Trends in Alcohol Use Disorder Treatment Utilization and Location from 2008 to 2017

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Word Count: 2,984

Highlights:

- Data from the 2008-2017 National Survey of Drug Use and Health were used to study trends in overall treatment utilization and changes in treatment location among those with alcohol use disorder.

- Treatment for alcohol use disorder declined by 1.1 percentage points from 6.9% in 2008-2010 to 5.8% between 2014-2017.

- After controlling for confounders, compared to the baseline of 2008-2010, the probability of receiving no treatment increased by 1.4 percentage points in 2011-2013 and 1.5 percentage points in 2014-2017.

- In adjusted models, compared to the baseline of 2008-2010, the likelihood of receiving treatment in any medical location declined by 1.0 percentage points and the probability of receiving only self-help treatment declined by 0.5 percentage points in 2014-2017.

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Abstract

Objective: Little is known about recent trends in treatment for alcohol use disorder. This study used national data to examine treatment trends among individuals with alcohol use disorder.

Methods: A sample of non-elderly adults (18-64) with alcohol use disorder were identified from the National Survey of Drug Use and Health. Multinomial logistic regression analysis was conducted to examine trends in treatment for alcohol use disorder in 2008-2010, 2011-2013, and 2014-2017 in: (1) any medical setting (including hospitals, rehab centers, mental health centers, emergency room, and private doctors' offices); (2) self-help groups only (no medical setting); and (3) no setting (i.e., no treatment). Additional analyses investigated trends in mental health treatment. Regression models adjusted for predisposing, enabling, and need-related characteristics.

Results: Among those with an alcohol use disorder, the percentage that received any treatment was significantly lower in 2011-2013 (5.6%) compared to 2008-2010 (6.9%, p<0.05). In adjusted analyses, the probability of receiving no treatment increased by 1.5 percentage points in 2014-2017 (95% CI = 0.5, 2.5), compared to the baseline of 2008-2010. Significant declines were observed in the receipt of any treatment in a medical setting (M.E. = -1.0%, 95% CI= -2.0, -0.0) and self-help treatment only (M.E. = -0.5%, 95% CI=-0.8, -0.1) in 2014-2017 compared to baseline. The probability of receiving any mental health treatment did not change during the study period.

Conclusions: Treatment among those with an alcohol use disorder declined from 2008-2017. Future studies should examine the mechanisms that may be responsible for the decline in treatment.

As of 2018, alcohol use disorder was the most common substance use disorder in the United States, with 5.4% of Americans over age twelve affected (1). Alcohol use disorder is associated with various medical problems, including cancer, diabetes, and cardiovascular disease, and it was associated with 95,158 deaths a year from 2011-2015 in the United States (2-5). Although efficacious treatments for alcohol use disorder exist, only about 10% of those with alcohol use disorder receive treatment in a given year and many individuals with alcohol use disorder seek mental health (MH) treatment instead of alcohol treatment (6, 7).

In the past decade, two significant laws were implemented with the potential to address the treatment gap for alcohol use and other behavioral health disorders -- the Mental Health Parity and Addiction Equity Act (MHPAEA) and the Patient Protection and Affordable Care Act (ACA) -- in 2008 and 2010, respectively. These laws increased the number of insured, increased coverage for behavioral health treatment among the insured, and more tightly integrated behavioral healthcare and medical healthcare (8-13). The MHPAEA established parity for substance use disorder benefits, which required that both treatment limits (e.g., caps on outpatient visits) and financing (e.g., co-pays) were no more restrictive for substance use treatment than for medical benefits (8). The ACA extended parity to individual and Medicaid plans and required covering substance use disorder benefits as a part of the essential health benefits (EHB) (9). The ACA also increased the number of insured individuals through the individual marketplace and Medicaid expansion (10, 12). Finally, payment reform and other ACA incentives were expected to lead to greater substance use disorder treatment integration with primary care, facilitating access to treatment (11, 13).

