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Missed Opportunities for HIV Testing Among STD Clinic Patients

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Abstract

Background—Current HIV testing guidelines recommend that all adolescents and adults aged 13–64 be routinely screened for HIV in healthcare settings. Sexually transmitted disease (STD) clinic patients represent a population at increased risk for HIV, justifying more frequent risk assessment and testing. This analysis describes missed opportunities for HIV testing among a sample of STD clinic patients to identify areas where HIV testing services may be improved.

Methods—Secondary analysis was conducted using data from Project AWARE, a randomized trial of 5,012 adult patients from 9 STD clinics in the United States, enrolled April–December 2010. HIV testing history, healthcare service utilization, and behavioral risks were obtained through audio computer-assisted self-interview. Missed opportunities for HIV testing, defined as having a healthcare visit but no HIV test in the last 12 months, were characterized by location and frequency.

Results—Of 2,315 (46.2%) participants not tested for HIV in the last 12 months, 1,715 (74.1%) had a missed opportunity for HIV testing. These missed opportunities occurred in both traditional (54.9% at family doctor, 20.3% at other medical doctor visits) and non-traditional (28.5% at dental, 19.0% at eye doctor, 13.9% at correctional facility, and 13.3% at psychology visits) testing settings. Of 53 participants positive for HIV at baseline, 16 (30.2%) had a missed testing opportunity.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Compliance with Ethical Standards

All procedures performed as part of Project AWARE were conducted in accordance with the ethical Institutional Review Board (IRB) at each study site, as well as the 1964 Helsinki declaration and its later amendments or comparable ethical standards. For this secondary analysis of de-identified data, formal consent was not required.

Conclusion—Missed opportunities for HIV testing were common in this population of STD clinic patients. There is a need to increase routinized HIV screening and expand testing services to a broader range of healthcare settings.

Keywords

HIV Testing; HIV/AIDS; health screening; missed opportunities; sexually transmitted diseases

Background

The current Centers for Disease Control and Prevention (CDC) guidelines for HIV testing in the United States (US) recommend that all persons aged 13–64 be screened for HIV infection in healthcare settings [1]. These guidelines encourage healthcare providers to initiate HIV screening as part of routine care, utilizing an opt-out testing approach when possible. The objectives of routine screening are to increase the proportion of HIV-infected individuals who are aware of their infection, facilitate early HIV diagnosis, provide timely linkage to care, and normalize screening to reduce stigma associated with HIV testing. Several studies have shown that offering routine screening is, indeed, associated with an increased uptake of testing, especially when testing is recommended by a healthcare provider [2–8].

Individuals seeking testing or treatment for sexually transmitted infections (STIs) represent a population at increased risk for HIV. STIs may increase the risk for HIV infection and are indicators of behavioral risks for HIV infection. Therefore, in addition to the general HIV screening guidelines, the CDC recommends that patients seeking STI treatment be screened for HIV at any STI-related healthcare visit, even if a recent HIV test was conducted [9]. These recommendations are reinforced by the United States Preventive Services Task Force [10].

Since the 2006 HIV testing guidelines were released, widespread implementation of routine screening in healthcare settings has been slow. The percentage of US adults who report ever having an HIV test has been stagnant since the early 2000s and remains at less than half [11,12]. Even among high-risk populations, HIV testing is suboptimal. Kwan et al. (2016) report that among high-risk heterosexual men and sexually active men who have sex with men (MSM) participating in the National Survey of Family Growth, there was no statistically significant difference in HIV testing rates before and after the routine screening recommendations were released [13]. Data from the most recent survey cycles of the National HIV Behavioral Surveillance (NHBS) show that only 41% of high-risk heterosexuals, 58% of injection drug users, and 71% of MSM reported testing for HIV in the last 12 months [14]. Over two-thirds of those not tested had a missed opportunity for testing during a recent healthcare visit. Among these individuals, 75% reported not being offered an HIV test during any of their healthcare visits [14]. Such findings may be attributed to a lack of provider awareness about HIV testing guidelines and failure to implement operational procedures for routine testing [2, 15–16]. A 2014 review of HIV testing barriers found that only 2.0–35.8% of providers offer routine HIV testing while most continue to perform risk-based testing [15]. This wide variability in testing practices across healthcare settings and

low overall screening rates contribute to inconsistent service delivery [17]. Gaps in routine HIV screening lead to missed opportunities for testing and diagnosis, and subsequent delays in treatment. Expansion of testing is critical to achieving current HIV treatment targets.

