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Assessing HIV Testing and Linkage to Care Activities and Providing Academic Support to Public Health Authorities in Houston, TX

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Abstract

Background—Health departments often have little knowledge of HIV testing and linkage activities outside of those they directly fund. Many health departments also have limited access to outside academic expertise.

Methods—We conducted a survey of health organizations in the Houston/Harris County region to determine the number of HIV tests completed in 2011, activities that organizations conducted to promote linkage to care for persons newly diagnosed with HIV, and barriers to linkage to care. We also convened a Scientific Advisory Council to advise the local health department on HIV prevention activities.

Results—In 2012, 55 of 84 organizations (65.5%) completed the survey, and 43 of those 55 organizations reported conducting HIV testing, so were included in this analysis. Organizations reported conducting 210,565 HIV tests in 2011, 50.9% under health department contract. The median number of tests per organization was 1045 (IQR 159 and 3520). Over 90% of the organizations used active linkage to care methods, but only 46.5% had written linkage to care protocols. Barriers to linkage to care most often reported were client refusal, followed by staff capacity and funding limitations. The Scientific Advisory Council provided valuable informal expertise to the local health department.

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Conclusions—Half of the HIV testing in the Houston/Harris County region is conducted without local health department funding, and half the organizations conducting HIV testing have linkage to care protocols. The findings of the study and Scientific Advisory Council advice have helped the health department with policy, procedures, evaluation tools, and technical assistance offerings.

Keywords

HIV/AIDS; Linkage to Care; Barriers to Care; HIV/AIDS Testing

Introduction

Of the over 1.1 million persons estimated to be living with HIV in the United States, it is estimated that only about 28% have HIV viral suppression.[1] Two major drivers of this poor rate of viral suppression are delayed diagnosis due to insufficient testing for HIV infection, and delayed linkage to HIV care once a diagnosis is established. According to Centers for Disease Control and Prevention (CDC) estimates, about 18% of persons estimated to be living with HIV in the US are undiagnosed and 55% of adults living in the US have never had an HIV test.[1,2,3] Similarly, about 25% of persons diagnosed are not linked to HIV care within 90 days of diagnosis.[1] The National HIV/AIDS Strategy (NHAS) has set goals to increase the proportion of persons living with HIV who are diagnosed to 90% and increase the percent of newly diagnosed who are linked to care within 3 months of diagnosis to 85% by 2015.[4]

HIV positive test results are reportable nationwide, therefore, a jurisdiction's health authority is able to use surveillance data to describe the number of newly diagnosed clients, where they were tested, and the demographics of persons with positive test results.[5] However, there is no reporting requirement for HIV test results that are negative. This limits the ability of many jurisdictions to describe the total amount of tests conducted. From a programmatic perspective, this barrier confounds determination of HIV positivity rates because a denominator of tests performed is not available. It also hampers an understanding of whether HIV testing rates are increasing in response to CDC recommendations and how dependent HIV testing is on public funding.[6]

Houston is a large city, with over 2 million persons in the City, over 4 million in Houston/Harris County, and over 5 million persons in the six-county eligible metropolitan area (EMA). HIV is concentrated in Houston/Harris County, which accounts for over 90% of the HIV diagnoses made in the EMA. There are an estimated 20,022 persons living with HIV in Houston/Harris County (not including the undiagnosed), and between 2006 and 2011, an average of 1,253 persons were newly diagnosed with HIV infection per year.[7] Despite this relatively high burden of HIV, there is currently no estimate of HIV testing in Houston. The public health authority responsible for coordinating HIV testing efforts in Houston/Harris County is the City of Houston's Department of Health and Human Services (HDHHS). While the HDHHS is aware of the volume of HIV tests that it and its contractors complete, it has no estimate of tests performed outside of those programs, including tests performed in routine clinical inpatient and outpatient care and in programs funded by private entities.

Similarly, while the HDHHS can assess and require linkage to care activities of its contractors, linkage to care activities outside of those funded by the HDHHS are unknown.

