



Update Report # 45

Patterns of Sexual Behaviors and Sexual Risk among HIV Positive People in New York City

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C.H.A.I.N. REPORT

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INTRODUCTION

This report on sexual behavior among CHAIN participants is the first in depth look at changing patterns of sexual behavior in a large, representative cohort of HIV-infected individuals followed over time. Unprotected sex can expose the HIV infected to potentially serious viral and bacterial infections that may adversely affect their health and it may transmit HIV to uninfected partners. Thus, it is important that we have as clear an understanding of high risk sexual behavior as we do of alcohol and other drug use in order to provide the continuum of care so essential to those living with HIV and AIDS.

Information on the prevalence of sexual behaviors associated with HIV transmission will also assist the New York City EMA in determining the overall need for Title III-funded early intervention, outpatient health care and related services to low-income people with HIV AIDS which have recently been expanded to include those **at risk** of contracting HIV. This information will also allow the New York City EMA, the epicenter of the ongoing AIDS epidemic in the US, to plan for the integration of HIV treatment and prevention activities proposed by CDC in SAFE: the serostatus approach to fighting the HIV epidemic (NCHSTP Briefing 2001).

CDC urges expansion of HIV prevention programs to include outreach and risk reduction services targeted to individuals living with the disease. Increasing the integration of prevention and HIV care services is an important component of the SAFE prevention strategy, with the ultimate goal of increasing the number of HIV positive individuals who adopt and sustain HIV-STD risk reduction behaviors. Understanding patterns of sexual behavior and sexual relationships among the CHAIN sample will help inform the design and implementation of prevention programs for HIV positives in New York City communities.

STUDY QUESTIONS

Specific research questions are to investigate:

- 1) What are the patterns of sexual behavior among adults who are HIV positive? How have these changed over time?
- 2) How do study participants describe themselves with regard to sexual orientation? How is self-identification related to patterns of sexual behavior?
- 3) What are patterns of marriage, non-marital partnering, and casual sexual relationships among persons living with HIV in New York City?
- 4) What are the patterns of sexual risk behavior among adults living with HIV and how have these changed over time?
- 5) What predicts sexual risk behaviors among the CHAIN study cohort?

BACKGROUND AND METHODOLOGY

The CHAIN survey and data

Patterns of sexual behavior and sexual risk will be examined through an analysis of aggregate data from a representative sample of HIV-infected adults (age 20+ yrs) in New York City. The data were collected as part of the CHAIN Project, an ongoing longitudinal study funded since 1994 by the City's Title I Health and Human Services Planning Council (the Planning Council). The CHAIN Project tracks individuals' encounters with both medical care and ancillary services and links patterns of service delivery to a wealth of information on individual characteristics and health outcomes. The CHAIN Project has interviewed HIV-infected individuals in the cohort every 6-12 months since 1994, and data for this study are current as of 2002.

The CHAIN Project followed a recruitment procedure designed to yield a broadly representative sample of people living with HIV in New York City. Study recruitment was conducted in 43 agencies which were selected so that there would be roughly an equal number of medical care and social service sites represented, as well as representation both from sites that were Title I grant recipients, and sites which were not. At 30 sites, staff contacted a random sample of clients. A sequential enrollment procedure was implemented at the remaining 13 agencies. All eligible clients present on a small number of recruitment days were invited by agency providers and CHAIN staff to participate in the CHAIN study. A total of 648 individuals recruited from participating agencies completed baseline interviews. The agency-based sample was supplemented with 50 interviews conducted with HIV+ individuals with little or no connection to medical and social services. These individuals were contacted at outreach sites and through nominations from CHAIN participants. More detailed information on sampling strategy and recruitment may be obtained upon request from MHRA (CHAIN Technical Report #1, 1995).

Subsequent interviews were conducted at approximately six to twelve month intervals. Round two interviews were completed with 568 participants, 92% of the cohort still alive and not known to have moved outside of New York City. Round three interviews were conducted with 480 of CHAIN participants, 88% of the cohort who were alive and still residing in New York City. Round four interviews were conducted with 420 CHAIN participants or 82% of the surviving cohort. In an effort to replenish the CHAIN sample which had lost a number of participants to death and other factors, in 1998 an additional 267 individuals were added to the study, using the same agency and community sources. These individuals constituted the 'refresher' sample and joined the 385 CHAIN continuing participants who have been involved in the project since its inception in 1994, bringing the total number of people interviewed in round five to 652. In round six 508 participants, in round seven 444 participants and in round eight, 387 were interviewed representing at least 80% of those eligible at each interview period (not known to be deceased or moved out of the NYC area).

