

Published in final edited form as:

*Drug Alcohol Depend.* 2014 July 1; 140: 48–55. doi:10.1016/j.drugalcdep.2014.03.010.

## Gender and race/ethnicity differences for initiation of alcohol-related service use among persons with alcohol dependence\*

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### Abstract

**Background**—Prior studies on treatment for alcohol-related problems have yielded mixed results with respect to gender and race/ethnicity disparities. Additionally, little is known about gender and racial differences in time to first alcohol-related service contact amongst persons with alcohol dependence. This study explored gender and race/ethnicity differences for first alcohol-related service utilization in a population-based sample.

**Methods**—Primary analyses were restricted to Blacks, Whites and Hispanics, ages 18–44, with lifetime alcohol dependence (n=3,311) in Wave I of the National Epidemiologic Survey on Alcohol and Related Conditions. We compared time to service use among men and women within and across race/ethnicity strata using multivariable Cox proportional hazard methods.

**Results**—In the sample of individuals age <45 with alcohol dependence, only 19.5% reported alcohol-related service use. Overall, women were less likely than men to receive alcohol-related

\*Supplementary material can be found by accessing the online version of this paper at <http://dx.doi.org> and by entering doi:...

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#### Contributors:

Author Crum designed the study. Author Storr undertook statistical analyses. Author Alvanzo wrote the first draft of the manuscript and Authors Crum, Cullen, Green, La Flair, Mojtabai, Pacek and Storr edited manuscript drafts. All authors contributed to and have approved the final manuscript.

#### Conflict of Interest:

All authors declare that they have no conflicts of interest.

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services in their lifetime. However, women who did receive treatment were younger at first service utilization and had a shorter interval between drinking onset and service use than men. Gender differences were consistent across racial/ethnic groups but only statistically significant for Whites. There were no appreciable race/ethnicity differences in hazard ratios for alcohol-related service use or time from drinking initiation to first service contact. Results of sensitivity analyses for persons > 45 years old are discussed.

**Conclusions**—There are important gender differences in receipt of and time from drinking initiation to service utilization among persons with alcohol dependence. Increased recognition of these differences may promote investigation of factors underlying differences and identification of barriers to services.

### Keywords

alcohol; alcohol dependence; service utilization; gender; race/ethnicity

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## 1. INTRODUCTION

Despite the high prevalence and substantial associated medical, psychiatric and socioeconomic burden, only a minority of persons with alcohol dependence receive treatment (Cohen et al., 2007; Grella et al., 2009; Schmidt et al., 2007; Substance Abuse and Mental Health Services Administration, 2011). A study using data from the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) found that only about one-quarter of those with alcohol dependence reported treatment utilization (Cohen et al., 2007). Research has demonstrated that specialty alcohol treatment, 12-Step facilitation, and non-specialty alcohol-related community services are all effective in achieving long-term abstinence or reductions in alcohol consumption (Dawson et al., 2006; Weisner et al., 2003a, 2003b). Thus, a better understanding of who is accessing treatment for alcohol and in what settings is important for design of services.

There appear to be differences in alcohol-related service use by gender and race/ethnicity, though the results of past research are inconsistent. An earlier study by Weisner and colleagues (1995) using data from three nationally representative samples found that the odds for treatment for men were twice that of women, after controlling for alcohol dependence symptoms and social consequences. This finding was corroborated in a more recent analysis of the NESARC (Cohen et al., 2007). However, another analysis of NESARC data found that this gender difference was reversed after adjustment for sociodemographic characteristics, general medical condition and psychiatric disorders (Oleski et al., 2010). Other studies of local treatment samples and a general population-based sample found no gender differences (Kessler et al., 2001; Weisner et al., 2002; Wu et al., 2003). Some of the inconsistency in gender differences may be explained by cohort differences in the pursuit and receipt of alcohol services. Recent studies have shown increased drinking and alcohol use disorders in younger birth cohorts with differences more pronounced in women, resulting in decreased gender differences for these outcomes (Gruzca et al., 2008a; Keyes et al., 2008a).

Findings of past research regarding racial/ethnic differences also vary with some studies reporting that minorities, particularly Blacks and Hispanics, are more likely (Oleski et al., 2010; Weisner et al., 2002), equally likely (Cohen et al., 2007; Keyes et al., 2008b) or less likely (Schmidt et al., 2007; Wu et al., 2003) than Whites to receive alcohol-related services. Sample differences may explain these findings: Hispanics are under-represented in alcohol treatment settings, whereas, both Blacks and Hispanics are over-represented in public sector and criminal justice systems (Chartier and Caetano, 2010; Schmidt et al., 2006).

In addition to disparities in alcohol-related services, there may also be gender or racial/ethnic differences in time from drinking onset to treatment entry. Several studies have shown gender differences in drinking careers with women progressing faster than men from drinking initiation to the onset of first alcohol-related problem, alcohol dependence and treatment entry (Hernandez-Avila et al., 2004; Piazza et al., 1989; Randall et al., 1999; Schuckit et al., 1998). This “telescoping” effect was demonstrated in earlier clinical research and substance disorder treatment samples; however, more recent analyses of the NESARC found no gender differences in time to progression from drinking initiation to development of alcohol dependence (Alvanzo et al., 2011; Keyes et al., 2010). Yet, little is known about gender differences within race/ethnicity strata or racial/ethnic differences within gender strata in the course from onset of drinking to treatment entry in the general population. The assessment of these utilization patterns may aid our understanding of and potential improvement in access and treatment utilization for individuals with alcohol dependence.