Houston is also home to robust academic medical and public health institutions, including Baylor College of Medicine (BCM), the University of Texas Houston (UTH) School of Medicine, the UTH School of Public Health (UTSPH), and others. Since 2005, BCM and UTH have had an NIH-funded joint Center for AIDS Research (CFAR), the Baylor-UTHouston CFAR, whose mission is to enhance, coordinate, and help fund high quality HIV basic, clinical, and public health research. Despite this local expertise, no mechanism exists by which the HDHHS, the public health authority ultimately responsible for HIV prevention and linkage to care, can regularly solicit input from the local academic expertise.

The Baylor-UTHouston CFAR Enhanced Comprehensive HIV Prevention Planning (ECHPP) project was therefore designed with the aims of forming a collaborative relationship with the HDHHS to better understand who conducts HIV testing in Houston, the quantity and type of HIV testing that occurs in Houston, as well as linkage to care processes and barriers to linkage efforts. This knowledge is critical to improve HIV testing and linkage to care in Houston, consistent with NHAS goals. We also sought to establish a standing council of academicians and local experts from which the HDHHS could solicit guidance on public health activities, again to enhance the region's response to HIV/AIDS. To accomplish these aims, we conducted a survey of local healthcare systems, community organizations, and clinics that would be expected to test for HIV infection to obtain information on tests performed and linkage to care efforts. We also recruited and convened a Scientific Advisory Council from which the HDHHS could solicit advice. Herein we report the results of those efforts.

Methods

Survey

Survey development—The primary objective of the survey was gathering data from organizations conducting HIV testing in Houston/Harris County in 2011. The survey tool was designed jointly by investigators from the HDHHS, Houston Area HIV Services Ryan White Planning Council's Office of Support (the administrative office that coordinates the local Ryan White Planning Council, conducts the local HIV needs assessment, and co-authors [with the HDHHS] the area's comprehensive HIV prevention and care services plan), and Baylor-UTHouston CFAR. The tool included nine questions to assess number of HIV tests performed in 2011, as well as linkage to care policies, practices, and barriers. While there is extensive literature on barriers to linkage to care from the patient perspective, there is less literature on barriers to providing linkage to care services from the organizational perspective. We therefore modified a list of barriers to HIV testing from the organizational perspective[8] to apply to linkage to care. Barriers to HIV linkage to care were assessed by having respondents indicate the extent to which they agreed with pre-specified barriers on a 5-point scale ranging from no barrier (1) to major barrier (5). Organizations were given the opportunity to provide other barriers in an open-ended format and rank each on the same 5-point scale as the pre-specified barriers. The survey was piloted by an in-

person interview with an administrator from a private hospital in Texas that conducts routine HIV testing but is outside of Houston/Harris County.

Participants—The sampling frame included large healthcare systems, community organizations, and clinics expected to conduct HIV testing in the Houston/Harris County area. The HDHHS funded two distinct HIV testing services in 2011: (1) targeted HIV testing and prevention counseling by community-based organizations (CBOs), and (2) routine, opt-out HIV testing performed in emergency departments and outpatient clinics. Ten organizations in Houston/Harris County were funded by the HDHHS to provide these services in 2011. In order to gain an understanding of all testing in Houston/Harris County, including testing not funded by the HDHHS, we created an exhaustive list of known HIV testing organizations that included CBOs, hospitals, clinics, substance abuse treatment centers, homeless shelters, and universities. The list was generated by starting with organizations funded for HIV prevention or care services by the local city or county health department, state health department, the CDC, and/or the Substance Abuse & Mental Health Services Administration (SAMHSA). Study team members then added major hospitals, clinics, and university health centers to the list. We then obtained the names of substance abuse treatment centers in Houston/Harris County from the Texas Department of State Health Services and SAMHSA web sites and called each center to ascertain if HIV testing was provided. If testing was provided, the center was added to the comprehensive list of possible participants. The list of possible participants was also reviewed by HIV prevention and care administrators to ensure inclusion of known testing organizations and homeless shelters. Finally, since resources and time to conduct the face-to-face in-depth survey were limited, and one of our primary aims was to estimate the total number of HIV tests conducted in the area, we prioritized the list to focus on surveying the HDHHS HIV prevention contractors, major public and private hospitals and clinics, and other organizations known to provide HIV testing.

