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Acceptability of HIV Testing Sites among Rural and Urban African Americans Who Use Cocaine

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Abstract

African Americans (AAs) who use cocaine in the Southern region of the U.S. have a relatively high risk of HIV and need for HIV testing. Among this group, those residing in rural areas may have less favorable opinions about common HIV testing sites, which could inhibit HIV testing. We examined rural/urban variations in their acceptability of multiple HIV testing sites (private physician clinic, local health department, community health center, community HIV fair, hospital emergency department, blood plasma donation center, drug abuse treatment facility, and mobile van or community outreach worker). Results from partial proportional odds and logistic regression analyses indicate that rural AA who use cocaine have lower odds of viewing local health departments (OR=0.09, 95%CI=0.03–0.21), physician offices (OR=0.19, 95%CI=0.09–0.42), and drug use treatment centers (OR=0.49; 95% CI=0.30–0.80) as acceptable relative to their urban counterparts. The findings have implications for further targeting HIV testing toward AAs who use of cocaine, particularly those residing in the rural South.

Keywords

cocaine use; HIV testing; African American; rural; urban

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COMPLIANCE WITH ETHICAL STANDARDS

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

INTRODUCTION

African Americans (AAs) overall have a relatively high risk of HIV/AIDS. According to Centers for Disease Control and Prevention (CDC) estimates, the HIV incidence rate is approximately 7 times greater among AAs than whites (1). Among AAs, cases of AIDS declined in all U.S. Census regions in recent years except the South (2). In fact, more than 50% of AAs reside in the South and this area accounts for over half of the total cases of AIDS among AAs in the U.S. (2,3).

Risky sexual behaviors, including inconsistent condom use and multiple sexual partners, may explain some of the elevated risk of HIV/AIDS among AAs in the Southern U.S. Risky sexual behaviors have been linked to cocaine use (4–8), which is among the more frequently used illicit drugs in rural and urban areas nationally (9). Cocaine use and risky sexual behaviors have become more common among AAs who use cocaine and reside in rural communities (4,8,10). Prior multi-state studies of rural people who used stimulants found that AAs, most of whom were using cocaine, had greater odds of trading sex for drugs or money (8) and multiple sexual partners relative to whites using methamphetamine and/or cocaine (4).

Improving access to HIV testing among AAs who use cocaine is an essential first step in identifying those who have HIV and could benefit from treatment and counseling. An important dimension of access to care is acceptability, which refers to consumers' attitudes about the characteristics of providers and health services organizations (11). In the case of HIV testing locales, perceived acceptability of a given HIV testing location may influence their likelihood of seeking HIV testing at that site.

A handful of studies have investigated the acceptability or preferences for the location of HIV testing (12–15), but none have investigated rural and urban differences. One study of rural AAs using cocaine found that many were reluctant to seek HIV testing at local health departments or physician clinics due to privacy and stigma concerns (16). An urban-based study found that AA men were more likely to be willing to be tested in medical locations, such as a hospital or physician's office, than non-medical settings, such as a church or grocery store (12). Another urban study of men who have sex with men (MSM) found that respondents were most willing to use rapid home self-testing using saliva and to be tested at a physician's office and were least willing to be tested by means of couples testing and home specimen collection with dried blood spotting (13). A study of clients of public testing services in San Francisco found that 63% chose public clinics as their first choice for the location for HIV testing, while 24% chose home self-testing and only 12% chose a physician's office (14). Lastly, a study conducted in south side Chicago found that participants were more likely to favor primary care clinics and multispecialty sites as their HIV testing locations over community centers and facilities that only conduct HIV tests (15).

The majority of the research described above was conducted in urban settings, but rural and urban populations have been shown to differ across many attitudes, beliefs, and behaviors (17–24). Rural residents are more likely to stigmatize the use of mental health care (17,19)

and exhibit risky health behaviors (20,21) and less likely to receive needed health care (18,22). Additionally, rural HIV-infected individuals have been shown to view HIV as more stigmatized in their communities and have lower social support when compared to urban residents (23). Variations in stigma and other social factors across rural and urban communities may also influence the perceptions of the acceptability of HIV testing locations in AAs who use drugs.

This study investigated rural vs. urban differences in the acceptability of various HIV testing locations as well as other drug use, demographic, social, economic, and health status correlates of the acceptability of HIV testing sites. We examined these issues among a community-based cohort of rural and urban AAs residing in Arkansas (25). The study described in this paper provides new information that could be applied to better target AAs who use cocaine and encourage greater overall HIV testing rates.

