

WHAT CONTRIBUTES TO ADVERSE OUTCOMES IN STATE-FUNDED DRUG
TREATMENT FOR JUSTICE-INVOLVED WOMEN WITH METHAMPHETAMINE
DEPENDENCE?

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by

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WHAT CONTRIBUTES TO ADVERSE OUTCOMES IN STATE-FUNDED DRUG TREATMENT FOR JUSTICE-INVOLVED WOMEN WITH METHAMPHETAMINE DEPENDENCE?

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Abstract

Methamphetamine use is highly addictive, heavily stigmatized, and on the rise in the United States, particularly in Western and Midwestern states. Considerable research has shown a correlation between methamphetamine use and criminal activity, among both men and women. Further research has shown that as methamphetamine use increases, its use among non-white populations is rising, although methamphetamine is still predominantly used by white people. Methamphetamine use is also associated with psychiatric conditions, such as depression, anxiety, and PTSD, and the use of other addictive substances, as users tend to self-medicate with the substance. In the absence of a chemical treatment alternative, treatment for methamphetamine dependence usually requires in-depth cognitive behavioral therapy, which can be prohibitively expensive and logistically challenging for addicted individuals. This thesis uses data on discharges from state-funded drug treatment to determine potential contributing factors to adverse outcomes in treatment, limiting the sample to women who are methamphetamine users and within the criminal justice system. Key findings include that non-white women are less likely to realize positive outcomes in treatment than white women, despite the fact that methamphetamine use and addiction is predominantly seen among white people. Experiences like unemployment, having a diagnosed psychiatric condition, and being reliant on government assistance to pay for treatment are associated with failure to complete treatment. Additionally, women on probation or parole – regardless of race or ethnicity and controlling for other factors –

tend to experience worse outcomes than those who are in prison. Due to some limitations, including lack of specific data from treatment facilities on why a person fails to complete treatment, there is significant room for additional research. However, these findings suggest that policymakers should consider addressing challenges that methamphetamine-addicted women who are suffering from environmental stresses – such as reduced income from unemployment or diagnosed psychiatric conditions – and/or non-white women or those who are under community supervision, on probation or parole, experience, as it appears to reduce the likelihood of treatment completion.

The research and writing of this thesis are dedicated to my loving friends and family. I would be nowhere without your support.

To Richard, thank you for your patience, your thoughtful advice, and your willingness to listen to all my many thoughts on U.S. drug policy.

To Mom and Dad, thank you for inspiring me to do and be more.

To Jack, Ned, and Annie, thank you for your steadfast support and encouragement.

And to James Joyce, thank you for the words to live by:

*“A man of genius makes no mistakes;
his errors are volitional and are the portals of discovery.”*

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Introduction

Once characterized as “the most dangerous drug problem of small-town America” by the United States Drug Enforcement Administration (DEA), methamphetamine is a highly addictive stimulant, the use of which carries significant social stigma (Murakawa, 2011). And methamphetamine use is on the rise: between 2015 and 2018, an annual average of 1.6 million adults used methamphetamine; of that number, 50% met the diagnostic criteria for methamphetamine use disorder (NIDA, 2021; Jones et al., 2020). Many current methamphetamine users use other substances or have diagnosed mental illnesses (Jones et al., 2020). The number of deaths linked to methamphetamine use is also rising, from 5,526 in 2015 to 15,489 in 2019 – a 180% increase (Han et al., 2021). Much of the stigma associated with methamphetamine use stems from the perceived relationship between its use and crime, as well as its effects on the behavior and appearance of users. Considerable research has shown a correlation between methamphetamine use and criminal activity, for both violent and property crimes (Gizzi & Gerkin, 2010; Timko et al., 2017; McKetin et al., 2020, Brecht & Herbeck, 2013). This relationship between methamphetamine use and criminal behavior persists for men and women, who use methamphetamine at comparable rates, unlike other illicit drugs (Hunt et al., 2006).