Recruitment and data collection—A leader in each organization was emailed a formal invitation, followed by at least two phone calls if there was no response to the email invitation. The leader was asked to identify a staff member responsible for HIV testing who could most accurately respond to the survey questions. Typically, survey respondents included HIV program directors, nurse managers, and/or lab directors. Respondents were encouraged to seek input from other members of their organization to increase the accuracy of responses. Surveys were completed by an in-person interview. If an in-person interview was not possible, a telephone interview was conducted. All interviews were conducted by the same HDHHS staff member.

Analysis—The number of total tests performed at each organization in 2011 was summarized. Based on the frequency distribution of the results, each organization was categorized as an infrequent (<104 tests per year, or less than 2 per week), moderate (104-1040 tests per year), or frequent (>1040 tests per year, approximately the median number of tests per year in the sample) HIV testing organization.

The percentage of organizations that offered any linkage to care assistance was determined, as well as percentage of organizations that reported having linkage to care protocols in

place. Types of linkage to care activities were assessed, and categorized as active or passive. Active activities included those that involved direct facilitation of linkage (e.g., scheduling appointments, providing reminder calls, and intervening if persons missed appointments). Passive activities included referrals without additional follow-up (e.g., providing a list of HIV clinics). The personnel most frequently facilitating linkage at the organization was assessed, along with the places newly diagnosed are most often referred for care.

For the barriers to linkage, we determined the median, 25th percentile, and 75th percentile rating on the 5-point Likert scale for all the organizations, as well as by type of organization, volume of HIV tests conducted, and whether routine, opt out testing was offered to non-pregnant patients. Specific barriers of particular interest to the HDHHS included funding, staff capacity, and training issues.

The goals of the study were descriptive in nature and did not include hypothesis testing. Because of the small sample size and descriptive nature of the survey, we did not test our results for statistical significance. Data analysis was conducted using SAS 9.3 (SAS Institute, Cary, NC). This study was approved by the institutional review boards of Baylor College of Medicine and Affiliated Hospitals and the George Washington University.

Scientific Advisory Council

Local HIV prevention and treatment experts from academic institutions as well as public health departments were invited to participate. Academic clinicians, clinical researchers, health services researchers, epidemiologists, behavioral scientists, public health administrators, and laboratory clinicians were asked to serve as members of the Council. Key functions of the Council include: reviewing data collected by the HDHHS and local care partners, guiding the HDHHS program design and evaluating program activities, providing feedback on national HIV testing and linkage models to inform local activities, and offering guidance on future program directions. Council meetings were to be held monthly with topics selected by the HDHHS.

Results

Survey Participants

There were 84 healthcare systems, hospitals, community organizations, and freestanding clinics contacted for study inclusion. Between March and October 2012, 55 of the 84 organizations (65.5%) completed the survey. Among the 29 organizations that did not participate, 4 (4.8%) declined and 25 (29.8%) did not reply to the interview request. Seventy three percent of the invited hospitals completed the survey, along with 53% of the invited community-based or community service organizations (CBOs) and 77% of the invited clinics or university health centers (clinics). Phone rather than in-person interviews were conducted for 14.5% of the organizations. Forty-three of the 55 participating organizations reported conducting any HIV testing. These organizations include 114 different healthcare clinics or facilities in the Houston/Harris County area. This analysis was limited to those 43 organizations. Eleven of the organizations (25.6%) were hospitals, ten (23.3%) were CBOs, and 22 (51.2%) were clinics.

HIV Testing in Houston

Forty-one of the 43 organizations (95.3%) that reported conducting HIV testing were able to provide administrative or clinical data on the number of HIV tests completed in 2011 (Table 1). Review of administrative and/or clinical data was the primary methodology used for gathering HIV testing data (81.4% of organizations). For organizations that could not provide testing data, estimates from staff members were used (11.6%). Two organizations that conducted HIV testing did not provide an estimate of testing volume. Organizations reported conducting a total of 210,565 HIV tests in 2011. The median number of tests per organization was 1,045, with a range of 2 to 47,209 (IQR 159 and 3,520). According to HDHHS programmatic data, 50.9% of these tests were funded by the HDHHS, leaving 49.1% of the tests supported by other sources (which could include private insurance, self-pay, Medicaid, Medicare, other grants, philanthropy, and the organization's general revenue). A total of 169,635 standard HIV blood tests were conducted by 34 organizations (median=585 tests each, IQR 146 and 2069), while 40,910 rapid tests (median=1478 tests each, IQR 200 and 2253) were conducted by 21 organizations.

