

# Ethnic Differences in Delays to Treatment for Substance Use Disorders: African Americans, Black Caribbeans and Non-Hispanic Whites

Brian E. Perron, Ph.D.\*; Ben Alexander-Eitzman, Ph.D.\*\*; Daphne Watkins, Ph.D.\*\*\*;  
Robert Joseph Taylor, Ph.D.\*\*\*\*; Ray Baser, M.S.\*\*\*\*\*;  
Harold W. Neighbors, Ph.D.\*\*\*\*\* & James S. Jackson, Ph.D.\*\*\*\*\*

**Abstract**—Prior research has shown that minority groups experience greater levels of disability associated with psychiatric and substance use conditions due to barriers to treatment. Treatment delays are an important part of the overall problem of service utilization and access to treatment, yet little work has been done to understand the factors associated with treatment delays among ethnic minorities. This study compares African Americans, Caribbean Blacks and non-Hispanic Whites regarding their probability of making treatment contacts over time, using a combined sample of African Americans and Caribbean Blacks from the National Survey of American Life (NSAL) and non-Hispanic Whites from the National Comorbidity Survey-Replication (NCS-R). Alcohol and other drug use disorders (abuse and dependence) were assessed using the World Mental Health Composite International Diagnostic Interview. Cumulative lifetime probability curves were used to examine race differences in treatment contact. Cox regression analysis was used to test the association between race and treatment groups while controlling for other potential confounding variables. Significant delays in making treatment contact were observed across all disorders. However, no evidence of delays was found for racial differences. In the multivariate analysis, race was not significantly associated with delays. However, comorbid anxiety disorders were found to be a consistent factor associated with a faster time to treatment.

**Keywords**—ethnic differences, racial differences, substance abuse treatment, survival analysis, treatment delays

Substance use disorders (SUDs) are among the most common and debilitating mental disorders. SUDs are associated with poor physical health, accidental injury, homelessness, unemployment, and criminal activity (Robins

\*Assistant Professor, University of Michigan, School of Social Work, Ann Arbor, MI.

\*\*Assistant Professor, Appalachian State University, Department of Social Work, Boone, NC.

\*\*\*Assistant Professor, University of Michigan, School of Social Work, Ann Arbor, MI.

\*\*\*\*Professor, University of Michigan, School of Social Work; Program for Research on Black Americans, Ann Arbor, MI.

\*\*\*\*\*Data Analyst, University of Michigan, Program for Research on Black Americans, Ann Arbor, MI.

& Regier 1991). While treatment for SUDs is effective, only a small proportion of people with SUDs seek or receive treatment (Andrews & Henderson 2000). National epidemiological and health services research show that, while

\*\*\*\*\*Professor, University of Michigan, Program for Research on Black Americans; School of Public Health, Ann Arbor, MI.

\*\*\*\*\*Director, University of Michigan, Institute for Social Research, Ann Arbor, MI.

Please address correspondence and reprint requests to Brian E. Perron, University of Michigan, School of Social Work, 1080 S. University Avenue, Ann Arbor, MI 48109; phone 734 763-9272; email: beperron@umich.edu

African Americans have similar rates of SUDs compared to Whites (Wells et al. 2001), they are less likely to use treatment services (Wang et al. 2004; Alegria et al. 2002; Wang, Demler & Kessler 2002; Sue, Zane & Young 1991), and the disorders may persist over longer periods of time (Breslau et al. 2005).

In addition to the numerous consequences of SUDs on individuals and families (Wolf-Branigin 2007), SUDs result in significant financial costs to the public system of care (Mark et al. 2000). This is particularly true for ethnic minorities. For example, African Americans account for approximately 25% of the total drug-related emergency room visits, even though they represent only 12% of the US population (SAMHSA 2002). Emergency care is among the most expensive and least effective way of addressing the long-term care needs of persons with SUDs (Alexandre et al. 2006).

The President's New Freedom Commission described in detail the racial, cultural, and ethnic problems associated with service access, concluding that a higher burden of disability among minorities remains because of treatment barriers (New Freedom Commission on Mental Health 2003). Even for those who do engage in treatment, there are often long delays between the onset of SUD and contact with a treatment provider (Wang et al. 2004; Kessler et al. 2001). These delays are an important part of the overall problem of service utilization and access to treatment, yet little work has been done to understand the factors associated with treatment delays among ethnic minorities.

### ETHNIC DIFFERENCES

A growing body of work on ethnic disparities in services utilization can be found in the broader health services research. However, important challenges remain with respect to defining ethnic groups. For example, it is common to study African Americans as a homogenous group (Breslau et al. 2005; Kessler & Merikangas 2004; Kessler & Ustun 2004; Merline et al. 2004; Ma & Shive 2000). However, recent research has suggested that Caribbean Blacks have important differences compared to US-born African Americans (Broman et al. 2008). For example, Broman and colleagues (2008) found that older, divorced African Americans had higher rates of substance abuse and dependence compared to their Caribbean Black counterparts.

In past years, assuming that African Americans represented a homogenous group was defensible. However, with the growing population of Caribbean Blacks in the United States (Logan & Deane 2003), aggregating all Blacks into a single category may mask important differences in their reasons for delays to treatment for substance abuse disorders. Acknowledging the role of cultural differences is an important factor in the study of the ethnically diverse U.S.

Black population, particularly for structuring services and systems of care (New Freedom Commission on Mental Health 2003; USDHHS 2001).

### TREATMENT DELAY

The time between onset of symptoms of a psychiatric condition and initial treatment contact is a critical component in understanding the patterns of service utilization and access. Developing a better understanding of what factors are associated with the receipt of service—in particular, *when* services are received—can be particularly useful for identifying key leverage points for increasing access and utilization. This information can then be used to develop targeted interventions based on cultural or demographic differences, such as screening programs, that could potentially reduce time to treatment contact for these at risk groups.