Researchers have determined that socioeconomic status and economic stress are strong determinants of risk for lifetime methamphetamine use (Hansen et al., 2021). NSDUH respondents who report having an annual family income below \$20,000, having been unemployed for the past 12 months, or receiving government assistance have an increased likelihood of long-term methamphetamine use (King et al., 2019). In terms of racial dynamics, white and Hispanic adults are significantly more likely than Black adults to have used

methamphetamines (King et al., 2019). Young, white individuals, particularly men in rural areas, comprise most methamphetamine users; but recent research suggests that rates of consistent use are highest among Native Americans, homosexual and bisexual men of all races, Native Hawaiians, and multiracial Americans (King et al., 2019). And as methamphetamine use increases nationwide, the racial dynamics of infrequent and frequent users continue to change, with increased use seen among Hispanic/Latino, Black, and other minority populations (Han et al., 2021a; Rivera et al., 2020; Martino et al., 2021). Regional analyses of methamphetamine use suggest that its use is primarily concentrated in the Western and Midwestern regions of the United States, particularly in rural communities (Timko et al., 2017; Hayes-Smith & Whaley, 2009; Artigiani et al., 2018). There is significant regional variation in terms of methamphetamine availability; in regions with more access to the drug, particularly in Western states, law enforcement report that it is one of the significant concerns (Artigiani et al., 2018). Across the United States, methamphetamine was reported as the greatest drug threat for nearly 30% of the surveyed law enforcement agencies, according to the U.S. Drug Enforcement Administration's 2017 Annual Drug Threat Survey (Artigiani et al., 2018).

The increase in supply-side drug policy intervention in recent years from federal and state officials may also increase the likelihood of property crimes committed by methamphetamine users to fund their drug use, given the potential for increased costs, and the reality that the relative affordability of methamphetamine contributes to its appeal among regular users (Hansen et al., 2021; Gonzales et al., 2010). The intersection of crime, drug use, and incarceration has featured prominently in national discourse for decades. In recent years, however, policies associated with that intersection have led to a massive increase in prison and jail populations, with disproportionate impact on women, particularly women of color (Lapidus et al., 2005). Research

has shown a relationship between women's lived experience – particularly of domestic violence, psychiatric conditions, and socioeconomic pressures – and the likelihood of using drugs; additional data suggest that women, especially those who are mothers or abuse survivors, are less able to access available treatment options, due to cost or logistical barriers (King et al., 2019; Lapidus et al., 2005).

Involvement in the criminal justice system comes with devastating consequences for a woman and her family – including loss of income and displacement of children – consequences that can trigger the urge to begin using drugs again, given the well-established association between socioeconomic distress and illicit drug use (Lapidus et al., 2005). However, the political popularity of supply-side intervention – such as increased policing and mandatory minimum sentencing and other penalties – historically outweighs that of demand reduction strategies, including comprehensive drug treatment, harm reduction, and more accessible behavioral therapy, to the detriment of those suffering from methamphetamine use disorder and other addictions (Sarasvita et al., 2008).

In this thesis, I use data on discharges from government-funded drug treatment for justice-involved women with methamphetamine dependence from the Substance Abuse & Mental Health Data Archive (SAMHDA) 2011 Treatment Episode Data Set - Discharges (TEDS) from the United States Department of Health and Human Services Administration Center for Behavioral Health Statistics and Quality. I build upon previous work examining the relationship between criminal activity and methamphetamine use to explore the outcomes of government-funded drug treatment on justice-involved women with methamphetamine dependence. Methamphetamine use disorder is typically treated with a combination of medical detox and in-depth behavioral therapy, which can be prohibitively expensive and logistically challenging to

pursue (Chandler et al., 2009). As more behavioral treatments with promising effects, such as contingency management, become available, and as supply-side interventions increase, it is critical that policymakers consider the potential outcomes of state-funded treatment on individuals with methamphetamine dependence, particularly those who are involved in the justice system.

Literature Review

Significant research has focused on the intersection between illicit drug use and criminal behavior, particularly for methamphetamine use. However, most researchers focusing on drug abuse in the criminal justice system tend to focus on the criminal activity and illicit drug use of men rather than women, despite the comparable rates at which both men and women use methamphetamine. Furthermore, there are pervasive gaps in access to drug treatment for those who are and are not involved in the criminal justice system.

