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# Who Receives Treatment for Opioid Use Disorder?

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# Who Receives Treatment for Opioid Use Disorder?

Dan Madden

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# APPROVAL PAGE

Masters of Public Health Thesis

## Who Receives Treatment for Opioid Use Disorder?

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## **Introduction**

The United States is in the midst of a public health epidemic involving opioid use. In particular, prescription pain reliever use has drastically increased. From 2000 to 2010, opioids prescribed to US patients increased by 104% to a total of 89.2 million prescriptions (Clark & Schumacher, 2017). According to the 2015 National Survey on Drug Use and Health (NSDUH), roughly four million people aged 12 or older were current misusers of prescription opioids (Center for Behavioral Health Statistics and Quality (CBHSQ), 2016). Two million people had a pain reliever use disorder in 2015, yet only 800,000 received treatment (CBHSQ, 2016). Although less common, heroin use in 2013 was higher than it was ten years ago (Lipari & Hughes, 2014). Over half a million people had heroin dependence defined by the Diagnostic and Statistical Manual of Mental Disorders 4<sup>th</sup> Edition (DSM-IV), yet only half of these individuals received treatment at a specialty facility, such as a hospital, rehabilitation facility, or mental health facility (CBHSQ, 2016).

The opioid epidemic has had devastating consequences. According to the Department of Health and Human Services, over 130 people died every day from opioid-related drug overdoses from 2016 to 2017 (U.S. Department of Health & Human Services, 2018). The opioid crisis is estimated to have cost the United States over \$1 trillion from 2001 to 2017 and will cost an additional \$500 billion by 2020 (Altarum, 2018). These costs are estimated from lost wages, lost productivity, healthcare costs, lost tax revenue, as well as additional spending on criminal justice, social services, and education (Altarum, 2018). With the growing costs as well as prevalence of opioid use and undertreatment of opioid use disorder (OUD), it is essential that treatment is available and accessible to all who may require it.

## **Specific Aims:**

The aim of this study was to use the 2017 NSDUH to answer the following questions:

- 1.) What are the characteristics of individuals who have OUD due to either pain reliever misuse or heroin use?
- 2.) Among those identified with OUD, what are the characteristics of individuals utilizing treatment for this substance use disorder?
- 3.) What types of treatment did persons with OUD access?
- 4.) What are the reasons why individuals with OUD do not enter substance abuse treatment?

Ultimately, the research goal was to identify the characteristics of those with OUD underutilizing treatment in an effort to inform interventions aimed at improving access to treatment.

## **Background**

Certain populations are known to be at risk for opioid misuse as well as developing OUD. This includes individuals with a prior history of substance use disorder (SUD), younger age, males, individuals with more severe pain, and individuals with co-occurring mental disorders (Kaye et al., 2017). There are also many characteristics that influence the utilization of treatment for OUD. As the opioid epidemic continues to expand and change, it is important to maintain up-to-date knowledge on the scope of the problem as well as who it may disproportionately impact.

## ***Demographics:***

Gender:

Male gender is considered a risk factor for misuse and death from opioid overdose (Rudd, Seth, David, & Scholl, 2016). From the 2005 through 2013 NSDUH data, the majority (58%) of persons with OUD were male (Wu, Zhu, & Swartz, 2016). The same analysis showed that females with OUD were more likely to receive treatment in the past year, although the findings were not statistically significant (Wu et al., 2016). Females with prescription opioid use disorder have greater functional impairment and more co-occurring psychiatric conditions than their male counterparts, which may increase referral and utilization of treatment for OUD (John & Wu, 2019). Women are more likely to access healthcare, which grants more opportunities for referral to treatment (John & Wu, 2019).

#### Race/ethnicity:

The opioid epidemic has disproportionately affected whites living in rural areas or who have low-income (Wu et al., 2016). According to data from the 2005-2013 NSDUH, whites represented 72% of persons with OUD (Wu et al., 2016). The same analysis suggests that more whites with OUD enter treatment while blacks and Native-Hawaiians/Pacific-Islanders/Asian-Americans underutilize opioid-specific treatment (Wu et al., 2016). Only 1.24% of Native-Hawaiians/Pacific-Islanders/Asian-Americans with OUD received opioid-specific treatment, making this demographic group the lowest utilizer of OUD treatment (Wu et al., 2016).

#### ***Socioeconomic Status:***

##### Income:

Individuals with low-income have been impacted tremendously by the burden of OUD (Wu et al., 2016). In prescription drug monitoring program data from 2011 through 2015, the majority

of opioids prescribed in California were to adults living in regions with the lowest-income (Friedman et al., 2019). This suggests that there might be a socioeconomic bias in prescription patterns for opioids leading to the increased burden of OUD on lower-income individuals. There is also inadequate access to substance treatment resources in low-income areas (Wu et al., 2016). The loss of productivity associated with OUD as well as the high cost of opioids often leads to a worsening financial situation for the individual impacted by the disease and their family, thus making it difficult to afford treatment (Hansen et al., 2011).

***Health insurance:***

Although lack of insurance is associated with under-utilization of substance use treatment (Wu et al., 2016), even privately insured individuals may be at risk of inadequate treatment (Ali & Mutter, 2013). According to a report from the CBHSQ, patients with private insurance received limited follow-up services after opioid-related hospitalizations (Ali & Mutter, 2013). Forty percent of privately insured individuals who were hospitalized for reasons related to opioids did not receive any follow-up services such as medication or therapy (Ali & Mutter, 2013). Rather than due to the financial burden, inadequate referral to treatment after hospitalization may be due to barriers, such as stigma surrounding illicit drug use, lack of perceived treatment need, or lack of knowledge of appropriate therapies (Robinson & Adinoff, 2018). An analysis of data from the 1997 National Household Survey on Drug Abuse found that persons having private insurance did not differ from those with no insurance in predicting treatment for SUD (Wu, Ringwalt, & Williams, 2003). Published analyses exist for data that predates the Affordable Care Act, which led to millions of people gaining coverage. Further studies need to be conducted to see if expansion of health insurance has impacted treatment utilization for OUD.

