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Applying classification and regression tree analysis to identify prisoners with high HIV risk behaviors

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Abstract

Among prisoners, past research has associated several factors with HIV risk behaviors, including illicit drug use, engaging in sex trade, older age (for drug-related risk), younger age (for sex-related risk), low education, low income, type of offense, history of abuse, mental health disorders, and self-perceived efficacy and vulnerability. This study employs data collected through the Transitional Case Management study of the Criminal Justice Drug Abuse Treatment Studies collaborative to analyze characteristics of prisoners who engaged in high-risk behaviors prior to incarceration. For the first 787 participants of this study, we employed recursive partitioning techniques to better identify groups at varying levels of HIV risk behaviors, including Risky Needle Use, Risky Sexual Behaviors, and overall HIV/AIDS Risk Behaviors. Sub-scales of two assessments developed at Texas Christian University, the Client Evaluation of Self and Treatment and the Criminal Thinking Scale, helped to differentiate among offenders. Demographic factors such as age, employment, stable housing, and white race were also important. The results are used to develop a decision tree classifying overall risk behavior.

Introduction

The rates of HIV/AIDS infection are three to five times higher in prison than in the general population (CDC 2006; Maruschak 2004). A majority of prisoners have a history of substance abuse (Cotten-Oldenburg et al. 1999; Mumola 1999), which is related to HIV risk behavior. Intravenous drug use has been consistently found to be correlated with higher seroconversion rates and risk behaviors prior to and during incarceration (Altice et al. 2005; Altice et al. 1998; Cotten-Oldenburg et al. 1999; Lopez-Zetina et al. 2001; Rich et al. 1999). Past studies have found that there is a strong relationship between illicit drug use and HIV risk sexual behavior (Altice et al. 2005), and inmates often continue to use illicit drugs while incarcerated (Clarke et al. 2001; Seal et al. 2004). Especially among women, the fastest growing segment of the HIV population, those incarcerated are highly likely to have performed sex in exchange for money or drugs, a behavior closely linked to HIV risk (Lanier & Paoline 2005; McClelland et al. 2002). Sexually transmitted diseases (STDs) and

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other blood-borne viruses have been linked to risk for HIV infection (Altice et al. 1998; Hellard & Aitken 2004). However, sexual risk has not been consistently linked to HIV seroconversion among women prisoners (Rich et al. 1999).

In contrast to studies describing the rates of *HIV transmission*, a growing literature sheds light on the characteristics of prisoners and other people who engage in *HIV high-risk behavior*. For example, among male prisoners, a strong predictor of in-prison risk behavior is their pre-incarceration behavior, including having anal sex, having sex in exchange for money, and injection drug use (Moseley & Tewksbury 2006; Altice et al. 1998). While minority populations are at higher risk of contracting HIV than their white counterpart (Altice et al. 2005; CDC 2006; Maruschak 2004; Krebs 2006; Altice et al. 1998; McClelland et al. 2002), it is white race that is associated with engaging in risk behaviors. For example, Alarid & Marquart (1999) found that white women were more likely to engage in risk behaviors than their Black or Hispanic counterparts. Similarly, Black men who have sex with men are more likely than their white counterparts to contract HIV, despite engaging in no greater HIV risk behavior (Millet et al. 2006)

Other demographic factors previously identified as associated with risk behaviors include age, education, and socioeconomic status. Research suggests that older individuals have more risky behaviors overall (Krebs 2006; Martin et al. 1998; Altice et al. 2005; CDC 2006; Alarid & Marquart 1999). However, being younger in age has a strong association with increased sex risk behaviors for both males and females (Cotten-Oldenburg et al. 1999; Lang & Belenko 2001), whereas older men were more likely to report risk behaviors related to drug use (Lang & Belenko 2001). Lower educational attainment has been related to high risk behavior (Paasche-Orlow et al. 2005; Krebs 2006; Moseley & Tewksbury 2006; Altice et al. 2005; Jacobs 1997). A study by Alarid & Marquart (1999) found that females with a higher household income and higher socioeconomic backgrounds were less likely to report risky behavior.

Criminal history and certain charges such as burglary and property offenses have been found to be related to both higher HIV prevalence and risk behavior, many times related to drug use (Lang & Belenko 2001; Maruschak 2004). Arrest charges associated with HIV risk were different for females, where drug charges were strongly associated with higher sexual risk and intravenous drug use (IDU) (McClelland et al. 2002; Alarid & Marquart 1999). Also, number of incarcerations and length of incarceration were related to risky behavior before, during, and after incarceration, especially for males (Altice et al. 1998; Krebs 2006; Clarke et al. 2001; CDC 2006; McClelland et al. 2002).

