

Published in final edited form as:

*Curr HIV Res.* 2009 November ; 7(6): 580–588.

## Relationship of Self-Reported Prior Testing History to Undiagnosed HIV Positivity and HIV Risk

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### Abstract

Screening everyone for HIV at least once is estimated to be cost-effective. Screening in health care settings is recommended to help achieve that goal. Health care settings often encounter the same patient repeatedly, and it is unknown if limited resources are better allocated to conduct repeat screening, or to screen patients not yet tested. We reviewed data for a targeted ED based HIV screening program for 2003–2007. The role of prior testing history as a predictor of undiagnosed HIV positivity was assessed using a negative binomial model adjusted for demographics and risk behaviors. HIV testing was provided to 8,450 unique patients. There were 5,781 (70%) self-reporting a prior HIV test. Compared with patients reporting no prior test, the relative risk of HIV positivity for those reporting a test within the prior year was 0.90 (95% CI 0.48–1.66), and for those reporting a prior test more than a year previously the relative risk was 0.91 (95% CI 0.48–1.73). Among patients testing positive, those who did not report a prior test had a median CD4 count that was 228 cells/mm<sup>3</sup> lower than those with a prior test (CI<sub>95</sub> of the difference in medians 20–436 cells/mm<sup>3</sup>). Diagnosis of prevalent HIV among those who are at risk but have never been tested should be a priority. However, repeat screening of target populations for incident infection remains important and results in earlier diagnosis. Recent self-reported testing history is not associated with undiagnosed positivity among targeted patients irrespective of the timing of the prior test.

### Keywords

HIV seropositivity; risk factors; mass screening; preventive health services; emergency service; hospital

### INTRODUCTION

Expansion of HIV screening is a critical public health priority. Testing all but the lowest risk persons in the United States at least once has been estimated to be cost-effective [1,2]. Yet, only about 40% of US persons report ever being tested for HIV [3,4]. This is likely to be one factor contributing to the estimated 21% of infected persons in the U.S. who are unaware of their HIV positive status [5]. To expand testing, the Centers for Disease Control (CDC)

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**Author Contributions:** MSL, CJL, AHR, ATT, and CJF participated in operating the program from which data were obtained. MSL and CJL conceived the study and obtained IRB approval. CJL was responsible for data management and statistical analysis. MSL and CJL drafted the manuscript and all authors contributed substantially to its revision. MSL takes responsibility for the paper as a whole.

currently recommends that all healthcare settings provide voluntary screening for all patients between the ages of 13–64, regardless of their apparent risk for infection [6]. When resources are limited, offering an HIV test at every patient visit is not feasible. Because patients are frequently encountered on a repeated basis, the public health goal of screening all patients at least once to identify prevalent infection might be best achieved by preferentially testing those who have never been tested. Conversely, the CDC recommends testing all high risk patients for HIV at least annually to identify infection that is incident since the last negative test [6]. It is difficult to know whether scarce resources are better allocated to testing patients who have never been tested, or to repeated screening of at-risk patients who have previously been tested. This decision depends on the likelihood of undiagnosed HIV positivity for a given population, which in turn is determined by risk of virus exposure and acquisition and might be modified by prior testing history.

Exploration of the relationship between prior testing history and HIV risk has been limited. There is an apparent association between participating in risk behaviors and repeat testing [4, 7], and there is some indication that the probability of test positivity might be higher among those undergoing repeat testing than those who have never been tested [8]. Among patients newly diagnosed with HIV, injection drug use and geography have been shown to differ between repeat testers and those who have never been tested [9]. These data do not provide the practical direction needed for screening programs in health care settings.

Large-scale screening programs working at the limits of available resources need guidance as to the importance of asking about prior testing history, and the use of that information in evaluating the likelihood of undiagnosed HIV infection. In our targeted screening program, we frequently encounter patients who initially decline testing based on a prior negative test, but who are successfully encouraged to undergo repeat testing after further exploration of their continued risk for HIV. We do not know if this practice is appropriate, or if self-reported testing history should be incorporated into assessing the need for repeat testing; if these patients have a low likelihood of having acquired HIV since their last negative test, repeat testing is less desirable. This study uses data from our large, Emergency Department (ED) based HIV screening program to describe patients with and without a self-reported prior test, and to estimate whether a self-reported prior negative test is associated with HIV test positivity.