### ***Depression:***

The relationship between mental health and opioid use is complex. It is known, however, that adults with mental health disorders receive more than half of the total opioids prescribed in the US (Davis, Lin, Liu, & Sites, 2017). More specifically, depressive symptoms are associated with increased rates of self-reported opioid misuse in patients with no previous history of substance abuse (Grattan, Sullivan, Saunders, Campbell, & Von Korff, 2012). In a review of the NSDUH from 2005 through 2013, 29% of persons with OUD had a major depressive episode (MDE) in the past year based on DSM-IV criteria (Wu et al., 2016). Having a MDE in the past year was associated with increased odds of utilizing opioid-specific treatment (Wu et al., 2016).

### ***Employment:***

According to the 2015 NSDUH, the majority of people with OUD were unemployed (Han et al., 2017). Interestingly, Becker et al. (2008) found that unemployment was associated with treatment receipt for those with OUD. The authors hypothesized that there is a higher severity of OUD in those who are unemployed that requires attention for treatment. Severity of OUD may also lead to unemployment. Another hypothesis to explain increased treatment with unemployment is that those employed may have private insurance that may have more restrictive coverage of services, which could discourage affected addicts from receiving treatment (Ali & Mutter, 2013).

### ***Criminal Justice Involvement:***

Over one-third of US adults involved in the criminal justice system have SUD (Saloner, Bandara, McGinty, & Barry, 2016), including higher rates of OUD and overdose (Krawczyk,

Picher, Feder, & Saloner, 2017). Criminal justice reform, as well as the Affordable Care Act expansion of Medicaid, have improved access to and coverage for treatment for these individuals over the past five years (Saloner et al., 2016). Through increased referral to treatment for SUD, the criminal justice system seeks to reduce recidivism (Saloner et al., 2016).

The literature shows that certain characteristics of persons with OUD act as either supports or barriers to substance use treatment utilization. This includes demographics (such as age, gender, and race/ethnicity), health insurance, history of depression, employment status, and criminal justice involvement. Although analyses of previous NSDUH data (2005-2013) supports the associations of these characteristics with treatment utilization, limited research has examined more recent NSDUH data. This study analyzed 2017 NSDUH data to provide current verification of the characteristics related to treatment utilization for OUD. By identifying the demographics/characteristics of those with OUD utilizing treatment, interventions that are aimed at improving access to treatment may be better informed.

## ***Methodology***

### *Data Source:*

The study was a secondary analysis of the data from the 2017 NSDUH, which is a representative survey of the US population sponsored SAMHSA. The NSDUH collects data through face-to-face interviews with residents of households who are US civilians, older than 12, and not institutionalized. This survey does not include individuals who live in group residencies, such as shelters, rooming houses, dorms, and military bases. The survey excludes people who are homeless, in jails, or in hospitals. The sample size includes over 70,000 participants annually.

The analysis sought to describe the relationship of certain characteristics of persons with OUD who did or did not receive opioid use treatment.

The 2017 NSDUH data was downloaded as an SPSS file from the SAMHSA website. A total of 56,276 persons aged  $\geq 12$  completed the survey interview. The 2017 NSDUH codebook and questionnaire were also downloaded to identify variables used to select cases of interest. From the full data set, cases of adults 18 years or older were selected and extracted. From the adults, cases were selected that had reported using heroin and/or prescription pain reliever misuse in the past year. Individuals with OUD were then selected and extracted from this data set, in which the NSDUH identified individuals as having heroin and/or pain reliever dependence or abuse in the past year based on their answers to survey questions. The type of OUD (HUD, Rx OUD, or both) as well as characteristics of individuals with past-year OUD were described. OUD is a diagnosis defined currently by the DSM-V as two or more of the criterion checked in Table 1. For more accurate comparisons to previous NSDUH data, the 2017 NSDUH continued to use the DSM-IV for diagnosing opioid abuse (one or more the criterion checked in Table 1) and opioid dependence (three or more of the criterion checked in Table 1). OUD in the 2017 NSDUH is defined as opioid abuse and/or dependence.

**Table 1:** DSM-IV and DSM-V Criteria for Opioid Abuse, Opioid Dependence, and Opioid Use Disorder

	<b>DSM-IV Opioid Abuse</b>	<b>DSM-IV Opioid Dependence</b>	<b>DSM-V Opioid Use Disorder</b>
Hazardous Use	X		X
Social/Interpersonal Problems	X		X
Neglected Major Roles	X		X
Legal Problems	X		
Withdrawal		X	X
Tolerance		X	X

Use larger amounts longer		X	X
Repeated attempts to quit		X	X
Much time spent using		X	X
Physical/psychological problem related to use		X	X
Activities given up to use		X	X
Craving		X	X

