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Probability and predictors of treatment-seeking for substance use disorders in the U.S

Carlos Blanco^{a,*}, Miren Iza^{a,b}, Jorge Mario Rodríguez-Fernández^a, Enrique Baca-García^{a,b}, Shuai Wang^a, and Mark Olfson^a

^aNew York State Psychiatric Institute, New York, NY, USA

^bFundación Jiménez-Díaz, Department of Psychiatry, Madrid, Spain

Abstract

Background—Little is known about to what extent treatment-seeking behavior varies across individuals with alcohol abuse, alcohol dependence, drug abuse, and drug dependence.

Methods—The sample included respondents from the Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) who reported a lifetime diagnosis alcohol abuse, alcohol dependence, drug abuse, or drug dependence. Unadjusted and adjusted hazard ratios are presented for time to first treatment contact by sociodemographic characteristics and comorbid psychiatric disorders. Individuals were censored from the analyses if their condition remitted prior to seeking treatment.

Results—In the first year after disorder onset, rates of treatment-seeking were 13% for drug dependence, 5% for alcohol dependence, 2% for drug abuse, and 1% for alcohol abuse. The lifetime probability of seeking treatment among individuals who did not remit was also highest for drug dependence (90%), followed by drug abuse (60%), alcohol dependence (54%), and alcohol abuse (16%). Having had previous treatment contact for a substance use disorder (SUD) increased the probability of seeking treatment for another SUD. By contrast, an early age of SUD onset, belonging to an older cohort, and a higher level of education decreased the lifetime probability of treatment contact for SUD. The role of comorbid mental disorders was more complex, with some disorders increasing and other decreasing the probability of seeking treatment.

Conclusions—Given high rates of SUD and their substantial health and economic burden, these patterns suggest the need for innovative approaches to increase treatment access for individuals with SUD.

Keywords

Treatment-seeking; Substance use disorders; Comorbidity; NESARC

*Corresponding author at: Department of Psychiatry, New York State Psychiatric Institute/Columbia University New York, NY 10032, USA. Tel.: +1 646 774 8111; fax: +1 646 774 8105. cb255@columbia.edu (C. Blanco).

Contributors

Carlos Blanco designed the study and wrote the initial draft of the manuscript. Shuai Wang undertook the statistical analysis. All authors contributed to and have approved the final manuscript.

Conflict of Interest Statement

All the authors declare that they have no conflicts of interest.

1. Introduction

Substance use disorders (SUDs) are pervasive in the general population and result in critical threats to health and well-being, substantial family distress, and a massive societal economic burden (Blanco et al., 2013c; Compton et al., 2007; Hasin et al., 2007; Mokdad et al., 2004; Rubio et al., 2014, 2013). Alcohol consumption ranks third among preventable causes of death (Mokdad et al., 2004) and drug offenses are the leading cause of incarceration with half of federal inmates reporting illegal drug use in the month before their offense (Mumola and Karberg, 2004). Illicit drug use accounts for nearly two hundred billion dollars each year in healthcare, lost productivity, incarceration, and drug enforcement costs (NDIC, 2014).

Despite their high prevalence and numerous associated adverse health consequences (Aharonovich et al., 2002; Blanco et al., 2014b; Degenhardt and Hall, 2012; García-Rodríguez et al., 2014), many individuals with SUD do not receive treatment (Blanco et al., 2013a; Compton et al., 2007; Edlund et al., 2012; Hasin et al., 2007; Kessler et al., 1999; Olfson et al., 1998; Regier et al., 1993). The great extent of unmet need for substance abuse treatment underscores the critical public health importance of understanding factors that promote the flow of individuals with SUDs into treatment. Although there are important differences between perceived and objective need for substance abuse treatment (Mojtabai et al., 2002), quality of life substantially declines following the onset of SUD (Rubio et al., 2014). Because individuals with SUDs who receive treatment increase their likelihood of remission and decrease their likelihood of developing new SUDs, increasing access to SUD treatment tends to improve outcome (Blanco et al., 2014a). Of course, SUD treatment is often court mandated or occurs following the pressure exerted by friends or family members (Cook and Alegria, 2011).

Epidemiological research has sought to identify personal characteristics that either facilitate or impede treatment-seeking for SUD. Among individuals with SUDs, factors that have been associated with lower rates of SUD treatment include an earlier age of SUD onset, being married, membership in an older cohort, minority racial/ethnic ancestry, and having attained less than a high school education (Alegria et al., 2002; Gee et al., 2007; Grant, 1996; Sue et al., 1991; Sussman et al., 1987; Wang et al., 2005, 2004, 2002). Although adults with SUDs commonly have comorbid of Axis II and other Axis I psychiatric disorders (Armstrong and Costello, 2002; Blanco et al., 2013b, 2015; Havassy et al., 2004; Kessler et al., 1997; Merikangas et al., 1998; Mertens et al., 2003), the effect of psychiatric comorbidity on treatment-seeking for SUD has not been previously examined. Furthermore, despite wide variation in prevalence, severity, and associated adverse consequences (Compton et al., 2007; Hasin et al., 2007), differences in treatment seeking behavior of people with alcohol abuse, alcohol dependence, drug abuse, and drug dependence have not been extensively characterized (Wang et al., 2005).