Previous research on treatment delays based on the National Comorbidity Study (NCS) and the NCS-Replication (NCS-R) have shown longer delays to treatment to be associated with more severe substance use symptoms, type of substance (cocaine or heroin), and age of onset. Although race was not associated with treatment delays, these studies did not have the required sample size to provide an in-depth analysis on race/ethnic differences. This is an important consideration, particularly with subgroups such as Caribbean Blacks, which have been shown to have unique presentations of psychiatric disorders. For example, Williams and colleagues (2007) report that chronicity of major depressive disorder was higher for African Americans and Caribbean Blacks compared to non-Hispanic Whites. Moreover, fewer than half of African Americans and Caribbean Blacks who met criteria received any form of therapy. This underscores the importance of looking specifically across a range of disorders to understand possible differences in when and how services are accessed, especially for the most severe and disabling conditions such as substance use disorders.

### PURPOSE OF CURRENT STUDY

In response to multiple federal initiatives that have made the reduction of race and ethnic disparities in access and utilization of treatment services a priority (New Freedom Commission on Mental Health 2003; U.S. Department of Health and Human Services 2001, 2000; IOM 2001), this study systematically compares delays in treatment among African Americans, Caribbean Blacks, and non-Hispanic Whites. Specifically, using nationally representative data, it compares rates of treatment contact within one year following the onset of a substance use disorder, examines the probability of making treatment contact over time, and tests whether race/ethnicity is associated with timing of treatment after controlling for other sociodemographic factors.

## METHODS

## Study Population and Data Collection

The National Survey of American Life (NSAL) and the National Comorbidity Survey Replication (NCS-R) are both part of the National Institute of Mental Health (NIMH) Collaborative Psychiatric Epidemiology Surveys (CPES; Pennell, Bowers & Carr 2004). The objective of the CPES initiative was to assess the prevalence, associated severity and functional impairments, risk factors, and treatment of mental disorders and symptoms, as well as to investigate how mental disorders are connected to social and cultural issues, using similar sampling, data collection, and survey methodologies in large, nationally representative samples of the adult U.S. population (Pennell, Bowers & Carr 2004). All NIMH-CPES data collections were based on a multistage area probability sample and used sampling frames, sample selection procedures, and professional interviewers from the Institute for Social Research at University of Michigan (Heeringa et al. 2004).

The present study examines subgroups from the NCS-R and the NSAL together. Both the NSAL and the NCS-R are nationally representative household surveys of English-speaking, non-institutionalized adults aged 18 and over. Data collection for both surveys began in early 2001 and ended in the spring of 2003. As detailed elsewhere (Kessler & Merikangas 2004), the NCS-R was administered in two parts: Part I included 9,282 respondents and assessed core psychiatric diagnoses, and Part II included 5,692 of the Part I respondents and assessed additional disorders, demographics, and risk factors. The overall NCS-R response rate was 70.9%. The NCS-R sample was selected to have race/ethnicity proportions similar to those of the overall U.S. population. Also described in detail elsewhere (Jackson et al. 2004), the total NSAL sample included 3,570 African Americans, 1,621 Blacks of Caribbean descent (Caribbean Blacks), and 891 non-Hispanic Whites. Most ( $n = 1,357$ ) of the Caribbean Black respondents were selected as part of a Caribbean supplement to the NSAL core sample design in order to attain the target sample size of 1,600 Caribbean Black respondents. The response rate was 71.5% for the NSAL core sample and 76.4% for the Caribbean Black sample.

Data from both surveys were weighted to adjust for disproportionate sampling probabilities, for nonresponse, and for remaining sociodemographic differences between the samples and the 2000 U.S. Census population (Heeringa et al. 2004; Little & Rubin 2002; Kish 1949). An additional weight for the Part II NCS-R respondents adjusts for the oversampling of Part I respondents. The present study examines only the African American and Caribbean Black subsamples from the NSAL, and only the subsample of 6,696 non-Hispanic White respondents from the NCS-R. Unlike the NCS-R White respondents, the NSAL White respondents

did not receive the diagnostic sections of the survey and are therefore excluded from the present study.

## Measures

**Demographics.** In this study, "African American" refers only to Black adults who self-identified as Black but did not identify ancestral ties to the Caribbean, while "Caribbean Black" refers only to Black adults who self-identified as Black and additionally indicated either that they were from a country included on a list of Caribbean countries presented to them by the interviewer or that at least one of their parents or grandparents were from one of the Caribbean countries.

**Psychiatric Diagnosis Assessment.** The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV; APA 2000) criteria version of the World Mental Health Composite International Diagnostic Interview (WMH-CIDI; Kessler & Üstun 2004), a fully structured diagnostic interview, was used to assess a wide range of serious mental disorders and conditions. This instrument generates both 12-month and lifetime diagnoses of the DSM-IV disorders. For a given disorder, lifetime diagnoses were given if respondents had a history of ever meeting criteria for the disorder, and 12-month diagnoses were given if respondents met criteria for the disorder within the 12-months prior to their interview. The present study examines respondents diagnosed with a substance use disorder, including drug abuse, drug dependence, alcohol abuse, and alcohol dependence. The age of onset of each disorder was determined using a series of questions designed to enhance respondent recall. If respondents could not remember their exact age when they first had the syndrome, follow-up questions attempted to elicit a plausible estimate of their age of onset. The full set of questions are publicly available (Institute for Social Research 2001).