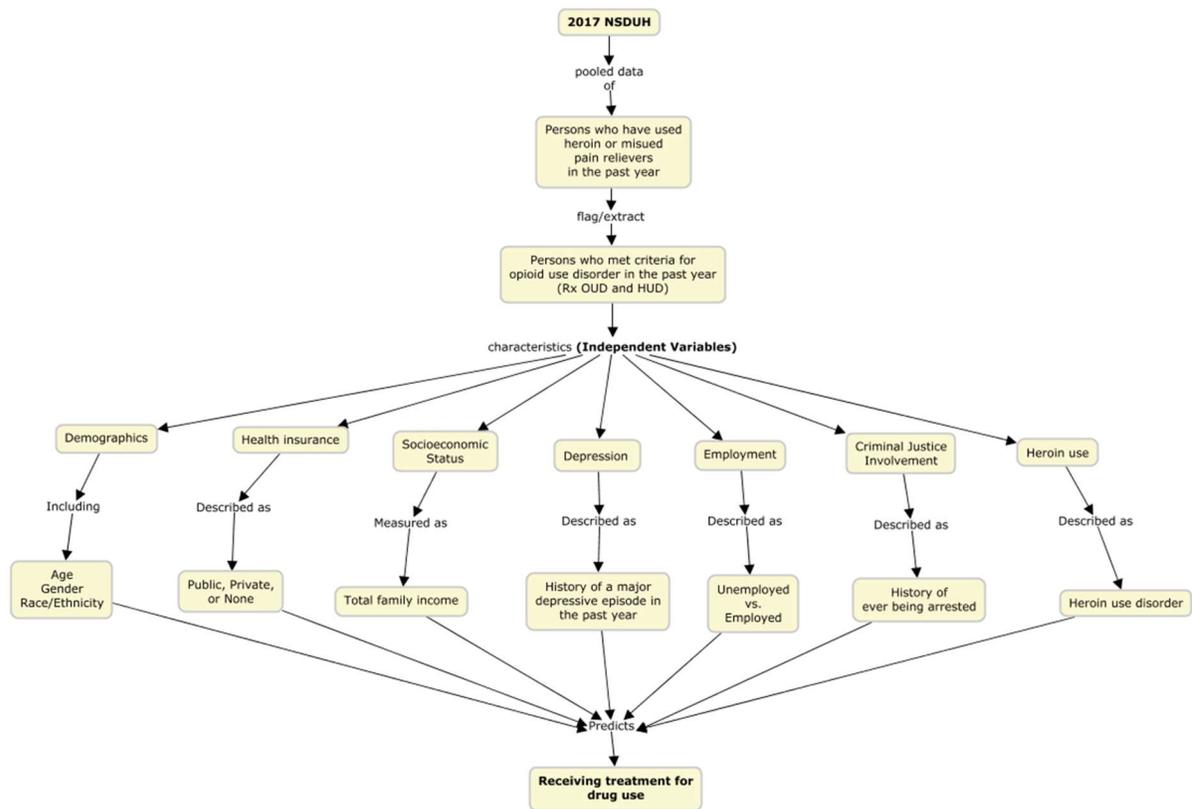
*Study Variables:*

Independent variables used in the analysis were selected based upon support from the literature. Age was recoded into three categories, including “18-29”, “30-49”, and “50+”. Gender was dichotomized into males and females. Race/ethnicity was recoded into “White vs. Non-white”, “White vs. Black/African American”, and “White vs. Hispanic”. Health insurance variables were dichotomized into “yes vs. no” categories for each type of insurance, including private insurance, public insurance, and no insurance. Public insurance included any individuals with Medicaid, Medicare, or Tricare/CHAMPUS. Employment was dichotomized and measured as employed in the past year (including partially employed) compared to unemployed in the past year. The NSDUH variable for a major depressive episode (MDE) in the past year remained as a dichotomous “yes vs. no” measure. The NSDUH utilizes computer-assisted interviewing (CAI) instrumentation to determine whether a respondent has experienced a MDE in the past year or their lifetime based on DSM-IV criteria. Criminal justice involvement was measured as “yes vs. no” for being arrested and booked in the past year, excluding minor traffic violations. The number of times arrested and booked in the past year was also used for analysis as a categorical variable including “none”, “one time”, “two times”, and “three or more times”. In the NSDUH, individuals were only asked how many times they had been arrested and booked in the past year

if they answered “yes” to being arrested and booked in the past year. The outcome variable was receipt of treatment for drug use in the past year at any location (“yes vs. no”). This variable was independent of treatment for alcohol use.

*Data analysis:*

Descriptive and logistic regression analyses were performed in SPSS to characterize differences between individuals with OUD who received drug use treatment in the past year and those with OUD who did not. Descriptive analyses were also performed to identify where individuals received treatment as well as the reasons reported for why individuals did not receive treatment.