This study draws on data from a large nationally representative sample of US adults with SUD to evaluate treatment-seeking for SUDs. Our goal is to assess the effects of type of SUD, treatment history, comorbid psychiatric disorders, and sociodemographic characteristics lifetime probability of SUD treatment.

2. Methods

2.1. Sample

The 2004–2005 Wave 2 NESARC (Grant et al., 2007b) is the second wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) (Grant et al., 2003a). The target population was the civilian non-institutionalized population, 18 years and older residing in households and group quarters (e.g., college quarters, group homes, boarding houses, and non-transient hotels). In Wave 2, attempts were made to conduct face-to-face re-interviews with all 43,093 respondents to the Wave 1 interview. Excluding respondents ineligible for the Wave 2 interview (e.g., deceased), the Wave 2 response rate was 86.7%; thus, 34,653 respondents completed Wave 2 interviews. Sample weights were developed to additionally adjust to Wave 2 non-response (Ruan et al., 2008). Comparisons between Wave 2 respondents and the target population (comprising Wave 2 respondents and eligible non-respondents) indicated that there were no significant differences in baseline (Wave 1) sociodemographic measures or the presence of any lifetime substance, mood, anxiety, or personality disorder (Grant et al., 2007a).

2.2. Assessment

Extensive AUDADIS-IV questions probed DSM-IV criteria for alcohol and drug-specific abuse and dependence for 10 classes of substances, aggregated in this report to yield diagnoses of any drug abuse and any drug dependence (Compton et al., 2007). Among individuals with drug abuse, the most commonly abused drugs were cannabis (77.8% of individuals), cocaine (19.5%), and hallucinogens (15.3%), whereas among those with dependence, the most common drugs were cannabis (51.6%), cocaine (35.0%), and amphetamine (21.1%). Good to excellent ($k = 0.70$ – 0.91) test–retest reliability of AUDADIS-IV SUD diagnoses have been documented in clinical and general population samples (Canino et al., 1999; Chatterji et al., 1997; Grant et al., 2003b, 1995; Hasin et al., 1997a). Convergent, discriminant and construct validity of AUDADIS-IV SUD criteria, and diagnoses were good to excellent (Cottler et al., 1997; Hasin et al., 1997b; Hasin and Paykin, 1999; Hasin et al., 1990, 1994, 2003, 1997c; Nelson et al., 1999; Pull et al., 1997; Ustun et al., 1997; Vrasti et al., 1998).

2.3. Statistical Analyses

Weighted cross-tabulations were used to calculate the proportion of respondents with lifetime alcohol abuse, alcohol dependence, drug abuse, and drug dependence who had ever sought treatment for their disorder. The tabulations were stratified by sociodemographic and clinical characteristics. Kaplan–Meier analyses were conducted to estimate the cumulative probability of treatment-seeking for each disorder. For all analyses, consistent with DSM-IV, abuse and dependence were treated hierarchically.

To assess the effects of sociodemographic and clinical characteristics on probability of SUD treatment contact among those with lifetime diagnoses of SUD, Cox proportional hazards models with time-varying covariates were performed. Retrospective follow-up time started at age of disorder onset and terminated at age of first treatment contact or remission of the disorder. The probabilities of treatment-seeking for alcohol abuse, alcohol dependence, drug

abuse, and drug dependence were first modeled separately for each individual sociodemographic and diagnostic predictor and again in a single model that controlled for the potentially confounding effects of sex, race/ethnicity, nativity, age at disorder onset, education years, marital status, and each of the other Axis I and II categories. Comorbid mental disorders, marital status, and educational level were also added as time varying variables. Comorbid disorders were coded as absent until their first occurrence, and then coded as present until the observation was censored. Marital status was coded as single until the individual was married for the first time (or coded as single until the observation was censored) and then modified each year the individual changed marital status. For each participant, a maximum of two changes were coded, including the first and most recent change in marital status. Educational level was coded as starting at age six and increasing each year by one until the highest level of education was achieved. For example, an individual completing high school would be coded starting at age six with one additional year of education until age 18.

Personality disorders were coded as lifetime disorders with onset at age 18. The variance inflation factor (VIF) was used to assess possible collinearity among the variables included in the multivariable models. For all analyses, individuals were censored at the time of remission if remission occurred before seeking treatment. Results are reported as hazard ratios and adjusted hazard ratios with associated 95% confidence intervals (95% CI). Standard errors and 95% CI for all analyses were estimated using SUDAAN to adjust for the complex design of the NESARC.

3. Results

3.1. Cumulative lifetime probability of treatment-seeking for substance use disorders

Regardless of the timeframe considered (one year after disorder onset, first 10 years after onset, or lifetime), the probability of treatment-seeking was highest for drug dependence followed by alcohol dependence, drug abuse, and alcohol abuse. In the first year after disorder onset, rates of treatment-seeking among individuals who did not remit were 13% for drug dependence, 5% for alcohol dependence, 2% for drug abuse, and 1% for alcohol abuse. After 10 years, the highest rates of seeking treatment continued to be among those with drug dependence (43%) followed by those with alcohol dependence (19%). Less common was the treatment seeking for drug abuse (14%) and for alcohol abuse (5%). The lifetime probability of seeking treatment among individuals who did not remit was also highest for those with drug dependence (90%), followed by drug abuse (60%), alcohol dependence (54%), and alcohol abuse (16%). Among those who sought treatment, the midpoints in the cumulative probability distributions were 12 years for drug dependence, 18 years for alcohol dependence, 20 years for alcohol abuse, and 23 years for drug abuse (Fig. 1).