METHODS

Overview

The data are from a cross-sectional, population-based cohort study of AAs using cocaine who were not receiving any substance use treatment. The study was conducted in rural and urban counties in the state of Arkansas (26,27). We defined urban/rural residence according to the U.S. Office of Management and Budget (OMB) definitions for metropolitan (urban) and non-metropolitan (rural) counties (28). The urban county is home to the state capital and has a population of 382,748; the 2 rural counties are located along or nearby the Mississippi River and have populations of 28,258 and 10,424 (29). The study counties were selected because they have sizeable AA populations and prior data from treatment admissions showed that cocaine use was the primary drug of abuse among AAs in the state (30).

Eligibility Criteria

The minimum criteria for study eligibility were: (a) age 18 years or older; (b) AA race; (c) cocaine use at least 2 times in the past 30 days by any route except for injection; (d) no drug treatment services of any kind in the past 30 days, including services at a drug treatment facility, counseling for drug use, and self-help meeting attendance; and (e) residence in a study county, confirmed by driver's license or other identification. People who had recently used cocaine via injection were excluded because our prior research indicated that injection drug use was extremely rare among the population of interest and these types of people who use cocaine may be very different than non-injection people who use cocaine (we also note that there was no self-reported injection use encountered during screening) (10). To reduce the inclusion of participants faking cocaine use in order to receive monetary compensation, study recruiters asked each participant four questions about cocaine use and disqualified participants who did not answer the questions adequately.

Recruitment and Sampling

Respondent-driven sampling (RDS) was used to identify and recruit participants (31–34). RDS is useful in identifying "hidden populations" such as people who use drugs and has been shown to produce more representative samples of hidden populations than targeted or

snowball sampling (32,33). To initiate study recruitment, trained research staff members canvassed areas thought to be frequented by people who use drugs and engaged in conversations with community members. Staff members also attended community events, visited shelters, and handed out business cards and posted flyers at local health departments, courts, and treatment centers. Potential participants were given a study business card and instructed to call a study phone number to be screened. Persons who were deemed eligible for the study were scheduled for structured in-person interviews at a local study office. All participants received $50 cash for completion of the interview and were given three referral coupons that they could pass along to others "like them." Each participant also received $10 for each referral that resulted in a completed interview. Recruitment occurred between May 2011 and April 2012, culminating in sample of 400 (200 urban; 200 rural) participants. The study was approved by investigators' university institutional review board and participants' identities were further protected by a Certificate of Confidentiality issued by the National Institute on Drug Abuse.

Measures

Dependent Variables—We included items asking each participant to rate the acceptability of 8 different HIV testing sites (private physician clinic, local health department, community health center, community HIV fair, hospital emergency department, blood plasma donation center, drug abuse treatment facility, and mobile van or community outreach worker) on the following scale: (1) definitely acceptable, (2) mostly acceptable, (3) neutral, (4) mostly unacceptable, and (5) definitely unacceptable. Based on the distributions of the responses and cell size concerns, we combined the definitely and mostly acceptable responses into a single category and similarly combined the definitely and mostly acceptable responses (i.e., a trichotomous definitely/mostly acceptable, neutral, or definitely/mostly unacceptable variable) for the partial proportional logistic regression analyses. Because of especially small numbers of persons rating the acceptability of private physician clinics and local health departments as mostly or definitely unacceptable, we combined these responses with the neutral category, thereby creating a binary acceptable vs. other rating for multivariable analyses of these variables.

Independent Variables—As mentioned above, we defined urban/rural residence according to the OMB definitions of metropolitan and non-metropolitan. Demographic variables included age, gender, and education (less than high school vs. high school or more). Because access to medical care could be associated with the acceptability of HIV testing locations, we also included variables indicating whether the participant visited a physician in the past year and had a regular physician, health insurance, and any prior history of HIV testing at any location. Because engagement in risky sexual behaviors might be associated with the acceptability of HIV testing sites, we included a variable indicating whether the participant engaged in any unprotected oral, vaginal, or anal sex within the past 30 days. We also included a variable for number of other types of drugs used in the last 30 days and ever being incarcerated. Lastly, we included the Substance Abuse Outcomes Module (SAOM), which has been shown to be strongly concordant with the Composite International Diagnostic Interview (CIDI-SAM), to assess the presence of past 12-month alcohol and cocaine use disorders (35).

