are only accessible by air. The term "First Nations community" will also be used to refer to a reserve throughout this document.

In the 1991 Census, 4% of the people in Canada reported Aboriginal origins (1,002,675) (Statistics Canada, 1993a). There were just over half a million status Indians registered in 1991, representing 1.9% of the total Canadian population (DIAND, 1992). Over 59% (304,759) lived on reserves. The population of Aboriginal people is young, such that 37% are under 15 years of age, compared to 21% for the total Canadian population (Statistics Canada, 1993a). There were 117,152 status Indians in Ontario in 1991, representing the largest total population of registered Indians in any province (DIAND, 1992). Fifty-three percent lived on reserves.

In Ontario, the predominant First Nations peoples are the Iroquois and the Algonkian (Driben, 1987). The Iroquois, or Six Nations, are located in the southern portion of Ontario. This group consisted of eleven tribes at the time of European contact. Of these, six were organized into the League of the Iroquois: the Seneca, Cayuga, Onondaga, Oneida, Mohawk, and

Tuscarora, which resulted in the term "Six Nations" used today. In 1991 there were five Iroquois reserves in Ontario (Ontario Native Affairs Secretariat, 1993).

The Algonkians occupied almost all of Ontario at the time of European contact (Driben, 1987). The largest Algonkian tribe is the Ojibway, also called Chippewa. This group occupies the largest area of Ontario, from the northern regions around Lake Superior, throughout central Ontario, and into the southern region of the province. The Ojibway consist of four distinct groups: the Ojibwa of the Lake Superior region, the Mississauga, the Odawa of the Georgian Bay region, and the Potawatomi. In 1991 there were 85 Ojibway, 1 Odawa, and 3 Potawatomi First Nations communities in Ontario (Ontario Native Affairs Secretariat, 1993).

Another Algonkian tribe, the Cree, occupy the northernmost part of Ontario. Thirty-three Cree First Nations communities existed in Ontario in 1991 (Ontario Native Affairs Secretariat, 1993). Other Algonkian tribes in Ontario include the Algonquin in the central eastern region and a few Delaware who settled in the southern tip of Ontario after the American Revolutionary War and the War of 1812-14 (Driben, 1987).

Although there are similarities among the cultures of the different First Nations tribes in Ontario, there is also a great cultural diversity. The First Nations people of North America and Canada should not be considered as one cultural group, just as it would be misleading to group all European nations under one cultural label. First Nations groups are distinct from each other with respect to their individual heritages, languages, religious beliefs, cultural practices, and history of European contact. The cultural lifestyle of each group was influenced by its environmental surroundings, such that there are some First Nations whose traditional lifestyle was nomadic hunting and gathering, whereas other First Nations lived in permanent agricultural and fishing villages. Because of this great cultural diversity, one must exercise caution in generalizing from one tribe to another. The results from research in one community may not be applicable to another. Studies of sexual and HIV/STD preventive behaviour in a variety of First Nations communities are of the utmost importance, since prevention efforts that work in one community may not work in another.

Moreover, native culture differs substantially from the mainstream, white European culture in Canada. Dr. Clare Brant (1990), a Mohawk and psychiatrist, has written about native ethics based on his experience with the Iroquois, Ojibway, and Swampy Cree in Ontario and

Quebec. For example, the ethic of non-interference implies that "instructing, coercing or attempting to persuade another person" is seen as rude. This has implications for HIV/STD prevention efforts that are by definition interventionist. In keeping with the ethic of non-interference, First Nations practice teaching by modeling, rather than the white European tradition of shaping. Individuals learn how to do things by watching, rather than being told. Since condom use and sexual behaviour in general are private activities, this may also have implications for HIV/STD preventive behaviour. Because of these and other cultural differences, it is unwise to assume that findings from the general white Canadian population in HIV/STD research are directly applicable to First Nations communities.

Historically and in contemporary Canadian society, Aboriginal people are one of the most economically and socially disadvantaged groups. First Nations people have a lower socioeconomic status than the general Canadian population. Among North American Indians who lived on-reserve in 1991, 28% of adults aged 15 to 49 had no formal schooling or less than a grade 9 education, compared to only 6% in the general Canadian population (Statistics Canada, 1993b). Similarly, in 1991 25% reported having some post-secondary education, compared to 51% of the general Canadian population. The economic status of North American Indians living on-reserve was also less than that of the general population. The unemployment rate was over three times greater than for the general population, and 65% of respondents earned less than $10,000 in 1990, compared to 35% in the general population. This may be due in part to a large proportion of individuals receiving social assistance. Living conditions on the reserves are poorer than in the general population; there are higher levels of crowding and nearly five times as many dwellings are in need of major repairs (Statistics Canada, 1993c).

It follows that these inequalities in socioeconomic status will be reflected in the health status of First Nations people in Canada. Access to health care services is "less than optimal" on rural and remote reserves, especially in northern communities (Shah, 1994). Mortality rates are significantly higher on reserves, such that mortality from all causes is nearly double the rate in the general Canadian population (Mao et al., 1992). In particular, deaths due to injuries and violence are substantially higher; this includes motor vehicle crashes, suicide, homicides and fires. Deaths due to alcoholism or cirrhosis are also greatly elevated in comparison to the general Canadian population. Life expectancy among status Indians has increased over time, however

there is still a gap with the national average (Health and Welfare Canada, 1992). Illness is more prevalent among the First Nations population than among the Canadian population as a whole. They experience higher rates of suicide, depression, diabetes, respiratory disease, tuberculosis, alcoholism, substance abuse (Health and Welfare Canada, 1992) and disability (Statistics Canada, 1993c).

Birth rates are high in First Nations communities. This is of particular relevance for condom use, which is a contraceptive as well as an STD prophylactic. The crude birth rate among status Indians was more than 60% higher than the overall Canadian rate in 1991 (Health and Welfare Canada, 1992). How much of this increased birth rate is due to contraceptive non-use or failure is uncertain. The Aboriginal population is growing in Canada, and DIAND predicts that there will be 700,600 status Indians by the year 2001 (DIAND, 1992). Since many risky sexual behaviours are prevalent among the young, greater numbers of Aboriginal youth may result in higher rates of STD infections through demographic change alone. The Joint National Committee on Aboriginal AIDS Education and Prevention reported that there is an increasing number of teenage pregnancies among First Nations people, although no data were presented (Health and Welfare Canada, 1990). In the United States in 1990, birth rates among American Indian/Alaskan Native teenagers were about twice as high as those for White non-Hispanic teenagers (Natality, Marriage, and Divorce Statistics Branch, CDC, 1993). High rates of teenage pregnancies are of critical concern as they indicate that unprotected sexual activity is occurring.

One final characteristic of the First Nations population that is relevant to HIV/STDs is travel and migration. Because many reserves are rural or remote, there may be a misconception that First Nations are protected from HIV due to their isolation. However, this is not the case. Aboriginal people travel back and forth between reserves and to urban areas for education, jobs, medical care, ceremonial activities such as pow wows, and to visit friends and family (Health and Welfare Canada, 1990). If individuals have sexual partners on and off the reserve, this is an important potential route of transmission of HIV and other STDs into reserve communities. Information collected from the *Ontario First Nations AIDS and Healthy Lifestyle Survey* showed that 22% of people who engaged in sexual activity had sexual partners both within and outside the reserve community (Calzavara et al., 1996).

STDs in Aboriginal Populations

The prevention of STDs in a population is important for several reasons. Firstly, STDs have a direct impact on health through such consequences as infertility and ectopic pregnancy in the case of gonorrhea and chlamydia; cardiovascular and neurological disease resulting from syphilis; genital cancers due to infection with human papillomavirus (HPV); recurrent episodes of disease due to herpes; and chronic hepatitis, cirrhosis and liver cancer due to hepatitis B virus (Jones and Wasserheit, 1991). Second, the presence of STDs in a population indicates that the behaviours necessary for HIV transmission are indeed occurring. Third, studies have shown that prevalent STD infections increase the likelihood of HIV infection. Various STDs, such as gonorrhea, chlamydia, and trichomoniasis (Laga et al., 1993) and syphilis (Otten et al., 1994) have been associated with a significant increase in HIV seroconversion.

There is a lack of published information on rates of STDs among the Aboriginal population compared with the non-Aboriginal population in Ontario. According to this review of the literature, the only information available is from government health ministries. In Ontario, a number of STD infections, such as chlamydia and gonorrhoea, are reportable by law to the Ministry of Health. Information on ethnicity is not reported. Rates are reported for the total population of Ontario and by age and sex. However, cases among First Nations people living on-reserve are not included in this data. Rather, Medical Services Branch (MSB) of Health Canada is responsible for providing health care on Aboriginal reserve communities in Ontario, and reports cases of chlamydia and gonorrhoea separate from the general Ontario population. Therefore, it is possible to compare crude STD incidence rates between the general population of Ontario and the on-reserve population based on these data sources. For example, during the period of January 1 to June 30, 1996, a total of 5,119 cases of chlamydia were reported in Ontario (Ontario Ministry of Health, 1996) and 186 cases were reported to the Ontario region of MSB (Medical Services Branch, Health Canada, personal communication). This results in an incidence of 46.8 per 100,000 in the general population and 288.7 per 100,000 in the on-reserve population in Ontario in a six month period — a six-fold difference. Similarly, rates of gonorrhoea during this period were nearly twice as high in the on-reserve population compared to the general population of Ontario. A total of 1,065 cases were reported in Ontario (9.7 per 100,000) (Ontario Ministry of Health, 1996) and 197 cases were reported among the on-reserve

population (17.1 per 100,000) (Medical Services Branch, Health Canada, personal communication).

However, there are several problems with these two data sources which limit their interpretation. For any reportable disease, there may be underreporting or delays in reporting of cases. Second, case reporting of chlamydia or gonorrhoea depends on the infected individual seeking medical care. Because STD infections may be asymptomatic, it is unlikely that all cases seek care. Asymptomatic infection with chlamydia is particularly common among women (Jones and Wasserheit, 1991). Third, cases reported by the Ontario region of MSB probably do not represent all diagnosed cases among the on-reserve population. In the northern regions of Ontario (Sioux Lookout and Moose Factory zones), health services are provided on-reserve by MSB health care providers, and services external to the reserve may be hundreds of kilometres away, requiring air travel. However, in the more southern regions of Ontario (Thunder Bay and Southern Ontario zones), First Nations people must seek care from non-MSB health care professionals practicing off reserve. Inter-governmental agreements provide that information on cases treated off-reserve are forwarded to the MSB community health nurse on-reserve, who then reports it to MSB (Medical Services Branch, Health Canada, personal communication). Despite these provisions to maximize the number of reported cases to MSB, it is possible that information on cases treated off-reserve may never reach the MSB database. Fourth, only STD infections that are identified through laboratory diagnosis are reportable. Physicians who suspect an STD may prescribe broad spectrum antibiotics, and never submit a swab for laboratory confirmation; these cases would never be reported. Finally, the above comparison is not age-adjusted. The incidence of STDs is greater among younger people, and it is known that the Aboriginal population is younger than the non-Aboriginal population in Canada. These limitations imply that the calculated rates of STDs based on reported cases are conservative estimates, and that the comparison of the rates between Aboriginal and non-Aboriginal people may be confounded by age differences. Nevertheless, the data are suggestive of higher rates of chlamydia and gonorrhoea infections among the on-reserve population compared to the general population in Ontario.

Information obtained from other regions in North America also demonstrate that rates of chlamydial infections are high among Aboriginal people. In Manitoba, laboratory-confirmed

cases of chlamydial infections have been reportable by law to public health authorities since 1987; reports include information on whether the case is a status Indian. Reported infections in Manitoba from 1988 to 1990 indicated a greater incidence among status Indians than in non-Indians (Orr et al., 1994). The overall annual incidence among status Indians was 861.6 per 100,000 residents with a relative risk for infection of 1.8 compared to non-Indians. Furthermore, the relative risk for recurrent infection with *Chlamydia trachomatis* was 2.9 for Indians compared to non-Indians. However, Orr et al. (1994) caution that they were unable to control for socioeconomic status. Similarly, rates of chlamydial infection were high in a sample of Native American women seeking prenatal care in Arizona (Cullen et al., 1990). All Native American women who came to the Indian Health Service clinics for initial prenatal evaluation of their pregnancy during a six month period in 1987 were screened for chlamydia. Twenty-four percent (44/183) were positive. Even in a geographically isolated Eskimo population in Alaska, 23% (114/493) of Eskimo women undergoing pelvic examination for any reason within a one year period had a chlamydial infection (Toomey et al., 1987). Medical care in this remote community was only available from one source; therefore the authors were able to screen 52% of all women of reproductive age in the region.

Gonorrhoea and syphilis infections are also disproportionately high among Aboriginal people. A study of reported gonorrhea and syphilis cases between 1984 and 1988 in 13 American states with large Native populations was able to compare rates among racial groups, including "American Indian or Alaska Native" (Toomey et al., 1989). The average rates of reported gonorrhea and primary and secondary syphilis among Native Americans were more than twice the rates in non-Native Americans, although the gap in morbidity declined over the four year period. Similarly, syphilis infections have been high in Canadian Aboriginal populations. Case information based on retrospective chart review was obtained for 1,089 cases of infectious syphilis during an outbreak centred in Edmonton, Alberta during the period of 1983 to 1985 (Romanowski et al., 1991). Fifteen percent of male cases and 59% of female cases were of North American Indian origin. Many of these Aboriginal women were sex trade workers in Edmonton (percentage was not reported). A similar outbreak of infectious syphilis centred in Winnipeg, Manitoba in 1984 had a disproportionate representation of Aboriginal people (Lee et al., 1987). Eighty-two case reports, which included racial information, were reviewed. In this

outbreak, the case rate for non-Natives was 6.6 per 100,000 population, whereas the case rate for Natives was over three-fold higher at 21.7 per 100,000 population.

In the Manitoba AIDS Virus Epidemiology Study, 250 people at risk for HIV infection were recruited from teaching hospitals and downtown public clinics in Winnipeg (Hammond et al., 1988). Of those recruited, more Native or Metis individuals were at risk for HIV infection due to a current STD than in Caucasian and other races (proportions were not provided). Because the Native and Metis subjects in their sample were also more likely to be less educated and unemployed, Hammond et al. (1988) recommended that prevention programs be specifically targeted to Native peoples.

HIV/AIDS in Aboriginal Populations

There are two sources of data available to describe the pattern of HIV/AIDS in Canadian Aboriginal people: AIDS case reporting and HIV seroprevalence studies. There are advantages and disadvantages to both of these types of data.

AIDS incidence data are the only nationally available data on the size of the HIV/AIDS epidemic in Canada. HIV infection reporting is not mandatory in some provinces and does not include ethnicity information in other provinces. However, trends in AIDS case incidence do not reflect the current trends in HIV infection due to the long incubation period. AIDS case data must also be adjusted for reporting delays and underreporting, and these corrections may not accurately adjust rates to their "true" value. Furthermore, changes to the definition of an AIDS case over time complicate the interpretation of temporal trends.

As of March 31, 1996, 13,291 cases of AIDS had been reported to the Laboratory Centre for Disease Control in Canada, and of these 187 were Aboriginal (Nguyen et al., 1996). As of December 31, 1995, the cumulative AIDS incidence rate among Canadian Aboriginal people was 18.7 per 100,000. If this is adjusted for reporting delay, the rate of AIDS cases among Aboriginal people by the end of 1995 was 24.0 per 100,000. This rate is lower than in the overall population of Canadians (44.9/100,000 or 56.3/100,000 after adjusting for reporting delay) (Mai Nguyen, Laboratory Centres for Disease Control, personal communication). However, the rate among Aboriginal people is likely to be underestimated due to reporting delays, non-reporting, and omission of data on ethnic origin, as approximately 40% of reported cases lacked

information on ethnic origin. The reporting of Aboriginal ethnicity only began in 1988. Moreover, one province stopped reporting ethnicity information in 1990.

Of the AIDS cases with known ethnicity, 4.4% were Aboriginal during the period 1993-95, compared to 2.4% during 1990-92 and 1.3% during 1984-90 (Nguyen et al., 1996). In general, reported Aboriginal AIDS cases were highest in British Columbia, Quebec, Manitoba and Alberta, and were greater for males than for females. The lower numbers of reported AIDS cases in Ontario, which has the largest population of Aboriginal people, may be due to extensive under-reporting of cases in that province (Calzavara et al., 1994). Regarding risk factors of Aboriginal cases compared to the general population, fewer men are homosexual/bisexual (67.3% versus 79.6%), and more women are intravenous drugs users (IDUs) (42.9% versus 14.3%) (Nguyen et al., 1996).

As opposed to AIDS case reporting, HIV prevalence data provides important information about the magnitude of the HIV epidemic in the present. However, few HIV prevalence surveys have been conducted among North American Aboriginal people, and those that have been conducted have been in selected populations, such as STD clinic patients and prisoners (see Table 1). Seroprevalence data from selected populations may not be representative due to selection bias. It is difficult to know if members of a selected population are representative of that population; for example, a convenience sample of injection drug users may not be representative of all injection drug users. Furthermore, the proportions of selected populations in the overall population are usually not known. A better estimate of HIV seroprevalence can be obtained using representative probabilistic sampling, although this methodology may still be biased due to refusals to participate. Unfortunately, published data on HIV prevalence among the general population of North American Aboriginal people based on representative probabilistic sampling do not exist.

TABLE 1:	Summary of Studies of HIV Prevalence Among North American Aboriginal People		
Reference	**Population**	**Methodology**	**HIV prevalence rate**
Conway et al., 1992	Indian Health Service in USA: initial prenatal female patients, third trimester/perinatal female patients, and patients being evaluated for STD (n = 34,045)	• anonymous unlinked HIV seroprevalence survey • all consecutive blood samples drawn for syphilis serology during 1989-1991 in 58 Indian Health Service facilities throughout the U.S.	range 0.3 - 4.5/1,000
Harris et al., 1993	Injection drug users entering drug treatment in Washington state, USA (n = 3,039), where prevalence rates were reported for American Indian/Alaskan Natives (n = 72)	• anonymous unlinked HIV seroprevalence survey • leftover blood samples collected for routine clinical purposes from consecutive eligible IDU clients at drug treatment centres between 1988 and 1991 • blood samples were available for 909 IDUs entering treatment	5.6%
Martin and Mathias, 1996	Clients entering native alcohol and drug treatment centres in British Columbia (n = 1,165)	• all clients entering two native alcohol and drug treatment centres were asked to participate in voluntary HIV serological testing • 80% participation rate	3.5/1,000
Rekart et al., 1991	Aboriginal street-involved persons in Vancouver, BC (n = 448)	• voluntary HIV seroprevalence survey • Aboriginal street-involved persons were recruited by the AIDS Street Nurse Program during the period 1988-1990	overall 6% range 2.0 - 32%
Rothon et al., 1994	Adults inmates in British Columbia (n = 2,482), where HIV prevalence was reported for inmates with Native status (n = 572)	• voluntary, anonymous HIV prevalence survey using saliva samples • all adults being admitted to provincial prisons in British Columbia were asked to participate • 91% participation rate	9/1,000

Efficacy of Condoms in Preventing HIV/STDs

Condoms have long been recommended for the prevention of STDs, and in recent history for the prevention of HIV. Their use protects the male from direct penile contact with cervical, vaginal or rectal secretions or lesions, and at the same time protects the female from contact with infected semen, discharge or penile lesions (Cates and Stone, 1992). In vitro studies have shown that latex condoms are impermeable to all known sexually transmitted pathogens (Stratton and Alexander, 1993).

Studies that have examined temporal trends in rates of condom use and rates of infection with HIV/STDs using repeated cross-sectional surveys have found an association between increasing condom use and decreasing infection. A study of men who visited an STD clinic in San Francisco between 1990 and 1992 found that a significant decline in HIV seroprevalence was accompanied by an increase in rates of condom use for anal, vaginal, and oral sex, after adjustment for other factors (Schwarcz et al., 1995). Similar results were found in a prospective series of cross-sectional surveys among newly attending female patients at a genitourinary medicine clinic in London, England during the period of 1982 to 1992 (Evans, McCormack, et al., 1995). Significant increases in condom use and decreases in the number of sexual partners were accompanied by decreases in the bacterial STDs gonorrhea, chlamydia, and trichomoniasis. However, rates of infection with genital warts and genital herpes, both viral STDs, did not change despite increasing condom use. The authors attributed this finding to the fact that these viral STDs may infect external genitalia and may be transmitted independently of penile penetration into the vagina, so that the use of condoms may not prevent their transmission.

Cross-sectional and cohort studies have shown a highly protective effect of condoms against gonorrhea and *Ureaplasma urealyticum* in males (Cates and Stone, 1992). However, the relative risk of STD infection in women whose partners used condoms ranged from 0.18 for genital ulcers to about 0.70 for gonorrhea, vaginal trichomoniasis, pelvic inflammatory disease and tubal infertility; condoms were not protective in studies of HPV infection, cervical chlamydia and bacterial vaginosis (Cates and Stone, 1992). Human studies of condom use and HIV infection are more consistent. Nearly all show a protective effect and relative risks of

infection for condom users compared to non-users ranges from 0.0 to 0.6 (Cates and Stone, 1992).

Possible explanations for the failure of condoms to prevent STD infection include transmission via the external genitalia; transmission through sexual activity other than vaginal or anal intercourse, such as oral sex; or condom failure. The incorrect use, breakage, slippage or leakage of condoms may result in condom failure. Condoms are most effective in preventing STD infection when used correctly, and condom failure is most often due to human error rather than manufacturer's defect (Cates and Stone, 1992). Incorrect use of condoms includes improper storage; fingernail tears; incorrect application of condom; insufficient lubrication or the use of an oil-based lubricant; delaying the use of the condom until after intercourse starts; and failure to hold the condom on the penis during withdrawal.

Prevalence of Condom Use in Aboriginal and Canadian Populations

Few reports on the prevalence of condom use in Aboriginal populations exist. The only Canadian study found was based on a convenience sample of 582 Aboriginal women in Canada who were asked about knowledge, attitudes and behaviour relevant to HIV/AIDS (Aboriginal Nurses Association of Canada, 1993). Three thousand questionnaires were distributed to Friendship Centres, Band Councils, and health centres in Aboriginal communities throughout Canada. Women were given more than one questionnaire to pass along to others. The response rate was 19.4%. Despite the limitations of this study due to its convenience sample and low response rate, it provides some preliminary information on condom use among First Nations women. Of the 289 women who responded to the question on frequency of condom use, 43.9% never, 25.3% sometimes, 15.2% most times, and 15.6% always used condoms (no time frame specified).