Because they serve high-risk populations, testing at Sexually Transmitted Disease (STD) clinics is an effective way to detect incident HIV cases. However, the ability of these sites to capture a large proportion of new cases across the general population is limited. First, only 27.3% of incident HIV cases detected by CDC-funded tests are reported from STD clinics [18–19]. Primary care clinics, HIV testing centers, emergency departments, correctional facilities, and non-healthcare settings account for a significant number of reported cases and remain important components of a comprehensive surveillance strategy. Second, public health clinics have experienced funding cuts over the past several years, with 61.5% of state and local health departments reporting budget reductions for STD programs [20–21]. Many clinics have cut back services and some have had to close their doors [22–24]. As a result, some services traditionally provided by STD clinics, such as HIV testing, must be shifted to other sectors of the healthcare system. Third, HIV testing rates at the time of STI diagnosis is inadequate in many clinics. Bradley et al. (2013) analyzed national STD surveillance data and showed only 51% of patients diagnosed with gonorrhea were also tested for HIV at the time of STI testing [25]. A similar analysis of Medicaid enrollees showed that only 43% of STI-diagnosed patients were tested for HIV [26]. These findings not only highlight the need for improved testing services at the time of STI diagnosis, but they also suggest the need for testing in other settings. Finally, and perhaps most importantly, it is possible when an individual seeks STI services, transmission of HIV or other infections to sex partners has already occurred. Routine HIV testing may be one way to identify such individuals, provide opportunities for early detection, and deliver interventions that may prevent subsequent transmission of HIV or other STIs.

The current study examines the HIV testing history of individuals seeking services at STD clinics in the US. The aim is to describe missed opportunities for routine HIV testing among this high-risk population and to identify areas of the healthcare system where implementation of HIV testing services can be improved.

Methods

This study utilized data from Project AWARE, a randomized trial to evaluate the effect of risk-reduction counseling, given at the time of HIV rapid testing, on the risk of acquiring STIs. Study methods are described elsewhere [27]. Briefly, eligible participants presenting at STD clinics in 9 US cities were randomized to receive rapid HIV testing with either client-centered risk-reduction counseling or prevention information only. Rates of STIs were compared between the two groups after six months. Study approval by an Institutional Review Board was obtained at each study site, and subjects provided written informed consent to participate.

At each study visit, participants completed a risk factor assessment administered using audio computer-assisted self-interview (ACASI). Topics included sexual risk, drug use, history of HIV testing, access to healthcare, and healthcare utilization. Baseline ACASI assessment

data were used for this secondary analysis. Descriptive statistics were calculated for patient demographics including sex, race, education, employment status, annual income, and marital status. Statistical differences between participants with different HIV testing histories were assessed using chi-square tests. Analyses were carried out in SAS 9.4 [28].

Description of Measures

HIV Testing History

HIV testing history was evaluated for the full study sample based on responses to the questions, “Have you ever been tested for HIV?” and “When did you have your most recent HIV test?” Non-testers for this analysis were defined as participants who reported never testing for HIV and those who reported not testing in the 12 months prior to enrollment.

Healthcare History

Healthcare visits within the last 12 months were assessed using the questions, “During the past 12 months, were you a patient in a hospital overnight?” and “In the past 12 months, how many times have you seen, or talked with the following health care professionals about your own health?” The nine categories of health care professionals included 1) family doctor or general practitioner, 2) eye doctor, 3) chiropractor, 4) nurse, 5) dentist or orthodontist, 6) physiotherapist, 7) speech, audiology, or occupational therapist, 8) psychologist, and 9) any other medical doctor. Visits to a physiotherapist and speech, audiology, or occupational therapist were combined into a single category called “allied health therapist” due to small numbers reported in these categories.