Analysis

Sample characteristics by rural/urban status were compared using t-tests for continuous variables and chi-square tests for categorical variables. We then compared and contrasted the acceptability of HIV testing sites by rural/urban residence using chi-square tests. Results of these analyses are included in Table I and Table II, respectively.

Next, we conducted logistic regression analyses to estimate unadjusted and adjusted odds ratios (ORs) and 95% confidence intervals (95%CIs) to compare rural/urban differences in the acceptability of 3 HIV testing locations: (1) local health departments and (2) physician offices, as these were the locations with the greatest acceptability among participants, and (3) drug abuse treatment centers, as this location is of particular interest given the target population of the study. Specifically, we first conducted proportional odds logistic regression analyses with each of the 3 main dependent variables of interest treated as having a 3 level ordinal value (i.e., acceptable, neutral, and unacceptable). However, because several variables within each model did not meet the proportional odds assumption, we moved to estimate a partial proportional odds model. This type of model treats independent variables that do not satisfy the proportional odds assumption as non-proportional while treating those that satisfy the assumption as proportional. The proportional odds assumption is that the odds ratios at any given break point in the ordinal dependent variable are not statistically different and therefore a single summary odds ratio can be provided for variables meeting the proportional odds assumption (36,37). In contrast, when a variable does not meet the proportional odds assumption, odds ratios must be provided at each break point for the dependent variable.

The proportional odds models for 2 of the dependent variables (the acceptability of local health departments and physician offices) yielded odds ratios with very wide confidence intervals corresponding to several independent variables, which were attributable to small sizes (0–5) for some levels of the dependent variable. Based on the distributions of the responses and cell size concerns, we ultimately decided to report the binary logistic regression results modeling the odds of acceptability (definitely/mostly acceptable vs. neutral/mostly/definitely unacceptable) of local health departments and physician offices (Table III) and the partial proportional odds regression results modeling the acceptability (definitely/mostly acceptable, neutral, and mostly/definitely unacceptable) of the drug treatment centers (Table IV).

Four respondents, all from the urban county, reported positive HIV status and were excluded from all multivariable analyses. Missing values were excluded from the multivariable analyses, culminating in final sample sizes ranging from 392 to 396 depending on the dependent variable analyzed. Finally, we calculated RDS weights for each dependent variable using the RDS Analysis Tool 7.1.46 developed by Heckathorn (available at http://www.respondentdrivensampling.org/) and applied these weights in the multivariable analyses. Because of their potential confounding effects, we included all independent variables in the multivariable analyses.

RESULTS

Table I describes rural/urban differences in study participant characteristics. Rural residents were significantly less likely to have a high school diploma than urban residents (62.5%% vs. 73.0%, p=0.03), more likely to have had a doctor visit within the last year (25.5% vs. 12.2%, p<0.001), and more likely to have a regular doctor (40% vs. 21.4%, p<0.001). They were also more likely to have engaged in unprotected sex within the last 30 days (34.5 vs. 22%, p=0.006), more likely to have ever been incarcerated (59.0% vs. 48.5%), and more likely to have used other types of drugs in addition to cocaine in the last 30 days (p-value=0.001), with 57.0% using 1 additional drug and 21.5% using 2 or more additional types of drugs compared to 50.5% and 12.2% for urban residents, respectively.

The sample did not vary significantly by residence across the other characteristics (age, gender, having health insurance, having previously been tested for HIV, a cocaine use disorder in last 12 months, and an alcohol use disorder in last 12 months). Mean age of rural residents was 39.1 (SD=12.1) and was 39.1 (SD=10.8) for urban. Approximately one third of the sample was female for both groups (rural=38.5%; urban=34.7%). A minority of participants had health insurance, with 31.0% of rural and 26.0% of urban residents having some form of coverage. Most participants had been previously tested for HIV (rural=87.0%; urban=80.6%). Finally, more than 3/4 of residents met the criteria for a cocaine use disorder (rural=77.5%; urban=76.5%) and more than half met the criteria for an alcohol use disorder (rural=64.0%; urban=55.1%).