3.2. Univariate Analyses

In the univariate analyses, an increased likelihood of treatment across for all disorders was related to later onset of disorder, belonging to a more recent cohort, having never been married, and having sought treatment previously for another mental or substance use

disorder. Having a change in marital status increased the probability of treatment across all disorders except alcohol abuse, whereas having less than a high school education and being widowed, separated or divorced, increased the probability of treatment for all disorders except for drug dependence. Being Black, Hispanic, or foreign-born increased the likelihood of treatment for alcohol abuse. Males had a greater probability of treatment than females for alcohol abuse, but a decreased probability compared with females of treatment for drug abuse (Table 1).

Most comorbid Axis I disorders increased the probability of treatment for alcohol dependence, drug abuse, and dependence. However, the effect of personality disorders was less consistent. The likelihood of treatment for alcohol abuse was increased by comorbid drug abuse and dependence, major depressive disorder, bipolar disorder, and four personality disorders (avoidant, borderline, histrionic, and antisocial; Table 2).

3.3. Multivariable Analyses

After adjusting for the effects of other covariates, fewer factors significantly predicted treatment-seeking. Across all SUDs, having previously sought treatment for another SUD-predicted treatment. In the multivariable models, a history of prior mental health treatment also predicted treatment for alcohol abuse and drug dependence. A later age of onset, having never been married and receiving less than a college education continued to increase the probability of treatment-seeking for alcohol abuse and dependence, but not for drug abuse or dependence.

Younger cohorts had a greater probability of seeking treatment for drug and alcohol abuse, whereas there was no cohort effect for treatment of alcohol or drug dependence. Being widowed, separated, or divorced was associated greater probability of treatment for alcohol abuse and dependence, whereas changes in marital status were associated with lower probability of treatment for alcohol abuse. Male sex was associated with an increased probability for treatment of alcohol abuse but a decreased probability for treatment of alcohol dependence, whereas being Native American was associated with a lower probability of treatment of drug abuse (Table 3).

Among Axis I disorders, alcohol abuse decreased the probability of treatment of drug abuse, whereas alcohol dependence decreased the probability of treatment of drug abuse and dependence. Complementary analyses indicated that among individuals with drug dependence, the adjusted hazard ratio for treatment of drug dependence was 1.04 (95% CI: 0.79, 1.36) among individuals who did not seek treatment for alcohol dependence and 0.58 (95% CI: 0.42, 0.80) among individuals with treated alcohol dependence. Dysthymia increased the probability of treatment of alcohol dependence and drug abuse, comorbid major depressive disorder was associated with greater probability of treatment of alcohol abuse and comorbid bipolar disorder was associated with increased probability of treatment of alcohol abuse and dependence. Comorbid-specific phobia was associated with a lower probability of treatment of alcohol abuse and comorbid pathological gambling with a lower probability of treatment of drug abuse, whereas comorbid PTSD increased the probability of treatment of alcohol dependence.

Among personality disorders, dependent personality disorder increased the probability of treatment of alcohol dependence, schizoid personality disorder was associated with increased treatment of drug abuse, and avoidant personality disorder increased the probability of treatment for drug dependence. By contrast, narcissistic personality disorders lowered the probability of treatment of alcohol abuse and antisocial personality disorder lowered the probability of treatment of drug dependence (Table 4). VIFs for all variables in the multivariable model were less than two, indicating there were not substantial collinearity problems in the estimations.

4. Discussion

In a large nationally representative sample, the lifetime probability of treatment-seeking was highest for drug dependence, followed by drug abuse, alcohol dependence, and alcohol abuse. A history of SUD treatment increased the probability of treatment for all SUD disorders while a history of mental health treatment only increased the probability of treatment for alcohol abuse and drug dependence. A later age of onset and not receiving a college education increased the likelihood of treatment for alcohol abuse and dependence. The effects of comorbid psychiatric disorders on treatment-seeking were more complex and varied by disorder.

In keeping with prior US studies (Olfson et al., 1998; Wang et al., 2005), the rates of treatment-seeking were low for the first several years after onset of the disorder for all SUDs. A novel finding of our study was that time to first treatment contact varied substantially across SUD diagnoses in the year after diagnosis and over the lifetime of the individual. There was a lower probability of treatment, regardless of the timeframe considered, for drug dependence followed by alcohol dependence, drug abuse, and alcohol abuse. This ordering is consistent with the extent of their overall impact on quality of life and daily function (Compton et al., 2007; Hasin et al., 2007; Rubio et al., 2014). Symptoms of withdrawal, which are common to dependence but not of abuse criteria (Compton et al., 2007; Hasin et al., 2007; Hedden and Gfroerer, 2011), may also lead to greater perceived need among individuals with substance dependence than abuse and motivate greater treatment-seeking behavior. As compared to individuals with abuse, those with dependence might also experience greater social pressure to seek treatment exerted by family, economic realities, or legally-related consequences of their behavior.