**Figure 1:** Model outlining the key characteristics associated with OUD treatment utilization.

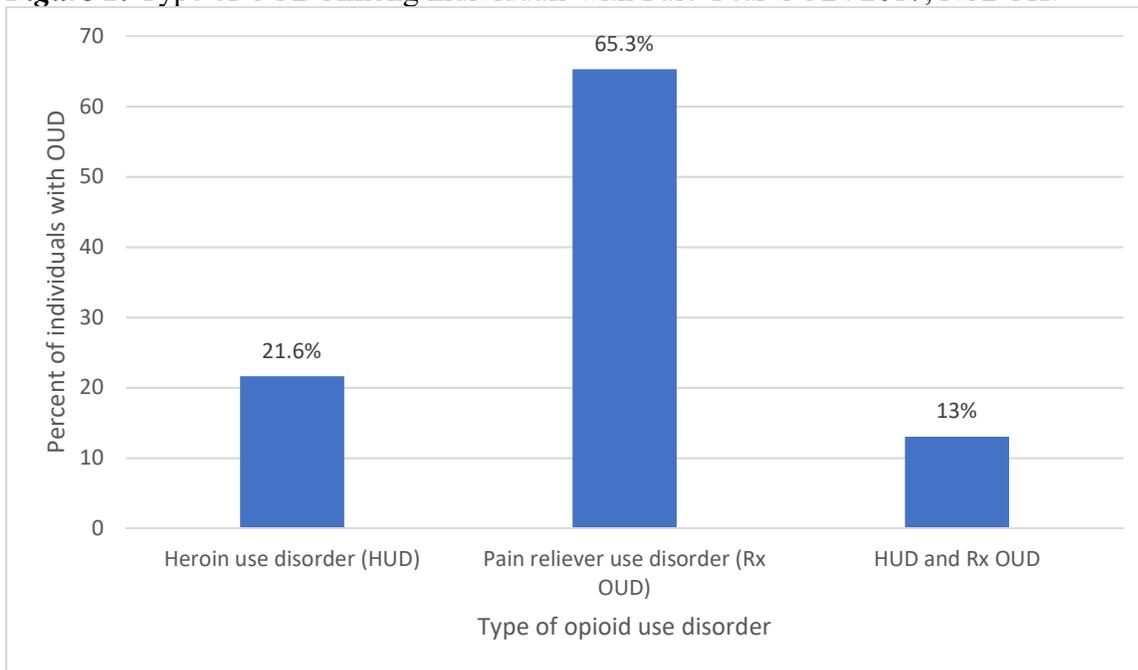
## Results

### Population of Opioid Users:

**Table 2:** Frequency of Opioid Use in the Past Year among Persons Aged 18 or Older: 2017, NSDUH.

	HEROIN USE		
		Yes	No
PAIN RELIEVER MISUSE	Yes	0.5%	6.3%
	No	0.2%	93.0%

**Figure 2:** Type of OUD Among Individuals with Past-Year OUD: 2017, NSDUH.



Pain reliever misuse only, defined by NSDUH as taking an opioid medication in a manner or dose other than prescribed, was more than thirty times more prevalent than heroin use only. Overall, 7% of individuals had used heroin and/or misused pain relievers (Table 2).

The prevalence of OUD among individuals surveyed was 0.85%. Of individuals with OUD, the majority of those were related to prescription pain relievers. There were three times

more individuals with Rx OUD only than individuals with HUD only. Individuals with both HUD and Rx OUD represent 13% of individuals with opioid use disorder (Figure 2).

*Characteristics of persons with OUD:*

**Table 3:** Characteristics of Individuals by Type of OUD with Past-Year OUD: NSDUH, 2017.

<b>Age</b>	<b>HUD</b>	<b>Rx OUD</b>	<b>HUD and Rx OUD</b>
18-29	55.3%	51.4%	50.0%
30-49	38.8%	37.3%	43.5%
50+	5.8%	11.3%	6.5%
<b>Gender</b>			
Male	65.0%	52.7%	54.8%
Female	35.0%	47.3%	45.2%
<b>Race</b>			
Non-Hispanic White	76.7%	67.8%	77.4%
Non-Hispanic Black	2.9%	10.9%	3.2%
Non-Hispanic Native American/AK Native	1.9%	2.6%	3.2%
Non-Hispanic Hawaiian/Pacific Islander	0.0%	0.3%	0.0%
Non-Hispanic Asian	1.0%	1.9%	1.6%
Non-Hispanic more than one race	4.9%	5.1%	3.2%
Hispanic	12.6%	11.3%	11.3%
<b>Family Income</b>			
Less than \$20,000	41.7%	27.7%	27.4%
\$20,000-\$49,999	28.2%	33.4%	43.5%
\$50,000-\$74,999	13.6%	16.7%	12.9%
\$75,000 or More	16.5%	22.2%	16.1%
<b>Health Insurance</b>			
Private	23.3%	43.2%	24.2%
Public	47.6%	55.9%	45.2%
None	25.5%	15.5%	17.7%
<b>Employment status</b>			
Full time	36.9%	43.4%	29.0%
Part-time	11.7%	10.6%	12.9%
Unemployed	20.4%	15.8%	21.0%
Other (e.g. student)	31.3%	30.2%	37.1%

<b>Past year major depressive episode (MDE)</b>			
Yes	27.5%	36.2%	34.5%
No	72.5%	63.8%	65.5%
<b>Arrested in the past year</b>			
Yes	33.0%	18.5%	42.6%
No	67.0%	81.5%	57.4%

Individuals with OUD in 2017 tended to be younger adults with more than half of those surveyed between the ages of 18 & 29. More men than women met criteria for each type of OUD. A high proportion of those with past-year OUD were non-Hispanic white, followed by Hispanic individuals, and non-Hispanic black individuals. Non-Hispanic Native Hawaiians/Pacific Islanders represented the smallest portion of individuals with past-year OUD. Most individuals had some type of insurance, with the greatest proportion being individuals with some form of public insurance. More than half of those with OUD were employed at least part-time. There was a significant proportion of individuals that were coded as “other”, which includes individuals that are disabled, keeping house full-time, in school/training, or retired. One-third of those with OUD reported having had a MDE in the past year. Criminal justice involvement was also relatively prevalent among those with past-year OUD; 18.5%-42.6% had been arrested and booked in the past year for offenses beyond minor traffic violations. Individuals with HUD only tended to be younger, male, non-Hispanic white, lack private insurance, and had higher rates on unemployment as well as criminal justice involvement. Those with Rx OUD had the highest percentage of individuals over the age of fifty.

