ABSTRACT

Objective: To examine the contribution of patterns of sexual partnering to the spread of HIV/STD infection between communities.

Methods: 651 randomly selected Aboriginals from 11 reserve communities in Ontario were interviewed. This analysis included those who had sex in the previous 12 months. Descriptive statistics and multivariate analyses identified associations with patterns of sexual partnering.

Results: 22% reported having partners from both within and outside the community, 51% from within only, and 27% from outside only. Those with partners from both within and outside were more likely to be male, unmarried, from a remote community, have more sexual partners and perceive that their behaviour placed them at higher risk of HIV/STD infection. They were least likely to perceive their community to be at risk from their behaviour.

Conclusions: Findings suggest that Aboriginal communities are not insulated and that HIV could spread rapidly if introduced.

ABRÉGÉ

Objectif : examiner la contribution des types de partenariat sexuel à la propagation du VIH et des MTS entre les communautés.

Méthodes : 651 Autochtones choisis au hasard dans 11 communautés des réserves de l'Ontario ont été interviewés. L'analyse comprenait les individus ayant eu des relations sexuelles au cours des 12 mois précédents. Les statistiques descriptives et les analyses multivariées ont identifié des associations selon les types de partenariat sexuel.

Résultats : 22 % ont déclaré avoir eu des partenaires tant au sein qu'à l'extérieur de la communauté, 51 % au sein de la communauté seulement, et 27 % à l'extérieur de la communauté seulement. Les individus ayant eu des partenaires tant à l'intérieur qu'à l'extérieur de la communauté étaient plus souvent des hommes, célibataires, venant d'une communauté éloignée, qui étaient plus susceptibles d'avoir davantage de partenaires sexuels et de penser que leur comportement leur faisait courir des risques plus élevés d'être infectés par des MTS et le VIH. Ils étaient aussi les moins susceptibles de percevoir le risque qu'ils faisaient courir à leur communauté par leur comportement.

Conclusions : les résultats suggèrent que les communautés autochtones ne sont pas isolées contre le risque et que le VIH pourrait rapidement se propager s'il était introduit.

Sexual Partnering and Risk of HIV/STD Among Aboriginals

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In 1990 the Joint National Committee on Aboriginal AIDS Education and Prevention expressed concern that the Human Immunodeficiency Virus (HIV) epidemic may pose a significant threat to their communities. Canadian Aboriginals have rates of sexually transmitted disease (STD) as much as four times higher than the general population.^{1,2} As of March 31, 1996, 187 Aboriginal cases of AIDS had been reported to the Laboratory Centre for Disease Control, Health Canada for an estimated rate of 18.7 per 100,000.³ Most agree that these numbers understate the true level of the epidemic due to under-reporting of ethnicity.^{3,4} Information on the prevalence of HIV infection is limited to small studies of specific sub-groups (i.e., injection drug users, street people, prisoners, those attending STD clinics) in large urban centres in Western Canada.⁵⁻⁷ Information on behaviours associated with the transmission of HIV infection is even more limited.⁸ A review of studies conducted on American Indians and Alaska Natives suggests similarities between the

HIV epidemic among Canadian and American Aboriginals.⁹⁻¹¹ Early in the epidemic there was a general belief that on-reserve populations would be less threatened by HIV infection since they were more insulated.

The extent to which HIV and other STDs are spread in a population depends on a number of factors including the probability that a particular sexual partner is infected, the level of infectivity of the partner, and the number and types of unprotected sexual exposures. Little is known about the patterns and processes of sexual partnering. A survey of American adults indicates that partner selection is not random, but to a great extent is determined by one's social network and environment.¹²

This paper reports on how patterns of partner selection and sexual behaviour contribute to the risk of HIV/STD infection among Aboriginals living on-reserve in Canada. First, it describes the community affiliation of sexual partners and identifies individual and community characteristics associated with each pattern of partner selection. Second, it examines the risk for HIV/STD infection associated with the sexual behaviour engaged in by those with different types of sexual partnering patterns. Third, it describes the perceived level of HIV/STD risk for the individual and the community.