A history of being abused has also been linked to increased risk behaviors. In a study of men, Lang & Belenko (2001) found that men with a history of physical abuse had increased drug-related risk behaviors. Male sexual victimization was related to higher sex risk behavior (Belenko et al. 2005). Similarly, a history of both childhood and adult sexual violence are predictive of HIV sexual risk behavior among women (Ravi et al. 2007; Mullings et al. 2000; Jacobs 1997).

Some emotional and mental health characteristics have been related to HIV risk behaviors. Anxiety and antisocial personality disorders, as well as PTSD were also found among women with high sex risk behavior (Hutton et al. 2001; Jacobs 1997), and women with severe mental health disorders have higher sexual risk behavior than those women without them (McClelland et al. 2002). Low self-efficacy and less perceived vulnerability may be associated with more risk behaviors (Swartz et al. 2004).

Several studies have found that knowledge of HIV transmission and risk education resulted in decreased high risk behavior in men and women (Swartz et al. 2004; Moseley &

Tewksbury 2006; Alarid & Marquart 1999). Therefore, many researchers advocate for HIV programs in prison that specifically address the needs of the groups with the highest risk behaviors. By creating profiles of high risk prisoners, and tailoring programs to particular behaviors, risk education may be more effective (Lang & Belenko 2001; Cotten-Oldenburg et al. 1999).

The purpose of this study was to analyze characteristics of prisoners who engaged in high-risk behaviors prior to incarceration using classification and regression tree analysis in order to identify groups at varying levels of HIV risk behaviors.

METHODS

Participants

The present investigation employed baseline data from the multi-site experimental study of strengths-based Transitional Case Management (TCM) (see Prendergast & Cartier, 2008), which is one of the studies conducted under the National Institute on Drug Abuse's Criminal Justice Drug Abuse Treatment Studies (NIDA CJ-DATS) cooperative. The protocol was approved by Institutional Review Boards at the University of California Los Angeles, the Connecticut Department of Mental Health and Addiction Services, the University of Kentucky, and the National Development & Research Institutes, Inc. The first 787 participants from the TCM study were included in the present study. Recruited from prisons in Oregon, Kentucky, Colorado, and Connecticut, these prisoners were all adults within 3 months of prison release; had participated in drug treatment while incarcerated; and were being recommended for addiction treatment upon release. Also, eligible participants were slated for release to one of the metropolitan areas where the transitional case managers had been positioned. Persons excluded from participation were sex offenders; those with other case management arrangements; those with parole restrictions preventing their participation; and those unable to provide informed consent. Recruitment was conducted in private areas of prisons by trained research assistants (RAs) who met with the potential participants to check for eligibility and obtain informed consent. A baseline interview was conducted by the RAs prior to random assignment to the TCM condition or to the comparison condition (standard parole services). The time period referred to during most of the baseline interview, including the variables being studied here, was the period prior to the arrest for which the prisoner was incarcerated.

Measures

All measures employed for the present analyses were self-report instruments, collected through face-to-face interviews with the RAs.

HIV/AIDS risk variables—Three composite variables: HIV/AIDS risk, risky needle use, and risky sexual behaviors were used as the target outcome variables. These three composite variables were derived from the Texas Christian University AIDS Risk Assessment (ARA) (Simpson, 1997), which is a 30 item instrument that assesses drug use and sexual risk behaviors in 30-day and 6-month time frames. For this analysis, the 30-day time frame was used for each of the composite variables. The HIV/AIDS risk composite variable is the summary score of any intravenous drug use (IDU), any use of dirty drug works, any multiple sex partners, and any sex without condoms. This composite variable has a range from 0 to 4, with 0 reflecting no engagement in HIV/AIDS risk behaviors and 4 reflecting engagement in all four types of behaviors. Similarly, the needle use composite variable is a summary score for any of the following behaviors: any IDU, or any sharing of needles, cookers, cotton, or water for drug injection. It ranges from 0 to 3, with 0 reflecting no engagement in any of the risky needle use behaviors and 3 reflecting engagement in all three types of risky needle use

behaviors. However, since only 20.1% of participants reported engaging in any risky needle behavior, and even fewer than 8% of participants reported engaging in more than one type of risky needle behavior, we decided to dichotomize the risky needle behavior to 0 versus 1 or more, i.e., any use, for the outcome analyses. The risky sexual behavior composite variable is the summary of any sex while under the influence of drugs, any sex with IDU users, any sex with strangers, any sex with cocaine users, and engaging in the sex trade. The score ranges from 0 to 5, with 0 reflecting no engagement in risky sexual behaviors and 5 reflecting involvement in all five types of risky sexual behaviors. The ARA has demonstrated adequate reliability and validity (Simpson 1997), with Cronbach's alpha ranging from 0.59 to 0.71.