**Table 4:** Characteristics of Individuals with Past-Year OUD Who Received Treatment for Drug Use in the Past Year.

<b>Characteristic</b>	<b>Received Treatment</b>	
	<b>Yes</b>	<b>No</b>
<b>Age</b>		

18-29	49.0%	53.5%
30-49	43.9%	35.7%
50+	7.0%	10.7%
<b>Gender</b>		
Male	52.9%	57.1%
Female	47.1%	42.9%
<b>Race/ethnicity</b>		
White	78.3%	67.4%
Black/African American	4.5%	10.0%
Native American/AK Native	2.5%	2.5%
Native HI/Other Pacific Islander	0.6%	0.0%
Asian	0.0%	2.5%
More than one race	5.1%	4.7%
Hispanic	8.9%	12.9%
<b>Family Income</b>		
Less than \$20,000	35.7%	28.2%
\$20,000-\$49,999	33.8%	33.5%
\$50,000-\$74,999	12.1%	17.2%
\$75,000 or More	18.5%	21.0%
<b>Health insurance</b>		
Private	28.7%	40.3%
Public	48.4%	54.9%
Uninsured	19.2%	17.4%
<b>Employed</b>		
	87.9%	89.3%
<b>Major depressive episode in the past year</b>		
	32.2%	34.9%
<b>Arrested in the past year</b>		
	39.0%	17.9%
<b>Number of times arrested and booked in past 12 months</b>		
None	36.3%	29.5%
One time	22.3%	10.3%
Two times	10.2%	3.4%
Three or more times	5.7%	3.8%

<b>Heroin use disorder</b>	59.9%	22.3%
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**Table 5:** Characteristics of Individuals with Past-Year OUD Associated with Utilizing Treatment for Drug Use in the Past Year.

<b>Characteristic</b>	<b>Odds Ratio</b>	<b>95% CI</b>
<b>Age</b> (vs. 18-29)		
30-49	1.392	0.670 – 2.891
50+	1.871	0.890 – 3.932
<b>Gender</b> (male vs. female)	0.844	0.575 – 1.239
<b>Race/ethnicity</b> (vs. white)		
Black/African American	1.675	0.878 – 3.196
Native American/AK Native	0.641	0.231 – 1.774
Native HI/Other Pacific Islander	1.464	0.382 – 5.619
Asian	Indeterminate	
More than one race	0.000	0.000
Hispanic	1.562	0.546 – 4.467
<b>Race/ethnicity</b>		
White vs. non-white	<b>1.750</b>	<b>1.120 – 2.734</b>
White vs. Black/African American	<b>2.615</b>	<b>1.121 – 6.102</b>
White vs. Hispanic	1.675	0.878 – 3.196
<b>Family Income</b> (vs. less than \$20,000)		
\$20,000-\$49,999	1.438	0.830 – 2.488
\$50,000-\$74,999	1.144	0.663 – 1.976
\$75,000 or More	0.798	0.405 – 1.575
<b>Health insurance</b> (yes vs. no)		
Private	<b>0.600</b>	<b>0.397 – 0.905</b>
Public	1.295	0.883 – 1.899
Uninsured	0.882	0.539 – 1.443
<b>Employment</b> (yes vs. no)	0.866	0.477 – 1.574
<b>Major depressive episode in the past year</b> (yes vs. no)	0.886	0.587 – 1.338

<b>Arrested in the past year</b> (yes vs. no)	<b>1.767</b>	<b>1.082 – 2.886</b>
<b>Number of times arrested and booked in past 12 months</b> (vs. none)		
One time	<b>2.655</b>	<b>1.634 – 4.315</b>
Two times	<b>4.644</b>	<b>2.562 – 8.417</b>
Three or more times	<b>6.369</b>	<b>2.731 – 14.851</b>
<b>Heroin use disorder</b> (yes vs. no)	<b>5.212</b>	<b>3.445 – 7.885</b>

<sup>a</sup>**Boldfaced OR, CI:** Statistically significant (P<0.05)

The largest group of people with past-year OUD who received treatment related to their drug use were young adults aged 18-29 (49%), predominantly male (52.9%) of non-Hispanic white ethnicity (78.3%). The majority had some type of health insurance (80.1%), were employed either part-time or full-time (72.2%), and were in the lowest bracket for family income (33.8%). Having a history of a MDE in the past year was found among one-third, and 39% reported some criminal justice involvement in the past year.

In order to determine which characteristics were correlated with drug use treatment among persons with OUD, logistic regressions were conducted. Odds ratios with 95% confidence intervals are reported in Table 5 for each logistic regression performed. Age, gender, NSDUH coded race/ethnicity, employment status, and history of MDE in the past year were not statistically significant in affecting the odds of individuals with past-year OUD receiving treatment for drug use. When race/ethnicity was dichotomized, individuals who were non-Hispanic white had greater odds of receiving drug use treatment than those who were non-white (OR 1.750). Compared to individuals who were black, the odds of receiving treatment for drug

use were more than 2.5 times higher for white individuals. Although having public insurance or being uninsured were not associated with affecting the odds of using treatment for drug use, having private insurance was associated with decreased odds of treatment usage (OR 0.600). Criminal justice involvement was associated with increasing odds of receiving treatment (OR 1.767), with the odds increasing the more times an individual was arrested and booked in the past 12 months (OR increases from 2.655 for being arrested once to 6.369 for being arrested three or more times). Finally, individuals with past-year HUD had increasing odds of using treatment related to drug use than those who did not (OR 5.212).

**Table 5:** Treatment Setting of Individuals with Past-Year OUD Who Received Treatment in the Past Year.

<b>Treatment location</b>	<b>Percent*</b>
Outpatient rehabilitation	64.3%
Self-help group	54.1%
Mental health facility	42.7%
Inpatient rehabilitation	39.5%
Doctor’s office	36.3%
Hospital inpatient	31.8%
Emergency room	24.2%
Prison/Jail	14.6%
Detox only	13.4%

\* Categories do not add to 100% because multiple response options could be selected

Table 5 describes the various settings where individuals with past-year OUD received treatment related to their drug use in 2017. The most common treatment settings were outpatient settings, including outpatient rehabilitation (64.3%) and self-help groups (54.1%), such as Narcotics Anonymous. Short-term treatment settings such as the emergency room and detoxification alone were less commonly reported (14.6% and 13.4%, respectively).