All CHAIN interviews are conducted in person by interviewers recruited from communities throughout New York City and trained specifically for the study. Interviewers are matched to

respondents as much as possible with regard to gender and race/ethnicity. Approximately one-third of the field staff are themselves HIV positive. Interview topics include sociodemographic characteristics, the full range of experiences with access and use of medical and social services, and quality of life. At baseline interview, participants were asked about history of various sexual behaviors and at each round of interviews, information is collected about current (past six months) sexual behaviors, collected as part of everyone's health profile.

Between 1994 and 2002, 4,159 interviews were conducted with the 968 individuals recruited in to the study, over eight rounds of data collection. Most interviews were conducted in English, although approximately 10% were conducted in Spanish. The CHAIN data can be considered a fairly representative sample of the total population of persons living with HIV in New York City. Thus, generalizations can be made from the patterns seen in the data at hand to the broader population.

Measure of Sexual Behavior

We ask respondents if they have ever had sex with opposite sex partners and with same sex partners as well as the number of lifetime partners for each. Questions about recent (past six months) sexual behaviors are included in each interview including unprotected sexual intercourse with a partner who is HIV negative or whose status is unknown. For some behaviors, distinctions are made between "regular" partners and "casual or one-time" partners. Separate questions about marital and partner status, and relationships within the household allow us to further classify individuals with regard to patterns of sexual relationships. In addition to questions about unprotected sex, respondents are asked about lifetime and recent experience of exchanging sex for money or drugs. Respondents are also asked to describe their sexual orientation as: "straight, heterosexual; gay, homosexual; bisexual (attracted to both men and women)" allowing the option to describe oneself as "other." All analyses are conducted separately for women and men.

FINDINGS

Patterns of Sexual Behavior

Table 1 shows the number of lifetime opposite sex and same sex partners prior to baseline interview (mean age at baseline, 39.2 yrs). A diverse ranges of sexual histories are represented by the sample. All but 1% of women have had sex with men and almost two-thirds (64%) have had more than five male partners. Among men, 88% have had at least one female sex partner in their lifetime and 65% have had more than five female partners. About the same proportion of men and women have had 50 or more opposite sex partners (18% and 21%, respectively). About half of men in the sample (53%) report no same sex experience, and about one-quarter report 50 or more same sex partners. About 80% of women have had no sexual experience with other women.

Table 1. Number of Lifetime Opposite Sex and Same Sex Partners until Baseline Interview¹

	Men	Women
Total Sample (N=968)	579	389
Number of Opposite Sex Partners		
None	12%	1%
1-2	13%	6%
3-5	10%	29%
6-10	13%	24%
11-20	13%	12%
21-50	18%	10%
more than 50	21%	18%
Number of Same Sex Partners		
None	53%	78%
1-2	4%	10%
3-5	5%	5%
6-10	4%	2%
11-20	4%	2%
21-50	7%	1%
more than 50	24%	2%

1. Baseline interviews conducted in 1994-95 and 1998. Average age at baseline 39.2 (sd 8.4)

Table 2. Lifetime and Recent Sexual Behavior Pattern

	Men	Women
Total Sample (N=968)	579	389
Lifetime History of Sexual Behaviors		
Exclusively with Opposite Sex	51%	77%
Exclusively with Same Sex	11%	<1%
Both	38%	23%
Recent Sexual Behavior Pattern¹		
Exclusively with Opposite Sex	43%	72%
Exclusively with Same Sex	27%	3%
Both	5%	6%
Not Sexually Active	25%	19%

1. Sexual behaviors reported anytime during the six month period prior to interview from baseline to the most recent interview.