Demographic and background variables—Demographic and background predictors included participants' self-reported gender, age, race/ethnicity (Non-Hispanic White vs. others), education (in years), marital status (married vs. others), housing stability (score 5 or higher on the living arrangement question, where a higher score reflects a more stable housing situation), employment status (full or part time vs. not), any social support, any violent behavior in the past 30 days, and Global Severity Index (GSI), a measure of overall psychological distress level derived from the Brief Symptom Inventory (Derogatis 1993). Any family support was defined by whether the respondent reported in a positive direction "you helped each other with problems" in relation to spouse/partner, parents, and/or siblings. This item was part of the TCU Client Problem Profile (Broome et al 1997, Joe et al., 2004). The residential stability item was taken from a modified version of the Progress Evaluation Scale (PES) (Ihilevich et al 1981). The modified version was used in the NIDA-funded studies described in Inciardi et al., 1993.

TCU Criminal Justice Client Evaluation of Self and Treatment (CJ-CEST)—The TCU CJ-CEST is a 5-point Likert scale ranging from 1=disagree strongly to 5=agree strongly, which contains 15 subscales that measure treatment motivation, and psychosocial functioning (Simpson & Joe 1993). In the present study, we only included the scales that assess psychosocial functioning: Self-Esteem, Depression, Anxiety, Decision Making, Self Efficacy, Childhood Problems, Hostility, Risk Taking, and Social Consciousness. Scores for each scale are obtained by multiplying the mean rating score by 10 so that they range from 10 to 50 (midpoint of 30). The TCU CJ-CEST has good reliability and validity (Garner et al. 2007), with alpha coefficients ranging from 0.64 to 0.84.

TCU Criminal Thinking Scale (TCU-CTS)—The TCU-CTS is 37-item 5-point Likert-type scale (1=disagree strongly and 5=agree strongly) designed to assess "criminal thinking" (Knight et al. 2006). It includes six subscales: Entitlement, Justification, Personal Irresponsibility, Power Orientation, Cold Heartedness, and Criminal Rationalization. Scores for each subscale are computed by multiplying the average rating by 10 so that the final scores range from 10 to 50. High scores for Entitlement reflect that offenders believe that they are privileged and that the world "owes them;" high scores for Justification suggest the offenders' tendency to use perceived social injustice to justify their antisocial behaviors; high scores for Personal Irresponsibility suggest that offenders refuse to be responsible for their actions and are more likely to blame others; high Power Orientation scores reflect offenders' need for power and control; high Cold Heartedness conveys the offenders' lack of emotional involvement in any relationship; and, finally, high scores for Criminal Rationalization reflect general negative attitudes toward the law and authority figures. The TCU-CTS has good reliability and validity (Knight, Garner, Simpson, Morey, & Flynn, 2006), with Cronbach's alpha ranging from 0.68 to 0.81 and test-retest correlations range from 0.66 to 0.84.

Data Analysis

To identify inmates who are more likely to engage in HIV/AIDS risk behaviors, we applied the classification and regression tree (C&RT) analysis (Breiman et al. 1984). C&RT is a non-parametric technique used to explore the relationships between a target outcome variable and a large number of potential predictors. C&RT examines each predictor variable to identify the most significant predictor at each step to split the sample into two mutually exclusive and homogenous subgroups. Each C&RT split is an optimal balance between sensitivity and specificity for predicting the outcome variable. This process is conducted repeatedly until the sample is split into completely homogeneous groups or until a pre-determined maximum level of splits is reached. The final result is a classification tree. The starting group (entire sample) is referred to as the root, each split is referred to as a branch, and the data subset resulting from the split is called a node; the terminal or ending nodes are referred to as leaves.

C&RT is an alternative to traditional Ordinary Least Squares regression for multivariable analyses, especially for exploring patterns in complicated datasets. In a simulation study comparing the misclassification rates between C&RT and logistic regression, C&RT outperformed logistic regression, especially when there was inequality of covariance matrices for the predictors between groups (Finch & Schneider 2006). Other advantages of C&RT include its lack of assumptions about the form of the underlying distribution; the flexibility of measurement level (i.e., nominal, ordinal, or interval) for both outcome and predictors; robustness against potential biases from outliers; and lack of restrictions on the number of predictor variables. Furthermore, C&RT results are presented in the form of a decision tree, requiring no formula or calculations, rather than in the form of equations that are given by traditional regression methods. Although C&RT is more flexible, it tends to grow many-leveled trees, which raises the issues of over-fitting the model and not presenting the results efficiently. Thus, C&RT usually includes a complex pruning process to reduce the tree size to a more efficient and interpretable one. (Kraemer 1992).