Stigma (Farley-Toombs, 2012), a tendency to externalize responsibility for their behavior (Olfson et al., 1998; Wang et al., 2005), low perceived need for treatment (Mojtabai et al., 2002), and limited availability of treatment facilities (Cummings et al., 2014) may contribute to low treatment-seeking by individuals with SUD. A focus on the short-term euphoric effects of drug use and negligence of longer-term negative consequences may also diminish motivation to seek treatment. In contrast to the dysphoric states that coincide with onset of mood and anxiety disorders, substantial delays may occur in the onset of adverse subjective states in drug use (Arria et al., 2012; Zuvekas and Hill, 2000). It is also possible that treatments for SUD may be perceived as not efficacious as treatments for mental disorder, which may further impede treatment-seeking for SUDs (Mojtabai and Crum, 2012). In

addition, some mental health professionals may be reluctant to treat individuals with SUDs (Moodley-Kunnie, 1988).

In accord with prior research on help seeking for behavioral health care (Christiana et al., 2000; Kessler et al., 1998; Wang et al., 2005), an earlier age of onset tended to decrease the probability of treatment-seeking. Younger individuals often depend on their parents to recognize their symptoms and assist them into care (Dakwar et al., 2014). However, many parents are not aware of the extent and deleterious effects of substance use by their children (Green et al., 2011). Nevertheless, given the strong association of earlier age of onset with greater disorder severity and functional limitations, the lower likelihood of treatment-seeking among younger individuals represents an important challenge for health planners. Higher rates of treatment-seeking among people who were members of more recent cohorts could be due to increased perceived need for treatment among these individuals, less stigma, and greater knowledge of treatment availability or effectiveness (Kessler et al., 1998; Mackenzie et al., 2012; Wang et al., 2005).

Prior treatment of SUDs markedly increased the likelihood of treatment following onset of new SUDs. Familiarity with the treatment system may contribute to treatment seeking when new SUDs arise. By serving as a marker of severity, comorbid SUDs may also increase the likelihood of treatment-seeking (Chiappetta et al., 2014; Compton et al., 2007; Garcia-Rodriguez et al., 2013; Hasin et al., 2007; Rubio et al., 2014, 2013).

A history of mental health treatment was less robustly related to treatment seeking for new SUDs. Pervasive problems exist in integrating substance abuse treatment with other mental health services (Drake et al., 1998, 1996; McGovern and McLellan, 2008; McGovern et al., 2007; Watkins et al., 2005). Screening for SUD remains uneven (Pilowsky and Wu, 2012); some mental health professionals receive only limited training in SUD treatment and/or lack confidence in their ability to treat SUD. Negative perceptions of individuals with SUD may further impede referrals from general mental health to SUD treatment. Although screening, brief intervention, and referral for treatment (SBIRT) models (Babor et al., 2007; Bernstein et al., 2009) have shown some promise, our data suggests that the integration of treatment for SUD and other psychiatric disorders continues to be an area with great opportunities for improving access to care.

Individuals who had not attended college were more likely to seek treatment for alcohol abuse and dependence than their college-educated peers. This contrasts with findings in mood and anxiety disorders (Olfson et al., 2012; Wang et al., 2005), but is in accord with recent findings from the National Survey on Drug Use and Health indicating that socioeconomically less-advantaged groups are more likely to receive treatment for SUD (Cook and Alegria, 2011). A similar education effect was not observed for treatment of drug use and dependence, which might be related to the greater role of mandated treatment in drug versus alcohol use disorders.

The effects of comorbid psychiatric disorders on treatment-seeking for SUD was substantially smaller than previously reported corresponding effects on treatment-seeking for mood (Moreno et al., 2012; Olfson et al., 2012) or anxiety disorders (Iza et al., 2013).

The smaller effects on treatment-seeking for SUD are consistent with a predominance of external factors, rather than internal motivation on treatment-seeking for SUD. In the multivariable models, bipolar disorder increased the likelihood of treatment-seeking for alcohol abuse and dependence, but not for drug abuse or dependence. The reason for these associations may be related to the differences in the pharmacological effects of alcohol and drugs or their effects on bipolar symptoms. It is also possible that alcohol abuse and dependence are perceived as more severe in the presence of mood swings, whereas comorbidity of bipolar disorder does not increase the perceived severity of drug abuse and dependence. Furthermore, individuals with bipolar and alcohol use disorders, which commonly co-occur (Blanco et al., 2002; Hasin et al., 2007; Oquendo et al., 2010), may enter the treatment system through the treatment of bipolar disorder and then be referred for the treatment of their alcohol abuse or dependence, while individuals with bipolar disorder and drug abuse or dependence seek help directly in substance abuse treatment-settings.

Increased probability of treatment-seeking among individuals with avoidant and schizoid personality disorder may be related to their high degree of social isolation (Davis et al., 2013). The reasons for the association between dysthymia and increase treatment-seeking for alcohol dependence and drug abuse, but not for alcohol abuse or drug dependence are less clear and deserve further study.

In the adjusted models, several disorders decreased the likelihood of treatment-seeking. These included specific phobia and narcissistic personality disorder for alcohol abuse as well as alcohol dependence, alcohol abuse for drug abuse, antisocial personality for drug dependence, and alcohol dependence for drug abuse and dependence. Fears regarding the health care system (specific phobias), increased interpersonal sensitivity to rejection (narcissistic personality disorder), comorbidity with other SUD (alcohol abuse and dependence), or a heightened tendency to externalize problems (antisocial personality disorder) may contribute to avoidance of help-seeking. The findings about pathological gambling may be related to the low treatment-seeking rates for this disorder (Blanco et al., 2006).