Physiological Effects of Methamphetamine Use

Methamphetamine users experience an immediate euphoric high, resulting from the stimulation of pleasure centers in the brain (May et al., 2020; Prakash et al., 2017). Users often seek the euphoric effects of the drug to counteract negative feelings or circumstances, or to enhance experiences such as sexual activity or celebration; the latter is more frequently seen among male users (May et al., 2020). However, prolonged use of methamphetamine has been shown to reduce the body's natural responsiveness to other rewards, such as eating, positive social interaction, or earning money.

This reduced responsiveness to reward serves to reinforce the appeal of continuing to use methamphetamine, despite the significant potential social and physical costs that come with addiction (May et al., 2020). These physiological dynamics can be exacerbated by existing

mental illness. Mental health diagnoses of depression and anxiety have strong associations with methamphetamine use disorder; users seek to reduce the negative symptoms of their condition with the euphoric effects of methamphetamine (May et al., 2020). Among women, the alleviation of symptoms of depression associated with methamphetamine use is particularly appealing, as well as support finishing tasks and losing weight (May et al., 2020; Prakash et al., 2017). Research from May et al., 2020 suggests that women may be more likely than men to use substances to combat negative emotional states.

Methamphetamine use is also associated with heart issues and is frequently seen along other addictions and psychiatric diagnoses (Han et al., 2021a). Research suggests that as methamphetamine use increases, death rates are increasing among those experience sociostructural disadvantages, such as American Indian and Alaska Native individuals, particularly women (Han et al., 2021a).

Methamphetamine Use & Crime

There is a well-established link between methamphetamine use and criminal behavior in research spanning several disciplines, including economics, psychology, criminology, and public health. It is important to note that other heavily abused drugs, such as opioids, are not closely correlated with crime use. Hammersley et al., 1989 interviewed Scottish prisoners to explore determinants of criminal behavior among opioid users and non-users and found that opioid use and crime tend to influence each other equally, and that use of other drugs, such as cannabis, alcohol, and combinations of substances, is more closely tied to criminal behavior than use of opioids (Hammersley et al., 1989).

Gizzi & Gerkin, 2010 used structured interviews and court records research to explore the relationship between methamphetamine use and criminology. Key findings from Gizzi & Gerkin,

2010 include that methamphetamine use is associated with increased property crime, including “theft, burglary, robbery, criminal mischief, trespass, arson, and fuel piracy.” Additionally, among the drug users in the analysis, meth users were most likely to claim that they were intoxicated at the time of their crime.

The negative physiological effects of methamphetamine use – including negative mood states, deficits in executive functioning, psychosis, increased propensity for violence, increased agitation, increased aggression, and other adverse cognitive effects – may manifest in criminal behaviors, including violent and non-violent crime (May et al., 2020; Darke et al., 2018).

Illustrative of its adverse effects on mental state, methamphetamine use is closely associated with suicide attempts, among both men and women; suicide has been estimated to account for nearly 1 in 5 methamphetamine-related deaths (Darke et al., 2018).

Methamphetamine Use in Disadvantaged & Rural Communities

As methamphetamine use has proliferated across the United States, many researchers have sought to examine in which communities its use is most prevalent. Researchers like Courtney & Ray, 2014 explored how methamphetamine dependence is largely concentrated among the white population, roughly evenly divided between men and women, attributing these trends to increased availability of the drug and the materials required to create it in rural Western and Midwestern states. Hayes-Smith & Whaley, 2009 examine characteristics of communities with heavy methamphetamine use from a macro-level perspective, focusing on structural factors such as poverty and region, as well as household and family structure. The results indicate that poverty is significantly correlated with methamphetamine use, even as the researchers controlled for community type and other population variables. The researchers also found that methamphetamine use is significantly higher in suburban and rural communities in comparison

to urban communities. A limitation of Hayes-Smith & Whaley, 2009 is that its analysis, which examines data from school districts in Michigan, does not expand on the structural role of gender in methamphetamine use, beyond acknowledging that female-headed households in their reporting were positively correlated with low-income status.