**Treatment Contact.** Each diagnostic section asked whether respondents had ever talked to a medical doctor or other professional (i.e., psychiatrist, psychologist, counselor, spiritual advisor, herbalist, acupuncturist, or other healing professional) about the symptoms associated with the disorder under assessment. Respondents answering affirmatively were then asked how old they were the first time they talked to the professional about their problems related to the substance use disorder. This question was used to determine age at initial treatment contact. In addition, this question in conjunction with the substance use disorders age at onset questions was used to define delay in making initial treatment contact after disorder onset, the main outcome of the present investigation.

**Predictors.** We investigated sociodemographic factors to ascertain groups potentially at elevated risk of delaying or failing to make treatment contact. Predictor variables included race/ethnicity (non-Hispanic White, African American, and Caribbean Black), sex, age cohort (categorized as age at interview of 18 to 29, 30 to 44, 45 to 59, and 60 or

**TABLE 1**  
**Summary of Subjects with Lifetime Substance Use Disorders by Ethnicity**

Disorder	Overall N = 9,187 % (SE)	Racial Comparison			$\chi^2_2$ (p-value)
		NSAL African American N = 3,426 % (SE)	NSAL Caribbean Black N = 1,581 % (SE)	NCS-R White N = 4,180 % (SE)	
Alcohol Abuse	7.0 (.31)	6.0 (.41)	5.8 (1.8)	7.8 (.45)	7.9 (.019)
Alcohol Dependence	4.8 (.26)	3.7 (.41)	3.4 (1.1)	5.6 (.34)	13.4 (.001)
Drug Abuse	4.4 (.24)	3.8 (.35)	3.0 (1.2)	4.9 (.33)	5.7 (.059)
Drug Dependence	2.8 (.21)	2.5 (.39)	2.8 (1.08)	3.0 (.24)	1.1 (.58)

**TABLE 2**  
**Summary of Treatment Contacts within First Year After Onset of Disorder**

Disorder	Overall % (SE)	Racial Comparison			$\chi^2_2$ (p-value)
		NSAL African American N = 57 % (SE)	NSAL Caribbean Black N = 23 % (SE)	NCS-R White N = 122 % (SE)	
Alcohol Abuse	N = 202 26.8 (2.8)	N = 57 29.3 (3.4)	N = 23 13.4 (5.9)	N = 122 26.3 (4.1)	2.0 (.361)
Alcohol Dependence	N = 278 18.5 (2.4)	N = 22 29.7 (3.4)	N = 10 29.8 (26.2)	N = 25 12.2 (3.0)	6.8 (.034)
Drug Abuse	N = 162 26.8 (3.9)	N = 44 28.2 (4.9)	N = 12 27.5 (21.7)	N = 106 26.2 (5.5)	0.1 (.958)
Drug Dependence	N = 193 24.6 (3.7)	N = 57 38.1 (5.5)	N = 19 41.7 (38.1)	N = 117 14.5 (3.8)	5.8 (.054)

more years), age at onset of the given disorder (0 to 12, 13 to 19, 20 to 29, and 30 years or older), region of residence (Northeast, North Central, South, and West census regions), education (0 to 11, 12, 13 to 15, or 16 or more years), marital status (never married, currently married, or previously married), and the presence or onset of a comorbid DSM-IV mood disorder (major depressive disorder, dysthymia, or a bipolar disorder) or anxiety disorder (generalized anxiety disorder, social anxiety disorder, post traumatic stress disorder, panic disorder, or agoraphobia without history of panic disorder).

**Statistical Analysis**

All analyses were weighted with a combined version of the NCS-R and NSAL weights in order to derive estimates nationally representative of the populations and subgroups of interest. Procedures were employed in all of the analyses to properly adjust standard errors, confidence intervals, and significance tests for the complex sample designs of the NSAL and NCS-R.

Cross-tabulations were conducted using the PROC SURVEYFREQ procedure of the SAS Version 9.1.3 software package (SAS Institute 2005) to calculate the proportions of respondents with substance use disorders, stratified by

race/ethnicity and by sociodemographic variables, who had made treatment contact by their ages at interview. This SAS procedure uses the Taylor-series linearization technique for calculating the complex-design based estimates of variance and standard error. The  $\chi^2$  and corresponding p-values from these cross-tabulations are based on the Rao-Scott chi-square test, a complex design-adjusted version of the Pearson chi-square test (SAS Institute 2005).

Survival analysis methods were used both to derive the cumulative probability of making treatment contact after substance use disorder onset and to assess potential sociodemographic predictors associated with delay and failure to make treatment contact. Respondents who had not made treatment contact by the time of the interview were treated as right-censored observations. Survival curves were used to characterize the treatment histories of respondents after onset of substance use disorder and to estimate the probabilities of making treatment contact by a given time after onset of substance use disorder. Specifically, cumulative probabilities of treatment contact after substance use disorder onset were estimated for each disorder and for each of the three race/ethnicities from the corresponding Kaplan-Meier survival curves (Hosmer & Lemeshow 2000) by subtracting the values of each point on the curves from

1.00. Log-rank  $\chi^2$  statistics were used to test for statistically significant differences in the patterns of treatment contact after disorder onset across the three race/ethnic groups. Cox proportional hazards (PH) regression was used to assess the associations of the sociodemographic factors with initial treatment contact after disorder onset. The standard Cox PH model assumes that all covariates are constant over time. However, some variables change over time, which may affect the outcome being modeled. Such covariates should be modeled as *time-varying* covariates, which account for the temporal effects of the covariate on the outcome (Tian, Zucker & Wei 2005). In this study, marital status, education, and the presence of psychiatric conditions (i.e., mood and anxiety disorders) were specified as time-varying covariates. All survival analyses were conducted in R, an open-source statistical programming language and environment (R Development Core Team 2008), using the "surv" package to adjust standard errors and significance tests for the effects of the weighting, stratification, and clustering of the surveys' sample designs. Analyses conducted in R used the Taylor-series linearization technique for calculating the complex-design based estimates of variance and standard error. The coefficients of the Cox proportional hazards models and their 95% confidence intervals were exponentiated and are reported as risk ratios (RRs) for ease of interpretation. Categorical factors in the Cox proportional hazards models

