HIV Testing among Homeless Adults: Prioritizing the Need for Routine Care

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Abstract

**Background.** The Memphis metropolitan statistical area (MSA) represents a Deep Southern U.S. city disproportionately affected by the ongoing transmission of new HIV cases as well as those diagnosed in late-stage disease. This region is a subset of 9 states, including Memphis, Tennessee (project site), driving the epidemic in the United States. Memphis ranks 3rd among all U.S. MSAs for new HIV infections and has been identified in the CDC's Ending the HIV Epidemic Initiative as a high HIV burden geographic focus area. The Memphis Ryan White Part A Program conducted a pilot project among adults seeking services in Memphis emergency and transitional housing shelters to offer on-site, rapid HIV testing. This paper aims to describe the results from this aforementioned pilot study, including the rate of HIV test acceptance and potential factors associated with a history of HIV testing.

**Methods.** Community-engaged research approaches were employed via a partnership between the local health department, a federally qualified faith-based health center, and an academic university. An interviewer-administered survey to measure potential factors associated with HIV testing history and voluntary HIV testing services were offered to adults living in transitional housing establishments. Bivariate chi-square analyses were performed to determine the association between predisposing, enabling, and need variables with HIV testing history in the past 12 months.

**Results.** Survey respondents (n=109) were mostly cisgender male (n=96; 88.1%), African American or Black (n=79; 72.5%) and reported engaging in condomless sex (n=55; 50.5%). Acceptability and uptake of HIV testing was high (n=97; 89.0%).

**Conclusions.** Implementing rapid HIV testing programs outside of traditional healthcare settings offers a strategy to engage high-risk individuals and those unaware of their HIV status. To our knowledge, this study represents the first that documents HIV testing acceptance rates offered outside of traditional healthcare settings for homeless and transitionally housed adults in a Deep Southern state.

**Background**

According to the Centers for Disease Control and Prevention (CDC), an estimated one in eight persons living with HIV in the United States were unaware that they are infected (1). The National HIV/AIDS Strategy (NHAS) cites this estimate as a challenge to reducing HIV transmission and acquisition since persons unaware of their status may unintentionally expose others (2). In 2010, the NHAS first recommended early testing and treatment as a primary strategy for reducing HIV incidence, and the updated NHAS 2020 Strategy includes specific guidelines, suggesting all HIV-negative people at high risk for infection should be tested at least annually (3). The NHAS 2020 also calls for ongoing support to the Ryan White HIV/AIDS Program (RWHAP), which works with cities, states, and local community-based organizations to provide a comprehensive system of care for those who do not have sufficient health care coverage or financial resources to cope with HIV disease (2). While the majority of RWHAP funds support primary medical care and essential support services, activities related to ‘early intervention services’ are
allowed to facilitate access to the HIV care system using HIV testing, referral services, health literacy, and care linkage to bridge medication access and treatment adherence (4).

Southern states accounted for approximately 51% of all people with HIV at the end of 2018 (5). The Memphis metropolitan statistical area (MSA) represents a Southern city disproportionately affected by the ongoing transmission of new HIV cases as well as those diagnosed in late-stage disease. In 2018, the Memphis MSA represented the third-highest rate of new HIV diagnoses in the United States (6). In 2007, The Memphis Area RWHAP was first awarded Part A and Minority Initiative AIDS funding by the Health Resources and Services Administration (HRSA) to provide primary medical care and essential support services for people living with HIV who are uninsured or underinsured within a seven-county area surrounding Memphis, spanning across Tennessee, Mississippi, and Arkansas. (7). By 2011, the program had grown to serve over 4,500 persons living with HIV or AIDS; however, an estimated additional 2,000 individuals were infected but unaware of their positive status at the end of 2010 (8). In response to the large estimates of those unaware of their HIV status, as well as HRSA requirements mandating early intervention strategies for all RWHAP nationwide, the Memphis Area RWHAP identified several vulnerable populations on which to focus early detection and treatment resources, including homeless and transitionally housed populations (9). This strategy was corroborated by results from an annual point-in-time survey conducted by the Memphis and Shelby County Department of Housing and Urban Development, where two percent of homeless adults self-identified an HIV positive status (10). Furthermore, no HIV testing services were provided specifically for the homeless in concentrated, routine outreach efforts during this time.