## MATERIAL AND METHODS

### Study Design

This study is an analysis of prospectively collected HIV counseling and testing data. The Institutional Review Board approved the study.

### Study Setting and Population

The population covered by the HIV screening program includes all adults presenting to the ED of a Midwestern, urban, teaching hospital. The annual ED census is over 85,000, the majority of which are indigent patients, 57% black, 39% white, and 0.5% are Latino. Almost all patients are over 18 years old; an ED dedicated to the care of children is located several blocks away. The lower limit of undiagnosed HIV prevalence in the ED is estimated to be 43.3 per 100,000, and the proportion of positive tests in the program is about 0.7% [10,11]. Health department surveillance data indicate that the prevalence of diagnosed HIV/AIDS in the surrounding county is 217 per 100,000 persons [12].

The HIV counseling and testing program has been described elsewhere [11]. Briefly, it is an adjunct clinical program of the ED run in collaboration with an academic HIV treatment center. Targeted screening, based on review of triage notations, electronic medical records, or referral

by ED staff, is used to identify patients. Risk profile, clinician concern, and patient request are the primary means of selection. Written informed consent to undergo a confidential HIV test is required. For the majority of patients, counselors provide structured counseling based on a comprehensive risk-assessment questionnaire to promote an individualized, achievable plan for risk reduction. When counselors are not available, testing may be initiated by the physician and patients complete an abbreviated risk-assessment questionnaire.

Testing was performed at no charge to the patient. For the time-period of this study, the program used standard HIV ELISA testing with confirmatory Western Blot analysis. Result notification occurred when results became available, typically within two weeks following the date of testing. In 2007, results were successfully provided to negative patients in 75% of cases and to positive patients in 81% of cases.

### Study Protocol

Data for this study were extracted from the program's electronic clinical record. Included visits were for patients presenting between January 2003 and December 2007. Available data include prior self-reported testing history, test results, demographics and behavioral risk factors. Behavioral risk factors included risks from injection drug use, risk behavior, number and gender of sex partners, the exchange of sex for drugs or money, sexual assault, prior history of sexually transmitted diseases, and use of crack cocaine.

### Data Analysis

Initial analyses are descriptive in nature and characterize the cohort grouped by prior testing behavior and by test results. Factors associated with prior testing were explored using univariable logistic regression models. The odds of a recent test were compared between patient groups using odds ratios; 95% confidence intervals are given.

The primary goal of this study is to ascertain the association between prior testing behavior and risk for HIV positivity. A negative binomial model was used to estimate the independent effects of prior testing history on risk of undiagnosed HIV. A single multivariable model was fit without consideration of interactions. The main outcome measure was test result. Analyses were conducted using SPSS version 16.0 (SPSS Inc., Chicago, IL).

## RESULTS

From January 1, 2003 to December 31, 2007, there were 15,462 HIV tests offered either by a physician or by program counselors. There were 9,629 tests completed, with the majority (82%) being conducted by a counselor. Of the 5,833 offers of testing that were declined, a reason for declining was given in 5,554 cases. Having had a prior test was given as the reason for declining testing in 3,027 (54%) instances. There were 33 cases who said they had had a prior positive HIV test, 2482 reported having had a prior negative test within the past 6 months, and 512 reported having had a negative test more than 6 months previously.

Of the 9,629 tests provided, 6,693 (70%) were for patients who reported having had a prior HIV test and 2,936 (30%) were for patients with no self-reported prior testing (Fig. 1). There were 1,179 visits for patients who had undergone prior testing within our program; there were a total of 8,450 unique patients. From among the 1,179 visits by patients with prior testing, there were 73 occasions (6.2%, CI<sub>95</sub> 4.9% to 7.8%) where patients erroneously reported not having had a prior test. Of these, eight (11%) had an unknown result from their prior test, and the remainder tested negative during their prior test. Among the 8,450 unique patients, 5781 self-reported prior testing while 2669 did not. The proportion positive was 0.78% (CI<sub>95</sub> 0.6% to 1.0%) among those self reporting a prior test, and 1.16% (CI<sub>95</sub> 0.8% to 1.7%) among those

with no reported prior testing; the difference in proportions is 0.38% (CI<sub>95</sub> -0.05% to 0.9%). To avoid biasing the analyses towards those with a repeat test, the final visit by each patient is considered as the representative visit and has been included in all further analyses.