The findings of this study should be interpreted in light of several limitations. First, as in previous studies of probability of treatment-seeking (Wang et al., 2004; Olfson et al., 2012), information about health insurance coverage, income, and geographic location for each year of the person's life was not available. Second, we examined patterns of treatment-seeking among all individuals with SUD. Because many individuals achieve remission without accessing treatment (Blanco et al., 2013c; Lopez-Quintero et al., 2011), it is possible that some individuals with SUD may not require treatment, although recent data suggest that treatment for SUD increases the probability of remission and decreases the probability of new onset of other SUDs (Blanco et al., 2014a). There is a need to systematically examine how to most appropriately define objective need for the treatment. Third, information on some potentially important determinants of help-seeking, such as local availability of SUD treatment services (Cummings et al., 2014), was not available. Fourth, we based our analyses in DSM-IV categories. Recent work proposes cross-walks between DSM-IV and DSM-5 disorders and suggests different potential thresholds (Compton et al., 2013). Our analyses, indicating that more severe SUD categories are associated with greater likelihood

of treatment suggest that higher thresholds in those cross-walks tend to be associated with greater rates of treatment. Future studies, collecting information on DSM-5 categories should test this prediction. Fifth, to maximize statistical power and increase the stability of the estimates, we examined jointly bipolar I and II disorders, although SUDs are more strongly associated with bipolar I than bipolar II disorder and they may differ in their clinical characteristics, patterns of comorbidity, course, and prognostic implications (Chamorro et al., 2012; Moreno et al., 2012; Sala et al., 2014, 2012). Similarly, we examined all drugs together, although patterns of treatment-seeking may vary by drug.

Seeking help for substance use disorders is a complex process that involves individual, clinical, social, economic, cultural, and, sometimes, legal determinants. We found that greater severity of substance use severity as measured by dependence rather than abuse and having received previous SUD treatment markedly increase the likelihood of seeking treatment for a new SUD. Past treatment of psychiatric disorders modestly increased treatment of alcohol abuse. Early age of SUD onset, belonging to an earlier birth cohort, and receiving higher education all decreased the probability of SUD treatment contact. Psychiatric comorbidity operated in a more complex manner with some disorders increasing and other decreasing the probability of treatment-seeking. Given the high rates of SUD, their substantial toll on the individual and society, and the importance of external rather than internal motivators for treatment, these patterns suggest the need for innovative approaches to increase timely access to care for individuals with SUD.

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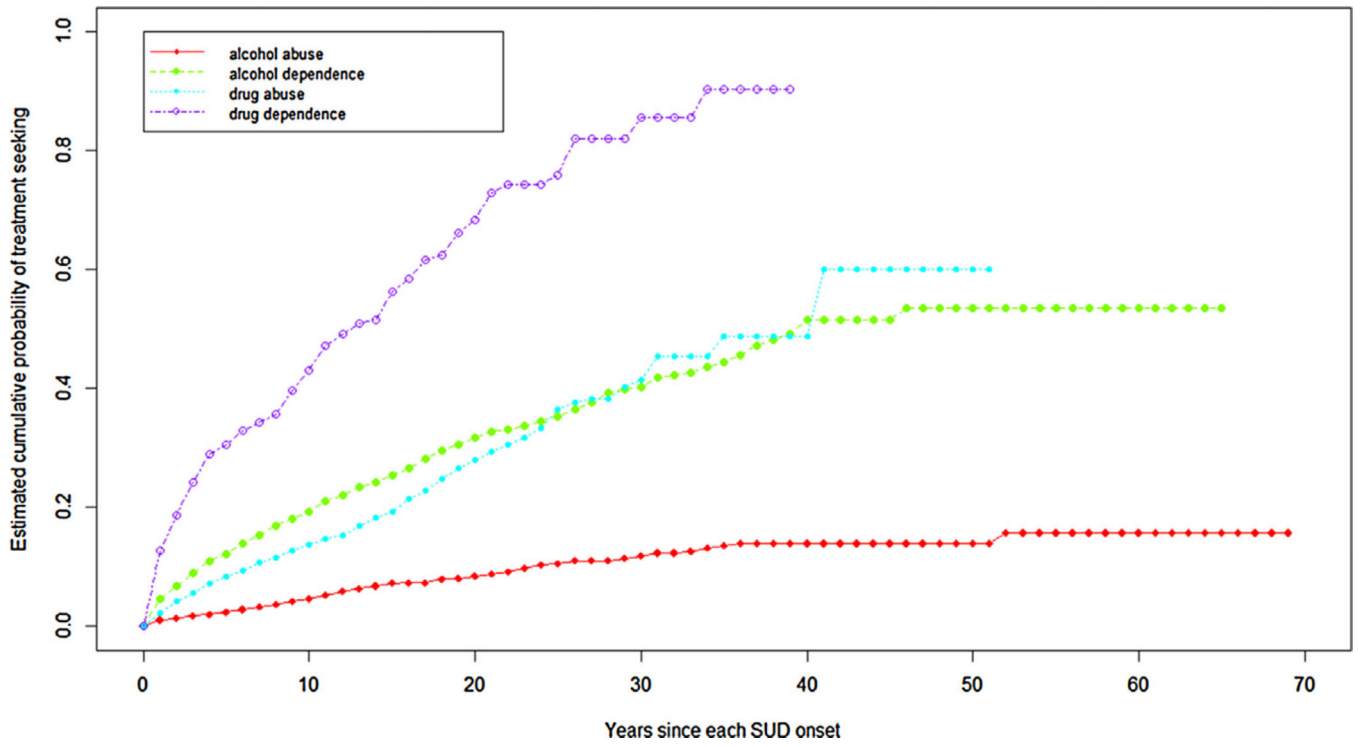


Fig. 1.
Cumulative probability of treatment for substance use disorders.