Homeless and unstably housed individuals represent subpopulations at high risk for HIV infection, due in part to higher prevalence of alcohol dependence, illegal substance use, and sexual risk behaviors (11–13). Research estimates of HIV prevalence among unstably housed populations vary widely by geographic region and sampling methodologies; a meta-analysis including 43 studies conducted in the U.S. found prevalence rates of HIV among those with unstable housing from 0.3–21% (14). Studies throughout the U.S. have concluded that community-based rapid HIV testing is feasible, acceptable, and effective for homeless populations, but these studies have not been documented in Southern states, and few describe the rates of HIV test acceptance through on-site screening programs (15–16). The Memphis RWHAP conducted a pilot project among adults seeking services in Memphis emergency and transitional housing shelters to offer on-site, rapid HIV testing as well as an interviewer-administered survey to measure potential factors associated with HIV testing history. This paper aims to describe the results from this aforementioned pilot study, including the rate of HIV test acceptance and potential factors associated with a history of HIV testing.

Methods

A total of 116 adults receiving services from emergency and transitional housing providers in Memphis were recruited to develop a cross-sectional, convenience sample. Inclusion criteria required participants to report they were currently sleeping at a housing shelter or had no place to sleep and were at least
18 years of age. Upon completion of a written informed consent form, participants were asked to complete an interviewer-administered survey and then offered voluntary HIV testing services. Survey data collected from seven participants were excluded due to incomplete data or non-eligibility, resulting in a final sample of 109 participants for data analysis. Participants received a gift card to a local grocery store in the amount of five dollars for completing the survey.

This study describes a number of predisposing, enabling, and need factors under the Behavioral Model for Vulnerable Populations with relation to utilization of HIV testing services (17–18). This model addresses factors relevant to understanding the health and health-seeking behaviors of vulnerable populations and has been applied in other studies to identify challenges in obtaining needed services for the homeless (19–20). Utilization of HIV testing services were documented in two ways: the interviewer-administered survey [see attachment] included a question to document self-report of HIV testing within the past 12 months, and interviewers also recorded whether or not the participant accepted or refused voluntary HIV testing services following the survey.

Assessment of predisposing variables included socio-demographic factors (gender, age, race, and education), duration of homelessness, history of incarceration, alcohol abuse or dependence, and general physical and mental health status. This study employed The Alcohol Use Disorders Identification Test – Consumption (AUDIT-C), a validated, three-item screening tool, to assess alcohol abuse or dependence (21). To evaluate general physical and mental health status, a standardized measure included self-report response options of excellent, very good, fair, or poor. Enabling factors were defined as those that affect health education opportunities and HIV-risk assessment. These variables included current health insurance coverage, when and where the participant last accessed a doctor, and whether or not the participant had one person considered as a personal doctor or healthcare provider. To evaluate factors related to need for HIV testing, variables were collected to describe self-perceived susceptibility and risk behaviors. Perceived susceptibility for HIV infection was evaluated using a scale from zero to four, where zero represented the participant was “not worried at all” about being infected, and four indicated the participant was “extremely worried.” This scale has previously been utilized in research studies with homeless adults and has been assessed for internal reliability and predictive validity (22). The Fogg HIV Screening Questionnaire was employed to assess HIV-risk behaviors in the 12 months prior to the survey. This tool has been evaluated for reliability within homeless populations; it utilizes eight questions to assess self-report of specific sexual risk behaviors and two additional questions to assess injection drug use and diagnosis of a sexually transmitted infection (23).

