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## RURAL/URBAN RESIDENCE, ACCESS, AND PERCEIVED NEED FOR TREATMENT AMONG AFRICAN AMERICAN COCAINE USERS

TYRONE F. BORDERS, PHD<sup>1</sup>, BRENDA M. BOOTH, PHD<sup>2,3</sup>, KATHARINE E. STEWART, PHD<sup>4</sup>, ANN M. CHENEY, PHD<sup>2,3</sup>, and GEOFFREY M. CURRAN, PHD<sup>2,3</sup>

<sup>1</sup> DEPARTMENT OF HEALTH MANAGEMENT AND POLICY, COLLEGE OF PUBLIC HEALTH, UNIVERSITY OF KENTUCKY, LEXINGTON, KENTUCKY

<sup>2</sup> DIVISION OF HEALTH SERVICES RESEARCH, PSYCHIATRIC RESEARCH INSTITUTE, UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES, LITTLE ROCK, ARKANSAS

<sup>3</sup> CENTRAL ARKANSAS VETERANS HEALTHCARE SYSTEM, NORTH LITTLE ROCK, ARKANSAS

<sup>4</sup> UNIVERSITY OF NORTH CAROLINA GENERAL ADMINISTRATION, CHAPEL HILL, NORTH CAROLINA

### Abstract

**Objective**—To examine how rural/urban residence, perceived access, and other factors impede or facilitate perceived need for drug use treatment, a concept closely linked to treatment utilization.

**Study Design**—Two hundred rural and 200 urban African American cocaine users who were not receiving treatment were recruited via Respondent-Driven Sampling and completed a structured in-person interview. Bivariate and multivariate analyses were conducted to test the associations between perceived need and rural/urban residence, perceived access, and other predisposing (eg, demographics), enabling (eg, insurance), and health factors (eg, psychiatric distress).

**Principal Findings**—In bivariate analyses, rural relative to urban cocaine users reported lower perceived treatment need (37% vs 48%), availability, affordability, overall ease of access, and effectiveness, as well as lower perceived acceptability of residential, outpatient, self-help, and hospital-based services. In multivariate analyses, there was a significant interaction between rural/urban residence and the acceptability of religious counseling. At the highest level of acceptability, rural users had lower odds of perceived need (OR=.23); at the lowest level, rural users had higher odds of perceived need (OR=2.74) than urban users. Among rural users, the acceptability of religious counseling was negatively associated with perceived need (OR=.64). Ease of access was negatively associated (OR=.71) whereas local treatment effectiveness (OR=1.47) and the

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FOR FURTHER INFORMATION, CONTACT: TYRONE F. BORDERS, PHD, PROFESSOR AND CHAIR, DEPARTMENT OF HEALTH MANAGEMENT AND POLICY, FOUNDATION FOR A HEALTHY KENTUCKY ENDOWED CHAIR IN RURAL HEALTH POLICY, COLLEGE OF PUBLIC HEALTH, UNIVERSITY OF KENTUCKY, 111 WASHINGTON AVE. ROOM 105B, LEXINGTON, KY 40536, USA; [TY.BORDERS@UKY.EDU](mailto:TY.BORDERS@UKY.EDU); TEL: 859-218-2041, FAX: 859-257-2821..

acceptability of hospital-based treatment (OR=1.29) were positively associated with perceived need among all users.

**Conclusions**—Our findings suggest rural/urban disparities in perceived need and access to drug use treatment. Among rural and urban cocaine users, improving perceptions of treatment effectiveness and expanding hospital-based services could promote treatment seeking.

### Keywords

ACCESS; COCAINE; ILLICIT DRUG; PERCEIVED NEED FOR TREATMENT; RURAL

Overall illicit drug use remains slightly higher in urban than rural counties, but it clearly is no longer an exclusively urban phenomenon,<sup>1</sup> raising concerns about rural access to drug use treatment services. Many policy makers, researchers, and treatment providers presume that access to drug use treatment is worse in rural areas, but a review of the extant literature revealed that very little information exists on this issue.<sup>2</sup> One study found that drug users residing in a single urban area were twice as likely to receive treatment as compared to those from a single rural area of Florida.<sup>3</sup> A unique longitudinal study of at-risk rural and urban drinkers residing in 6 southern states found in bivariate analyses that rural at-risk drinkers had greater use of help for their drinking, more use of psychiatrists, and more use of inpatient, outpatient, and ER treatment than their urban counterparts.<sup>4</sup> However, these differences did not remain when adjusting for demographic, social, and economic factors.