Several studies have examined treatment trends for substance use disorders since the MHPAEA and ACA were passed (14-18). These studies have typically found no change in the

treatment rate for substance use disorders. However, these studies aggregate treatment for all substance use disorders, potentially masking differential trends for illicit drug use disorders and alcohol use disorder. To date, only one known study has used national data (from 2010 to 2015) to investigate recent trends in alcohol use disorder treatment specifically (19). This study reported no change in alcohol use disorder treatment over that period. Because this study only included data through 2015 (the first full year after ACA implementation), more recent data are needed to understand how trends in treatment for alcohol use disorder have changed since its implementation. In addition, prior research examined trends in alcohol use disorder treatment across all settings in aggregate (including medical settings and self-help groups) instead of by treatment location.

To address this gap in the literature, we used national data from the 2008-2017 National Survey of Drug Use and Health to examine trends in treatment for alcohol use disorder. We hypothesized that alcohol use disorder treatment increased over that period due, in part, to the increase in insurance coverage because of the ACA. We examined three measures of alcohol use disorder treatment (no treatment, any treatment in a medical setting, self-help treatment only) and MH treatment for those with alcohol use disorder.

Methods

Data and Sample

We used pooled data from the 2008-2017 National Survey of Drug Use and Health (NSDUH). NSDUH is an annual, nationally-representative, cross-sectional survey of the US civilian, non-institutionalized population over 12 (20). NSDUH uses DSM-IV criteria to determine whether respondents have an alcohol use disorder (i.e., alcohol abuse or dependence). We identified 38,335 individuals with alcohol use disorder between 18-64 in the pooled sample,

of whom 36,707 had complete information on all of the model covariates for the analytic sample used to examine the three-alcohol use disorder treatment outcomes. When estimating a separate MH treatment model among those with alcohol use disorder, an additional 79 observations were missing on the measure of MH treatment and dropped from the analytic sample. Similar to prior research examining behavioral health services changes over time using NSDUH data, we examined trends in alcohol use disorder treatment across three periods: 2008-2010, 2011-2013, and 2014-2017 (14, 16, 18, 19).

Dependent Variables

The receipt of any alcohol use disorder treatment was measured using a categorical variable (received no treatment; received any medical treatment; received self-help treatment only). We derived this measure from a question in which respondents were asked whether they received treatment for alcohol or drugs in the last twelve months and whether that treatment was for alcohol, drugs, or both. Those who did not report treatment for alcohol or both alcohol and drugs were coded as not receiving alcohol treatment.

Respondents who received treatment were categorized based on the location in which they reported receiving treatment – either in a medical setting (hospital as an inpatient, rehab center, MH center, emergency room, private doctor's office), or whether they received self-help only treatment such as Alcoholics Anonymous; we excluded from analyses those who only received treatment in jail or for whom treatment location could not be ascertained (n=654). Consistent with prior studies using NSDUH (21-23) we aggregated treatment locations into these categories to separate treatment locations where health insurance coverage is likely to facilitate financial access to services (medical settings) and where insurance is unlikely to make a difference (self-help treatment only).

The receipt of MH treatment was measured using a dichotomous variable (yes/no). Respondents who reported receiving inpatient treatment, outpatient treatment, or prescription medication for MH treatment were coded as receiving MH treatment. We include MH treatment as a separate dependent variable because previous research has found that individuals with alcohol use disorder are more likely to seek MH treatment than substance use disorder treatment and that outpatient MH treatment increased overall in the years after the ACA was passed (7, 24). However, it is unclear to what extent utilization of MH treatment changed for those with alcohol use disorder.

Independent Variables

Sociodemographic characteristics. Regression models controlled for predisposing and enabling characteristics (25). Predisposing characteristics included age category (18 to 25, 26 to 34, 35 to 49, and 50 to 64), race/ethnicity (Non-Hispanic white, Non-Hispanic black, Hispanic, and Non-Hispanic other), gender (male versus female), educational attainment (less than high school, high school graduate, some college/associate's degree, and college graduate and above), marital status (married, widowed or divorced, and never married), and employment status (full time employed, part-time employed, unemployed, and other). Due to small sample sizes, we combined four race/ethnicity categories into Non-Hispanic other for analysis: non-Hispanic Native Am/AK Native, non-Hispanic Native HI/Other Pac Islander, non-Hispanic Asian, and non-Hispanic more than one race. Enabling characteristics included income (less than $20,000, $20,000 to $49,999, $50,000 to $74,999, $75,000 or more), and insurance status (any private insurance, Medicaid [no private insurance], other insurance [no Medicaid or private, and other insurance], and uninsured). Income was imputed for 8.6% of the sample (3,167).