**Table 6:** Reasons Why Individuals Did Not Receive Drug Use Treatment

<b>Reason for not receiving treatment</b>	<b>Percent</b>
Could not afford or not insured	7.8%
Not ready to stop using	6.9%
Treatment might have a negative effect on job	4.4%

Treatment might cause neighbors/community to have a negative opinion of you	3.1%
Insurance doesn't cover treatment	2.5%
You thought you could handle the problem without treatment	2.2%
Didn't want others to find out you needed treatment	1.6%
No time (job, childcare, or other commitment)	1.6%
Didn't know where to get treatment	1.3%
Treatment not found for type wanted	1.3%
No transportation/too far away/inconvenient	0.9%
No openings	0.9%
Didn't think you needed treatment at the time	0.9%
Lacked motivation	0.3%
Didn't think treatment would help	0.3%

Several of the reasons why people with past-year OUD did not receive treatment for drug use are highlighted in Table 6. The most common reasons were related to cost. More than 11% of individuals indicated that they did not receive treatment due to being uninsured, lacking coverage through their insurance, or not being able to afford treatment. Not being ready to stop using was a relatively common reason cited among individuals with OUD for not receiving treatment. Of note, many responders chose to skip this question in the survey.

## Discussion

The National Institute on Drug Abuse (NIDA) utilizes the NSDUH to publish current epidemiological data on drug use in the United States. Heroin use was relatively stable as reported by 0.1% to 0.2% of the population most years from 2002 to 2008 (Lipari & Hughes, 2014). The data from this report as well as SAMHSA suggested that 0.2 to 0.3% of the population were current heroin users in 2017, which is an increase from the previous decade (2018). Although heroin use may not be as common as prescription opioid use, the rise in heroin use has led to an exponential increase in heroin-related overdose deaths with a 286% increase from 2002 to 2013 (Hedegaard, Chen, & Warner, 2015). Reasons for this rise include a surge in

accidental overdoses related to the circulation of higher purity heroin as well as increasing sales of much more potent synthetic opioids being sold as heroin (Lipari & Hughes, 2014). Some users of prescription pain killers for chronic pain may switch over to heroin resulting in accidental overdoses by unknowingly taking too much, though this is not common among those who abuse prescription pain relievers. Although this study showed that two-thirds of individuals who used heroin also misused pain relievers, the majority of individuals who misuse pain relievers never switch to heroin. One study found that less than 4% of people who had abused prescription opioids started to use heroin within five years (Muhuri, Gfroerer, & Davies, 2013).

This study highlights the much higher prevalence of prescription opioid misuse than heroin use. Approximately three million individuals 18 or older were estimated to be current misusers of pain relievers in 2017 (SAMHSA, 2018), which is less than the estimated 3.5 million adults that were current misusers of pain relievers in 2015 (CBHSQ, 2016). This decline in misuse may be for numerous reasons, including federal and state initiatives that have resulted in a drop in the total number of prescriptions from over 255 million prescriptions in 2012 to 191 million prescription in 2017 (“U.S. Opioid Prescribing Rate Maps,” 2018). Still, prescription pain reliever use disorder remains the most common category of opioid use disorder which needs to be addressed through further reduction in prescription rates as well as improving access to treatment for those with Rx OUD.

By understanding the characteristics of the population that has OUD, prevention efforts can be better targeted. Persons with OUD tended to be young, non-Hispanic white, and male, which is consistent with prior analyses of the NSDUH data from 2005 through 2013 (Wu et al., 2016). Knowing these demographics are associated with Rx OUD is critical to inform efforts to prevent opioid overdoses, as well as target those who may require treatment for OUD. The other

characteristics reported demonstrate the complexity of OUD. Individuals with OUD are more likely to be unemployed, have a past-year history of criminal justice involvement, and/or past-year history of a MDE. Beyond the characteristics studied here, further research is needed to help identify other risk factors significantly associated with OUD.

People with OUD who received treatment for drug use were significantly more likely to be white compared to minorities altogether as well as compared to African Americans. This is an example of the greater disparities in healthcare that minorities face (Colby & Ortman, 2015). Compared with whites, members of racial and ethnic minorities receive care that is often lower in quality, a result of systematic racism (Hostetter & Klein, 2018). Even when referred to treatment, blacks and Hispanics are less likely than whites to complete addiction treatment, often for reasons that are cited in this study, such as cost, access to treatment, and other socioeconomic factors (Saloner & Cook, 2013). These disparities underline the importance of increasing access to treatment for minorities as well as addressing any systematic racism that may be negatively affecting the healthcare provided to minorities.

Another salient finding was that individuals with private insurance had significantly lower odds of receiving treatment for drug use compared to those without private insurance. This supports what was reported by Ali & Mutter (2013), who pointed to individuals with private insurance receiving inadequate coverage and referral for services. A report from the American Society of Addiction Medicine describes several regulatory barriers among private insurance policies that hinder access and appropriate care, such as “fail first” criteria that require other therapies to be attempted prior to initiating medication assisted therapy (Volkow, Frieden, Hyde, & Cha, 2014). There are often arbitrary limits health insurers have outlined for the duration of therapy (Volkow et al., 2014). This may stem from the stigma that still exists in healthcare, as

well as the general public, that OUD is a moral weakness rather than a disease or illness (Olsen & Sharfstein, 2014). Such stigma creates a barrier for individuals with OUD to receive the care they need. Furthermore, reasons for not receiving treatment for OUD included cost or lack of insurance coverage. As the opioid epidemic continues to impact the lives of millions, it is critical that treatment be affordable and accessible. This requires patient advocacy and policy reform through a multidisciplinary approach involving all parties impacted by the opioid epidemic.