METHODS

Study population

Approximately one million people (4% of the Canadian population) self-identify as Aboriginal. Of these, 121,867 are registered Indians in Ontario, of whom 63,422 live on-reserve.¹³ The data used in this analysis are part of a large survey, "The

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Ontario First Nations AIDS and Healthy Lifestyle Survey."¹⁴ The study was developed in partnership with the health directors of 4 Aboriginal Provincial Territorial Organizations (PTOs), the Office of the Chiefs of Ontario, and representatives from 11 First Nations in Ontario.

The 11 participating reserve communities represent an on-reserve population of 6,100, or approximately 10% of the registered Indians living on-reserve in Ontario. All 4 PTOs and the Aboriginal languages, Cree and Ojibway, were represented in similar proportions to the total on-reserve population. The sample under-represented individuals who spoke only English, and those who live in the northwestern region of the province.

Sample

The study sample was selected in proportion to the on-reserve population in each Provincial Territorial Organization and community. Within each community, the sample was randomly selected from the list of on-reserve members, stratified by gender and four age groups (15-19, 20-29, 30-39, 40 and older). Data were weighted by age and sex to correct for the stratified selection, and by region and language to ensure the sample was representative of the Ontario on-reserve population.

A total of 651 individuals (87.3% of those randomly selected) agreed to be interviewed. The primary reason given for non-participation was "too busy." There were no gender, age or marital status differences between those who did and did not participate. The results presented in this paper are based on a sub-sample of 380 respondents (weighted $n=369$) who reported having sex during the 12 months prior to the interview, provided information on the community affiliation of their sexual partner(s), and answered all questions included in the multivariate analysis.* Individuals who were monogamous in the 12 months prior to the interview have

* 282 individuals (weighted data) were not included in the analysis: 64 reported no sexual activity in the past year; 64 had missing data on variables necessary to calculate sexual risk; 123 were missing data on one or both of the partner type questions; and 31 had missing data on one or more of the other questions included in the multivariate analysis.

TABLE I
Characteristics of the Study Population and Sub-sample Used in this Analysis*

Characteristics	Study Population (N=651) Percent	Analysis Sub-sample (N=369) Percent	P-value for significant z-scores
Gender			
Male	50.6	54.8	N.S.
Female	49.4	45.2	N.S.
Age Group (years)			
15-19	15.3	16.1	N.S.
20-29	29.4	39.0	0.0009
30-39	23.4	23.7	N.S.
40 and older	31.9	21.2	0.0001
Education			
Grade school or less	25.7	12.9	0.0001
Some high/vocational school	54.6	64.1	0.002
Some college/university	19.7	23.1	N.S.
Marital Status			
Single, never married	37.7	45.2	N.S.
Married/common-law	48.9	45.4	N.S.
Separated/divorced/widowed	13.4	9.3	N.S.
Sexual Orientation Over Lifetime, of Sexually Active Individuals			
Heterosexual	96.9	96.1	N.S.
Gay/bisexual	3.1	3.9	N.S.
Nation			
Ojibway	77.3	82.6	0.02
Iroquois	6.1	6.0	N.S.
Cree	16.6	11.3	0.01
Region of Province			
North	32.9	29.8	N.S.
Central	25.2	26.9	N.S.
South	42.2	43.2	N.S.
Remoteness†			
Urban	24.6	25.2	N.S.
Rural	47.5	50.3	N.S.
Semi-remote	11.4	13.2	N.S.
Remote	16.6	11.3	0.01
Population of Reserve			
Small (1-500)	32.3	37.7	N.S.
Medium (501-800)	35.9	36.0	N.S.
Large (801 and over)	31.8	26.4	N.S.

* The sub-sample includes those individuals who reported having sex during the previous 12 months and who provided information on partner selection; it reports weighted data.