Table 1
Sociodemographic predictors of first treatment contact in individuals with each SUD (univariate analyses).

Variable	Alcohol abuse (N = 5947)		Alcohol dependence (N = 4863)		Drug abuse (N = 3228)		Drug dependence (N = 1062)					
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI				
Sex												
Male	1.39	1.01	1.90	1.08	0.90	1.28	0.98	0.90	0.64	1.26		
Female	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Race/ethnicity												
White	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Blacks	1.42	0.89	2.26	1.08	0.85	1.38	0.81	0.56	1.17	0.75	1.04	
Native	1.07	0.46	2.52	1.49	0.97	2.31	0.34	0.11	1.00	0.54	1.22	
Americans												
Asians	1.57	0.41	6.01	0.41	0.13	1.30	1.52	0.48	4.78	0.93	0.25	3.42
Hispanic	2.28	1.46	3.56	1.06	0.81	1.38	1.40	0.96	2.04	1.05	0.66	1.67
Nativity												
US born	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Foreign born	1.90	1.14	3.16	0.87	0.57	1.31	1.65	0.90	3.00	1.71	0.93	3.13
Age at onset	1.06	1.04	1.08	1.05	1.04	1.06	1.02	0.99	1.05	1.05	1.02	1.08
Educational years												
0–11	3.76	2.18	6.47	1.75	1.28	2.39	2.08	1.18	3.65	1.01	0.53	1.92
12	2.22	1.41	3.50	1.67	1.30	2.14	1.40	0.80	2.43	1.14	0.67	1.95
13–15	1.86	1.16	2.99	1.55	1.22	1.98	1.69	1.01	2.83	1.00	0.58	1.73
>16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Cohort												
1976–1985	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1966–1975	0.63	0.36	1.12	0.73	0.54	1.01	0.40	0.26	0.61	0.44	0.30	0.66
1956–1965	0.35	0.20	0.62	0.76	0.56	1.03	0.27	0.18	0.41	0.25	0.15	0.41
1946–1955	0.23	0.13	0.40	0.62	0.45	0.86	0.13	0.07	0.22	0.17	0.09	0.32
1936–1945	0.20	0.11	0.36	0.56	0.38	0.83	0.09	0.03	0.22	0.24	0.11	0.50
1901–1935	0.10	0.05	0.20	0.37	0.21	0.65	<0.01	<0.01	<0.01	0.05	<0.01	0.52
Marital status												

Variable	Alcohol abuse (N = 5947)		Alcohol dependence (N = 4863)		Drug abuse (N = 3228)		Drug dependence (N = 1062)	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Married	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Widowed/separated/divorced	2.20	1.51	3.20	1.77	1.45	2.15	0.93	0.55
Never married	3.43	2.53	4.64	1.75	1.41	2.16	1.40	0.97
Marital transition (any change in marital status)	1.01	0.64	1.59	1.29	1.06	1.57	1.95	1.39
Past substance use disorder treatment	11.32	6.22	20.61	7.55	5.89	9.69	15.59	11.41
Past mental health treatment	2.57	1.67	3.95	1.84	1.51	2.24	3.02	2.10
							2.32	1.67
							9.43	6.67
							21.30	13.32
							2.73	1.22
							1.65	2.23
							1.42	2.18
							1.00	1.48
							1.00	0.54
							1.00	0.92
							1.00	2.32

Table 2
Comorbidity predictors of first treatment contact in individuals with substance use disorders (univariate analyses).

