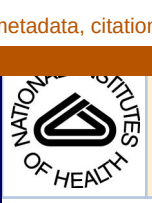

Published in final edited form as:

J Adolesc Health. 2014 December ; 55(6): 765–773. doi:10.1016/j.jadohealth.2014.07.009.

A Comparison of Network-based Strategies for Screening At-Risk Hispanic/Latino Adolescents and Young Adults for Undiagnosed Asymptomatic HIV Infection

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Conflict of Interest

The authors do not have any commercial or other associations that might pose a conflict of interest.

Clinical Trials Registry Site and Number: Not Applicable.

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Abstract

Purpose—Hispanic/Latino adolescents and young adults are disproportionately impacted by the HIV/AIDS epidemic; yet, little is known about the best strategies to increase HIV testing in this group. Network-based approaches are feasible and acceptable means for screening at-risk adults for HIV infection, but it is unknown whether these approaches are appropriate for at-risk young Hispanics/Latinos. Thus, we compared an alternative venue-based testing (AVT) strategy with a social and sexual network referral (SSNIT) strategy.

Methods—All participants were Hispanics/Latinos, aged 13–24 years with self-reported HIV risk; they were recruited from 11 cities in the U.S. and Puerto Rico, and completed an audio computer-assisted self-interview and underwent HIV screening.

Results—1,596 participants (94.5% of those approached) were enrolled: 784 (49.1%) through AVT and 812 (50.9%) through SSNIT. HIV infection was identified in three SSNIT (0.37%) and four AVT (0.51%) participants (p=0.7213).

Conclusions—Despite high levels of HIV risk, a low prevalence of HIV infection was identified with no differences by recruitment strategy. We found overwhelming support for the acceptability and feasibility of AVT and SSNIT for engaging and screening at-risk young Hispanics/Latinos. Further research is needed to better understand how to strategically implement such strategies to improve identification of undiagnosed HIV infection.

Keywords

Hispanic/Latino adolescents and young adults; HIV testing/screening; network-based HIV screening

INTRODUCTION

With a population of 53 million, Hispanics/Latinos represent nearly17% of the United States (U.S.) population (1), but account for 20% of persons living with AIDS (1). HIV/AIDS cases among adolescents and young adults are unacceptably high (2–4). In 2012, Hispanic/Latino adolescents, aged 13–19 years, represented 20% of all new HIV cases among adolescents, reflecting an 8% increase in the number of cases between 2008 and 2010 (2,5). In 2010, Hispanic/Latino young adults, aged 20–24 years, accounted for 18% of the population and AIDS cases (5,6). Specifically among Hispanics/Latinos, male-to-male sexual contact accounted for an estimated 68% new HIV infections, overall, and approximately 79% of new infections among Hispanic/Latino men (28% of these infections were among young men, aged 13–24 years). Also, in 2010, Hispanic women/Latinas accounted for 14% of the estimated new infections among all Hispanics/Latinos (2,7). Of the persons in the U.S. living with HIV/AIDS, an estimated 16% are unaware of their HIV status (8); the rate for adolescents is projected to be 60%–80% (8,9). HIV-infected

individuals who are unaware of their HIV status are estimated to account for more than half of all new HIV infections (8,10). Research has shown higher rates of HIV testing among Hispanics/Latinos compared to other ethnic and racial groups (11). However, national surveillance data also indicate that Hispanics/Latinos are more likely than other racial ethnic groups to test late for HIV infection; over one-third (36%) that are diagnosed with AIDS within one year of testing positive for HIV (2,12). Little is known about the best strategies for increasing HIV testing among at risk Hispanic/Latino adolescents and young adults (here forth referred to as young Hispanics/Latinos). Thus, data on acceptable strategies to encourage HIV testing among this group are needed.

Although fixed facilities such as sexually transmitted disease clinics play an important role in HIV screening and prevention, they are limited in reaching asymptomatic persons who do not perceive that their behaviors put them at high risk for HIV (13,14), which is a reason cited by diverse groups of adolescents (15,17) and the most prevalent reason given by Hispanic/Latino adolescents and adults (75%) for not seeking HIV testing (17,18). Many factors that may increase the risk for HIV in Hispanics/Latinos may also serve as barriers to HIV testing, including lack of healthcare access and insurance, mistrust of healthcare systems, language barriers, experiences of racism, perceived stigma and homophobia, poverty, and educational disparity (14,18,19).

A possible effective means for reaching individuals who are at risk for HIV infection includes social and sexual network-based (network-based) recruitment approaches (17, 20, 21). The basic premise underlying these approaches is that people socialize and have sex with people who are similar to them. Furthermore, it is speculated that the network of an HIV-infected person is more likely to include other HIV-infected persons compared to the network of an uninfected person (13,17). Two types of network-based recruitment approaches that were designed for research purposes that may more effectively reach diverse sub-groups of at-risk young Hispanics/Latinos for HIV screening are time-space sampling and respondent driven sampling (RDS) (20). Alternative venue-based testing (AVT), which draws upon principles of time-space sampling, is a strategy for recruiting members of a group that congregate in known locations at specific times (21). The value of this strategy for identifying undiagnosed HIV is that at-risk, hard-to-reach groups tend to congregate at certain types of locations. That is, alternative venues (e.g., clubs, street corners) serve as a geographical entry into a network, especially among those whose network members (NMs) may not have a fixed residence or who engage in behaviors that may be stigmatized or occur away from their residence (21). RDS is another strategy for reaching at-risk, hard-to-reach groups. RDS, a variation of chain referral sampling, is a strategy in which respondents are asked to recruit members of their social and sexual networks, which extends reach to a wide range of individuals (21, 22). Given our focus on young people where there is limited evidence on effective recruitment strategies for HIV screening and given potential barriers to HIV screening among Hispanics/Latinos (14,18,19), the primary goal of this research was to compare the effectiveness of AVT with a social and sexual network-based interviewing and HIV testing (SSNIT) strategy that utilized select principles of RDS.