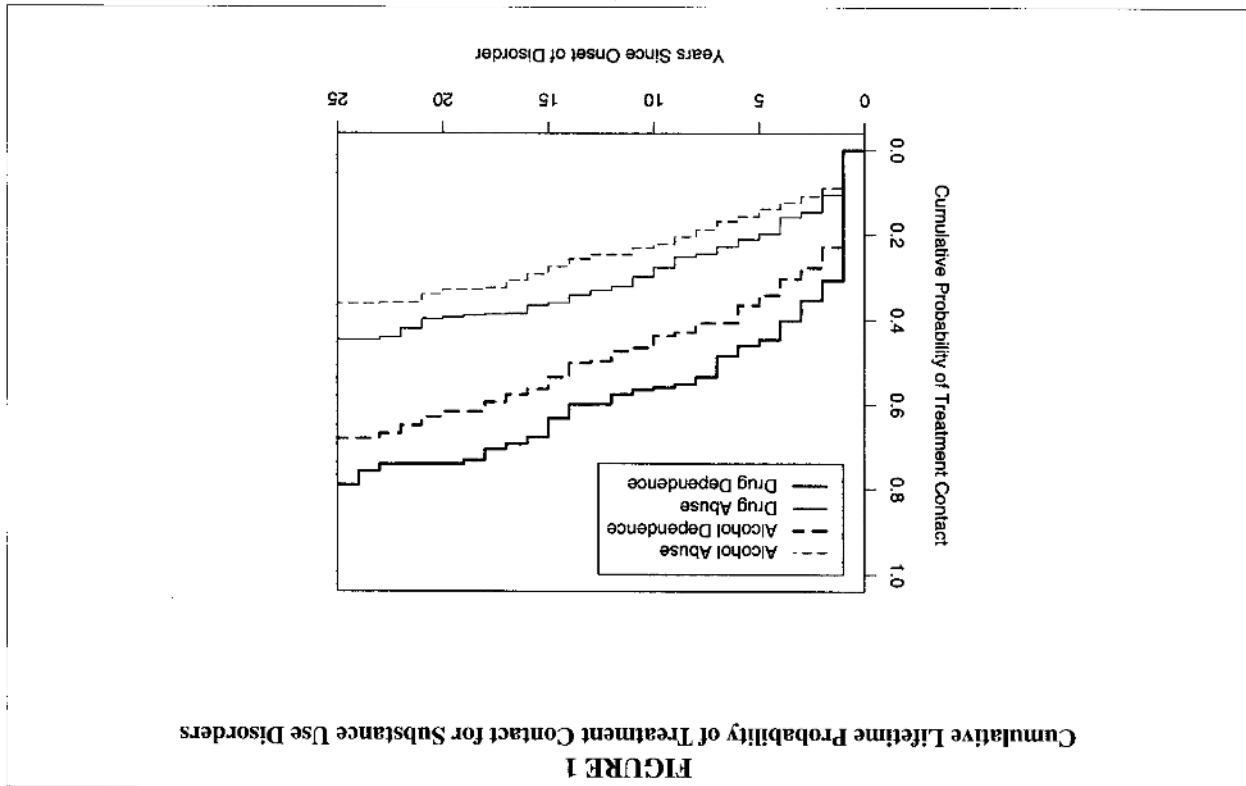
Figure 1 displays the cumulative lifetime probability of treatment contact following onset of substance use disorders for the overall sample. This figure shows that persons with drug dependence disorders have the fastest time to treatment

Table 1 summarizes the proportion of substance use disorders across the different racial groups. Overall, Whites had slightly higher rates of alcohol dependence (5.6%) compared to African Americans and Caribbean Blacks (3.7% and 3.4%, respectively). There was a similar pattern for alcohol abuse diagnoses as well. While Whites exhibited slightly higher rates of drug abuse (4.9%) compared to African Americans (3.8%) and Caribbean Blacks (3.0%), these differences were not statistically significant. No differences in rates of drug dependence were observed across the three groups. Table 2 summarizes treatment contacts within the first year after onset of disorder. Few differences were observed, and the large standard errors and small cell sizes suggest these differences have no practical significance.