Timko et. al 2017 expand on criminal behavior and substance use among rural users, finding that individuals using drugs, who are not in treatment, and are based in rural communities are more likely to be involved in the criminal justice system. While Timko et. al 2017 is not specific to methamphetamine use disorder, its analysis highlights many of the challenges associated with effectively treating individuals in rural communities, as well as the higher likelihood of recidivism among rural drug users. The researchers' analysis relies upon self-reports from participants, a possible limitation given the potential for bias from flawed recall and under or over-reporting.

Other adverse social determinants, such as unstable housing and social victimization, appear to influence likelihood of methamphetamine use and the severity of methamphetamine addiction. Li et al., 2018 found that men who have sex with men are more likely to use methamphetamine if they have a history of homophobic victimization, and more likely to experience severe methamphetamine use. (Li et al., 2018).

Methods of Methamphetamine Treatment & Responsiveness Among Women

Public health researchers have examined different methods of treating methamphetamine use disorder; there is consensus in existing literature that behavioral intervention and medical detox are among the most effective. Courtney & Ray, 2014 describe some of the challenges associated with methamphetamine treatment, including that while good outcomes can be associated with behavioral therapy, fundamental challenges include poor rates of treatment –

both induction into treatment, as well as retention and completion of programs. Chandler et al., 2009 explore how behavioral intervention can help in managing stresses associated with drug relapse and the stigma and shame associated with regular use and addiction.

Results from Dluzen et al., 2008 reveal that, compared to men, women begin using methamphetamine at an earlier age, appear more dependent on methamphetamine, and respond better to treatment. Furthermore, methamphetamine use among women appears to be more closely associated with depression and other mental health conditions. The researchers also share that these gender-based disparities in methamphetamine use and physiological response have not been deeply explored.

Measuring Effectiveness of Drug Treatment Behind Bars

Challenges abound in measuring the effectiveness of drug treatment behind bars, particularly for methamphetamine use disorder, despite the high rates of routine drug use reported among justice-involved individuals (McIntosh & Saville, 2006). This can be traced to the lack of a standardized criminal justice response to drug crimes, leading to the disparities in court referrals to drug treatment – particularly for minorities – and the challenges of treating methamphetamine use disorder and co-occurring psychiatric conditions (Nicosia et al., 2012; McIntosh & Saville, 2006). McKetin et al., 2017 found that methamphetamine users who remained in individual counselling after in-patient drug treatment experienced better outcomes than those who did not; and among intravenous methamphetamine users, longer stays in treatment led to better outcomes in abstaining from the drug (McKetin et al., 2017).

There are significant gaps in existing literature in exploring the complex gender dynamics associated with methamphetamine use disorder in the United States, particularly when it comes to criminal behavior. This thesis will build upon previous research on the role of

methamphetamine use in the criminal justice system by exploring the ways by which justice-involved, methamphetamine-dependent women receive and respond to state-funded behavioral treatment.

Conceptual Framework

Methamphetamine dependence is a particularly challenging issue from both a criminal justice and a public health perspective. The conceptual framework that I propose in this thesis will focus on factors that may generate adverse treatment outcomes for women who enter the criminal justice system with methamphetamine dependence, as illustrated in Figure 1 below. The conceptual framework includes additional factors that may be correlated with a woman’s likelihood of achieving positive or adverse outcomes from state-funded drug treatment, including education, marital status, region, income, and age. Consequently, these factors are associated with women before treatment, as they may impact why a woman begins using, their propensity for criminal behavior, and the potential for success in drug treatment.