Table II describes rural-urban differences in the acceptability of each of the HIV testing locations. Rural residents were significantly less likely than urban residents to find 6 of the 8 sites to be acceptable locations for HIV testing: a) local health departments (79% vs. 97%, p<0.001), b) private physician clinic (80% vs. 95%, p<0.001), c) physician clinics (77% vs. 95%, p<0.001), d) hospital emergency departments (71% vs. 93%, p<0.001), e) community HIV fairs (72% vs. 84%, p<0.012), and f) drug abuse treatment facilities (63% vs. 77%, p=0.007). There were no statistically significant rural vs. urban differences in acceptability across the other two locations: g) blood plasma donation center (66% vs. 61%, p=0.411) and h) mobile van/community outreach worker (52% vs. 53%, p=0.139).

Table III shows the results from binary logistic regression analysis comparing rural-urban differences in the odds of identifying a location as an acceptable HIV testing site. As described in the methods section, we focused the binary logistic regression analyses on the two locations that were found to be most acceptable among the sample: local health departments and physician offices.

In the adjusted model for local health departments, rural residence (OR=0.09; 95%CI: 0.03, 0.21) and having an alcohol use disorder (OR=0.33; 95%CI: 0.14, 0.74) were associated with decreased odds of finding the location as an acceptable HIV testing site, while having previously had an HIV test had a significant positive association (OR=3.85; 95%CI: 1.67, 8.87). The adjusted model showed no significant associations between the outcome and age (OR=1.01; 95%CI:0.98, 1.04), female gender (OR=1.47; 95%CI: 0.66, 3.28), having a high school diploma or greater education (OR=0.71; 95%CI: 0.35, 1.43), having health insurance

(OR=0.57; 95%CI: 0.27, 1.20), having a doctor's visit in the last year (OR=0.92; 95%CI: 0.42, 2.02), having a regular doctor (OR=1.31; 95%CI: 0.60, 2.84), engaging in unprotected sex in the past 30 days (OR=0.82; 95%CI: 0.42, 1.63), ever being incarcerated (OR=0.76; 95%CI: 0.36, 1.62), a cocaine use disorder (OR=1.10; 95%CI: 0.46, 2.60), and using one additional (OR=1.40; 95%CI: 0.61, 3.20) or two or more additional (OR=0.84; 95%CI: 0.30, 2.30) drugs other than cocaine in the past 30 days. However, engaging in unprotected sex in the past 30 days (OR=0.56; 95%CI: 0.32, 0.99), ever being incarcerated (OR=0.56; 95%CI: 0.31, 0.99), and using two or more additional drugs other than cocaine in the past 30 days (OR=0.36; 95%CI: 0.16, 0.80) were significant in the unadjusted analysis.

In the adjusted model for physician offices, rural residence (OR=0.19; 95%CI: 0.09, 0.42), having had unprotected sex (OR=0.40; 95%CI: 0.20, 0.78), and having an alcohol use disorder (OR=0.31; 95%CI: 0.14, 0.70) were associated with a decreased odds of finding the location as an acceptable HIV testing site, while having a high school diploma or greater education (OR=1.97; 95%CI: 1.01, 3.85) and having previously been tested for HIV (OR=2.51; 95%CI: 1.11, 5.68) had significant positive associations. The adjusted model showed no significant associations between the acceptability of physician offices and age (OR=0.99; 95%CI: 0.96, 1.02), female gender (OR=2.04; 95%CI: 0.90, 4.61), having health insurance (OR=1.24; 95%CI: 0.56, 2.76), having a doctor's visit in the last year (OR=2.10; 95%CI: 0.83, 5.29), having a regular doctor (OR=0.68; 95%CI: 0.31, 1.51), ever being incarcerated (OR=1.90; 95%CI: 0.91, 3.98), a cocaine use disorder (OR=0.61; 95%CI: 0.23, 1.57), and using one additional (OR=0.80; 95%CI: 0.34, 1.86) or two or more additional (OR=0.73; 95%CI: 0.25, 2.13) drugs other than cocaine in the past 30 days.