The extant literature also offers very little information about rural or urban residents' perceptions of the accessibility of substance use treatment. The longitudinal study of at-risk drinkers mentioned earlier found no significant rural vs urban differences in perceptions of waiting times, the acceptability of formal treatment for alcohol problems, and privacy concerns.<sup>4,5</sup> Evidence from the broader mental health literature may lend some insight into potential rural/urban differences. For example, depressed persons living in rural areas have been found to have worse perceptions of the availability, accessibility, and acceptability of specialty mental health services than their urban counterparts.<sup>6</sup>

Related to actual treatment utilization is perceived need for treatment. Conceptually, perceiving a need for treatment reflects recognition of a drug use problem and a belief that treatment will help.<sup>7-11</sup> Thus, it is arguably an essential "first step" in making the decision to seek treatment, at least among persons who are not mandated into treatment by the legal system.<sup>8,12</sup> In fact, prior research suggests a strong association between perceived need and actual drug use treatment attendance.<sup>7,13,14</sup> Perceived need has also been linked to remaining in substance use treatment and positive treatment outcomes.<sup>15,16</sup> Despite the relevance of studying perceived need to advance our understanding of treatment-seeking decisions, few studies have examined the factors that promote or impede perceived need for drug, alcohol, or mental health services.<sup>7,10,12</sup> Even less research has focused specifically on perceived need for drug use treatment, with the notable exception of a 3-state study of rural stimulant users which found that prior substance use treatment, family and social problems, and legal problems resulting from drug use were positively associated with perceived need.<sup>8</sup>

African American cocaine users residing in rural areas of the southern US may be at particularly high risk for low perceived need for treatment. According to data from the National Survey on Drug Use and Health (NSDUH), the lifetime prevalence of crack cocaine use is higher among African Americans age 18 years and older than among every other racial/ethnic group except persons reporting 2 or more races.<sup>17</sup> The NSDUH also showed that only 2.8% of African Americans age 12 years and older who satisfy criteria for a drug use disorder think they need and actually attempt to seek treatment.<sup>18</sup> Lastly, the multi-state study of rural stimulant users mentioned earlier found heavy cocaine use and low rates of treatment among mostly African American participants in the southern state of Arkansas.<sup>13,19,20</sup>

A better understanding of the factors associated with African American cocaine users' perceived need for treatment could enable health policy makers, managers, and providers to make more informed decisions about the targeting and tailoring of programs aimed at increasing treatment uptake. Andersen's Behavioral Model of Health Services has been frequently used to identify the predisposing, enabling, and need/health status factors that explain health services utilization,<sup>21</sup> including substance use treatment.<sup>13</sup> Predisposing factors, such as demographics, are considered largely immutable but can be used to identify subgroups of persons at risk for inadequate utilization or, in the case of this study, perceived need for treatment. Enabling social and economic factors, such as health insurance and rural/urban residence, are thought to affect individuals' ability to obtain services. Enabling access factors are sometimes distinguished from other enabling indicators because they are more modifiable by institutional or policy-level changes.<sup>22</sup> Finally, health is typically assessed by self-reports or a clinical diagnosis and is theorized to have the strongest association with health services use.

The study's primary purpose was to examine how rural/urban residence and other predisposing, enabling, and health status factors are associated with perceived need for drug use treatment. A secondary purpose was to compare and contrast rural and urban drug users' perceived access to drug use treatment. Because prior research suggests that rural residents less frequently utilize substance use services,<sup>3,4</sup> we hypothesized that they would have lower perceived need. To address these study questions, we conducted a population-based study of not-in-treatment African American cocaine users residing in rural and urban areas of Arkansas.

## Methods

### Setting

Participants were recruited in 2 rural (non-metropolitan) counties and 1 urban (metropolitan) county as designated by the Office of Management and Budget (OMB). A non-metropolitan county has fewer than 50,000 persons while a metropolitan county is part of a metropolitan statistical area with an urban core of at least 50,000 persons.<sup>23</sup> All of the county sites exhibited signs of cocaine use in prior research<sup>19</sup> or treatment admissions data.<sup>24</sup> The 2 rural counties vary in population size (28,258 and 10,424) and are predominantly African American (52%-55%).<sup>25</sup> The urban county has a population of 382,748 and a large African American population (35%).<sup>25</sup>