Seven organizations were classified as infrequent testers, 13 organizations as moderate testers, and 21 as frequent testers. Hospitals conducted a median of 3,520 HIV tests each, followed by clinics with a median of 1,373 tests each and CBOs with a median of 603 tests each. Upon examination by test type, this pattern remained for number of standard tests conducted (hospitals median=2,795, clinics median=675, CBOs median=260). Clinic sites had the highest median number of rapid tests (1,869), followed by CBOs (813) and hospitals (619).

Linkage to Care Efforts

Forty-one of the 43 organizations (95.3%) that conducted HIV testing also reported facilitating linkage into HIV care. Twenty of the facilities (46.5%) reported having a standardized, written linkage to care protocol. Ninety percent of the 10 organizations that received HDHHS funding for HIV testing had a written linkage protocol, compared to 36.3% of the facilities that were not HDHHS contractors. The one HDHHS contractor that did not have a written linkage protocol was a hospital that only conducted routine, opt-out testing, not targeted testing. Most hospital organizations (7 of 11, or 63.6%) and clinics (14 of 22, or 63.6%) did not have linkage protocols, while most CBOs (9 of 10, or 90%) did.

Organizations reported performing a number of active linkage to care activities, including scheduling an HIV clinic appointment for the patient (86.0% of organizations), providing reminders about the up-coming HIV clinic appointment (48.8%), and confirming that the patient attended the HIV appointment (62.8%; Table 2). Overall, 90.7% of the organizations reported at least one active linkage effort. Passive linkage efforts include providing referrals or consults to a specific HIV provider (69.8%), providing a list of local HIV providers (65.1%), and referring patients internally for HIV medical care (25.6%).

Persons frequently responsible for linkage activities included social workers, case managers, and treatment counselors, health educators, outreach workers, risk reduction specialists and counselors, and service linkage workers, referral coordinators, and service counselors (Table

2). Most organizations (93.1%) that did not provide HIV medical care reported referring persons who were newly diagnosed with HIV to external organizations, as expected. A majority of organizations that did provide HIV medical care referred to an internal provider at their facility (71.4%) and/or to a provider at another facility within their organization (64.3%). However, over 57% of organizations that provide HIV medical care also referred to providers outside of their organization.

Barriers to Facilitating Linkage to Care Services

Barriers to facilitating linkage to care of HIV-infected persons are reported in Table 3. On a scale of 1 to 5, the median response for all the barriers listed in the survey was 1, except for "client refusal" which had a median response of 2, indicating that at least half the organizations did not consider the listed structural and system items as barriers. The structural or system barriers that were endorsed most commonly were funding and staffing issues. A number of organizations (46.5%) indicated "other" barriers were moderate or high barriers (defined as a rating of 3 or higher). The most commonly cited other barriers were difficulties with care coordination (6 organizations) and patient factors (14 organizations).

When analyzed by type of organization, hospitals, followed by clinics, had overall lower reported barriers than did CBOs. In particular, hospitals reported low barriers attributed to client refusal and past negative experiences with linkage, while clinics and CBOs reported these items as their greatest barriers overall. Clinics reported staff size, time needed for linkage efforts, and the ability to charge/reimburse as higher barriers, while CBOs rated these as lower barriers. CBOs ranked amount of dedicated funding, client refusal, and negative experiences with linkage higher than did the other site types.

When analyzed by testing volume, the amount of dedicated funding was rated a higher barrier by moderate and frequent testers than by infrequent testers. In contrast, infrequent testers rated staff time as a slightly higher barrier than did moderate and frequent testers. The requirement to notify clients of their test results was also a higher barrier for infrequent testers in comparison to the other organizations. Moderate testers reported facilities/space to facilitate linkage to care and amount of dedicated funding as their highest barriers, while frequent testers reported their highest barriers were client refusal and amount of dedicated funding. The ability to charge/reimburse was also a slightly higher barrier among frequent testers.