Two American studies reported rates of condom use among Aboriginal people. Fisher et al. (1993) surveyed drug users in Anchorage, Alaska, on their HIV-related risk behaviour using a convenience sample (the sampling strategy was not described). Of the 353 individuals who were interviewed, 62 self-identified as Alaskan Natives. Condom use was only reported for Alaskan Native women: 12% had used condoms for vaginal sex, 5% for oral sex, and 25% for anal sex during the last 30 days. The 1987 Montana American Indian Health Risk Assessment Study

assessed the reproductive behavior of 232 on- and off-reservation women (Warren et al., 1990). The methodology of this study included both on- and off-reservation Indians in Montana, a face-to-face survey design, and a stratified, systematic, random sample from tribal lists. Unfortunately, the study only reported contraceptive use among the 96 currently married women. Only 4.2% of married women were currently using condoms for contraception. Condom use among unmarried women may be different from married women, therefore the results should be interpreted with caution.

More information on the prevalence of condom use is available in the non-Aboriginal Canadian population. The results of several published studies are summarized in Table 2. Rates of condom use are quite variable, as are the measures of condom use. The generalizability of these findings to First Nations populations is unknown.

TABLE 2:	Summary of Studies of the Prevalence of Condom Use in Canada		
Reference	**Population**	**Methodology**	**Rate of condom use**
Boroditsky et al., 1995 (The Canadian Contraception Study)	women aged 15 to 44 years (n = 1,428)	• random sample from a database of 20,000 households that have agreed to participate in market research studies • mailed, self-administered questionnaire • 69% response rate	• 21% current condom users for contraception • 29% used condoms for contraception in the previous 6 months
Godin et al., 1996	Latin American adults (n = 346), English-speaking Caribbean adults (n = 358) and South Asian men (n = 355) in Canada	• convenience sample: respondents were recruited from the telephone book, community organizations, and other venues where these ethnocultural communities were known to frequent • self-completed anonymous questionnaire	• Latin American adults: 30% always used condoms with new partners in the last year • English-speaking Caribbean adults: 28% always used condoms with new partners in the last year • South Asian men: 47% always used condoms with new partners in the last year
Kasenda, 1994 (Ontario Health Survey)	young adults in Ontario aged 16 to 44 years (excluded Indian reserves) with 2 or more sex partners in the last year (n = 2,365)	• stratified cluster sampling: within each public health unit in Ontario, households were randomly selected in each urban/rural strata • one individual was interviewed for information on all members of the household • self-completed questionnaires for household members aged 12 years or older, which contained questions on sexual behaviour • 77% response rate for self-completed questionnaire	• 41% never, 39% inconsistent, and 18% always used condoms for the prevention of STDs in the last year (2% non-response)
Langille et al., 1994	adolescents aged 13 to 19 years attending high school in a county in Nova Scotia (n = 1,239)	• self-completed questionnaire administered by teachers during class time • all schools in county participated • 61% student participation rate	• 18% never, 27% sometimes, 20% most times, and 35% always used condoms • no time frame specified
MacDonald et al., 1990 (Canada Youth and AIDS Study)	first year community college and university students (n = 5,514)	• cross-Canada survey • two-stage cluster sampling: institutions selected by region, type and size; random sample of eligible classes • self-completed questionnaire administered by instructor during class time • 75% institution participation rate • 97% student participation rate	• males: 24% never, 34% sometimes, 17% often, and 25% always used condoms • females: 30% never, 44% sometimes, 10% often, and 16% always used condoms • no time frame specified
MacDonald et al., 1994 (Canada Youth and AIDS Study)	street youth aged 15 to 20 years (n = 712)	• 10 Canadian urban centers across the country • street youth recruited through service agencies and directly from the streets • face-to-face interviews • 90% participation rate	• males: 27% consistently used condoms • females: 25% consistently used condoms
Myers and Clement, 1994	college students (n = 486)	• convenience sample of college students who were offered and accepted condoms at health displays at four college campuses • self-completed questionnaire • 78% response rate	• 69.4% reported condom use on at least one occasion in the past year
Ornstein, 1989	adults aged 18 years or older with 2 or more sexual partners in the last 5 years (n = 272)	• sampling by random digit dialing in all ten Canadian provinces • telephone interview with a randomly selected household member • 64% response rate	• males: 44% never, 5% seldom, 19% sometimes, 13% almost every time, and 19% always used condoms • females: 62% never, 11% seldom, 9% sometimes, 6% almost every time, and 12% always used condoms

Studies of Factors Affecting Condom Use

There is a great deal of published literature on factors associated with the use or non-use of condoms in a variety of populations, including adolescents, college and university students, men who have sex with men, injection drug users, sex trade workers, HIV-positive individuals, and the general population. Nonetheless, only one study of factors affecting condom use in a North American Aboriginal population was found. This was a study of drug users in Anchorage, Alaska, in which 16% of the sample were American Indian/Alaskan Native (Fenaughty et al., 1994). A total of 353 drug users were recruited using a "targeted sampling scheme". Face-to-face interviews collected information on demographic characteristics and drug and sexual behaviour. Condom use within the last 30 days was analyzed using multiple regression. Among American Indian/Alaskan Native drug users (n = 56), trading sex for money, a greater number of sexual behaviours, being homeless, and using intravenous drugs were positively correlated with condom use. However, it is unlikely that the sexual behaviour of an urban, drug using population is representative of First Nations people living in reserve communities.

Because of the lack of research on condom use among First Nations people, the generalizability of research findings in other cultural groups to First Nations people is unknown. Some consistencies on the factors affecting condom use are nevertheless available in the non-Aboriginal population. Some of these factors can be broadly categorized as sociodemographic characteristics; sexual behaviour; contraceptive behaviour and attitudes; prior history of STDs and HIV testing experiences; knowledge about HIV/STDs; and attitudes towards HIV/STDs, condoms and sexual communication. The following literature review of factors affecting condom use is by no means exhaustive. A substantial amount of literature has been published on the topic, and over one hundred variables have been reported or proposed to be important. Rather, the discussion has focused on factors for which information was collected in the OFNAHLS.

Sociodemography

Sociodemographic characteristics may influence condom use in a variety of indirect ways through their effect on attitudes, sexual behaviour and an individual's social environment. Age

has been associated with condom use in various studies, such that condom use generally decreases with age (Campbell and Baldwin, 1991; Catania et al., 1992; Donald et al., 1994; Johnson et al., 1994; Kasenda, 1994; Laumann et al., 1994; Strike et al., 1995; Tanfer et al., 1993). There is more than one possible explanation for this trend. There may be an age effect on condom use due to the typical lifetime pattern of several short-term sexual relationships during the adolescent and young adult years, followed by the development of long-term monogamous relationships in middle and late adulthood (Laumann et al., 1994). Several studies have shown that the type of partnership affects condom use (Laumann et al., 1994; Morris et al., 1995; Strike et al., 1995; Watkins et al., 1993). According to this explanation, age affects one's pattern of sexual partnering, and subsequently affects condom use. Alternatively, period effects may explain variations in condom use between age cohorts. Early sexual experiences during one's initiation into sexuality have an impact on one's sexual behaviour throughout adulthood (Laumann et al., 1994). Various events have occurred in the past several decades that have influenced sexual behaviour in the Western world: the introduction of oral contraceptives in the 1950s; the sexual revolution of the 1960s and 1970s; and the emergence of HIV/AIDS in the 1980s. Depending on when a person "came of age" sexually, these events may have influenced their sexual behaviour, including condom use. For example, adolescents and people in their twenties today became sexually active during the AIDS epidemic, and this may explain their increased tendency to use condoms.

Males tend to report the use of condoms more often than females (Donald et al., 1994; Catania et al., 1992; Hingson et al., 1990; Kasenda, 1994). This could be due to their greater control over their use, the tendency of males to have greater numbers of sexual partners and to have partners that are younger, or may be due to biased reporting of condom use in either or both sexes.

Social class may also play a role in condom use. Presumably, individuals with greater income and education would have greater access to condoms and should be more aware of the importance of their use. For example, socioeconomic status was the strongest predictor of AIDS knowledge in a 1988 study of Canadian adults (Ornstein, 1989). However, the role of education and condom use is not clear. Individuals with more than a high school education were more likely to use condoms than those who had not received a high school education in a national

random sample in the U.S. (Catania et al., 1992). The relationship of education and condom use varied by race in a U.S. sample of men; condom use increased with education among White men, but was lowest for Black men with exactly 12 years of education, and higher for Black men with either less than 12 or more than 12 years of education (Tanfer et al., 1993). Contrary to expectation, there was decreased consistency of condom use among young adults with post-secondary education and among those who worked compared to students in Ontario (Kasenda, 1994).

The incidence of HIV and other STDs is associated with race, and it has been suggested that this is due in part to differences in sexual behaviour and condom use (Aral et al., 1991). Race and ethnicity may be proxy measures for culture. Culture plays a role in the social environment that an individual lives in, and provides the context for behaviour (Aral et al., 1991). Individual behaviour is affected by culture and social environment through their effects on individual opportunities, role models, social norms, religious faith, beliefs, attitudes and values, and one's self-perception (Aral et al., 1991). Culture will also determine gender roles and power relations between men and women, which influence sexual relations and pregnancy issues (Pivnick, 1993). Results of cross-sectional surveys in 18 developing countries in Africa, South America and Asia showed huge variability in the proportion of individuals with a non-regular sex partner, participation in commercial sex, and rates of condom use for commercial sex (Caraël et al., 1995). A study of ethnocultural communities in Canada found that the relative importance of factors affecting the intention to always use condoms differed according to ethnocultural community (Godin et al., 1996). The most important predictor of an intention to use condoms among Latin American and English-speaking Caribbean adults was the belief that condom use was part of the respondent's personal standard. Among South Asian men, however, the belief that there are few barriers or many conditions that facilitate condom use was the most important predictor of an intention to use condoms. These findings which show cultural variation in sexual behaviour and determinants of behaviour demonstrate the importance of exercising caution when generalizing the results of a study in one culture to another.

Alternatively, differences in condom use between ethnic groups may reflect differences in social class, income and education. Race has been associated with condom use in a number of studies; however, the effect of socioeconomic status is not always controlled for, and the

relationship is inconsistent. One study of drug users in Alaska examined condom use among American Indian/Alaskan Natives (Fenaughty et al., 1994). The percentage of all sexual behaviour in the last month for which condoms were used was higher among Blacks than among Whites or Natives. Similarly, Blacks were more likely than Whites to use condoms in American national surveys of women (Campbell and Baldwin, 1991) and men (Tanfer et al., 1993). Conversely, Watkins et al. (1993) reported that Black and Hispanic injection drug using women were less likely to report condom use. Whites were also more likely to use condoms than Blacks in a sample of Massachusetts adolescents (Hingson et al., 1990). Unfortunately, the vast majority of studies of condom use that examine the effect of ethnicity tend to compare Whites, Blacks and Hispanics, but Native North Americans are grouped into the ambiguous category "other". For the most part, the effect of belonging to this ethnocultural group on condom use is largely unknown.

An alternative measure of culture is religious affiliation. Religious faith may affect contraceptive use through specific prohibition of the use of contraception, or through its effect on cultural values such as gender roles, family roles, or the effect of community influence (Johnson et al., 1994). White men in the U.S. were more likely to have used condoms if they were affiliated with a non-Christian religion or no religion than if they were Christian (Tanfer et al., 1993). This was also the case in a national survey conducted in the United Kingdom (Johnson et al., 1994).

Sexual behaviour

Since the use of condoms is a sexual behaviour, it follows that condom use will be influenced by other aspects of one's sexual behaviour. An individual's risk of HIV/STD infection increases with the number of sexual partners. Assuming that people rationalize their STD risk and sexual behaviour, this leads to the hypothesis that condom use should increase with the number of partners. This relationship has been found in a number of studies (Campbell and Baldwin, 1991; Fleisher et al., 1994; Johnson et al., 1994; Tanfer et al., 1993) but not in others (MacDonald et al., 1990; Weinstock et al., 1993).

A frequently mentioned determinant of condom use is relationship status or stability. In casual sexual relationships, individuals are generally less familiar with their partners and may be

less willing to have unprotected sex. Conversely, issues of trust and fidelity are more important in stable relationships so that individuals may feel that condoms are unnecessary. Relationship status was a predictor of condom use in several studies. Individuals were more likely to use condoms with casual partners than with steady or marital partners in a Canadian sample (Strike et al., 1995) and an IDU sample (Watkins et al., 1993). In the U.S. National Survey of Men, condom use was negatively related to relationship stability, in that condom use decreased in order of single without regular partner, single with regular partner, cohabiting, or married (Tanfer et al., 1993). Similarly, men who had a one-night stand were more likely to report condom use (Tanfer et al., 1993). Marital status is another measure of relationship stability. Unmarried Americans were more likely to use condoms than those that were married or cohabitating in two national studies (Catania et al., 1992; Campbell and Baldwin, 1991).

Sexual experience could influence condom use. Some sexual activities are more risky than others and this could affect an individual's perceived need for the use of protection. For example, the risk of HIV transmission is greater for anal intercourse than for vaginal intercourse (Aral, 1993); thus individuals who practice anal sex may be more likely to use condoms. American men who engaged in anal intercourse in the four weeks before the interview were more likely to have used condoms than men who did not participate in anal intercourse (Tanfer et al., 1993). However, the authors did not control for homosexual or bisexual orientation. This same study found no relationship between having engaged in oral sex and condom use.

Another marker for greater sexual experience is younger age at first intercourse, or coitarche. The age of first intercourse is associated with number of lifetime partners and age cohort, which in turn may influence condom use. Whether this variable is an independent correlate of condom use is uncertain. Kasenda (1994) only found an association of age at first intercourse with condom use in univariate analysis; it dropped out in the multivariate analysis.

Contraception Behaviour and Attitudes

The fact that condoms not only prevent HIV/STD infection but pregnancy as well should not be overlooked. The decision to use a particular method of contraception may predominate in the choice whether to use condoms or not. In a study of inner-city women, the use of condoms for birth control was the strongest determinant of condom use; it was also associated with a

greater number of previous pregnancies (Fleisher et al., 1994). A study of adolescents in Florida found that males in a steady relationship were more likely to use condoms if they believed that preventing pregnancy was more important than preventing AIDS (Langer et al., 1994).

If condoms are used for contraceptive rather than prophylactic reasons, then individuals using other methods of birth control may be less likely to use condoms for STD prevention. A number of studies have shown that condom use is decreased among adolescent couples using oral contraceptives (Joffe, 1993). In a study of Canadian college students, individuals switched from condoms to oral contraceptives as the number of sex partners increased (MacDonald et al., 1990). Women in Ontario who used oral contraceptives tended to use condoms less consistently, and men who were sterilized were less likely to use condoms (Kasenda, 1994). Similarly, men who were sterilized rarely used condoms in the U.S. National Survey of Men (Tanfer et al., 1993).

Prior History of STDs and HIV Testing Experiences

A history of an STD infection may also affect condom use, but the association could be positive or negative. Condom use could be greater among individuals with a history of an STD, presumably because it would affect self-perceived risk of a subsequent infection. Alternatively, individuals who do not use condoms may be more likely to have a history of an STD, because not using condoms increases the risk of an STD infection. Greater condom use was associated with a history of an STD infection among inner-city women (Fleisher et al., 1994), women in the U.S. National Survey of Family Growth (Campbell and Baldwin, 1991) and in the National Survey of Men (Tanfer et al., 1993). However, a history of STD did not influence condom use in Canadian college students (MacDonald et al., 1990).

The provision of HIV testing and counselling has been promoted as a way to encourage safer sexual behaviour in the community. Current guidelines for HIV testing and counselling recommend that the health care provider educate the individual on the various ways to reduce the risk of HIV infection, including the use of condoms (Canadian Medical Association, 1995). It is hoped that the experience of an HIV test would encourage people to use condoms for sexual intercourse, regardless of whether they test HIV antibody positive or negative. However, the effect of the test experience on condom use is not clear. It has resulted in increased condom use

in some studies, had no effect in others, and even resulted in decreased condom use in others, perhaps due to a false sense of security after a negative test result (Higgins et al., 1991).

Knowledge about HIV/STDs

Increased knowledge of STDs and HIV should lead to increased condom use, presumably because individuals engaging in risky sexual behaviour would perceive themselves to be at greater risk. Aboriginal people in Canada have reduced access to health information (Health and Welfare Canada, 1990). Existing materials on HIV/STDs may not be relevant or culturally sensitive, they may not be in a format that is easy to understand, or they may not be available in Aboriginal languages. This may have an impact on the level of knowledge about HIV/STDs in the Aboriginal community, and hence an impact on rates of condom use. Approximately 17% of First Nations people living on-reserve in Ontario had not heard of AIDS in the OFNAHLS (Myers et al., 1993).

Greater condom use was associated with increased AIDS knowledge in Canadian college students (MacDonald et al., 1990). The same relationship was found among Black men, but not in White men in an American sample (Tanfer et al., 1993). AIDS knowledge may have reached a saturation point in some communities, so that virtually everyone has a high level of knowledge. This would reduce the ability to detect any association between knowledge and condom use due to low statistical power. However, it is also questionable whether knowledge about HIV/STDs immediately translates to behaviour change such as condom use. For example, Canadians with greater AIDS knowledge were more likely to have had unprotected sex with someone they did not know very well (Ornstein, 1989). It is possible that individuals who engage in higher risk behaviour may be more likely to seek out AIDS information, resulting in their increased levels of knowledge.

Attitudes Towards HIV/STDs, Condoms, and Sexual Communication

Attitudes towards HIV/STDs and condoms have been shown to be associated with condom use and other sexual behaviour. This includes such attitudes as self-perceived risk of HIV infection, worry about STDs or AIDS, and negative or positive attitudes towards condoms. However, the interpretation of these associations between condom use and attitudes is

problematic. The fact that there is an association between an attitude and condom use does not necessarily mean that that attitude is the direct cause of condom use. Rather, individuals who use condoms may develop those attitudes. For example, individuals who perceive their risk of HIV infection to be high may be more likely to use condoms. Alternatively, individuals who use condoms may believe they are less at risk, because they accurately assess their risk is lowered due to the use of protection.

The perception that one is susceptible to HIV/STD infection is generally related to increased condom use in the literature. American men who believed they were at risk of infection with HIV, who had a high level of concern about AIDS, or who knew someone with AIDS were more likely to use condoms (Tanfer et al., 1993). Likewise, a national survey of American women found that they were more likely to use condoms as their self-perceived risk of getting AIDS increased (Campbell and Baldwin, 1991). Adolescents who worry about getting AIDS are more likely to use condoms (Joffe, 1993). However, this may not always be the case. Fear of an STD infection or AIDS was not related to condom use in a study of Canadian college students (MacDonald et al., 1990).

The belief that condom use is beneficial should be related to their increased use. Positive attitudes towards condoms, such as the belief that they are effective in preventing HIV, are associated with their increased use in adolescents (Joffe, 1993). The belief that condoms are efficient in preventing STDs or pregnancy was associated with increased condom use in the U.S. National Survey of Men (Tanfer et al., 1993).

Nonetheless, there are a number of perceived costs associated with condom use. In his review of condom use in adolescents, Joffe (1993) concluded that negative attitudes towards condoms were associated with reduced condom use. These included the belief that condoms reduce sexual pleasure, are inconvenient or a hassle, are painful, or are embarrassing to obtain. Women in an STD clinic sample were less likely to use condoms if they believed condoms reduced sexual pleasure (Weinstock et al., 1993). In a study of Canadian college students, decreased condom use was associated with embarrassment about condom purchase and the belief that condoms interfere with sexual pleasure (MacDonald et al., 1990). These negative perceptions may have a significant impact on condom use.

Condom use may be more likely if one believes that one has the skills and the self-confidence to use condoms (Hornik, 1991). These skills include the ability to talk about sex and the use of condoms with a sexual partner, as well as the ability to correctly use condoms. Canadian college students were less likely to use condoms if they had difficulty discussing condom use with a prospective partner; however, plans to discuss previous sexual experiences with a partner or trust in partners' information about previous experiences was not related to condom use (MacDonald et al., 1990). Although good sexual communication skills may affect the ability to discuss condoms, they may not predict condom use directly.

RATIONALE FOR THE ANALYSIS

The preceding literature review demonstrates the need for examining condom use among First Nations people in Canada. The impact of STDs among Aboriginal people is greater than in the general population. This fact alone indicates a need for attention to this population. Contrary to the perception that First Nations communities are isolated and therefore protected from the current AIDS epidemic, data show that HIV has entered this population. First Nations people are vulnerable to an outbreak of HIV through their lower socioeconomic status, reduced health status, lower education, reduced access to health care and health information, and high rates of STDs. Travel between reserves and back and forth to urban areas promotes the continued spread of HIV/STDs.

The latex condom has been shown to effectively lower the risk of infection with HIV, and also reduces the risk of many other STDs. Because complete abstinence from sexual activity or mutual monogamy may not be realistic for everyone, the condom must be promoted as a means to reduce the risk of HIV/STDs. Effective promotion of condoms requires a knowledge of the prevalence of their use in the community, and knowledge of the factors associated with their use. Knowledge of the prevalence of condom use also provides a yardstick for the evaluation of future condom promotion interventions. Furthermore, the development of condom promotion strategies without an understanding of the factors affecting condom use may not be an effective use of scarce resources. There has been a great deal of literature published on condom use in non-Aboriginal populations, and many consistencies have emerged. These findings provide some direction on which factors may be important in the Aboriginal population, but these hypotheses have yet to be tested.

Despite frequent reference to high rates of STDs, fertility, and teenage pregnancy among Aboriginal people in the literature, only three studies were found that reported rates of condom use in this population (Aboriginal Nurses Association of Canada, 1993; Fisher et al., 1993; Warren et al., 1990). The generalizability of these findings is questionable due to the methodologies used (convenience samples, low response rate) or the use of selected populations that may not be representative of the larger population of Aboriginal people (drug users, married

women), and the fact that they were all limited to women. Furthermore, the only study dealing with factors affecting condom use among Aboriginal people involved a sample of urban drug users where 16% of the sample were American Indian/Alaskan Native (Fenaughty et al., 1994). Cultural differences between the Aboriginal population and the predominant White population suggest that there may be differences in sexual behaviour and condom use. The analysis of condom use within this population is necessary.

The data collected in the *Ontario First Nations AIDS and Healthy Lifestyle Survey (OFNAHLS)* provide an excellent opportunity to describe condom use patterns among Canadian Aboriginal people. Previous analyses of this survey reported protected and unprotected sexual activity, where mutual masturbation or oral, vaginal, or anal intercourse with a condom was classified as "protected", and vaginal or anal intercourse without a condom was classified as "unprotected" (Myers et al., 1993). Condom use specifically for vaginal and anal intercourse had not been examined, nor had an in-depth analysis of the factors affecting condom use been conducted. Therefore, the analysis presented in this thesis is the first in-depth examination of an important sexual health behaviour in a people that has had little representation in the HIV/STD literature.