Healthcare categories were further classified into “traditional” and “non-traditional” settings to distinguish between sites where HIV testing is typically performed and those where HIV testing is historically less common. Traditional healthcare visits included those to a hospital, family doctor or general practitioner, nurse, and any other medical doctor. Non-traditional visits included those to an eye doctor, chiropractor, dentist or orthodontist, psychologist, and allied health therapist. In addition, correctional facilities and substance use treatment centers were included as non-traditional healthcare sites because these are settings where HIV screening is recommended according to current testing guidelines. History of engagement in these settings was assessed based on responses to the questions, “In the last 6 months, have you ever been in jail, prison, or a correctional facility?” and “In the last 6 months, have you received any residential or outpatient drug treatment?”

Missed Opportunities for HIV testing and diagnosis

A missed opportunity for HIV testing was defined as history of a healthcare visit in the last 12 months, incarceration in the last 6 months, or substance use treatment in the last 6 months in a participant who did not have an HIV test in the last 12 months. A missed opportunity for HIV diagnosis was defined as a missed opportunity for HIV testing in a participant who tested HIV-positive at baseline. Missed opportunities for HIV testing and diagnosis were characterized by frequency and healthcare venue.

High-Risk Participants

A sub-analysis of missed opportunities for HIV testing was conducted specifically among high-risk participants. A high-risk individual was defined according to CDC criteria for individuals who should be offered repeat HIV testing due to increased risk of infection. This included injection drug users, individuals with a known HIV-positive sex partner, and those with multiple sex partners but no history of HIV testing in the last 12 months. As an additional criterion, participants reporting a sexually transmitted infection in the last 6 months were considered high-risk. The risk assessment instrument in this study did not include questions regarding transactional sex and thus, this was not included as a high-risk criterion.

Results

Participant demographics are shown in Table 1. The majority of the sample was male (65.5%) and aged 18–29 years (53.3%). The sample was racially diverse and included 44.1% Black, 3.7% Asian, and 11.8% “other race” participants. The sample was 15.3% Hispanic. Most participants were single (73.9%) and reported some education beyond high school (61.5%). Over half (54.7%) were unemployed and 70.1% reported a personal income less than \$20,000 per year. More than half of the sample reported having no health insurance (56.0%), but most (71.8%) reported having a regular healthcare provider when in need of care. The most common site of regular healthcare was a health center or clinic (48.3%) followed by a doctor’s office (24.5%) and emergency room (19.4%). Less than half (47.0%) reported seeing a healthcare provider in the last 12 months.

Participants who tested for HIV in the last 12 months were more likely to be younger, Hispanic, of Black, Asian, or “other” race (vs. White, American Indian, or Native Hawaiian), and single (vs. married, cohabitating, or separated/divorced/widowed) compared to participants who did not test. They were also more likely to have higher income, private insurance, a regular healthcare provider, and a healthcare visit within the last 12 months.

While most participants reported previous HIV testing, 616 (12.3%) individuals reported never testing for HIV. Among those with a history of testing, 1,699 (38.5%) reported their last HIV tested as being over 12 months prior to study enrollment. Together, these 2,315 (46.2%) participants comprised the group of individuals considered non-testers for this analysis. Among non-testers, 1,715 (74.1%) reported at least one healthcare visit in the last 12 months, representing a missed opportunity for HIV testing (see Table 2). The majority of these individuals (76.6%) reported having multiple healthcare visits (mean=6.6 visits, SD=10.0). Most healthcare visits occurred in traditional venues, with the most common site being a family doctor (54.9%) followed by some other type of doctor (20.3%), or nurse visit (18.8%). Only 12.9% of participants had a missed opportunity in the inpatient hospital setting. In non-traditional healthcare venues, participants had missed HIV testing opportunities at dentist or orthodontist visits (28.5%), followed by eye doctor visits (19.0%), correctional facilities (13.9%), psychology visits (13.3%), chiropractors (7.7%), substance use treatment centers (6.4%), and allied health therapy visits (2.5%).