The current study extends the literature by exploring both gender and race/ethnicity subgroups simultaneously to evaluate age differences for time of first alcohol-related service utilization and time from drinking initiation to first alcohol-related service use. Using data from the first wave of the NESARC, we compared a nationally representative sample of White, Black and Hispanic men and women with lifetime alcohol dependence. As has been done in previous studies, the primary sample was restricted to persons younger than 45 years in an effort to minimize recall bias and the possibility of differential alcohol-related mortality (Alvanzo et al., 2011; Keyes et al., 2010; Wagner and Anthony, 2007). Additionally, sensitivity analyses were conducted with persons 45 years old.

## 2. METHODS

### 2.1 Sample

The sample consisted of participants in Wave 1 of the NESARC, a nationally representative, multi-stage probability survey of 43,093 non-institutionalized adults 18 years and older conducted in 2001–2002 (Grant et al., 2004). Blacks, Hispanics, and young adults were oversampled and the overall response rate was 81%. Detailed sampling, training and quality control procedures are reported elsewhere (Grant et al., 2004; Hatzenbuehler et al., 2008). The primary analyses were restricted to persons who were self-identified as Black, White, or Hispanic under age 45 years who met criteria for lifetime alcohol dependence (N=3,311). Additional sensitivity analyses were completed for those 45 years.

## 2.2 Measures

Alcohol initiation, alcohol dependence, and lifetime alcohol-related service utilization were assessed using the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM IV Version (AUDADIS-IV), via a structured computer-assisted personal interview (Grant et al., 2003, 1995; Hatzenbuehler et al., 2008). Alcohol-related service utilization was assessed by a question asking whether the respondent had ever gone anywhere or seen anyone for a reason related to their drinking. Persons endorsing alcohol-related service utilization were subsequently asked about types of services, ranging from 12-step facilitation to inpatient hospitalization.

Drinking initiation and age at first alcohol-related service utilization were assessed from questions regarding age of first alcohol use (“not counting small tastes or sips”) and age when the respondent first sought help because of drinking, respectively. The time between age at drinking initiation and age at first alcohol-related service utilization was calculated as the difference in years.

Race/ethnicity was assessed from self-reports. Individuals reporting Hispanic or Latino ethnicity were classified as Hispanic regardless of race. The current analyses included persons identified as non-Hispanic White, non-Hispanic Black, and Hispanic.

Multivariable analyses controlled for age, age of alcohol dependence onset or age of alcohol abuse onset if age of dependence onset was missing, education level, income, insurance status, urbanicity, family history of alcohol problems (first degree relative identified as “ever an alcoholic or problem drinker”), alcohol consumption (typical number of daily drinks during the heaviest drinking period) and lifetime diagnosis of mood/anxiety, personality and drug use disorders, excluding nicotine.

Psychiatric and drug use disorders included in the analyses were disorders of mood (major depressive disorder, dysthymia, mania, hypomania), anxiety (panic, social phobia, specific phobia, generalized anxiety disorder), personality (antisocial, avoidant, histrionic, obsessive-compulsive, paranoid, schizoid), abuse and/or dependence involving amphetamines, cannabis, cocaine, hallucinogens, inhalants, opioids (heroin and/or prescription “painkillers”), sedatives, and tranquilizers.

## 2.3 Data Analysis

Initial analyses compared mean ages at first alcohol-related service utilization and mean years from drinking initiation to first service contact after dividing the sample into strata. For the first set of analyses, the sample was evaluated by race/ethnicity, and men were compared to women of the same race/ethnicity group. The second set of analyses explored race/ethnicity differences within gender strata. All analyses took into account the variation in analytical weights and clustering within sample strata using Taylor linearization implemented via STATA survey commands (StataCorp, 2009). Mean ages at first alcohol-related service utilization and mean time in years from drinking initiation to first service use were compared using adjusted Wald tests.

Hazard ratios of service utilization were examined using unadjusted and adjusted Cox proportional hazard models. For the estimation of the cumulative probability of treatment utilization, we set two time perspectives: since birth, and since first alcohol use. Years for persons not reporting service use were calculated by subtracting initiation age from the individuals' age at the time of interview. Individuals whose first treatment was at the same age as alcohol initiation were set at 0.5 to reflect halfway through the year (n=28). To assess for potential differences with the primary analyses due to truncating the sample at age 45, we also conducted sensitivity analyses for those < 45 years at the time of interview.