Health status. Regression models also adjusted for differences in need-related

characteristics (25). Health status measures included a categorical measure of self-reported

health status (excellent, very good, good, fair, and poor), dichotomous indicators for comorbid

illicit substance use disorder, comorbid MH disorder, and alcohol use disorder severity.

Comorbid substance use disorder was created from heroin abuse or dependence, cocaine abuse or

dependence, and marijuana abuse or dependence; these were the measures of illicit substance

abuse or dependence that were consistently measured during the study period (26). The measure

of comorbid MH status was created using information from the NSDUH prediction model that

determines the predicted probability of any mental illness based on responses to several

questions; individuals with a predicted probability greater or equal to a specified cutoff value

were considered to have a comorbid MH disorder (26). Alcohol use disorder severity was

assessed with an indicator for whether the individual met DSM-IV criteria for alcohol

dependence (versus alcohol abuse). In addition, the models included indicators for the following

self-reported health conditions: diabetes, liver cirrhosis, hepatitis, asthma, HIV or AIDS, and

high blood pressure. Each condition was assessed with an indicator for whether the individual

reported ever being told by a doctor or other health professional they had each respective

condition.

Analysis

Analysis was conducted in STATA using the SVY command to account for the complex

survey design elements of NSDUH. We first conducted bivariate analyses using Adjusted Wald

tests to compare treatment rates in 2011-2013 and 2014-2017 to the baseline period of 2008-

2010. Next, we adjusted for predisposing, enabling, and need-related factors that may have

changed over time using multinomial and binomial logistic regression models.

We estimated a multinomial logistic regression for the dependent variable of alcohol treatment: received no treatment, received any treatment in a medical location, and received self-help group treatment only (i.e., no medical treatment). We estimated a separate logistic regression for the dependent variable of any MH treatment. Marginal effects were reported for all models. Marginal effects can be interpreted as the percentage point change in the predicted probability that individuals fall into one outcome category compared to the other outcome categories combined, holding all other covariates constant. The alpha level for statistical significance was set to 0.05.

This study was exempt from IRB review in a letter of determination from Emory University's IRB because the data came from publicly available sources without Private Health Information identifiers.

Results

The prevalence of alcohol use disorder among adults declined over the period from 2008-2017. Bivariate analysis indicated a decline in alcohol use disorder among all NSDUH respondents from 8.9% in 2008-2010 to 8.1% in 2011-2013 ($p<0.01$) to 7.3% in 2014-2017 ($p<0.01$) (Table 1). However, among those with alcohol use disorder, a higher proportion had alcohol dependence, the more severe form of alcohol use disorder, in 2014-2017 (52.3%) than in 2008-2010 (46.8%, $p< 0.01$) (Table 2).

Among those with an alcohol use disorder, bivariate analysis indicated that there was an overall decline in any treatment for alcohol from 6.9% in 2008-2010 to 5.6% ($p< 0.05$) in 2011-2013 (Table 2). There was a significant decline in treatment in any medical setting from 5.6% in 2008-2010 to 4.4% in 2011-2013 ($p<0.05$). Both any treatment and treatment in any medical settings had nonsignificant declines from 2008-2010 to 2014-2017. Self-help treatment only

declined from 1.2% in 2008-2010 to 0.8% (p<0.05) in 2014-2017. For MH treatment, there was a nonsignificant increase from 22.6% in 2008-2010 to 23.9% in 2014-2017.

Next, we examined differences in characteristics of those with an alcohol use disorder across these periods (Table 2). Notably, there were significant health insurance status changes for those with alcohol use disorder. A higher percentage of those with alcohol use disorder reported having Medicaid coverage (13.6%) and private insurance (64.5%) in 2014-2017 compared to 2008-2010 (8.0%, p<0.01; 61.4%, p<0.01). The percentage of those with alcohol use disorder that were uninsured declined from 25.1% in 2008-2010 to 16.0% in 2014-2017 (p<0.01). In addition to increases in insurance coverage, there were significant changes in other enabling characteristics. A higher percentage of those with alcohol use disorder had incomes above $75,000 per year (35.9%) and obtained college degrees or higher (30.6%) in 2014-2017 compared to 2008-2010 (30.0%, p<0.01; 24.5%, p<0.01).

