

## Longitudinal Patterns of Sexual Behavior and Condom Use in a Cohort of HIV-Negative Gay and Bisexual Men in Vancouver, British Columbia, Canada, 1995–2000

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**Objective:** To characterize longitudinal patterns of sexual behavior in a cohort of young gay and bisexual men and determine their reasons for not using condoms.

**Methods:** Prospective data from a cohort of young gay and bisexual men aged 18 to 30 years were studied. Study participants had completed a baseline questionnaire and HIV test between May 1995 and April 1996 and four annual follow-up questionnaires.

**Results:** A total of 130 HIV-negative Vanguard participants met the eligibility criteria for this analysis. The median age at baseline was 26 years (range, 24–28). Most were white (79%), had completed high school (85%), were currently employed (82%), lived in stable housing (95%), and reported annual incomes of  $\geq$ \$10,000 (82%). (All dollar amounts are given in Canadian dollars.) Consistently over the 5-year study period, >70% of study subjects reported having  $\geq$ 1 regular male sexual partners in the previous year. During each of the five successive 1-year periods, between 34% and 40% of respondents reported having had unprotected receptive anal intercourse with regular partners. Slightly fewer individuals (between 29%–39%) reported having had unprotected insertive anal intercourse with regular partners. Between 13% and 25% of participants reported having had insertive unprotected anal intercourse with casual sexual partners; and between 9% and 18% reported having had unprotected receptive anal intercourse with casual sexual partners. Reasons for engaging in unprotected anal intercourse varied depending on type of sexual partnership.

**Conclusion:** High-risk sexual behaviors remained fairly consistent over a 5-year period in this study. This suggests that it is critically important to understand the motivations for unprotected sex when designing and implementing programs aimed at reducing HIV risk among young gay and bisexual men.

**Key Words:** Gay men—Bisexual men—Sexual behavior—Risk factors—Unprotected anal intercourse—Condom use.

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Recent studies indicate that sexual risk-taking behavior and the incidence of HIV infection among North American gay and bisexual men appear to be increasing. In the United States, recent studies report an overall

prevalence of HIV infection of 7% in young gay and bisexual men in seven large urban centers and an increase in sexual risk-taking behaviors (1–3). Other recent reports from the United States and Canada indicate that the incidence of HIV infection among gay men has been rising in large urban centers (4–8). In San Francisco, incidence of HIV infection nearly doubled from 1996 to 1998 (6). In Canada, data from the province of Ontario indicate that the HIV infection rate among gay and bisexual men has more than doubled from 1.01 per 100 person years (py) in 1995 to 2.07 per 100 py in 1999 (7). In Vancouver, British Columbia, we previously reported an HIV incidence among young men who have sex with men of approximately 2% per annum (9). However, we have recently observed an increase in HIV incidence among young gay and bisexual men in our study from 1.9 per 100 py in 1995 to 5.0 per 100 py with respect to the number of sexual partners and frequency of unprotected anal intercourse, and to determine reasons given by cohort members for not using condoms while engaging in high-risk sexual behavior.

## METHODS

The Vanguard Project is an ongoing prospective cohort study of gay and bisexual men in the Greater Vancouver region, the methods for which have been described previously (10). Men who self-identified as gay or bisexual or who had sex with other men were eligible to participate if they were aged 18 to 30, lived in the Greater Vancouver region, and had not previously tested seropositively for HIV infection. Participants were recruited through community outreach at gay community events, community health clinics or local physicians, and through gay and mainstream media. After providing written informed consent, participants were referred to local HIV testing clinics, the study's research nurses, or a physician's office, where they completed confidential self-administered questionnaires and provided blood samples for HIV testing at baseline and annually thereafter.

### Study Instrument

Baseline questionnaires provide demographic data as well as information regarding sexual behavior. Data were collected on the numbers of male and female sexual partners in the previous year and lifetime, age at which respondents first engaged in sexual activity, and frequencies of specific consensual sexual practices over the previous year (e.g., insertive vs. receptive anal intercourse). Sexual behaviors were recorded for study subjects with one or more regular male sexual partners (men with whom respondents had sex more than once per month on average) and for those with  $\geq 1$  casual male sexual partners (men with whom they had sex less than once per month on average).