† Remote and semi-remote communities have no year-round land access. Remoteness is defined by the Department of Indian Affairs and Northern Development, Ottawa.

been included in the sub-sample (Note: practising monogamy or serial monogamy is not a guarantee of safety – Diaz and colleagues reported 17% of men and 35% of women who were HIV+ reported having only one sexual partner during the previous five years.¹⁵) A description of the study sample is provided in Table I.

Although not included in Table I, 2.8% of the sample reported bisexual activity and 0.2% of the sample reported exclusively gay sexual activity within their lifetime. In addition, 1.4% reported injecting non-prescription drugs in the past five years. There were no significant differences

between the sample and the analysis sub-sample on any of these variables. Males were not significantly more likely than females to report practising gay, bisexual or injection drug use behaviour within their lifetimes ($p=0.35$, 0.28 and 0.42 respectively), although the small proportion reporting these behaviours may leave insufficient power to detect a significant difference.

Data collection

Face-to-face interviews were conducted by trained First Nations interviewers from within the participating communities. In communities with both male and female

TABLE II
Individual and Community Characteristics Associated
with Each Sexual Partnering Pattern (weighted N = 369)

Variables	Percent of Sub-sample Reporting Each Partnering Pattern		
	Within and Outside	Outside Only	Within Only
Individual Characteristics			
Gender ***			
Male	29.5	26.2	44.3
Female	12.2	27.6	60.2
Age Group (years)***			
15-19	29.1	40.8	30.1
20-29	27.4	26.5	46.1
30-39	12.7	25.2	62.1
40 and older	16.2	19.4	64.4
Education **			
Grade school or less	28.0	21.6	50.4
Some high/vocational school	25.2	28.5	46.3
Some college/university	8.7	27.0	64.3
Marital Status ***			
Single, never married	32.0	38.8	29.2
Married/common-law	10.2	14.3	75.5
Separated/divorced/widowed	29.4	31.1	39.5
Language Spoken *			
English only	18.2	34.4	47.4
First Nation language	24.3	21.3	54.4
Community Characteristics			
Remoteness ***			
Urban	12.1	36.9	51.0
Rural	20.8	28.8	50.4
Semi-remote	13.5	16.5	70.0
Remote	57.2	7.5	35.3
Region of Province ***			
Northern Ontario	39.1	25.2	35.7
Central Ontario	15.0	27.2	57.8
Southern Ontario	13.4	27.8	58.8
Population of Reserve ***			
Small (1-500)	22.1	34.5	43.4
Medium (501-800)	13.3	28.5	58.2
Large (801 or larger)	32.7	13.0	54.3

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

interviewers, respondents were interviewed by individuals of the same gender; however, in four of the communities all interviewers were female, and in one community the sole interviewer was male. Interviews were completed in private in the respondent's home (46.8%), the band office (20.0 %), the interviewer's home (12.2%), the health centre (10.8%), or another private place (10.2%).

The research group developed a unique method for administration of the instrument to address a number of challenges related to research on sensitive topics within the Aboriginal population.†

Variables specific to this analysis include: socio-demographic characteristics of the individual, characteristics of the reserve community, sexual behaviour, and perceived risk of acquiring HIV/STDs through sexual contact and threat to the community. Community affiliation of the sexual partner(s) was measured by two questions that addressed whether the respondent had any sex partners from within their community and whether they had any sex partners from outside their community in the previous 12 months. Sexual partnering was subsequently categorized as "no sexual partners," "only with-

in," "only outside," or "both within and outside" the community.

Data analysis

Descriptive statistics (chi-square) were used to identify bivariate associations between sexual partnering and individual and/or community characteristics. Variables found to be statistically significant in the bivariate analysis were included in a logistic regression model, and odds ratios were calculated.¹⁶

RESULTS

Community affiliation of sexual partners

Fifty-eight percent of the total sample reported having had a sexual partner within the 12 months prior to the interview. The age of the study sample ranged from 15 to 93 years (mean=32.0, SD=14.0). Individuals reporting no partners in the previous 12 months were primarily younger, single individuals and older individuals who were separated, widowed or divorced. Of those having sex in the previous 12 months and reporting the community affiliation of their partner(s), 51% reported that all their sexual partners were from within their community, 27% reported that all their sexual partners were from outside their community, and 22% reported having sex with partners from both within and outside.