At baseline, 53 participants tested positive for HIV. Of these newly diagnosed individuals, 16 (30.2%) reported at least one healthcare visit in the last 12 months but were not tested for HIV (see Table 3). Most of these missed HIV diagnosis opportunities occurred in the setting of a doctor's office, with seven individuals (43.8%) reporting a visit to their family doctor and four individuals (25.0%) reporting a visit to some other type of doctor. Five individuals (31.3%) had seen a dentist, two (12.5%) had been incarcerated, two (12.5%) reported a visit with a nurse, and there was one visit (6.3%) each reported to an eye doctor, chiropractor, allied health therapist, and inpatient hospital stay.

The study sample consisted of 2,284 (45.6%) individuals considered to be high-risk. Reported risk factors included having a sexually transmitted infection in the last 6 months (51.2%), having multiple sex partners but no HIV test in the last 12 months (44.3%), sexual contact with a known HIV-positive partner (15.8%), and injection drug use in the last 6 months (5.8%). Among these high-risk participants, 109 (4.8%) reported never testing for HIV and 1,136 (52.3%) reported not testing in the last 12 months, for a total of 1,245 non-testers. Of the non-testers, 932 (74.9%) reported at least one healthcare visit in the last 12 months representing a missed testing opportunity (see Table 4). Of these, 77.4% reported multiple healthcare visits (mean=6.7, SD=10.7). In traditional healthcare venues, high-risk participants had missed opportunities for HIV testing at family doctor visits (52.4%), visits to some other doctor (21.0%), nurse visits (18.9%), and inpatient hospital stays (13.5%). In non-traditional healthcare venues, missed testing opportunities for high-risk participants occurred at dental visits (27.4%), eye doctor visits (17.8%), correctional facilities (16.6%), psychology visits (13.2%), chiropractors (8.2%), substance use treatment centers (7.3%), and allied health therapy visits (2.9%).

Discussion

The results of this study revealed that almost half (46.2%) of individuals in this sample of STD clinic patients had not tested for HIV in the last 12 months, with the majority (74.1%) of non-testers having a missed opportunity for testing. Additionally, many participants who were not tested had multiple missed opportunities for testing. This suggests that there are still gaps in routine HIV screening in healthcare settings, several years after the recommendations for routine testing were released. This finding is consistent with other studies that have shown low rates of routine testing [15]. However, given the high-risk profile of this cohort, the high proportion of missed testing opportunities is concerning.

Even more worrisome are the missed opportunities for HIV diagnosis. Delayed diagnosis postpones treatment and contributes to the transmission of disease. The CDC estimates that among individuals diagnosed with HIV in 2015, the median time between infection and diagnosis was three years [14]. In this sample, earlier diagnosis may have been made in up to 30.2% of HIV-infected participants if HIV testing had been conducted during a previous healthcare visit. Furthermore, individuals who are unaware of their infection account for up to 40% of ongoing HIV transmission [29]. In this sample, newly diagnosed HIV-infected individuals with missed opportunities for diagnosis had an average of 11.6 sexual partners (SD=15.2) in the six months prior to the baseline visit when diagnosis occurred. Earlier

diagnosis could have prompted linkage to HIV treatment and/or counseling to reduce transmission to sexual partners.

A major contribution of this study is that it provides granularity about the types of healthcare settings where missed HIV testing opportunities occur. Among traditional healthcare sites, family doctors had the most missed opportunities for HIV testing, and therefore should be a target for efforts to increase routine testing. Primary care providers who have successfully incorporated routine HIV screening into practice describe several tools that can aid in the implementation of routine testing such as automated prompts built into electronic health records, scripts to facilitate discussions about HIV testing, streamlining the consent process through verbal, opt-out protocols, and providing staff training to promote a culture of routine HIV testing [30–31]. Training topics may include national guidelines for routine testing, local consent laws, the provision of screening without cost-sharing (as recommended under the Affordable Care Act), as well as clinic-specific protocols for HIV testing. In addition to primary care settings, specialty care clinics may be another venue where routine HIV screening can improve detection of HIV infection. A recent analysis of missed opportunities for early HIV testing showed that 37% of newly diagnosed patients had been seen in a specialty clinic in the 12 months prior to diagnosis [32]. Efforts to expand screening in specialty clinics have increased in parts of Europe, where the recommendation is to test for HIV when patients present with indicator conditions of HIV infection [33]. Screening in dermatology, neurology, and oncology centers are a few examples of settings where expanded testing has been implemented [34–36]. In the US, HIV screening initiatives in specialty areas including dermatology and psychiatry units have shown success in terms of acceptability and feasibility [37].