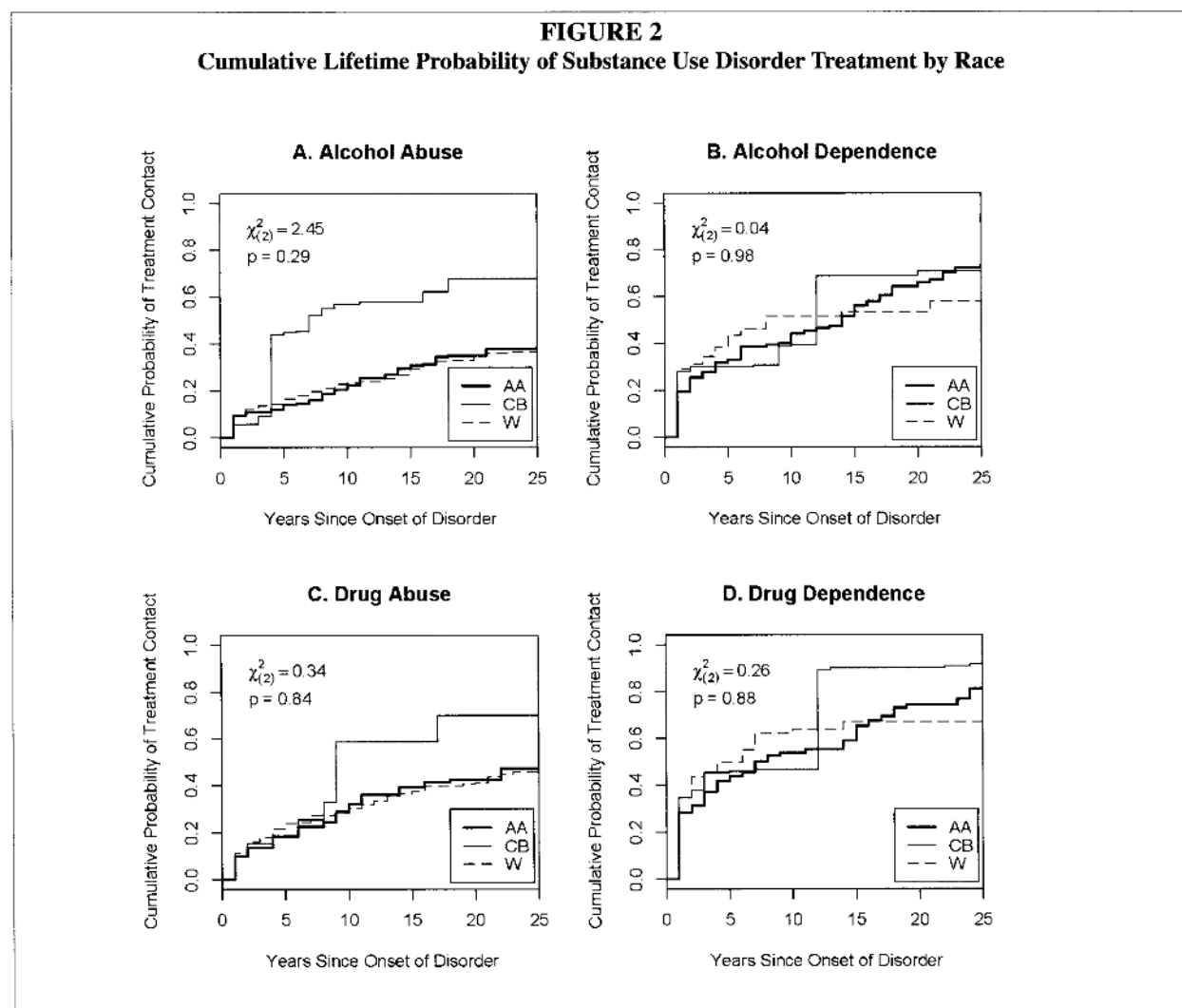
**Summary of Substance Use Disorders**

**RESULTS**

Table 1 summarizes the proportion of substance use disorders across the different racial groups. Overall, Whites had slightly higher rates of alcohol dependence (5.6%) compared to African Americans and Caribbean Blacks (3.7% and 3.4%, respectively). There was a similar pattern for alcohol abuse diagnoses as well. While Whites exhibited slightly higher rates of drug abuse (4.9%) compared to African Americans (3.8%) and Caribbean Blacks (3.0%), these differences were not statistically significant. No differences in rates of drug dependence were observed across the three groups. Table 2 summarizes treatment contacts within the first year after onset of disorder. Few differences were observed, and the large standard errors and small cell sizes suggest these differences have no practical significance.



**FIGURE 1**  
Cumulative Lifetime Probability of Treatment Contact for Substance Use Disorders



contacts among all the substance use disorders. Figures 2A-D provides the cumulative lifetime probabilities of making treatment contact for each disorder separated by race. This set of figures suggests some variation across racial groups. However, the wide confidence intervals (not shown) indicate significant variability in these estimates, especially for delays exceeding 25 years.

#### Cox PH Regression Analyses

**Main effects.** A series of Cox PH regression models were specified to identify psychosocial and demographic characteristics associated with delays in receipt of substance use disorder treatment for each substance use disorder. Table 3 summarizes overall model fit statistic and rate ratios (RRs) with 95% confidence intervals (CI) for each variable. RRs greater than 1.0 indicate a faster time to making treatment contact (relative to the reference group). RRs less than 1.0 indicate a slower time to making contact (relative to the

reference group). RRs with a 95% CI that bound 1.0 are considered nonsignificant.

Contrary to the central hypothesis of the study, race was not significantly associated with delays in treatment for any of the substance use disorders. For alcohol abuse, the younger cohorts had a treatment time that was 2.5 times to 5.6 times faster than the oldest cohort (60+ years). The 45- to 59-year-old cohort had a fast treatment contact time for alcohol dependence (RR = 2.0, 95% CI = 1.7 - 5.8), but a slower contact time for drug dependence (RR = .2, 95% CI = .1 - .7), relative to the oldest cohort (60+ years). Subjects who were students or had 12 years of education had longer delays for alcohol dependence compared to subjects with the highest levels of education (16+ years). Education was not associated with delays for other substance use diagnoses. Other demographic variables (i.e., gender, marital status, and region) were not associated with treatment delays.

Regarding psychiatric conditions, mood disorders did not have any influence on delays in treatment. However, persons with anxiety disorders made treatment contacts as fast as persons without anxiety disorders for alcohol dependence (RR = 1.9, 95% CI = 1.1 - 3.3), drug abuse (RR = 2.0, 95% CI = 1.2 - 3.4), and drug dependence (RR = 2.1, 95% CI = 1.2 - 3.7). Subsequent analyses were conducted to identify which anxiety disorders were associated with treatment delays. As indicated in Table 4, PTSD was associated with a faster treatment contact time for each substance use disorder except drug dependence. Social anxiety disorder exhibited problems with convergence.

**Sensitivity analyses.** A series of exploratory analyses were conducted to check the stability of the results and possibility of model misspecification. This involved including insurance status, psychiatric severity, poverty, and psychosis. None of these variables were significantly associated with treatment delays when added to the baseline models. When all of these variables were included simultaneously, models exhibited problems with convergence.

was associated with a faster treatment contact time for alcohol dependence and drug dependence. The other anxiety disorders exhibited no significant effect.