### 3. RESULTS

#### 3.1 Prevalence and Mean Years from Drinking Initiation to Service Utilization

**3.1.1 Prevalence of Lifetime Alcohol-related Service Utilization**—Of the 3,311 persons <45 years with lifetime alcohol dependence, only 19.5% reported ever seeking alcohol-related services. The prevalence of service utilization and use of different types of alcohol-related services, stratified by race/ethnicity and gender, is presented in Table 1. Overall, a greater proportion of men than women received alcohol services ( $F_{2, 2600}=10.28$ ;  $p<0.001$ ). Men in each race/ethnicity group had higher rates of service use when compared to women of the same race/ethnicity, with approximately 7%, 9% and 10% higher for White, Black, and Hispanic men, respectively. However, only the difference for Whites ( $F_{2, 2393}=8.64$ ;  $p<0.001$ ) and Hispanics ( $F_{2, 2550}=3.93$ ;  $p<0.020$ ) achieved statistical significance. There were no statistically significant race/ethnicity differences in prevalence of service utilization overall or within gender strata. Of the different types of services used, alcohol and drug specific services and self-help programs were the most commonly reported, each being endorsed by approximately three-quarters of those reporting service use.

**3.1.2 Mean Age at First Alcohol-related Service Utilization: Gender and Race/ethnicity Differences**—Table 2 shows the age at first use of alcohol-related services. The mean age at which individuals with alcohol dependence first received a service related to drinking was 24.4 years. Overall, women had a younger mean age of first alcohol-related service use than men ( $F_{1, 1301}=7.04$ ;  $p=0.008$ ). This gender difference was consistent across race/ethnicity strata, with the range of women being younger than men at first service use of 1.2–3.0 years; however, the difference only reached statistical significance for Whites and Hispanics ( $F_{1, 1301}=4.63$ ;  $p=0.032$  and  $F_{1, 1301}=4.06$ ;  $p=0.044$ , respectively).

When exploring race/ethnicity differences stratified by gender, Black men were two to almost three and one-half years older than Hispanic and White men, respectively, at first service utilization but only the difference between Blacks and Whites was statistically significant ( $F_{1, 1301}=6.58$ ;  $p=0.010$ ). Similarly, Black women were almost four years older than White and Hispanic women ( $F_{1, 1301}=8.32$ ;  $p=0.004$  and  $F_{1, 1301}=6.57$ ;  $p=0.011$ , respectively). There was a one-year difference in age at service utilization between White and Hispanic men, with White men being younger, but it was not statistically significant, and there was little difference in age between White and Hispanic women.

**3.1.3 Time to Progression from Drinking Initiation to First Treatment: Gender and Race/ethnicity Differences**—Also shown in Table 2, the mean time from initiation of drinking to first service use was 8.9 years. Overall, women transitioned from onset of drinking to first alcohol-related service utilization in fewer years than men ( $F_{1, 1301}=7.25$ ;  $p=0.007$ ). In all instances for the race/ethnicity stratified analyses, women had a shorter mean time from drinking onset to first alcohol-related service utilization than men of the same race/ethnicity, ranging from 1.1 fewer years for Blacks to 2.2 fewer years for Hispanics. The difference between White women and men was statistically significant ( $F_{1, 1301}=5.33$ ;  $p=0.021$ ).

Black men had a longer mean time from drinking initiation to service utilization when compared to White and Hispanic men, with 2.4 and 1.8 more years, respectively. The difference between Black and Hispanic men was not statistically significant. While there was a trend for the difference between Black and White men, it did not achieve statistical significance. Likewise, Black women had a longer interval between drinking initiation and first service use, approximately three years and two and one-half years longer, when compared to White and Hispanic women, respectively; yet, only the difference between Black and White women was statistically significant ( $F_{1, 1301}=4.05$ ;  $p=0.045$ ). There was little difference ( $<1$  year) between Whites and Hispanics.

### 3.2. Cox regression analyses

**3.2.1 Gender Differences**—Hazard ratios for alcohol-related service utilization and the transition from drinking initiation to alcohol-related service utilization exploring gender differences within each race/ethnicity are presented in Table 3. In the unadjusted models, White men had significantly higher hazards for service utilization when compared to White women ( $p=0.001$ ), and White men also had higher hazards for the time from drinking initiation to first alcohol-related service utilization compared to White women ( $p=0.002$ ). These differences persisted after adjustment for potential confounders. In both unadjusted and adjusted models, Black men had a higher hazard than Black women for service utilization, and for the time from drinking onset to first service use but the estimates were not statistically significant. Among Hispanics, men also had a higher hazard for service utilization relative to women in the unadjusted model; yet while there was a trend ( $p=0.062$ ), the difference was not statistically significant. After adjustment, this trend disappeared. When examining time from drinking initiation to first alcohol-related service use, Hispanic men had a significantly higher hazard than Hispanic women in the unadjusted model ( $p=0.037$ ). In the multivariable analyses, Hispanic men still had a higher hazard than Hispanic women, but there was a dampening of the effect and it was no longer statistically significant.

**3.2.2 Race/ethnicity Differences**—Table 4 shows hazard ratios for race/ethnicity differences when stratified by gender. There were no significant race/ethnicity differences in the hazards for men or women for either service utilization or years from onset of drinking to first service.