Sexual partnering pattern was associated with the socio-demographic characteristics of the respondent (see Table II). Individuals having sex with partners from both within and outside the community were more likely to be male, in the 15-19 or 20-29 year age groups, not married, with an education level of high school or less, and were able to speak a First Nations language. There were no significant associations between sexual partnering and sexual orientation of the respondent, alcohol use in the last week, or recreational drug use in the past month. Sexual partnering also was associated with the characteristics of the community in which the respon-

† Interviewers who could speak the language and dialect were hired from within each community and trained to conduct face-to-face interviews. Translation of at least a portion of the instrument into either Cree or Ojibway was necessary in 12.6% of interviews. An answer booklet was utilized for sensitive questions – specifically on sexual behaviour and alcohol and drug consumption. Interviewers would read the questions from a master interview schedule and respondents would check off answers in their answer booklet and then personally seal it in an envelope. In cases where respondents could not read English, the interviewer would lead the respondent through a master answer booklet, while the respondents checked their answers in their own booklet. To increase respondents' comfort and understanding, at the beginning of the sexual behaviour section respondents were given the opportunity to choose between either common words or technical terms to describe the sexual acts.

dents lived. Individuals who had sexual partners both from within and outside the community were more likely to live on a reserve in the Northern region of the province, in a remote area with no year-round land access, and with a large population.

Sexual activity and partnering pattern

Fifty-eight percent of those who had sex in the previous 12 months reported having had only one sexual partner, 30% had sex with two to four partners, and 12% had five or more partners during that time. There was a strong association between the number of partners in the previous 12 months and the community affiliation of the sexual partners ($p < 0.0001$). Of those who had sex with partners from both within and outside the community, 66% reported having two to four partners compared to 15% of those with partners only from within and 31% of those with partners only from outside. Thirty-four percent of those with partners from both within and outside the community reported having five or more partners in the previous 12 months compared with 3% of those with partners only from within, and 11% of those with partners only from outside.

Table III shows the types of sexual activities reported by those who were sexually active over the 12-month period and variations by sexual partnering. Almost all respondents in the sub-sample (98.4%) reported hugging and/or kissing and/or mutual masturbation, 87.4% reported engaging in vaginal intercourse, 52.6% reported oral sex, and 13.4% engaged in anal intercourse. When individuals were asked if they used condoms "never," "sometimes," or "always," only 9.0% of those who engaged in vaginal intercourse reported "always" using condoms, and 11.2% of those who engaged in anal intercourse reported "always" using condoms.

Individuals with partners from both within and outside the community appeared to engage in a greater variety of sexual activities. They were more likely to engage in oral sex than the other two groups (71.7% versus 47.5% and 47.2%), and more likely to engage in anal intercourse (31.8% versus 6.1% and 9.3%).

TABLE III
Sexual Activities Engaged in Over the Previous 12 Months
by Sexual Partnering Pattern (weighted N = 369)

Sexual Activity	Partnering Pattern	Frequency of Condom Use			
		Never	Sometimes	Always	Not Applicable
Hug/Kiss/Masturbate	Within and outside				94.70
	Outside only				100.0
	Within only				99.16
	Total				98.41
Oral Sex	Within and outside	47.05	20.90	3.77	
	Outside only	30.43	9.01	8.09	
	Within only	36.89	6.80	3.46	
	Total	37.39	10.47	4.76	
Vaginal Intercourse	Within and outside	25.62	53.66	7.98	
	Outside only	47.10	34.52	7.58	
	Within only	62.86	15.84	7.93	
	Total	50.54	29.06	7.84	
Anal Intercourse	Within and outside	15.99	12.52	3.32	
	Outside only	3.46	2.39	0.29	
	Within only	6.02	1.90	1.36	
	Total	7.52	4.35	1.51	

TABLE IV
Logistic Regression Model of Individual and Community Characteristics
Associated with having Partners "Both Within and Outside" the Community
(weighted N = 369)