We also stratified the organizations into those that offered routine HIV testing outside of obstetrics and gynecology services and those that did not, but there were no substantial differences in reported barriers to linkage to care (data not shown).

Scientific Advisory Council Membership and Activities

The Council included a total of 21 members, 6 in health services or clinical research, 5 in epidemiology or statistics, 4 in behavioral sciences, 3 in laboratory sciences, 2 in HIV prevention/care administration, and 1 in health economics. There were a total of 10 Council meetings held between February 2012 and June 2013. On average, approximately 10 Council members participated in each meeting. The meeting format included a 30-minute presentation by the HDHHS staff soliciting input, or a presentation by a local expert on a

topic of interest to the HDHHS, followed by an interactive discussion during which the Council could provide recommendations to the HDHHS.

There are a number of specific achievements attributable to the Scientific Advisory Council. The HIP HOP for HIV Awareness (HIP HOP) event is a large scale HIV education and testing event. The Council reviewed and recommended revisions to the pre- and post-assessments for the event. These tools measure change in knowledge and attitudes after completing an HIV prevention educational session at HIP HOP. The new assessments have been successfully utilized in both the 2012 and 2013 events. Based on input from the Council, the HDHHS pursued new avenues for provider outreach during the 2012 syphilis outbreak in Houston. For the first time, the HDHHS attended a large conference targeted to primary care practitioners in Texas and the surrounding region, to promote syphilis awareness directly to providers. The Scientific Advisory Council provided a summary letter of the benefits, challenges, and implementation status of HIV pre-exposure prophylaxis (PrEP) in Houston to the local HIV prevention and HIV care planning bodies, which helped them prioritize their allocations and efforts. The Council also provided advice on the HDHHS' HIV Elimination Project and its Enhanced Linkage to Care Initiative and reviewed planned revisions to the HDHHS' HIV diagnostic testing algorithm. Locally collected data that informs targeted testing in Houston, including the survey results presented herein and results of a study on transgender HIV care, were also reviewed by the Council.

The Scientific Advisory Council has afforded the HDHHS the opportunity to build relationships with and collaborate with local researchers and experts from varied institutions. Due to these new partnerships, the scientific community of Houston is kept abreast of health department initiatives, while the HDHHS is informed of innovative recent publications, clinical trends in HIV care, and on-going research projects. Most importantly, the Council has enabled the HDHHS to access the knowledge base of nationally renowned academicians to guide health department activities. The Council has added academic expertise to the HDHHS that greatly improves the City's ability to implement HIV prevention activities in a scientifically based approach. While the members give generously of their time, a primary challenge has been maintaining high attendance as members represent multiple institutions and have varied schedules and priorities throughout Houston.

Discussion

HIV testing levels are inadequate in the US, and linkage to HIV care within 3 months of diagnosis is estimated to be below the national goal of 85%.[4] In this regional survey of organizations that provide HIV testing, we found that about 50% of HIV testing occurs in organizations without the receipt of local public health funding to conduct that testing. We also found that organizations that conduct HIV testing vary in the ways they approach linkage to HIV care, including who provides linkage services and whether formal linkage processes exist. Only half the organizations have written policies to support linkage to care, including most of the CBOs that provide HIV testing, but only about one-third of the hospital and clinic organizations. Finally, we determined that our Scientific Advisory Council, an informal mechanism to provide academic expertise to the public health authority, was feasible and provided valuable guidance to the HDHHS.

The survey of organizations that are not HDHHS contractors provided beneficial insight to the HDHHS. Since we found that about half of the HIV testing in the region occurs outside of HDHHS funding, efforts to change HIV testing procedures, implement routine HIV testing, and improve linkage to HIV care, need to pay equal attention to providers who do not receive local public funding for testing. Communication of new procedures and policies to hospitals and clinics is especially vital since they conducted about 96% of all tests reported in our survey.