Utilization of HIV testing services are described as a percent of participants 1) ever tested for HIV, 2) tested within the past 12 months, and 3) accepting HIV testing at the time of the survey. Bivariate chi-square analyses were performed to determine the association between predisposing, enabling, and need variables with HIV testing history in the past 12 months. All analyses were performed using the SAS Statistical Analysis package (SAS Institute, Cary, NC, USA).
A community engaged partnership approach was employed between a local health department, university, and community federally qualified health center to develop the study design, co-create the survey instrument, administer surveys, and disseminate study findings (24). The community health center was identified as a viable research partner given their range of medical and supportive services for persons living with HIV/AIDS, prior experience in providing outreach HIV testing services for the homeless population, and long-standing partnership with the local health department. Approval of an Institutional Review Board was obtained from the University of Memphis (Protocol #2049).

**Results**

Among the 109 participants, the majority of our study's respondents were male (n = 96; 88.1%), African American or Black (n = 79; 72.5%), had a history of incarceration (n = 91; 83.5%), and reported their overall physical health (n = 77; 70.6%) and mental health (n = 79; 72.5%) as either good, very good, or excellent. Participants between 40–49 years (n = 41; 37.6%) and 50 + years (n = 39; 35.8%) accounted for the two largest age groupings. Almost half of the participants reported short-term homelessness, where 47.7% (n = 52) indicated they had been homeless for less than 12 months. Less than half screened positive for alcohol dependence or abuse (n = 48; 44.0%) on the AUDIT-C tool. Sex without a condom (n = 55; 50.5%), sex while drunk or high on drugs (n = 52; 47.7%), and sex with an unknown person (n = 26; 23.9%) emerged as the three most prevalent risk behaviors in the 12 months preceding the survey administration. Chi-square analyses found no significant associations between predisposing, enabling, and need variables with HIV testing history in the past 12 months (Table 1).

The large majority of participants accepted HIV testing following survey administration (n = 97; 89.0%). While 73.4% (n = 80) participants reported ever having an HIV test in the past, only 29.4% (n = 32) had been tested for HIV in the 12 months prior to the survey. Nearly three-quarters of the study participants reported no health insurance coverage, or they didn't know if they had coverage; however, 72.5% (n = 79) reported seeing a doctor in the past 12 months. Among the 79 participants self-reporting a doctor visit in the 12 months prior, only 34.1% (n = 27) of these individuals reported they had been tested for HIV during the same time period. For those reporting a doctor's visit or HIV test within the past 12 months, the location is displayed in Table 2. A hospital or emergency room accounted for both the largest number of participants reporting the location of last doctors' visit (n = 25; 31.6%) and last HIV test (n = 7; 21.9%). The second and third most frequently cited locations for last doctors’ visit included public health clinics/health departments (n = 15; 19.0%) and the Veterans Affairs hospital (n = 14; 17.7%). Public health clinics/health departments accounted for the second most frequently cited location among participants reporting an HIV test in the past 12 months (n = 7; 21.9%), while outreach mobile clinics accounted for the third most frequently cited location (n = 5; 15.6%).

**Discussion**

Implementing rapid HIV testing programs outside of traditional healthcare settings offers a strategy to target high-risk individuals and those unaware of their HIV infection. To our knowledge, this study
represents the first that documents HIV testing acceptance rates offered outside of traditional healthcare for homeless and transitionally housed adults in a Southern state. Two studies have demonstrated the rate of acceptance for rapid HIV testing in community-based outreach programs range from 60–75%, varying by geography and venue for recruitment (15, 25). The acceptance of HIV testing following our survey administration was higher than expected within the aforementioned studies. When offered the option to receive an HIV test following completion of the survey interview, almost 90% agreed, suggesting that rapid HIV testing is well-accepted among this population when given the option onsite at locations offering services to homeless and transitionally housed adults.