We estimated a multinomial logistic regression to assess whether there were significant changes in the probability of treatment after controlling for changes in predisposing, enabling, and need characteristics during the study period (Table 3). Compared to 2008-2010, the probability of not receiving treatment (versus receiving treatment in any setting) increased by 1.4 percentage points (95% CI= 0.4, 2.4) in 2011-2013 and 1.5 percentage points (95% CI= 0.5, 2.5) in 2014-2017, after adjusting for confounders. There were also significant declines in treatment in medical settings and self-help treatment only. Compared to baseline, the probability of receiving treatment in any medical location declined by 1.3 percentage points in 2011-2013 (95% CI= -2.2, -0.4) and 1.0 percentage points in 2014-2017 (95% CI= -2.0, -0.0). Moreover, the probability of self-help treatment only declined 0.5 percentage points in 2014-2017 (95% CI = -0.8, -0.1).

Insurance status was also associated with trends in alcohol treatment. Compared to being uninsured, those with Medicaid insurance had a lower probability of not receiving any treatment (marginal effect = -2.2 percentage points; 95% CI = -3.9, -0.4). Moreover, Medicaid increased the probability of receiving treatment in a medical location by 2.3 percentage points (95% CI = 0.5, 4.0).

Results from the logistic regression model for MH treatment (Table 4) as the dependent variable were similar to those from the bivariate analysis. After controlling for predisposing, enabling, and need factors, there were no significant differences in respondents' likelihood of receiving any MH treatment across the study period.

Discussion

Treatment among those with alcohol use disorder declined from 6.9% in 2008-2010 to 5.6% in 2011-2013. When predisposing, enabling, and need-related factors were controlled, significant decreases in alcohol use disorder treatment were observed in medical settings and self-help settings. Furthermore, during the study period, the probability of not receiving any treatment increased by 1.4 percentage points in 2011-2013 and 1.5 percentage points in 2014-2017 compared to the baseline 2008-2010.

Our results differ from previous studies of the trends in substance use disorder treatment. Earlier research found no increase in substance use or specialty substance use treatment among those with a substance use disorder from 2005-2014 (14) or 2011-2014 (16). The decline noted in this study may be due to the additional years of data available and/or to differences in the population with an alcohol use disorder compared to the broader population with any substance use disorder.

Although there was a decline in the proportion of those with alcohol use disorder who were uninsured during the study period, the probability of receiving no treatment increased. There are several potential explanations for the observed declines in treatment. First, even with expanded insurance coverage, the out-of-pocket cost may be high for individuals seeking treatment. Although MHPAEA intended to reduce the treatment limitations and cost-sharing patients face when seeking behavioral health care, recent research has questioned whether MHPAEA was effective. In 2017, substance use disorder care was more likely to be out-of-network than medical/surgical care for inpatient visits (10.1x), outpatient visits (8.5x), and office visits (9.5x). These disparities increased for all service types from 2013 to 2017 (27). Out-of-network services have higher cost-sharing than in-network services and are thus more expensive for individuals. Although many individuals with alcohol use disorder gained insurance, the out-of-pocket expenses for receiving alcohol treatment may have been high if seeking out-of-network services (28).

Another possible explanation is that the supply of alcohol treatment facilities is limited, preventing individuals with alcohol use disorder from accessing alcohol treatment. However, data from the National Survey of Substance Abuse Treatment Services (N-SSATS), an annual survey of substance use treatment facilities in the United States, shows a modest increase in the number of facilities offering various alcohol use disorder treatment types during the study period. (29, 30). Even so, the number of individuals who received treatment for alcohol alone or alcohol and drugs in these facilities has decreased every year since 2011, declining from 756,890 in 2011 to 712,480 in 2017 (29). Future research should examine whether an increased emphasis on or increased demand for other types of substance use disorder treatment, such as opioid use disorder, has reduced these facilities' capacity to treat those with alcohol use disorder.