Variable	Alcohol abuse (N = 5947)			Alcohol dependence (N = 4863)			Drug abuse (N = 3228)			Drug dependence (N = 1062)		
	HR	95% CI		HR	95% CI		HR	95% CI		HR	95% CI	
Alcohol abuse	N/A	N/A	N/A	1.02	0.62	1.68	0.44	0.27	0.71	0.77	0.46	1.30
Alcohol dependence	N/A	N/A	N/A	N/A	N/A	N/A	1.58	1.23	2.03	1.17	0.89	1.55
Any drug abuse	2.37	1.52	3.70	1.66	1.34	2.05	N/A	N/A	N/A	0.90	0.66	1.24
Any drug dependence	3.78	1.76	8.14	3.28	2.55	4.21	N/A	N/A	N/A	N/A	N/A	N/A
Nicotine dependence	1.22	0.82	1.81	1.46	1.22	1.73	2.05	1.43	2.94	1.31	0.96	1.77
Mood disorders	3.02	2.02	4.51	1.94	1.58	2.37	2.70	1.93	3.77	1.85	1.36	2.51
Dysthymia	2.36	0.62	9.00	2.02	1.48	2.76	4.15	2.38	7.24	1.71	1.08	2.71
MDD	2.17	1.22	3.86	1.48	1.14	1.94	1.89	1.19	3.00	1.28	0.81	2.01
Bipolar disorder	4.64	2.78	7.73	2.03	1.56	2.64	2.33	1.46	3.70	1.76	1.16	2.67
Any anxiety disorder	0.68	0.43	1.10	1.28	1.06	1.55	1.60	1.17	2.20	1.40	1.01	1.93
Generalized anxiety disorder	1.61	0.58	4.47	2.14	1.48	3.10	2.43	1.32	4.47	1.73	1.07	2.81
Social anxiety disorder	0.59	0.22	1.57	1.24	0.93	1.64	1.17	0.70	1.94	0.87	0.53	1.44
Panic disorder	0.83	0.25	2.78	1.95	1.35	2.80	1.90	1.02	3.56	1.79	1.16	2.75
Specific phobia	0.53	0.29	0.96	1.02	0.79	1.30	1.50	0.97	2.30	1.36	0.93	2.00
PTSD	1.80	0.72	4.51	1.89	1.35	2.64	2.55	1.38	4.70	1.57	0.86	2.88
Pathological gambling	3.28	0.43	25.38	0.70	0.23	2.13	<0.01	<0.01	<0.01	0.66	0.16	2.74
ADHD	1.95	0.54	7.07	1.57	1.10	2.25	1.84	1.17	2.89	1.07	0.61	1.88
Any personality disorder	1.45	1.10	1.90	1.29	1.09	1.51	1.46	1.05	2.02	1.14	0.80	1.62
Avoidant	2.44	1.02	5.82	1.80	1.30	2.48	1.08	0.56	2.07	1.63	1.06	2.53
Dependant	2.31	0.33	16.19	3.27	1.96	5.47	0.39	0.05	3.34	1.24	0.54	2.86
Obsessive-compulsive	1.01	0.62	1.63	0.95	0.74	1.22	0.98	0.64	1.51	0.64	0.40	1.04
Paranoid	1.71	0.95	3.09	1.30	0.97	1.75	1.10	0.63	1.91	0.83	0.54	1.28
Schizoid	1.34	0.75	2.39	1.24	0.91	1.68	1.71	0.99	2.97	1.21	0.75	1.93
Schizotypal	1.36	0.73	2.52	1.66	1.28	2.17	1.23	0.79	1.93	1.21	0.79	1.84
Narcissistic	0.87	0.52	1.46	1.19	0.90	1.58	1.10	0.73	1.64	1.10	0.75	1.61
Borderline	2.51	1.59	3.96	1.80	1.44	2.25	1.73	1.23	2.43	1.60	1.11	2.31
Histrionic	2.62	1.11	6.17	1.37	0.96	1.98	1.34	0.65	2.79	0.78	0.40	1.53

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Variable	Alcohol abuse (N = 5947)		Alcohol dependence (N = 4863)		Drug abuse (N = 3228)		Drug dependence (N = 1062)					
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI				
Antisocial	1.68	1.04	2.70	1.48	1.16	1.88	1.36	0.94	1.96	0.73	0.52	1.03

Table 3

Sociodemographic predictors of first treatment contact in individuals with substance use disorders (multivariable analyses).

Variable	Alcohol abuse (N = 5947)		Alcohol dependence (N = 4863)		Drug abuse (N = 3228)		Drug dependence (N = 1062)					
	AHR	95% CI	AHR	95% CI	AHR	95% CI	AHR	95% CI				
Sex												
Male	1.73	1.23	2.42	1.20	0.99	1.45	0.69	0.52	0.91	0.88	0.64	1.22
Female	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Race/ethnicity												
White	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Blacks	0.91	0.57	1.46	0.88	0.68	1.13	0.88	0.57	1.37	0.69	0.46	1.02
Native Americans	0.73	0.29	1.83	1.38	0.94	2.04	0.25	0.08	0.79	0.66	0.34	1.28
Asians	0.91	0.15	5.40	0.57	0.20	1.60	1.47	0.48	4.54	1.11	0.43	2.87
Hispanic	1.51	0.86	2.64	1.05	0.78	1.40	1.01	0.66	1.54	0.90	0.61	1.33
Nativity												
US born	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Foreign born	1.00	0.45	2.19	0.70	0.41	1.20	1.29	0.65	2.60	1.59	0.88	2.85
Age at onset	1.06	1.04	1.07	1.05	1.03	1.06	1.01	0.98	1.04	1.01	0.99	1.04
Educational years												
0–11	4.33	2.49	7.54	1.71	1.26	2.32	1.86	1.02	3.39	1.25	0.67	2.34
12	2.40	1.54	3.74	1.37	1.05	1.77	1.31	0.74	2.32	1.51	0.85	2.68
13–15	1.98	1.28	3.06	1.25	0.97	1.61	1.26	0.74	2.14	1.30	0.76	2.22
> 16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Cohort												
1976–1985	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1966–1975	0.68	0.36	1.29	0.88	0.63	1.23	0.70	0.48	1.04	0.73	0.47	1.14
1956–1965	0.40	0.21	0.74	0.96	0.68	1.34	0.49	0.31	0.77	0.46	0.28	0.78
1946–1955	0.27	0.14	0.50	0.78	0.54	1.13	0.38	0.22	0.66	0.38	0.18	0.78
1936–1945	0.27	0.14	0.50	0.81	0.54	1.22	0.37	0.15	0.90	1.11	0.46	2.68
1901–1935	0.12	0.06	0.25	0.66	0.40	1.11	<0.01	<0.01	<0.01	0.26	0.03	2.09
Marital status												