METHODS

Methodology of the *Ontario First Nations AIDS and Healthy Lifestyle Survey*

Purpose and Objectives of the Ontario First Nations AIDS and Healthy Lifestyle Survey

The overall purpose of the OFNAHLS was to determine what knowledge, attitudes and behaviours related to HIV infection existed among First Nations Peoples living within reserve communities in order to: a) assist in the development of culturally sensitive HIV educational materials and general health promotion efforts; b) provide a baseline measure from which to assess the effectiveness of programmes; and c) develop and test a culturally sensitive research method for use by other First Nations in Canada. The specific objectives of the survey were to obtain information on: a) the level of knowledge about AIDS and the prevention of the spread of the HIV within subgroups of First Nations People; b) the extent of high risk and preventive behaviour within the population; c) the sexual practices, substance use, roles and traditions that are barriers to behavioural change and health; and d) attitudinal, lifestyle, socioeconomic and cultural factors that prevent the development of illness and spread of HIV/AIDS (Myers et al., 1993).

History of the project

In 1988 and 1989, members of the university research team, health directors of the four First Nations Provincial Territorial Organizations (Association of Iroquois and Allied Indians, Grand Council Treaty Number Three, Nishnawbe-Aski Nation and the Union of Ontario Indians), and representatives from the Federal Centre for AIDS and the province of Ontario participated in meetings coordinated by the Office of the Chiefs of Ontario. These meetings lead to the initiative "*The Ontario First Nations AIDS and Healthy Lifestyle Research Project*". Ethics approval was granted by the University of Toronto Human Subjects Review Committee. The project was funded by Health and Welfare Canada - The Federal Centre for AIDS and the Ontario Ministry of Health, and officially began in 1990 (Myers et al., 1993).

The project was jointly managed by the researchers at the University of Toronto and by the First Nations Steering Committee. This committee was made up of 15 members: the health directors of the four Provincial Territorial Organizations, two representatives from the Office of the Chiefs of Ontario, and nine members from the participating communities (most were the community health representative). The Steering Committee was involved in all aspects of decision making surrounding the project. This included the recruitment of communities; advice on community sensitivity to topics; hiring of project staff; advice on the content, format and wording of questions in the survey instrument; interpretation of the results; and the preparation of the report "*Ontario First Nations AIDS and Healthy Lifestyle Survey*" (Myers et al., 1993).

Recruitment of communities

All 130 First Nations communities in Ontario were invited to participate via a letter sent from the Office of the Chiefs of Ontario. Each First Nation community was required to pass a band council resolution prior to participation. As a result of this invitation, eleven First Nations communities volunteered to participate in the survey (see Appendix A for a map of the location of participating communities). The eleven participating communities represented 10% of the total on-reserve population in Ontario. All four Provincial Territorial Organizations were represented, as well as the three predominant First Nations cultures in Ontario (Cree, Iroquois, and Ojibway). However, the communities under-represented the northwestern region of Ontario and English-only speaking individuals (Bullock, 1995).

Development of the survey instrument

Various strategies were used to develop the survey instrument. Questionnaires used in First Nations populations of adults and adolescents in Canada, the United States and Australia, as well as surveys used with the general population and gay men, were reviewed. An anthropologist familiar with First Nations culture was consulted for the development of questions on sexuality, risk-taking behaviour and the traditional way of life. In addition, seven focus groups were held in seven of the eleven participating communities; about 7 to 11 First Nations people of various ages, both genders, and viewpoints on the need for a survey about AIDS were in attendance in each focus group. This process resulted in the input of a wide range of

community members representing different age groups, genders, and occupations, as well as band council members and community health representatives. Information gathered from these focus groups was used to evaluate the acceptability, relevance, and construct validity of the survey instrument.

Finally, the survey instrument was pilot tested in two communities. Forty people were randomly selected from band lists and participated in the pilot test. The questionnaire was administered twice to the same individuals, two weeks apart, to determine test-retest reliability of the questions. Only questions with high test-retest reliability (kappas or correlations greater than or equal to 0.7) were included in the revised questionnaire. Information gathered from this process was used to evaluate the wording of questions, non-response, and interview procedures.

Sampling procedure

To ensure sufficient representation of the northern, central and southern regions of Ontario, the sample was selected in proportion to the on-reserve population in each Provincial Territorial Organization. A minimum of 40 interviews were required in each of the eleven First Nation communities.

Within each community, stratified random sampling was used to select eligible participants. The sample source was community-specific band lists prepared by DIAND. These are government lists that include everyone who is a status Indian and lives in the reserve community; an individual must be present on the list to receive benefits such as housing and health care. Band membership clerks in each community reviewed the DIAND lists and crossed off anyone who was no longer living on the reserve. A table of random numbers was then used to select individuals. Equal numbers of males and females were chosen within four age categories: 15 to 19, 20 to 29, 30 to 39, and 40 and older. This resulted in eight age and sex categories. Equal numbers were selected from each age group such that there was oversampling in the younger age groups. This was done to ensure adequate representation of younger individuals since HIV/STD infections are more common among young adults. An extra 15% was sampled in case of refusals or if individuals had relocated. Individuals were eligible for participation if they were aged fifteen or older and were registered band members. Parental

consent was required for individuals aged 15 and 16 in two communities due to band council decisions; there were no cases of parents refusing to provide consent.

Recruitment procedure

There was advance promotion of the study in most of the participating communities. The method of promotion was chosen by each community, and varied from flyers and reports in newsletters to the use of local television channels. A letter of introduction from a Steering Committee member and/or a band chief was sent to all persons who were selected to participate. This letter informed potential participants about the nature of the study, why they were chosen, what would be required from them if they chose to participate, and assured them about issues of confidentiality. Interviewers then contacted the selected individuals in person or by telephone to schedule interviews. Signed consent was obtained from each respondent, and respondents were paid $15 due to the amount of time required and the sensitive nature of the study. Interviews were conducted during the summer and fall of 1991.

Of the 754 individuals asked to participate, a total of 658 individuals were interviewed, representing an overall response rate of 87.3% (Myers et al., 1993). Individuals that refused to be interviewed were more likely to be older ($p = 0.04$, chi-squared test) and male ($p = 0.05$, chi-squared test). The main reason for refusal was "too busy" (Bullock, 1995).

The interview procedure

Interviewers were of First Nation origin and in most cases were a member of the participating community. In communities where both male and female interviewers were available, the interviewer was the same gender as the respondent. All interviewers attended a two-day training session, spoke and read English, and could also act as translators for respondents who did not speak English. The interviews took approximately 45 minutes (mean = 48, range = 19 - 110 minutes) and were conducted either in a room at the Health Centre or Band office, at the respondent's home, at the interviewer's home, or in the outdoors. According to the interview protocol, interviews were to be conducted in private; however, interviewers noted that for 82 of the 658 interviews (12%) there were people within hearing distance of the interview.

The method of interviewing was face-to-face combined with self-completed answer booklets for sensitive questions on sexual behaviour and attitudes, alcohol and drug use, history of an STD or HIV testing, whether they knew someone who had AIDS, and self-perceived risk of developing AIDS. For these questions, interviewers faced away from respondents and read the questions aloud, while the respondent checked the appropriate response in the answer booklet. This method of interviewing was chosen by the Steering Committee as being most appropriate within the First Nations culture. If the respondent could not read English, the interviewer held up the instrument and read out the question and responses while pointing at the appropriate place to check. For questions on sexual activities, respondents were given the choice of technical (polite) or common (street) wording.

Upon completion of the interview, the respondent placed the response booklet in an envelope and sealed it. Envelopes were not opened until they reached the university. To ensure confidentiality, there were no personal identifiers in the survey instrument and the names of the respondents could not be linked to the completed interview schedule.

Analysis Methodology

This thesis was based on an analysis of secondary data from the OFNAHLS (see Appendix B for the letter of permission to access the data). The limitations of the OFNAHLS methodology are described in the discussion chapter. The survey collected information on sociodemographic factors, familiarity with First Nations culture, general health status, alcohol and drug use, sexual behaviour (including condom use), and knowledge, attitudes, and beliefs about AIDS. Non-response to specific questions ranged from zero for questions on demographic characteristics to 7.3% for questions about sexual practices. Refusals to answer the sexual behaviour questions were more common among males, those who spoke Cree only, those who attended a residential school, those with less formal education and those aged thirty to thirty-nine (Myers et al., 1993).

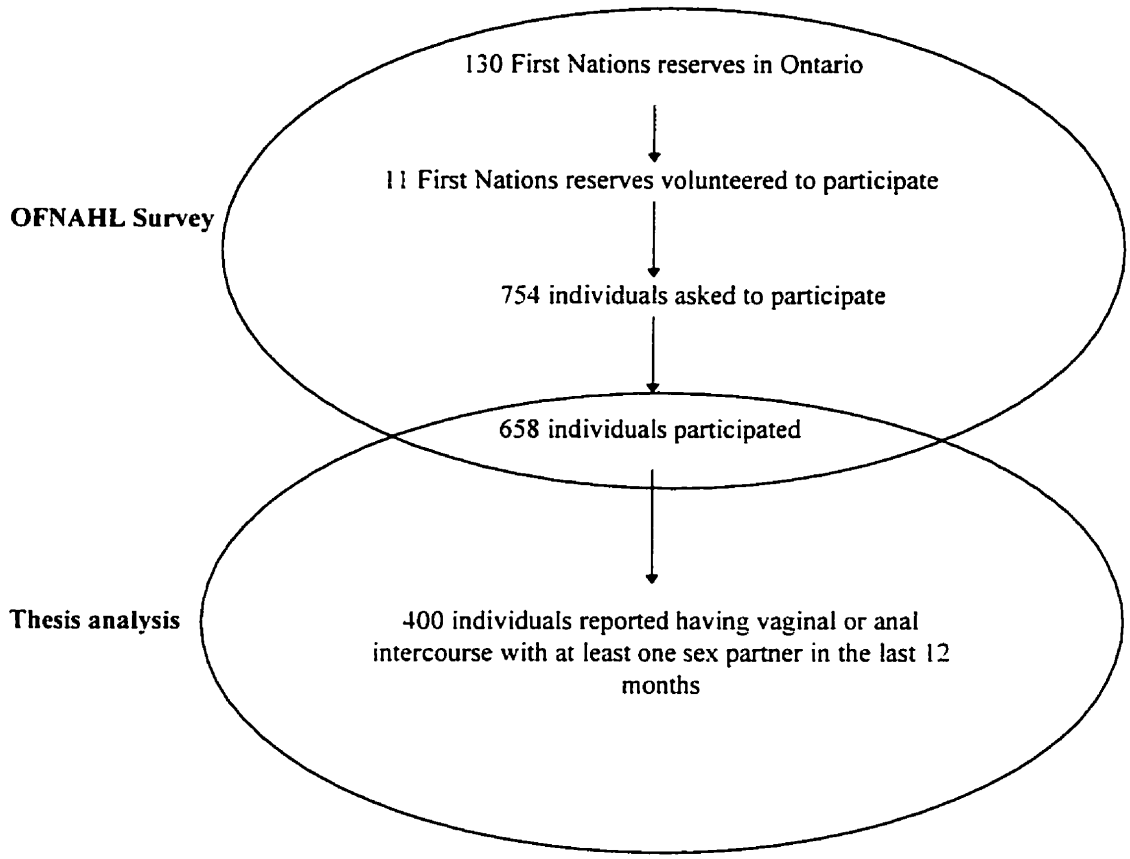
The SAS dataset provided contained information on all 658 men and women who participated in the OFNAHLS. The following section describes the analysis methodology specific to the thesis (see Appendix C for further information on the role of the student in the

OFNAHLS and this analysis). All procedures were conducted using the SAS data management and statistical analysis package (version 6.10) on an IBM compatible computer. The traditional significance level of 0.05 was used for statistical analyses. The questions from which all variables were derived are listed in Appendix D. The limitations of the OFNAHLS methodology are described in the discussion chapter.

Inclusion criteria for analysis

Only individuals that reported sexual intercourse (vaginal or anal) with at least one sex partner in the last 12 months were included in the analysis (n = 400). This subsample consists of heterosexuals, bisexuals, and homosexuals. Only 3% of the sample reported any sexual experience with someone of the same sex in their lifetime, and 1.5% had a same-sex partner in the last year. Therefore the effect of sexual orientation could not be examined. Figure 1 describes how the final sample size for analysis was obtained.

FIGURE 1: Derivation Of Final Sample Size For Analysis



Development of condom use variables

Five measures of condom use in the 12 months preceding the interview were derived to address the objectives of this analysis (see Table 3). They were the frequency of condom use (never, sometimes, always); ever used a condom (yes, no); consistent use of condoms among condom users (yes, no); used condoms to prevent STDs (yes, no); and used condoms for birth control (yes, no). The specific wording of the questions used to derive these variables is provided in Appendix D.

The frequency of condom use was based on two questions that asked about a variety of sexual activities while sober or drunk/high in the last 12 months. These included vaginal sex with and without a condom and anal sex with and without a condom. Subjects who only indicated that they had vaginal or anal sex with a condom were coded as always used condoms. Conversely, subjects who only reported vaginal or anal sex without a condom were coded as never used condoms. Subjects who reported a combination of vaginal or anal sex with and without condoms were coded as sometimes using condoms.

The frequency of condom use (never, sometimes or always) was further broken down into two binary variables: ever used a condom in the past 12 months (yes versus no) and consistency of use among condom users only (consistent versus inconsistent). For the first variable, ever used a condom in the last 12 months, individuals who sometimes or always used condoms were coded as yes, whereas individuals who never used condoms were coded as no. The second variable, consistency of use, was restricted to those individuals who used a condom at least once in the last 12 months (n = 165). Individuals who always used condoms were coded as consistent users, whereas individuals who sometimes used condoms were coded as inconsistent users.

It was also possible to determine the purpose of condom use, namely whether it was for STD prevention or birth control. Respondents were asked if they used any protection to avoid getting STDs, with no specific time frame. If a respondent used protection sometimes or always, they were asked what they used; the choices were condoms, spermicide, condoms and spermicide, or another method. Individuals that reported they used condoms or condoms and spermicide and who had used condoms in the 12 months preceding the interview were coded as having used condoms for STD prevention. Similarly, respondents were asked if they used any

protection to keep (a woman) from getting pregnant, with no specific time frame. If a respondent answered sometimes or always, they were asked what method they used. Individuals who said they used condoms and who had used condoms in the 12 months preceding the interview were coded as having used condoms for birth control. Therefore, two variables were developed: whether one used condoms for STD prevention and whether one used condoms for birth control. These variables are not exclusive. A person may have used condoms for STD prevention only, for birth control only, or for both STD prevention and birth control.

TABLE 3: Condom Use Variables

Variable	Possible responses
Frequency of condom use in the last 12 months	• never • sometimes • always
Ever used a condom in the last 12 months	• yes • no
Consistency of condom use among condom users in the last 12 months	• consistent (always used condoms) • inconsistent (sometimes used condoms)
Used condoms for STD prevention in the last 12 months	• yes • no
Used condoms for birth control in the last 12 months	• yes • no

Analysis for objective one: the prevalence of condom use

The first objective was to describe the prevalence of condom use among the First Nations on-reserve population in Ontario: a) measured as the frequency of condom use according to i) sociodemographic characteristics and ii) sexual behaviour that affects the risk of HIV/STD infection; and b) measured as the proportion reporting condom use specifically for STD prevention versus birth control. Implicit in this objective is that the estimated prevalence rates are to be generalized to the on-reserve population in Ontario. In order to provide estimates, the OFNAHLS sample had to be corrected for the stratified age and sex sampling procedure, as well as differences between the eleven communities that participated and other First Nations reserves in Ontario. To more accurately represent the First Nations on-reserve population in Ontario, the prevalence of condom use was weighted by age, sex, language and geographic region.

Weights had been developed for previous reports of the OFNAHLS, and were constructed based on the total sample size of 658 individuals (Bullock, 1995). Weights for age and sex were

used to correct for the stratified sampling procedure and were based on the composition of the participating communities. According to information from DIAND and Statistics Canada, the eleven communities were similar in age and sex distribution to all reserve communities in Ontario. However, they under-represented the northwestern region of Ontario, and English-only speaking individuals. Individual weights for language were developed using Statistics Canada data for the entire on-reserve population in Ontario. Community weights were also developed using DIAND data on geographic region. Finally, these three weights (age and sex, language, and region) were combined and capped at 0.5 and 2.0 to prevent excess bias from single individuals.

Because weights were developed using the total OFNAHLS sample of 658 individuals, they were re-adjusted slightly for the size of the subsample of 400 individuals. The 400 individuals who had sexual intercourse in the 12 months preceding the interview represented 438.1 individuals in the weighted total sample of 658 individuals. Therefore, weights were multiplied by the fraction 400/438.1 to prevent an artificial inflation of the subsample size. This adjustment ensured that the weighted subsample size was equal to the actual subsample size — 400 individuals.

The first part of objective one was to describe the prevalence of condom use measured as the frequency of condom use according to i) sociodemographic characteristics and ii) sexual behaviour that affects the risk of HIV/STD infection. All variables were analyzed using contingency table analyses and chi-squared tests, weighted by age, sex, language, and region. The frequency of condom use in the 12 months preceding the interview according to age group, gender, marital status, and highest level of education achieved was calculated. The frequency of condom use was also examined according to sexual behaviour that affects the risk of HIV/STD infection. The number of sex partners, having a steady sex partner, and participation in anal intercourse were used as proxy measures for the risk of infection with an STD or HIV. Presumably, the risk of exposure to HIV/STDs increases as the number of sex partners increases, if an individual does not have a steady sex partner, or if an individual participated in anal intercourse. Finally, the introduction of HIV/STDs into the reserve community will depend on patterns of sexual networking. Therefore, the frequency of condom use according to whether an

individual has sex partners within the community, outside of the community or both within and outside of the community was examined.

The second part of objective one was to describe the prevalence of condom use measured as the proportion reporting condom use specifically for STD prevention versus birth control. This was addressed using simple frequency distributions, contingency tables, and chi-squared tests, weighted by age, sex, language, and region.

Analysis for objective two: factors associated with condom use

The second objective of this analysis was to determine whether condom use is associated with: a) sociodemographic factors; b) cultural factors specific to First Nations populations; c) sexual behaviour; d) contraceptive behaviour and attitudes; e) HIV/STD risk awareness; f) condom knowledge and attitudes; and d) attitudes towards sexual communication. Thirty-two variables were selected for examination of their effect on condom use (see Table 4). The questions on which these were based are listed in Appendix D. Three outcome measures of condom use in the 12 months preceding the interview were analysed: whether an individual ever used a condom; whether condom use was consistent (i.e. for every act of intercourse) among those who used condoms; and whether condoms were used to prevent STD infection. The analysis of whether condoms were ever used or whether they were used to prevent STD infection was conducted using the subsample of 400 individuals. Because the analysis of consistent use of condoms was restricted to individuals who had used a condom at least once in the 12 months preceding the interview, only 165 individuals were available for that analysis.

TABLE 4: Variables Examined for an Association with Condom Use

Sociodemographic variables
- age
- gender
- marital status
- education level achieved
- attendance at residential schools
- has children in their care

Cultural variables
- speak a First Nations language (Cree, Ojibway, or Oji-Cree)
- familiarity with traditional way of life
- religious faith

Sexual behaviour
- age at first sexual intercourse
- number of sexual partners in last 12 months
- has a steady sex partner
- length of time with steady sex partner
- participation in anal intercourse in last 12 months
- location of sex partner (on or off reserve)

Contraceptive behaviour
- use of contraceptives other than condoms (spermicides, oral contraceptives, IUD, diaphragm, other)
- permanent sterilization or infertility
- worry about pregnancy

Risk awareness
- history of STD
- heard of AIDS
- ever tested for HIV
- know someone with HIV/AIDS
- general AIDS knowledge
- HIV transmission knowledge (overall and sexual)
- self-perceived risk of developing AIDS
- worry about AIDS/STDs

Condom knowledge/attitudes
- perceived efficacy of condoms to prevent AIDS
- embarrassment obtaining condoms

Sexual communication
- trust a person to tell the truth about their past sexual experience
- ease in letting partner know when they want to have sex
- communication with sexual partners

The analysis of the second objective attempted not only to determine which variables were associated with condom use, but which variables were most important. This was achieved using multiple logistic regression modeling. As recommended by Hosmer and Lemeshow (1989), the strategy used was to seek "the most parsimonious model that still explains the data." Modeling was conducted using the three binary outcome variables described above: the use of a condom ever in the last year, consistency of use among condom users, and whether or not condoms were used for STD prevention. Logistic regression of binary outcomes variables was chosen over other methods (e.g. probit models or polytomous logistic regression) for several reasons. Firstly, the analysis attempted to understand the differences between people who used condoms at all and people who never used condoms; therefore, the analysis of whether one ever

used condoms was performed. Secondly, whether one consistently used condoms was analysed among condom users only, since it was hypothesized that condom users would be different from people who never used condoms. Thirdly, the vast majority of published studies analyze condom use behaviour using a binary condom measure and logistic regression (e.g. Catania et al, 1992; Leigh et al, 1994; Watkins et al., 1993; Weinstock et al., 1993); therefore, the results of this analysis are more comparable to the literature.

The first step was a univariate analysis of the effects of all variables in Table 4. This was done using contingency tables and chi-squared tests or t-tests, according to whether the independent variable was categorical or continuous. Odds ratios were estimated for variables that were categorical. In addition, particular attention was given to contingency tables with zero cell counts or extremely low cell counts. The strategy used to deal with variables with zero cell or extremely low cell counts was either to collapse the categories of the variable or to drop the variable from the analysis if it only had two levels. Continuous variables were divided into quartiles and visually examined for the magnitude of their effect as well as for linearity using a plot of the odds ratios and the midpoint of each quartile. Depending on the result of this visual inspection, continuous variables were either grouped into appropriate categories or kept on a continuous scale.

Based on the results of the univariate analysis, variables were selected for multivariate analysis. Any variable with a p-value of 0.25 or less in the univariate analysis was considered a candidate for multivariate modeling. This 0.25 "screening criterion" has been recommended because the use of a more conservative value at this modeling stage, such as the traditional significance level 0.05, may result in the failure to identify important variables (Hosmer and Lemeshow, 1989). In addition, age, gender, and marital status were included in modeling regardless of their p-values in the univariate analysis since they have been reported as important confounders in the literature.