This study also identified several non-traditional healthcare settings as potential sites for routine HIV screening. While some settings may not be obvious venues for HIV testing, they may be valuable additions to testing programs. For example, 28.5% of non-testers reported visiting a dental office in the last 12 months. A nationwide study of dentists showed that 56.7% of those surveyed reported a willingness to offer HIV testing, and 40% believed that HIV testing was part of a dental provider's role [38]. Among dentists already offering HIV testing, many report favorable results with implementation, patient acceptability, and linkage to care [39]. Given that many individuals seek dental care on a routine basis, and for some it may be their only engagement with a healthcare professional in a year, offering HIV testing in dental practices may reach a population that would not otherwise be tested [40].

Correctional facilities are also potential sites for effective HIV testing programs, given that incarcerated populations are often high-risk [41]. While some jurisdictions have successfully implemented screening programs, many correctional institutions report barriers to HIV testing including cost, privacy concerns, logistical challenges, untrained staff, and high turnover of inmate populations [42–43]. However, on-site rapid testing, which can be integrated with the intake process, may provide a means to overcome some of these barriers [44]. Additionally, the CDC has released guidelines to help correctional facilities develop testing programs [45]. Substance use treatment centers were also identified as venues where HIV testing could be offered to reach high-risk populations. These have been shown to be suitable sites for routine testing [46], but several barriers to implementation remain. Such

barriers include complex reimbursement procedures, lack of trained staff, and the absence of local policies to allow for the provision of HIV testing in these facilities [47–50]. Given the increased risk of HIV among substance users, continued research on ways to facilitate screening in treatment centers is needed.

Many non-testers in this study reported a recent visit with a psychologist. This is consistent with previous findings that despite increased risks for HIV, testing rates among individuals with mental health disorders are low [51–53]. While mental health counseling centers may not be equipped to provide testing, finding ways to incorporate discussions about HIV during mental health visits is worth exploring. Healthcare centers that integrate HIV care and mental health treatment have demonstrated that these services can be linked successfully, and may provide a model for sustained expansion of HIV testing services [54]. Finally, data on self-testing for HIV were not collected during this assessment, but at-home tests may serve as another non-traditional testing venue. This would work well in instances where HIV testing is not offered due to assumptions of low risk, the result of stigma, or because of privacy concerns. Self-tests provide an alternative means for testing, despite the missed opportunities that may occur in healthcare settings.

The results of the current study should be interpreted in the context of certain limitations. First, the questions assessing healthcare utilization were phrased to include both seeing and talking to a healthcare provider during the last 12 months. It is possible that an individual could have verbally consulted with a healthcare provider without seeing that provider in-person. In this instance, HIV testing is not feasible and would not be offered. However, this type of occurrence is believed to be uncommon under the assumption that in many healthcare settings, patients are not able to talk with healthcare providers without an in-person appointment. Second, for participants who had a missed opportunity for HIV testing, it was not possible to distinguish between visits where HIV testing was not offered by a provider and visits where HIV testing was offered but declined by the participant. This could lead to an overemphasis on the recommendation to offer routine HIV testing, when there should be increased focus on encouraging patients to accept HIV testing. Third, the data used in this analysis were collected by self-report and are subject to both recall and social desirability bias. Finally, no information about the nature of previous healthcare visits was available for analysis. This precludes analysis of the specific healthcare visit characteristics associated with missed opportunities for HIV testing. Examination of this type of data is a potential subject for future research.

In summary, the results of this analysis demonstrate that missed opportunities for both HIV testing and diagnosis were common in this high-risk population of STD clinic patients. Efforts to increase routine HIV testing in both traditional and non-traditional healthcare venues are needed.