Respondents were asked to indicate the frequency of condom use during sexual encounters, reasons for inconsistent condom use as selected from a list of options, and whether they had had unprotected anal intercourse with a male partner known to be HIV positive at the time of intercourse. Four additional reasons for engaging in unprotected anal intercourse were added to the follow-up questionnaires. Because these options were added to the questionnaire at a later timepoint, we were

unable to determine the extent of change, if any, in their frequency from baseline to the follow-up periods, however, their frequency was analyzed for change over the follow-up periods.

The analysis presented here was restricted to those individuals who had completed a baseline questionnaire and HIV test between May 1995 and April 1996 as well as all four annual follow-up questionnaires between September 1996 and October 2000. Variables of interest in these analyses included sociodemographic characteristics such as age, ethnicity, income, housing status and education; sexual behavior variables including the frequency of receptive and insertive anal intercourse with regular and casual partners; the frequency of condom use during receptive and insertive anal intercourse; and reasons for not using condoms during anal sex. Questions about sexual activity were prefaced by a definition of sex (oral or anal intercourse) and referred to behavior over the previous 12 months.

## Statistical Analysis

We compared participants who had completed fewer than five questionnaires during our study period to those who had completed all five questionnaires. This comparison allowed us to determine whether those excluded varied in sociodemographic characteristic and sexual risk behavior from those included in the analysis.

The Cochran-Armitage Test was used to assess behavioral trends over time. The critical value for rejection was set at 0.05 and all  $p$  values are two-sided.

## RESULTS

We identified 130 HIV-negative study participants who met the criteria for this analysis. The sociodemographic characteristics of eligible study subjects at baseline are reported in Table 1. The median age of the participants was 26 years old (range, 24–28). Most were white, had completed high school, were currently employed, lived in stable housing, and reported annual incomes of at least \$10,000. (Dollar amounts are given in Canadian dollars.) Compared with those who had completed fewer than five questionnaires, participants who completed all five questionnaires were more likely to have completed a high school education (85% vs. 75%;  $p = .030$ ), live in stable housing (95% vs. 79%;  $p < .001$ ) and be employed (82% vs. 66%;  $p = .002$ ). In addition, those who completed all five questionnaires were less likely to have an income of  $< \$10,000$  (19% vs. 31%;  $p = .005$ ) and to have had sex with a woman in the past year (8% vs. 23%;  $p < .001$ ). The participants who completed fewer than five questionnaires did not differ significantly from those who had completed all five questionnaire in age, ethnicity, number of male sexual partners (casual or regular), and frequency of unprotected receptive or insertive anal intercourse.

The number of regular and casual male sexual partners reported for each year of the study is shown in Table 2. Throughout the 5-year period, a steady number of participants (between 72–79%), reported having had 1 or

**TABLE 1.** Baseline sociodemographic characteristics of 130 HIV-negative Vanguard Project participants, May 1995 to April 1996

Characteristic	n (%)
Age (yr)	
Median	26.0
Interquartile range	24–28
Ethnic group	
White	103 (79.2)
First Nations (Native American)	6 (4.6)
Other	21 (16.2)
Completed high school?	
Yes	111 (85.4)
No	19 (14.6)
Annual income (n = 124)	
Less than \$10,000	23 (18.6)
\$10,000–\$19,999	31 (25.0)
\$20,000–\$29,999	32 (25.8)
\$30,000 or more	38 (30.6)
Employment status	
Currently employed	105 (82.0)
Not currently employed	23 (18.0)
Stable housing	
Yes	123 (94.6)
No	7 (5.4)

Amounts shown in Canadian dollars. At the time of editing, \$CDN 1.00 = \$U.S. 0.65.

more regular male sexual partners in the previous year. Of those with regular partners, there was a decline in the number of individuals reporting having had 2 or more regular partners in the previous year. Moreover, over the course of the study, there was a significant decrease over time in the number of men reporting 3 or more regular partners in the previous year ( $p = .023$ ). A steady number of participants reported casual male sexual partners in the previous year. Of those men with casual partners, consistent numbers reported 2 or more casual male sexual partners. The number of casual partners did not differ significantly over time ( $p = .361$ ).