Variable	Alcohol abuse (N = 5947)		Alcohol dependence (N = 4863)		Drug abuse (N = 3228)		Drug dependence (N = 1062)	
	AHR	95% CI	AHR	95% CI	AHR	95% CI	AHR	95% CI
Married	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Widowed/separated/divorced	2.10	1.40	3.16	1.39	1.12	1.72	0.90	1.57
Never married	2.98	2.13	4.17	1.57	1.25	1.97	1.40	2.08
Marital transition (any change in marital status)	0.58	0.34	0.97	0.93	0.76	1.15	1.41	2.00
Past substance use disorder treatment	6.15	3.21	11.76	5.38	4.16	6.96	12.53	17.41
Past mental health treatment	2.11	1.36	3.29	1.20	0.96	1.52	1.38	2.17
							10.64	7.73
						1.44	1.03	2.03

Table 4

Comorbidity predictors of first treatment contact for substance use disorders (multivariable analyses).

Variable	Alcohol abuse (N = 5947)			Alcohol dependence (N = 4863)			Drug abuse (N = 3228)			Drug dependence (N = 1062)		
	AHR	95% CI		AHR	95% CI		AHR	95% CI		AHR	95% CI	
Any alcohol abuse	N/A	N/A	N/A	1.00	0.65	1.54	0.51	0.31	0.84	0.60	0.36	1.01
Any alcohol dependence	N/A	N/A	N/A	N/A	N/A	N/A	0.62	0.47	0.82	0.59	0.45	0.77
Any drug abuse	1.52	0.89	2.58	1.21	0.96	1.51	N/A	N/A	N/A	0.79	0.62	1.01
Any drug dependence	0.85	0.24	3.05	1.24	0.91	1.69	N/A	N/A	N/A	N/A	N/A	N/A
Nicotine dependence	0.85	0.55	1.31	1.08	0.90	1.29	1.23	0.86	1.77	0.87	0.66	1.16
Mood disorders												
Dysthymia	1.19	0.36	3.91	1.51	1.02	2.25	2.74	1.50	4.99	1.22	0.71	2.12
MDD	1.67	1.06	2.64	1.08	0.77	1.52	0.97	0.62	1.51	0.76	0.50	1.16
Bipolar disorder	3.95	2.26	6.92	1.45	1.09	1.94	1.36	0.80	2.33	1.27	0.89	1.82
Any anxiety disorder												
Generalized anxiety disorder	0.71	0.27	1.85	0.98	0.68	1.40	0.92	0.52	1.63	1.15	0.70	1.91
Social anxiety disorder	0.51	0.17	1.57	0.98	0.75	1.27	0.82	0.45	1.46	0.65	0.43	1.01
Panic disorder	0.37	0.11	1.25	1.14	0.76	1.69	0.98	0.51	1.89	1.12	0.73	1.72
Specific phobia	0.48	0.25	0.93	0.91	0.72	1.14	1.22	0.79	1.88	1.39	0.95	2.04
PTSD	1.22	0.56	2.68	1.43	1.05	1.96	1.02	0.56	1.86	0.79	0.45	1.40
Pathological gambling	3.13	0.43	23.01	0.71	0.23	2.22	<0.01	<0.01	<0.01	0.56	0.25	1.25
ADHD	1.48	0.39	5.56	1.12	0.79	1.58	0.99	0.58	1.68	0.87	0.51	1.48
Any personality disorder												
Avoidant	0.90	0.36	2.24	0.98	0.68	1.42	1.22	0.60	2.46	1.59	1.01	2.52
Dependent	0.74	0.08	6.45	1.90	1.09	3.33	0.26	0.03	2.50	0.73	0.30	1.77
Obsessive-compulsive	0.94	0.57	1.54	0.78	0.60	1.02	0.95	0.58	1.57	0.73	0.45	1.18
Paranoid	1.11	0.56	2.22	0.94	0.68	1.29	0.77	0.41	1.45	0.99	0.64	1.53
Schizoid	1.08	0.52	2.25	1.04	0.75	1.43	1.95	1.20	3.16	1.29	0.82	2.05
Schizotypal	0.86	0.48	1.54	0.94	0.71	1.25	0.64	0.36	1.13	0.83	0.57	1.22
Narcissistic	0.51	0.29	0.90	0.90	0.68	1.20	0.88	0.56	1.40	0.91	0.64	1.32
Borderline	1.33	0.77	2.31	1.15	0.89	1.48	1.49	0.99	2.24	1.18	0.79	1.77
Histrionic	1.98	0.71	5.49	1.03	0.74	1.44	0.58	0.30	1.10	0.74	0.45	1.20

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Variable	Alcohol abuse (N = 5947)		Alcohol dependence (N = 4863)		Drug abuse (N = 3228)		Drug dependence (N = 1062)						
	AHR	95% CI	AHR	95% CI	AHR	95% CI	AHR	95% CI					
Antisocial	1.20	0.76	1.90	1.06	1.06	0.84	1.33	0.93	0.64	1.36	0.50	0.35	0.72