## Eligibility Criteria

Minimal participation eligibility criteria were: 1) age 18 years or older; 2) African American race; 3) use of cocaine at least 2 times in the past 30 days by any route other than injection; 4) no formal or informal drug treatment service use in the past 30 days, defined as services at a drug treatment facility, counseling for drug use, or attendance at self-help meetings; and 5) residence in 1 of the study counties, which study staff confirmed with a driver's license or other identification. To reduce the chances of persons faking cocaine use to be in the study and receive monetary compensation, potential participants had to adequately answer to the judgment of the study recruiter each of 4 questions about cocaine use, such as the current price of cocaine locally and the amount of cocaine needed to become high. A total of 562 persons were screened; only 1 was deemed ineligible because of the implausibility of cocaine use.

## Recruitment and Sampling

We used Respondent-Driven Sampling (RDS)<sup>26-28</sup> to identify and recruit participants. RDS is frequently used when seeking out “hidden populations” such as illicit drug users and persons with HIV. This methodology has been shown to produce a more representative sample of hidden populations than targeted or snowball sampling.<sup>27</sup>

To initiate study recruitment, research staff canvassed areas known to be frequented by drug users and engaged community members in conversation about where or how to find drug users. Staff members attended community events; visited shelters; called on local treatment providers, health departments, and courts to obtain permission to post study flyers or leave business cards to pass along; and personally handed out business cards to suspected cocaine users. When communicating with potential participants, study staff described the study in general terms as a “Healthcare Access Study” and encouraged individuals to call the study phone number to be screened.

Eligible participants were scheduled a time to complete the in-person structured interview at a study office. If participants completed an interview, they were paid \$60 cash (\$50 for the interview and \$10 for travel). Study “seeds” were given 3 referral “coupons” to pass along to people who were “like them.” For each referral that resulted in a completed interview, the seed received \$10 (for a maximum of \$30). The cycle continued as each referral that completed an interview was given 3 coupons. Recruitment occurred between May 2011 and April 2012, culminating in a sample of 200 rural and 200 urban participants (N=400).

The investigators’ university institutional review board approved the study, informed consent was obtained from all participants, and the National Institute on Drug Abuse issued a Certificate of Confidentiality to further protect the privacy of research subjects.

## Measures

**Perceived need for drug use treatment** was assessed by a single item adapted from the National Comorbidity Study and which has been used in prior research on perceived need for mental health and substance use treatment.<sup>10</sup> The question asked, “Was there ever a time during the past 12 months when you felt that you might need to see a professional because

of problems with your use of drugs?,” with a yes/no response option. Similar single-item measures (or Likert scales recategorized into dichotomous variables) have been used in other studies of perceived need for drug use<sup>8</sup> and alcohol use treatment.<sup>12</sup>

**Predisposing factors** included self-reported age in years, gender, and any (yes/no) lifetime history of substance use treatment, which was based on, “In your lifetime, how many different times have you been a patient or client in a drug abuse treatment or detox program, including residential, inpatient, or outpatient programs (not counting self-help programs like AA or NA)?”

**Enabling-social and economic factors** included marital status (single vs married or living with a partner), educational attainment (less than a high school degree or equivalency vs a high school degree/equivalency), health insurance coverage (any vs uninsured), and rural/urban residence.

**Enabling-access items** were categorized according to Penchansky and Thomas’ dimensions of availability, affordability, accommodation, acceptability of different types or locations of treatment, overall ease of access, and effectiveness of treatment.<sup>29</sup> The majority of the items were adapted from 2 multi-state studies of substance users.<sup>4,19</sup> Perceived availability was assessed by a single item, “A person who is in need of drug abuse treatment services can get them in this community.” Perceived affordability was assessed by, “Drug abuse treatment costs too much.” Accommodation of privacy was assessed by, “A person who is in need of drug abuse treatment can get it without other persons knowing about it.” Overall ease of access was assessed by, “I have easy access to substance abuse treatment.” Perceived effectiveness of treatment was assessed by, “Drug use services in this community are effective.” Response options for each of the aforementioned measures were on a 5-point scale from 1=strongly disagree to 5=strongly agree; because the affordability item was worded in a negative tone, we reversed the values for its responses. Acceptability was assessed by 5 separate items asking about the acceptability of different types or locations of drug use treatment: a) seeking overnight care at a drug treatment center, b) seeking outpatient treatment at a drug treatment center, c) going to a self-help group, d) seeking counseling from a preacher, priest, or other religious leader, and e) getting treatment at a hospital. Participants were asked to report the acceptability of each type of service on a 5-point scale ranging from 1=definitely acceptable to 5=definitely not acceptable; we reversed the values for the coding of the acceptability variables for a 5 to indicate definitely acceptable and thus be consistent with the direction of the other perceived access variables.