Table 3 shows the number of respondents who indicated having engaged in unprotected insertive or receptive anal intercourse with regular or casual partners at baseline and at follow-up. During the five successive periods, a steady number of respondents reported having had unprotected receptive anal intercourse with regular partners, whereas fewer reported having engaged in unprotected insertive anal intercourse with regular partners over the same period. Less than 20% of participants reported having had unprotected insertive anal intercourse with casual sexual partners, and slightly fewer men reported having had unprotected receptive anal intercourse with casual sexual partners during the same time period.

Tables 4 and 5 report reasons as indicated by participants for having engaged in unprotected anal intercourse with regular and casual partners. Table 4 shows the reasons participants cited at baseline and at follow-up for

not using condoms while engaging in anal intercourse with regular sexual partners. Four of the five most common reasons indicated for not using condoms were common at baseline and the four follow-up periods. These reasons included: “We are in a long-term relationship,” “We are in a monogamous relationship,” “We are both HIV-negative,” and “It feels better without a condom.” Conversely, reports that “The sex was too hot” were more common at baseline and sex being “more intimate” was a reason more often provided at follow-up. There were significant increases over time in the number of participants who stated “It was more intimate” ( $p = .010$ ), “We are both HIV-negative” ( $p = .017$ ) and “I wanted to try it” ( $p = .035$ ), as the reasons for not using condoms during receptive intercourse. There were marginally statistically significant increases over time in the number of participants stating “We didn’t have a condom at the time” ( $p = .063$ ) and “It feels better without a condom” ( $p = .054$ ), as well as a decrease in the number of participants stating that “The sex was too hot” ( $p = .078$ ) as the reasons for not using condoms.

The most commonly cited reasons for not using condoms during insertive intercourse with regular partners are comparable with those given for unprotected receptive anal intercourse with regular partners: “being in a long-term relationship,” “We are both HIV-negative,” “We are monogamous.” Reports that “The sex was too hot” ( $p = .051$ ) were given more often at baseline than at follow-up, and “it was more intimate” was a common reason at follow-up only. From baseline to follow-up there was a significant increase in the number of participants reporting that “the condom broke or slipped off” ( $p = .019$ ) and a marginally statistically significant decrease in the number of participants stating that “the sex was too hot” ( $p = .051$ ) as reasons for not using condoms during insertive intercourse with regular partners.

The most common reasons for engaging in unprotected receptive anal intercourse with casual partners in the previous year are highlighted in Table 5. During the 5-year study period, a steady number of participants reported engaging in this behavior. Respondents indicated “At the time I just didn’t care,” “I was drunk or stoned at the time,” “It feels better without a condom,” and “We are both HIV-negative” as the most common reasons for not using condoms, both at baseline and at follow-up. “We got carried away” and “The sex was too hot” were important reasons reported at follow-up. There was a significant decrease over time in the number of participants reporting “We didn’t have a condom at the time” ( $p = .041$ ), and a marginally statistically significant decrease in the number of participants reporting “I wanted

**TABLE 2.** Number and proportion of Vanguard Project participants reporting regular and casual male sexual partners in the previous year, at baseline and the subsequent 4 years of follow-up (n = 130)

	Baseline 5/95–4/96 n (%)	Year one 9/96–10/97 n (%)	Year two 9/97–10/98 n (%)	Year three 9/98–10/99 n (%)	Year four 9/99–10/00 n (%)
<b>Regular partners</b>					
None	31 (23.8)	28 (21.5)	33 (25.4)	34 (26.1)	36 (27.7)
1	51 (39.2)	58 (44.6)	63 (48.5)	63 (48.5)	62 (47.7)
2	27 (20.8)	23 (17.7)	20 (15.4)	21 (16.2)	20 (15.4)
≥3	21 (16.2)	21 (16.2)	14 (10.7)	12 (9.2)	12 (9.2)
Total	130 (100)	130 (100)	130 (100)	130 (100)	130 (100)
<b>Casual partners</b>					
None	32 (24.6)	30 (23.1)	29 (22.3)	26 (20.0)	29 (22.3)
1	8 (6.2)	16 (12.3)	11 (8.5)	20 (15.4)	16 (12.3)
2–19	42 (32.3)	35 (26.9)	41 (31.5)	31 (23.9)	31 (23.9)
≥20	48 (36.9)	49 (37.7)	49 (37.7)	53 (40.7)	54 (41.5)
Total	130 (100)	130 (100)	130 (100)	130 (100)	130 (100)