Table IV describes the results of the partial proportional odds model for the acceptability of drug treatment centers as HIV testing sites. Of the independent variables that satisfied with proportional odds assumption, as distinguished in Table IV, rural residence (OR=0.49; 95%CI: 0.30, 0.80) was associated with a decreased adjusted odds of finding the location as more acceptable, while age (OR=1.05; 95%CI: 1.02, 1.07) was associated with an increased odds of finding it as more acceptable. The adjusted model showed no significant associations between the acceptability of drug use treatment centers as an HIV testing site and having a high school diploma or greater education (OR=0.99; 95%CI: 0.60, 1.61), health insurance (OR=0.86; 95%CI: 0.49, 1.51), a doctor's visit in the last year (OR=1.00; 95%CI: 0.55, 1.81), a regular doctor (OR=0.80; 95%CI: 0.45, 1.40), unprotected sex in the past 30 days (OR=0.93; 95%CI: 0.56, 1.53), prior incarceration (OR=0.86; 95%CI: 0.50, 1.47), prior HIV testing (OR=0.92; 95%CI: 0.48, 1.77), an alcohol use disorder (OR=0.60; 95%CI: 0.35, 1.01), and using one additional (OR=1.26; 95%CI: 0.71, 2.23) or two or more additional (OR=1.40; 95%CI: 0.65, 3.00) drugs other than cocaine in the past 30 days.

Two independent variables, gender and cocaine use disorder status, did not satisfy the proportional odds assumptions. Female gender was positively associated with greater odds of finding a drug use treatment center as acceptable than neutral/unacceptable (OR=1.78; 95%CI: 1.01, 3.15), but was not significantly associated with finding a drug use treatment center as acceptable/neutral than unacceptable (OR=1.07; 95%CI: 0.51, 2.24). Having a cocaine use disorder showed no significant association in either comparison.

DISCUSSION

AAs, particularly those residing in the Southern region of the U.S., have an elevated risk of HIV/AIDS. Within the South, the AIDS case rate is comparatively high among urban as well as rural AAs relative to their white counterparts (38). In the Southern state of Arkansas, where we conducted the study described in this paper, the HIV incidence rate among AAs is approximately 5 times higher than the incidence rate among whites (39). Given the elevated risk of HIV among AAs, particularly among those who reside in the South and use cocaine, it is important to understand how they view the acceptability of potential HIV testing sites.

A small body of research on HIV testing preferences and acceptability has largely focused on urban residents. Similar to an urban-based study of public testing service clients (14), we found that the vast majority of both urban and rural AAs who use drugs viewed public health departments and community health centers as acceptable HIV testing sites. Also similar to urban-based studies of urban AA men (12) and MSM (13), we found that the vast majority of both urban and rural AAs who use cocaine view a physicians' office as an acceptable HIV testing location. Medical care clinics have the potential to serve as a key venue for HIV testing, especially in the rural populations that we studied as they were significantly more likely to have had a doctor visit in the last year (25.2% vs. 12.2%, $p<0.001$) and to have a regular doctor (40% vs. 21.4%, $p<0.001$) than their urban counterparts. However, physician visit rates would likely need to be improved to facilitate clinic-based HIV testing. Increased health insurance coverage through the expansion of Medicaid and development of health exchanges has occurred as part of the Affordable Care Act since this study was conducted and could help to facilitate access to physician services and HIV testing, but other non-financial barriers to medical care may persist among rural and urban AAs. Lastly, "opt-out" HIV testing policies have been shown to improve acceptance of HIV screening over "opt-in" policies in emergency departments (40,41). Given that local health departments and physician offices had the highest acceptability in both rural and urban respondents, adaptation of "opt-out" HIV testing may be beneficial in these settings to improve HIV screening rates among high risk populations.

Although the majority of rural participants viewed local health departments, community health centers, or private physician clinics as acceptable HIV testing sites, they were substantially less likely to view these sites as acceptable relative to their urban counterparts. Exactly why fewer rural people who use cocaine find HIV testing sites as acceptable remains unclear, but we posit that it could be explained by doubts about the need for HIV testing, stigma associated with getting tested, and concern about the confidentiality of testing results, which were cited as barriers to HIV testing in a qualitative research study conducted among rural AAs using cocaine in Arkansas (42). In related research, we found that worse perceptions of the effectiveness of local substance use treatment was negatively associated with a preference to seek local over non-local substance use treatment (43). Similarly, perceptions of the accessibility and availability of HIV testing locations may contribute to perceptions of their acceptability. Every county in the state of Arkansas houses a health department and one study reported that 87% of county public health clinics in rural counties of 10 southern states offer HIV testing (44), which suggests at least some minimal potential access to HIV testing. Although the two adjacent rural counties where we conducted this

research have medical care providers and outpatient substance use treatment available, these services are arguably not as easily accessible as they are in larger population areas.