In addition to declines in overall treatment, self-help treatment declined by 0.5 percentage points in 2014-2017 compared to the baseline of 2008-2010. This finding is consistent with data that has reported a steady decline in Alcoholics Anonymous members since 2001 (31). Future efforts to increase treatment rates may need to address attitudinal barriers such as stigma and awareness about the effectiveness of therapies for alcohol use disorder and the financial barriers that were the focus of the ACA and MHPAEA.

The current findings suggest that expanded insurance was not enough to increase rates of alcohol use disorder treatment. Potential interventions to increase demand for treatment among those with alcohol use disorder may be one way to increase treatment. Mass media public awareness campaigns can be a step in this direction, although they may need to be coupled with other demand side and targeted interventions such as advertising restrictions and the targeting of high-risk groups, as the overall evidence base for their efficacy at increasing treatment uptake is relatively weak (32).

It is also notable that there were no significant changes in the likelihood of receiving MH treatment during the study period after controlling for confounders. While the percentage of those with alcohol use disorder with a comorbid MH condition significantly increased during the study period, there was no commensurate increase in MH treatment. These findings suggest that individuals with alcohol use disorder are not likely to substitute for a decline in alcohol treatment with increases in MH treatment.

This study has several limitations. These analyses are descriptive; other unmeasured constructs may confound changes over time, and causality cannot be established in any reported associations. Thus, this study cannot provide reasons for the unexpected decline in alcohol use disorder treatment. Several potential explanations need to be explored in future studies to better

understand these trends, including changes in insurance benefits for alcohol use disorder treatment, changes in the geographic availability and capacity of substance use treatment facilities that offer alcohol use disorder services, changes in screening practices for alcohol use disorder, and changes in attitudes about alcohol use disorder treatment. In addition, the study only contains four years of post-ACA data. Another limitation is that survey design changes in 2015 restricted the measurement of comorbid substance use disorders in these analyses to those consistently measured during the study period (26). Lastly, NSDUH excludes the institutionalized and non-civilian US population. The estimates from this study cannot be generalized to those populations.

Conclusions

This study findings show unexpected declines in the treatment rates for alcohol use disorder in any setting, including medical and self-help settings, in both unadjusted and adjusted analyses. Given the gains in insurance coverage during this period, further research is needed to understand and address the factors responsible for the decline in treatment.

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TABLE 1. Prevalence of adults with alcohol use disorder from 2008-2017 NSDUH[a]

Period	Total N	N	Weighted %
2008-2010	107,893	13,432	8.9
2011-2013	107,713	11,733	8.1[b]
2014-2017	155,868	13,170	7.3[b]

[a] NSDUH, National Survey of Drug Use and Health. P values from adjusted Wald test comparing 2011-2013 and 2014-2017 values to the baseline of 2008-2010
[b] P-value less than .001

TABLE 2. Characteristics of individuals with alcohol use disorder from the 2008-2017 NSDUH[a]