The C&RT analysis was done using SPSS decision tree software (SPSS, 2002). We used the Least-Squared Deviation (LSD) impurity measure as the tree-splitting criterion for continuous outcome variables (i.e., general risk behavior, and risky sexual behavior) and the Gini impurity function for categorical outcome variables (i.e., risky needle behavior). The cost-complexity parameter and cross-validation procedure were taken into account when determining the appropriate size for the final tree. The minimum subgroup size was set to be 40, approximately 5% of the entire sample. (Fewer than 5% of the entire sample for subgroup size is considered too small to be stable.) This criterion has commonly been used in other studies applying C&RT (Lemon et al. 2003). The plus and minus one standard error (SE) rule was used to prune the tree (Breiman et al., 1984). To avoid over-fitting the models (data-driven), we applied a 10-fold cross-validation procedure. This procedure randomly divides the sample into 10 mutually exclusive subsets. The training and testing for trees grown and pruned is then carried out 10 times, with each subset used as an independent testing dataset in turn, while the nine other subsets are united to form the training subsets. This process is conducted iteratively, and the tree with the largest tree size and smallest deviation is selected as the optimal size. An average risk estimate (classification rate) is obtained from the 10 subsets. This is the most common cross-validation method used for relatively small sample sizes, and studies have demonstrated that this method shows little bias in model selection, compared to other cross-validation methods (Weiss & Indurkha, 1996). In sum, the final best fitting tree is one that has the most efficient level of splits and the smallest cross-validation error.

RESULTS

The majority of the participants were male (76.0%), with an average age of 34.0 years (range 18–66). Fewer than half of the sample (43.8%) had graduated from high school or had earned a GED. Only 48.3 % reported that they had been employed prior to incarceration. About 16.9% of the sample was either legally married or living as married (never married, separated, divorced, and widowed were counted as not married), and 69.1% was in stable housing. (See Table 1 for details.) Table 2 presents the means and standard deviations for all 30 HIV/AIDS risk variables, as well as the percentage of nonzero responses for each item.

Classification and Regression Tree Analysis

The results of C&RT for the three target outcome variables--risky needle use behaviors, risky sexual behaviors, and overall risky HIV/AIDS behaviors--are presented in Figures 1, 2, and 3, respectively. Each figure includes the predictor variables and the value that split each subgroup. Within each node, the mean score or proportion of participants in each response category are presented.

Risky needle use behaviors—The tree achieved adequate cross-validation. There is no marked difference in risk estimate (i.e., misclassification rate for the binary outcome) for the entire sample and the cross-validation estimate (20.0% vs. 21.6%). Figure 1 shows that the first characteristic dividing those with and without risky needle behavior is race, i.e., White versus non-White. The non-White subgroup did not split again, and this subgroup exhibits low risk for needle use compared to the White subgroup. Among White participants, those who were employed just prior to incarceration engaged in fewer needle risk behaviors than the unemployed subgroup. Among the employed subgroup, those who scored 38.33 or lower on the Decision Making subscale of the CEST were more likely to engage in risky needle behaviors than were those who scored higher than 38.33. For those who were not employed prior to incarceration, participants with a score of 24.17 or lower on the Justification subscale of the TCU-CTS were more likely to engage in risky needle behaviors than were participants scoring higher than 24.17.

Risky sexual behaviors—The cross-validation shows only a small difference in the risk estimate: 1.79 for the entire sample and 1.73 for the cross-validation average. The final tree accounts for about 8% of the variance. As shown in Figure 2, the first split for the risky sexual behaviors composite score is based on the score from the Risk-Taking scale of the CEST, and the cut value is 36.43. Those with a Risk-Taking score higher than 36.43 were more likely to engage in sexual risk behavior than were those who scored 36.43 or lower. The high Risk-Taking subgroup did not split again. Among the low Risk-Taking subgroup, those who had been in stable housing prior to incarceration were less likely to engage in risky sexual behaviors than were those who were not in stable housing. These subgroups did not split further.

Overall Risky HIV/AIDS behaviors—The tree also shows good cross-validation, the risk estimate for the entire sample is 0.66, and 0.63 for the cross-validation. The final tree accounts for 16.2% of the variance. Figure 3 shows the result for the final tree. The first split for risky HIV/AIDS behaviors is based on the score of the Risk-Taking behavior scale from the TCU-CTS. The subgroup that represented higher risk taking scores (higher than 37.85) was further split based on participants' employment status, with those who were employed prior to incarceration exhibiting fewer HIV/AIDS risk behaviors than were those who were not employed. In fact, those with high scores on risk-taking who were also unemployed had the highest risk for HIV/AIDS behaviors. Following employment status, this branch was not

further split. Among those who had a lower risk-taking score (37.85 or lower), the next split was related to participant age. Participants who were older than 47.16 were less likely to engage in HIV/AIDS risk behaviors. This subgroup does not split again. Participants who were 47.16 or younger were again split based on their age, with 25.68 years old as the cut point. For those who were 25.68 or younger, offenders who scored 27.86 or lower on the Power Orientation subscale of the TCU-CTS had relatively lower risk for HIV/AIDS behaviors than did offenders with higher scores on this scale. For participants older than 25.41 (but younger than 46.79), those who were in stable housing showed relatively lower risk for HIV/AIDS behaviors than did those who were not in stable housing.