to try it" ( $p = .050$ ) as the reasons for not using condoms during receptive intercourse with casual partners.

The most common reasons given for unprotected insertive anal intercourse with casual partners are comparable with reasons given for unprotected receptive anal intercourse with casual partners. Respondents most often indicated "I was drunk or stoned at the time," "At the time I just didn't care," and "It feels better without a condom" as the reason for engaging in the unprotected anal intercourse. "We got carried away" was indicated by 50% to 67% of the participants at follow-up. There was a significant decrease in the number of participants reporting "We didn't have a condom at the time" ( $p = .010$ ), and a marginal statistically significant decrease in the number of participants who reported "I was drunk or stoned at the time" ( $p = .061$ ) as the reasons for unprotected intercourse. An average of only 4% of respondents indicated "He threatened to leave me if I didn't" or "He made me do it/he threatened me" as their reason for engaging in insertive or unprotected receptive anal intercourse with casual partners at baseline or at follow-up.

## DISCUSSION

Sexual risk-taking behavior, as measured by the frequency of condom use for anal sex, has remained fairly stable in this cohort. Over the 5-year study period, the proportion of men with 1 or more male sexual partners in the previous year, as well as the frequency of unprotected receptive and insertive anal intercourse with regular and casual partners has remained relatively constant. In addition, although the reasons for engaging in unprotected sex varied with casual versus regular partners, these reasons did not vary greatly by unprotected receptive versus insertive anal intercourse.

Previous work in this area has proposed a number of reasons why seronegative men engage in unprotected sex. Most notably, researchers have suggested that there is an increasing complacency toward HIV derived from optimism regarding advances in antiretroviral therapy. Published work in this area has suggested that complacency may relate to an increase in sexual risk-taking among some HIV-negative men (11–13). Another poten-

**TABLE 3.** Number and proportion of Vanguard Project participants reporting unprotected anal intercourse, at baseline and the subsequent four years of follow-up (n = 130)

	Baseline 5/95–4/96 (N = 130) n (%)	Year one 9/96–10/97 (N = 130) n (%)	Year two 9/97–10/98 (N = 130) n (%)	Year three 9/98–10/99 (N = 130) n (%)	Year four 9/99–10/00 (N = 130) n (%)
<b>Regular partner</b>					
Insertive anal intercourse	38 (29.2)	39 (30.0)	51 (39.2)	47 (36.2)	48 (36.9)
Receptive anal intercourse	45 (34.6)	52 (40.0)	50 (38.5)	44 (33.9)	52 (40.0)
Any anal intercourse	54 (41.5)	60 (46.2)	64 (49.2)	59 (45.4)	66 (50.8)
<b>Casual partner</b>					
Insertive anal intercourse	24 (18.5)	21 (16.2)	17 (13.1)	21 (16.2)	32 (24.6)
Receptive anal intercourse	21 (16.2)	12 (9.2)	15 (11.5)	15 (11.5)	20 (15.4)
Any anal intercourse	33 (25.4)	25 (19.2)	28 (21.5)	29 (22.3)	42 (32.3)

**TABLE 4.** Number and proportion of Vanguard Project participants reporting specific reasons for not using condoms with regular partners, at baseline, and the subsequent 4 years of follow-up (n = 130)