Criminal justice involvement was significantly associated with receiving treatment for drug use. There were increasingly greater odds of receiving treatment as the number of times arrested in the past year increased. Courts will often mandate treatment if an offense is related to drug use (Wu, Blazer, Li, & Woody, 2011). Reform in the criminal justice system has also increased treatment access among justice-involved individuals due to the high prevalence of SUD in this population (Saloner et al., 2016). This is also related to Medicaid expansion through the Affordable Care Act resulting in the uninsured rate among justice-involved individuals with SUD to decline from 38% to 28% in 2014 (Saloner et al., 2016). However, treatment received by justice-involved individuals may not be the most effective or evidence-based care. One study found that only 4.6% of justice-referred adults with opioid use disorder received methadone or buprenorphine, which is significantly lower than the 40.9% of those referred elsewhere (Krawczyk et al., 2017). Again, this highlights an important population requiring advocacy for evidence-based treatment.

This study found that individuals with alcohol abuse in the past year were associated with lower odds of receiving treatment for drug use than individuals who did not have a past-year history of alcohol abuse. Alcohol abuse may be associated with reduced insight and judgment on

an individual's problem with other substances as well as the need for treatment. Although alcohol lowered the odds of receiving treatment, having a past-year history of HUD significantly increased the odds of receiving treatment for drug use compared to those without a history of HUD. Heroin may cause more severe adverse outcomes as well as increased chances of overdose causing the need for treatment to be higher. Also, since heroin is an illicit substance, its use may result in criminal justice involvement resulting in increased access to treatment.

Since OUD is a chronic disease, treatment for OUD is long-term and occurs in several settings. Oftentimes individuals may be referred to multiple settings for treatment through the course of their disease, which is supported by the data showing the various settings utilized by individuals with OUD. The data also shows that almost a quarter of individuals with OUD received treatment related to their illicit drug use at an ED. A recent CDC report stated that there was a 30% increase in ED opioid overdose visits from 2016 to 2017, which reflects an increase in death rates from opioids ("Emergency Department Data Show Rapid Increases in Opioid Overdoses," 2018). The increase in ED visits from opioid overdoses may be an area to improve treatment utilization through increased referral to other treatment settings as well as the initiation of medication assisted therapy, such as buprenorphine/naloxone. Although an area of current debate and controversy, initiation of medication assisted therapy in the ED was found in a randomized clinical trial to increase engagement in addiction treatment as well as reduce subsequent self-reported illicit opioid use (D'Onofrio et al., 2015).

### *Study limitations*

There are several limitations to this study. First, self-report data on illicit drug use may be underreported, introducing recall bias. Generally, studies have supported the validity of self-reported data on substance use (Harrison, 1997). Other procedures to measure drug use (such as

testing biological specimens) are often too expensive and impractical to perform for general population epidemiological studies (SRNT Subcommittee on Biochemical Verification, 2002). Second, treatment related to illicit drug use was measured as the outcome variable rather than treatment specific for OUD. Chi-square analysis of these two variables suggested that they were so correlated with one another that the Phi-value was approximating 1.0 (not shown). Nonetheless, some external validity might be limited due to inclusion of all illicit drug use treatment as the outcome rather than only opioid-specific treatment. Another limitation is that the logistic regressions were all conducted independently for each characteristics. When combined, the variance in receipt of treatment accounted for by each characteristic was attenuated to statistically insignificant findings for odds ratios (not shown). Further studies will need to control for the variance accounted for from each characteristic to determine the extent in which they impact treatment utilization. Finally, external validity is also limited due to the exclusion of non-civilians and non-institutionalized individuals, which is approximately 3% of the US population (Center for Behavioral Health Statistics and Quality, 2016). People missed by the NSDUH include individuals who are homeless, incarcerated, or hospitalized, which may be at higher risk for OUD.

## Works Cited

- Ali, M. M., & Mutter, R. (2013). *Patients Who Are Privately Insured Receive Limited Follow-Up Services After Opioid-Related Hospitalizations. The CBHSQ Report*. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/27054227>
- Altarum (2018). Economic toll of opioid crisis in U.S. exceeded \$1 trillion since 2001. Retrieved March 13, 2019, from <https://altarum.org/news/economic-toll-opioid-crisis-us-exceeded-1-trillion-2001>
- CDC Injury Center (2018). Retrieved March 18, 2019, from <https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html>
- CDC Online Newsroom (2018). Emergency department data show rapid increases in opioid overdoses. Retrieved March 18, 2019, from <https://www.cdc.gov/media/releases/2018/p0306-vs-opioids-overdoses.html>
- Clark, D. J., & Schumacher, M. A. (2017). America's opioid epidemic. *Anesthesia & Analgesia*, 125(5), 1667–1674. <https://doi.org/10.1213/ANE.0000000000002388>
- Colby, S. L., & Ortman, J. M. (2015). *Population Estimates and Projections Current Population Reports*. Retrieved from [www.census.gov](http://www.census.gov)
- D'Onofrio, G., O'Connor, P. G., Pantalon, M. V., Chawarski, M. C., Busch, S. H., Owens, P. H., ... Fiellin, D. A. (2015). Emergency department–initiated Buprenorphine/Naloxone treatment for opioid dependence. *JAMA*, 313(16), 1636. <https://doi.org/10.1001/jama.2015.3474>
- Davis, M. A., Lin, L. A., Liu, H., & Sites, B. D. (2017). Prescription opioid use among adults with mental health disorders in the United States. *Journal of the American Board of Family Medicine : JABFM*, 30(4), 407–417. <https://doi.org/10.3122/jabfm.2017.04.170112>