Table 2 classifies the overall pattern of opposite sex and same sex experience for women and men in the CHAIN sample. Eleven percent (11%) of men have been exclusively with same sex partners and 38% have had both male and female sexual partners over their lifetime. For women, fewer than 1% have had only same sex partners; however about one-quarter (23%) of women have been with both men and women. The bottom half of Table 2 classifies recent patterns of sexual behavior, operationally defined as at any time during the six months period prior to CHAIN study interview. We found that at any interview period, a sizeable proportion of respondents are not sexually active. 25% of men and 19% of women report no sexual partners at all during the study period. Both men and women are more likely to report either exclusively heterosexual relationships or exclusively homosexual relationships. Regardless of a wide range of experiences over their lifetime, relatively few individuals continue to have sexual experiences with both men and women.

Differences between lifetime and more recent sexual experiences are shown in Table 3. Forty-one percent (41%) of men and 22% of women had opposite sex partners prior to their baseline interview but not afterward; 17% of men and 14% of women reported some same sex experience during their lifetime but not recently.

Table 3. Recency of Opposite Sex and Same Sex Experience

	Men	Women
Total Sample (N=968)	579	389
With Opposite Sex		
Recently (after baseline interview)	48%	78%
Previously Only	41%	22%
Never	11%	<1%
With Same Sex		
Recently (after baseline interview)	32%	9%
Previously Only	17%	14%
Never	51%	77%

Figures 1 thru 4 present graphically patterns of sexual behaviors over time for men and women separately. The bars represent the total sample of men and women interviewed in each wave of the survey (W5, W6, etc.), and the proportion who reported 1-2 opposite sex partners, 3-5 opposite sex partners, or 6 or more opposite sex partners as well as the same breakdown for same sex partners. Also shown are the proportion who were not sexually active at all during the six month period prior to each interview. Patterns appear relatively constant over time. The greatest variability appears to be with the proportion who are not sexually active at all which varies from about 20% to 40% for both men and women.

Figure 1. Trends: Number of Opposite Sex Partners for Past 6 Months for Men ¹

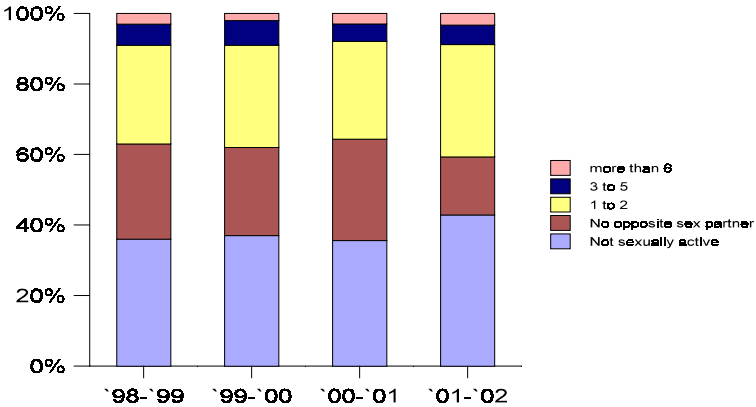
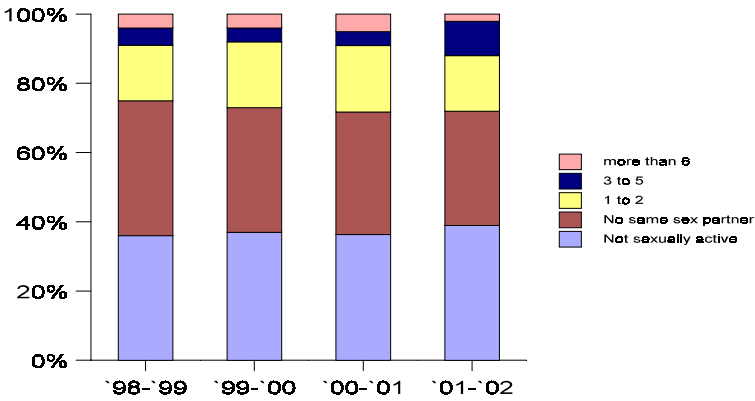


Figure 2. Trends: Number of Same Sex Partners for Past 6 Months for Men ¹



¹ Analysis restricted to same individuals interviewed over time (n=301)