The integration of HIV testing within drug use treatment centers could potentially facilitate HIV testing, at least among persons making the decision to seek formal treatment. A community-based study of mostly AAs who use drugs in Kentucky found that prior treatment for drug use was associated with a greater likelihood of prior HIV testing (45). Another study found that a history of substance abuse treatment was positively associated with the number of self-reported HIV tests in unadjusted analysis, but this association did not remain significant when adjusting for other factors (46). Other research has shown that HIV education included as part of a formal methadone treatment program is effective in improving awareness of HIV risk and reducing risky sexual behaviors (47). In recognition of the potential benefits of integrating HIV testing and substance use treatment, both the Centers for Disease Control and Prevention (48) and Veterans Administration (VA) recommend that all persons being treated at substance abuse facilities be tested for HIV (49). However, prior research indicates that the majority of substance abuse facilities do not offer HIV testing (42,50). Despite these potential advantages, this study suggests that integration of testing in drug treatment centers may encounter some barriers, particularly in rural settings.

Our findings also indicate that rural AAs using cocaine less frequently view drug use treatment centers as an acceptable HIV testing site relative to their urban counterparts. One plausible explanations is that some study participants contemplated the difficulty or learning about a potential HIV diagnosis within the confines of substance use treatment while attempting to reduce their drug use. Also, because rural AAs using cocaine are also less likely to perceive a need for drug use treatment (26,27), which is strongly correlated with actual treatment utilization, and face greater geographic barriers to drug use treatment (51–53), the integration of HIV testing with drug use treatment may be less effective in reaching rural AA people who use cocaine.

Of note, age and female gender were positively associated with the acceptability of drug use treatment facilities as HIV testing sites. Older people who use cocaine may have had more interactions with drug use treatment and, as a result, may be more comfortable with the thought of being tested for HIV in this setting. We are not sure why women find drug use treatment sites as more acceptable than men. However, this finding points to a potential strategy of targeting HIV testing toward female AA people who use cocaine who have entered the treatment system.

Finally, persons meeting criteria for an alcohol use disorder were significantly less likely to find local health departments and physician offices to be acceptable HIV testing sites. One explanation for the latter finding is people who use cocaine with an additional alcohol use problem are less concerned about their overall need for HIV testing. In other words, lower perceived need for HIV testing may translate into lower acceptability of a wide range of HIV testing sites.

Limitations

The cross-sectional design of the study prevents us from making conclusions about temporal relationships between explanatory factors and perceptions of acceptable HIV testing locations. Also, the study sample was taken through respondent-driven sampling, but it is difficult to obtain a truly random sample when studying “hidden” populations such as people who use drugs. Additionally, it should be noted that asking about acceptability of HIV testing location does not necessarily equate to utilization. In order to improve testing rates identification of acceptable locations is just the first step and improving access, availability, and utilization of these locations will be key toward this goal. Another potential weakness was the inclusion of a ‘neutral’ response option in the Likert scale for the acceptability variables, which creates issues with analysis and interpretation. However, we conducted additional analyses in an attempt to mitigate these concerns and regardless of the method used the major findings of the study were consistent. It is also important to note that the lower acceptability of drug use treatment centers compared to private physician clinics and local health departments may be attributed to the fact that participants in the survey were not engaged in treatment. AAs using cocaine who are engaged in substance use treatment may have different acceptability ratings than the population in this study. Finally, the findings of the study may only be generalizable to AAs residing in Arkansas, although it is reasonable to assume that the results could be generalizable to other southern states in the U.S. that have similar populations to Arkansas.

CONCLUSIONS

Overall, rural AAs who use cocaine were found to view common HIV testing sites as less acceptable than their urban counterparts. Local health departments, physician clinics, and community health centers were found to be the most acceptable sites among both rural and urban residents and may be the best sites for programs designed to improve HIV testing rates. Policy-makers have recently encouraged the provision of HIV testing within drug use treatment centers. However, our findings suggest that some AAs who use cocaine, particularly those living in the rural South, find drug use treatment as an unacceptable setting for HIV testing. Understanding the reasons behind these perceptions and ways to change them will be important to improve integration of HIV testing in various health care settings. Finally, future studies of rural residents that include stratification of sub-groups within this population may be beneficial in order to elucidate demographic and other characteristics associated with finding certain locations as acceptable HIV testing sites.