A combination of subset regression and backward elimination were used to develop the final models. Rather than combine all of variables in Table 4, each category of variables was examined separately: sociodemographic variables, cultural variables, sexual behaviour, contraceptive behaviour, risk awareness, condom knowledge and attitudes, and sexual communication. It was felt that variables within these categories were measuring similar things,

so that a subset approach would identify the most important variables within each of the categories. The first "subset" analyzed was the sociodemographic variables that were considered for multivariate analysis based on the results of the univariate analysis. Age, gender, and marital status were included regardless of their p-value in the univariate analysis. A full model was analyzed incorporating all of these variables. Variables were then removed using backward elimination, so that variables that no longer exhibited an association with condom use (Wald chi-squared statistic having a p-value greater than 0.25 screening criterion) were eliminated, one by one. At each step, careful attention was given to changes in the -2 loglikelihood value as well as to changes in the odds ratios of the remaining variables. If the result of removing a variable was a significant change in the -2 loglikelihood or if the remaining variables had odds ratios that changed remarkably in magnitude, the removed variable was considered necessary for adjustment. Therefore, any variables that retained a p-value of less than or equal to 0.25 according to Wald tests or confounded the effects of other variables were retained for further analysis.

This approach was then repeated for all of the remaining "subset" categories of variables: cultural characteristics, sexual behaviour, contraceptive behaviour and attitudes, risk awareness, condom knowledge and attitudes, and sexual communication. However, the variables that were deemed important in the analysis of sociodemographic variables were also included for adjustment in each of these subset analyses. This was done to ensure that variables whose effects in the univariate analysis were due to confounding by age or some other sociodemographic variable were eliminated at this stage. Again, any variables that retained a p-value of less than or equal to the 0.25 screening criterion or confounded the effects of other variables were retained for further analysis.

The final stage involved the development of the final model using the variables that were identified in the subset multiple regression analyses. This was done using backward elimination using the same approach of deleting variables, refitting the model, and verifying the changes in the -2 loglikelihood and the effects of the remaining variables as described above. At this last stage, variables that retained a p-value less than the traditional 0.05 significance level or confounded the effects of other variables were retained in the final model. Variables that showed

a trend association with the outcome (p-value less than 0.10 but greater than or equal to 0.05) were also kept in the final model.

The last step in the development of the final model was to assess interactions between variables. Based on the literature review, the most plausible candidates for effect modifiers were age, gender, number of sex partners, and partnership status (i.e. marital status, having a steady sex partner, or length of time with steady sex partner). Therefore, interaction terms between these variables and others in the final model were examined. A statistically significant interaction term would suggest that the effect of an independent variable (e.g. worry about pregnancy) on condom use varies according to the level of a third independent variable (e.g. whether one is male or female). Particular attention was given to gender interactions, since some studies of condom use have found that gender is an important effect modifier and have presented results separately for males and females (Donald et al., 1994; Weinstock et al., 1993).

Because the literature suggested that the determinants of condom use would likely be different between males and females, gender differences were assessed in further analysis. Variables that had effects on condom use according to the 0.25 screening criterion were individually evaluated for effect modification by gender. A logistic regression model was fitted with a given independent variable, gender, and an interaction term between the independent variable and gender. The magnitude and significance of these gender interaction terms were then examined. Another approach used to assess gender interactions was a separate analysis of males and females. Multiple logistic regression modeling using the process described above was done for males only (n = 204) and females only (n = 196). The models obtained were similar to the final models for males and females combined, with the exception that some variables were no longer statistically significant due to loss of power. Nearly all odds ratios estimated in the stratified models were within the 95% confidence interval of the odds ratios in the combined male and female models; for this reason, the results of the modeling of males and females separately has not been presented.

RESULTS

Characteristics of the Sample

Eleven First Nations communities agreed to participate in the OFNAHLS. The characteristics of these communities, as well as the actual survey participants and participants who had sexual intercourse in the 12 months preceding the interview, are presented in Table 5.

TABLE 5: Characteristics of First Nations Communities Participating in the *Ontario First Nations AIDS And Healthy Lifestyle Survey*

	Number of communities	Participants in the OFNAHLS (n = 658)	Participants who had sex in the last 12 months (n = 400)
Geographic location in Ontario			
North	3	215 (32.7%)	119 (29.8%)
Central	3	168 (25.5%)	103 (25.8%)
South	5	275 (41.8%)	178 (44.5%)
Remoteness			
Less than forty miles to urban centre	4	160 (24.3%)	111 (27.8%)
Greater than forty miles to urban centre	5	315 (47.9%)	200 (50.0%)
No road access	2	183 (27.8%)	89 (22.2%)
Population of community			
1 - 500	5	215 (32.7%)	165 (41.3%)
501 - 800	4	235 (35.7%)	146 (36.5%)
800 or more	2	208 (31.6%)	89 (22.3%)
Provincial/Territorial Organization			
Association of Iroquois and Allied Indians	1	40 (6.1%)	25 (6.3%)
Grand Council Treaty #3	2	107 (16.3%)	81 (20.3%)
Nishnawbe-Aski Nation	1	108 (16.4%)	38 (9.5%)
Union of Ontario Indians	7	403 (61.2%)	256 (64.0%)
Predominant language spoken			
Cree and English	1		
Ojibway and English	8		
English	2		

[1] See Table 6 for a break-down of language spoken by individual.

Table 6 describes the individual characteristics of participants in the OFNAHLS and individuals who indicated that they had vaginal or anal intercourse in the 12 months preceding the interview. Individuals who had sex were significantly younger ($p = 0.001$, chi-squared test), less likely to be widowed ($p = 0.001$, chi-squared test), more likely to have more than a grade 8 education ($p = 0.001$, chi-squared test), more likely to have children under their care ($p = 0.001$,

chi-squared test), more likely to follow the traditional faith and less likely to be Catholic (p = 0.001, chi-squared test).

TABLE 6: Characteristics of Participants in the *Ontario First Nations AIDS And Healthy Lifestyle Survey* and Participants Who Had Sexual Intercourse in the 12 Months Preceding the Interview		
	All participants in OFNAHLS (n = 658)	**Participants who had sex in the last 12 months (n = 400)**
Age		
15 - 19	164 (25.0%)	91 (22.9%)
20 - 29	182 (27.8%)	141 (35.4%)
30 - 39	167 (25.5%)	103 (25.9%)
40 and older	142 (21.7%)	63 (15.8%)
Sex		
Female	325 (49.4%)	196 (49.0%)
Male	333 (50.6%)	204 (51.0%)
Marital Status		
Married/common-law	296 (45.0%)	190 (47.5%)
Separated/divorced/widowed	70 (10.6%)	29 (7.3%)
Never married	292 (44.4%)	181 (45.3%)
Children under care		
Yes	285 (43.3%)	194 (48.5%)
No	373 (56.7%)	206 (51.5%)
Language Spoken		
English only	268 (40.7%)	195 (48.8%)
Cree only	10 (1.5%)	4 (1.0%)
Ojibway only	16 (2.4%)	4 (1.0%)
Cree and English	271 (41.2%)	162 (40.5%)
Ojibway and English	92 (14.0%)	34 (8.5%)
Cree, Ojibway, and English	1 (0.2%)	1 (0.3%)
Education		
Grade 8 or less	157 (23.9%)	56 (14.1%)
Some high school	301 (45.9%)	195 (49.0%)
Completed high school	53 (8.1%)	40 (10.0%)
Vocational school	22 (3.4%)	15 (3.8%)
Some college or university	72 (11.0%)	54 (13.6%)
Completed college or university	47 (7.2%)	35 (8.8%)
Familiarity with traditional way of life		
Very familiar	161 (24.5%)	96 (24.1%)
Somewhat familiar	408 (62.2%)	255 (63.9%)
Not familiar	87 (13.3%)	48 (12.0%)
Faith/religion/spirituality		
None	49 (7.5%)	35 (8.8%)
Traditional	105 (16.0%)	80 (20.1%)
Catholic	276 (42.1%)	144 (36.2%)
United	107 (16.3%)	73 (18.3%)
Anglican	42 (6.4%)	24 (6.0%)
Other	76 (11.6%)	42 (10.6%)
Participants in the OFNAHLS were selected using a random sample stratified by age and sex categories.		

Prevalence of Condom Use

The first objective was to describe the prevalence of condom use among the First Nations on-reserve population in Ontario: a) measured as the frequency of condom use according to i) sociodemographic characteristics and ii) sexual behaviour that affects the risk of HIV/STD infection; and b) measured as the proportion reporting condom use specifically for STD prevention versus birth control. Since the estimated rates of condom use are to be generalized to the on-reserve population in Ontario, they were weighted by age, sex, language, and geographic region.

Frequency of condom use

The results of the analysis of the frequency of condom use in the 12 months preceding the interview are reported in Table 7. Condoms were never used by 61.2%, sometimes used by 30.9%, and always used by 7.9% of First Nations people living on-reserve. The frequency of condom use varied significantly according to sociodemographic characteristics (see Table 7). Rates of condom use were significantly higher among the young, males, the never-married, and those with a high school or vocational school education.

The number of sex partners, having a steady sex partner, and participation in anal intercourse variables were used as proxy measures for the risk of infection with HIV/STDs. Presumably, the risk of exposure to an STD or HIV increases as the number of sex partners increases, if an individual does not have a steady sex partner, or if an individual participated in anal intercourse. To reduce the risk of individual infection and transmission within the population, the frequency of condom use should be greater among individuals with these types of sexual behaviour. The prevalence of condom use was significantly higher among those with more than one sex partners in the last 12 months, and among those without a steady sex partner (see Table 7). However, the prevalence of condom use was not significantly greater among those who had participated in anal intercourse. Finally, the frequency of condom use was examined according to the location of sex partners relative to the community, because patterns of sexual networking will influence the likelihood of the introduction of HIV/STDs into a community. Condoms were used more frequently by those who had sex partners outside the community or

both within and outside, but were used less frequently by people who had partners only within the community (see Table 7).

TABLE 7: Frequency of Condom Use in the Last 12 Months Among First Nations People Living On Reserve in Ontario

	Never	Sometimes	Always
Overall (n = 400)	61.2 %	30.9%	7.9%
Age group ***			
15-19 (n = 73)	39.9%	49.2%	10.8%
20-29 (n = 157)	54.9%	33.2%	11.9%
30-39 (n = 106)	75.8%	20.2%	3.9%
40+ (n = 63)	76.5%	22.0%	1.5%
Gender ***			
Male (n = 198)	51.9%	40.0%	8.1%
Female (n = 202)	70.3%	21.9%	7.8%
Marital status ***			
Married/common law (n = 195)	73.3%	20.1%	6.6%
Separated/widowed/divorced (n = 32)	81.1%	17.5%	1.4%
Never married (n = 173)	43.8%	45.6%	10.6%
Education *			
Grade 8 or less (n = 50)	62.0%	33.3%	4.7%
Some/completed high school or vocational school (n = 252)	57.3%	32.2%	10.5%
Some/completed college/university (n = 96)	72.3%	24.6%	3.1%
Number of sex partners ***			
One (n = 237)	74.7%	18.2%	7.2%
Two - four (n = 116)	42.1%	48.9%	9.0%
Five or more (n = 45)	38.2%	52.4%	9.4%
Steady sex partner ***			
No (n = 131)	42.6%	44.0%	13.4%
Yes (n = 268)	70.3%	24.5%	5.2%
Participation in anal intercourse			
No (n = 353)	62.0%	29.7%	8.3%
Yes (n = 47)	55.3%	39.7%	5.0%
Location of sex partners ***			
Outside community (n = 105)	49.6%	43.0%	7.4%
Within community (n = 162)	71.7%	20.1%	8.2%
Both (n = 78)	42.5%	47.7%	9.9%

Weighted by age, sex, language and region.
Chi-squared tests were used to determine significance.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Condom use for STD prevention versus birth control

Besides being asked about the frequency of condom use, respondents were also asked whether they used protection for STD or pregnancy prevention. If they responded sometimes or always they were asked which type of protection they used. Proportions were weighted by age, sex, language, and region to generalize to the on-reserve population in Ontario. In the last year, 29.6% said they had used condoms to prevent STDs. Similarly, in the last year, 30.4% said they had used condoms for birth control. Of those who used condoms for STD prevention or birth control ($n = 145$), 8.0% used them for STD prevention only, 10.4% used them for birth control only, and 81.6% used them for both STD prevention and birth control.

Further analysis looked at differences between people who used condoms for STD prevention only, birth control only, or both. There were no significant differences in the reported purpose of condom use according to age, gender, marital status or having a steady sex partner, familiarity with the traditional way of life, number of sex partners, whether sex partners were located within or outside of the community, participation in anal sex, worry about pregnancy, or knowledge of HIV transmission. The use of birth control other than condoms had the only statistically significant effect on whether condoms were used for birth control or STD prevention ($p < 0.001$, chi-squared test). People who did not use birth control other than condoms were more likely to say they used condoms for both STD and pregnancy prevention (89%) than people who did use birth control other than condoms (64%). However, among those who did use birth control other than condoms, more said they used condoms for birth control only (23%) than among those who did not use birth control other than condoms (5%). Finally, people who never worried about AIDS or STDs were more likely to have used condoms for birth control only (22%) than people who sometimes worried (10%) or always worried (3%), although this difference was not significant ($p = 0.13$, Fisher's exact test).

Because 90% of people using condoms for STD prevention also used condoms for birth control, the use of other methods of contraception was examined. This analysis was restricted to females, since males may not be aware of the method of contraception their female partner is using, although females would be aware if their male partners were using condoms. Respondents were not limited to a particular time frame, as the question was phrased, "Do you use any

protection to keep from getting pregnant? What do you use?" The results are presented in Table 8. The predominant form of birth control used by women was sterilization or no longer being in child-bearing years (28.4%), followed by the birth control pill (27.3%) and condoms (27.2%). Fifteen percent of women used condoms in conjunction with another method of birth control.

TABLE 8: Method of Contraception Among First Nations Females Living On Reserve in Ontario	
	Percent using method (n = 196) *
Sterilized/no longer in child-bearing years	28.4%
Birth control pill	27.3%
Condoms	27.2%
Condoms and another method of birth control	15.4%
Intrauterine device (IUD)	11.2%
Spermicide	1.5%
Diaphragm	0.2%
Weighted by age, sex, language and region. * Categories are not exclusive so percentages do not add up to 100.	

Factors Associated With Condom Use

The second objective was to determine whether condom use is associated with: a) sociodemographic factors; b) cultural factors specific to First Nations populations; c) sexual behaviour; d) contraceptive behaviour and attitudes; e) HIV/STD risk awareness; f) condom knowledge and attitudes; and d) attitudes towards sexual communication. This was accomplished using logistic regression modeling of three outcome variables: ever used a condom in the 12 months preceding the interview, consistent use of condoms among those who used condoms in the 12 months preceding the interview, and use of condoms for STD prevention in the 12 months preceding the interview.

Ever used a condom

The results of the univariate logistic regression of ever used condoms in the 12 months preceding the interview are presented in Table 9. In this analysis, condom use was significantly more likely if an individual was younger, male, not married, did not have children in their care, was very familiar with the traditional way of life, did not have a steady sex partner they had been with for more than a year, had more than one sex partner in the last year, had sex partners outside

or both within and outside the community, used birth control other than condoms, was not permanently sterilized or infertile, worried about pregnancy, was very knowledgeable about AIDS transmission overall, was very knowledgeable about AIDS transmission through sexual contact, worried about getting AIDS or STDs, was not embarrassed to obtain condoms, believed that condoms work well or very well in preventing AIDS, or trusted a person to tell the truth about their sexual past.

There was also a statistically significant gender interaction for the variable "know a person with HIV/AIDS" ($p = 0.03$, Wald chi-squared, data not presented in Table 9). Females were more likely to have used a condom in the last year if they knew someone with HIV/AIDS, and this relationship approached significance (OR = 2.3, $p = 0.07$, Wald chi-squared). However, the effect for males was not significant (OR = 0.38, $p = 0.32$, Wald chi-squared).

TABLE 9: Variables Examined for an Association with Ever Using a Condom in the Last 12 Months Using Univariate Logistic Regression (n = 400)

Characteristic	n	Crude odds ratio	95% confidence interval
Sociodemographic characteristics			
Age (p = 0.0001)			
15 - 19	91	5.1 ***	(3.0 - 9.0)
20 - 29	141	3.5 ***	(2.2 - 5.8)
(reference = 30+)	166		
Males (p = 0.0006)	204	2.0 ***	(1.3 - 3.0)
(reference = females)	196		
Married/common-law (p = 0.0001)	190	0.39 ***	(0.25 - 0.58)
(reference = no)	210		
Education (p = 0.11)			
Grade school or less	56	0.74	(0.41 - 1.3)
Some college/university	89	0.60 *	(0.36 - 0.99)
(reference = high school/vocational)	253		
Lived at residential school (p = 0.47)	41	1.3	0.66 - 2.4)
(reference = no)	358		
Children under care (p = 0.0001)	194	0.38 ***	(0.25 - 0.57)
(reference = no)	206		
Cultural characteristics			
Speak a First Nations language (p = 0.48)	205	1.1	(0.77 - 1.7)
(reference = no)	195		
Familiarity with traditional way of life (p = 0.04)			
Very familiar	96	2.2 *	(1.1 - 4.6)
Somewhat familiar	255	1.2	(0.66 - 2.4)
(reference = not familiar)	48		
Religious faith (p = 0.07)			
Traditional	80	1.2	(0.54 - 2.7)
Catholic	144	0.92	(0.44 - 2.0)
United	73	0.51	(0.22 - 1.2)
Anglican	24	1.0	(0.35 - 2.9)
Other religion	42	0.47	(0.18 - 1.2)
(reference = no religion)	35		
Sexual behaviour			
Has a steady sex partner (p = 0.0001)			
With steady sex partner for one year or less	63	1.1	(0.62 - 2.2)
With steady sex partner for > one year	220	0.29 ***	(0.18 - 0.46)
(reference = no steady sex partner)	116		
Age at first vaginal intercourse (p = 0.08)			
Less than 13	38	1.4	(0.67 - 3.0)
13 to 16	223	1.7 *	(1.1 - 2.7)
(reference = aged 17 or older)	119		
Number of sex partners in last year (p = 0.0001)			
Two - four	110	3.7 ***	(2.3 - 6.0)
Five or more	49	5.3 ***	(2.8 - 11)
(reference = one)	239		

* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001

TABLE 9 (continued): Variables Examined for an Association with Ever Using a Condom in the Last 12 Months Using Univariate Logistic Regression (n = 400)			
Characteristic	**n**	**Crude odds ratio**	**95% confidence interval**
Sexual behaviour, continued			
Participation in anal intercourse (p = 0.05)	52	1.8	(1.0 - 3.2)
(reference = no)	348		
Location of sex partner (p = 0.0001)			
Outside community	99	2.1 **	(1.3 - 3.5)
Both within and outside community	74	3.6 ***	(2.1 - 6.5)
(reference = within community)	176		
Contraceptive behaviour			
Use birth control other than condoms (p = 0.02)	119	1.6 *	(1.1 - 2.5)
(reference = no)	280		
Sterilized/infertile (p = 0.0001)	66	0.16 ***	(0.067 - 0.32)
(reference = no)	334		
Worry about pregnancy (p = 0.0001)			
Always or sometimes	199	4.0 ***	(2.6 - 6.2)
(reference = never)	189		
Risk awareness			
History of STD (p = 0.43)	29	1.4	(0.63 - 2.9)
(reference = no)	371		
Heard of AIDS (p = 0.98)	365	1.0	(0.50 - 2.1)
(reference = no)	34		
Been tested for HIV (p = 0.11)	31	1.8	(0.87 - 3.9)
(reference = no)	338		
Know someone with HIV/AIDS (p = 0.79)	33	1.1	(0.52 - 2.3)
(reference = no)	332		
Self-perceived risk of AIDS (p = 0.39)			
Some chance or greater	39	0.72	(0.34 - 1.4)
Small chance	82	1.2	(0.75 - 2.1)
(reference = almost certain I will not)	244		
High general AIDS knowledge (4 out of 4 questions correct) (p = 0.69)	281	1.1	(0.71 - 1.7)
(reference = less than 4 correct or not heard of AIDS)	118		
High overall AIDS transmission knowledge (18 or more correct out of 20) (p = 0.03)	44	2.0 *	(1.1 - 3.8)
(reference = less than 18 correct or not heard of AIDS)	355		
High knowledge of AIDS transmission through sexual contact (4 out of 4 questions correct) (p = 0.003)			
(reference = less than 4 correct or not heard of AIDS)	147	1.9 **	(1.2 - 2.8)
	252		
* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001			

TABLE 9 (continued): Variables Examined for an Association with Ever Using a Condom in the Last 12 Months Using Univariate Logistic Regression (n = 400)			
Characteristic	**n**	**Crude odds ratio**	**95% confidence interval**
Risk awareness, continued			
Worry about getting STDs/AIDS (p = 0.002)			
Always	64	2.3 **	(1.2 - 4.2)
Sometimes	180	2.0 **	(1.3 - 3.2)
(reference = never)	154		
Condom knowledge/attitudes			
Not embarrassed to obtain condoms (p = 0.03)			
(reference = somewhat embarrassed or embarrassed)	268 93	1.7*	(1.0 - 2.8)
Perceived efficacy of condoms in preventing AIDS (p = 0.0006)			
Very well	114	2.1 *	(1.0 - 4.5)
Well	138	2.0	(1.0 - 4.3)
Don't know how well	68	0.69	(0.29 - 1.6)
(reference = not well)	42		
Sexual communication			
Trust person to tell the truth about their sexual past (p = 0.01)			
Agree	179	1.9 **	(1.2 - 3.1)
Don't know	45	1.7	(0.86 - 3.4)
(reference = disagree)	142		
Ease in telling partner that they want sex (p = 0.09)			
Easy	201	0.71	(0.31 - 1.7)
Sometimes easy, sometimes difficult	170	1.1	(0.49 - 2.7)
(reference = difficult)	25		
Communication with sexual partners (p = 0.50) Composite score [range (-10) to (10)] where a positive score indicates willingness to talk about HIV status or past sexual experiences with a partner	357	1.02	(0.97 - 1.07)
* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001			

Multiple logistic regression was used to further analyze the use of a condom ever in the 12 months preceding the interview. A number of variables that had significant associations with condom use in the univariate analysis were no longer significant in multivariate analysis and were excluded from the model. They included marital status, having children under one's care, location of sex partners, sterilization or infertility, knowledge of AIDS transmission through

sexual contact, and worry about getting AIDS or STDs. Furthermore, the significant gender interaction with knowing someone with HIV/AIDS in the univariate analysis was no longer significant in multivariate modeling ($p = 0.50$, Wald chi-squared).

Seven variables remained as significant predictors of ever using condoms in the multiple logistic regression model (see Table 10). Individuals who had used a condom at least once in the last year were more likely to have the following characteristics: younger age, male gender, no steady sex partner or less than one year with a steady sex partner, more than one sex partner in the last year, worry about pregnancy, high overall knowledge of HIV transmission, and lack of embarrassment obtaining condoms. Familiarity with the traditional way of life, the use of birth control other than condoms, and trust in a person to tell the truth about their sexual past had positive associations with ever using a condom that approached significance. There were no statistically significant interactions with age, gender, partnership status, or number of sex partners in this model.