Figure 3. Trends: Number of Opposite Sex Partners Past 6 Months for Women ¹

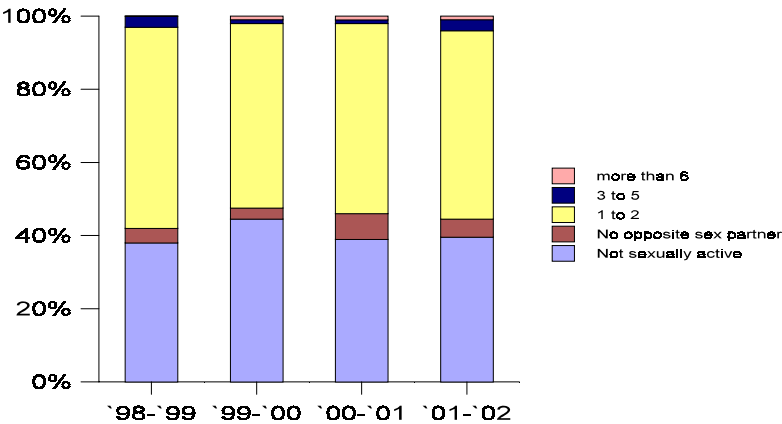
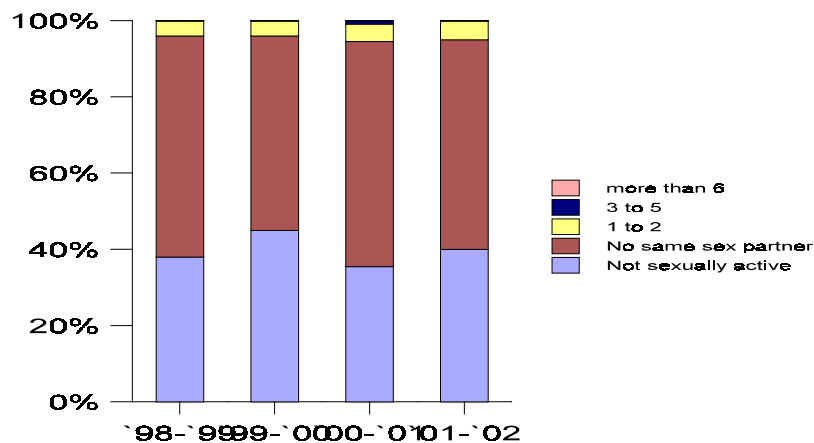


Figure 4. Trends: Number of Same Sex Partners Past 6 Months for Women ¹

¹ Analysis restricted to same individuals interviewed over time (n=231)

Self Described Sexual Orientation

At each CHAIN interview, respondents are asked to describe how they see themselves with regard to sexual orientation; answers are recorded separately from any consideration of reported sexual behaviors. Table 4 presents answers to the sexual orientation question that was asked at each interview. This analysis is restricted to individuals interviewed 3 or more times (n=654) to enable us to examine stability of self-described sexual orientation over time. We see that 50% of men and 82% of women consistently describe themselves as straight or heterosexual, 28% of men and 3% of women consistently described themselves as gay, lesbian, or homosexual, a small number consistently chose the bisexual or 'other' category. Surprisingly one in five (20%) of men gave different self-descriptions at different interviews. The proportion for women is 14%.

We examined more closely the specific self-designations among individuals who described themselves as bisexual or who switched designations at different interview times (Table 4). For men, the most common pattern (44%) among bisexuals and switchers was to describe sexual orientation at times as "bisexual" and then other times as "gay, homosexual." For women, the most common pattern was alternating between "bisexual" and "heterosexual". For 11% of men and 14% of women, shifting answers regarding sexual orientation were such that no predominate pattern could be discerned. There were no race/ethnic differences in the proportion of individuals who described sex orientation as bisexual or who switch classification at different interview times.