According to our survey results, there were about 5 HIV tests per hundred residents per year (tests per 4.1 million Houston/Harris County residents) in 2011. A national survey found that 13.0% of men and 21.4% of women aged 15-44 years reported having an HIV test performed in the past year.[9] If these proportions were applied to the Houston/Harris County population aged 15-44 in 2011, an estimated 317,000 persons would have been tested. As our survey did not reach all HIV test providers, 210,565 is certainly an underestimate of the number of HIV tests conducted in the Houston/Harris County area. However, it is plausible that fewer than 300,000 Houstonians were tested in 2011. Our review suggests that further studies are needed to determine if Houston's rate of testing is on par with national rates.

We found substantial heterogeneity in linkage to care efforts at different organizations, which is probably a reflection of heterogeneity in the organizations and their missions. The lack of linkage to care protocols, especially among hospitals and clinics, is not surprising given that many of the organizations we surveyed have very broad clinical missions, including inpatient care, substance use treatment, and routine outpatient primary and specialty care. The HDHHS funding mechanisms for targeted testing stipulate that a written linkage protocol be in place, but similar stipulations are not in place for the HDHHS-funded routine testing sites. The routine sites must document a detailed scope of work to include linkage to care, but linkage at these sites is managed by the City, which maintains their own linkage protocols. Therefore, the high proportion of HDHHS-funded organizations reporting written linkage protocols is consistent with expectations. Written protocols are a standard quality management tool, and promoting the development and adoption of linkage protocols regardless of funding sources or testing strategies might increase linkage to care rates. Additional research and organizational-level follow-up could assess the impact of developing and adopting linkage to care protocols.

While almost 91% of the surveyed organizations reported performing at least one active linkage effort, identifying barriers to facilitating linkage are vital to improving outcomes across the care continuum. Barriers to linkage that were identified in the survey as substantial barriers were client refusal, followed by financial concerns and staffing limitations. Hospitals reported overall lower barriers than CBOs and clinics, perhaps due to more varied skill sets among staff and/or a larger operating budget and diversity of funding to absorb HIV testing and linkage activities. Efforts to increase coordination of care, including efforts to build patient-centered medical homes, use patient navigators, and provide comprehensive services through Ryan White funded programs could alleviate some financial and staffing limitations. The set of barriers that were more focused on patient factors suggest that technical assistance to inform providers about the clinical and case management services available in the area, as well as strategies for helping patients access

those services, might be useful. It is also possible that additional clinical and case management services are needed. The survey process itself prompted some organizations to think about and discuss HIV testing and linkage with the HDHHS and other collaborators. As a result of the survey, the HDHHS, CFAR, and Ryan White Grants Administration are in the process of providing technical assistance to interested survey participants on these and other topics.

Based on input from the Scientific Advisory Council, the HDHHS has implemented new tools, new outreach strategies, and new guidance for community distribution. Just as importantly, the HDHHS has established new relationships with academicians in Houston, and the Council has facilitated a bidirectional flow of information between academicians and the HDHHS. Texas' reluctance to expand Medicaid will necessitate closer collaboration between all relevant parties delivering or designing HIV services in the Houston area, which the Council could help facilitate.

The survey component of our project has several limitations. The survey sample was not random; instead, we focused on recruiting larger organizations and known HIV testing sites. The data were self-reported, and are limited by the organizational knowledge of the person or persons completing the survey on behalf of the organization. Many of the larger organizations may have linkage to care procedures that vary from department to department, or based on funding sources. We do not know how the HIV tests conducted outside of the HDHHS-funded programs were reimbursed. This information might be important for guiding efforts to increase HIV testing in Houston/Harris County. Despite our desire to determine organizational barriers to linkage to care, most respondents rated the pre-specified barriers as low barriers. Instead, they volunteered other barriers, which were generally patient factors and problems with care coordination. This result may indicate that our list of barriers was inadequate, or may reflect a social desirability bias in the survey responses in which participants wanted to portray to the HDHHS that their organization was not responsible for problems with linkage to HIV care, and instead attributed these problems to the patient and other providers.

The survey and Scientific Advisory Council components of our ECHPP project yielded a number of valuable results. We learned that about half of the HIV testing in the Houston/Harris County region is conducted without local public health funding, and that about half the organizations conducting HIV testing have written linkage to care protocols. We gained valuable insight into barriers to linkage to care from the perspective of these organizations. The results have prompted review of policies and procedures, offering of technical assistance, and continued solicitation of input from the Scientific Advisory Council. It is encouraging that the US Preventive Services Task Force recently recommended that all adolescents and adults 15 to 65 years old be tested for HIV.[10] This recommendation may improve local HIV testing rates and help move us closer to achieving the goals of the National HIV/AIDS Strategy.