Demographics, behavioral risk, and test results are given in Table 1, grouped by prior testing history. These are further grouped in Table 2 by the timing of prior testing; for the 5,625 patients reporting the duration since their last negative test, 2265 (40%) stated they had been tested less than one year ago. Associations between patient characteristics and odds of a recent test are shown in Table 3. Age less than 35 years and male sex with men were associated with lower odds of recent testing. Being black, having multiple partners, being sexually active, injection drug use, crack use, and sex with an at risk partner were associated with increased odds of recent testing.

The characteristics of patients with positive, negative, indeterminate, or unknown HIV test results are shown in Table 4. The characteristics of patients testing negative and those with an indeterminate test result were not statistically different ( $p>0.1$  for all variables), so these groups have been combined in the multivariable model of test positivity (Table 5). Cases with unknown results have been excluded. Having received a prior test was not associated with a change in risk for undiagnosed HIV. Black race and male sex with men were associated with risk for HIV positivity, while age less than 35, crack use, and sex with an at-risk partner were associated with decreased risk for undiagnosed HIV. There was a non-significant trend for injection drug use to be associated with decreased risk for HIV positivity.

Among patients testing positive for HIV, the characteristics of those without a prior test, those with a recent prior test and those with a test more than a year previously are shown in Table 6. Those who did not report a prior test had a median CD4 count that was 228 cells/mm<sup>3</sup> lower than those with a prior test (CI<sub>95</sub> of the difference in medians 20–436 cells/mm<sup>3</sup>). Among those reporting a prior test, the trend was for a lower CD4 count among those with testing more than a year prior compared to those with more recent testing (difference in medians 143 cells/mm<sup>3</sup>, CI<sub>95</sub> 111–397 cells/mm<sup>3</sup>).

## DISCUSSION

The CDC currently recommends expanded HIV screening for low risk populations in healthcare settings [6]. A primary question is how to best allocate limited resources when it is not feasible to fully screen all populations that might benefit. In particular, it is unknown whether resources should be preferentially allocated to repeat testing among those still at risk, or whether efforts should be focused on those who have never been tested. Our findings suggest that repeat screening is neither protective nor predictive of HIV test positivity. Further, we show that when patients test positive at a repeat test, the diagnosis is likely earlier than when testing positive at a first ever test.

Patients who have high levels of risky behavior have an increased risk of virus acquisition. Although the correlation between actual risk and reported risk is imperfect, targeted screening programs have used risk assessment in the attempt to maximize the diagnostic yield achieved with existing resources. The impact of self-reported prior testing history on the risk assessment is poorly understood, but it likely interacts with the probability of undiagnosed HIV. For example, the chance that a test will be positive if the person recently tested negative might be exceedingly low even if they were otherwise at high risk of HIV acquisition. Alternatively, a patient who is unaware of their risk might be less likely to have become infected, but also less likely to have sought or been offered testing. Our study explores the relative contribution of prior testing history and other patient characteristics to the likelihood of undiagnosed HIV positivity. Injection drug users, crack users, and those with risky sexual behavior were all more

likely to have been tested recently and less likely to test positive for HIV. Conversely men who have sex with men were less likely to have been tested recently yet more likely to test positive for HIV. The overall effects were such that, in our program's experience, prior testing history was not associated with the HIV test result. However, among those who reported prior testing the initial CD4 count was significantly higher, suggesting a much earlier diagnosis. This alters the relative benefit of first time tests compared with repeat tests, and clearly demonstrates that cost-effectiveness studies that fail to consider a temporal component to HIV screening efforts are limited. The costs and benefits of targeting patients with ongoing high-risk behavior are likely to be quite different than for other screening strategies.

While our primary findings support the need for both initial and repeat screening among targeted populations, it is possible that different results would occur in different settings or with different populations. In particular, we caution that our results should not be extrapolated to non-targeted screening programs. Screening program experience and additional research will continue to accumulate evidence for the relative merit of applying limited resources to repeat testing or to testing those who have never been previously tested. In the interim, we suggest a clear conceptual distinction between the risk of prevalent infection amongst those who have never been tested, and the risk of incident infection newly acquired since an individual's last negative test.