**3.2.3 Other Covariates**—As shown in Table 3, there were varying race/ethnicity associations with characteristics related to socioeconomic status (education, income and insurance status) and service use and time from drinking onset to first alcohol service. Comorbid drug use disorder was associated with a higher hazard for both service use and time from initiation of drinking to service but only achieved statistical significance for Whites and Blacks. Family history of alcoholism, increased alcohol consumption and comorbid personality disorder were all significantly positively associated with both service use and time from onset of drinking to first alcohol-related service among Whites. For Hispanics, living in a rural area was significantly associated with service use, and there was a trend toward significance for time from drinking initiation to service utilization.

As shown in Table 4, increased alcohol consumption, family history of alcoholism, and a comorbid drug use disorder were significantly associated with both service use and time from initiation of drinking to first alcohol-related service for both men and women. Additionally, older age was associated with a lower hazard for both service use and time from drinking onset to service but only the difference for men achieved statistical significance. A comorbid personality disorder was associated with a higher hazard for service use in women.

### 3.3 Sensitivity Analyses

To assess for differences in findings related to age groupings, we conducted sensitivity analyses by age. We repeated the analyses shown in Tables 1–4 for persons ≥45 years old (Tables A–D in Supplementary Material<sup>1</sup>). The older age group (≥45 years) reported an 11% higher prevalence of service use compared to the primary sample (those <45 years; Table A;  $p < 0.001$ ). On average, the older group was 13 years older at receipt of first service (Table B;  $p < 0.001$ ) and had an approximately 12-year longer mean interval between drinking initiation and first alcohol-related service relative to the primary sample (Table B;  $p < 0.001$ ). Compared to persons <45 years, for the older age group, there were weaker hazard ratios for service utilization and for time from drinking initiation to first alcohol-related service utilization for White men, and stronger hazards for Black men compared to White and Black women, respectively (Table C). Finally, in contrast to the primary sample in which there were no statistically significant race/ethnicity differences, Black men in the older age group had significantly higher hazards than White men for both service utilization and time from onset of drinking to first alcohol-related service (Table D).

## 4. DISCUSSION

This study extends the literature by examining both gender and racial/ethnic differences simultaneously for age at first alcohol-related service use as well as the progression from first drink to service use in a U.S. general population sample of adults with lifetime alcohol dependence. Prior research demonstrated sex differences, specifically the telescoping effect with women initiating drinking later but progressing to treatment entry faster than men (Hernandez-Avila et al., 2004; Piazza et al., 1989; Schuckit et al., 1995). However, these

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<sup>1</sup>Supplementary material can be found by accessing the online version of this paper at <http://dx.doi.org> and by entering doi:...

studies were conducted with clinical research and treatment populations, limiting the generalizability of findings.

With respect to receipt of services for alcohol, our results are generally consistent with prior studies showing that only a minority of adults with alcohol dependence in the general population ever received alcohol-related services (Hasin et al., 2007; Weisner et al., 1995). In our primary sample of persons 18–44 years old less than 1/5 (19.5%) reported alcohol service utilization, while about 1/3 (31.5%) of those ≥ 45 years reported service use. The differences between the younger and older groups should be interpreted with caution for several reasons: 1) the older group had a longer time to develop symptoms and access treatment, 2) there is decreased precision of retrospective data due to the increased length of reporting time (Beckett et al., 2001; Henry et al., 1994), and 3) the older age group is more prone to survival biases linked to alcohol-related mortality (Neumark et al., 2000). However, an additional contributing factor may be that over time there has been a reduction in professional attention to alcohol problems. Multiple studies have demonstrated that physicians inconsistently screen for and only identify a minority of persons with alcohol problems (Bradley et al., 1995; D'Amico et al., 2005; Seale et al., 2005; Spandorfer et al., 1999) and one study actually showed a decline in the probability of physicians recommending reduction in drinking over time (Hasin et al., 1990).

With respect to gender differences, similar to another NESARC analysis (Oleski et al., 2010), we found that White, Hispanic, and Black women had a lower prevalence than men of the same race/ethnicity for receipt of alcohol-related services. Within race/ethnicity groups in our primary sample (18–44 years old), Black women tended to be less likely than Black men, and White women were significantly less likely than White men to receive services for alcohol, consistent with the overall gender difference reported by Cohen and colleagues (2007).

However, for the older age group (≥ 45 years old) significant gender differences were only found for Blacks. Prior reports indicate that barriers for help seeking for alcohol problems among women and men are disparate with women reporting more shame and embarrassment and being more likely to report interpersonal and childcare concerns (Brienza and Stein, 2002; Oleski et al., 2010; Schober and Annis, 1996), which may explain some gender differences. Information on these types of barriers was not available in the NESARC. However, our results suggest that women with alcohol dependence in general, and older Black women in particular, may have the greatest barriers to treatment.