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Table 1

Characteristics of the study sample by HIV testing history (n=5,012)

	Total sample (n=5,012)		Tested last 12m (n=2,484)		Not Tested last 12m (n=2,315)		Unknown test history (n=213)		Significance test	
	n	%	n	%	n	%	n	%		
Sex										$\chi^2=25.7$ p<0.001
Male	3285	65.5%	1653	66.5%	1525	65.9%	107	50.2%		
Female	1700	33.9%	815	32.8%	780	33.7%	105	49.3%		
Transgender	10	0.2%	7	0.3%	6	0.3%	2	0.9%		
Age (years)										$\chi^2=73.3$ p<0.001
18–29	2671	53.3%	1448	58.3%	1110	47.9%	113	53.1%		
30–39	1126	22.5%	540	21.7%	538	23.2%	48	22.5%		
40–49	741	14.8%	327	13.2%	385	16.6%	29	13.6%		
50+	474	9.5%	169	6.8%	282	12.2%	23	10.8%		
Race										$\chi^2=36.6$ p<0.001
White	1824	36.4%	829	33.4%	929	40.1%	66	31.0%		
Black	2208	44.1%	1127	45.4%	979	42.3%	102	47.9%		
Asian	187	3.7%	96	3.9%	83	3.6%	8	3.8%		
American Indian	156	3.1%	71	2.9%	76	3.3%	9	4.2%		
Native Hawaiian	44	0.9%	23	0.9%	18	0.8%	3	1.4%		
Other	593	11.8%	338	13.6%	230	9.9%	25	11.7%		
Hispanic Ethnicity	766	15.3%	432	17.4%	308	13.3%	26	12.2%		$\chi^2=17.0$ p<0.001
Education										$\chi^2=15.3$ p=0.178
< HS graduate	636	12.7%	302	12.2%	295	12.7%	39	18.3%		
HS graduate/GED	1294	25.8%	614	24.7%	626	27.0%	54	25.4%		
Some College	1778	35.5%	880	35.4%	821	35.5%	77	36.2%		
College Degree+	1304	26.0%	688	27.7%	573	24.8%	43	20.2%		
Unemployed	2740	54.7%	1331	53.6%	1295	55.9%	114	53.5%		$\chi^2=2.8$ p=0.245
Marital Status										$\chi^2=69.6$ p<0.001
Single	3705	73.9%	1933	77.8%	1623	70.1%	149	70.0%		
Married	275	5.5%	113	4.5%	144	6.2%	18	8.5%		

	Total sample (n=5,012)		Tested last 12m (n=2,484)		Not Tested last 12m (n=2,315)		Unknown test history (n=213)		Significance test
	n	%	n	%	n	%	n	%	
Cohabit	422	8.4%	215	8.7%	192	8.3%	15	7.0%	
Separated, Divorced, Widow	603	12.0%	221	8.9%	192	8.3%	29	13.6%	
Income (annual)									$\chi^2=26.1$ p=0.001
< \$20,000	3512	70.1%	1681	68.9%	1677	72.4%	154	72.3%	
\$20,001 – \$30,000	531	10.6%	266	10.9%	249	10.8%	16	7.5%	
\$30,001 – \$40,000	273	5.4%	152	6.2%	111	4.8%	10	4.7%	
\$40,001 – \$50,000	190	3.8%	1.1	0.0%	72	3.1%	8	3.8%	
\$50,001 +	397	7.9%	229	9.4%	156	6.7%	12	5.6%	
Health Insurance									$\chi^2=26.1$ p=0.006
Uninsured	2807	56.0%	1343	54.5%	1333	57.6%	125	58.7%	
Medicaid/Medicare	881	17.6%	358	14.5%	329	14.2%	23	10.8%	
VA	107	2.13%	38	1.5%	50	2.2%	4	1.9%	
Private Insurance	1121	22.4%	520	21.1%	398	17.2%	31	14.6%	
Other (specify)	145	2.89%	204	8.3%	174	7.5%	23	10.8%	
Has regular Healthcare provider	3599	71.8%	1889	76.1%	1568	67.7%	142	66.7%	$\chi^2=43.3$ p<0.001
Healthcare visit in last 12 m	2356	47.0%	1306	52.6%	978	42.2%	72	33.8%	$\chi^2=66.9$ p<0.001
Hospitalized in last 12 m	462	9.2%	226	9.1%	222	9.6%	14	6.6%	$\chi^2=2.2$ p=0.340
Incarcerated in last 6 m	519	10.4%	261	10.5%	238	10.3%	20	9.4%	$\chi^2=18.6$ p=0.001
Injection drug use in last 6 m	132	2.6%	63	3.0%	63	2.7%	6	2.8%	$\chi^2=0.2$ p=0.911