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Table I

Rural/Urban Comparison of Sample Characteristics

Variable	Urban N=196	Rural N=200	Total N=396	Chi-Sqr/T-Test Test Stat	Chi-Sqr/T-Test p-value
Age, mean (SD)	39.4 (10.8)	39.1 (12.1)	39.3 (11.5)	0.26	0.79
Female, %	34.7	38.5	36.6	0.62	0.43
Education ≥High School, %	73.0	62.5	67.7	4.95	**0.03**
Have Health Insurance, %	26.0	31.0	28.5	1.20	0.27
Doctor Visit Last Year, %	12.2	25.5	18.9	11.30	**<0.001**
Have Regular Doctor, %	21.4	40.0	30.8	16.02	**<0.001**
Unprotected Sex Last 30 Days, %	22.0	34.5	28.3	7.70	**0.006**
Ever Incarcerated, %	48.5	59.0	53.8	4.41	**0.04**
Previous HIV Testing, %	80.6	87.0	83.8	2.98	0.08
Cocaine Use Disorder, %	76.5	77.5	77.0	0.05	0.82
Alcohol Use Disorder, %	55.1	64.0	59.3	3.25	0.07
# Other Drugs Used in Last 30 Days				14.16	**<0.001**
0	37.2	21.5	29.3		
1	50.5	57.0	53.8		
≥2	12.2	21.5	16.9		

Note: Statistically significant ($\alpha = 0.05$) p-values in bold

Table II

Frequency of the Acceptability of HIV Testing Locations by Rural/Urban Status

	Urban		Rural		Total		Chi-Square	
	#	%	#	%	#	%	Test Stat	*p*-value
Local Health Department							32.40	**<0.001**
Acceptable	191	97%	158	79%	349	88%		
Neutral	3	2%	18	9%	21	5%		
Unacceptable	2	1%	24	12%	26	7%		
Private Physician Clinic							22.02	**<0.001**
Acceptable	187	95%	160	80%	347	88%		
Neutral	4	2%	27	14%	31	8%		
Unacceptable	5	3%	12	6%	17	4%		
Frequency Missing = 1			1	-	1	-		
Community Health Center							26.37	**<0.001**
Acceptable	186	95%	153	77%	339	86%		
Neutral	5	3%	21	11%	26	7%		
Unacceptable	5	3%	25	13%	30	8%		
Frequency Missing = 1			1	-	1	-		
Hospital Emergency Department							36.81	**<0.001**
Acceptable	182	93%	141	71%	323	82%		
Neutral	12	6%	26	13%	38	10%		
Unacceptable	2	1%	32	16%	34	9%		
Frequency Missing = 1			1	-	1	-		
Community HIV Fair							8.82	**0.012**
Acceptable	164	84%	143	72%	307	78%		
Neutral	17	9%	22	11%	39	10%		
Unacceptable	15	8%	33	17%	48	12%		
Frequency Missing = 2			2	-	2	-		
Drug Abuse Treatment Facility							9.87	**0.007**

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	Urban		Rural		Total		Chi-Square	
	#	%	#	%	#	%	Test Stat	*p*-value
Acceptable	151	77%	123	63%	274	70%		
Neutral	22	11%	40	20%	62	16%		
Unacceptable	23	12%	33	17%	56	14%		
Frequency Missing = 4			4	-	4	-		
Blood Plasma Donation Center							1.78	0.411
Acceptable	120	61%	130	66%	250	64%		
Neutral	26	13%	27	14%	53	14%		
Unacceptable	50	26%	39	20%	89	23%		
Frequency Missing = 4			4	-	4	-		
Mobile Van or Community Outreach Worker							3.94	0.139
Acceptable	103	53%	102	52%	205	52%		
Neutral	47	24%	34	17%	81	21%		
Unacceptable	46	23%	60	31%	106	27%		
Frequency Missing = 4			4	-	4	-		

Table III

Logistic Regression Results for Reporting Local Health Departments and Physician Offices as Acceptable HIV Testing Sites