**Health status** measures included items from the University of Arkansas for Medical Sciences (UAMS) Substance Abuse Outcomes Module (SAOM),<sup>30</sup> the Brief Symptom Inventory-Global Severity Index (BSI-GSI),<sup>31</sup> and the SF-12 to assess general physical health-related quality of life.<sup>32</sup> From the UAMS-SAOM, we included diagnostic measures of past 12-month alcohol and cocaine use disorders, which have high agreement with the Composite International Diagnostic Interview (CIDI-SAM) and strong internal consistency, as well as past 30 days’ use of alcohol, marijuana, powder cocaine, and crack cocaine, which are highly associated with substance use measures from the Addiction Severity Index and have strong test-retest reliability.<sup>30</sup> The BSI-GSI is a commonly used, well-validated and

reliable measure of overall psychological distress.<sup>31</sup> From the SF-12, an abbreviated but valid and reliable version of the larger SF-36, we included the physical component summary (PCS) score.<sup>32</sup>

## Analysis

We first described and compared the sample characteristics by rural/urban residence, with *t* tests conducted to examine differences in continuous and chi-square tests for differences in categorical variables. Next, we conducted bivariate logistic regression analyses of the relationship between each independent variable and perceived need for treatment. Lastly, we conducted multivariate logistic regression analyses to examine the factors associated with perceived need. To adjust for potential confounding, we forced all of the predisposing and enabling factors into the final multivariate models regardless of their *P* values in the bivariate analysis. Because indicators of health status (reflected by past 30 days' substance use, cocaine and alcohol use disorders, BSI-GSI scores, and SF-12 PCS scores) are theoretically highly correlated with perceived need, we estimated 2 separate multivariate models: 1 excluding and 1 including health status. We used the SAS Proc MI command to impute 5 missing SF-12 values based on available data for the individual SF-12 items (SAS Institute Inc., Cary, North Carolina). We then used the corresponding Proc MIANALYZE command to model parameter estimates for the model including SF-12 scores.

Because the relationships between each perceived access variable and perceived need could differ by rural/urban residence, we also tested for potential interactions between rural/urban residence and each perceived access variable. To achieve parsimonious models, only significant rural by perceived access interactions ( $P < .05$ ) were included in the 2 final multivariate models. As described later in the results section, we found a significant interaction between rural/urban residence and the acceptability of religious counseling (ARC). Because we found an interaction between rural residence and ARC, we estimated the odds of 1) the association between rural/urban residence and perceived need by each level of ARC and 2) the association between ARC and perceived need among rural and among urban participants.

## Results

### Perceived Need and Sample Characteristics by Rural/Urban Residence

Table 1 describes perceived need for treatment and the sample characteristics for the total sample and by rural or urban residence. Perceived need was more common among urban (48%) than rural (37%) participants. Predisposing factors (age, gender, and lifetime drug treatment use) did not differ by residence. Of the enabling social and economic factors, marital status and health insurance coverage did not differ by rural/urban residence, but a lower percentage of the rural sample completed high school or an equivalent education. Urban participants perceived local treatment availability, overall ease of access, and local treatment effectiveness more favorably but treatment affordability less favorably than rural participants. Urban participants also reported greater acceptability of residential, outpatient, self-help, and hospital-based drug use services. Regarding health status, rural participants



had greater past 30 days' use of powder cocaine and marijuana and higher (worse) BSI-GSI scores than urban participants.

### Bivariate Results

Table 2 displays the results of bivariate and multivariate logistic regression analyses. In bivariate analyses, 2 predisposing factors, age (OR=1.06) and a lifetime history of any drug use treatment (OR=4.25), were positively associated with perceived need. Only 2 enabling factors, rural residence (OR=.62) and perceived treatment effectiveness (OR=1.41) were associated with perceived need. Of the health status factors, past 30 days' use of crack cocaine (OR=1.07), powder cocaine (OR=1.06), and alcohol (OR=1.03) were positively associated whereas marijuana (OR=.98) was negatively associated with perceived need. A 12-month diagnosis of a cocaine use disorder (OR=9.97) and BSI-GSI scores (OR=2.25) were also positively associated with perceived need. Lastly, higher (better) SF-12 PCS scores (OR=.95) were negatively associated with perceived need.