A secondary goal of this research was to examine facilitators for and barriers to HIV screening. Such information will help to tailor approaches for reaching at-risk young Hispanics/Latinos.

METHODS

Study Participants

All study participants were Hispanic/Latino/a, aged 13–24 years, with self-reported HIV risk. Figure 1 shows the inclusion criteria for study participants by recruitment strategies. Since AVT represents a geographical point of entry into a network, we set a broad criteria for inclusion of young men who have sex with men (MSM) and a slightly stricter inclusion criteria to increase the likelihood of identifying young heterosexual women who may have had a reasonable chance of being exposed to HIV. The main goal of the SSNIT approach was to extend reach into the networks of individuals who were either HIV positive or who engaged in high-risk behaviors.

Study Design

This cross-sectional study was implemented in 11 Adolescent Medicine Trial Units (AMTUs) of the National Institutes of Health-funded Adolescent Trials Network for HIV/AIDS Interventions (ATN) that provided clinical care to young Hispanics/Latinos. Of the 11 AMTUs, nine (Baltimore, Bronx, Chicago, Los Angeles, Philadelphia, Puerto Rico, Tampa, San Francisco and Washington DC) recruited participants using AVT and SSNIT strategies. The remaining two AMTUs (Memphis and Miami) only used SSNIT due to limited experience in conducting outreach with the target group at the time of the study's start.

AVT Recruitment and Study Procedures

For AVT, each AMTU developed a venue-based sampling strategy within their respective communities. Prior to study implementation AMTUs provided a detailed, culturally appropriate, community-tailored plan for reaching their targeted group. Using local epidemiological surveillance data (e.g. Hispanic/Latino adolescents living with HIV/AIDS by neighborhood, gonorrhea cases among Hispanic/Latino adolescents by Zip code), each AMTU determined a specific Hispanic/Latino subgroup that was deemed to be at high risk for HIV to target for the duration of the study. A detailed description of the AMTUs' use of geographic information system (GIS) mapping and the selection and formation of community partners to identify and engage at-risk adolescents and young adults are described in detail elsewhere (23,24). Eight AMTUs selected young MSM and one AMTU (Baltimore) selected heterosexual adolescent and young adult women for AVT recruitment. At targeted venues (e.g., youth-serving community-based organizations, clubs, churches, and street venues such as health fairs) during predetermined dates and times, project staff recruited participants by approaching individuals who appeared to be in the target group. All study procedures took place in a dedicated private room or a mobile van associated with the project.

SSNIT Recruitment and Study Procedures

For SSNIT, project staff directly invited patients from the AMTUs or clients from community-partnered agencies to serve as index recruiters (IRs). Those who agreed to be screened for study eligibility participated in a brief interview to provide an assessment of his/her social and sexual networks. For all eligible IRs, a protocol-driven system for disbursement of coupons and incentives and for network mapping (assessment of the network characteristics and size) was used. Each IR was trained on how to recruit their NMs, with consideration given to possible social, cultural, and structural barriers. Each IR was provided four coupons to give to their NMs who identified as Hispanic/Latino and whom they thought might benefit from HIV screening.

For both AVT and SSNIT, potential study participants provided verbal consent to undergo a brief screening interview for eligibility. If eligible, they provided written, informed consent/assent. Each AMTU's Institutional Review Boards (IRB) approved all study procedures with only one IRB requiring parental permission. Study participants completed an audio computer-assisted self-interview (ACASI) and underwent HIV screening. Participants with a presumptive HIV positive test result were referred to their local AMTU for confirmatory testing, post-test counseling and referral for linkage to healthcare. Study participants received $25–$50 for completing the ACASI, IRs received $35–$60 for registering as an IR, and $15–$25 for successful referral of each NM. The varying amounts were determined by each AMTU with local IRB approval. Data were collected between January 2011and January 2013.

Measures

The ACASI was developed on the basis of our prior research and other investigations that focused on sociodemographic markers of HIV risk, HIV-related risk and/or prevention factors, and facilitators and barriers to HIV screening. The ACASI took approximately 30 minutes to complete.

Sociodemographic Characteristics—Sociodemographic characteristics included: (1) age; (2) race and ethnicity; (3) Zip codes; (4) level of education (25–27); (5) origin of birth and level of acculturation (28); (6) living situation (25–27); (7) religious affiliation; (8) healthcare utilization (29), (9) material and financial family/personal resources (30); and (10) sexual identity/orientation (25–27).

Behavioral HIV Risk—Behavioral HIV risk measures used criteria established by Seage et al., (31) and Boyer et al., (25,32), including: (1) sexual experience, (2) sexual partnerships, (3) history of sexually transmitted infections (STIs) and pregnancy, (4) risk behaviors (e.g., number of sexual partners, percent condom use), and (5) types of sexual partnerships (e.g., steady or casual). The frequency and quantity of intravenous drugs, alcohol, marijuana, and other substances used were also assessed.