Variables	2008-2010 (N=12,810[b]/12,788[c])		2011-2013 (N=11,211[b]/11,186[c])			2014-2017 (N=12,686[b]/12,654[c])		
	N	Weighted %	N	Weighted %	P[a]	N	Weighted %	P[a]
Alcohol Treatment								
Any	780	6.9	573	5.6	.033	738	5.8	.054
Medical Location	644	5.6	454	4.4	.030	626	5.0	.252
Self-Help Only	136	1.2	119	1.1	.290	112	0.8	.017
Mental Health Treatment	2,504	22.6	2,373	23.3	.365	2,922	23.9	.130
Age								
18-25	8,731	32.7	7,415	30.5	.019	5,756	26.6	<.001
26-34	1,878	25.3	1,650	25.4	.920	3,042	25.2	.918
35-49	1,722	26.9	1,598	27.6	.569	2,933	27.4	.674
50-64	479	15.1	548	16.4	.237	955	20.8	<.001
Male	7,749	65.9	6,658	64.0	.043	7,456	63.2	.009
Race/Ethnicity								
NH-White	8,602	69.6	7,274	67.9	.115	8,002	65.6	<.001
NH-Black	1,218	11.0	1,125	10.2	.377	1,318	11.1	.844
Hispanic	1,910	15.2	1,792	16.7	.049	2,074	16.7	.043
NH-Other	1,080	4.2	1,020	5.2	.014	1,292	6.6	<.001
Marital Status								
Married	2,181	32.3	1,879	32.3	.969	3,053	33.2	.437
Widowed or Divorced	1,121	16.1	1,044	16.3	.829	1,551	16.4	.737
Never Married	9,508	51.6	8,288	51.5	.901	8,082	50.4	.285
Income								
Less than $20,000	3,810	22.2	3,477	23.4	.234	3,086	20.5	.047
$20,000 - $49,999	4,189	31.0	3,691	31.5	.619	3,973	28.3	.002
$50,000 - $74,999	1,908	16.8	1,505	14.8	.031	1,893	15.2	.044
$75,000 or more	2,903	30.0	2,538	30.3	.863	3,734	35.9	<.001
Self-Reported Health Status								
Excellent	2,871	20.3	2,404	20.2	.877	2,444	18.5	.012
Very Good	5,249	39.3	4,626	38.5	.553	5,044	38.5	.447
Good	3,523	28.9	3,084	28.2	.475	3,749	29.8	.293
Fair	1,028	9.6	933	10.6	.091	1,273	11.0	.041
Poor	139	1.9	164	2.5	.147	176	2.1	.506
Education								
Less than high school	2,191	15.8	1,690	14.1	.050	1,537	11.7	<.001
High School Graduate	4,021	29.8	3,366	27.2	.025	3,280	24.3	<.001
Some College/Associate's Degree	4,202	29.9	3,868	30.8	.362	4,569	33.4	<.001
College Graduate and Above	2,396	24.5	2,287	27.9	.001	3,300	30.6	<.001
Employment Status								
Full-Time	6,425	58.7	5,633	57.9	.514	7,442	61.3	.021
Part-Time	2,753	16.9	2,410	15.9	.244	2,199	15.1	.013
Unemployed	1,514	9.9	1,286	9.3	.337	1,089	7.6	<.001
Other	2,118	14.5	1,882	17.0	.005	1,956	16.0	.023
Comorbid Substance Use Disorder	1,997	11.4	1,668	11.1	.664	1,685	11.3	.868
Comorbid Mental Illness	4,458	36.0	4,114	38.8	.009	5,282	39.3	.001
Alcohol Dependence	5,635	46.8	5,123	47.1	.790	6,396	52.3	<.001
Number of Alcohol Use Disorder Criteria								
1-2	4,224	33.6	3,633	33.3	.840	3,908	30.7	.003
3-4	5,362	40.6	4,816	41.3	.550	5,420	42.0	.101
5+	3,224	25.8	2,762	25.4	.649	3,358	27.3	.061
Insurance Status								
Private	7,445	61.4	6,681	60.6	.558	8,009	64.5	.004
Medicaid	1,189	8.0	1,127	8.3	.585	1,837	13.6	<.001
Other Insured	774	5.9	769	6.0	.746	871	6.3	.424
Uninsured	3,402	24.8	2,634	25.0	.824	1,969	15.6	<.001
Health Indicators								
Diabetes	224	3.1	223	3.3	.690	405	4.4	.007
Cirrhosis	23	0.3	29	0.4	.451	45	0.5	.217

Hepatitis B or C	96	1.3	94	1.7	.121	157	1.9	.028
Asthma	1,852	13.0	1,607	13.4	.535	1,607	11.7	.057
HIV or AIDS	32	0.4	22	0.2	.340	40	0.4	.801
High Blood Pressure	1,113	15.2	1,080	15.8	.509	1,234	13.7	.048

[a] NSDUH, National Survey of Drug Use and Health. P values from adjusted Wald test comparing 2011-2013 and 2014-2017 values to the baseline of 2008-2010

[b] Sample for Alcohol treatment models

[c] Sample for Mental Health Treatment model

TABLE 3. Marginal effects (in percentages) for receiving treatment among those with alcohol use disorder from 2008-2017 NSDUH[a]