### Multivariate Results

Model 1 excludes and model 2 includes health status variables, which are theoretically closely linked to perceived need for treatment. Of the predisposing factors, age was positively associated with perceived need in both model 1 (OR=1.05) and model 2 (OR=1.04), as was a lifetime history of drug use treatment (ORs of 3.12 and 2.19, respectively). In model 2, males had higher odds (OR=2.02) of perceived need than females.

Four of the enabling access factors were significant. Higher reported ease of accessing drug use services was negatively associated with perceived need in models 1 and 2 (OR=.71 in each model). Greater perceived effectiveness of local drug use treatment was associated with higher odds of perceived need in model 1 (OR=1.52) and model 2 (OR=1.47). Greater acceptability of hospital-based treatment was also positively associated with perceived need for treatment in model 1 (OR=1.23) and model 2 (OR=1.29). We found a significant interaction between rural/urban residence and the acceptability of religious counseling for drug use. In other words, the effect of rural vs urban residence differs according to the level of the acceptability of religious counseling, or ARC.

To illustrate the effects of the interaction between rural/urban residence and ARC, we estimated the odds of rural vs urban differences at each of the 5 levels of ARC. As shown in Table 3, among persons who reported that religious counseling was definitely acceptable, those residing in a rural area reported lower odds of perceived need (OR=.22 in model 1 and OR=.23 in model 2) than their urban counterparts. Among those who reported that religious counseling was mostly acceptable, those residing in a rural area had slightly lower odds of perceived need (OR=.45 in model 1 and OR=.40 in model 2). In contrast, among those who reported that religious counseling was definitely not acceptable, those residing in rural areas had higher odds of perceived need (OR=3.97 in model 1 and 2.74 in model 2). Also shown in Table 3, the effect of the acceptability of religious counseling differs between urban and rural participants. *Among rural* participants, ARC was negatively associated with perceived need in both model 1 (OR=.65) and model 2 (OR=.64). *Among urban* participants, ARC was

positively associated with the odds of perceived need (OR=1.32) in model 2, but not model 1.

Lastly, in model 2, which included health status, both rural and urban cocaine users who satisfied criteria for a past 12-month cocaine use disorder had higher odds (OR=6.97) of perceived need compared to those without a disorder. Moreover, higher or worse psychological distress as reflected by the BSI-GSI was associated with greater odds (OR=1.99) of perceived need.

## Discussion

We used data from a population-based study to examine rural and urban variations in perceived access and need for drug use treatment as well as the factors explaining perceived need for treatment. We focused on African American cocaine users in Arkansas because prior research pointed to high rates of cocaine use and low treatment attendance among the Arkansas sample of a multi-state study of rural stimulant users.<sup>13,19</sup> Perceiving a need for treatment is considered a first and essential step in a process to decide to seek treatment services<sup>8,12</sup> and has been shown to be among the stronger predictors of treatment utilization.<sup>7,13,14</sup> A handful of prior studies have examined perceived need for substance use or mental health treatment nationally,<sup>7,10</sup> perceived need for alcohol use treatment nationally,<sup>12</sup> and perceived need for drug use treatment among rural stimulant users.<sup>8</sup> To our knowledge, this is the first report of rural vs urban variations in perceived need for drug use treatment.

Overall, 42% of our sample of African American cocaine users perceived that they needed treatment for their drug use. Yet, 77% of the study participants were not simply recreational cocaine users, but satisfied clinical criteria for a past 12-month cocaine abuse or dependence disorder. Our findings also indicate a rural vs urban disparity, with a lower percentage of rural as compared to urban cocaine users perceiving need for treatment, at least in bivariate analyses.

In addition to describing rural and urban differences in perceived need for treatment, a second study objective was to compare and contrast numerous dimensions of rural and urban African American cocaine users' perceived access to drug use treatment. In recent years, the US health care system has increasingly become more consumer-oriented, placing more emphasis on collecting information on the consumer perspective of health care access. The current study expands our knowledge of rural and urban differences in multiple dimensions of drug treatment accessibility. Compared to urban cocaine users, rural users in our study reported worse scores on 7 of our 10 access measures. At least in the rural areas where we conducted the study, perceived availability of services, overall ease of accessing them, and effectiveness of local services may need to be improved to facilitate more treatment utilization. Also, our findings suggest that rural cocaine users find inpatient, outpatient, self-help, and hospital-based treatment less acceptable than do their urban counterparts. Alternative means of delivering drug use screening and treatment, such as through primary care clinics, may need to be strengthened in these rural communities.