Women who received alcohol-related services were generally younger, on average, and had a shorter interval between onset of drinking and first alcohol-related service than men. This pattern was consistent by race-ethnicity, but only the differences for Whites reached statistical significance. (In the older age group, there were no gender differences in age at time of first service and the gender differences in the interval between drinking onset and first service use were only significant for Blacks.) The association persisted even after adjusting for multiple covariates. Although family history of alcoholism, higher consumption and comorbid drug use disorder were associated with a shorter interval to treatment for women and men among some racial/ethnicity subgroups, they did not explain



the gender differences found. Women's increased morbidity and psychosocial consequences at equivalent or lower levels of drinking than men (Brienza and Stein, 2002), may explain this finding. Additionally, alcohol dependence may have stronger associations with comorbid mood and anxiety disorders among women (Kessler et al., 1997). Consequently, women may receive alcohol-related treatment earlier because their alcoholism was identified in the course of treatment for psychiatric conditions. In fact, Weisner and Schmidt (1992) found that women were more likely than men to receive alcohol-related care in mental health settings. While we found similar a prevalence of alcohol-related social services' use by men and women in our sample, previous research has indicated that social service institutions are a potential access point for identification and subsequent referral source to treatment for women with substance use disorders (Brady and Randall, 1999; Grella and Joshi, 1999), and that substance using mothers receiving cash assistance were more likely to receive substance use disorder treatment services (Pollack and Reuter, 2006). Thus, women with alcohol dependence who interact with Departments of Social Services may have a greater probability of being identified and referred for alcohol-related services than men which may, in part, explain the shorter interval.

In contrast to gender differences in service utilization and progression from drinking initiation to first alcohol-related service use, we found few race/ethnicity differences. For persons 18–44 years old, we did find that both Black men and women were notably older (range approximately 2–4 years) when compared to Hispanic and White men and women at time of first alcohol-related service use. The differences between Blacks and Whites were statistically significant for men and women, but the difference between Blacks and Hispanics was only significant for women. This age difference is not reflective of a longer interval to service utilization, but rather the older age at time of first alcohol-related service utilization among Blacks is likely due to delays in drinking onset. Multiple studies have found that Whites initiate drinking at younger ages than Blacks and Hispanics (Alvanzo et al., 2011; Gruzca et al., 2008b; Johnson et al., 2005). We found no race/ethnicity differences in the prevalence of service use and no race/ethnicity differences in our primary sample for either time to service utilization or interval from drinking onset to first service. However, in the older sample, Black men had higher hazards than White men for both service utilization and the interval between initiation of drinking and first alcohol-related service.

Our general lack of findings for race/ethnicity differences in receipt of alcohol-related services are consistent with two previous analyses of the NESARC (Cohen et al., 2007; Keyes et al., 2008b). However, these prior studies did not include sex and race/ethnicity subgroup analyses, nor did they examine potential differences in time from drinking initiation to first alcohol-related service. Although Black drinkers may have a slower progression to alcohol dependence than Whites (Alvanzo et al., 2011; Lopez-Quintero et al., 2011), there may be disparities in how different groups get to treatment. At least two studies have found that at higher levels of problem severity both Blacks and Hispanics were less likely to receive services (Chartier and Caetano, 2011; Schmidt et al., 2007). Furthermore, Black men are more likely to receive mandated treatment by the criminal justice system (Chartier and Caetano, 2010; Schmidt et al., 2006), and recycling through the system and policy changes over time (Nicosia et al., 2013; Taxman et al., 2005) may explain the higher hazard found for Black men in our older age sample.

Our findings must be interpreted in the context of several limitations. First, all data collected were via self-report and no confirmatory records of service utilization were available. Reporting bias may be of concern particularly when participants are asked to report on stigmatizing conditions such as alcohol dependence. However, interviews were conducted in private and with the assistance of computers, which may have minimized motivation to withhold information. Recall bias may have led to decreased reliability of retrospectively reported ages and intervals. We attempted to mitigate this risk by restricting our primary sample to persons <45 years old. Additionally, we did not examine the impact of coercion such as social pressures or criminal justice mandates on service utilization. Prior studies have found both race/ethnicity and gender differences in coercion (Hasin, 1994; Schmidt et al., 2006; Weisner and Schmidt, 1992). Finally, although this sample is one of the largest to provide this type of substance disorder and service use data with oversampling of Blacks and Hispanics, some subgroups were relatively small.

Notwithstanding these limitations, this study extends the literature by contributing to our understanding of gender and race/ethnicity patterns in the progression to alcohol-related service utilization for alcohol dependence in the general population. Our findings raise several questions about the causes of disparities between men and women. In particular, more investigation is needed on the factors resulting in women's earlier presentation to alcohol services, as well as understanding the personal and environmental characteristics that may delay men from treatment entry. Additionally, more research on gender and race/ethnicity-specific barriers to service utilization overall and particularly with regard to gender specific barriers underlying these differences is warranted.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

### Role of Funding Source:

Funding for this study was provided by National Institute on Alcohol Abuse and Alcoholism (1K23AA020316), National Institute on Alcohol Abuse and Alcoholism (AA016346), and Johns Hopkins School of Medicine Clinician Scientist Award. The NIAAA nor Johns Hopkins University School of Medicine had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

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**Table 1**

Service utilization and type of alcohol-related service used among persons < 45 years old with lifetime alcohol dependence who utilized a service, NESARC Wave 1, 2001–2002 (weighted prevalence, %)