Almost three-quarters of our participants had a doctor visit within the past 12 months, but only 34% of these individuals had also been tested for HIV during this same period. This disparity, coupled with the high acceptance of HIV testing in this pilot outreach testing project, potentially demonstrates missed opportunities to implement early testing strategies supported by the NHAS in a variety of healthcare settings. The majority of participants reported the site of last doctor visit was received at hospitals/emergency rooms or public health clinics, indicating these venues as important points of healthcare access for this population. Our pilot project recruited participants from venues serving homeless populations, such as emergency shelters, transitional housing, and drop-in centers providing meals. The high acceptance rates of HIV testing following the survey administration indicates these sites as potential venues to provide mass HIV testing strategies outside of traditional healthcare access points.

Although this study did not significantly associate any predisposing, enabling, or need variables with a history of HIV testing in the 12 months prior to the survey, the reported high-risk behaviors are not without warrant. Over two-thirds of the sample reported engaging in at least one high-risk behavior, where the most frequently cited behaviors within the past 12 months included engaging in sexual activity with unknown persons, under the influence of alcohol or drugs, and without a condom. High risk behaviors such as aforementioned may be attributed to survival sex to secure goods, services, and maintain housing (26). Nevertheless, these results still highlight the need to prioritize routine and early testing strategies for this at-risk population.

This study is not without limitations. With respect to assessing a history of HIV testing, we did not document if other healthcare providers offered testing for regular office visits and if our participants declined. Likewise, homeless adults from these facilities self-selected to participate in the survey and thus may view issues related to HIV testing differently from non-participants. Finally, we did not assess same sex behaviors and survival sex among our mostly cisgender male sample, which could potentially provide additional risk for HIV acquisition.

Conclusions

As the Memphis community works toward developing a local plan for the U.S. Ending the HIV Epidemic Initiative (27), housing and economic instability will remain barriers to reaching benchmarks for prevention and testing pillars. These two social determinants of HIV are associated with viral suppression
(28). Permanent housing for those living with HIV increases medication adherence, retention in care, and access to supportive services to better achieve viral suppression (29). Similarly, housing stability could facilitate other prevention goals such as testing and access and adherence to PrEP for those engaging in condomless sex.

However, with the recent onset of COVID-19 and the subsequent effect that the pandemic will have on housing and economic instability, it remains essential to maintain HIV testing outside of traditional health care settings (30). More and more Black Americans living in the South will no longer have reliable and consistent employment to maintain stable housing or health insurance coverage to seek HIV preventive services. Lack of Medicaid expansion to an already vulnerable southern city alongside threats of disruption of coverage under the Affordable Care Act will exacerbate existing disparities (31–32). Furthermore, our health care systems will likely see an uptick in utilization of hospital or emergency rooms for primary health care for mostly preventable illness post COVID-19 (33–34).

The findings from this pilot HIV testing intervention in non-traditional settings has significant public health implications for future prevention and testing goals to curve the epidemic in the South. The high acceptability and uptake of HIV screening support the utility of community-engaged approaches and strategies to successfully partner with the local public health department and federally qualified health center. It also provides context to the feasibility of offering testing in transitional housing locations with limited disruption to facility operations. Finally, the practicality of involving frontline staff in the research design and implementation of an HIV testing research study strengthens the validity of community-based projects and community participation.

**List Of Abbreviations**

MSA: metropolitan statistical area CDC: Centers for Disease Control and Prevention NHAS: National HIV/AIDS Strategy RWHAP: Ryan White HIV/AIDS Program HRSA: Health Resources and Services Administration AUDIT-C: Alcohol Use Disorders Identification Test

**Declarations**

**Ethics approval and consent to participate.** The University of Memphis Institutional Review Board approved the research (Protocol #2049). We obtained written informed consent from study participants prior to conducting the survey and HIV test.

**Consent for publication.** Not applicable

**Availability of data and materials.** The dataset generated and analyzed during the current study are not publicly available due to our lack of non-data sharing agreement during the acquisition of data but are available from the corresponding author on reasonable request.

**Competing interests.** The authors declare that they have no competing interests.
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Tables

Due to technical limitations the Tables are available as a download in the Supplementary Files.

Supplementary Files

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- Survey.docx
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