Having shown the benefit of repeat screening in a targeted screening program, a question that follows is how often that repeat screening should occur. The CDC recommends screening those at high risk at least annually [6]. Our screening program encourages repeat testing even at short time intervals. In part, this reflects the need for follow-up testing when using antibody assays, which can miss early infection. It also reflects the degree to which our program encounters patients who engage in high levels of ongoing risky behavior and visit the ED with great frequency. Our results suggest a similar positivity rate among those with a repeat test in the prior year and those for whom the prior test was more than a year previously. Accordingly, the relative risk of undiagnosed HIV did not vary according to whether the test occurred more than or less than one year previously. The infection of patients after a negative test has been linked to calls for improved prevention measures [8]. Our results additionally suggest that an arbitrary time criteria for repeat testing is likely less appropriate than individualized risk assessment that considers both the timing of the patient's risk behavior and the timing of their prior testing. This emphasizes the continued importance of risk assessment in HIV screening. Even if a program performs non-targeted screening for patients who have never been tested, offering repeat testing among those with ongoing risk is likely to be important.

We found that the likelihood of self-reported prior testing was associated with the category of risk. Although men having sex with men had the highest likelihood of undiagnosed HIV, they had lower odds of recent testing. The opposite was found for other risk categories. Men having sex with men may have been less likely to seek testing, and it is possible that they were less likely to have been offered testing previously. For example, in our program it is easier to recognize risk factors uncovered as a matter of course during the medical evaluation, such as substance abuse or sexually transmitted diseases, than it is to recognize the gender of a patient's sexual partners. Continued efforts to access populations at highest risk for HIV to provide repeat screening are of clear importance, particularly in the case of men who have sex with men.

Without robust information systems, providers are limited to using self-reported prior testing history in risk assessment. Our results are encouraging in that few patients with prior testing by the program failed to disclose that testing history. However, conclusions regarding accuracy in recall and reporting of prior testing are highly limited given the lack of testing records from other venues.



There are several limitations inherent in our approach that must be considered when interpreting the results. While data were collected prospectively using structured questionnaires, this was done as part of a clinical encounter and not a rigorously controlled research encounter. As a result, some data are missing, in particular HIV test results were missing for about 3% of cases. If patients with unknown results were predominantly positive or negative, it would likely alter our results. As well as some missing data, risk behaviors and prior testing information were subject to recall and reporting bias. The program uses a detailed assessment of prior testing behavior in conjunction with a resource-intensive risk assessment. This may have contributed both to the accuracy of patient reports as well as the high number of patients who declined testing because of a recent prior test. Also, the number of patients consenting to testing who reported prior HIV testing was dramatically higher than the national estimate of 40% [3,4]. This may be because our program selects patients for testing based on risk-targeting, or because ED-based screening had been in place in this setting for five years even prior to this study. Our results may not be generalizable to other settings and we do not know how the tested population compares with our overall ED population. Lastly, while our data may be used to inform decision makers about the relative merits of resource allocation in HIV testing programs, they do not directly address the implementation of CDC recommendations concerning HIV testing in healthcare settings.

## CONCLUSIONS

Diagnosis of prevalent HIV among those who are at risk but have never been tested is a priority. However, repeated screening of target populations for incident infection is of importance. Among those newly diagnosed with HIV, median initial CD4 is higher for those diagnosed by repeat screening than by initial screening. Repeat screening more often than annually is advisable for some populations. Risk assessment and targeting may become increasingly important as the proportion of patients never tested decreases and more screening is conducted on a repeated basis. Cost-effectiveness studies of screening approaches should more fully account not only for the benefits of screening the population one time, but also the benefits of repeated screening among populations of varying levels of self-reported risk and at varying time intervals.