Variables	No Treatment (Baseline = 93.9%)		Any Medical Location (Baseline = 5.1%)		Self-Help Only (Baseline = 1.1%)	
	ME.	95% CI.	ME.	95% CI.	ME.	95% CI.
Year (reference = 2008-2010)						
2011-2013	1.4**	0.4 to 2.4	-1.3**	-2.2 to -0.4	-0.1	-0.5 to 0.3
2014-2017	1.5**	0.5 to 2.5	-1.0*	-2.0 to -0.0	-0.5**	-0.8 to -0.1
Male	-2.0**	-2.8 to -1.1	1.4**	0.7 to 2.2	0.5**	0.2 to 0.9
Age (reference = 18-25)						
26-34	-2.1**	-3.3 to -0.8	1.9**	0.7 to 3.2	0.1	-0.3 to 0.5
35-49	-4.2**	-5.8 to -2.6	4.1**	2.6 to 5.6	0.1	-0.4 to 0.5
50-64	-3.1*	-5.8 to -0.3	3.4*	0.7 to 6.1	-0.4	-0.9 to 0.2
Race/Ethnicity (ref = NH-White)						
NH-Black	1.9**	0.9 to 2.9	-1.4**	-2.4 to -0.5	-0.5**	-0.8 to -0.1
Hispanic	1.7**	0.7 to 2.7	-1.8**	-2.7 to -0.9	0.1	-0.4 to 0.5
NH-Other	1.5*	0.3 to 2.7	-1.3*	-2.3 to -0.2	-0.2	-0.7 to 0.3
Marital Status (ref = Married)						
Widowed or Divorced	-2.0**	-3.5 to -0.5	2.1**	0.7 to 3.5	-0.1	-0.6 to 0.4
Never Married	-1.3*	-2.6 to -0.1	1.5*	0.3 to 2.7	-0.1	-0.6 to 0.3
Income (ref = 75,000+)						
Less than $20,000	-1.3	-2.9 to 0.2	1.5	0.0 to 3.0	-0.2	-0.6 to 0.2
$20,000 - $49,999	-0.6	-2.0 to 0.9	0.7	-0.6 to 2.1	-0.2	-0.6 to 0.3
$50,000 - $74,999	-1.2	-3.1 to 0.7	1.3	-0.5 to 3.2	-0.1	-0.6 to 0.3
Self-Reported Health Status (ref = Excellent)						
Very Good	-0.3	-1.6 to 1.1	0.3	-1.1 to 1.6	0.0	-0.5 to 0.5
Good	-1.4	-2.9 to 0.1	1.3	-0.1 to 2.8	0.1	-0.5 to 0.6
Fair	0.2	-1.3 to 1.8	-0.7	-2.1 to 0.8	0.4	-0.4 to 1.3
Poor	0.8	-1.5 to 3.1	-0.3	-2.5 to 1.9	-0.5	-1.5 to 0.4
Insurance Status (ref = Uninsured)						
Private	-0.5	-1.7 to 0.6	0.7	-0.4 to 1.7	-0.1	-0.6 to 0.3
Medicaid	-2.2*	-3.9 to -0.4	2.3*	0.5 to 4.0	-0.1	-0.5 to 0.4
Other Insured	-1.5	-3.3 to 0.3	0.9	-0.5 to 2.4	0.5	-0.5 to 1.6
Education (ref = High School Graduate)						
Less than high school	-0.3	-1.4 to 0.8	0.1	-0.9 to 1.1	0.2	-0.5 to 0.9
Some College	-0.7	-2.0 to 0.5	0.2	-0.8 to 1.3	0.5	-0.0 to 1.0
College Graduate and above	0.3	-1.3 to 1.7	-0.4	-1.9 to 1.0	0.2	-0.3 to 0.8
Employment Status (ref = Full-Time						
Part-Time	-0.9	-2.3 to 0.5	1.1	-0.3 to 2.4	-0.2	-0.7 to 0.3
Unemployed	-3.6**	-5.4 to -1.9	3.8**	2.1 to 5.5	-0.1	-0.8 to 0.5
Other	-2.8**	-4.4 to -1.2	3.0**	1.5 to 4.5	-0.2	-0.7 to 0.3
Comorbid substance use disorder	-5.1**	-6.5 to -3.8	4.4**	3.1 to 5.6	0.8*	0.1 to 1.4
Comorbid Mental Illness	-3.6**	-4.5 to -2.7	3.1**	2.3 to 4.0	0.5**	0.2 to 0.9
Alcohol Dependence (ref = Abuse)	-5.7**	-6.6 to -4.8	5.0**	4.2 to 5.9	0.7**	0.3 to 1.0
Health Indicators						
Diabetes	0.4	-1.3 to 2.1	-0.1	-1.6 to 1.5	-0.3	-1.2 to 0.6
Cirrhosis	-5.0	-10.8 to 0.8	6.1*	0.3 to 11.8	-1.1**	-1.2 to -0.9
Hepatitis B or C	-3.7	-7.6 to 0.1	1.1	-1.4 to 3.6	2.7	-0.2 to 5.5
Asthma	-0.5	-1.9 to 0.9	0.6	-0.7 to 1.9	-0.1	-0.7 to 0.5
HIV or AIDS	-0.0	-5.6 to 5.6	-1.9	-4.6 to 0.9	1.9	-4.0 to 7.8
High Blood Pressure	-0.4	-1.8 to 1.0	0.6	-0.7 to 1.9	-0.2	-0.7 to 0.3