	Total n (%)	White			Black			Hispanic				
		Men %	Women %	Total %	Men %	Women %	Total %	Men %	Women %	Total %		
Service Utilization <sup>d</sup>												
No service utilization	2626 (80.2)	77.7	84.6	80.1	77.7	84.3	81.1	77.7	87.3	80.0	77.7	85.1
Any service utilization	685 (19.5)	22.0 <sup>b</sup>	15.0 <sup>b</sup>	19.8	22.2 <sup>b</sup>	15.6 <sup>b</sup>	18.3	21.3	12.7	18.2	21.3 <sup>b</sup>	11.4 <sup>b</sup>
Type of Service <sup>c</sup>												
Self-help <sup>d</sup>	512 (73.4)	71.3	78.8	73.4	71.2	78.8	78.3	76.4	84.4	70.0	69.0	74.2
Social Services <sup>e</sup>	255 (37.8)	38.0	37.4	38.7	40.0	35.7	43.1	43.4	42.1	27.3	20.7	54.8
Alcohol/drug services <sup>f</sup>	505 (74.2)	73.2	76.9	74.3	73.8	75.6	89.8	88.1	95.3	63.5	59.8	78.8
Emergency Department	188 (28.7)	28.7	28.6	29.6	30.0	28.5	22.2	19.3	31.3	26.2	25.7	28.0
Other	95 (14.1)	15.7	10.3	14.1	15.5	10.6	20.0	22.3	12.5	11.4	13.0	5.0

<sup>a</sup> May not sum to 100 due to missing data on service utilization

<sup>b</sup> Difference between men and women,  $p < 0.05$

<sup>c</sup> Categories are not mutually exclusive

<sup>d</sup> 12-step meetings

<sup>e</sup> Family services, employee assistance programs, or clergy

<sup>f</sup> Alcohol/drug detoxification clinic or ward, alcohol/drug rehabilitation program, inpatient hospital, outpatient, halfway house/therapeutic community, crisis center, or private professional



Means for first alcohol-related service utilization and time from drinking onset to service use among alcohol dependent persons < 45 years old in NESARC, Wave 1, 2001–2002

**Table 2**

	TOTAL n	Service Use n	Age at First Service Use Mean (95% CI)	Years from Drinking Initiation to Service Use Mean (95% CI)
Total	3,311	685	24.42 (23.84–25.01)	8.85 (8.28–9.42)
Men	1,936	458	24.93 (24.24–25.61) <sup>a</sup>	9.34 (8.63–10.04) <sup>a</sup>
White	1,350	327	24.55 (23.77–25.32) <sup>a</sup>	9.10 (8.31–9.89) <sup>a</sup>
Black	217	43	27.92 (25.42–30.42) <sup>b</sup>	11.49 (8.96–14.02)
Hispanic	369	88	25.78 (24.02–27.55) <sup>a</sup>	9.70 (7.77–11.63)
Women	1,375	227	23.15 (22.05–24.26) <sup>a</sup>	7.62 (6.62–8.62) <sup>a</sup>
White	985	171	22.95 (21.70–24.20) <sup>a</sup>	7.44 (6.30–8.58) <sup>a</sup>
Black	160	23	26.74 (24.52–28.97) <sup>b,c</sup>	10.43 (7.76–13.10) <sup>b</sup>
Hispanic	230	33	22.79 (20.72–24.87) <sup>a</sup>	7.52 (5.40–9.64)

Mean comparisons within gender and within race performed using Wald test.

<sup>a</sup> Difference between men and women,  $p < 0.05$

<sup>b</sup> Difference between Blacks and Whites,  $p < 0.05$

<sup>c</sup> Difference between Blacks and Hispanics,  $p < 0.05$

Table 3

Hazard ratios for alcohol-related service utilization and time from drinking onset to service use, **gender differences within race/ethnicity strata, NESARC 2001–2002 wave 1,**

	Service Utilization		Years from Initiation to Service Utilization			
	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics
	Unadjusted HR (95% CI)		Unadjusted HR (95% CI)			
	p-value		p-value			
Sex (reference = women)						
men	1.43 (1.15 – 1.76)	1.69 (0.94–3.03)	1.64 (0.98–2.75)	1.40 (1.13–1.73)	1.44 (0.80–2.60)	1.85 (1.04–3.30)
	0.001	0.077	0.062	0.002	0.221	0.037
	Adjusted HR (95% CI)		Adjusted HR (95% CI)			
	p-value		p-value			
Sex (reference = women)						
men	1.32 (1.02–1.71)	2.19 (0.97–4.95)	1.17 (0.66–2.07)	1.33 (1.03–1.72)	1.73 (0.77–3.89)	1.35 (0.73–2.51)
	0.034	0.061	0.583	0.032	0.185	0.332
Age	0.97 (0.96–0.99)	1.01 (0.94–1.08)	0.92 (0.85–0.98)	0.98 (0.96–0.99)	1.02 (0.95–1.09)	0.94 (0.87–1.01)
	0.008	0.786	0.013	0.010	0.651	0.071
Urbanicity (reference = urban)						
	0.87 (0.67–1.12)	0.74 (0.39 – 1.40)	1.77 (1.14 – 2.73)	0.88 (0.68–1.14)	0.75 (0.40–1.40)	1.52 (0.97–2.38)
	0.280	0.348	0.010	0.348	0.363	0.065
Education (reference > high school)						
high school	1.18 (0.92–1.51)	1.55 (0.79–3.05)	1.31 (0.75–2.29)	1.14 (0.89–1.46)	1.52 (0.76–3.07)	1.24 (0.70–2.19)
	0.188	0.198	0.347	0.289	0.238	0.470
< high school	1.51 (1.06–2.16)	1.80 (0.63–5.13)	1.60 (0.92–2.77)	1.40 (0.98–2.00)	1.56 (0.58–4.15)	1.39 (0.78–2.48)
	0.024	0.270	0.095	0.067	0.377	0.261
Income(ref = \$1–\$19,999)						
income = \$0	0.73 (0.37–1.44)	2.26 (0.38–13.47)	1.12 (0.41–3.05)	0.79 (0.40–1.55)	2.34 (0.51–10.76)	1.65 (0.63–4.36)
	0.360	0.369	0.831	0.492	0.276	0.310
income = \$20,000–\$34,999	0.78 (0.58–1.05)	0.95 (0.44–2.06)	1.20 (0.69–2.08)	0.85 (0.63–1.14)	1.02 (0.46–2.24)	1.11 (0.64–1.94)
	0.099	0.905	0.519	0.276	0.967	0.712