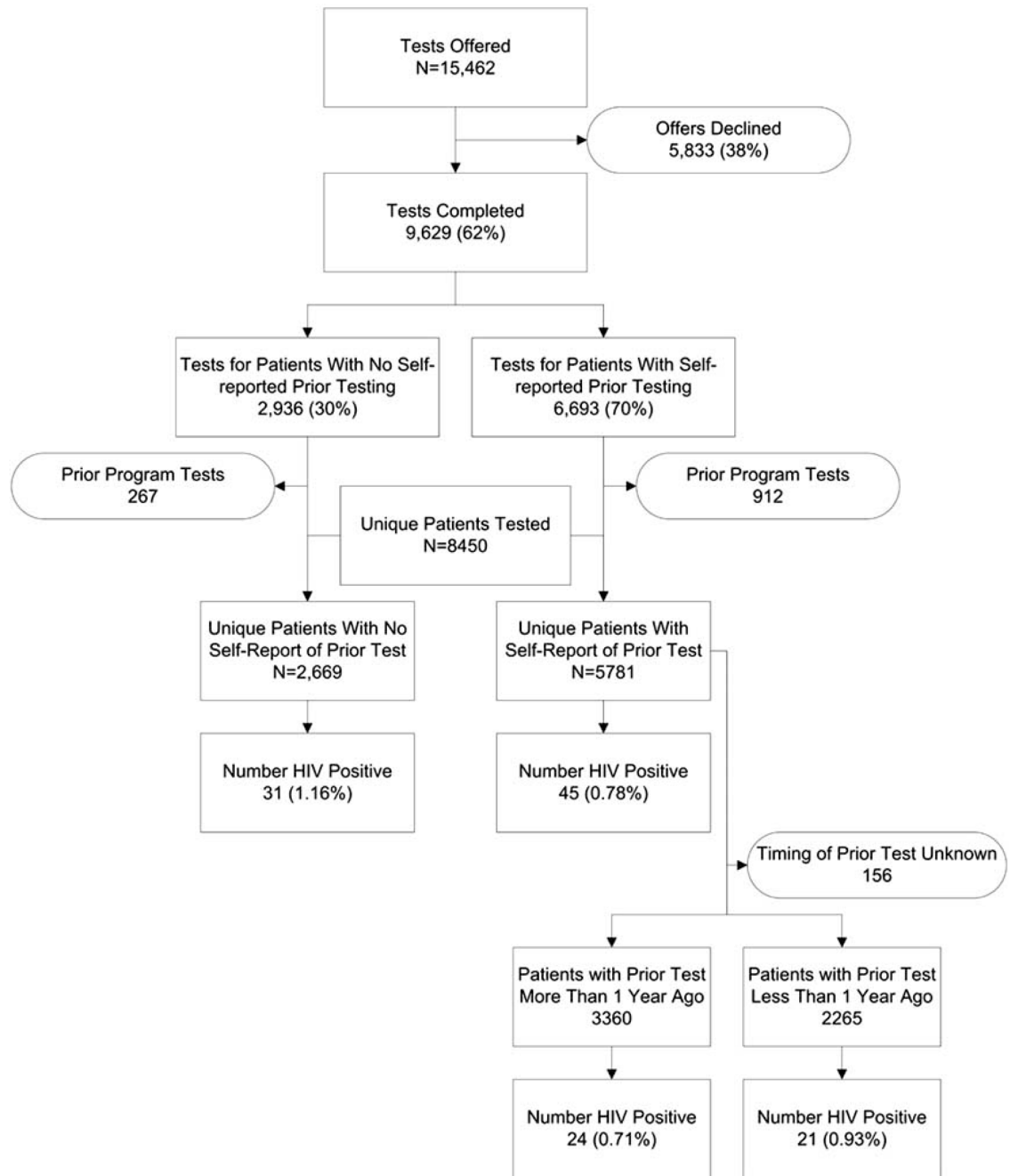
## Acknowledgments

**Financial Support:** The clinical program described in this report was supported by the Ohio Department of Health and the Cincinnati Health Network. The research component was supported in part by NIAID K23 AI068453.

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**Fig. 1.**  
Flow diagram depicting patient enrollment and allocation of patients within analysis plan by prior testing history and test result.