Table 4. Self-described Sexual Orientation

	Men	Women
Total sample (n= 654) ¹	370	284
Heterosexual	50%	82%
Gay, Lesbian, Homosexual	28%	3%
Bisexual or Other	2%	2%
Changing Identification ²	20%	14%
Pattern of Self-Description for Bisexual or Switcher (n=125)	81	44
Consistently Bisexual	11%	11%
Bisexual /other and Heterosexual	19%	55%
Bisexual /other and Homosexual	44%	11%
Homosexual and Heterosexual	15%	9%
Multiple Categories	11%	14%

1. Among persons interviewed 3 or more times

2. Respondent gave different self-description at different interviews

Table 5. Patterns of Sexual Behavior and Self-described Sexual Orientation

	PATTERN OF SEXUAL BEHAVIOR	Exclusively Opposite Sex Experience	Exclusively Same Sex Experience	Sex with Both Men and Women
MEN	Total Sample (n=370)¹	174	46	150
	Straight, Heterosexual	95%	0%	13%
	Gay, Homosexual	0%	78%	45%
	Bisexual or Other	0%	2%	5%
	Changing Self-description ²	5%	20%	37%
WOMEN	Total Sample (n=284)¹	217	1	66
	Straight, Heterosexual	97%	0%	33%
	Gay, Homosexual	0%	100%	11%
	Bisexual or Other	<1%	0%	6%
	Changing Self-description ²	3%	0%	50%

1. Among persons interviewed 3 or more times

2. Respondent gave different self-description at different interviews

We examined the relationship between patterns of sexual behavior and described sexual orientation (Table 5). Among men who report exclusively opposite sex experience during the study period (1994 - 2002), 95% consistently describe themselves as straight or heterosexual and 5% give a changing self-description. Greater variance is found among men who reported exclusively same sex partners during the study period; 78% consistently describe themselves as homosexual but 20% give a changing self-description. Not surprisingly, the least stable self designations are found among men who have had both opposite sex and same sex partners during the study period. They are most likely to describe themselves as gay or homosexual (45%) but sizeable proportions give a changing designation(37%) and 13% consistently describe themselves as straight or heterosexual. The situation is similar with women. However there are too few individuals with exclusively same sex partners during the study period to enable investigation of possible shifts in self-described sexual orientation. Women who have sex with both men and women seem more likely than their male counterparts to give a changing self-description of sexual orientation.

Marriage and Partner Relationships

Table 6 examines marriage and partner relationships among the CHAIN sample. The majority of men(55%) are single, never married, 37% had been married but were divorced, separated, or widowed during the study period, and the remainder (8%) were legally married and living with spouse during the study period. For women, 40% have never been married, 48% had been married in the past, and 12% were married and living with spouse at least at some time during the study period (1994-2002).

We examined partner relations, not restricted to legal marriage (Table 6). During the study period, thirty-five percent (35%) of men have had either a spouse or a live-in partner, and 37% have had an intimate partner they do not live with. Slightly more than one-quarter (28%) of men have had neither spouse, live in partner, nor a non-live in intimate partner. The majority of women (52%) have had either a spouse or live-in partner and another third (32%) have a non-live in partner. Approximately 16% of women have neither.

The bottom panel in Table 6 shows reported sexual experience with “casual or one-time” sexual partners. For men, 51 % of men had a one time or casual partner during study period. 29% have had casual, heterosexual sexual partners and 25% have had casual same sex partners. 25% of women had a one time or casual partner during study period. Less than 1% of women reported casual same sex partners; 23% reported casual or one time heterosexual partners.

Sexual Risk Behaviors

The final section of this paper examines sex risk behaviors: sexual intercourse without condom and exchanging sex for money or drugs. Answers to questions about opposite sex and same sex partners were coded “risky” if the respondent answered that he or she had sex without a condom

Table 6. Marriage and Partner Relationships

	Men	Women
Total Sample (n=968)	579	389
Legal Marriage		
Married during Study Period	8%	12%
Formerly Married	37%	48%
Single, Never Married	55%	40%
Partner Relationships		
Live-in Partner during Study ¹	37%	52%
Non-Live-in Partner Only	35%	32%
No Partner during Study	28%	16%
Casual Relationships		
Sex with One-time or Casual Partner during Study Period ²	51%	25%
(with heterosexual partners)	(29%)	(23%)
(with homosexual partners)	(25%)	(1%)