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Table 1

HIV Testing Volume Overall and by Subcategory.

	Testing Volume in 2011			
Total tests	210,565			
Funding source				
HDHHS	107,237 (50.9%)			
Other	103,328 (49.1%)			
	n	*25th*	*Median*	*75th*
Tests per organization	41	159	1045	3520
Testing volume				
Infrequent (<104)	7	8	20	28
Moderate (104-1040)	13	159	323	749
Frequent (>1040)	21	1900	3520	9729
Type of test				
Standard (169,635 tests)	34	146	585	2069
Rapid (40,910 tests)	21	200	1478	2253
Type of organization				
Hospitals	11	28	3520	7749
Clinics	20	235	1373	3978
CBOs	10	213	603	1426

Table 2

Linkage efforts and personnel who facilitate linkage into HIV care among 43 organizations that offer HIV testing.

Linkage effort	N	%
Passive linkage efforts		
We do not facilitate entry	2	4.7%
Facility is an HIV medical provider and refers internally	11	25.6%
Provide HIV-infected clients with a list of HIV clinics	28	65.1%
Provide a referral or consult to a specific HIV medical care provider	30	69.8%
Active linkage efforts		
Schedule initial HIV care appointment	37	86.0%
Provide a reminder about initial HIV care appt	21	48.8%
Confirm patient attended first HIV care appt	27	62.8%
Other*	31	72.1%
Personnel who facilitate linkage		
Physician, Nurse Practitioner, or Physician Assistant	17	39.5%
Nurse, healthcare asst., medical asst.	13	30.2%
Social worker, case mg, substance abuse counselor	25	58.1%
Service linkage worker, referral coordinators, service coordinator	11	25.6%
Mental health provider	1	2.3%
Disease intervention specialist	2	4.7%
Health educator, outreach worker, risk reduction specialist	14	32.6%
N/A, does not facilitate entry	2	4.7%
Other†	9	20.0%

Organizations could select more than one response.

*The most common “other” responses included the following active efforts: providing transportation assistance (n=20), having staff dedicated to linkage to care (n=11), providing case management services (n=9), and accompanying clients to appointments (n=6); the most common passive effort was providing translation services (n=13).

†The most common “other” response was program director or project coordinator (n=4).

Table 3

Barriers to linkage to care by organization type and testing volume.

	All Organizations (n=43)			CBOs (n=10)			Hospitals (n=11)			Clinics (n=22)			Infrequent testers (n=7)			Moderate testers (n=13)			Frequent testers (n=21)		
Barrier	***25th***	***Median***	***75th***	***25th***	***Median***	***75th***	***25th***	***Median***	***75th***	***25th***	***Median***	***75th***	***25th***	***Median***	***75th***	***25th***	***Median***	***75th***	***25th***	***Median***	***75th***
Staff knowledge/skill/experience	1	1	2	1	1	2	1	1	1	1	1	2	1	1	1	1	1	2	1	1	2
Staff time	1	1	3	1	1	1	1	1	2	1	1	3	1	1	4	1	1	2	1	1	3
Staff size	1	1	3	1	1	1	1	1	3	1	1	4	1	1	4	1	1	3	1	1	3
Facilities/space	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1
No established procedure or protocol in place	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Amount of dedicated funding	1	1	4	1	1.5	5	1	1	3	1	1	4	1	1	2	1	1	4	1	2	3
Ability to charge/reimburse	1	1	3	1	1	1	1	1	3	1	1	4	1	1	2	1	1	1	1	1	3
Leadership resistance	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Staff resistance	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Staff cultural competency/comfort with issue	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Unsure where to refer clients identified as HIV+	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Client refusal	1	2	3	2	2.5	3	1	1	3	1	2	3	1	1	3	1	1	2	1	2	3
Negative experience with linkage	1	1	3	1	2.5	4	1	1	1	1	2	3	1	1	2	1	1	2	1	1	3
Requirement to notify clients of results	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1