Facilitators for HIV Screening—The Facilitators for HIV Screening measure comprised 13, 4-point Likert-scaled items ("strongly disagree" to "strongly agree") that focused on factors that facilitate HIV testing, including: (1) being concerned for one's health and past

behaviors; (2) available treatments if HIV positive; and (3) desire to confirm HIV status as either positive or negative. These measures were identified as facilitators to HIV screening in our previous research (25).

Barriers to HIV Screening—Participants were queried about factors that prevented them from getting tested previously using 18, 4-point Likert-scaled items ("strongly disagree" to "strongly agree") such as: (1) embarrassment in discussing personal behaviors; (2) fear in knowing HIV status; (3) concern about the confidentiality of the results; (4) mistrust of health providers; and (5) concern about stigma and homophobia. These measures were identified in previous research as barriers to HIV screening (5,18,19,25).

HIV Testing and Linkage to Healthcare—HIV tests identified participants as HIV negative or positive on the basis of oral rapid testing using the OraQuick HIV test with confirmatory tests using Western blot assays. Participants with a presumptive HIV positive test were referred to the AMTU for confirmatory testing. AMTUs followed site-specific standard protocols in providing pre- and post-test counseling. Linkage to healthcare (i.e., attending an initial healthcare visit within 42 days of referral) was conducted in accordance with site-specific procedures and the ATN Strategic Multi-site Initiative for Identification, Linkage- and Engagement-to-Care (SMILE) program that was implemented at all ATMUs. Details regarding the SMILE program are described elsewhere (33,34).

Data Analyses

Conventional descriptive statistics were used to evaluate study participants' characteristics. Frequencies and proportions for categorical variables and means and standard deviations for continuous variables were computed. If the distribution of continuous variables was highly skewed, medians and ranges were computed. Comparisons by recruitment method (AVT vs. SSNIT) were made using Fisher's exact test for categorical variables and Wilcoxon rank-sum test for continuous variables. All p-values are two-sided and, statistical significance was set to p-value <0.05. Data analyses were performed using SAS V9.2 (SAS Institute, Inc., Cary, NC) (35).

RESULTS

Sociodemographic Characteristics

Overall, 1,690 individuals were approached for study participation; of these, 92 (10.5%) who were approached through AVT refused study participation and two (0.2%) approached through SSNIT also refused. Thus, 1,596 (94.4%) participants were enrolled: 784 (49.1%) through AVT and 812 (50.9%) through SSNIT. All but one male participant in the AVT group underwent HIV screening; this participant was excluded from further data analyses (n=1,595). The SSNIT participants, (NMs), were recruited by 311 IRs who had a median age of 21.0 years; they were primarily male (69.3%), generally spoke both Spanish and English (51.1%), and graduated high school/completed a GED or had some college or technical school (55.0%). One-third (33.3%) was previously diagnosed with an HIV infection and all reported behavioral risk for HIV (data are not shown).

Comparisons by HIV Recruitment Strategy

A number of statistically significant differences in recruitment screening strategies were identified (Table 1). Compared with SSNIT participants, AVT participants were significantly more likely to: be older (median age=21.0 vs. 19.0), male (80.6% vs. 54.9%), and have completed high school/GED or some college/technical school (61.7% vs. 55.8%). Table 1 also shows that SSNIT participants were significantly more likely than AVT participants to report use of public insurance and financial assistance, and not having or barely having enough money to pay for bills.

HIV-Related Factors

Comparisons by HIV Recruitment Strategy—As indicated in Table 2 participants, overall, reported high levels of HIV risk. However, comparisons by HIV recruitment strategies revealed significant group differences. For example, AVT participants were significantly more likely to identify as gay or lesbian (53.1% vs. 8.6%), or bisexual (20.7% vs. 12.9%), and report risk associated with sexual behaviors with male partners, including a higher number of men with who they had sex with (median = 5.0 vs. 1.0), and inconsistent condom use for anal sex with male sex partners (55.6% vs. 48.9%). AVT participants were also more likely to report sex with an HIV-infected person (11.0% vs. 6.7%). In contrast, SSNIT participants were significantly more likely to identify as straight (74.4% vs. 21.4%), and report a number of risks associated with female and male partners, including sex with: an incarcerated female (29.3% vs. 10.7%), an STI-infected female (11.1% vs. 5.2%), and a female drug dealer (31.7% vs. 12.2%). Moreover, SSNIT participants were also more likely to report sex with: an incarcerated male (51.6% vs. 23.2%), a male drug dealer ever (45.8% vs. 25.9%), and in the last year (76.7% vs. 67.1%). Comparisons related to prior HIV screening also revealed significant differences by recruitment strategy. That is, the SSNIT strategy was significantly more likely to identify at-risk participants with no prior history of HIV screening (Table 2).

Diagnosis of HIV Infection, Post-test Counseling, and Linkage to Healthcare—The overall prevalence of HIV infection was (0.44%). HIV infection was identified in three SSNIT participants (0.37%) and four AVT participants (0.51%; p=0.7213). Each of the seven participants who were newly identified with an HIV positive test received post-test counseling, but only one of three in the SSNIT group and three of four in the AVT group were successfully linked to healthcare.