Reason for not using a condom	Follow-up									
	Baseline		Insertive				Receptive			
	Insertive N = 38 (%)	Receptive N = 45 (%)	96/97 N = 39 (%)	97/98 N = 51 (%)	98/99 N = 47 (%)	99/00 N = 48 (%)	96/97 N = 52 (%)	97/98 N = 50 (%)	98/99 N = 44 (%)	99/00 N = 52 (%)
We are/were in a long term relationship.	61.0	75.0	79.0	80.0	72.0	77.0	81.0	92.0	77.0	81.0
We are/were in a monogamous relationship.	50.0	58.0	59.0	59.0	57.0	54.0	71.0	64.0	68.0	65.0
We are/were both HIV-negative.	55.0	60.0	38.0	49.0	53.0	63.0	51.0	64.0	64.0	79.0
It was more intimate.	—	—	54.0	45.0	51.0	69.0	46.0	50.0	55.0	71.0
It feels better without a condom.	50.0	42.0	41.0	37.0	51.0	52.0	42.0	40.0	55.0	58.0
We got carried away.	—	—	31.0	25.0	26.0	17.0	21.0	10.0	11.0	12.0
The sex was too hot.	32.0	28.0	13.0	2.0	11.0	15.0	8.0	4.0	9.0	13.0
I wanted to try it.	—	—	13.0	8.0	2.0	10.0	6.0	4.0	5.0	17.0
At the time I just didn't care.	8.0	16.0	15.0	8.0	15.0	13.0	17.0	10.0	7.0	15.0
We didn't have a condom at the time.	5.0	7.0	10.0	2.0	4.0	4.0	4.0	6.0	14.0	13.0
I was drunk or stoned at the time.	11.0	13.0	10.0	10.0	6.0	10.0	10.0	10.0	11.0	11.5
I don't know/no reason.	8.0	9.0	5.0	12.0	2.0	8.0	10.0	8.0	7.0	10.0
He talked me into it.	0	2.0	5.0	4.0	6.0	8.0	2.0	2.0	0	12.0
The condom broke or slipped off.	13.0	4.0	0	2.0	4.0	0	6.0	2.0	11.0	4.0
We are both HIV positive.	—	—	3.0	4.0	0	4.0	4.0	2.0	0	2.0
He threatened to leave me if I didn't.	0	2.0	0	0	0	2.0	0	0	0	4.0
He made me do it/threatened me if I didn't.	0	0	0	0	0	2.0	0	0	0	2.0

tial reason for high-risk behavior may be the diminished impact of community education campaigns specifically targeting high-risk sexual behavior among young men who have sex with men. For example, Katz et al. (14) found no decrease in sexual risk behaviors in young gay and bisexual men despite an increase in prevention programs in San Francisco. Whether this finding can be generalized to other populations of men in other cities remains to be determined (15). Overall, there appears to be no consensus among researchers about why sexual risk behavior in gay and bisexual men may be changing.

Our study is one of the first to examine longitudinally why individuals engage in unprotected anal intercourse. Among regular partners, stable and monogamous relationships and knowledge of a partner's seronegative status were the most common reasons for men to engage in unprotected anal intercourse. With casual partners, substance use, not caring at the time, and getting carried away at the time were the three most common reasons for men engaging in unprotected anal intercourse. Concomitant seronegative status among both partners was a common reason cited by those having unprotected anal in-

tercourse with either casual or regular partners, although studies have shown that many men are not completely certain of their partner's serostatus (2,16).

The most commonly reported reasons for unprotected anal intercourse with regular partners in this study suggested that the notion of negotiated safety is a common prevention strategy employed by men in our cohort. The primary premise associated with negotiated safety is that seronegativity is established between partners and second, that both partners agree to a monogamous relationship or to have only protected sex outside of the relationship (17). The reasons given by respondents in steady relationships in our study suggest negotiated safety as a reason for not using condoms. Although monogamy, long-term relationships, and the assumption of partner seronegativity are indicators of a rational choice in deciding not to use condoms with regular partners, one published study has shown that the two factors required for negotiated safety to be effective are not always being met (16). More men reported unprotected anal intercourse with their regular partner than their casual partners, but one third of these did not know their steady

**TABLE 5.** Number and proportion of Vanguard Project participants reporting specific reasons for not using condoms with casual partners, at baseline, and the subsequent 4 years of follow-up (n = 130)