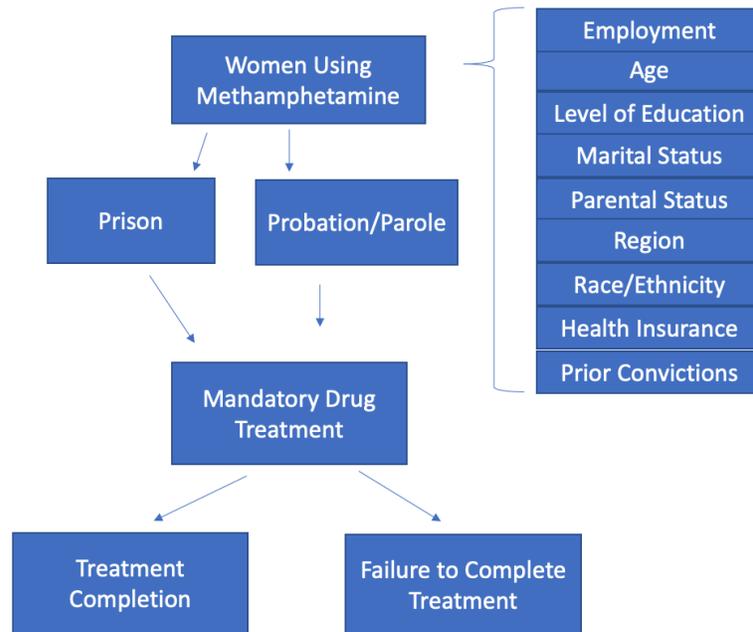


Figure 1: Conceptual Framework

Given the variation in potential levels of involvement within the criminal justice system, such as probation or parole, court diversionary programs, or incarceration, it is possible that they may contribute to different outcomes in state-funded drug treatment. For example, women may respond to the incentive of avoiding incarceration by completing drug treatment under probation, parole, or a court-mandated diversionary program, given the likelihood of incarceration if they fail, potentially increasing their dedication to completing the program. It is possible that this incentive may outweigh environmental factors – such as social groups, external stresses, or concurrent illnesses or addictions – in creating a pathway for success in treatment for justice-involved women who are addicted to methamphetamine.

Hypotheses

- I. Women who are low-income, less educated, and/or live in rural areas, are less likely to complete state-funded drug treatment for methamphetamine dependence than those who are not.
- II. Women who are in state-funded drug treatment through probation or parole and/or court-ordered diversionary programs are more likely to realize positive outcomes than those who are in treatment while incarcerated.

Data and Methods

In this thesis, I use the 2011 Substance Abuse & Mental Health Data Archive (SAMHDA) Treatment Episode Data Set – Discharges (TEDS-D), a dataset provided by the U.S. Department of Health and Human Services, to explore outcomes of government-funded drug treatment for women who are methamphetamine users and involved in the criminal justice system. The dataset includes information on discharges from substance abuse treatment for

alcohol and drug use occurring in 2011. Variables measured include the substance(s) used, the length of time in treatment, as well as demographic characteristics such as ethnicity, age, marital status, and education. The dataset also includes referral information on how treatment was begun, whether it was a personal decision, a referral from an employer, a referral from the criminal justice system such as courts, probation, or diversionary programs, referral from a prison system, or others. These data are collected by state treatment centers to oversee their systems of treating substance abuse.

The TEDS-D dataset, obtained online, has two key components: an Admissions Data Set and a Discharges Data Set. The variables are the same in both datasets. The TEDS-D dataset contains more than 1.5 million observations, including observations excluded from my analysis. As this thesis focuses on women with methamphetamine dependence within the criminal justice system, men – who compose 66.47% of the observations in the dataset – are removed from the sample in the analysis. After this elimination, there are 580,954 remaining observations. Of these observations, the sample includes women with reported methamphetamine dependence who were involved in the criminal justice system at the time of treatment, whether incarcerated, referred into treatment by the court system, under community supervision through probation or parole, involved in a diversionary program, or otherwise, resulting in a sample size of 9,094 observations. The states and regions represented in the sample are: Alabama, Alaska, Arkansas, Colorado, Delaware, District of Columbia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, North Dakota, Oklahoma, South Dakota, Utah, and Wyoming.