Facilitators for and Barriers to HIV Screening—Overall, study participants favorably endorsed (strongly agreed or agreed) facilitators for HIV screening (Table 3). Compared with SSNIT participants, AVT participants were significantly more likely to endorse statements related to HIV screening as a means of prevention such as thinking about getting an HIV test prior to testing (84.0% vs. 78.1%), and confirming a prior HIV negative test (71.9% vs. 51.8%). Conversely, SSNIT participants were significantly more likely to endorse statements related to the role that peers played in encouraging them to seek HIV screening, including being asked to get an HIV test by a friend (64.7% vs. 42.2%)(Table 3). Study participants, generally, did not favorably endorse (reported as strongly agree or agree) statements related to barriers for HIV screening prior to study participation (Table 3).

However, SSNIT participants were generally more likely to report a barrier than AVT participants.

DISCUSSION

Hispanics/Latinos are disproportionately impacted by the HIV/AIDS epidemic (1); yet, little is known about the best approach for increasing HIV screening among those who are at risk for HIV. Although research suggests that network-based approaches are feasible and acceptable means for screening at-risk adults for HIV infection (17,20,36), it is unknown whether such approaches would be a feasible or acceptable means for engaging and screening at-risk young Hispanics/Latinos. In an attempt to fill this gap in current literature, this research compared a venue-based (AVT) strategy that heavily relied on partnerships with community stakeholders and use of neighborhood-level surveillance data to identify at-risk young Hispanics/Latinos with a recruitment strategy that utilized HIV-infected and at-risk Hispanic/Latino IRs to recruit their NMs (SSNIT) to be screened for HIV infection. Our findings provide overwhelming support for the acceptability and feasibility of both AVT and SSNIT as evident by the high rate of the targeted young people who enrolled in the study and the high acceptance rate of participants who agreed to be screened for HIV using both recruitment strategies. Although both recruitment strategies identified high-risk individuals, we found differences in the profiles of those who were screened by each strategy. Since our venues primarily targeted MSM, it was not surprising that we identified HIV risk associated with sex among men. In contrast, through the SSNIT strategy we were able to reach a sizeable group of at-risk young heterosexual men, many who had no prior experience with HIV screening; few studies have reported community-based HIV risk or screening data on this group. Our findings underscore that network-based approaches that target at-risk young Hispanics/Latinos should consider venue-based testing strategies for young Hispanic/Latino MSM, whereas social and sexual network referral approaches should be considered for young Hispanics/Latinos who report heterosexual contact. Such tailored approaches may help to: accomplish the Centers for Disease Control and Prevention's national policy for universal HIV screening of adolescents and young adults (37); achieve the National HIV/AIDS Strategy's goal to reduce HIV-related health disparities related to age and race/ethnicity (38); and increase the likelihood of successfully reaching young Hispanics/Latinos who are at increased risk for HIV, but who may not perceive themselves to be at risk or who may not readily have access to healthcare.

Despite the high levels of HIV risk reported by our participants, we identified a low, overall, rate of HIV infection with no differences identified by recruitment strategy. Previous research, which examined the cost-effectiveness of HIV testing and treatment in the U.S. indicates that a prevalence of undiagnosed HIV infection as low as 0.1% is cost-effective for routine HIV testing among outpatients (39), and a prevalence of 0.2% is cost effective when it takes into account the potential transmission effects of a routine HIV testing program (40). Although our overall prevalence exceeds these, further research that is designed specifically with the goal of establishing precise cost-effective parameters for use of AVT and SSNIT for identifying undiagnosed HIV in at-risk young Hispanics/Latinos is needed. Moreover, since we successfully linked three-fourths of the newly diagnosed AVT participants, but only one-third of the newly diagnosed SSNIT participants to HIV-related healthcare, a

clearer understanding of barriers to linking young Hispanics/Latinos to healthcare is also warranted. Consideration should, perhaps, be given to barriers that are influenced by cultural beliefs, perceived stigma, acculturation, and those that are structural such as stable housing and financial hardship.

A second goal of this research was the examination of the facilitators and barriers to HIV screening. Although we found no singular pattern, overall, our findings suggest that the type of recruitment strategy matters. It appears that AVT may be a useful approach for identifying individuals who are accustomed to HIV screening and who desire to have a repeat test to confirm their HIV status, but the influence of friends in the SSNIT approach seems to be important for participants in whom HIV screening was not normative. Our findings related to barriers for HIV screening prior to study participation are less clear. Although the barrier measures we examined were found to be important in prior research (14,18), our participants did not identify with these barriers to testing. This suggests the need for more in-depth qualitative examination of barriers to HIV screening among young Hispanics/Latinos. Such a study should not be conducted at the same time participants have agreed to undergo HIV screening, which occurred in this study. Instead, greater insights may be gained at the time when young people decline screening so that they can be queried at length regarding their reason(s) for declining HIV screening, particularly in light of information provided to them about free and confidential tests. A number of limitations of this research should be noted. Because of the cross-sectional methodological design, causal inferences about HIV screening or facilitators and barriers to HIV screening should not be made. Also, despite a carefully tailored approach that relied on partnership with local Hispanic/Latino youth-serving community stakeholders and use of GIS mapping to target high-risk neighborhoods as well as our careful attention to enroll individuals who were considered to be at increased risk for HIV infection, we identified a low HIV prevalence. This low prevalence may, in part, be due to our limited resources and the set time intervals in which we screened at targeted venues. We determined, a priori, that each AMTU would recruit/screen 15–20 participants during each of the eight planned recruitment intervals over the two-year study period. Not all AMTUs were able to accomplish the recruitment goals for a variety of logistical reasons, including IRB delays and staffing changes. This limited our ability to implement the strategies that were fully consistent with our sampling plan. Notwithstanding this, our results do suggest that both AVT and SSNIT have promise for recruitment of at-risk, hard-to-reach young Hispanics/Latinos.