**Table 1**

Characteristics of Patients Grouped by Self-Reported Prior HIV Testing

	No Self-Reported Prior Test		Self-Reported Prior Test		Total
	N=2669 (31.6%)		N=5781 (68.4%)		
	N=8,450				
Demographics					
Age (median, range)	25	(12–77)	28	(15–73)	27 (12–77)
Male	1588	(59.5)	2860	(49.5)	4448 (52.6)
Female	1066	(39.9)	2889	(50.0)	3955 (46.8)
TG	1	(0.0)	1	(0.0)	2 (0.0)
Unknown	14	(0.5)	31	(0.5)	45 (0.5)
White	833	(31.2)	1429	(24.7)	2262 (26.8)
Black	1617	(60.6)	4149	(71.8)	5766 (68.2)
Other or mixed raced	34	(1.3)	58	(1.0)	92 (1.1)
Hispanic	117	(4.4)	67	(1.2)	184 (2.2)
Unknown	68	(2.5)	78	(1.3)	146 (1.7)
Risk factors					
No partners in past year	434	(16.3)	477	(8.3)	911 (10.8)
One partner in past year	892	(33.4)	2077	(35.9)	2969 (35.1)
Multiple partners in past year	1343	(50.3)	3227	(55.8)	4570 (54.1)
Men who have sex with men	89	(3.3)	246	(4.3)	335 (4.0)
Men who have sex with men and are injection drug use	9	(0.3)	36	(0.6)	45 (0.5)
Men who have sex with women	1450	(54.3)	2761	(47.8)	4211 (49.8)
Men or women who have sex with bisexual men	90	(3.4)	299	(5.2)	389 (4.6)
Women who have sex with men	973	(36.5)	2835	(49.0)	3808 (45.1)
Sex with an injection drug use	146	(5.5)	523	(9.0)	669 (7.9)
Sex with an HIV+ partner	27	(1.0)	94	(1.6)	121 (1.4)
Sex while using drugs/intoxicated	1283	(48.1)	3322	(57.5)	4605 (54.5)
Exchanged sex for drugs or money	243	(9.1)	885	(15.3)	1128 (13.3)
Sexually assaulted	351	(13.2)	1275	(22.1)	1626 (19.2)

	No Self-Reported Prior Test		Self-Reported Prior Test		Total
	N=2669 (31.6%)		N=5781 (68.4%)		N=8,450
Prior STD	858	(32.1)	3473	(60.1)	4331 (51.3)
Injection drug use	133	(5.0)	531	(9.2)	664 (7.9)
Shares works	50	(1.9)	225	(3.9)	275 (3.3)
Crack use in past year	204	(7.6)	670	(11.6)	874 (10.3)
<b>HIV test results</b>					
Negative	2534	(94.9)	5535	(95.7)	8069 (95.5)
Positive	31	(1.2)	45	(0.8)	76 (0.9)
Indeterminate	13	(0.5)	25	(0.4)	38 (0.4)
Unknown	91	(3.4)	176	(3.0)	267 (3.2)

Data are given as frequencies and percents unless otherwise indicated.

Table 2

Characteristics of Patients Grouped by Prior Testing Behavior

	No Previous Test Reported N=2669	Unknown Timing N=156	Tested More than a Year Ago N=3360	Tested Less than a Year Ago N=2265
<b>Age</b>				
< 35 years	1796	96	2097	1636
	(67.7)		(61.5)	(72.5)
35 to < 45 years	421	34	727	379
	(15.9)		(21.8)	(16.8)
45+ years	435	26	530	242
	(16.4)		(16.7)	(10.7)
<b>Sex</b>				
Male	1588	81	1661	1118
	(59.8)		(51.9)	(49.6)
Female	1066	75	1678	1136
	(40.2)		(48.1)	(50.4)
<b>Race</b>				
White	833	35	921	473
	(32.0)		(23.0)	(21.2)
Black	1617	115	2328	1706
	(62.2)		(75.7)	(76.6)
Other	151	2	75	48
	(5.8)		(1.3)	(2.2)
<b>Number of partners during past year</b>				
None	434	34	290	153
	(16.3)		(21.8)	(6.8)
One	892	58	1258	761
	(33.4)		(37.2)	(33.6)
Two or more	1343	64	1812	1351
	(50.3)		(41.0)	(59.6)
<b>Risk behaviors</b>				
Had sex with a male in past year	1029	67	1733	1185
	(38.6)		(42.9)	(52.3)
Had sex with a female in past year	1450	70	1620	1071
	(54.3)		(44.9)	(47.3)
Men who have sex with men	56	4	81	61
	(2.1)		(2.6)	(2.7)
Injection drug use	133	22	305	204
	(5.0)		(14.1)	(9.0)
Used crack	204	23	374	273
	(7.6)		(14.7)	(12.1)
High risk sexual behavior	411	40	779	542
	(15.4)		(25.6)	(23.9)
<b>HIV test results</b>				
Negative	2534	147	3226	2162
	(94.9)		(94.2)	(95.5)
Positive	31	0	24	21
	(1.2)		(0.0)	(0.9)
Indeterminate	13	0	14	11
	(0.5)		(0.0)	(0.5)