Measures

Treatment Completion. This measure, which serves as the dependent variable in the analysis, was coded from treatment outcomes to include individuals who completed treatment. The other outcomes include failure to complete treatment, death, and referral into other treatment programs. Given the lack of available information on what specifically leads to the adverse outcomes, treatment completion serves as the dependent variable. Additionally, the analysis uses a series of dummy variables to examine the effects of different factors in determining success in treatment completion, as listed below in Table 1.

Table 1: Patient Characteristics

Factor	Dummy Variables
Race/Ethnicity	White (1 = white; 0 = non-white)
	Non-White (0 = white; 1 = non-white)
Criminal Justice Referral	Prison (1 = Prison; 0 = all other referrals – court, community supervision, etc.)
	Probation/Parole (1 = probation/parole; 0 = all other referrals – prison, court, etc.)
Region	West (1 = West; 0 = all other regions – Northeast, South, Midwest)
	South (1 = South; 0 = all other regions – Northeast, West, Midwest)
	Midwest (1 = Midwest; 0 = all other regions – Northeast, West, South)
Financial Status	Reliant on Government Assistance to Pay for Treatment (1 = Reliant on Government Assistance to Pay for Treatment; 0 = Not)
	No Health Insurance (1 = No Health Insurance; 0 = Has Health Insurance)
	Unemployed (1 = Unemployed; 0 = Employed)
No Prior Convictions	No Priors (1 = No Prior Convictions; 0 = Prior Convictions)
Age	Under 24 (1 = Under Age 24; 0 = 24 or Older)
	Under 30 (1 = Under Age 30; 0 = 30 or Older)
	Under 40 (1 = Under Age 40; 0 = 40 or Older)

Education	High School (1 = At Least a High School Education; 0 = Less Than High School Education)
	At Least Some College (1 = At Least Some College Education; 0 = Less Than Some College)
Psychiatric Conditions	Psychiatric Conditions (1 = Diagnosed Psychiatric Condition; 0 = No Diagnosed Psychiatric Condition)
Pregnant	Pregnant (1 = Pregnant at Time of Treatment Admission; 0 = Not Pregnant at Time of Treatment Admission)
Alcohol Co-Dependence	Alcohol Co-Dependence (1 = Also Addicted to Alcohol; 0 = Not Also Addicted to Alcohol)

I used a logistic regression model to determine the effects of these factors on treatment completion for white and non-white methamphetamine-dependent women within the criminal justice system. I also examined treatment outcomes for women by limiting the sample to different races and ethnicities, namely: white, Hispanic, American Indian, Asian, Black, Native Hawaiian or other Pacific Islander, other single race, or two or more races.

My logit model is listed below, comparing outcomes for non-white women against white women, as are the models limiting the sample by race or ethnicity. I also doing models conditional on race/ethnicity.

Logistic Regression Model

$$\begin{aligned}
 TreatmentCompletion = & B0 + BNonWhiteWomen_i + BPrison_i + BProbation/Parole_i + \\
 & BWestRegion_i + BSouthRegion_i + BMidWestRegion_i + BGovernmentAssistance_i + \\
 & BNoHealthInsurance_i + BUnemployed_i + BNoPrior_i + BUnder24_i + BUnder30_i + BUnder40_i + \\
 & BHighSchoolEducation_i + BSomeHigherEd_i + BPsychProb_i + BPregnant_i + BAlcoholToo_i + \epsilon_i
 \end{aligned}$$

Results

Descriptive Statistics

Figures 1 and 2 compare white and non-white methamphetamine users in my sample, of women who are involved in the criminal justice system, with the CDC’s latest estimates of all white and non-white methamphetamine users in the United States overall, regardless of gender or

criminal justice involvement. Among women who are involved in the criminal justice system, nearly 88% are white non-Hispanic, compared to 12% non-white, including Hispanic, Black, and Asian individuals, which tracks with research showing that methamphetamine is predominantly used in white communities. It appears that the proportion of non-white women who use methamphetamine exceeds the proportion in treatment, which tracks with research indicating that non-white individuals are less likely to be referred into drug treatment in the criminal justice system (Lapidus et al., 2005).