This research is among the first to use community-level, network-based strategies to screen for HIV infection in at-risk young Hispanics/Latinos, many who were tested for HIV for the first time. We demonstrated that both recruitment strategies were highly accepted among participants and identified a comparable number of newly diagnosed cases, though each reached a different population of at-risk young Hispanic/Latinos. The AVT method primarily targeted young MSM, many who had been previously screened for HIV whereas the SSNIT approach largely screened individuals who reported heterosexual contact, many who had no prior experience with HIV screening. This research contributes to extant literature regarding the utility of network-based HIV recruitment and screening approaches as practicable means for reaching at-risk young Hispanics/Latinos. We clearly demonstrated that alternative venues and referral of social and sexual contacts are feasible and acceptable

means for engaging at-risk young Hispanics/Latinos for HIV screening; however, further research is needed to better understand how to strategically implement such strategies in contexts that will improve the identification of undiagnosed HIV infection among Hispanic/Latino youth.

Acknowledgments

Sources of Funding

The Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN) is funded by grants No. U01HD40533 and 5U01HD 40474 from the National Institutes of Health through the National Institute of Child Health and Human Development (NICHD) with supplemental funding from the National Institutes on Drug Abuse and Mental Health. This research was co-funded by NICHD and the Office of AIDS Research (OAR).

We wish to thank Richard Jenkins, PhD from the National Institute on Drug Abuse for his contributions to the protocol's development and his support of this project. We also thank Susannah Allison, PhD and Pim Brouwers, PhD from the National Institutes of Mental Health for their support of this project. We are grateful to the Principal Investigators of the participating AMTUs and their entire staff for their contributions to the project, including Patricia Emmanuel, MD, Marvin Belzer, MD, Lawrence D'Angelo, MD, Steven Douglas, MD, Jaime Martinez, MD, Lisa Henry-Reid, MD, Donna Futterman, MD, Barbara Moscicki, MD, Lawrence Friedman, MD, Patricia, Flynn, MD, Aditya Gaur, MD, and Vicki Tepper, PhD. We appreciate the scientific review provided by members of the Community Prevention Leadership Group of the ATN. We are grateful to the ATN Coordinating Center at the University of Alabama, including Craig Wilson, MD, Cynthia, Partlow, MEd; Marcia Berck, BA, and Jeanne Merchant, MPH, and the ATN Data and Operations Center at Westat, including; Barbara Driver, RN, MS and Sharon Swanigan, BS for their assistance. We also appreciate the technical assistance provided by Jacqueline Loeb, MBA and Milena Soto, BA from Westat. Additionally, we would like to acknowledge Anthony Kung, BA, and Rich Fallon, MA from the University of California, San Francisco, Division of Adolescent and Young Adult Medicine who provided administrative assistance. We are also very appreciative for the thoughtful input given to the project by participants of the ATN's national and local Youth Community Advisory Boards with assistance from Connie L. Trexler, RN. We are indebted to our community partners for their assistance with developing and implementing the venue-based plan and for supporting the network recruitment and referral portion of the project, and to the Connect to Protect® (C2P) Community Coordinators for their contributions to the project's implementation. Most of all, we wish to thank the young people who gave of their time to participate in this research.

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IMPLICATIONS AND CONTRIBUTION SUMMARY STATEMENT

This research contributes to extant literature regarding the utility of network-based HIV recruitment and screening approaches as practicable means for reaching at-risk young Hispanics/Latinos. We demonstrated that alternative venues and referral of social and sexual contacts are feasible and acceptable means for engaging at-risk young Hispanics/Latinos for HIV screening.

Alternative Venue-Based Testing (AVT) Participants	Social and Sexual Network Index Recruiter (IRs) Participants	Social and Sexual Network Members (NMs)
Self-reports a negative or unknown HIV status and at least one of the following:	**Self-reports at least one of the following:**	**Self-reports at least one of the following:**
• Is male, self-reports any unprotected anal sex with a male sexual partner within the past 6 months[1] • Is female, self-reports any unprotected anal or vaginal sex with ≥ 2 male sexual partners within the past 6 months[2] • Any unprotected anal or vaginal sex with a sexual partner who has a history of incarceration in a jail/ juvenile detention center[1,2] • A history of injection drug use[1,2] • A history of unprotected anal or vaginal sex with a known HIV positive person[1,2] • Unprotected anal/vaginal sex with an IDU within the past 12 months[1,2] • A history of sharing needles for any reason[1,2] • At least one sexually transmitted infection (STI) within the past 12 months[1,2] • Having a current sexual partner who has ≥ 1 other sexual partner[1,2] • Having a current sexual partner who ≥ 4 years older[1,2] • A history of anal or vaginal sex prior to age 16[1,2]	• Being diagnosed with HIV within the past 24 months[1,2] • Having unprotected anal/vaginal sex with a sexual partner who has a history of incarceration in jail /juvenile detention center[1,2] • A history of injection drug use[1,2] • A history of unprotected anal/vaginal sex with a known HIVpositive person[1,2] • Having unprotected anal/vaginal sex with an IDU in the past 12 months[1,2] • A history of sharing needles for any reason[1,2] • At least one sexually transmitted infection (STI) within the past 12 months[1,2] • Having a current sexual partner who has ≥ 1 other sexual partner[1,2] • Having a current sexual partner who ≥ 4 years older[1,2] • A history of anal or vaginal sex prior to age 16[1,2]	• Having unprotected anal/vaginal sexual activity within the past 6 months[1,2] • A history of injection drug use[1,2] • A history of sharing needles for any reason[1,2]

Figure 1.