Overall model fit:  $\chi^2_{20} = 43.5, p = .002$ ;  $\chi^2_{20} = 43.5, p < .001$ ;  $\chi^2_{20} = 43.3, p = .002$ ;  $\chi^2_{20} = 366, p < .001$ .

Note: Risk ratios (RR) in bold are statistically significant based on a 95% Confidence Interval (CI) that does not include the value 1.0. Mood disorder and anxiety disorder are time-varying covariates.

**TABLE 3**  
Variables Associated With Delays in Receipt of Treatment for Substance Use Disorders  
Based on Cox Proportional Hazards Regression

	Alcohol Abuse <sup>a</sup> RR (95% CI)	Alcohol Dependence <sup>b</sup> RR (95% CI)	Drug Abuse <sup>c</sup> RR (95% CI)	Drug Dependence <sup>d</sup> RR (95% CI)
Race	1.0	1.0	1.0	1.0
African American	1.5 (0.6, 4.0)	1.1 (0.3, 3.9)	1.2 (0.3, 5.5)	1.5 (0.4, 5.8)
Caribbean Black	0.7 (0.4, 1.3)	0.8 (0.5, 1.5)	1.0 (0.6, 1.8)	1.2 (0.5, 3.2)
NCS-R White				
Cohort				
18-29	5.6 (1.7, 19.1)	3.7 (0.9, 15.2)	4.8 (0.5, 43.6)	0.8 (0.2, 2.8)
30-44	3.1 (1.1, 8.3)	3.6 (0.9, 14.3)	2.2 (0.3, 17.9)	0.5 (0.2, 1.4)
45-59	2.5 (1.0, 6.2)	2.0 (1.7, 5.8)	1.8 (0.2, 14.3)	0.2 (0.1, 0.7)
60+	1.0	1.0	1.0	1.0
Age of Onset				
0-12	0.4 (0.1, 1.9)	0.1 (0.0, 1.4)	3.2 (0.8, 12.7)	0.1 (0.0, 0.5)
13-19	0.3 (0.1, 0.5)	0.4 (0.1, 1.6)	0.6 (0.3, 1.2)	0.1 (0.1, 0.4)
20-29	0.4 (0.2, 0.8)	0.4 (0.2, 1.1)	0.6 (0.3, 1.3)	0.3 (0.1, 0.7)
30+	1.0	1.0	1.0	1.0
Gender				
Male	1.0	1.0	1.0	1.0
Female	1.0 (0.7, 1.5)	0.7 (0.4, 1.2)	0.9 (0.6, 1.5)	1.2 (0.6, 2.5)
Education				
Student	1.4 (0.5, 3.4)	0.2 (0.1, 0.5)	0.7 (0.3, 1.7)	0.8 (0.1, 6.5)
0-11 Years	0.8 (0.1, 1.9)	0.5 (0.2, 1.3)	0.8 (0.3, 2.1)	1.2 (0.2, 6.2)
12 Years	1.1 (0.5, 2.4)	0.3 (0.1, 0.8)	0.8 (0.4, 1.7)	0.6 (0.1, 3.3)
13-15 Years	1.1 (0.5, 2.2)	0.5 (0.2, 1.4)	1.2 (0.5, 2.9)	2.0 (0.4, 9.1)
16+ Years	1.0	1.0	1.0	1.0
Marital Status				
Married	0.7 (0.4, 1.4)	0.7 (0.3, 1.6)	0.6 (0.3, 1.2)	0.6 (0.3, 1.3)
Previously Married	1.1 (0.5, 2.3)	1.3 (0.5, 3.5)	0.9 (0.4, 2.1)	1.0 (0.6, 1.6)
Never Married	1.0	1.0	1.0	1.0
Region				
Northeast	1.0	1.0	1.0	1.0
North Central	1.0 (0.5, 1.8)	1.0 (0.4, 2.3)	0.8 (0.4, 1.7)	1.3 (0.4, 4.8)
South	0.9 (0.5, 1.6)	0.9 (0.5, 1.8)	1.1 (0.5, 2.1)	0.9 (0.3, 3.0)
West	1.7 (0.9, 3.3)	0.9 (0.3, 2.3)	1.0 (0.4, 2.5)	2.1 (0.6, 7.9)
Mood Disorder	1.0 (0.6, 1.6)	1.1 (0.7, 1.6)	0.7 (0.4, 1.3)	1.1 (0.5, 2.4)
Anxiety Disorder	1.5 (1.0, 2.2)	1.9 (1.1, 3.3)	2.0 (1.2, 3.4)	2.1 (1.2, 3.7)

**TABLE 4**  
**Associations Between Anxiety Disorders and Delays in Substance Use Disorder Treatment**  
**Based on Cox Proportional Hazards Regression**

	<b>Alcohol Abuse</b> <b>RR (95% CI)</b>	<b>Alcohol Dependence</b> <b>RR (95% CI)</b>	<b>Drug Abuse</b> <b>RR (95% CI)</b>	<b>Drug Dependence</b> <b>RR (95% CI)</b>
Generalized Anxiety	.7 (1.3, 2.1)	.9 (.5, 1.6)	.8 (.4, 1.9)	.8 (.3, 2.4)
Social Anxiety Disorder	1.4 (.8, 2.2)	<b>1.8 (1.1, 2.9)</b>	1.5 (.7, 3.1)	<b>2.2 (1.2, 4.2)</b>
PTSD	<b>2.0 (1.17, 3.6)</b>	<b>1.7 (1.1, 2.7)</b>	<b>2.8 (1.4, 5.8)</b>	1.8 (1.0, 3.1)
Panic Disorder	1.1 (.5, 2.4)	1.0 (.5, 2.3)	1.5 (.5, 4.0)	.9 (.2, 4.5)
Agoraphobia without History of Panic	1.3 (.3, 6.2)	1.1 (.5, 2.5)	1.3 (.3, 6.0)	.4 (.1, 1.6)

Note: Each model was adjusted for race, cohort, age of onset of substance use disorder, gender, education, marital status, region, and mood disorder (time-varying). Each anxiety disorder was modeled as a time-varying covariate.