1. Respondent reports currently living with spouse or "living with someone as though married"

with a partner who was not HIV positive or whose serostatus was not known, even one time during the six months prior to interview. Table 7 presents rates of unsafe sex during the study period (any time during 1994-2002) and separates out individuals who were engaging in risky behavior at the most recent interview, Wave 7 or Wave 8 (2001 - 2002). Approximately 13% percent of men report unsafe sex with a woman who was not HIV positive or whose status was unknown, at least once during the study period. Ten percent (10%) have had unprotected sex with a woman in the last year or so. With regard to same sex partners, rates of unsafe sex are somewhat lower; 8% have had sex with another man without using a condom at some point during the study period, 5% in the last 12-18 months. Among women, 28% reported unprotected sex with a man who was HIV negative or of unknown status at some point during the study period and 17% reported unprotected sex at their most recent interview. Women were asked about unsafe sex with same sex partners; however numbers were too low to provide stable estimates.

Table 7. Sexual Risk Behaviors

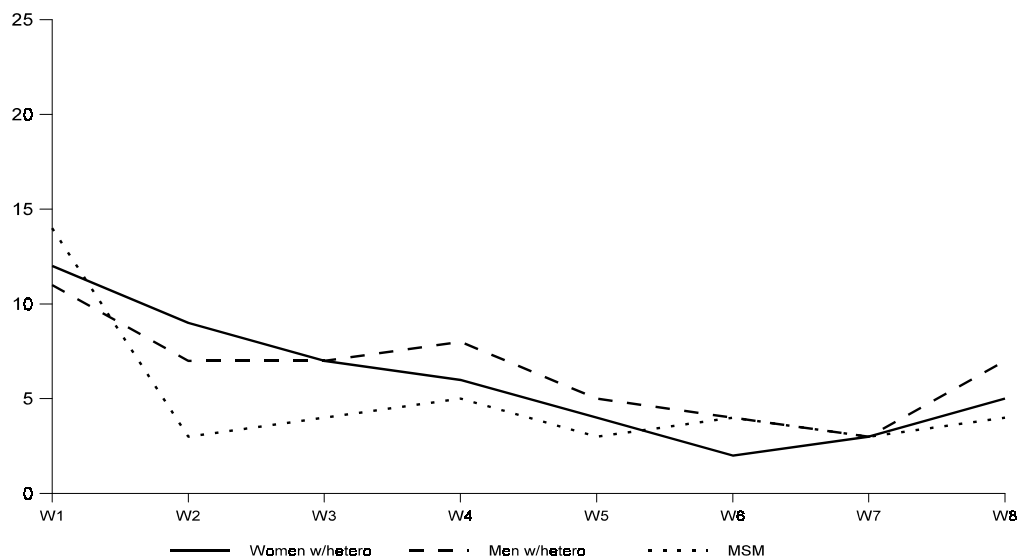
	Men	Women
Ever Unsafe Sex with Opposite Sex Partner	(N=218)	(N=180)
Never	88%	72%
Past	3%	11%
Current (Wave 7 or 8)	10%	17%
Ever Unsafe Sex with Same Sex Partner	(N=218)	-
Never	92%	-
Past	3%	-
Current (Wave 7 or 8)	5%	-
Ever Exchange Sex with Opposite Sex Partner for Money or Drugs	(N=218)	(N=180)
Never	71%	66%
Past	22%	27%
Current (Wave 7 or 8)	8%	7%
Ever Exchange Sex with Same Sex Partner for Money or Drug	(N=218)	-
Never	84%	-
Past	11%	-
Current (Wave 7 or 8)	5%	-
Ever Sex with IDUs prior to Baseline Interview	(N=579)	(N=389)
Yes	41%	59%
No	59%	41%
Among IDUs	(N=241)	(N=144)
Yes	68%	88%
No	32%	12%
Among non- IDUs	(N=338)	(n=245)
Yes	22%	42%
No	78%	58%

Exchanging sex for money or drugs is considered a risk behavior since participants most often have less control over sexual activities, and are less likely aware of the sex partner's HIV or other STD status than sex with known partners, within a relationship context. Approximately 30% of men have engaged in sex exchanges with women at some point in their lives; 22% have exchanged before and 8% exchanged sex during their most recent interview (20002). 16% of men have engaged in sex exchanges with other men. One-third (34%) of women have exchanged sex sometime in their lives, 27% have exchanged sex before and 7% have done so recently.