Inclusion Criteria for Alternative Venue-Based Testing, Index Recruiters, and Network Member Participants

Table 1

Comparison of Sociodemographic Characteristics, Spirituality, Health Utilization, and Financial Status By Recruitment Method

Variable[2]	Total n (%) (N=1595)	AVT n (%) (N=783)	SSNIT n (%) (N=812)	p-value[1] (AVT vs. SSNIT)
Gender				
Male	1077 (67.5)	631 (80.6)	446 (54.9)	<0.0001
Female	518 (32.5)	152 (19.4)	366 (45.1)	
Current age (median years, range)	20.0 (13–24)	21.0 (13–24)	19.0 (13–24)	< 0.0001
Ethnic group most identify with				
Puerto Rico	592 (37.3)	291 (37.2)	301 (37.3)	0.0014
Central America	653 (41.1)	310 (39.6)	343 (42.5)	
Caribbean	172 (10.8)	99 (12.7)	73 (9.0)	
South America	39 (2.5)	28 (3.6)	11 (1.4)	
Others	133 (8.4)	54 (6.9)	79 (9.8)	
Birth place				
Inside of US	902 (56.6)	402 (51.4)	500 (61.7)	<0.0001
Outside of US	691 (43.4)	380 (48.6)	311 (38.3)	
Age moved into US (median years, range)	13 (1–24)	15 (1–24)	9 (1–23)	< 0.0001
Language you generally speak				
Spanish	327 (20.5)	150 (19.2)	177 (21.9)	0.1861
English and Spanish	861 (54.0)	441 (56.3)	420 (51.9)	
English	405 (25.4)	192 (24.5)	213 (26.3)	
Language usually speak at home				
Spanish	650 (40.8)	331 (42.3)	319 (39.3)	0.1060
English and Spanish	467 (29.3)	210 (26.9)	257 (31.7)	
English	476 (29.9)	241 (30.8)	235 (29.0)	
Language usually think in				
Spanish	429 (26.9)	220 (28.1)	209 (25.8)	0.0022
English and Spanish	433 (27.2)	237 (30.3)	196 (24.2)	
English	731 (45.9)	326 (41.6)	405 (50.0)	
Highest education level				
Incomplete high school	532 (33.6)	225 (28.8)	307 (38.1)	0.0002
High school Graduate\GED\Some College or Tech School	930 (58.7)	481 (61.7)	449 (55.8)	
College\More than College Graduate	123 (7.8)	74 (9.5)	49 (6.1)	
Having ever been homeless	507 (31.8)	237 (30.3)	270 (33.3)	0.1972
Current living situation				
Alone	154 (9.7)	99 (12.6)	55 (6.8)	<0.0001
Parents	761 (47.7)	357 (45.6)	404 (49.8)	0.0983
Friends or relatives	541 (33.9)	278 (35.5)	263 (32.4)	0.2042
Partner or Spouse	232 (14.5)	92 (11.7)	140 (17.2)	0.0022
Others	100 (6.3)	36 (4.6)	64 (7.9)	0.0072

Variable[2]	Total n (%) (N=1595)	AVT n (%) (N=783)	SSNIT n (%) (N=812)	p-value[1] (AVT vs. SSNIT)
Religious preference				
No religion	368 (23.3)	159 (20.4)	209 (26.1)	<0.0001
Protestant	89 (5.6)	58 (7.4)	31 (3.9)	
Catholic	796 (50.3)	424 (54.4)	372 (46.4)	
Jewish	9 (0.6)	5 (0.6)	4 (0.5)	
Muslim	24 (1.5)	2 (0.3)	22 (2.7)	
Some other religion	296 (18.7)	132 (16.9)	164 (20.4)	
Usual place for health services				
Clinics[3]	1254 (79.1)	615 (78.8)	639 (79.4)	0.9574
Emergency departments	222 (14.0)	112 (14.4)	110 (13.7)	
Other health facilities	15 (0.9)	8 (1.0)	7 (0.9)	
Nowhere	94 (5.9)	45 (5.8)	49 (6.1)	
Health visit(s) in last year				
None	332 (20.9)	158 (20.2)	174 (21.5)	0.8149
1–2 times	836 (52.6)	413 (52.9)	423 (52.3)	
3 or more times	422 (26.5)	210 (26.9)	212 (26.2)	
Payment method for medical treatment				
Public insurance	734 (46.5)	319 (41.1)	415 (51.8)	0.0003
Private insurance	425 (26.9)	233 (30.0)	192 (24.0)	
Out of pocket cash	354 (22.4)	191 (24.6)	163 (20.3)	
Other	65 (4.1)	34 (4.4)	31 (3.9)	
Current personal/family financial status				
Not enough money to pay bills	306 (19.4)	139 (17.8)	167 (20.9)	0.0035
Barely have enough money to pay bills	604 (38.3)	277 (35.6)	327 (40.9)	
Enough money to do fun things/Not worried about money	668 (42.3)	363 (46.6)	305 (38.2)	
Receiving financial assistance	657 (44.2)	276 (37.1)	381 (51.2)	<0.0001

[1] Fisher exact test was used for categorical variables and Wilcoxon rank sum test for numeric variables.