Percentages shown represent column percentages

Missed opportunities for HIV testing in the last 12 months among non-testers (n=2,315)

Table 2

Number of Visits in the last 12 months	Had any Healthcare Visit (n=1,715)		Had a Traditional Healthcare Visit* (n=1,340)		Had a Non-Traditional Healthcare Visit* (n=1,063)	
	n	%	n	%	n	%
1	401	23.4%	361	26.9%	429	40.4%
2	322	18.8%	332	24.8%	191	18.0%
3-5	435	25.4%	355	26.5%	213	20.0%
6-10	279	16.3%	179	13.4%	111	10.4%
>10	278	16.2%	113	8.4%	119	11.2%
Mean Number of Visits	6.6		4.3		5.1	
Standard Deviation	10.0		5.8		9.5	
Median	3.0		2.0		2.0	
Range	1.0-107.0		1.0-69.0		1.0-101.0	
Type of healthcare visit*			(among traditional visits)		(among non-traditional visits)	
Family doctor	941	54.9%	941	70.2%		
Other doctor	349	20.3%	349	26.0%		
Nurse	323	18.8%	323	24.1%		
Overnight hospital stay	222	12.9%	222	16.6%		
Dentist	489	28.5%			489	46.0%
Eye doctor	326	19.0%			326	30.4%
Correctional facility	238	13.9%			238	22.4%
Psychologist	228	13.3%			228	21.4%
Chiropractor	132	7.7%			132	12.4%
Substance use treatment center	109	6.4%			109	10.3%
Allied health therapist	43	2.5%			43	4.0%

* Categories of healthcare visit type are not mutually exclusive

Table 3

Missed opportunities for HIV diagnosis among 53 participants testing HIV-positive at baseline

Had any healthcare visit in the last 12 months	16	30.2%
Type of healthcare visit *		
Family doctor	7	43.8%
Dentist	5	31.3%
Other doctor	4	25.0%
Nurse	2	12.5%
Correctional facility	2	12.5%
Overnight hospital stay	1	6.3%
Eye doctor	1	6.3%
Chiropractor	1	6.3%
Psychologist	1	6.3%
Allied health therapist	1	6.3%
Substance use treatment center	0	0.0%

* Categories of healthcare visit type are not mutually exclusive

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Missed opportunities for HIV testing in the last 12 months among high-risk non-testers (n=1,245)

Table 4

Number of Visits in the last 12 months	Had any Healthcare Visit (n=932)		Had a Traditional Healthcare Visit* (n=716)		Had a Non-Traditional Healthcare Visit* (n=599)	
	n	%	n	%	n	%
1	211	22.6%	197	27.5%	260	43.4%
2	170	18.2%	164	22.9%	101	16.9%
3–5	251	26.9%	196	27.4%	115	19.2%
6–10	158	17.0%	96	13.4%	65	10.9%
>10	142	15.2%	63	8.8%	58	9.7%
Mean Number of Visits	6.7		4.5		5.0	
Standard Deviation	10.7		6.3		10.2	
Median	3.0		2.0		2.0	
Range	1.0–107.0		1.0–69.0		1.0–101.0	
Type of healthcare visit*			(among traditional visits)		(among non-traditional visits)	
Family doctor	488	52.4%	488	68.2%		
Other doctor	196	21.0%	196	27.4%		
Nurse	176	18.9%	176	24.6%		
Overnight hospital stay	126	13.5%	126	17.6%		
Dentist	255	27.4%			255	42.6%
Eye doctor	166	17.8%			166	27.7%
Correctional facility	155	16.6%			155	25.9%
Psychologist	123	13.2%			123	20.5%
Chiropractor	76	8.2%			76	12.7%
Substance use treatment center	68	7.3%			68	11.4%
Allied health therapist	27	2.9%			27	4.5%

* Categories of healthcare visit type are not mutually exclusive