A single question was asked about sex with a partner known to use needles to inject drugs. Among men, 41% have had sex with a known IDU prior to their baseline interview and 59% of women have had IDU sex partners. This question was not asked during more recent interviews. However, it suggests that IDUs are among sexual partners of individuals in the sample. Sex with an injecting drug user is more common among individuals who are themselves IDUs; however, this is not always the case. Twenty-two percent of men who had never used a needle for drugs and 42% of women who never used a needle reported needle using sex partners.

We next examined patterns of sexual risk behavior over time. Figure 5 presents trends in unprotected sex. The trend line shows cross sectional rates of unprotected sex at each interview period. The highest rates are seen among women who report unprotected sex with men. Rates go from a high of 24% at baseline interview to a low of 10% in Wave6, with an increase in reported rates of unprotected sex during the last 2 interviews.

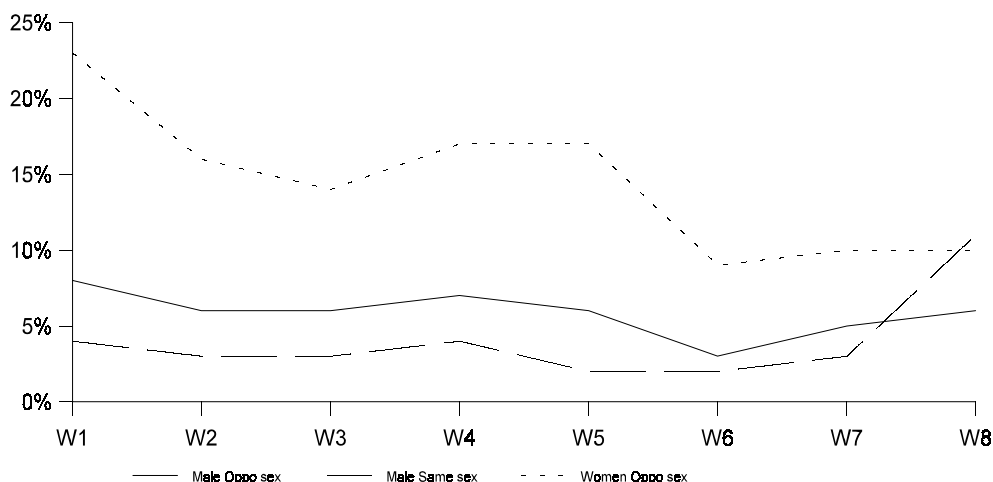
Figure 5. Trends: Patterns of Sexual Risk Behaviors over Time



The same general trend line is seen for men who have sex with men. Rates of unprotected sex are relatively low and decline over time but then appear to increase during the most recent, 2000-2002 period. This pattern would be consistent with findings reported in other research that has shown an increase in risky sex among men who have sex with men (CDC 2001).

While some changes in question wording for the most recent interview (Wave 8) may contribute to higher rates of reported unprotected sex, there were no changes in questions asking about recent experiences with sexual exchanges. The same general pattern of reduction in rates of risky behavior over time (Wave1 1994 - Wave6 1999) is seen until the most recent time periods (2000-2002) which see an increase in reported rates of sexual exchanges. This upturn is seen for men who have sex with women, men who have sex with men, and women who have sex with men.

Figure 6. Trends: Patterns of Exchange Sex for Money or Drug over Time



A series of logistic regression analyses were undertaken to examine if sexual risk behaviors were affected by the following factors:

Sociodemographic characteristics	Health status	Resources & Risks
Age	General health	HIV risk category
Race/ethnicity	Recent STD	Current substance use
Education		Recently exchanged sex
Annual household income		Low mental health functioning
Spouse/ partner		Self-efficacy
		Homelessness/ unstable housing
		Case management

For this set of analyses, we examine the relationship between client characteristics, health status indicators, and resources and risks at one interview as these factors increase or decrease the likelihood that the individual will engage in unprotected sex by the next interview period. We limit ourselves to the most recent data, provided by 540 individuals who completed interviews at at Time 6 , Time 7, and/or Time 8, and also who are engaged in sexual behavior during the time period 1999 through 2002. Each interview with each CHAIN study participant constituted an opportunity to observe the relationship between that person’s health status, risks and resources, and his or her risk behaviors, providing approximately 1000 observation points. We conducted separate analyses for women and men predicting unprotected sex (during the six months prior to interview) and exchanging sex for money or drugs (during the six months prior to interview).