- Department of Health and Human Services (2018). Retrieved December 28, 2018, from <https://www.hhs.gov/opioids/about-the-epidemic/index.html>
- Friedman, J., Kim, D., Schneberk, T., Bourgois, P., Shin, M., Celious, A., & Schriger, D. L. (2019). Assessment of racial/ethnic and income disparities in the prescription of opioids and other controlled medications in California. *JAMA Internal Medicine, 179*(4), 469. <https://doi.org/10.1001/jamainternmed.2018.6721>
- Grattan, A., Sullivan, M. D., Saunders, K. W., Campbell, C. I., & Von Korff, M. R. (2012). Depression and prescription opioid misuse among chronic opioid therapy recipients with no history of substance abuse. *Annals of Family Medicine, 10*(4), 304–311. <https://doi.org/10.1370/afm.1371>
- Han, B., Compton, W. M., Blanco, C., Crane, E., Lee, J., & Jones, C. M. (2017). Prescription opioid use, misuse, and use disorders in U.S. adults: 2015 National Survey on Drug Use and Health. *Annals of Internal Medicine, 167*(5), 293. <https://doi.org/10.7326/M17-0865>
- Hansen, R. N., Oster, G., Edelsberg, J., Woody, G. E., & Sullivan, S. D. (2011). Economic Costs of Nonmedical Use of Prescription Opioids. *The Clinical Journal of Pain, 27*(3), 194–202. <https://doi.org/10.1097/AJP.0b013e3181ff04ca>
- Harrison, L. (1997). The validity of self-reported drug use in survey research: an overview and critique of research methods. *NIDA Research Monograph, 167*, 17–36. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9243555>
- Hedegaard, H., Chen, L.-H., & Warner, M. (2015). *Drug-poisoning Deaths Involving Heroin: United States, 2000-2013 Key findings Data from the National Vital Statistics System (Mortality)*. Retrieved from <http://www.cdc.gov/>
- Hostetter, M., & Klein, S. (2018). Reducing racial disparities in health care by confronting

- racism. Retrieved March 18, 2019, from  
<https://www.commonwealthfund.org/publications/newsletter-article/2018/sep/focus-reducing-racial-disparities-health-care-confronting>
- John, W. S., & Wu, L.-T. (2019). Sex differences in the prevalence and correlates of emergency department utilization among adults with prescription opioid use disorder. *Substance Use & Misuse*, 1–13. <https://doi.org/10.1080/10826084.2019.1568495>
- Kaye, A. D., Jones, M. R., Kaye, A. M., Ripoll, J. G., Galan, V., Beakley, B. D., ... Manchikanti, L. (2017). Prescription opioid abuse in chronic pain. *Pain Physician*, 20(2S), S93–S109. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/28226333>
- Krawczyk, N., Picher, C. E., Feder, K. A., & Saloner, B. (2017). Only one in twenty justice-referred adults in specialty treatment for opioid use receive Methadone or Buprenorphine. *Health Affairs*, 36(12), 2046–2053. <https://doi.org/10.1377/hlthaff.2017.0890>
- Lipari, R., & Hughes, A. (2014). Trends in Heroin Use in the United States: 2002 to 2013. Retrieved March 13, 2019, from  
[https://www.samhsa.gov/data/sites/default/files/report\\_1943/ShortReport-1943.html](https://www.samhsa.gov/data/sites/default/files/report_1943/ShortReport-1943.html)
- Muhuri, P., Gfroerer, J., & Davies, M. C. (2013). Associations of Nonmedical Pain Reliever Use and Initiation of Heroin Use in the United States. *CBHSQ Data Review*.
- Olsen, Y., & Sharfstein, J. (2014). Confronting the stigma of opioid use disorder-and its treatment. *JAMA*. <https://doi.org/10.1001/jama.2014.2147>
- Robinson, S. M., & Adinoff, B. (2018). The mixed message behind “Medication-Assisted Treatment” for substance use disorder. *The American Journal of Drug and Alcohol Abuse*, 44(2), 147–150. <https://doi.org/10.1080/00952990.2017.1362419>
- Rudd, R. A., Seth, P., David, F., & Scholl, L. (2016). Increases in drug and opioid-involved

- overdose deaths — United States, 2010–2015. *MMWR. Morbidity and Mortality Weekly Report*, 65(5051), 1445–1452. <https://doi.org/10.15585/mmwr.mm655051e1>
- Saloner, B., Bandara, S. N., McGinty, E. E., & Barry, C. L. (2016). Justice-involved adults with substance use disorders: Coverage increased but rates of treatment did not in 2014. *Health Affairs*, 35(6), 1058–1066. <https://doi.org/10.1377/hlthaff.2016.0005>
- Saloner, B., & Cook, B. L. (2013). Blacks and Hispanics are less likely than whites to complete addiction treatment, largely due to socioeconomic factors. *Health Affairs*, 32(1), 135–145. <https://doi.org/10.1377/hlthaff.2011.0983>
- Volkow, N. D., Frieden, T. R., Hyde, P. S., & Cha, S. S. (2014). Medication-Assisted Therapies — Tackling the opioid-overdose epidemic. *New England Journal of Medicine*, 370(22), 2063–2066. <https://doi.org/10.1056/NEJMp1402780>
- Wu, L.-T., Blazer, D. G., Li, T.-K., & Woody, G. E. (2011). Treatment use and barriers among adolescents with prescription opioid use disorders. *Addictive Behaviors*, 36(12), 1233–1239. <https://doi.org/10.1016/j.addbeh.2011.07.033>
- Wu, L.-T., Ringwalt, C. L., & Williams, C. E. (2003). Use of substance abuse treatment services by persons with mental health and substance use problems. *Psychiatric Services*, 54(3), 363–369. <https://doi.org/10.1176/appi.ps.54.3.363>
- Wu, L.-T., Zhu, H., & Swartz, M. S. (2016). Treatment utilization among persons with opioid use disorder in the United States. *Drug and Alcohol Dependence*, 169, 117–127. <https://doi.org/10.1016/j.drugalcdep.2016.10.015>