Reason for not using a condom	Baseline		Follow-up							
			Insertive				Receptive			
	Insertive N = 24 (%)	Receptive N = 21 (%)	1996/1997 N = 21 (%)	1997/1998 N = 17 (%)	1998/1999 N = 21 (%)	1999/2000 N = 32 (%)	1996/1997 N = 12 (%)	1997/1998 N = 15 (%)	1998/1999 N = 15 (%)	1999/2000 N = 20 (%)
We are/were in a long term relationship.	0	5.0	5.0	0	5.0	0	8.0	7.0	0	0
We are/were in a monogamous relationship.	0	10.0	0	0	0	3.0	0	0	0	0
We are/were both HIV-negative.	17.0	43.0	14.0	12.0	10.0	19.0	42.0	27.0	40.0	55.0
It was more intimate.	—	—	0	0	0	19.0	17.0	20.0	13.0	30.0
It feels better without a condom.	38.0	29.0	38.0	41.0	33.0	31.0	17.0	20.0	13.0	40.0
We got carried away.	—	—	67.0	65.0	62.0	50.0	67.0	33.0	33.0	20.0
The sex was too hot.	29.0	29.0	24.0	12.0	33.0	31.0	17.0	27.0	27.0	40.0
I wanted to try it.	—	—	14.0	12.0	29.0	13.0	0	0	7.0	15.0
At the time I just didn't care.	29.0	43.0	62.0	47.0	38.0	25.0	58.0	47.0	20.0	45.0
We didn't have a condom at the time.	38.0	38.0	38.0	18.0	10.0	16.0	42.0	20.0	7.0	20.0
I was drunk or stoned at the time.	42.0	43.0	43.0	35.0	29.0	22.0	50.0	47.0	53.0	30.0
I don't know/no reason.	17.0	29.0	5.0	18.0	5.0	22.0	25.0	13.0	13.0	15.0
He talked me into it.	17.0	10.0	5.0	24.0	5.0	6.0	8.0	13.0	7.0	0
The condom broke or slipped off.	8.0	0	5.0	0	0	3.0	8.0	13.0	13.0	5.0
We are both HIV positive.	—	—	0	0	0	0	8.0	0	7.0	5.0
He threatened to leave me if I didn't.	0	0	0	0	0	0	0	0	0	0
He made me do it/threatened me if I didn't.	0	5.0	0	12.0	0	3.0	8.0	7.0	0	0

partner's HIV status (16). Without both components of negotiated safety having been satisfied, it may not be an effective method of reducing HIV transmission. These data underscore the need for intensive programs that focus on the importance of meeting both components of negotiated safety.

One of the most common reasons for not using condoms with casual partners was substance use at the time of sexual encounter. Drugs and alcohol reduce inhibitions and lead to poorer decision making, which may result in high-risk sexual behavior. Substance use leading to unprotected intercourse with a casual partner is riskier than with regular partners because it is more likely that the serostatus of a casual partner will be unknown. Prevention efforts aimed at reducing sexual risk in times of when substance use is not a factor may prove to have a positive effect on decision making while under the influence of drugs or alcohol and may contribute to a reduction in unprotected sex during these encounters.

As with all population-based studies, there are limitations to our analysis. This study consisted of a select

population of men. Although our analysis showed there were no significant differences in sexual behavior between men who had completed all five questionnaires and those who had not, the eligible men generally fit a more stable profile with respect to sociodemographic characteristics. Thus, it is possible that they may be in a position to better negotiate safe sex with their regular and casual partners. Furthermore, as is the case with many population-based studies, this cohort is based on a sample of convenience; thus, these findings may not be applicable to the general population of gay and bisexual men in Vancouver or elsewhere.

In conclusion, high-risk sexual behavior has remained at a relatively stable, high level in this cohort, suggesting that present prevention efforts are not working effectively to decrease unprotected anal intercourse among young men who have sex with men. Innovative HIV prevention campaigns, tailored to address both the social and cultural reasons for engaging in such behaviors, and focused on the most frequent reasons for unprotected sex are necessary to reduce the spread of HIV among young gay and bisexual men.

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