[2] All cells are not depicted for each measure.

[3] Clinics include private doctor's clinic, health clinic, teen clinic, and STD clinic.

Table 2

Comparisons of HIV Risk Factors by Recruitment Method

Variable[2]	Total n (%) (N=1595)	AVT n (%) (N=783)	SSNIT n (%) (N=812)	p-value[1] (AVT vs. SSNIT)
Sex orientation				
Straight	761 (48.3)	167 (21.4)	594 (74.4)	<0.0001
Gay or Lesbian	483 (30.6)	414 (53.1)	69 (8.6)	
Bisexual	264 (16.7)	161 (20.7)	103 (12.9)	
Transgender	35 (2.2)	23 (3.0)	12 (1.5)	
Not sure or undecided	34 (2.2)	14 (1.8)	20 (2.5)	
Ever been incarcerated	294 (18.5)	104 (13.3)	190 (23.5)	<0.0001
Ever had sex with a female	707 (65.9)	310 (49.1)	397 (89.8)	<0.0001
Number of women had sex with (median, range)	5 (1–309)	3 (1–150)	8 (1–309)	< 0.0001
Condom use during vaginal sex in past 3 months				
Every time	65 (13.7)	34 (29.1)	31 (8.7)	<0.0001
Some/Most of the time	291 (61.4)	61 (52.1)	230 (64.4)	
None of the time	118 (24.9)	22 (18.8)	96 (26.9)	
Condom use during anal sex with women in last 3 months				
Every time	42 (18.3)	24 (41.4)	18 (10.5)	<0.0001
Some/Most of the time	87 (37.8)	17 (29.3)	70 (40.7)	
None of the time	101 (43.9)	17 (29.3)	84 (48.8)	
Ever had sex with a male	1174 (73.8)	719 (92.1)	455 (56.2)	<0.0001
Number of men had anal sex with (median, range)	3 (0–800)	5 (0–800)	1 (0–150)	< 0.0001
Condom use during anal sex with men in last 3 months				
Every time	133 (17.1)	107 (19.2)	26 (11.7)	0.0003
Some/Most of the time	418 (53.7)	309 (55.6)	109 (48.9)	
None of the time	228 (29.3)	140 (25.2)	88 (39.5)	
Age first volitional sex (median, range)	15 (6–23)	15 (6–23)	14 (6–23)	< 0.0001
Ever had sex with an injected-drug user	178 (12.9)	68 (9.7)	110 (16.2)	0.0004
Ever had sex with an HIV infected person	118 (8.9)	75 (11.0)	43 (6.7)	0.0069
Ever had sex with an incarcerated female	137 (21.0)	31 (10.7)	106 (29.3)	<0.0001
Ever had sex with a incarcerated male	376 (34.2)	156 (23.2)	220 (51.6)	<0.0001
Ever had sex with a STD infected female	49 (8.4)	14 (5.2)	35 (11.1)	0.0106
Ever had sex with a STD infected male	138 (14.1)	78 (12.6)	60 (16.7)	0.0869
Ever had sex with a female drug dealer	149 (22.9)	36 (12.2)	113 (31.7)	<0.0001
Ever had sex with a male drug dealer	360 (33.6)	170 (25.9)	190 (45.8)	<0.0001
Ever exchanged sex for drugs or money	196 (12.5)	100 (13.0)	96 (12.2)	0.6473
Number of steady sex partners (median, range)	2 (0–499)	2 (0–100)	2 (0–499)	0.5784
Number of casual sex partners (median, range)	2 (0–798)	2 (0–798)	2 (0–188)	0.1313
Last steady partner had sex with others when you were together	294 (20.0)	145 (20.3)	149 (19.8)	0.6242
Had sex with others last steady partnership	548 (37.2)	241 (33.6)	307 (40.7)	0.0050
Having been pregnant	199 (39.3)	48 (32.7)	151 (41.9)	0.0571