Variables*	Odds Ratio	95% Confidence Interval	p-Value
Gender			
Male	3.62	1.85 - 7.09	0.0002†
Age Group (years)			
20-29	1.13	0.51 - 2.50	0.7634
30-39	0.79	0.27 - 2.37	0.6820
40 and older	0.62	0.20 - 1.91	0.3994
Education			
Some high/vocational school	2.01	0.81 - 4.99	0.1331
Some college/university	0.93	0.27 - 3.19	0.9134
Marital Status			
Single	3.49	1.57 - 7.36	0.0019†
Separated/divorced/widowed	7.64	2.69 - 21.66	0.0001†
Language Spoken			
First Nation language	0.73	0.35 - 1.53	0.4072
Remoteness			
Rural	1.51	0.51 - 4.48	0.4612
Semi-remote	1.14	0.31 - 4.23	0.8475
Remote	12.98	1.37 - 122.90	0.0252†
Region of Province			
Northern Ontario	1.65	0.30 - 9.22	0.5669
Central Ontario	0.87	0.18 - 4.21	0.8629
Population of Reserve			
Small (1-500)	1.44	0.32 - 6.41	0.2299
Large (801 or larger)	0.90	0.14 - 5.76	0.9145

* Reference groups for odds ratio calculations are: female, age 15-19, education of grade 8 or less, married/common-law, English language only, urban (within 8 kilometres of an urban centre), southern Ontario reserve, medium population size (501-800 people).

† Wald chi-square <0.05

They were also more likely to report condom use either "some of the time" or "always" when having vaginal or anal intercourse. While their use of condoms during

vaginal or anal intercourse was higher, condoms were not consistently used. Of individuals with partners from both within and outside, and who practised vaginal inter-

course, 29% never used condoms during vaginal sex, 62% sometimes used them, and 9% always used them. During anal intercourse, 50% never used condoms, 39% sometimes used them, and 10% always used them.

Predictors of sexual partnering pattern

Individual and community characteristics significantly associated with sexual partnering in the bivariate analysis were entered into a multivariate logistic regression model comparing individuals who had partners from both within and outside with individuals who had partners from within only or outside only (see Table IV). Odds ratios indicate that those more likely to have partners from both within and outside the community are male (OR=3.6), separated, widowed or divorced (OR=7.6), single (OR=3.4), and living in a remote community (OR=13.0). Age group, level of education, language spoken, geographic location of the reserve, and population of the reserve were not significant in the multivariate model.

Perceived risk of infection from AIDS and other STDs

Over 9% of individuals who said they were sexually active over the previous year had not heard of AIDS. Seventeen percent of individuals with partners from both within and outside of the community said they had not heard of AIDS, compared to 6.9% of those with partners only from outside the community, and 7.8% of those with partners only from within the community ($p=0.04$). Those who had not heard of AIDS were not asked about perceived risk or how much they worried about HIV infection.

When respondents were asked if they worried about getting AIDS as a result of sex, 53% said they worried "sometimes" or "always." Those with partners from both within and outside the community were more likely to worry ($p<0.0001$). Eighty-one percent of them said they worried about getting AIDS, compared to 60% of those with partners only from outside the community, and 38% of those with partners only from within the community.

To identify the extent to which AIDS is perceived as a threat to Aboriginal commu-

nities, individuals were asked whether they agreed or disagreed with a series of statements. When asked whether AIDS has become a health problem for First Nations people, 42% said yes. Respondents most likely to perceive AIDS as a problem for First Nations people were those who had sex with partners only from within the community (46%) and those with partners only from outside the community (41%). Only 36% of respondents with partners from both within and outside perceived AIDS as a threat for the community ($p=0.001$). Those with partners from both within and outside the community also were less likely to perceive that the behaviour of the people in the community would put the community at risk for AIDS ($p=0.01$). Twenty percent of them agreed with the statement, "People in our community do not do things that would put them in danger of getting AIDS" compared with 12% of those with partners only from within the community, and 9% of those with partners only from outside. Only 8% of the respondents agreed with the statement, "AIDS is usually found in large cities and will not likely reach First Nations communities" and there were no statistically significant differences by partner type.