The sample size in the multiple logistic regression model in Table 10 dropped from 400 to 345. Although missing observations for all variables contributed to this drop in size, it is due primarily to a skip pattern in the OFNAHLS questionnaire. People who had never heard of AIDS were not asked questions about their knowledge and attitudes towards AIDS, including whether they would be embarrassed to get condoms and whether they would trust a person to tell the truth about their sexual past.

TABLE 10: Factors Associated with Ever Using a Condom in the Last 12 Months in Multiple Logistic Regression (n = 345)		
Characteristic	**Adjusted odds ratio**	**95% confidence interval**
Age (p = 0.02)		
15 - 19	2.1	0.94 - 4.8
20 - 29	2.6 **	1.3 - 5.1
(reference = 30+)		
Males (p = 0.01)	2.1 *	1.2 - 3.8
(reference = females)		
Has a steady sex partner (p = 0.02)		
With steady sex partner for one year or less	0.87	0.39 - 1.9
With steady sex partner for > one year	0.39 **	0.19 - 0.77
(reference = no steady sex partner)		
Number of sex partners (p = 0.007)		
Two to four	2.5 **	1.3 - 4.8
Five or more	2.7 *	1.1 - 6.6
(reference = one sex partner)		
Worry about pregnancy (p = 0.01)		
Always or sometimes	2.1 **	1.2 - 3.8
(reference = never)		
High score on transmission knowledge questions (18 or more correct out of 20) (p = 0.03)	2.4 *	1.1 - 5.7
(reference = less than 18 correct or never heard of AIDS)		
Not embarrassed to get condoms (p = 0.03)	2.0 *	1.1 - 3.9
(reference = somewhat embarrassed and embarrassed)		

Variables retained in the model that showed a trend association ($0.05 \leq p < 0.10$):

Familiarity with the traditional way of life (p = 0.09)		
Very familiar	2.6	0.97 - 7.1
Somewhat familiar	1.3	0.57 - 3.2
(reference = not familiar)		
Use birth control other than condoms (p = 0.05)	1.9 *	1.0 - 3.4
(reference = no)		
Trust person to tell the truth about their sexual past (p = 0.06)		
Agree	2.0 *	1.1 - 3.7
Don't know	1.5	0.62 - 3.5
(reference = disagree)		
* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001		

Consistent use of condoms

The second outcome variable analyzed was the consistency of condom use among condom users in the 12 months preceding the interview. People who always used condoms were considered consistent condom users, whereas people who only used condoms sometimes were considered inconsistent condom users. The results of the univariate logistic regression are presented in Table 11. In this analysis, consistent condom use was significantly associated with AIDS knowledge variables only. Condom users who were very knowledgeable about general AIDS issues, HIV transmission overall, and HIV transmission through sexual contact were more likely to use condoms for every act of sexual intercourse. Certain variables were not analyzed due to zero cells or extremely low cell frequencies; these included religion, sterilization or infertility, history of STD, heard of AIDS, been tested for HIV, and embarrassment obtaining condoms.

TABLE 11: Variables Examined for an Association with Consistent Use of Condoms among Condom Users in the Last 12 Months Using Univariate Logistic Regression (n = 165)

Characteristic	n	Crude odds ratio	95% confidence interval
Sociodemographic characteristics			
Age (p = 0.28)			
15 - 19	55	1.8	(0.65 - 5.6)
20 - 29	72	2.2	(0.84 - 6.5)
(reference = 30+)	38		
Males (p = 0.13)	101	0.58	(0.28 - 1.2)
(reference = females)	64		
Married/common-law (p = 0.43)	56	1.3	(0.64 - 2.8)
(reference = no)	109		
Education (p = 0.50)			
Grade school or less	21	0.83	(0.25 - 2.3)
Some college/university	29	0.55	(0.17 - 1.5)
(reference = high school/vocational)	113		
Lived at residential school (p = 0.67)	19	0.79	(0.21 - 2.3)
(reference = no)	145		
Children under care (p = 0.07)	57	2.0	(0.94 - 4.0)
(reference = no)	108		
Cultural characteristics			
Speak a First Nations language (p = 0.68)	88	1.2	(0.57 - 2.4)
(reference = no)	77		
Familiarity with traditional way of life (p = 0.10)			
Very familiar	50	4.7	(0.82 - 90)
Somewhat familiar	98	6.0	(1.1 - 111)
(reference = not familiar)	16		
Sexual behaviour			
Has a steady sex partner (p = 0.31)			
With steady sex partner for one year or less	38	0.50	(0.17 - 1.4)
With steady sex partner for > one year	61	1.0	(0.47 - 2.2)
(reference = no steady sex partner)	66		
Age at first vaginal intercourse (p = 0.36)			
Less than 13	16	0.33	(0.05 - 1.4)
13 to 16	103	0.79	(0.35 - 1.8)
(reference = 17 or older)	40		
Number of sex partners in last year (p = 0.15)			
Two - four	65	0.51	(0.23 - 1.1)
Five or more	33	0.46	(0.15 - 1.2)
(reference = one)	67		
Participation in anal intercourse (p = 0.33)	28	0.61	(0.19 - 1.6)
(reference = no)	137		

Consistent use of condoms = always used condoms in the 12 months preceding the interview.
* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001

TABLE 11 (continued): Variables Examined for an Association with Consistent Use of Condoms among Condom Users in the Last 12 Months Using Univariate Logistic Regression (n = 165)			
Characteristic	**n**	**Crude odds ratio**	**95% confidence interval**
Sexual behaviour, continued			
Location of sex partner (p = 0.15)			
Outside community	50	0.44	(0.17 - 1.1)
Both within and outside community	47	0.54	(0.22 - 1.3)
(reference = within community)	57		
Contraceptive behaviour			
Use birth control other than condoms (p = 0.40)	59	1.4	(0.65 - 2.8)
(reference = no)	105		
Worry about pregnancy (0.24)			
Always	40	1.3	(0.52 - 3.3)
Sometimes	72	2.2	(0.84 - 6.0)
(reference = never)	46		
Risk awareness			
Know someone with HIV/AIDS (p = 0.06)	14	3.0	(0.97 - 9.5)
(reference = no)	133		
Self-perceived risk of AIDS (p = 0.05)			
Some chance or greater	13	0.61	(0.13 - 2.1)
Small chance	38	0.31 *	(0.10 - 0.80)
(reference = almost certain I will not)	100		
High general AIDS knowledge (4 out of 4 questions correct) (p = 0.001)	165	4.9 ***	1.8 - 17
(reference = less than 4 correct or not heard of AIDS)	47		
High overall AIDS transmission knowledge (18 or more correct out of 20) (p = 0.006)	25	3.5 **	(1.4 - 8.6)
(reference = less than 18 correct or not heard of AIDS)	140		
Knowledge of AIDS transmission through sexual contact (p = 0.008)			
4 out of 4 questions correct	75	4.8 *	(1.2 - 32)
3 out of 4 questions correct	71	1.7	(0.42 - 12)
(reference = less than 3 correct or not heard of AIDS)	19		
Worry about getting STDs/AIDS (p = 0.76)			
Always	32	1.2	(0.42 - 3.6)
Sometimes	85	1.4	(0.60 - 3.3)
(reference = never)	47		
Consistent use of condoms = always used condoms in the 12 months preceding the interview. * p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001			

TABLE 11 (continued): Variables Examined for an Association with Consistent Use of Condoms among Condom Users in the Last 12 Months Using Univariate Logistic Regression (n = 165)			
Characteristic	**n**	**Crude odds ratio**	**95% confidence interval**
Condom knowledge			
Perceived efficacy of condoms in preventing AIDS (p = 0.07)			
Very well	55	3.6 •	(1.2 - 13)
Well	65	2.0	(0.66 - 7.7)
(reference = not well or don't know how well)	29		
Sexual communication			
Trust person to tell the truth about their sexual past (p = 0.89)			
Agree	85	1.1	(0.51 - 2.7)
Don't know	20	1.3	(0.39 - 4.2)
(reference = disagree)	45		
Ease in telling partner that they want sex (0.68)			
Easy	72	0.54	(0.14 - 2.3)
Sometimes easy, sometimes difficult	80	0.58	(0.16 - 2.4)
(reference = difficult)	11		
Communication with sexual partners (p = 0.63) Composite score [range (-10) to (10)] where a positive score indicates willingness to talk about HIV status or past sexual experiences with a partner	148	0.98	(0.90 - 1.1)
Consistent use of condoms = always used condoms in the 12 months preceding the interview. * p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001			

Multiple logistic regression was used to further analyze consistent use of condoms among condom users in the 12 months preceding the interview (see Table 12). The drop in sample size from 165 to 143 is due primarily to the skip pattern for people who had not heard of AIDS, as described on page 54. Of the three AIDS knowledge variables that had significant effects in the univariate analysis, only general AIDS knowledge remained significant in the multiple logistic regression model. Knowing a person with HIV/AIDS became a significant predictor of consistent condom use. Having children under one's care, being almost certain one would not become infected with the AIDS virus, and believing that condoms work well or very in preventing AIDS had associations with consistent condom use that approached statistical

significance. There were no statistically significant interactions with age, gender, partnership status, or number of sex partners in this model.

TABLE 12: Factors Associated with Consistent Use of Condoms Among Condom Users in the Last 12 Months in Multiple Logistic Regression (n=143)

Characteristic	Adjusted odds ratio	95% confidence interval
Know someone with HIV/AIDS (p = 0.02) (reference = no)	4.3 *	1.2 - 17
High general AIDS knowledge (4 out of 4 questions correct) (p = 0.04) (reference = less than 4 correct or never heard of AIDS)	4.2 *	1.2 - 20

Variables retained in the model that showed a trend association ($0.05 \leq p < 0.10$):

Has children under care (p = 0.07) (reference = no children under care)	2.2	0.88 - 5.7
Self-perceived risk of AIDS (p = 0.08)		
Some risk or greater	0.81	0.14 - 3.6
Small risk	0.25 *	0.06 - 0.79
(reference = almost certain I will not)		
Perceived efficacy of condoms in preventing AIDS (p = 0.09)		
Very well	4.6 *	1.2 - 21
Well	3.5	0.93 - 16
(reference = not well or don't know how well)		

Consistent use of condoms = always used condoms in the 12 months preceding the interview.
Adjusted for age and gender.
* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001

Use of condoms for STD prevention

The third outcome variable analyzed was the use of condoms for the purpose of STD prevention in the 12 months preceding the interview. Respondents were asked if they used any protection to avoid getting STDs. Individuals that reported they used condoms to avoid getting STDs and who had used condoms in the 12 months preceding the interview were coded as having used condoms for STD protection. However, this variable is not exclusive from the use of condoms for birth control. A person may have used condoms for STD prevention only, for birth control only, or for both STD prevention and birth control.

The results of the univariate logistic regression are presented in Table 13. In this analysis, the use of condoms for STD prevention was significantly more likely if an individual was young, male, not married, had high school or vocational school education, did not have children in their care, was very familiar with the traditional way of life, did not have a religious faith, did not have a steady sex partner they had been with for longer than one year, had more than one sex partner in the last year, had sex partners outside or both within and outside the community, worried about pregnancy, was knowledgeable about HIV transmission through sexual contact, worried about getting AIDS or STDs, believed that condoms work well or very well in preventing AIDS, or trusted a person to tell the truth about their sexual past. The effect of sterilization or infertility was not analyzed due to extremely low cell frequencies.

There were three statistically significant gender interactions in the univariate analysis (data not presented in Table 13). The effect of number of sex partners on the use of condoms for STD prevention was more pronounced for males than for females ($p = 0.03$, Wald chi-squared). Males with 2 to 4 sex partners (OR = 7.3, $p < 0.0001$, Wald chi-squared) and with 5 or more partners (OR = 9.6, $p < 0.0001$, Wald chi-squared) were more likely to have used condoms than men with only one sex partner in the last year. Among females, the effect of having more than one sex partner only became significant if a woman had 5 or more sex partners in the last year (OR = 4.9, $p = 0.01$, Wald chi-squared). Women with 2 to 4 sex partners were no more likely to have used a condom than women with one sex partner (OR = 1.7, $p = 0.19$, Wald chi-squared).

The effect of using other methods of birth control besides condoms was different for males and females ($p = 0.02$, Wald chi-squared). Women who used other methods of birth control were more likely to use condoms for STD prevention than women who did not (OR = 2.7, $p = 0.004$, Wald chi-squared), but using other methods of birth control had no effect among men (OR = 0.80, $p = 0.55$, Wald chi-squared). Similarly, worry about pregnancy had a more pronounced effect on the use of condoms for STD prevention among women than among males ($p = 0.02$, Wald chi-squared). Women who worried about pregnancy sometimes or always were nearly 6 times more likely to use condoms for STD prevention than women who never worried (OR = 5.8, $p = 0.0001$, Wald chi-squared), yet males were less than 2 times more likely to have used condoms for STD prevention if they worried about pregnancy sometimes or always (OR = 1.8, $p = 0.05$, Wald chi-squared).

TABLE 13: Variables Examined for an Association with the Use of Condoms for STD Prevention in the Last 12 Months Using Univariate Logistic Regression (n = 400)

Characteristic	n	Crude odds ratio	95% confidence interval
Sociodemographic characteristics			
Age (p = 0.0001)			
15 - 19	91	7.8 ***	(4.2 - 15)
20 - 29	141	5.6 ***	(3.2 - 10)
(reference = 30+)	166		
Males (p = 0.0003)	204	2.2 ***	(1.4 - 3.4)
(reference = females)	196		
Married/common-law (p = 0.0001)	190	0.33 ***	(0.21 - 0.52)
(reference = no)	210		
Education (p = 0.009)			
Grade school or less	56	0.56	(0.28 - 1.1)
Some college/university	89	0.46 **	(0.25 - 0.80)
(reference = high school/vocational)	253		
Lived at residential school (p = 0.32)	41	1.4	(0.71 - 2.7)
(reference = no)	358		
Children under care (p = 0.0001)	194	0.33 ***	(0.21 - 0.51)
(reference = no)	206		
Cultural characteristics			
Speak a First Nations language (p = 0.61)	205	1.1	(0.73 - 1.7)
(reference = no)	195		
Familiarity with traditional way of life (p = 0.03)			
Very familiar	96	2.0	(0.96 - 4.4)
Somewhat familiar	255	1.1	(0.55 - 2.2)
(reference = not familiar)	48		
Religious faith (p = 0.02)			
Traditional	80	0.89	(0.40 - 2.0)
Catholic	144	0.69	(0.32 - 1.5)
United	73	0.37 *	(0.15 - 0.90)
Anglican	24	0.67	(0.22 - 1.9)
Other religion	42	0.27 *	(0.088 - 0.74)
(reference = no religion)	35		
Sexual behaviour			
Has a steady sex partner (p = 0.0001)			
With steady sex partner for one year or less	63	1.2	(0.64 - 2.2)
With steady sex partner for > one year	220	0.27 ***	(0.16 - 0.44)
(reference = no steady sex partner)	116		
Age at first vaginal intercourse (p = 0.05)			
Less than 13	38	1.7	(0.72 - 3.5)
13 to 16	223	1.8 *	(1.1 - 3.1)
(reference = 17 or older)	119		

* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001

TABLE 13: Variables Examined for an Association with the Use of Condoms for STD Prevention in the Last 12 Months Using Univariate Logistic Regression (n = 400)

Characteristic	n	Crude odds ratio	95% confidence interval
Sexual behaviour, continued			
Number of sex partners in last year (p = 0.0001)			
Two - four	110	4.1 ***	(2.5 - 6.8)
Five or more	49	7.6 ***	(4.0 - 15)
(reference = one)	239		
Participation in anal intercourse (p = 0.46)	52	1.3	(0.68 - 2.3)
(reference = no)	348		
Location of sex partner (p = 0.0001)			
Outside community	99	2.1 **	(1.3 - 3.7)
Both within and outside community	74	4.3 ***	(2.4 - 7.8)
(reference = within community)	176		
Contraceptive behaviour			
Use birth control other than condoms (p = 0.51)	119	1.2	(0.74 - 1.8)
(reference = no)	280		
Worry about pregnancy (p = 0.0001)			
Always or sometimes	199	2.6 ***	(1.7 - 4.1)
(reference = never)	189		
Risk awareness			
History of STD (p = 0.48)	29	1.3	(0.59 - 2.9)
(reference = no)	371		
Heard of AIDS (p = 0.46)	365	1.3	(0.63 - 3.1)
(reference = no)	34		
Been tested for HIV (p = 0.12)	31	1.8	(0.84 - 3.8)
(reference = no)	338		
Know someone with HIV/AIDS (p = 0.85)	33	0.93	(0.41 - 2.0)
(reference = no)	332		
Self-perceived risk of AIDS (p = 0.38)			
Some chance or greater	39	0.73	(0.33 - 1.5)
Small chance	82	1.3	(0.76 - 2.2)
(reference = almost certain I will not)	244		
High general AIDS knowledge (4 out of 4 questions correct) (p = 0.66)	281	1.1	(0.70 - 1.8)
(reference = less than 4 correct or not heard of AIDS)	118		
Overall AIDS transmission knowledge (p = 0.12)			
18 or more questions correct out of 20	44	2.0 *	(1.0 - 4.0)
14 - 17 questions correct out of 20	186	1.1	(0.72 - 1.8)
(reference = less than 14 correct or not heard of AIDS)	169		

* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001

TABLE 13: Variables Examined for an Association with the Use of Condoms for STD Prevention in the Last 12 Months Using Univariate Logistic Regression (n = 400)			
Characteristic	**n**	**Crude odds ratio**	**95% confidence interval**
Risk awareness, continued			
High knowledge of AIDS transmission through sexual contact (4 out of 4 questions correct) (p = 0.0002)	147	2.3 ***	(1.5 - 3.5)
(reference = less than 4 correct or not heard of AIDS)	252		
Worry about getting STDs/AIDS (p = 0.0001)			
Always	64	4.2 ***	(2.2 - 8.1)
Sometimes	180	2.7 ***	(1.7 - 4.6)
(reference = never)	154		
Condom knowledge/attitudes			
Not embarrassed to obtain condoms (p = 0.16)	268	1.4	(0.87 - 2.5)
(reference = somewhat embarrassed or embarrassed)	93		
Perceived efficacy of condoms in preventing AIDS (p = 0.001)			
Very well	114	2.9 ***	(1.6 - 5.3)
Well	138	2.4 **	(1.3 - 4.4)
(reference = not well or don't know how well)	110		
Sexual communication			
Trust person to tell the truth about their sexual past (p = 0.04)			
Agree	179	1.9 **	(1.2 - 3.1)
Don't know	45	1.5	(0.73 - 3.1)
(reference = disagree)	142		
Ease in telling partner that they want sex (p = 0.12)			
Easy	201	0.56	(0.24 - 1.4)
Sometimes easy, sometimes difficult	170	0.86	(0.37 - 2.1)
(reference = difficult)	25		
Communication with sexual partners (p = 0.48) Composite score [range (-10) to (10)] where a positive score indicates willingness to talk about HIV status or past sexual experiences with a partner	357	1.02	(0.97 - 1.1)
* p-value < 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001			

Multiple logistic regression was used to further analyze the use of condoms for STD prevention in the 12 months preceding the interview. Many variables that had significant associations with condom use in the univariate analysis were no longer significant in multivariate analysis and were excluded from the model: marital status, education, having children under one's care, religious faith, having a steady sex partner, location of sex partners, knowledge of AIDS transmission through sexual contact, worry about getting AIDS or STDs, perceived efficacy of condoms in preventing AIDS, and trust in a person to tell the truth about their sexual past. Furthermore, significant gender interactions in the univariate analysis were no longer significant in multivariate modeling. Gender no longer modified the effects of the number of sex partners ($p = 0.11$, Wald chi-squared), use of other methods of birth control ($p = 0.25$, Wald chi-squared), or worry about pregnancy ($p = 0.17$, Wald chi-squared).

Four variables were significant predictors of condom use for STD prevention in the multiple logistic regression model (see Table 14). Younger age, male gender, familiarity with the traditional way of life, having more than one sex partner in the last year, and worry about pregnancy were associated with a greater likelihood of condom use for STD prevention. Being very knowledgeable about HIV transmission overall had a positive association with condom use for STD prevention that approached significance. There were no statistically significant interactions with age, gender, partnership status, or number of sex partners in this model. The drop in sample size from 400 to 382 in this final model is due to the cumulative effect of missing observations for all variables included in the model.

TABLE 14: Factors Associated with Use of Condoms for STD Prevention in Multiple Logistic Regression (n = 382)		
Characteristic	**Adjusted odds ratio**	**95% confidence interval**
Age (p < 0.0001)		
15 - 19	7.8 ***	(3.7 - 17)
20 - 29	4.4 ***	(2.2 - 9.1)
(reference = 30+)		
Males (p = 0.0007)	2.8 ***	(1.5 - 5.0)
(reference = females)		
Familiarity with traditional way of life (p = 0.001)		
Very familiar	3.5 **	(1.3 - 9.4)
Somewhat familiar	1.1	(0.52 - 3.3)
(reference = not familiar)		
Number of sex partners (p < 0.0001)		
Two to four	3.5 ***	(1.9 - 6.5)
Five or more	6.4 ***	(2.9 - 15)
(reference = one)		
Worry about pregnancy (p = 0.002)		
Always or sometimes	2.4 **	(1.4 - 4.2)
(reference = never)		

Variables retained in the model that showed a trend association ($0.05 \leq p < 0.10$):

Overall AIDS transmission knowledge (p = 0.07)		
High knowledge (18 or more correct out of 20)	2.6 *	(1.1 - 6.3)
Medium knowledge (14 - 17 correct out of 20)	1.5	(0.86 - 2.8)
(reference = less than 14 correct out of 20)		
* p-value ≤ 0.05, ** p-value ≤ 0.01, *** p-value ≤ 0.001		

Summary of factors affecting condom use

Several patterns arose in the results of the analysis of ever using condoms, consistent condom use among condom users, and the use of condoms for STD prevention in the 12 months preceding the interview. Certain variables were never significantly associated with condom use in the univariate or the multivariate analyses. These included having lived at a residential school, speaking a First Nations language, age at first vaginal intercourse, participation in anal intercourse, history of an STD, heard of AIDS, been tested for HIV, ease in telling a partner that they want sex, and attitudes toward communication between sexual partners. Other variables had significant associations with condom use in the univariate analysis, but were no longer significant in multiple logistic regression modeling. The effects of marital status, education,

religious faith, knowledge of HIV transmission through sexual contact, and worry about getting AIDS or STDs were no longer important when the effects of other variables were adjusted for.