	No Previous Test Reported N=2669	Unknown Timing N=156	Tested More than a Year Ago N=3360	Tested Less than a Year Ago N=2265
Unknown	91	9	96	71
	(3.4)	(5.8)	(2.9)	(3.1)

Data are given as frequencies and percents. Age is missing for 31 cases; sex is missing, TG or TS other for 47 cases; race is missing for 146 cases; all risk behaviors are self reported. High risk sexual behavior includes sex involving the exchange of drugs or money, sex with an HIV+ partner, sex with an injection drug user and sex with men who have sex with men.

**Table 3**

Association Between Self-Reported HIV Risk Factors and the Odds of a Recent (&lt;1 Year) Prior Test

	Reference Category	OR for Recent Repeat Test	95%CI for OR	P-Value
Age 45+ Age 35 to <45	Age <35	0.78 0.60	(0.69 – 0.89) (0.51 – 0.69)	0.0002 0.0000
Black Other	White	1.59 0.80	(1.42 – 1.78) (0.57 – 1.10)	0.0000 0.1725
Multiple partners in past year One partner in past year	Not sexually active	1.71 2.08	(1.41 – 2.07) (1.73 – 2.50)	0.0000 0.0000
Men who have sex with men Men who do not have sex with men	Women	0.82 1.07	(0.75 – 0.91) (0.79 – 1.46)	0.0001 0.6517
Injection drug use	No injection drug use	1.23	(1.04 – 1.46)	0.0177
Crack use	No crack use reported	1.27	(1.09 – 1.48)	0.0018
High risk sex behavior	No high risk sex behavior reported	1.27	(1.13 – 1.42)	0.0001

Odds ratios were obtained from univariable logistic regression models.

**Table 4**  
Factors Commonly Associated with Increased Risk for HIV Grouped by HIV Test Results

	Negative N=7922	Positive N=76	Indeterminate N=38	Unknown N=258	Total N=8294
Prior testing behavior					
No prior test	2534 (32.0)	31 (40.8)	13 (34.2)	91 (35.3)	2669 (32.2)
Prior test > 1 year previously	3226 (40.7)	24 (31.6)	14 (36.8)	96 (37.2)	3360 (40.5)
Prior test in past year	2162 (27.3)	21 (27.6)	11 (28.9)	71 (27.5)	2265 (27.3)
Age (years)					
< 35	5311 (67.2)	44 (58.7)	21 (55.3)	153 (61.4)	5529 (66.9)
35 to < 45	1447 (18.3)	22 (29.3)	7 (18.4)	51 (20.5)	1527 (18.5)
45+	1143 (14.5)	9 (12.0)	10 (26.3)	45 (18.1)	1207 (14.6)
Sex					
Male	4160 (52.8)	65 (86.7)	21 (55.3)	121 (48.4)	4367 (53.0)
Female	3724 (47.2)	10 (13.3)	17 (44.7)	129 (51.6)	3880 (47.0)
Race					
White	2136 (27.4)	10 (13.2)	7 (18.4)	74 (30.1)	2227 (27.3)
Black	5392 (69.2)	63 (82.9)	29 (76.3)	167 (67.9)	5651 (69.3)
Other	264 (3.4)	3 (3.9)	2 (5.3)	5 (2.0)	274 (3.4)
Number of partners during past year					
None	791 (10.0)	17 (22.4)	5 (13.2)	64 (24.8)	877 (10.6)
One	2801 (35.4)	19 (25.0)	10 (26.3)	81 (31.4)	2911 (35.1)
Two or more	4330 (54.7)	40 (52.6)	23 (60.5)	113 (43.8)	4506 (54.3)
Risk behaviors					
Had sex with a male in past year	3778 (47.7)	31 (40.8)	15 (39.5)	123 (47.7)	3947 (47.6)
Had sex with a female in past year	3971 (50.1)	47 (61.8)	21 (55.3)	102 (39.5)	4141 (49.9)
MSM	170 (2.2)	20 (26.7)	0 (0.0)	8 (3.2)	198 (2.4)
Used IV drugs	610 (7.7)	2 (2.6)	5 (13.2)	25 (9.7)	642 (7.7)
Used crack	815 (10.3)	10 (13.2)	5 (13.2)	21 (8.1)	851 (10.3)
High risk sex behavior	1635 (20.6)	29 (38.2)	8 (21.1)	60 (23.3)	1732 (20.9)