The overall mean score for risky HIV/AIDS behavior is 1.39, and the 95 confidence interval (CI) around the mean is 1.33 – 1.45. Within each terminal node, we classified the overall score as *high risk* if it exceeded the upper limit of the 95 CI, as *moderate risk* if it fell within the CI, and as *low risk* if it was less than the lower limit of 95 CI. Through these classifications, we can derive a decision tree tool to identify offenders most in need of intervention. An example, based on the C&RT results for overall risk behavior, is presented in Figure 4.

Discussion

This analysis reveals the potential value of applying partitioning methods to the study of HIV risk behavior. While previous studies have identified particular characteristics that are associated with risk behavior overall, this method shows that some characteristics, such as unemployment, housing instability, and age, have a differential effect depending on subpopulation. For risky needle behavior, the primary variable connected with high risk behavior is White race. For both risky sexual behavior and overall HIV risk behavior, high risk was especially associated with the Risk-Taking subscale of the CEST assessment.

Indeed, two assessments developed by Texas Christian University, the CEST and the CTS, proved to be useful in this study in identifying persons who engage in behaviors that place them at high risk for contracting HIV/AIDS. It is likely that factors such as gender and mental health status that are sometimes associated with high-risk behaviors did not emerge as contributors to the model because they were over-shadowed by the CEST and CTS subscales.

A limitation of this study is that it was not primarily designed to address the question we posed here. The measures selected were intended to capture potentially important factors for later community adjustment. Prisoners who were invited to participate were not representative of the full prison population; they were offenders about to be released, who had participated in drug treatment while incarcerated.

Despite these limitations, it is clear that routine administration of the CEST and the CTS could help to determine which offenders are in greatest need of interventions to reduce HIV risk behaviors. Also, future research may benefit from wider use of recursive partitioning to understand subpopulations at risk.

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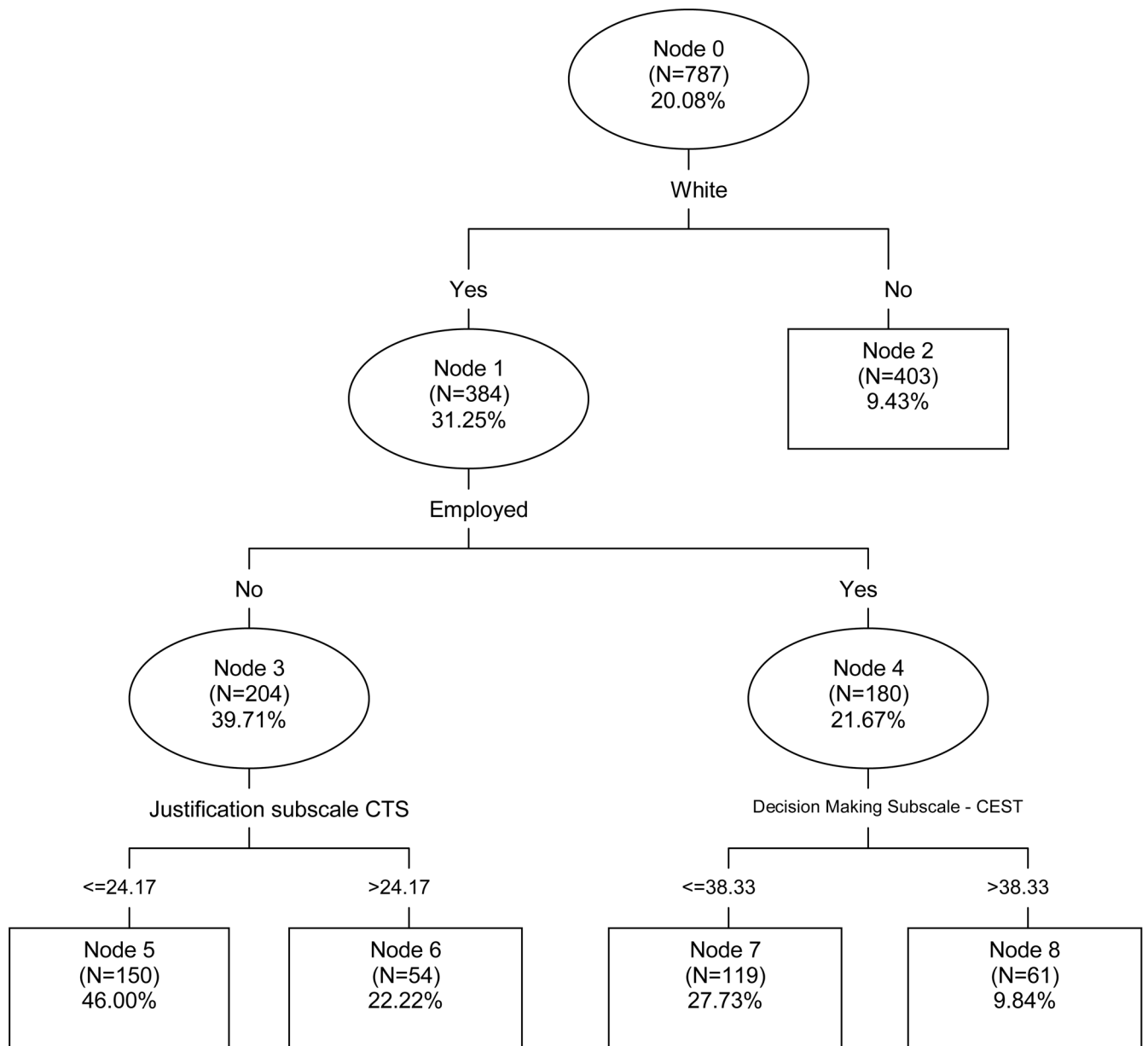