Further multivariate analysis portrayed a more complicated relationship between rural/urban residence and perceived need for treatment. At higher levels of religious counseling acceptability, rural cocaine users had lower odds of perceived need than their urban counterparts. One explanation for this finding is that rural African Americans who regard religious counseling as acceptable, and who may already have a religious leader with whom they can talk about their drug use, are more willing to substitute religious counseling for formal drug use treatment. Religion plays a key role in the lives of many African Americans in the southern US and may be especially important among rural African Americans.<sup>33</sup> In fact, prior work has shown that African American cocaine users in the South perceive pastoral care from clergy as integral to achieving sobriety<sup>34</sup> and the prevention and treatment of substance use.<sup>35</sup> In contrast, rural users had higher odds of perceived need for treatment at lower levels of acceptability. One potential explanation for the latter finding is that stigma associated with substance use in rural communities, where the church often plays a central role in African Americans' lives,<sup>33</sup> may deter some cocaine users' involvement in the church community and their views of the acceptability of religious counseling, thus increasing their perceived need for formal treatment. Both of these explanations are supported by qualitative findings related to this study.<sup>36</sup>

A corollary is that the association between the acceptability of religious counseling and perceived need differs by rural and urban residence. Among rural users, greater acceptability of religious counseling was negatively associated with perceived need. In contrast, the acceptability of religious counseling was positively associated with perceived need among urban cocaine users, implying that religious leaders who have completed some training on drug use screening and treatment could play a greater role in educating their urban congregations on the benefits of drug use treatment, directly counseling cocaine users, and referring cocaine users to formal treatment services.

Given that perceived local treatment effectiveness was associated with perceived need, state departments of behavioral health may need to further engage in efforts to promote knowledge about the effectiveness of drug use treatment. Other researchers have suggested that population-based educational efforts focus on raising awareness of the benefits of drug use treatment.<sup>12</sup> Substance abuse treatment managers may also consider steps to improve actual treatment effectiveness to stimulate treatment demand, such as assuring that they are using evidence-based protocols. To some surprise, a greater sense of ease of access was associated with lower perceived need for treatment, which could be explained by persons failing to consider a need for treatment if they think it is not readily accessible.

## Limitations

The cross-sectional design used in this study precludes our ability to conclude that particular factors directly lead to perceptions of treatment need. We also acknowledge that while RDS is better than convenience or snowball sampling, it does not yield population-level estimates like those that can be achieved through other sampling procedures such as door-to-door surveys.<sup>26,27</sup> Questions that were not from well-validated and reliable instruments were adapted from prior substance use research studies and reviewed by a multi-disciplinary team of addiction health services researchers, but we recommend that future research develop and

refine measures of the reports of drug use treatment accessibility. The acceptability of religious counseling was identified as an effect modifier in ex-post analyses, but we did not explicitly hypothesize such an interaction. Thus, this finding warrants further exploration in subsequent studies. Lastly, the generalizability of the findings may be limited to African Americans residing in Arkansas, but we suspect that the relationships found in the current study may extend to African American cocaine users in the larger southern region of the US.

## Conclusion

Rural African American cocaine users in our study were less likely to perceive a need for treatment and had generally worse perceived access to treatment than their urban counterparts, signaling that efforts aimed at promoting perceived need for treatment should be specifically targeted toward this population subgroup. If substance abuse treatment providers take a consumer-oriented perspective, then improving the accessibility of treatment is an important objective, regardless of whether access is associated with perceived need for treatment. Counseling provided by religious leaders may be more effective in promoting perceived need among urban than among rural African American cocaine users. Across rural and urban areas alike, substance use treatment managers and providers should consider steps to improve treatment effectiveness, or at least public images of treatment effectiveness, to promote perceived need. In summary, the current study findings provide new insight into the determinants of perceived need that could be modified to stimulate illicit drug users' thinking about entering drug treatment.