## DISCUSSION

The results presented above should be interpreted within the context of several limitations of this study. First, many respondents with substance use disorders who had not made treatment contact by their age at interview will subsequently do so. Thus, lifetime treatment prevalence estimates based on respondent status at age at interview are biased and tend to underestimate the lifetime probability of initiating treatment after disorder onset. This is particularly true with respect to respondents with very recent substance use disorder onset in which little time elapsed between their disorder onset and interview dates. There may also be significant bias associated with recall of onset of SUD symptoms and time of first treatment contact. As in any retrospective survey, the farther back in time the subject is asked to recall events it is possible that the less likely are precise estimates of actual dates and events. It should also be noted that estimates for alcohol and drug dependence may be slightly biased, as the survey design of the CIDI required individuals to meet both abuse and dependence criteria (Cottler 2007; Grant et al. 2007).

Despite these limitations, this study adds important information to a growing body of knowledge regarding treatment delays and access to treatment for adults with substance use disorders. The hypothesis that there would be significant differences in treatment delay between Whites, African Americans, and Caribbean Blacks was not supported. Specifically, no significant race differences were observed in provider contacts within one year following the onset of the disorder or the time to treatment contact over the course of the disorder. Moreover, in the Cox regression analysis, race was not significantly associated with treatment delays after controlling for other potential confounding sociodemographic and clinical variables. By combining data from the NSAL and NCS-R studies, we were able to examine these patterns of service utilization using a nationally representative sample that separately designated Caribbean Blacks from the rest of the American Black population.

These results do not imply that issues of culture, race, and ethnicity are unimportant with respect to treatment utilization for substance use disorders. More specifically, although there were no observed differences in delays to treatment, further research is needed to understand the type and quality of services that are received following treatment contacts. Treatments may not be culturally compatible, which may reduce the clinical utility of the interventions or increase risk of treatment dropout.

An interesting finding in this study that was not central to the study's main research objectives was that comorbid anxiety disorders, but not mood disorders, significantly reduced treatment delays. This provides some contrast to an earlier finding using the NCS-R data alone that individuals with mood disorders had faster times to treatment than those with other disorders, including substance abuse disorders (Wang et al. 2004). Considering the complex relationships between substance use disorders, mood, and anxiety disorders, further work on understanding why certain comorbid conditions are associated with longer or shorter times to treatment is warranted. For example, the finding that a mood disorder diagnosis does not predict shorter times to treatment in the substance-using population as it does in the nonsubstance-using population may indicate that advances in depression screening and primary care for depression are not reaching those with comorbid substance abuse problems.

Overall, this study shows that only a small proportion of individuals make a treatment contact with professional service providers within one year following the onset of a substance use disorder. These delays extend over the course of the disorder, highlighting a significant need for services that is associated with significant morbidity and health care utilization if left untreated. While various sociodemographics are associated with treatment delays, namely age and education, evidence was not found that African Americans, Caribbean Blacks, and non-Hispanic Whites differed in their time to treatment contact.