	Adjusted HR (95% CI) p-value		Adjusted HR (95% CI) p-value		Adjusted HR (95% CI) p-value	
	Whites	Blacks	Hispanics	Whites	Blacks	Hispanics
income = \$35,000–\$69,999	0.80 (0.58–1.09)	0.20 (0.07–0.55)	1.31 (0.60–2.82)	0.82 (0.60–1.13)	0.24 (0.09–0.67)	1.20 (0.51–2.86)
income = \$70,000	0.162	0.002	0.496	0.222	0.007	0.677
Insurance (reference = uninsured)	0.45 (0.26–0.80)	0.21 (0.02–2.60)	2.46 (1.16–5.21)	0.46 (0.26–0.81)	0.21 (0.02–2.33)	2.63 (1.24–5.62)
	0.006	0.224	0.019	0.007	0.204	0.012
Age of onset of alcohol use disorder <sup>d</sup>						
	0.88 (0.67–1.17)	1.43 (0.67–3.03)	0.56 (0.33–0.95)	0.97 (0.73–1.30)	1.23 (0.57–2.66)	0.56 (0.33–0.95)
	0.690	0.354	0.031	0.854	0.594	0.031
Typical # of drinks <sup>b</sup> (reference = 1–4)						
5–6	0.98 (0.96–1.01)	0.99 (0.95–1.04)	0.96 (0.91–1.01)	1.00 (0.98–1.02)	1.00 (0.95–1.04)	0.99 (0.94–1.04)
	0.173	0.700	0.103	0.826	0.880	0.619
7	1.47 (1.06–2.04)	0.47 (0.20–1.08)	0.59 (0.29–1.20)	1.45 (1.04–2.01)	0.51 (0.21–1.23)	0.70 (0.33–1.49)
	0.022	0.074	0.145	0.026	0.134	0.359
Family history <sup>c</sup> (reference = no family history)						
Yes	2.10 (1.55–2.86)	0.72 (0.34–1.50)	1.25 (0.69–2.28)	1.96 (1.43–2.69)	0.74 (0.35–1.57)	1.52 (0.82–2.79)
	<0.001	0.375	0.464	<0.001	0.435	0.181
Comorbidity (reference = no comorbidity)						
mood/anxiety disorder	1.93 (1.53–2.45)	1.44 (0.57–3.64)	1.16 (0.72–1.89)	1.86 (1.47–2.36)	1.32 (0.51–3.41)	1.17 (0.67–2.02)
	<0.001	0.437	0.552	<0.001	0.562	0.570
personality disorder	1.00 (0.78–1.29)	0.91 (0.43–1.95)	0.83 (0.50–1.37)	1.05 (0.82–1.34)	0.80 (0.37–1.73)	0.98 (0.60–1.60)
	0.997	0.812	0.456	0.687	0.574	0.937
drug use disorder	1.43 (1.13–1.81)	0.76 (0.36–1.49)	0.89 (0.52–1.51)	1.34 (1.06–1.70)	0.82 (0.43–1.56)	0.90 (0.53–1.51)
	0.003	0.418	0.661	0.015	0.545	0.689
	1.94 (1.53–2.47)	3.02 (1.70–5.36)	1.49 (0.89–2.48)	1.80 (1.41–2.29)	3.00 (1.63–5.54)	1.38 (0.81–2.37)
	<0.001	<0.001	0.129	<0.001	<0.001	0.238

<sup>a</sup> age of onset of alcohol abuse or dependence

<sup>b</sup> typical number of drinks usually consumed during the heaviest drinking period

<sup>c</sup> family history of alcohol problems in a first degree relative

**Table 4**

Hazard ratios for alcohol-related service utilization and time from drinking onset to service use, **race/ethnicity differences within gender strata, NESARC wave 1, 2001–2002**