	Local Health Department (N=396)				Physician Office (N=395)			
	OR_U	95% CI	OR_A	95% CI	OR_U	95% CI	OR_A	95% CI
Rural Resident	**0.10**	**0.04, 0.23**	**0.09**	**0.03, 0.21**	**0.18**	**0.09, 0.38**	**0.19**	**0.09, 0.42**
Age	1.01	0.98, 1.03	1.01	0.98, 1.04	1.00	0.97, 1.02	0.99	0.96, 1.02
Female	1.86	0.99, 3.51	1.47	0.66, 3.28	1.67	0.89, 3.13	2.04	0.90, 4.61
Education ≥ High School	0.89	0.49, 1.64	0.71	0.35, 1.43	1.76	0.99, 3.12	**1.97**	**1.01, 3.85**
Health Insurance	0.65	0.37, 1.17	0.57	0.27, 1.20	0.95	0.51, 1.75	1.24	0.56, 2.76
Doctor Visit Last 12 Months	0.78	0.39, 1.54	0.92	0.42, 2.02	1.68	0.74, 3.83	2.10	0.83, 5.29
Have Regular Doctor	0.81	0.45, 1.46	1.31	0.60, 2.84	0.67	0.37, 1.19	0.68	0.31, 1.51
Unprotected Sex Last 30 Days	**0.56**	**0.32, 0.99**	0.82	0.42, 1.63	**0.39**	**0.22, 0.70**	**0.40**	**0.20, 0.78**
Ever Incarcerated	**0.56**	**0.31, 0.99**	0.76	0.36, 1.62	0.94	0.53, 1.65	1.90	0.91, 3.98
Previously Tested for HIV	**2.08**	**1.09, 3.96**	**3.85**	**1.67, 8.87**	1.84	0.95, 3.60	**2.51**	**1.11, 5.68**
Cocaine Use Disorder	0.84	0.43, 1.66	1.10	0.46, 2.60	0.54	0.25, 1.17	0.61	0.23, 1.57
Alcohol Use Disorder	**0.36**	**0.19, 0.69**	**0.33**	**0.14, 0.74**	**0.31**	**0.16, 0.63**	**0.31**	**0.14, 0.70**
# Other Drugs Used 1	0.75	0.37, 1.53	1.40	0.61, 3.20	0.58	0.28, 1.20	0.80	0.34, 1.86
Last 30 Days (Ref=0) ≥2	**0.36**	**0.16, 0.80**	0.84	0.30, 2.30	0.43	0.18, 1.03	0.73	0.25 2.13

Note: Statistically significant (α=0.05) Odds Ratios in **BOLD** & Grey;

OR_U = Unadjusted Odds Ratio; OR_A = Adjusted Odds Ratio

Table IV

Partial Proportional Odds Results for Acceptability of Drug Abuse Treatment Centers as HIV Testing Sites (N=392)

Proportional Variables[a]		**OR_U**	**95% CI**	**OR_A**	**95% CI**
Rural Resident		**0.49**	**0.31, 0.75**	**0.49**	**0.30, 0.80**
Age		**1.04**	**1.02, 1.06**	**1.05**	**1.02, 1.07**
Education ≥ High School		1.04	0.66, 1.64	0.99	0.60, 1.61
Health Insurance		0.89	0.56, 1.42	0.86	0.49, 1.51
Doctor Visit Last 12 Months		0.93	0.55, 1.59	1.00	0.55, 1.81
Have Regular Doctor		0.78	0.50, 1.22	0.80	0.45, 1.40
Unprotected Sex Last 30 Days		0.69	0.43, 1.09	0.93	0.56, 1.53
Ever Incarcerated		0.81	0.53, 1.25	0.86	0.50, 1.47
Previously Tested for HIV		0.78	0.43, 1.43	0.92	0.48, 1.77
Alcohol Use Disorder		**0.56**	**0.36, 0.89**	0.60	0.35, 1.01
# Other Drugs Used	1	0.78	0.47, 1.30	1.26	0.71, 2.23
Last 30 Days (Ref=0)	≥2	0.54	0.28, 1.02	1.40	0.65, 3.00

	Acceptable vs. Neutral/Unacceptable				**Acceptable/Neutral vs. Unacceptable**			
Non-Proportional Variables	**OR_U**	**95% CI**	**OR_A**	**95% CI**	**OR_U**	**95% CI**	**OR_A**	**95% CI**
Female[b]	1.53	0.96, 2.43	**1.78**	**1.01, 3.15**	1.09	0.58, 2.02	1.07	0.51, 2.24
Cocaine Use Disorder[b]	1.06	0.63, 1.77	1.06	0.57, 1.98	1.60	0.83, 3.09	1.97	0.91, 4.26

Notes: Statistically significant (α=0.05) Odds Ratios in **BOLD** and Grey; OR_U = Unadjusted Odds Ratio; OR_A = Unadjusted Odds Ratio

[a] Proportional ORs represent odds of being in a higher acceptability category; acceptability categories are ranked from highest to lowest: acceptable, neutral, unacceptable

[b] Did not meet the proportional odds assumption in the model and therefore was treated as nonproportional.