- Alegria, M.; Canino, G.; Rios, R.; Vera, M.; Calderon, J.; Rusch, D.; Ojeda, A.N. 2002. Inequality in use of specialty mental health services among Latinos, African Americans, and non-Latino whites. *Psychiatric Services* 53 (12): 1547-55.
- Alexander, P.K.; French, M.T.; Matzger, H.; Weisner, C. 2006. Addictive treatment history, medical services utilization, and cost: A longitudinal analysis of problem drinkers. *Journal of Addictive Diseases* 25 (1): 105-20.
- American Psychiatric Association (APA). 2000. *Diagnostic and Statistical Manual of Mental Disorders: DSM-IV*. Washington, DC: American Psychiatric Association.
- Andrews, G., & Henderson, S. 2000. *Unmet Need in Psychiatry: Problems, Resources, Responses*. Cambridge: Cambridge University Press.
- Breslau, J.; Kendler, K.S.; Su, M.; Gaxiola-Aguilar, S.; & Kessler, R.C. 2005. Lifetime risk and persistence of psychiatric disorders across ethnic groups in the United States. *Psychological Medicine* 35: 317-27.
- Broman, C.L.; Neighbors, H.W.; Delva, J.; Torres, M.; & Jackson, J.S. 2008. Prevalence of substance use disorders among African Americans and Caribbean Blacks in the National Survey of American Life. *American Journal of Public Health* 98 (6): 1107-14.
- Cotler, L.B. 2007. Drug use disorder in the National Comorbidity Survey. *Journal of Public Health* 98 (6): 1107-14.
- Grant, B.F.; Compton, W.M.; Crowley, T.J.; Hasin, D.S.; Helzer, J.E.; Stinson, F.S.; & Saha, T.D. 2007. Errors in assessing DSM-IV substance use disorders. *Archives of General Psychiatry* 64 (3): 380-81.
- Heeringa, S.G.; Wagner, J.; Torres, M.; Duan, N.; Adams, T. & Berglund, P. 2004. Sample designs and sampling methods for the Collaborative Psychiatric Epidemiology Studies (CPEES). *International Journal of Methods in Psychiatric Research* 13 (4): 221-40.
- Hosmer, D.W. & Lemeshow, S. 2000. *Applied Survival Analysis: Regression Modeling of Time to Event Data*. New York: John Wiley & Sons.
- Institute of Medicine (IOM). 2001. *Crossing the Quality Chasm: A New Health System for the 21st Century*. National Academy Press, Washington, D.C.
- Institute for Social Research. 2001. *The National Survey of American Life: Main Adult Interview*. Available at <http://www.regd.irs.umich.edu/pub/qa/questionnaires/nsaladultintq.pdf>
- Jackson, J.S.; Torres, M.; Caldwell, C.H.; Neighbors, H.W.; Nesse, R.M.; Taylor, R.J.; Thierwelder, S.J. & Williams, D.R. 2004. The National Survey of American Life: A study of racial, ethnic and cultural influences on mental disorders and mental health. *International Journal of Methods in Psychiatric Research* 13 (4): 196-207.
- Kessler, R.C. & Merikangas, K.R. 2004. The National Comorbidity Survey Replication (NCS-R): Background and aims. *International Journal of Methods in Psychiatric Research* 13 (2): 60-68.
- Kessler, R.C. & Üstun, T.B. 2004. The World Mental Health (WMH) survey initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research* 13 (2): 93-121.
- Kessler, R.C.; Aguilar-Gaxiola, S.; Berglund, P.A.; Caraveo-Anduaga, W.A. 2001. Patterns and predictors of treatment seeking after onset of a substance use disorder. *Archives of General Psychiatry* 58 (11): 1065-71.
- Kish, L. 1949. A procedure for objective respondent selection with the household. *Journal of the American Statistical Association* 44: 380-87.
- Litlle, R.J.A. & Rubin, D.B. 2002. *Statistical Analysis with Missing Data*. New York: John Wiley and Sons.
- Logan, J.R. & Deane, G. 2003. *Black Diversity in Metropolitan America. Report from the Manford Center for Comparative Urban and Regional Research*. Albany, NY: State University of New York.
- Ma, G.X. & Shive, S. 2000. A comparative analysis of perceived risks and substance abuse among ethnic groups. *Addictive Behaviors* 25 (3): 361-71.
- Mark, T.L.; Coffey, R.M.; King, E.; Harwood, H.; McKusick, D.; Genardi, J.; Dillonardo, J. & Buck, J.A. 2000. Spending on mental health and substance abuse treatment, 1987-1997. *Health Affairs (Millwood)* 19 (4): 108-20.
- Mertine, A.C.; O'Malley, P.M.; Schulenberg, J.E.; Bachman, J.G., & Johnston, L.D. 2004. Substance use among adults 35 years of age: Prevalence, adulthood predictors, and impact of adolescent substance use. *American Journal of Public Health* 94 (1): 96-102.
- New Freedom Commission on Mental Health. 2003. *Achieving the Promise: Transforming Mental Health Care in America. Final Report*. DHHS Pub. No. SMA-03-3832. Rockville, MD: Department of Health and Human Services.
- Pennell, B.; Bowers, A. & Carr, D. 2004. The development and implementation of the National Comorbidity Survey Replication, the National Survey of American Life, and the National Latino and Asian American Survey. *International Journal of Methods in Psychiatric Research* 13 (4): 241-69.
- R Development Core Team. 2008. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. Available at [www.R-project.org](http://www.R-project.org)
- Robins, L.N. & Regier, D.A. 1991. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: Free Press.
- SAS Institute. 2005. *SAS/STAT User's Guide, Version 9.1*. Cary, NC: SAS Institute, Inc.
- Substance Abuse and Mental Health Services Administration (SAMHSA). 2002. *Emergency Department Trends from the Drug Abuse Warning Network, Preliminary Estimates 1994 to 2000*. DAWN Series D-20. Rockville, MD: Department of Health and Human Services.
- Sue, S.; Zane, N. & Young, K. 1991. Research on psychotherapy on culturally diverse populations. In: A. Bergin & S. Garfield (Eds.) *Handbook of Psychotherapy and Behavior Change*. New York: Wiley.
- Tian, L.; Zucker, D. & Wei, L. 2005. On the Cox model with time-varying regression coefficients. *Journal of the American Statistical Association* 100: 172-83.
- U.S. Department of Health & Human Services (US DHHS). 2001. *Mental Health: Culture, Race, and Ethnicity—A Supplement to Mental Health: Report of the Surgeon General*. Rockville, MD: USDHHS, SAMHSA, Center for Mental Health Services.
- U.S. Department of Health and Human Services (US DHHS). 2000. *Healthy People 2010*. Washington, DC: U.S. Government Printing Office.
- Wang, P.S.; Demler, O. & Kessler, R.C. 2002. Adequacy of treatment for serious mental illness in the United States. *American Journal of Public Health* 92 (1): 92-98.
- Wang, P.S.; Berglund, P.A.; Olfson, M. & Kessler, R.C. 2004. Delays in initial treatment contact after first onset of a mental disorder. *Health Services Research* 39 (2): 393-415.
- Wells, K.; Klap, R.; Koike, A. & Sherbourne, C. 2001. Ethnic disparities in unmet need for alcoholism, drug abuse, and mental health care. *American Journal of Psychiatry* 158 (12): 2027-32.
- Williams, D.R.; Gonzalez, H.M.; Neighbors, H.; Nesse, R.; Abelson, J.M.; Sweetman, J. & Jackson, J.S. 2007. Prevalence and distribution of major depressive disorder in African Americans, Caribbean blacks, and non-Hispanic whites: Results from the National Survey of American Life. *Archives of General Psychiatry* 64 (3): 305-15.
- Wolf-Bramig, M. 2007. Disability and abuse in relation to substance abuse: A descriptive analysis. *Journal of Social Work in Disability and Rehabilitation* 6 (3): 65-74.

## REFERENCES