The results of the multiple logistic regression modeling of ever used condoms, consistent use of condoms among condom users, and the use of condoms for STD prevention are summarized in Table 15. The important factors affecting condom use ever in the last 12 months and for the purpose of STD prevention were similar. Variables that appeared in both of these models included: age, gender, familiarity with the traditional way of life, number of sex partners in the last year, worry about pregnancy, and overall knowledge of HIV transmission. There were no statistically significant interactions with age, gender, partnership status, or number of sex partners in any of the multiple logistic regression models.

TABLE 15: Summary of Factors Associated with Condom Use in the 12 Months Preceding the Interview in Multiple Logistic Regression Modeling

Dependent variable	Independent variables that were statistically significant and were retained in model ($p < 0.05$)	Independent variables that had trend associations and were retained in model ($0.05 \leq p < 0.10$)
Ever used a condom (n = 345)	• age • gender • length of time with steady partner • number of sex partners in the last year • worry about pregnancy • overall HIV transmission knowledge • not embarrassed to obtain condoms	• familiarity with traditional way of life • use birth control other than condoms • trust person to tell the truth about their sexual past
Consistent use of condoms among condom users (n = 143) (adjusted for age and gender)	• know someone with HIV/AIDS • general knowledge about AIDS	• has children under their care • self-perceived risk of AIDS • perceived efficacy of condoms in preventing AIDS
Used condoms for STD prevention (n = 382)	• age • gender • familiarity with traditional way of life • number of sex partners in the last year • worry about pregnancy	• overall HIV transmission knowledge

DISCUSSION

This is the first in-depth analysis of the prevalence of condom use and the factors associated with condom use among First Nations people living on-reserve in Ontario, and perhaps in North America. The first objective of this analysis was to describe the prevalence of condom use among the First Nations on-reserve population in Ontario: a) measured as the frequency of condom use according to i) sociodemographic characteristics and ii) sexual behaviour that affects the risk of HIV/STD infection; and b) measured as the proportion reporting condom use specifically for STD prevention versus birth control. The second objective was to determine whether condom use is associated with: a) sociodemographic factors; b) cultural factors specific to First Nations populations; c) sexual behaviour; d) contraceptive behaviour and attitudes; e) HIV/STD risk awareness; f) condom knowledge and attitudes; and d) attitudes towards sexual communication. Various aspects of the methodology used for the OFNAHLS contribute to the credibility of the study's findings. These include extensive involvement of the First Nations community in the design, set-up, and in conducting the survey, and the use of a random probability sample stratified by age and sex. The results of the analysis have implications for HIV/STD prevention efforts and for future research of sexual and HIV/STD preventive behaviour among First Nations people.

Prevalence of Condom Use

Frequency of condom use

The majority of First Nations people had not used condoms for vaginal or anal intercourse in the last 12 months. Nearly one third had only used a condom sometimes, and 8% had always used condoms. Rates of condom use according to sociodemographic characteristics allow us to have a picture of the kind of First Nations person who tends to use or not use condoms. The sociodemographic profile of a person most likely to have used a condom in the last 12 months was a young, unmarried male, with some or a completed high school education.

Conversely, a married woman over the age of 30 was least likely to have used a condom in the last 12 months.

The low prevalence of condom use for every act of intercourse suggests that the potential for HIV/STD transmission within First Nations reserve communities is great, given that patterns of sexual partnering are conducive to transmission. The transmission of HIV/STD requires sexual contact between an infected and uninfected person, therefore the risk of infection increases with the number of sex partners an individual has. People with more than one sex partner in the last year were more likely to be young ($p = 0.001$, chi-squared test); male ($p = 0.001$, chi-squared test); never-married or separated/widowed/divorced ($p = 0.001$, chi-squared test); and to have partners located off-reserve ($p = 0.001$, chi-squared test). (For the characteristics of individuals according to the number of sex partners, see Appendix E.) Alternatively, an individual with only one partner may be at risk if their partner becomes infected through sexual activity with partners outside of the relationship. For example, 15.2% of people who were married or living in a common-law relationship and 28.1% of people with a steady sex partner had more than one sex partner in the last 12 months (see Appendix E).

Young First Nations people in Ontario tended to be more at risk for STDs due to greater numbers of sexual partners (Myers et al., 1993) and experience higher rates of STD infections (Medical Services Branch, Health Canada, personal communication). Condom use was more prevalent among First Nations people in their teens and twenties, in that 49% of adolescents and 57% of people in their twenties had used a condom at least once in the last year. These rates were not as high as those reported for Canadian college and university students, where 76% of males and 70% of females reported the use of a condom, although no time frame was specified (MacDonald et al., 1990). Despite the fact that many youth have used condoms, prevention efforts must encourage more to always use condoms. Condom use all of the time was rare among First Nations people in their teens and twenties (11% and 12%, respectively), which suggests that high rates of STD infection may continue.

Males in the OFNAHLS were more likely to have two or more sexual partners within the last year, in that 40% reported multiple sex partners whereas 18% of females reported more than one sex partner (Myers, George et al., 1994). Males reported more frequent condom use (40% sometimes and 8% always) than females (22% sometimes and 8% always). The rates of condom

use reported by First Nations women in this study were less than that reported elsewhere (Aboriginal Nurses Association of Canada, 1993). In that study, 56% of women had used a condom sometimes or most times, and 16% always used condoms. The lack of a time frame used for that question and the use of a self-selected sample in that study may have impacted on the higher rates of condom use reported among Aboriginal women.

Given that 40% of males were at increased risk of HIV/STDs due to multiple sex partners (Myers, George et al., 1994) yet only 8% used condoms always, the potential for STD transmission among males is great. Females were less likely to have multiple sex partners. However, females with only one sex partner may still be at risk for HIV/STDs if their partner has other sex partners, which must be true for at least some women given that nearly half of First Nations men had multiple partners. In a study of heterosexually acquired HIV infection in the United States, 35% of HIV infected women had only one sex partner in the last five years, and 85% of these women reported never using condoms (Diaz et al., 1994). Furthermore, a study of women visiting a genitourinary clinic in London, England found that regular heterosexual partners played the major role in the transmission of bacterial STDs to women; increasing condom use with regular partners was correlated with a decreasing incidence in gonorrhoea, chlamydia, and trichomoniasis (Evans, Kell, et al., 1995). First Nations women living on-reserve in Ontario experience higher rates of chlamydial infections than their male counterparts (Medical Services Branch, Health Canada, personal communication) and are more likely to experience health consequences from a chlamydial infection, such as infertility, ectopic pregnancy, and pelvic inflammatory disease (Jones and Wasserheit, 1991). In light of these findings, the low rates of condom use reported by First Nations women in this study are a concern.

Given that the number of sex partners is directly related to STD risk, the prevalence of condom use was examined among people with multiple sex partners within the 12 months preceding the interview. This includes people who have had more than one sex partner concurrently, or someone who has had a series of short, monogamous relationships (serial monogamy). People with two or more sex partners were in fact more likely to use condoms sometimes than people with one partner. However, although rates of always using condoms were slightly higher among those with multiple partners (9% c.f. 7%), they are too low to be effective in preventing STD transmission. These rates are also lower than those reported for

young adults with two or more sex partners in the Ontario Health Survey, where 18% reported always using condoms for the prevention of STDs in the last year (Kasenda, 1994). Canadian adults with two or more sex partners in the last five years reported higher rates of always using condoms as well (Ornstein, 1989). Nineteen percent of males and 12% of females always used condoms in that study.

Certain sexual activities carry a greater risk of HIV/STD infection than others. For example, the risk of HIV transmission is greater during anal intercourse than during vaginal intercourse (Aral, 1993). Approximately 12% of the men and women who had sexual intercourse in the last year had engaged in anal intercourse. Although people who had anal intercourse were less likely to have never used condoms, the difference was not statistically significant. Furthermore, only 5% always used condoms. Prevention efforts directed towards First Nations people should include information on HIV transmission risk for particular sexual activities such as anal intercourse.

Condom use is of the utmost importance among people who have sex partners both within and outside the community, as they are potential "bridges" of HIV/STD infection into the community. Yet only 10% always used condoms for sexual intercourse. This suggests that there are few barriers to the introduction of HIV/STDs into First Nations reserve communities. People with sex partners within and outside the community were more likely to be male, separated, widowed, or divorced, single, and living in a remote community (Calzavara et al., 1996). Successful condom promotion efforts targeted at these individuals would have a positive impact on HIV/STD transmission within First Nations reserve communities.

Condom use for STD prevention versus birth control

The majority of First Nations people who used a condom in the last year did so both to prevent STDs and pregnancy. Ten percent used condoms for birth control only, and 8% used them for STD prevention only. The use of condoms for either STD prevention or birth control was related to the use of other methods of birth control. People who used birth control other than condoms were more likely to use condoms for birth control only than people who did not use other methods of birth control. This suggests that these individuals are using multiple methods of birth control to prevent pregnancy. In fact, 36% of First Nations women who used condoms

for birth control reported that they used other methods of contraception. This is similar to Canadian women in general, in that 39% of women who used condoms for contraception in the last six months also used an additional method of contraception (Boroditsky et al., 1995).

The finding that condom use as a prophylactic was tightly linked with condom use as a contraceptive suggests that condom promotion must be viewed in both contexts. Contraceptive methods used by First Nations women on-reserve according to the results of this analysis are comparable to that of Canadian women in the general population reported by Boroditsky at al. (1995). The rates of use of sterilization (28% c.f. 29%), oral contraceptives (27% c.f. 27%), and spermicides (1.5% c.f. 3%) are remarkably similar. However, First Nations women on-reserve were more likely to use condoms for birth control (27%) than Canadian women in general (21%). A Steering Committee member of the OFNAHLS indicated that "historically, implants and physical barriers have been used by Aboriginal women, with less emphasis on the pill" (Myers et al., 1993, page 34). The fact that condoms were the third most common method of contraception suggests that many First Nations women are receptive to the use of condoms. Efforts to promote condom use may be successful among women who want a non-permanent, non-hormonal contraceptive method. However, women who choose to prevent pregnancy through surgical sterilization or the use of oral contraceptives need to be reminded that condoms are required to prevent STDs.

Factors Associated With Condom Use

The second objective of this analysis was to determine whether condom use is associated with: a) sociodemographic factors; b) cultural factors specific to First Nations populations; c) sexual behaviour; d) contraceptive behaviour and attitudes; e) HIV/STD risk awareness; f) condom knowledge and attitudes; and d) attitudes towards sexual communication. Multiple logistic regression modeling was used to identify which of these characteristics were most important in predicting whether a condom had ever been used in the last 12 months, whether those who used condoms used them consistently, and whether an individual used condoms for the purpose of STD prevention.

Similarities and differences in the results of the analysis of these three outcome variables suggested that there are two different processes specific to condom use behaviour (see Table 15 for a summary of the three models). Factors affecting whether a condom had ever been used in the last 12 months and whether an individual used condoms for the purpose of STD prevention were remarkably similar. This suggests that factors which affect whether a person includes condoms in their sexual lifestyle are fairly consistent, regardless of whether the "choice" to use condoms is for the prevention of STDs, pregnancy, or both. Conversely, the important factors which affected consistency of use among condom users were very different from the analysis of whether a condom had ever been used in the last 12 months or whether an individual used condoms for the purpose of STD prevention. Clearly, once a person has "chosen" to include condoms in their sexual lifestyle, a different set of factors determine whether they will use them consistently, i.e. for every act of sexual intercourse.

Several important themes emerged from the three models. These were age and gender, familiarity with the traditional way of life, sexual partnerships, HIV/STD versus pregnancy issues, and, to a lesser extent, comfort with sexuality. These themes will be discussed in the context of whether condoms are used at all or for STD prevention, and if used, whether they are used consistently.

Age and gender

Young age and male gender were independently associated with having used a condom at least once, and having used condoms for the prevention of STDs in the last 12 months. This is consistent with many studies of condom use in other populations (Campbell and Baldwin, 1991; Catania et al., 1992; Donald et al., 1994; Hingson et al., 1990; Johnson et al., 1994; Kasenda, 1994; Laumann et al., 1994; Strike et al., 1995; Tanfer et al., 1993). These associations remained after adjustment for the number of sex partners, which suggests that the relationship between young age and male gender with a greater number of sex partners is not an adequate explanation. However, there are other possible interpretations which could explain how young age and male gender may independently predict condom use.

People in their teens and twenties "came of age" sexually during the AIDS epidemic and a period of increased STD awareness. Because early sexual experiences during one's initiation

into sexuality impact on one's sexual behaviour throughout adulthood (Laumann et al., 1994), young people today may be more likely to consider the use of condoms as a normal part of sexual behaviour. In contrast, older individuals who "came of age" during the sexual revolution of the sixties and seventies, when AIDS did not yet exist and STDs known at that time could be cured with antibiotics, may be less likely to consider condoms as part of their sexual repertoire.

Male gender was also independently associated with having used a condom at least once in the last 12 months, and having used condoms to prevent STDs. The univariate analysis suggested that factors affecting condom use may differ for males and females (e.g. number of sex partners, use of other methods of birth control, and worry about pregnancy), although these interactions were not retained in multivariate modeling due to insufficient statistical power. It is somewhat puzzling that males report more frequent condom use than females. Given that the majority (97%) of the sample engaged in heterosexual activity, who are these males having protected sex with? This is similar to the nearly ubiquitous finding that males report more sexual partners than females (Johnson and Wadsworth, 1994), which was also true in the OFNAHLS. Condom use was more frequent with people who reported more than one sex partner, so males may report more condom use by virtue of the fact that they have more sex partners. However, male gender was an independent predictor of greater condom use even when the number of sex partners was adjusted for. Males may inaccurately report greater condom use due to self-presentation bias, in that they report condom use because it is the "socially acceptable" thing to do. Alternatively, males may accurately report greater condom use than females due to sexual mixing with younger females or with females outside the sampled population, such as with partners located outside the reserve community.

Another possible interpretation of male gender as an independent predictor of condom use is that males may be more empowered to use condoms, given that they are the individuals who wear them. The fact that the First Nations Steering Committee insisted on the use of a self-completed answer booklet for questions on sensitive topics such as sexual behaviour as a culturally appropriate interview tool suggests that First Nations people may be uncomfortable discussing sexuality. In some cultures, the discussion of sexual behaviour between men and women rarely occurs, and is considered to be inappropriate. For example, a study of ethnocultural communities in Montreal, Toronto, and Vancouver found that a woman asking a

man to use a condom would be unacceptable in the South Asian, Chinese, Horn of Africa, English-speaking Caribbean, Latin American, and Arabic-speaking communities (Singer et al., 1996). The majority of First Nations people in the OFNAHLS expressed willingness to discuss past sexual experiences with partners prior to having sex (Myers et al., 1993), yet it is unknown if they would feel comfortable asking a current or new partner to use a condom. If First Nations women would feel uncomfortable asking a male partner to use a condom, this might explain their reduced likelihood of using condoms at least once in the last year or to prevent STDs.

Despite the association of young age and male gender with condom use ever in the last year or to prevent STDs, age and gender had no significant effect on consistency of condom use among condom users. One interpretation of this finding is that younger people and males are more likely to consider the use of condoms, but once a person decides to use condoms, other factors determine whether they are used consistently.

Familiarity with the traditional way of life

Although the ability to speak a First Nations language or believing in the traditional faith were not important predictors of condom use, familiarity with the traditional way of life emerged as an important predictor of condom use for STD prevention in the last 12 months. There was also a trend of increased likelihood of having used a condom at least once in the last 12 months among people who were very familiar compared to those who were not familiar. It is difficult to determine which specific knowledge of traditional ways is important, because three different Aboriginal cultures were represented in the OFNAHLS (Ojibway, Cree, and Iroquois). Furthermore, there was variation among the eleven communities that participated. The study included remote communities in northern Ontario that were only accessible by air, as well as communities in the south that were close to an urban centre. Therefore, it is unlikely that there was consistent understanding of the question, "How familiar are you with the traditional way of life?" among respondents.

One possible interpretation of the association is that an individual who is familiar with the traditional way of life would have greater self-esteem, and would be more confident to insist on condom use in their sexual relationships. Since the arrival of European colonists, the history of Aboriginal people has consisted of a series of losses of language, traditions, spirituality, land,

and autonomy; for some Aboriginal people and communities, this has resulted in a loss of feelings of self-worth and pride in themselves (Aboriginal Nurses Association of Canada, 1993). Traditional Aboriginal education methods emphasize the development of self-esteem, such as a universal need for belonging, mastery of the individual's environment, the expression of independence, and the attainment of virtue through generosity (Aboriginal Nurses Association of Canada, 1993).

Another possible interpretation is that people who are very familiar with the traditional way of life may be more in touch with general health issues. That is, they would be more likely to protect themselves from disease, and avoid situations that put them at risk. Familiarity with the traditional way of life may also affect condom use through its effect on contraceptive method choice. First Nations people who are very familiar with the traditional way of life may prefer a non-surgical, non-hormonal contraceptive method.

Because familiarity with the traditional way of life was not important in determining consistent condom use among condom users, it appears that its effect lies in influencing individuals to include condoms as part of their sexual repertoire. It does not appear to play a role in the motivation to use condoms for every act of sexual intercourse.

Sexual partnerships

Of the sexual behaviour variables examined, the number of sex partners a person reported within the last 12 months was the most important predictor of condom use. This included people who have had more than one sex partner concurrently, and people who have practiced serial monogamy over the last 12 months. People who had more than one sex partner were more likely to have used a condom at least once or to have used condoms for STD prevention in the last 12 months, but were no more likely to use condoms consistently. The determinants of condom use among First Nations people in the OFNAHLS with multiple sex partners has been previously reported (Calzavara, Burchell, et al., 1996). There was little difference in the determinants of condom use reported in this analysis and for people with multiple sex partners, with the exception that the perception that condoms work well or very well in preventing AIDS was an important determinant of condom use for people with multiple sex partners.

The relationship of increased condom use among individuals with more than one sex partner has been reported in a number of other surveys (Campbell and Baldwin, 1991; Fleisher et al., 1994; Tanfer et al., 1993). One explanation for this association is that people rationalize that they are at increased risk for HIV/STDs due to greater potential exposure to people that may be infected, and therefore decide to protect themselves by using condoms.

An alternative explanation is that people who have had more than one sex partner are more likely to have had casual partners as opposed to steady partners. In the OFNAHLS, people were asked about participation in vaginal and anal intercourse with and without a condom, with no reference to the type of partner that the respondent had engaged in sexual activity with. Other studies have examined condom use specifically with casual and regular partners, and found that behaviour differs remarkably according to partner type (Laumann et al., 1994; Morris et al., 1995; Strike et al., 1995; Watkins et al., 1993). The general relationship that has emerged is higher frequency of condom use with casual, secondary, or commercial sex partners and lower frequency of use with regular or primary partners. Unfortunately, this relationship could not be examined in this analysis.

However, the effect of marital status, having a steady sex partner, and length of time with a steady sex partner on condom use aggregated across partners was examined. Having a steady sex partner was important in the analysis of whether a condom had ever been used in the last 12 months. People who had been with a steady sex partner for a year or longer were less likely to have used a condom in the last year. However, people who had a steady sex partner for less than one year were just as likely to have used a condom than people with no steady sex partner. This suggests that condom use is more likely to occur with new, casual partners or relatively new steady partners. Once the couple becomes well acquainted with one another (after a period of about one year), they are less likely to use condoms. Issues of trust become important in longer term relationships, and the introduction of condoms into the relationship may be perceived as an implication of infidelity. When asked about reasons for not using a condom in the past 12 months, the most common reason was "I was with my steady sex partner" regardless of age or gender (Myers et al., 1993) or number of sex partners (Calzavara, Burchell, et al., 1996).

Although they were important determinants of whether condoms were ever used or used to prevent STDs in the last 12 months, sexual partnership issues had no effect on the consistency

of condom use among condom users. Whether this is due to the aggregation of condom use behaviour across partners or to a true lack of association is unknown.

HIV/STD versus pregnancy issues

The results have shown that condoms are used by First Nations people to prevent both STDs and pregnancy. However, the relative importance of these issues as determinants of condom use varied according to the outcome variable examined: the use condoms ever or for STD prevention; or consistent use among condom users. It appears that pregnancy and contraception issues were more important determinants of whether condoms were ever used or used for STD prevention, and that HIV/STD issues are more important in determining whether a person who used condoms used them consistently.

People who used contraceptive methods other than condoms were more likely to have used a condom at least once in the last 12 months. This finding is contradictory to several other studies of non-Aboriginal people, in that the use of other methods of contraception is generally associated with decreased condom use (Kasenda, 1994; Joffe, 1993; MacDonald et al., 1990). The relationship of increased condom use among First Nations people that use other methods of birth control, combined with the finding that people who use other methods of birth control are more likely to use condoms for birth control only (discussed above), supports the suggestion that these individuals are using multiple methods of birth control to prevent pregnancy. The use of other methods of contraception had no effect on whether condoms were used to prevent STDs. Therefore, it appears that the use of other methods of birth control influence the use of condoms for preventing pregnancy, but not for preventing STDs.

Perhaps surprisingly, worry about pregnancy played a far greater role in predicting whether condoms were used at all than did worry about getting AIDS or STDs. People who sometimes or always worried about pregnancy were twice as likely to have used a condom in the last year and to have used condoms to prevent STDs. Worry about getting AIDS or STDs, although important in univariate analyses, was no longer an important predictor of ever using condoms in the last year or the use of condoms for STD prevention in the multivariate models. The desire to prevent pregnancy appears to be the predominant motive in the decision to use condoms among First Nations people.

The analysis suggests that having children under care may be important in determining the consistency of condom use among condom users. People with children in their care were more likely to always use condoms than people without children in their care. This trend suggests that among couples that have decided to use condoms, having children motivates some people to use condoms every time they have sex, presumably to prevent having more children. In fact, among people who always used condoms, people with children in their care were over five times more likely to say they worried about pregnancy because they did not want any more children than people without children in their care ($p = 0.06$, Fisher's exact test). Pregnancy history was an important predictor of condom use in a study of inner-city women (Fleisher et al., 1994). In that study, women who had a history of two or more pregnancies were 2.1 times more likely to use condoms for STD prevention than women who had a history of none or only one pregnancy.

Knowledge about AIDS was associated with greater condom use, although simply having heard of AIDS was not. A high score on the questions about HIV transmission knowledge was associated with increased odds of ever using a condom in the last 12 months and the use of condoms for STD prevention. Among condom users, those with greater general AIDS knowledge were more likely to practice consistent condom use than those with less general knowledge. Furthermore, condom users who knew someone with HIV/AIDS were more likely to always use condoms than condom users who did not know anyone with HIV/AIDS. Because of the cross-sectional design of the OFNAHLS, it is impossible to determine whether this association is causal. Increased knowledge about HIV/AIDS may result in increasing condom use, or those who use condoms may be more likely to have learned about HIV/AIDS. However, these findings suggest that efforts to increase awareness about HIV/AIDS may play an important role in increasing condom use among First Nations people living on-reserve in Ontario.