	Service Utilization		Years from Initiation to Service Utilization	
	Men	Women	Men	Women
	Unadjusted HR (95% CI)		Unadjusted HR (95% CI)	
	p-value		p-value	
Race/ethnicity (reference = White)				
Black	0.93 (0.65 – 1.33)	0.78 (0.47–1.31)	0.95 (0.66 – 1.37)	0.86 (0.51–1.45)
	0.677	0.352	0.758	0.565
Hispanic	1.08 (0.81 – 1.45)	0.96 (0.59–1.56)	1.09 (0.80 – 1.48)	0.81 (0.48–1.39)
	0.600	0.860	0.577	0.454
Adjusted HR (95% CI)				
p-value				
Adjusted HR (95% CI)				
p-value				
Race/ethnicity (reference = White)				
Black	0.90 (0.61–1.32)	0.88 (0.46–1.67)	0.92 (0.63–1.35)	0.89 (0.46–1.71)
	0.585	0.697	0.673	0.716
Hispanic	0.87 (0.63–1.21)	0.98 (0.55–1.74)	0.91 (0.65–1.27)	0.78 (0.44–1.40)
	0.420	0.942	0.579	0.409
Age	0.97 (0.95–0.99)	0.97 (0.94–1.00)	0.97 (0.95–0.99)	0.98 (0.95–1.01)
	0.007	0.072	0.007	0.149
Urbanicity (reference = urban)				
Rural	0.90 (0.68–1.18)	1.01 (0.73–1.40)	0.91 (0.69–1.20)	0.99 (0.71–1.37)
	0.448	0.958	0.516	0.947
Education (reference > high school)				
High school	1.27 (0.96–1.67)	1.20 (0.81–1.77)	1.22 (0.93–1.61)	1.10 (0.75–1.62)
	0.088	0.367	0.156	0.626
< high school	1.54 (1.05–2.25)	1.30 (0.74–2.28)	1.38 (0.94–2.04)	1.24 (0.71–2.15)
	0.028	0.354	0.103	0.454

	Adjusted HR (95% CI) p-value		Adjusted HR (95% CI) p-value	
	Men	Women	Men	Women
Income (ref = \$1-\$19,999)				
\$0	1.13 (0.54-2.35)	0.66 (0.28-1.52)	1.30 (0.61-2.76)	0.71 (0.32-1.61)
\$20,000-\$34,999	0.744	0.324	0.499	0.418
\$35,000-\$69,999	0.80 (0.58-1.10)	0.79 (0.51-1.22)	0.87 (0.63-1.21)	0.82 (0.53-1.28)
\$70,000	0.167	0.287	0.406	0.379
	0.66 (0.46-0.96)	1.24 (0.77-2.00)	0.69 (0.48-1.01)	1.22 (0.76-1.96)
	0.029	0.380	0.054	0.412
Insurance (reference = uninsured)				
Yes	0.49 (0.28-0.84)	0.19 (0.04-0.98)	0.51 (0.29-0.89)	0.21 (0.04-1.03)
	0.010	0.047	0.018	0.054
Age of onset of alcohol use disorder <sup>d</sup>				
Yes	1.03 (0.77-1.37)	0.71 (0.47-1.05)	1.04 (0.77-1.39)	0.73 (0.48-1.10)
	0.863	0.089	0.798	0.128
Typical # of drinks <sup>b</sup> (reference = 1-4)				
5-6	1.00 (0.97-1.02)	0.96 (0.92-0.99)	1.01 (0.99-1.03)	0.98 (0.94-1.02)
	0.673	0.019	0.492	0.307
7	1.11 (0.80-1.55)	1.38 (0.92-2.07)	1.16 (0.83-1.63)	1.33 (0.89-2.00)
	0.539	0.116	0.383	0.164
Family history <sup>c</sup> (reference = no family h/o)				
Yes	1.68 (1.24-2.29)	2.01 (1.34-3.02)	1.63 (1.18-2.23)	1.90 (1.26-2.87)
	0.001	0.001	0.003	0.002
Comorbidity (reference = no comorbidity)				
Mood/anxiety disorder	1.75 (1.37-2.25)	2.17 (1.48-3.18)	1.67 (1.30-2.15)	2.28 (1.53-3.40)
	<0.001	<0.001	<0.001	<0.001
Personality disorder	1.01 (0.78-1.30)	0.88 (0.56-1.36)	1.04 (0.80-1.33)	0.94 (0.61-1.47)
	0.962	0.560	0.784	0.798
Non-alcohol drug use disorder	1.27 (0.99-1.63)	1.46 (1.00-2.12)	1.21 (0.95-1.55)	1.41 (0.96-2.08)
	0.056	0.049	0.124	0.079
	1.71 (1.33-2.21)	2.49 (1.79-3.44)	1.62 (1.26-2.09)	2.41 (1.71-3.39)

	Adjusted HR (95% CI) p-value		Adjusted HR (95% CI) p-value	
	Men	Women	Men	Women
<i>a</i>	<0,001	<0,001	<0,001	<0,001
<i>b</i>				
<i>c</i>				

*a* age of onset of alcohol abuse or dependence

*b* typical number of drinks usually consumed during the heaviest drinking period

*c* family history of alcohol problems in a first degree relative