Figure 1.
Classification tree for risky needle behaviors among participants

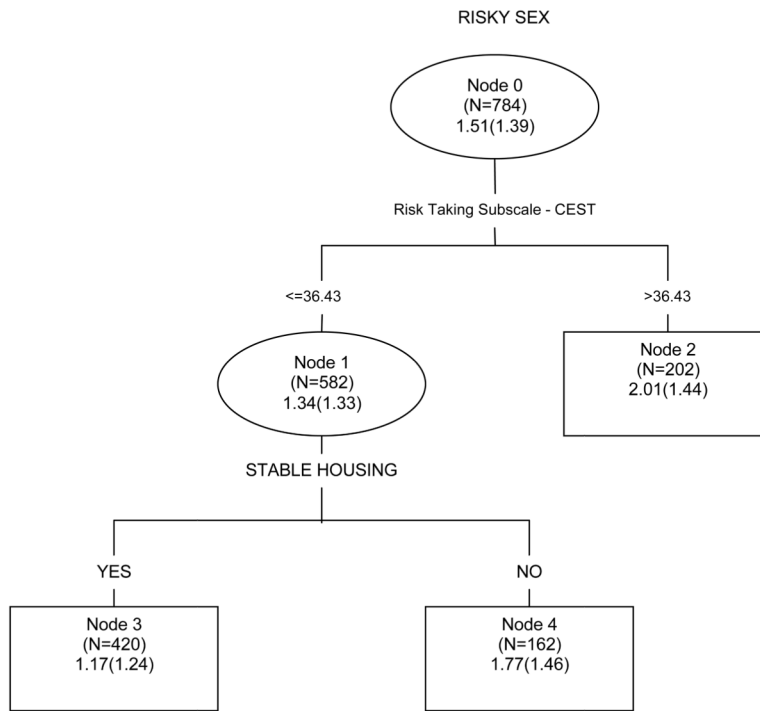


Figure 2. Classification tree for risky sexual behaviors among participants

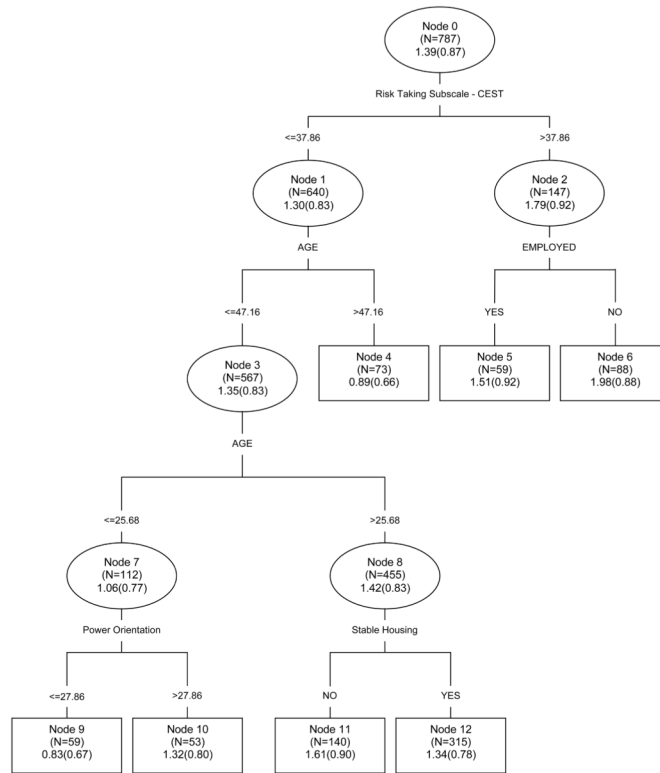


Figure 3.
Classification tree for risky HIV/AIDS behaviors among participants

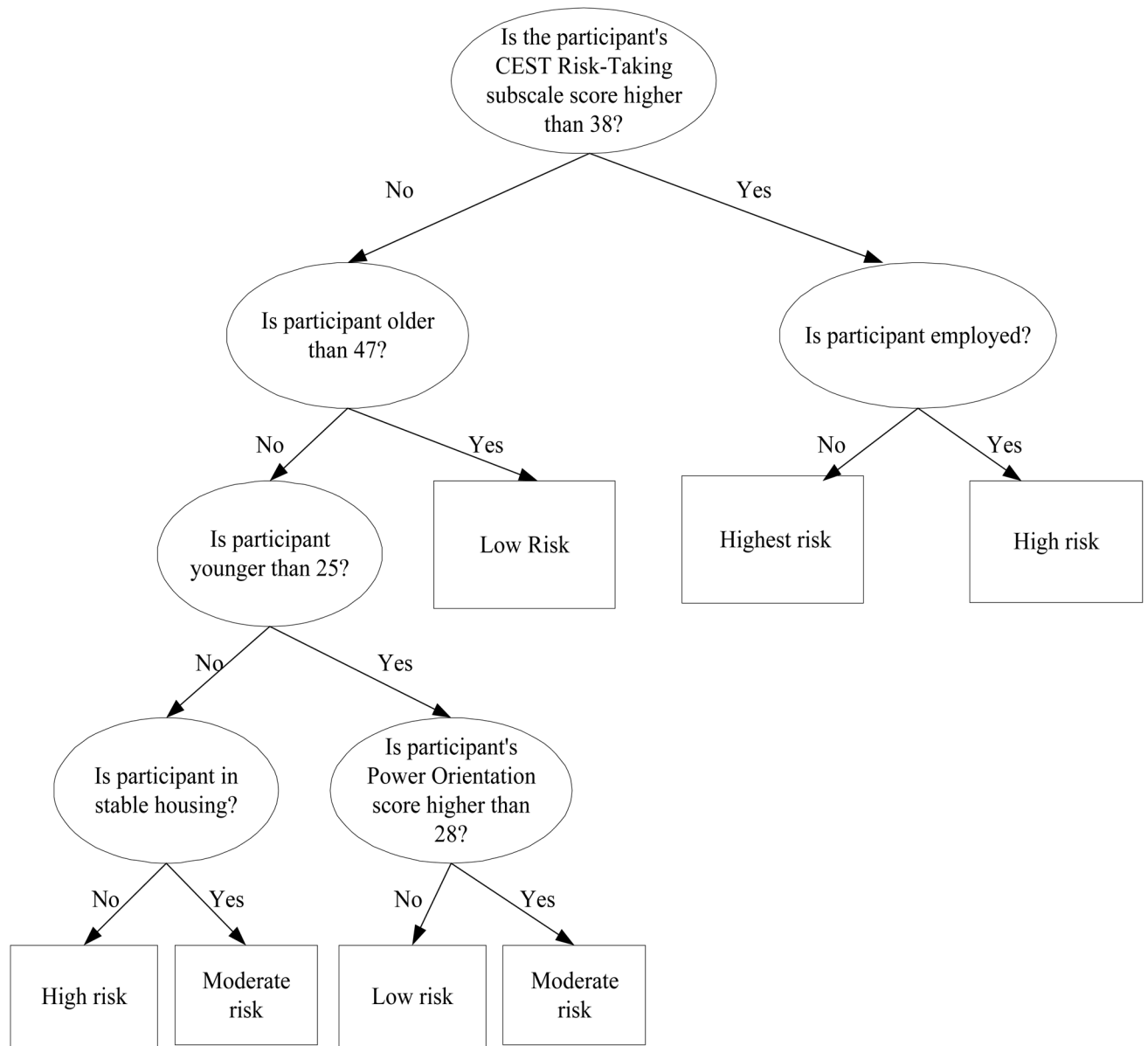


Figure 4.
Likelihood of Engaging in HIV Risk Behaviors

Table 1

Demographic and intake variables

Variables	M or N	SD or %
Race		
White, non-Hispanic	384	48.8%
Black, non-Hispanic	242	30.7%
Hispanic	123	15.6%
Other	38	4.8%
Male	598	76.0%
Age		
Median	33.38	
Range	18–66.59	
Education		
Years of education	10.86	1.97
Median	11	
Range	4–19	
HS graduation or GED	345	43.8%
Employed (part/full time)	380	48.3%
Married	133	16.9%
Stable Housing (PES>=60)	544	69.1%
Any social support	696	88.4%
% life with CJ involvement (since 1 st arrest)	0.47	0.17
TCU drug screen	6.88	3.59
CEST		
Problem Recognition	37.02	9.38
Desire for Help	41.16	7.18
Treatment Readiness	39.71	7.70
Self-Esteem	35.77	7.44
Depression	23.00	6.25
Anxiety	26.49	7.57
Decision Making	36.24	5.35
Self Efficacy Subscale	38.23	5.61
Childhood Problems	31.17	8.07
Hostility Subscale	24.45	7.66
Risk-Taking Subscale	31.67	7.14
Social Consciousness	38.17	4.85
CTS		
Entitlement	19.04	5.49
Justification	21.07	6.51
Power Orientation	25.72	7.42
Cold Heartedness	21.80	5.97
Criminal Rationalization	29.12	7.63