Table 8. Odd Ratio for Sexual Risk Behaviors

Factors	Unprotected Sex		Exchange Sex for Money or Drug	
	Men	Women	Men	Women
Sociodemographic Characteristics				
Age	0.97	0.93**	1.00	0.94***
Black	0.53	0.68	1.23	1.24
Latino	0.42	0.70	0.71	0.98
Less than HS	0.93	0.62	1.03	0.64
Spouse/Partner	1.49	3.49***	0.80	2.57***
Health Status				
General Health	1.07	0.72	0.76	0.82
Recent STD	0.85	3.44*	3.70	3.17*
Herpes	1.22	0.73	0.70	0.95
Resources & Risks				
Risk: MSM	2.04**	-	2.06**	-
Current Drug Use	3.03**	1.29	2.39*	1.39
Recently Exchanged sex	4.79***	4.53**	-	-
Low Mental Health Functioning	0.74	0.80	0.65	1.02
Self-Efficacy	0.99	0.99	0.98**	0.99
Unstable Housing	0.57	1.24	0.82	0.86
Homeless	3.62**	2.58	2.03	4.39**
Case management	0.85	1.58	0.93	1.43

* P<0.1 ** p<0.05 *** p<0.01

- For men, the greatest predictors of unprotected sex are recent history of exchanging sex for money or drugs, current drug use, homelessness, MSM risk exposure group, and having a spouse or partner. Controlling for all other variables in the model, men who have recently exchanged sex are 4.8 times more likely than other men to report unprotected sex. Men who are currently using heroin, crack/ cocaine or are problem drinkers are 3 times more likely to engage in unprotected sex than men who are not current drug users, regardless of prior history of drug use. Similarly, men who are currently homeless are 3.6 times more likely engage in high risk sex behavior, compared to the stably housed. MSM risk exposure group and having a regular partner doubles the odds of having unprotected sex.
- In a separate model predicting exchanging sex for money or drugs, among men, current drug use is the strongest predictor; drug users are 2.3 times more likely to engage in sex exchanges as those who are not currently using. Other variables significant are low self-efficacy and MSM risk exposure group.

- For women, the strongest predictors of unprotected sex are age and partner status. Younger women are somewhat more likely to engage in unprotected sex and women with regular partners are more than 3 times as likely as other women to have sex without a condom. Women who have recently exchanged sex are 4.5 times more likely than other women to report unprotected sex. Recent history of an STD is marginally associated with current report of unprotected sex, suggesting a prior pattern of unprotected sexual behavior.
- Housing status as well as age, partner status, and recent history of STD predicts exchanging sex for money or drugs among women. Homeless women are 4.4 times more likely to exchange sex than women with stable housing. Women with a regular partner, and women reporting a recent STD are each about 3 times more likely to exchange sex for money or drugs than other women. Younger women are also more likely to exchange sex for money or drugs.

SUMMARY AND CONCLUSIONS

Findings summarized here indicate that the current emphasis on “Prevention for Positives” is well advised. While absolute rates of high risk sex behaviors are not high, the fact that all persons in the sample are HIV positive means the likelihood of exposing others to infection is not insignificant. Each new HIV infection is the result of a seropositive individual transmitting the virus to another person. Comprehensive programs are needed to support persons living with HIV and their partners to adopt and sustain life-long HIV and STD risk reduction behaviors.

The findings on general patterns of sexual behaviors will provide an important starting point for developing prevention interventions for persons living with HIV. We have seen that sexual behaviors are highly variable, many persons are not sexually active at all for months at a time, many individuals, men especially, continue to have sex with both men and women. Finally, self-designations of sexual orientation are for many individuals not a fixed characteristic but remain in flux or perhaps change with the change in sexual partners or sexual networks. Prior research has shown that sexual orientation is an important consideration when designing HIV prevention interventions. The fluidity of both behaviors and self-identification seen in the current sample suggest that this is an area that requires further investigation to maximize effective risk reduction programs for HIV positive persons.