Besides knowledge about HIV/AIDS, knowing that condoms are an effective means to prevent HIV/STD infection has been associated with increased condom use in the literature (Joffe, 1993; Tanfer et al., 1993). There was a trend association between the perception that condoms work very well or well in preventing AIDS and consistent use of condoms among condom users. However, the perception of the efficacy of condoms was unimportant in determining whether a person used condoms at all or to prevent STDs.

It has been hypothesized that increased knowledge about HIV/AIDS would affect a person's self-perceived risk of HIV/AIDS, and therefore they would rationalize their decision to use condoms based on their perceived risk. Greater perceived risk has been associated with greater condom use in the literature (Tanfer et al., 1993; Campbell and Baldwin, 1991). Nevertheless, among First Nations people, self-perceived risk of HIV/AIDS was not an important factor affecting the use of a condom ever in the last 12 months, or the use of condoms for STD prevention. It was only among condom users that self-perceived risk of HIV/AIDS appeared to be important for consistent condom use. Condom users who were almost certain they would not become infected were more likely to always use condoms than condom users who believed their risk of HIV/AIDS was small. Interpretation of these findings is difficult because self-perceived risk may affect condom use, condom use may affect self-perceived risk, or there may be a combination of causal effects within a group of people. One possible interpretation is that people who always use condoms are certain they will not become infected because they know they always protect themselves.

In summary, it appears that awareness about AIDS played a minor role in determining whether condoms were used at all, but was very important in predicting consistent condom use among condom users. Although condom use ever or to prevent STDs in the last year was affected by knowledge about AIDS, it was also influenced by worry about pregnancy and the use of other birth control methods; no other risk awareness factors were important. Conversely, knowledge about AIDS, knowing someone with AIDS, the perceived efficacy of condoms in preventing AIDS, and self-perceived risk of AIDS were all important predictors of consistent condom use. This suggests a profile of the consistent condom user: a person who is very aware of the facts about the disease AIDS and the means to prevent it, and whose life has been touched by the disease in that they have known someone who is infected. The one additional motivating factor to consistently use condoms among condom users was having children in one's care.

Comfort with sexuality

Lack of embarrassment obtaining condoms was an important predictor of whether condoms were ever used in the last 12 months. First Nations people who were not embarrassed to get condoms from either a store or the Health Centre on the reserve were more likely to have

used a condom than people who indicated some embarrassment. Embarrassment about obtaining condoms has been found to be a deterrent of condom use in other studies (Joffe, 1993; MacDonald, 1990). Other negative attitudes towards condoms, such as the belief that that they reduce sexual pleasure, are painful, or are inconvenient or a hassle to use, are also important deterrents (Joffe, 1993; Weinstock et al., 1993; MacDonald, 1990).

In general, attitudes towards sexual communication did not play an important role in condom use among First Nations people. Communication between sexual partners, including discussing past sexual experiences and talking about HIV infection status, did not affect condom use, nor did ease in letting a partner know when they want to have sex. However, there was a trend association between trust in a sexual partner to tell the truth about their sexual past and the use of a condom at least once in the last 12 months. People who agreed that they would trust a person to tell the truth about their sexual past were more likely to have used a condom than those who disagreed with this statement. There is more than one possible interpretation of this relationship. People who use condoms may be more likely to say they trust their partner to tell the truth about their sexual past because they are less concerned about their risk of HIV/STD infection, due to their use of protection. Alternatively, people may say they trust their partner to tell the truth about their sexual past, if their partner did in fact disclose information about previous sex partners. In that scenario, a person may then choose to use a condom because they are aware that their partner may have been exposed to HIV/STD infection.

Limitations of the Study

Several limitations to the OFNAHLS and the analysis presented in this thesis affect the interpretation of the results. The communities that participated in the OFNAHLS did so on a volunteer basis. Eleven out of 130 First Nations communities in Ontario agreed to participate in the study, resulting in a 8.5% community participation rate. These communities under-represented the northwestern region of Ontario and English-only speaking individuals (Bullock, 1995); therefore, weighting by language and region was used to more accurately represent the on-reserve population. However, it is possible that these communities were different in other ways from the communities who did not agree to participate. The volunteer communities may

have felt that AIDS was more of an issue in their community, or they may have had little AIDS awareness and felt that the community would benefit from participation in the study. The eleven communities that did agree to participate represented approximately 10% of the on-reserve population in Ontario. They also included communities from the northern, central, and southern regions of Ontario, all four Provincial Territorial Organizations, and the three dominant First Nations cultures in Ontario. Nevertheless, the volunteer nature of community participation may affect the generalizability of these results to other communities.

There was representation of Cree, Iroquois, and Ojibway cultures in the OFNAHLS. However, there are differences between these First Nations cultures and others in North America, with respect to their individual heritages, languages, religious beliefs, cultural practices, and history of European contact. It is unknown if these results can be generalized for all Aboriginal people, as few studies of condom use among First Nations people could be found for comparison. Only three studies reporting rates of condom use were found (Aboriginal Nurses Association of Canada, 1993; Fisher et al., 1993; Warren et al., 1990). Furthermore, only one study of the factors affecting condom use among First Nations people could be found, and this was in an urban, drug using population where only 56 of the respondents self-identified as American Indian/Alaskan Native (Fenaughty et al., 1994).

The OFNAHLS was predominantly a survey of sexual behaviour. Because of the highly sensitive and private nature of sexual activity, the validity and reliability of sexual behaviour research has been questioned in the past, and research to improve its methodology has been less frequent than in other areas of study (Catania, Gibson et al., 1990). Participation bias, recall accuracy, and self-presentation bias are frequent concerns in sexual behaviour research (Catania, Gibson et al., 1990). Although the high participation rate (87.3%), the use of a one year recall period, and the use of a self-completed answer booklet for sensitive questions should have reduced the effects of these biases, they may not have been eliminated. Furthermore, the validity of self-reported condom use itself may be questioned. Suggested ways to validate condom use have included examination of rates of incident STDs (Zenilman et al., 1995), collection of used condoms in brothels, monitoring retail sales and estimating usage through collection of used condoms from refuge or sewer traps (Catania, Gibson et al., 1990). Unfortunately, these types of studies are done infrequently, and the results are inconsistent. Catania, Gibson et al. (1990) have

concluded that "in general, sex research lacks a gold standard for validating self-reported sexual behaviour".

Among the 87.3% who participated in the survey, 7.6% refused to respond to the question about sexual activities they had engaged in the 12 months preceding the interview. Refusals to answer this question were more common among males, those who spoke Cree only, those who attended a residential school, those with less formal education and those aged thirty to thirty-nine (Myers et al., 1993). Furthermore, non-response to this question may have been greater than 7.6% due to the format of this question. In the self-completed answer booklet, respondents were asked to check the activities that they had participated in. These activities ranged from "hug or kiss" to "vaginal sex with/without a condom" and "anal sex with/without a condom" (see Appendix D for the exact wording of this question). Respondents who had sex partners in the last year but did not check any of the sexual activities were coded as non-responders. However, some participants may have checked some activities (e.g. kiss or hug) but refused to answer others (e.g. vaginal sex); they would have been coded as not having engaged in these activities. Because the inclusion criteria for the analysis of condom use was participation in vaginal or anal intercourse, this may have introduced a bias.

The magnitude of this potential bias is best illustrated with an example. Only 69% of people who were married or living in a common-law relationship indicated that they had sexual intercourse in the last year. However, a large study of the general population in the U.S. found that 0% of cohabitating couples and only 1.3% of married couples did not engage in intercourse in the last year (Laumann et al., 1994). It is possible that some married or cohabiting couples truly did not engage in intercourse due to illness, or if one's partner was not living on the reserve due to travel, employment off-reserve, or incarceration. However, it is also likely that participants refused to respond to questions about sexual activities such as intercourse, but were willing to acknowledge kissing or hugging. Married or common-law respondents who did not indicate that they participated in intercourse were more likely to be older ($p = 0.001$, chi-squared test), to have had only elementary school education or no formal schooling ($p = 0.001$, Mantel-Haenszel chi-squared, adjusted for age), and to have attended a residential school ($p = 0.01$, Mantel-Haenszel chi-squared, adjusted for age).

A recall period of 12 months was used in the OFNAHLS to minimize errors in recall. Studies that have examined test-retest reliability of reported condom use have shown that the reliability of the condom use measure decreases as the length of the recall period increases, especially for people with multiple sex partners (Sheeran and Abraham, 1994). As a result, the authors suggested the use of a 2-3 month recall period. This suggests that the 12 month recall period may still be too long, and therefore prone to errors in recall. Nevertheless, the question format used may have minimized problems with recall. Respondents were asked whether they participated in specific sexual activities, with yes or no response categories; for example, whether they engaged in vaginal intercourse with a condom in the last year (see Appendix D). Errors of recall for a question of this type would be less frequent than if respondents had been asked how many times they engaged in vaginal intercourse with a condom in the last year.

If a respondent had more than one sex partner, condom use behaviour was averaged for all partners combined, yet it may be substantially different. Aggregating condom behaviour across partner types makes the assumption that the "meaning and protective value of condom use to respondents is invariant across partners" (Sheeran and Abraham, 1994), an assumption that has not been true in studies that have differentiated between partner types (Laumann et al., 1994; Morris et al., 1995; Strike et al., 1995; Watkins et al., 1993). Thus a potentially important piece of the puzzle is missing in this analysis.

Several condom use variables were developed for this analysis: frequency of use (never, sometimes, always) for vaginal/anal intercourse in the last year, ever used for vaginal/anal intercourse in the last year, consistent use for vaginal/anal intercourse among condom users in the last year, and use of condoms for STD prevention in the last year. The frequency of condom use measure (never, sometimes, always) is problematic because it groups someone who has only used a condom once or twice in the last year with people who nearly always used condoms. This measure also does not incorporate frequency of intercourse. For example, a person who had sex once in the last year and used a condom is categorized as always used condoms, whereas a person who had sex 100 times and used a condom 99 times would be categorized as sometimes used condoms. It is likely that people who nearly always use condoms are more like people who always use condoms than people who rarely use them, and that people who rarely use condoms are more like people who never use them. The use of the frequency measure (always,

sometimes, or never) therefore results in nondifferential misclassification, and a bias towards the null value in statistical analysis.

Multiple logistic regression was used to identify the most important factors associated with condom use among First Nations people. The advantage of this statistical method is that is allows the modeling of several independent variables at once. Therefore, the effect of a variable can be assessed after adjustment for several other variables, such as age, gender, and marital status. However, there are statistical limitations to logistic regression modeling. An example is colinearity, where two independent variables are highly correlated, resulting in an inflation of the standard errors, and a loss of power to detect significant effects. Several variables examined in this analysis were colinear, and an attempt was made not to include two highly colinear variables in the models at once (e.g. number of sex partners and location of sex partner, and overall HIV transmission knowledge and knowledge of HIV transmission through sexual contact). Rather, the variable whose effect had the greatest magnitude and was most significant when both were included in the model was retained, and the other was dropped from the analysis. Furthermore, the choice of variables to include in multivariate modeling may have affected the results. Variables that had insignificant effects in the univariate analyses ($p > 0.25$) were dropped from multivariate modeling, although it is always possible that a null effect may be due to masking by some other variable or set of variables. For these reasons, variables that may be important in determining condom use may have been excluded.

The sample size of 400 used for the analysis of ever used condoms or use of condoms for STD prevention in last year may not have provided sufficient power to detect real associations and interactions. Lack of power was even more problematic in the analysis of consistent use of condoms among condom users, in that only 165 individuals were included in that analysis. A number of independent variables examined (such as participation in anal intercourse, sterilization, history of an STD, and prior HIV test experience) had very low frequencies which further reduced statistical power. Moreover, a total of 32 independent variables were examined for their effects on condom use. It is entirely possible that significant associations reported in this analysis may have been spurious.

There was a further loss of sample size in the final multiple logistic regression models of whether one ever used a condom (Table 10, from 400 to 345) or whether people who used

condoms always used them (Table12, from 165 to 143). Although missing observations for all variables contributed to this drop in size, it is due primarily to a skip pattern in the OFNAHLS questionnaire. People who had never heard of AIDS were not asked questions about their knowledge and attitudes towards AIDS. Therefore, they had missing values for these variables and were excluded from the regression models. In the overall OFNAHLS sample, 17% had not heard of AIDS; they tended to be older, male, and living in northern communities (Myers et al., 1993). The loss of these individuals may have resulted in an overestimation of the importance of the issues surrounding HIV as determinants of condom use among First Nations people.

This analysis could not address differences in behaviour among individuals who had same-sex partners due to the low number of people who reported same-sex partners in the last year (1.5% of the sample). Condom use is generally greater among men who have sex with men than in the heterosexual population. For example, rates of condom use were twice as high among bisexual or homosexual men than among heterosexual men in the National Survey of Men in the US (Tanfer et al., 1993). People who engaged in homosexual activity were retained in the analysis, because the objective was to examine patterns of condom use among *all* First Nations people living on-reserve in Ontario. However, it is unfortunate that same-gender sexual activity could not be analyzed separately, as factors associated with condom use may be different among homosexuals and bisexuals (e.g. the effect of pregnancy issues).

Besides sexual orientation, a number of other factors not addressed in this analysis have been found to be important in other studies of condom use. These include partner's attitudes towards condoms (Fleisher et al., 1994; Joffe, 1993; Weinstock et al., 1993); social norms towards condom use (Joffe, 1993); attitudes towards condoms besides embarrassment, such as whether one believes that condoms are "fun" or decrease sexual pleasure (Joffe, 1993), or imply infidelity and mistrust of a partner (Overby and Kegeles, 1994; Pivnick, 1993); cognitive health behaviour models, including psychological characteristics (Catania, Kegeles et al., 1990); and alcohol and drug use (Graves and Leigh, 1995; Hingson et al., 1990; Kasenda, 1994; Leigh et al., 1994; Weinstock et al., 1993). It had previously been reported that First Nations people were not more likely to engage in unprotected sexual intercourse while "drunk or high" than when they were sober (Myers et al., 1996); therefore, the effects of alcohol and drug use were not included in this analysis. The important predictors of condom use presented in this analysis should not be

considered as the only important factors, as many others could be important. The choice of factors that were examined was limited by those that had been measured in the OFNAHLS.

Implications of the Study for Prevention

The results of this analysis of condom use have several implications for HIV/STD prevention efforts among First Nations people living on-reserve in Ontario. These implications have been summarized below in terms of recommendations for programme development, targeting, and prevention messages. Many HIV/STD prevention and condom promotion programmes may already be following these recommendations, therefore the results would provide evidence that they are on the right track.

Programme development

Given that embarrassment obtaining condoms was a deterrent to condom use:

- It is recommended that condoms be available anonymously and confidentially in First Nations communities.

Targeting

Given that rates of always using condoms were insufficient to prevent HIV/STD transmission among youth and individuals with multiple sex partners:

- It is recommended that there be condom promotion efforts directed at youth and individuals who have more than one sex partner, particularly those who have sex partners both within and outside the reserve community.

Given that rates of condom use were less among women:

- It is recommended that condom promotion efforts target males who have multiple sex partners to use condoms with both casual and regular female partners, and encourage women to consider condom use as an important component of sexual health.

Messages

Given that people aged 30 and over were less likely to use condoms regardless of their risk of HIV/STDs measured as the number of sexual partners:

- It is recommended that prevention efforts emphasize that the risk of HIV/STDs is not restricted to youth.

Given that familiarity with the traditional way of life was an important determinant of condom use:

- It is recommended that condom promotion efforts be culturally sensitive and incorporate teachings about First Nations culture and the traditional way of life.

Given that the use of condoms was less frequent among those who were in a steady relationship for a year or longer:

- It is recommended that messages stress that having one partner as a means to prevent HIV/STD infection is only effective if both partners are monogamous.

Given that individuals who engaged in anal intercourse were not more likely to use condoms:

- It is recommended that information provided about HIV/AIDS include information about the risk of infection for specific sexual activities.

Given that condoms were used for pregnancy prevention as well as STD prevention, and that pregnancy and contraception issues were important determinants of condom use:

- It is recommended that HIV/STD prevention efforts be linked with family planning programmes, and that individuals who choose alternative methods of birth control be encouraged to use condoms for STD prevention.

Given that knowledge about HIV/AIDS was an important determinant of condom use:

- It is recommended that condom promotion efforts continue to provide information about HIV/AIDS and other STDs.

Directions for Future Research

Because of the lack of research among First Nations people on HIV-related risk behaviour in general, and specifically on condom use, additional studies in the Aboriginal population are needed. The OFNAHLS was collected in 1991, and it is possible that current behaviour may be different. Ongoing research among First Nations people living in reserve communities in Ontario is needed to assess temporal changes in behaviour. Furthermore, studies of First Nations people not living in reserve communities would be important to determine issues that are important for that population. It would also be worthwhile to examine these issues among other First Nations in Canada and North America, as only the Ojibway, Cree, and Iroquois of Ontario were represented in the OFNAHLS.

Future studies of condom use should differentiate between behaviour with regular partners and casual partners. Studies among other ethnocultural groups have shown that behaviour differs according to partner type, and this analysis of First Nations people suggested the same. Further refinements to the condom use measure should include recall periods shorter than one year, and an incorporation of a measure of frequency of intercourse and the number of sex partners.

A particularly encouraging result of this analysis was that being very familiar with the traditional way of life was associated with greater use of condoms for STD prevention. First Nations people could greatly benefit by learning which aspects of being familiar with the traditional way of life are important, so that they may reduce HIV/STD transmission within their communities. Future research should examine specific aspects of Aboriginal culture and condom use, as well as other sexual behaviours.

Many studies of condom use that have focused on HIV/STD prevention have overlooked contraceptive and childbearing issues. The analysis presented here was able to differentiate between condoms used for birth control versus STD prevention. Future studies should also consider whether condoms are used for STD prevention or birth control, and examine the effects of use of other methods of contraception, worry about pregnancy, pregnancy history and/or having children in one's care, and desire to have children.

Finally, it is recommended that evaluation studies of prevention efforts be undertaken to assess changes in the prevalence of condom use. Evaluation would help to identify positive effects of programs or the need for more intensive efforts.

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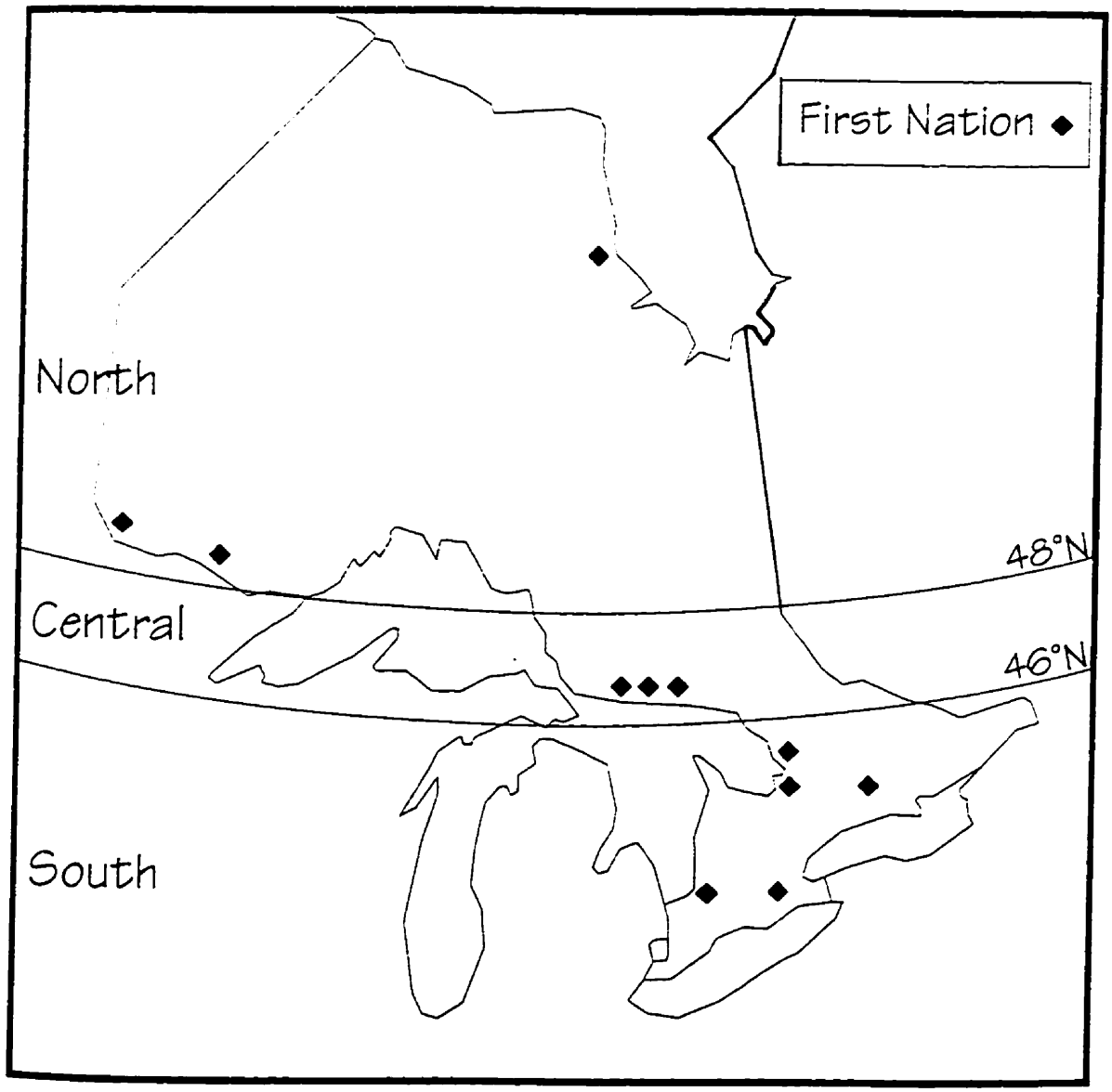
APPENDIX A: Map of Ontario Showing the Location of Participating First Nations Communities



Source: Myers et al., 1993

APPENDIX B: Letter of Permission to Access Data from the *Ontario First Nations AIDS and Healthy Lifestyle Survey*

We must not let the disease break our spirit

ONTARIO FIRST NATIONS AIDS SURVEY

Department of Health Adminstration
Division of Community Health, Faculty of Medicine
McMurrich Building, Second Floor
12 Queen's Park Crescent West
Toronto, Ontario M5S 1A8

Telephone 416/ 978 1830 Fax 416/ 978 7350

April 30, 1995.