Variable[2]	Total n (%) (N=1595)	AVT n (%) (N=783)	SSNIT n (%) (N=812)	p-value[1] (AVT vs. SSNIT)
Having ever had STD	284 (17.9)	133 (17.1)	151 (18.7)	0.4321
Had STI check in health care facility in past year	620 (38.9)	343 (43.9)	277 (34.2)	<0.0001
Ever been tested for HIV	949 (60.4)	588 (76.1)	361 (45.3)	<0.0001
Place of last HIV test				
Clinics[3]	749 (79.4)	459 (78.2)	290 (81.5)	0.1126
Health Fair	78 (8.3)	57 (9.7)	21 (5.9)	
Other place	116 (12.3)	71 (12.1)	45 (12.6)	
Time since last HIV test				
Less than 6 months ago	414 (45.4)	295 (51.8)	119 (34.8)	<0.0001
6 to 12 months ago	299 (32.8)	184 (32.3)	115 (33.6)	
Longer than 12 months ago	199 (21.8)	91 (16.0)	108 (31.6)	
HIV positive test result	4 (0.4)	1 (0.2)	3 (0.9)	0.1472
Ever had alcohol more than a few sips	1394 (87.8)	680 (87.2)	714 (88.5)	0.4431
Frequency of drinking alcohol				
≥ 1 per week or more	472 (34.0)	261 (38.4)	211 (29.8)	<0.0001
Amount consumed on a typical day				
1 to 5 drinks	791 (57.1)	400 (58.9)	391 (55.4)	0.1927
5 or more drinks	594 (42.9)	279 (41.1)	315 (44.6)	
Ever had sex while using alcohol	1030 (74.1)	491 (72.5)	539 (75.6)	0.1987
Ever smoked marijuana	997 (62.7)	438 (56.1)	559 (69.0)	<0.0001
Frequency of smoking marijuana				
≥1 per week or more	473 (48.7)	157 (36.5)	316 (58.4)	<0.0001
Ever used drugs not prescribed for you	405 (25.5)	170 (21.8)	235 (29.2)	0.0008
Having ever used cocaine (excluding crack)	196 (48.4)	84 (49.4)	112 (47.7)	0.7629
Having ever used crack cocaine	60 (14.9)	29 (17.2)	31 (13.2)	0.3209
Ever used methamphetamine	85 (21.0)	45 (26.5)	40 (17.0)	0.0259
Ever used Ecstasy	215 (53.1)	91 (53.5)	124 (52.8)	0.9198
Ever injected an abused drug	91 (5.7)	26 (3.3)	65 (8.0)	<0.0001

[1] Fisher exact test was used for categorical variables and Wilcoxon rank sum test for numeric variables.

[2] All cells are not depicted for each measure.

[3] Clinics include private doctor's clinic, health clinic, teen clinic, and STD clinic.

Table 3

Comparison of Facilitators and Barriers to HIV Screening By Recruitment Method

Variable[2]	Total n (%) (N=1595)	AVT n (%) (N=783)	SSNIT n (%) (N=812)	p-value[1] (AVT vs. SSNIT)
Facilitators to HIV Screening (strongly agree/agree)				
Concerned about my health	1413 (89.1)	681 (87.3)	732 (90.9)	0.0235
Protecting my future health	1558 (97.9)	772 (98.8)	786 (96.9)	0.0087
A friend asked me to have HIV tests	851 (53.6)	329 (42.2)	522 (64.7)	<0.0001
Free HIV tests	1357 (85.6)	667 (85.5)	690 (85.7)	0.9430
Test results confidential	1479 (93.2)	729 (93.3)	750 (93.1)	0.8425
Thinking about the HIV screening already	1286 (81.0)	656 (84.0)	630 (78.1)	0.0027
Seeking treatments if I am positive	1471 (92.7)	720 (92.3)	751 (93.1)	0.6298
My past risky behaviors for HIV infection	1219 (76.9)	603 (77.2)	616 (76.6)	0.8116
Painless HIV testing	1274 (80.2)	629 (80.5)	645 (79.9)	0.8010
Concerned about high HIV infection rate in community	1329 (83.6)	652 (83.5)	677 (83.7)	0.9460
Concerned about sexual partner having HIV infection	1056 (66.5)	509 (65.2)	547 (67.7)	0.2885
Tested negative recently and wanted to make sure I was still negative	973 (61.7)	558 (71.9)	415 (51.8)	<0.0001
Tested positive recently and wanted to make sure I was really positive	233 (14.8)	100 (12.9)	133 (16.6)	0.0396
Barriers to HIV Screening (strongly agree/agree)				
Not willing to share the results with anyone else	507 (32.1)	189 (24.3)	318 (39.7)	<0.0001
Not knowing anything about HIV	288 (18.2)	101 (13.0)	187 (23.2)	<0.0001
My behaviors not putting me at a risk for HIV infection	618 (39.1)	245 (31.5)	373 (46.5)	<0.0001
Embarrassed to deal with HIV screening	450 (28.4)	170 (21.8)	280 (34.7)	<0.0001
Not concerned about my health	414 (26.2)	150 (19.3)	264 (32.8)	<0.0001
Feeling safe and no needs for HIV screening	592 (37.6)	255 (32.9)	337 (42.1)	0.0002
Concerned about my parents/family/friends finding out test results	479 (30.3)	192 (24.7)	287 (35.6)	<0.0001
Concerned about my girlfriend/boyfriend finding out test results	385 (24.3)	146 (18.8)	239 (29.6)	<0.0001
Afraid to know my HIV status	612 (38.6)	266 (34.2)	346 (42.9)	0.0004
Afraid of my friends judging me because of my behaviors	468 (29.6)	193 (24.8)	275 (34.1)	<0.0001
No place to go to for medical care or treatment	447 (28.3)	174 (22.4)	273 (34.0)	<0.0001
Not trusting doctors and nurses	250 (15.8)	79 (10.1)	171 (21.3)	<0.0001
No health insurance for the expensive tests	448 (28.3)	177 (22.8)	271 (33.7)	<0.0001
Afraid of judging me because of my ethnicity	294 (18.6)	111 (14.3)	183 (22.7)	<0.0001
Afraid of people thinking that I am a gay	184 (11.6)	80 (10.3)	104 (13.0)	0.1165
Afraid of people thinking that I am a drug user	232 (14.7)	72 (9.3)	160 (20.0)	<0.0001
My doctor or nurse not friendly	211(13.4)	65 (8.4)	146 (18.2)	<0.0001

[1] Fisher exact test was used for categorical variables and Wilcoxon rank sum test for numeric variables.

[2] All cells are not depicted for each measure.