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**Table 1**

## Urban/Rural Comparison of Perceived Need for Treatment and Sample Characteristics

Variable		Total (N=400)	Urban (N=200)	Rural (N=200)	P
Perceived need for treatment, %	Yes	42.25	48.0	36.5	.02
	No	57.75	52.0	63.5	
<i>Predisposing</i>					
Age in years, mean (SD)		39.27 (11.48)	39.43 (10.81)	39.12 (12.14)	.78
Gender, %	Male	63.26	65.00	61.50	.47
	Female	36.75	35.00	38.50	
Lifetime Tx, %	Yes	41.25	45.50	37.00	.08
	No	58.75	54.50	63.00	
<i>Enabling-Social and Economic</i>					
Married/with partner, %	Yes	9.25	6.50	12.00	
	No	90.75	93.50	88.00	.06
Education, %	< HS/GED	32.25	27.00	37.50	
	HS/GED	67.75	73.00	62.50	.02
Health insurance, %	Yes	29.00	27.00	31.00	.38
	No	71.00	73.00	69.00	
<i>Enabling-Access, mean (SD)</i>					
Availability <sup>a</sup>		3.81 (1.09)	4.10 (0.78)	3.52 (1.12)	<.0001
Affordability <sup>b</sup>		2.65 (1.10)	2.52 (0.98)	2.77 (1.20)	.004
Accommodation of privacy <sup>a</sup>		3.40 (1.10)	3.49 (0.96)	3.32 (1.23)	.14
Ease of access <sup>a</sup>		3.14 (1.66)	3.34 (1.08)	2.94 (1.22)	.001
Effectiveness <sup>a</sup>		3.37 (1.01)	3.52 (0.85)	3.22 (1.13)	.003
<i>Acceptability</i>					
Residential Tx <sup>c</sup>		3.42 (1.32)	3.63 (1.25)	3.21 (1.37)	.001
Outpatient Tx <sup>c</sup>		3.53 (1.31)	3.75 (1.28)	3.32 (1.30)	.001
Self-help <sup>c</sup>		3.63 (1.22)	3.80 (1.13)	3.47 (1.28)	.007
Religious counseling <sup>c</sup>		3.43 (1.32)	3.37 (1.33)	3.50 (1.31)	.35
Medical hospital <sup>c</sup>		3.57 (1.25)	3.75 (1.12)	3.39 (1.35)	.003
<i>Health Status</i>					
Past 30 days' substance use, mean (SD)					
Crack cocaine		10.3 (11.4)	11.3 (11.4)	9.4 (11.5)	.10
Powder cocaine		5.1 (7.5)	3.7 (6.2)	6.5 (8.4)	.002
Marijuana		11.4 (12.2)	8.9 (11.0)	13.9 (12.8)	.03
Alcohol		14.5 (10.8)	14.7 (10.7)	14.8 (10.9)	.78
Alcohol disorder, %	Yes	59.25	54.50	64.00	.05
	No	40.75	45.50	36.00	
Cocaine disorder, %	Yes	77.00	76.50	77.50	.81

Variable		Total (N=400)	Urban (N=200)	Rural (N=200)	<i>P</i>
	No	23.00	23.50	22.50	
BSI-GSI, mean (SD)		.61 (0.85)	.46 (0.76)	.76 (0.91)	.0003
SF-12 PCS, mean (SD)		49.10 (10.29)	48.94 (10.39)	49.26 (10.73)	.76

Notes: Data are from a study of not-in-treatment African American cocaine users. *P* based on *t* tests for continuous and chi-square tests for categorical variables.

<sup>a</sup> 1=strongly disagree (worse) to 5=strongly agree (better)

<sup>b</sup> 1=strongly agree (worse) to 5=strongly disagree (better)