Ann Burchell
HIV Social, Behavioural and Epidemiological
Studies Unit
Faculty of Medicine, University of Toronto
12 Queen's Park Crescent West, 3rd Floor
Toronto, Ontario
M5S 1A8

Re: Access to information collected in the *Ontario First Nations AIDS and Healthy Lifestyle Survey* for M.Sc. Thesis project

Dear Ms. Burchell:

This is in response to your request to access data from the *Ontario First Nations AIDS and Healthy Lifestyle Survey* (OFNAHLS) for your Master of Science thesis project.

It is understood that you will be undertaking this research under the supervision of Dr. Liviana Calzavara, a co-investigator of the OFNAHLS, and that your thesis topic will be the determinants of condom use among First Nations people living on-reserve in Ontario. It was previously agreed by the First Nations Steering Committee that Dr. Calzavara should analyze these data.

I am pleased to provide you access to the data of the OFNAHLS for the purpose of your M.Sc. thesis project only. In view of the sensitivity of the data and ownership issues, you may be permitted to be involved in publications as a co-author only. As principal investigator of the OFNAHLS, I also accept your invitation to be a member of your thesis committee. I am confident that Dr. Calzavara and myself will be able to provide adequate guidance in the ethical, cultural, developmental, methodological, and interpretive aspects of your thesis project.

Sincerely,

Dr. Ted Myers
Principal Investigator of the *Ontario First Nations AIDS and Healthy Lifestyle Survey*
Director of the HIV Social, Behavioural, and Epidemiological Studies Unit

c.c. Liviana Calzavara, Rhonda Cockerill, Victor Marshall, and Sandra Bullock

APPENDIX C: Role of the Student

This thesis involved an analysis of secondary data from the *Ontario First Nations AIDS and Healthy Lifestyle Survey* (OFNAHLS). The student was not involved in the design or data collection phase of the research project, but rather learned about it through discussions with the investigating team and project coordinator, and through publications and oral presentations resulting from the project. At the time the student began the thesis, the information collected from the OFNAHLS was available on-disk in a SAS dataset.

Actions carried out by the student throughout the duration of this thesis included the development of the analysis objectives and data analysis plan; a review of the literature; the analysis methods described in the Analysis Methodology section in its entirety, including the development of over 50 variables necessary for the analysis; the interpretation of the results; and the write-up of all material presented in this thesis.

APPENDIX D: Questions from the *Ontario First Nations AIDS and Healthy Lifestyle Survey* Used to Develop Variables

DEPENDENT VARIABLES		
Variable (NAME)	**Categories**	**Question from OFNAHLS**
Frequency of condom use (CONDOM)	• Never • Sometimes • Always	Q.47b Please place a check mark beside the sexual activities you have done while sober in the past 12 months. e. Vaginal sex without a condom f. Vaginal sex with a condom g. Anal sex without a condom h. Anal sex with a condom Q.47c Please place a check mark beside the sexual activities you have done while drunk or high in the past 12 months. If you have not been drunk or high in the past 12 months leave blank. e. Vaginal sex without a condom f. Vaginal sex with a condom g. Anal sex without a condom h. Anal sex with a condom
Ever used a condom in the last 12 months (EVER)	• No • Yes	
Consistency of condom use among condom users (ALWAYS)	• Inconsistent (sometimes used condoms • Consistent (always used condoms)	
Used condoms for STD prevention (CONDSTD)	• No • Yes	Q.49a Do you use any protection to avoid getting sexually transmitted diseases like gonorrhoea, syphilis or herpes? (never, sometimes, always) Q.49b If you use protection to avoid sexually transmitted diseases, what do you use? a. Condom c. Condom and spermicide N.B. A person was only coded yes for CONDSTD if they had also reported condom use in the last 12 months in question Q.47.

DEPENDENT VARIABLES		
Variable (NAME)	**Categories**	**Question from OFNAHLS**
Used condoms for birth control (CONDBC)	• No • Yes	Q.48a Do you use any protection FOR FEMALES - to keep from getting pregnant? FOR MALES - to keep a woman from getting pregnant? (never, sometimes, always, not applicable - not within childbearing years or permanently sterilized) Q.48b If you use protection to avoid pregnancy, what do you use? a. Condom N.B. A person was only coded yes for CONDBC if they had also reported condom use in the last 12 months in question Q.47.
Sterilized/no longer in child-bearing years (STERILE)	• No • Yes	Q.48a Do you use any protection FOR FEMALES - to keep from getting pregnant? FOR MALES - to keep a woman from getting pregnant? (never, sometimes, always, not applicable - not within childbearing years or permanently sterilized)
Use the birth control pill to avoid pregnancy (Q48BC)	• No • Yes	Q.48a Do you use any protection FOR FEMALES - to keep from getting pregnant? FOR MALES - to keep a woman from getting pregnant? (never, sometimes, always, not applicable - not within childbearing years or permanently sterilized) Q.48b If you use protection to avoid pregnancy, what do you use? c. The birth control pill
Use the intrauterine device to avoid pregnancy (Q48BD)	• No • Yes	Q.48a Do you use any protection FOR FEMALES - to keep from getting pregnant? FOR MALES - to keep a woman from getting pregnant? (never, sometimes, always, not applicable - not within childbearing years or permanently sterilized) Q.48b If you use protection to avoid pregnancy, what do you use? d. IUD
Use spermicide to avoid pregnancy (Q48BB)	• No • Yes	Q.48a Do you use any protection FOR FEMALES - to keep from getting pregnant? FOR MALES - to keep a woman from getting pregnant? (never, sometimes, always, not applicable - not within childbearing years or permanently sterilized) Q.48b If you use protection to avoid pregnancy, what do you use? b. Spermicide
Use diaphragm to avoid pregnancy (Q48BE)	• No • Yes	Q.48a Do you use any protection FOR FEMALES - to keep from getting pregnant? FOR MALES - to keep a woman from getting pregnant? (never, sometimes, always, not applicable - not within childbearing years or permanently sterilized) Q.48b If you use protection to avoid pregnancy, what do you use? e. Diaphragm

INDEPENDENT VARIABLES		
Variable (NAME)	**Categories**	**Question from OFNAHLS**
Sociodemographic variables		
Age group (AGEGRP)	• 15 - 19 • 20 - 29 • 30 - 39 • 40+	A.6 Respondent's date of birth (yy/mm/dd)
Gender (A7)	• Male • Female	A.7 Respondent's gender
Marital status (MARSTAT)	• Married/common-law • Separated/divorced/ widowed • Never married	Q.3 Are you... (married, living common law, separated, divorced, widowed, or never been married?)
Education (SCHOOL)	• Grade school or less • High school/vocational school • Some college/university or greater	Q.7 How far have you gone in your education? (grade school, some high school, high school graduate, vocational or trade school, apprenticeship, some college/university, college/university graduate, some postgraduate education, completed professional degree)
Attendance at residential schools (Q9)	• No • Yes	Q.9 Did you ever live at a residential school? (no, yes)
Has children in their care (Q6A)	• No • Yes	Q.6a Do you presently have any children in your home, under your care? (no, yes)
Cultural variables		
Speak a First Nations language (FNLANG)	• No • Yes	Q.1 What languages do you speak? a. Cree b. Ojibway c. Oji-Cree d. Mohawk
Familiarity with the traditional way of life (Q12)	• Very familiar • Somewhat familiar • Not familiar	Q.12 How familiar are you with the traditional way of life... (very familiar, somewhat familiar, not at all familiar?)

INDEPENDENT VARIABLES		
Variable (NAME)	**Categories**	**Question from OFNAHLS**
Religious faith (RELIG)	• None • Traditional • Catholic • United • Anglican • Other	Q.14 What, if any, is your faith? (none, traditional, Catholic, United church, Anglican, Presbyterian, Baptist, Pentecostal, other)
Sexual behaviour		
Age at first sexual intercourse (AGEVAG)	• Less than 13 years • 13 - 16 years • 17+ years	Q.40a Have you ever had sexual intercourse with a partner? (no, yes) Q.40b If yes, at what age did you first have sexual intercourse? (years of age)
Number of sexual partners in the last 12 months (NUMPRT)	• One • 2 - 4 • 5+	Q.43a Have you ever had sex with a man? (no, yes) Q.43b If yes, how many male partners have you had sex with in the past 12 months? (none, one, 2-4, 5-9, 10-14, 15-24, 25 or more) Q.44a Have you ever had sex with a woman? (no, yes) Q.44b If yes, how many female partners have you had sex with in the past 12 months? (none, one, 2-4, 5-9, 10-14, 15-24, 25 or more)
Has a steady sex partner (Q36A)	• No • Yes	Q.36a Do you have a steady sex partner at the moment? (no, yes)
Length of time with steady sex partner (PARTNER3)	• No steady partner • One year or less • Greater than one year	Q.36a Do you have a steady sex partner at the moment? (no, yes) Q.36b If you do have a steady sex partner, how long have you been together? (1 year or less, between 1 and 5 years, between 6 and 10 years, over 10 years)
Participation in anal intercourse in the last 12 months (ANALSEX)	• No • Yes	Q.47b Please place a check mark beside the sexual activities you have done while sober in the past 12 months. g. Anal sex without a condom h. Anal sex with a condom Q.47c Please place a check mark beside the sexual activities you have done while drunk or high in the past 12 months. If you have not been drunk or high in the past 12 months leave blank. g. Anal sex without a condom h. Anal sex with a condom
Location or sex partner (PARTLOC)	• Outside reserve • Within reserve • Both within and outside reserve	Q.45 In the last 12 months did you have any sex partners from within this community? (no, yes) Q.46 In the last 12 months did you have any sex partners from outside of this community? (no, yes)

INDEPENDENT VARIABLES		
Variable (NAME)	**Categories**	**Question from OFNAHLS**
Contraceptive behaviour		
Use of contraceptives other than condoms (OTHBC)	• No • Yes	Q.48a Do you use any protection FOR FEMALES - to keep from getting pregnant? FOR MALES - to keep a woman from getting pregnant? (never, sometimes, always, not applicable - not within childbearing years or permanently sterilized) Q.48b If you use protection to avoid pregnancy, what do you use? b. Spermicide c. The birth control pill d. IUD e. Diaphragm
Sterilized/no longer in child-bearing years (STERILE)	• No • Yes	Q.48a Do you use any protection FOR FEMALES - to keep from getting pregnant? FOR MALES - to keep a woman from getting pregnant? (never, sometimes, always, not applicable - not within childbearing years or permanently sterilized)
Worry about pregnancy (WPREG)	• Sometimes or always • Never	Q.53a Do you worry about FOR FEMALES - getting pregnant as a result of sex? FOR MALES - getting a women pregnant as a result of sex? (never, sometimes, always)
Risk awareness		
History of STD (Q24A)	• No • Yes	Q.24a Have you ever had a sexually transmitted disease such as gonorrhoea, syphilis, herpes, or chlamydia? (no, yes)
Heard of AIDS (Q30)	• No • Yes	Q.30 Have you heard of the disease AIDS? (no, yes)
Ever tested for HIV (Q31A)	• No • Yes	Q.31a Have you ever been tested for AIDS or HIV? (no, yes)
Know someone with AIDS (KNOWPWA)	• No • Yes	Q.32 How many people have you known who have AIDS or who have tested positive for the AIDS virus? If you have not known anybody who has AIDS or the AIDS virus, please put a zero in the space provided. (total)
General AIDS knowledge (GENKNOW)	• High (4 out of 4 questions correct) • Less than 4 correct or never heard of AIDS	Q.30 Have you heard of the disease AIDS? (no, yes) Q.57a You can tell if people have the AIDS virus just by looking at them. (false*, true, don't know) Q.57d There is no cure for AIDS at present. (false, true*, don't know) Q.57g Most people with AIDS will die from it. (false, true*, don't know) Q.57l There is a blood test that will tell you if you have been exposed to the AIDS virus. (false, true*, don't know) * correct answer

INDEPENDENT VARIABLES		
Variable (NAME)	**Categories**	**Question from OFNAHLS**
Overall AIDS transmission knowledge (HIGHKNOW)	• High (18 or more questions correct out of 20) • Less than 18 correct or never heard of AIDS	Q.30 Have you heard of the disease AIDS? (no, yes) A person can get AIDS from... Q.56a Receiving a blood transfusion. (false*, true, don't know) Q.56b Donating or giving blood. (false*, true, don't know) Q.56c Working near someone with AIDS. (false*, true, don't know) Q.56d Eating in a restaurant where the cook has AIDS. (false*, true, don't know) Q.56e Kissing on the cheek a person who has AIDS. (false*, true, don't know) Q.56f Kissing - with exchange of saliva - a person who has AIDS. (false*, true, don't know) Q.56g Shaking hands with or touching someone who has AIDS. (false*, true, don't know) Q.56h Using a plate, fork, or glass of someone who has AIDS. (false*, true, don't know) Q.56i Sharing needles for drug use with someone who has AIDS. (false, true*, don't know) Q.56j Being coughed or sneezed on by someone who has AIDS. (false*, true, don't know) Q.56k Attending school with someone who has AIDS. (false*, true, don't know) Q.56l Mosquitoes or other insects. (false*, true, don't know) Q.56m Having sex without a condom with someone who has AIDS. (false, true*, don't know) Q.56n Using public toilet seats. (false*, true, don't know) Q.56o Sharing needles for ear piercing with someone who has AIDS. (false, true*, don't know) Q.56p Sharing tattoo needles with someone who has AIDS. (false, true*, don't know) Q.57a A pregnant woman who has AIDS can give it to her baby. (false, true*, don't know) Q.57j Women can get the AIDS virus through sex with a man who has AIDS. (false, true*, don't know) Q.57m Men can get the AIDS virus through sex with a woman who has AIDS. (false, true*, don't know) Q.57n A mother can pass AIDS to her baby through breast feeding. (false, true*, don't know) * correct answer

INDEPENDENT VARIABLES		
Variable (NAME)	**Categories**	**Question from OFNAHLS**
Knowledge of AIDS transmission through sexual contact (SEXKNOW)	• High (4 out of 4 questions correct) • Less than 4 questions correct or never heard of AIDS	Q.30 Have you heard of the disease AIDS? (no, yes) A person can get AIDS from... Q.56f Kissing - with exchange of saliva - a person who has AIDS. (false*, true, don't know) Q.56m Having sex without a condom with someone who has AIDS. (false, true*, don't know) Q.57j Women can get the AIDS virus through sex with a man who has AIDS. (false, true*, don't know) Q.57m Men can get the AIDS virus through sex with a woman who has AIDS. (false, true*, don't know) * correct answer
Self-perceived risk of developing AIDS (PRISK)	• Some chance or greater • Small chance • Almost certain I will not	Q.33 Considering all of the different factors that may contribute to AIDS, what would you say are your chances of developing AIDS? (already have it, I am almost certain I will, a large or very large chance, some chance, a small or very small chance, I am almost certain I will not)
Worry about AIDS/STDs (Q54Q55)	• Never • Sometimes • Always	Q.54 Do you worry about getting AIDS as a result of sex? (never, sometimes, always) Q.55 Do you worry about getting a sexually transmitted disease, other than AIDS as a result of sex? (never, sometimes, always)
Condom knowledge/attitudes		
Perceived efficacy of condoms to prevent AIDS (CONDEFFR)	• Very well • Well • Not well or don't know how well	Q.58a How well do condoms work in preventing AIDS... (very well, well, not well, don't know how well, don't know the method)
Not embarrassed to obtain condoms (NOTEMB)	• No (some embarrassment) • Yes (not embarrassed)	Q.71 I would be embarrassed to buy condoms in a store. (disagree, don't know, agree) Q.77 I would be embarrassed to go to the Health Centre to get condoms. (disagree, don't know, agree)
Sexual communication		
Trust person to tell the truth about their sexual past (Q82)	• Disagree • Don't know • Agree	Q.82 When you are going to have sex with someone, you can usually trust the person to tell the truth about their past sexual experiences. (disagree, don't know, agree)

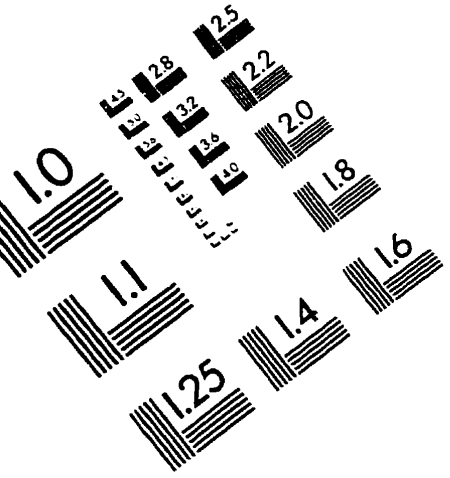
INDEPENDENT VARIABLES		
Variable (NAME)	**Categories**	**Question from OFNAHLS**
Ease in telling partner they want to have sex (Q51)	• Easy • Sometimes easy, sometimes difficult • Difficult	Q.51 How easy do you find it to let your partner(s) know when you want to have sex? (easy, sometimes easy/sometimes difficult, difficult)
Attitudes towards communication between sexual partners (ATT_TALK)	• Composite score [range (-10) to (10)] where a positive score indicates willingness to talk about HIV status or past sexual experiences with a partner	Q.74 Before having sex, I would talk with my partner about my past sexual experiences. (disagree, don't know, agree) Q.80 I would be willing to ask my sexual partner whether they had the AIDS virus. (disagree, don't know, agree) Q.85 Before having sex, I would talk with my partner about his or her past sexual experiences. (disagree, don't know, agree) Q.88 I would tell my sexual partner if I thought I had the AIDS virus. (disagree, don't know, agree)

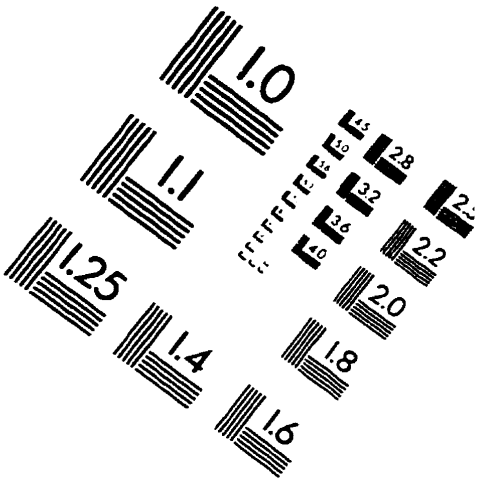
APPENDIX E: Characteristics of Individuals According to Number of Sex Partners

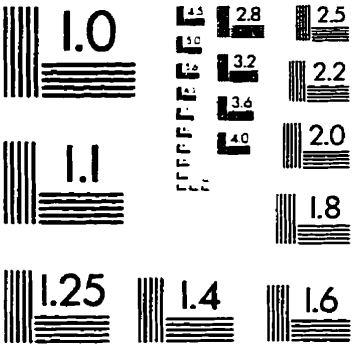
TABLE 16: Number of Sex Partners in the Last 12 Months Among First Nations People Living On Reserve in Ontario			
	One parter (%)	Two to four partners (%)	Five or more partners (%)
Overall (n = 398)	59.5	29.1	11.4
Age group ***			
15-19 (n = 73)	39.5	46.2	14.1
20-29 (n = 155)	57.5	27.3	15.2
30-39 (n = 105)	69.3	22.9	7.8
40+ (n = 63)	71.5	23.8	4.4
Gender ***			
Male (n = 197)	46.9	35.2	17.9
Female (n = 201)	71.9	23.1	5.0
Marital status ***			
Married/common law (n = 193)	84.8	12.8	2.4
Separated/widowed/divorced (n = 32)	38.3	41.9	19.7
Never married (n = 173)	35.2	44.9	19.9
Education *			
Grade 8 or less (n = 50)	52.6	36.3	11.1
Some/completed high school or vocational school (n = 250)	55.5	32.4	12.1
Some/completed college/university (n = 96)	73.6	16.5	9.9
Steady sex partner ***			
No (n = 131)	34.1	43.9	22.0
Yes (n = 266)	71.9	21.9	6.2
Participation in anal intercourse			
No (n = 353)	61.4	27.8	10.8
Yes (n = 47)	44.5	39.6	15.9
Location of sex partners ***			
Outside community (n = 105)	50.5	36.3	13.2
Within community (n = 162)	80.6	14.8	4.6
Both (n = 78)	-	68.1	31.9

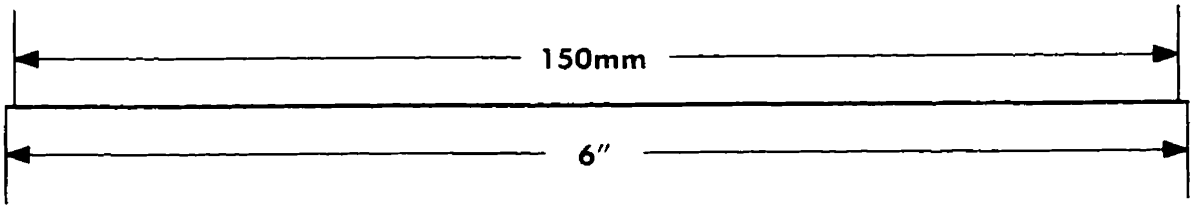
Weighted by age, sex, language and region.
Only people who reported participating in sexual intercourse were included.
Chi-squared tests were used to determine significance.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

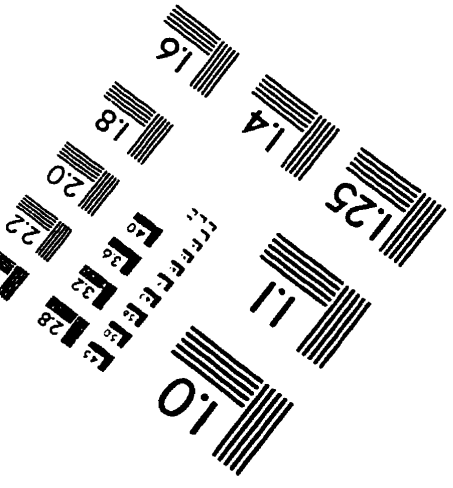
IMAGE EVALUATION TEST TARGET (QA-3)

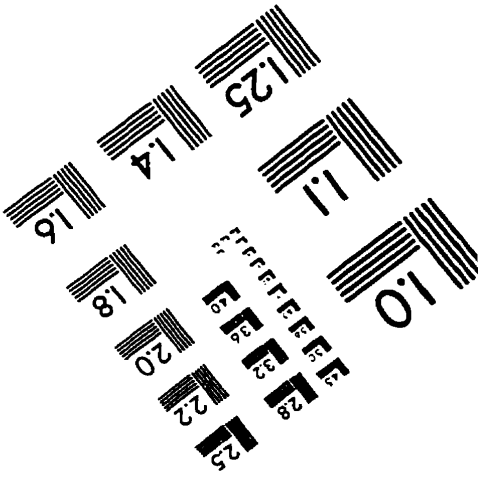












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