DISCUSSION

The results of the "Ontario First Nations AIDS and Healthy Lifestyle Survey" indicate that sexual behaviour poses a risk for HIV/STD infection in the Aboriginal communities surveyed. A large proportion of the population engages in vaginal and/or anal intercourse, and does so with multiple partners and without consistent use of condoms. Data on sexual partnering patterns indicate that a sizable proportion of individuals have sex with partners from both within and outside their community. These individuals have more sexual partners than either those with partners only from within or only from outside of the community. Those with partners from both within and outside the community serve as a sexual bridge between communities, a possible pathway for the transmission of HIV/STD. These individuals perceive themselves to be at

risk of HIV infection but were the least likely to perceive their communities as being at risk from HIV. In addition, they were least likely to have heard of AIDS. As a result, persons living on-reserve are not insulated from the sexual transmission of HIV infection from outside communities.

The pattern of sexual partnering and sexual risk reported in this study suggest that if the pool of infection among the partners from outside the community increases, HIV will spread rapidly into and within the communities. In addition, once HIV is transmitted into the community, the respondents reporting two or more partners from within the community would provide a significant transmission risk within the community itself.

Individuals who are single or separated/divorced/widowed were more likely to have had sexual partners from within and outside of the community. In part, this represents the finding that these individuals are more likely to have had more than one partner. Also, these individuals may be more available to travel outside of the community than married individuals.

Individuals who live in remote communities are significantly more likely to have sexual partners from both within and outside of the community. Although untested, this could be partly due to an increased likelihood of being away from the community for longer periods when they do leave, due to the effort and cost of the trip. In addition, for these individuals a trip outside of the community would typically require an overnight stay – likely in a hotel. Such a trip could induce a vacation-like atmosphere, which has been suggested to lead to higher rates of sex, including unprotected intercourse.¹⁷

Educators, health care providers and policy makers are faced with an enormous challenge. Convincing individuals that their behaviour may place them and their communities at risk of HIV infection is not an easy task in light of the lack of HIV prevalence data and the existence of more visible and pressing health and social problems in Aboriginal communities.

This survey was not designed to obtain in-depth/detailed information on the nature of each specific sexual partnership,

the density of the sexual networks within the community, and the social structure of partnering prior to the one-year period. The survey instrument gathered limited information on the use of condoms by partner type (primary or casual partners) or by partnering pattern (within, outside, or both within and outside of the community). It is possible that individuals used condoms more frequently with casual and less frequently with primary partners, and it is also possible that they used condoms more frequently with individuals from outside of the community and less often with partners from within. Thus the risk scenario presented in this paper provides a less conservative estimate of the spread of HIV. Such information is essential in constructing epidemiologic models of infection spread and developing effective intervention messages. While limited, the information collected serves as a starting point.

The "Ontario First Nations AIDS and Healthy Lifestyle Survey" is the first Canadian survey to provide data on the sexual behaviour of a somewhat representative sample of Aboriginals living on-reserve in the province of Ontario. We were unable to locate studies of similar populations in other countries. To our knowledge this is the first attempt to examine how the community affiliation of sexual partners may facilitate or restrict the transmission of HIV and other STDs in such communities. Given the lack of research in this area, it is difficult to determine the extent to which our results and conclusions can be generalized to other Aboriginal populations. Due to the high rate of unprotected intercourse found in our study, and with the new more culturally sensitive (traditional) educational programs that have been developed by Aboriginal people, for Aboriginal people, the prevalence of unprotected intercourse in general is likely to have decreased, and individuals may be more likely to use condoms outside of a

monogamous, committed relationship, whether that relationship is within or outside of the community.¹⁸ Aboriginal communities should be encouraged to consider the results of this analysis and assess whether these Ontario findings are relevant to their situation. At a minimum, this study offers a conceptual and methodological prototype that may assist other communities in conducting research in this area.

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Meegwetich!

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