<sup>c</sup> 1=definitely not acceptable to 5=definitely acceptable



**Table 2**

## Unadjusted and Adjusted Odds of Perceived Need for Drug Use Treatment

Measure	Bivariate Analysis, N=400		Multivariate Model 1, N=400		Multivariate Model 2, N=400	
	OR <sub>un</sub>	95% CI	OR <sub>adj</sub>	95% CI	OR <sub>adj</sub>	95% CI
<i>Predisposing</i>						
Age	1.06	1.04-1.09 *	1.05	1.03-1.07 *	1.04	1.02-1.07 *
Male (ref: female)	1.50	.99-2.28	1.41	.85-2.35	2.02	1.12-3.64 *
Lifetime Tx history (ref: no Tx)	4.25	2.78-6.50 *	3.12	1.89-5.15 *	2.19	1.25-3.83 *
<i>Enabling-Social and Economic</i>						
Married/with partner (ref: single)	1.69	.86-3.33	1.19	.58-2.67	1.26	.51-3.13
<HS/GED (ref: HS educ)	1.02	.67-1.56	.95	.58-1.58	.85	.49-1.50
Health insurance (ref: uninsured)	1.16	.75-1.79	1.11	.66-1.87	1.24	.68-2.25
Rural (ref: urban)	.62	.42-0.93 *	8.22 <sup>d</sup>	2.10-32.24 *	5.18 <sup>d</sup>	1.12-23.93 *
Rural*ARC	-	-	.48 <sup>d</sup>	.33-.70 *	.52 <sup>d</sup>	.35-.80 *
<i>Enabling-Tx Access</i>						
Availability <sup>a</sup>	1.21	.99-1.48	1.16	.88-1.53	1.15	.85-1.56
Affordability <sup>b</sup>	.90	.75-1.07	1.00	.81-1.24	1.05	.83-1.34
Accommodation of privacy <sup>a</sup>	1.04	.87-1.25	1.01	.82-1.26	1.09	.86-1.38
Ease of access <sup>a</sup>	0.98	.83-1.16	.71	.56-.89 *	.71	.55-.93 *
Effectiveness <sup>a</sup>	1.41	1.15-1.74 *	1.52	1.16-1.98 *	1.47	1.10-1.97 *
Acceptability						
Residential Tx <sup>c</sup>	.95	.82-1.11	.89	.72-1.10	.99	.79-1.26
Outpatient Tx <sup>c</sup>	.95	.82-1.11	.99	.79-1.23	1.00	.86-1.39
Self-help <sup>c</sup>	1.08	.92-1.28	1.02	.81-1.29	1.15	.89-1.48
Religious counseling (ARC <sup>c</sup> )	1.07	.92-1.25	1.31 <sup>d</sup>	1.02-1.71 *	1.23 <sup>d</sup>	.92-1.64
Medical hospital <sup>c</sup>	1.15	.98-1.35	1.23	1.02-1.61 *	1.29	1.01-1.65 *
<i>Health Status</i>						
Past 30 days' substance use						
Crack cocaine	1.07	1.05-1.08 *	-	-	1.02	.98-1.07
Powder cocaine	1.06	1.04-1.08 *	-	-	1.02	.99-1.05
Marijuana	.98	.96-.99 *	-	-	.99	.96-1.01
Alcohol	1.03	1.01-1.05 *	-	-	1.01	.98-1.04
Cocaine disorder (ref: none)	9.97	4.84-20.55 *	-	-	6.97	2.85-17.02 *
Alcohol disorder (ref: none)	1.45	.97-2.20	-	-	.70	.36-1.36

Measure	Bivariate Analysis, N=400		Multivariate Model 1, N=400		Multivariate Model 2, N=400	
	OR <sub>un</sub>	95% CI	OR <sub>adj</sub>	95% CI	OR <sub>adj</sub>	95% CI
BSI-GSI	2.25	1.70-2.97 *	-	-	1.99	1.40-2.84 *
F-12 PCS	.95	.93-.97 *	-	-	.99	.96-1.01

Note: Data are from not-in-treatment African American cocaine users.

<sup>a</sup> 1=strongly disagree (worse) to 5=strongly agree (better)

<sup>b</sup> 1=strongly agree (worse) to 5=strongly disagree (better)

<sup>c</sup> 1=definitely not acceptable to 5=definitely acceptable

<sup>d</sup> See Table 3 for estimates of interaction effects.

\*  $P < .05$

**Table 3**

Estimated Interactive Effects of Rural/Urban Residence and the Acceptability of Religious Counseling (ARC) on the Odds of Perceived Need for Drug Use Treatment

	Multivariate Model 1, N=400		Multivariate Model 2, N=400	
	OR <sub>adj</sub>	95% CI	OR <sub>adj</sub>	95% CI
Effect of Rural/Urban Residence by Levels of ARC <sup>a</sup>				
Definitely acceptable	0.22	0.10-0.47 *	0.20	0.09-0.47 *
Mostly acceptable	0.45	0.26-0.77 *	0.38	0.20-0.70 *
Neutral	0.92	0.55-1.57	0.71	0.39-1.30
Mostly not acceptable	1.92	0.92-3.98	1.34	0.60-3.03
Definitely not acceptable	3.97	1.41-11.13 *	2.53	0.81-7.89
Effect of ARC by Rural and Urban Residence				
Rural	0.64	0.48-0.84 *	0.64	0.47-0.87 *
Urban	1.32	1.02-1.71 *	1.21	0.91-1.62

<sup>a</sup>1=definitely not acceptable to 5=definitely acceptable

\* P < .05