Variables	M or N	SD or %
Personal Irresponsibility	20.37	6.02

Table 2

Descriptive statistics for AIDS-Risk Assessment items

	Mean	SD	% any	Min	Max	N
Past 6 months (Before current incarceration)						
# Times Injected Drugs Past 6 Mos (rating scale 0 to 8)	1.31	2.59	23.4	0	8	787
# Times Used Dirty Needles Past 6 Mos (rating scale 0 to 8)	.18	.91	5.8	0	8	787
# Times Shared Cooker/Cotton/Rinse Water Past 6 Mos (rating scale 0 to 8)	.32	1.26	8.9	0	8	786
# People Shared Works With Past 6 Months	.25	1.51	8.5	0	30	787
# People Had Sex With Past 6 Months	5.36	13.02	62.0.*	0	200	783
# Times Had Sex w/out Condom w/Casual Partner Past 6 Months	.96	1.34	44.3	0	4	786
# Times Had Sex w/out Condom w/Injection Drug User Past 6 Months	.41	1.03	17.8	0	4	785
# Times Had Sex w/out Condom While Trading Sex for Drugs/Money Past 6 Months	.21	.70	10.6	0	4	785
Past 30 days (Before current incarceration)						
# Times Injected Drugs Past 30 Days	12.40	40.42	20.1	0	450	786
# Times Used Dirty Needles Past 30 Days	1.24	12.57	4.3	0	300	787
# Times Shared Cooker/Cotton/Rinse Water Past 30 Days	3.53	25.47	6.6	0	400	787
# Times Injected w/Others Past 30 Days	7.93	32.57	16.0	0	450	786
# People Shared Works With Past 30 Days	.38	4.91	6.1	0	120	787
# Times Gave Dirty Needles to Others Past 30 Days	.97	11.67	5.1	0	300	787
# People Had Sex With Past 30 Days	2.35	5.36	37.4*	0	100	787
# Male Partners Past 30 Days	.71	4.84	20.2	0	100	781
# Female Partners Past 30 Days	1.64	2.66	69.6	0	25	786
# Times Had Sex Past 30 Days	33.33	43.95	87.4	0	405	784
# Times had Sex w/out Condom Past 30 Days	28.21	38.91	77.6	0	335	784
# Times Had Sex w/out Condom w/Casual Partner Past 30 Days	6.57	20.38	31.6	0	240	784
# Times Had Sex w/out Condom w/Injection Drug User Past 30 Days	3.64	15.04	13.9	0	170	784
# Times Had Sex w/out Condom w/Someone Who Smokes Crack/Cocaine Past 30 Days	9.22	26.28	33.4	0	330	784
# Times Had Sex w/out Condom While High Past 30 Days	18.27	32.84	63.8	0	330	784
# Times Had Sex w/out Condom While Trading Sex for Drugs/Money Past 30 Days	1.58	9.52	8.4	0	152	784
# Times Had Sex w/out Condom During Vaginal Sex Past 30 Days	17.79	24.71	75.0	0	330	784
# Times Had Sex w/out Condom During Oral Sex Past 30 Days	13.13	26.81	61.4	0	405	784

	Mean	SD	% any	Min	Max	N
# Times Had Sex w/out Condom During Anal Sex Past 30 Days	2.10	14.22	15.1	0	330	783
# Acquaintances Have HIV/AIDS	3.54	14.69	56.0	0	200	787
# People w/HIV Shared Needles or Works With	.08	1.14	2.3	0	30	786
# People w/HIV Had Unprotected Sex With	.05	.32	2.9	0	5	786
Summary scores						
HIV/AIDS risk (4 items) ^a	1.39	.87	86.0	0	4	787
Risky needle behavior (3 items) ^b	.33	.76	20.1	0	3	787
Risky sexual behavior (5 items) ^c	1.51	1.39	67.7	0	5	784

* % for more than one sexual partner

^a**HIV/AIDS risk:** any IDU (AIDSR5), any dirty works (AIDSR6), multiple partners (AIDSR15), sex w/o condoms (AIDSR19).

^b**Risky needle behavior:** risky needle use: IDU (AIDSR5), shared dirty needles (AIDSR9), shares cooker, cotton, water (AIDSR7).

^c**Risky sexual behaviors:** while high (AIDSR23), W/IDU (AIDSR21), W/Stranger (AIDSR20), W/cocuser (AIDSR22), sex trade (AIDSR24).