**Table 5**

Relative Risks for HIV Positivity for those with and without a Self-Reported Prior Testing History, Adjusted for Age, Race and Risk Behavior

		<b>Risk Ratio for HIV</b>	<b>95% CI for Risk Ratio</b>	<b>P-Value</b>
Prior test in past year	No prior test	0.90	(0.48–1.66)	0.731
Prior test >1 year previously		0.91	(0.48–1.73)	0.779
>45	<35	0.22	(0.09–0.53)	0.001
35–45		0.51	(0.27–0.98)	0.042
Black	White	5.55	(2.45–12.57)	0.000
Other		1.13	(0.28–4.51)	0.867
Multiple partners	Not sexually active	1.57	(0.71–3.46)	0.264
One partner		1.27	(0.54–2.99)	0.589
Men who have sex with men	Women	24.41	(6.49–91.82)	0.000
Men who do not have sex with men		4.46	(2.16–9.22)	0.000
Injection drug use	No injection drug use	0.22	(0.03–1.81)	0.160
Crack use	No crack use reported	0.51	(0.24–1.12)	0.092
Risky sex behavior	No risky sex behavior	0.16	(0.07–0.41)	0.000

Patients with indeterminate HIV test results are included among negatives; there were no statistical differences in the risk behaviors between those with negative and those with indeterminate results (data not shown). Cases with unknown results have been excluded.

**Table 6**  
Characteristics and Risk Behaviors of Patients Testing Positive Grouped by Self-Reported Prior Testing History

	No Prior Test N=31	Tested More than One Year Previously N=24	Tested Less than One Year Previously N=21
<b>Age (years)</b>			
< 35	15 (50.0)	13 (54.2)	16 (76.2)
35 to < 45	9 (30.0)	9 (37.5)	4 (19.0)
45+	6 (20.0)	2 (8.3)	1 (4.8)
<b>Sex</b>			
Male	28 (93.3)	20 (83.3)	17 (81.0)
Female	2 (6.7)	4 (16.7)	4 (19.0)
<b>Race</b>			
White	5 (16.1)	2 (8.3)	3 (14.3)
Black	23 (74.2)	22 (91.7)	18 (85.7)
Other	3 (9.7)	0 (0.0)	0 (0.0)
<b>Number of partners during past year</b>			
None	12 (38.7)	4 (16.7)	1 (4.8)
One	6 (19.4)	8 (33.3)	5 (23.8)
Two or more	13 (41.9)	12 (50.0)	15 (71.4)
<b>Risk behaviors</b>			
Had sex with a male in past year	10 (32.3)	11 (45.8)	10 (47.6)
Had sex with a female in past year	19 (61.3)	15 (62.5)	13 (61.9)
Men who have sex with men	7 (23.3)	7 (29.2)	6 (28.6)
Used IV drugs	0 (0.0)	1 (4.2)	1 (4.8)
Used crack	4 (12.9)	4 (16.7)	2 (9.5)
High risk sex behavior	9 (29.0)	11 (45.8)	9 (42.9)
Median Initial CD4*	141 (6-1030)	281 (12-851)	424 (3-807)

\* CD4 counts were available for 22 patients with no prior history of testing, 17 who were tested more than a year previously, and 16 of those who were tested more than a year previously.