[a] NSDUH, National Survey of Drug Use and Health

*p<.05, **p<.01

TABLE 4. Marginal effects (in percentages) for receiving mental health treatment among those with alcohol use disorder from 2008-2017 NSDUH[a]

Variables	Mental Health Treatment (Baseline = 23.3%)[b]	
	ME.	95% CI.
Year (reference = 2008-2010)		
2011-2013	-0.6	-1.8 to 0.6
2014-2017	-1.3	-3.0 to 0.4
Male	-11.6**	-13.3 to -9.8
Age (reference = 18-25)		
26-34	4.3**	2.4 to 6.3
35-49	7.9**	5.5 to 10.2
50-64	8.1**	4.9 to 11.3
Race/Ethnicity (ref = NH-White)		
NH-Black	-8.7**	-10.5 to -6.8
Hispanic	-8.0**	-9.8 to -6.1
NH-Other	-7.4**	-9.3 to -5.5
Marital Status (ref = Married)		
Widowed or Divorced	2.4*	0.1 to 4.7
Never Married	0.6	-1.4 to 2.7
Income (ref = 75,000+)		
Less than $20,000	-0.8	-3.1 to 1.6
$20,000 - $49,999	-2.3*	-4.1 to -0.6
$50,000 - $74,999	-0.3	-2.4 to 1.9
Self-Reported Health Status (ref = Excellent)		
Very Good	0.1	-1.9 to 2.1
Good	3.0*	0.7 to 5.2
Fair	3.2*	0.3 to 6.1
Poor	3.1	-2.9 to 9.0
Insurance Status (ref = Uninsured)		
Private	6.2**	4.6 to 7.8
Medicaid	10.8**	7.8 to 13.8
Other Insured	9.7**	5.4 to 14.1
Education (ref = High School Graduate)		
Less than high school	-2.7*	-5.0 to -0.5
Some College	1.9*	0.1 to 3.7
College Graduate and above	6.0**	3.6 to 8.4
Employment Status (ref = Full-Time		
Part-Time	2.8**	0.7 to 4.8
Unemployed	5.7**	3.2 to 8.2
Other	7.4**	5.0 to 9.8
Comorbid substance use disorder	3.3**	1.5 to 5.2
Comorbid Mental Illness	24.0**	22.5 to 25.6
Alcohol Dependence (ref = Abuse)	4.1**	2.6 to 5.7
Health Indicators		
Diabetes	0.8	-2.9 to 4.5
Cirrhosis	1.6	-8.3 to 11.5
Hepatitis B or C	5.9	-0.4 to 12.3
Asthma	1.5	-0.5 to 3.6
HIV or AIDS	13.9*	1.8 to 26.0
High Blood Pressure	3.9**	1.7 to 6.2

[a] NSDUH, National Survey of Drug Use and Health
[b] Sample of 36,707 compared to 36,628 for alcohol treatment
*p<.05, **p<.01