Figure 3 demonstrates that most female methamphetamine users in the criminal justice system either have a high school diploma or less; compared to the distribution of education levels among women in the United States overall, female methamphetamine users in the criminal justice system tend to have much less education, particularly post-high school education, such as an associate or bachelor's degree.

Figure 4 shows the distribution of different age categories among the women admitted to treatment, showing that women below the age of 30 comprise 45.39% of treatment admits, and women above 50 only 3.27%. Figure 5 breaks down the number of women per different age category who were pregnant at the time of admission to treatment, clustered between 18 – 40 years of age. Women ages 12-24 comprise most pregnancies at time of treatment admission. By comparison, the median age at which a woman gives birth in the U.S. is 26, according to the Pew Research Centers.¹ This suggests that women who are involved in the criminal justice system and using methamphetamine are becoming pregnant at an earlier age than other women in the United States.

¹ <https://www.pewresearch.org/social-trends/2018/01/18/theyre-waiting-longer-but-u-s-women-today-more-likely-to-have-children-than-a-decade-ago/>

In terms of admission to treatment and treatment outcome, Table 6 shows the distribution of treatment outcomes – completing treatment is the predominant outcome, closely followed by transfer to another treatment program. As illustrated in Figure 7, women in state-funded drug treatment for methamphetamine use are most frequently referred through the court system (36.42%), or through the terms of their probation or parole (37.79%), or other legal entities (20.08%), such as local law enforcement or corrections agencies, youth services, or a review board. Referral into methamphetamine treatment through diversionary programs (1.20%), DUI/DWI (2.66%), and prison sentences (1.83%) are less frequently seen.

Among the states included in my sample, there is significant regional variability in methamphetamine use and corresponding arrests, as they are most frequently compounded in the West and Midwest regions of the U.S. Among women who are involved in the criminal justice system and receiving treatment for methamphetamine dependence, that trend persists – 51.48% are in the Midwest, 27.55% are in the West, and 20.75% are in the South – only 0.22% are in the Northeast in this sample, as shown in Figure 8. The shading in Figure 9 shows the states in which there are the most women in treatment, which shows that more rural states experience higher proportions of justice-involved women with meth dependence, which tracks with existing literature.

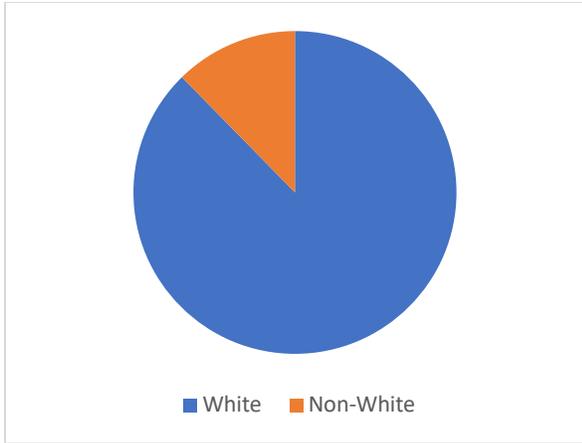


Figure 2: White and Non-White Female, Justice-Involved Meth Users in Treatment

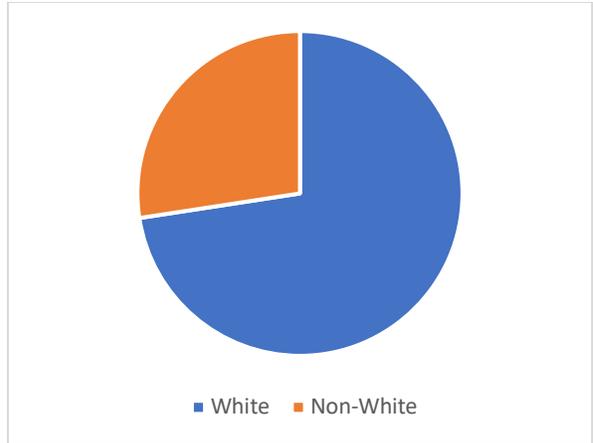


Figure 3: White and Non-White Meth Users in the U.S.

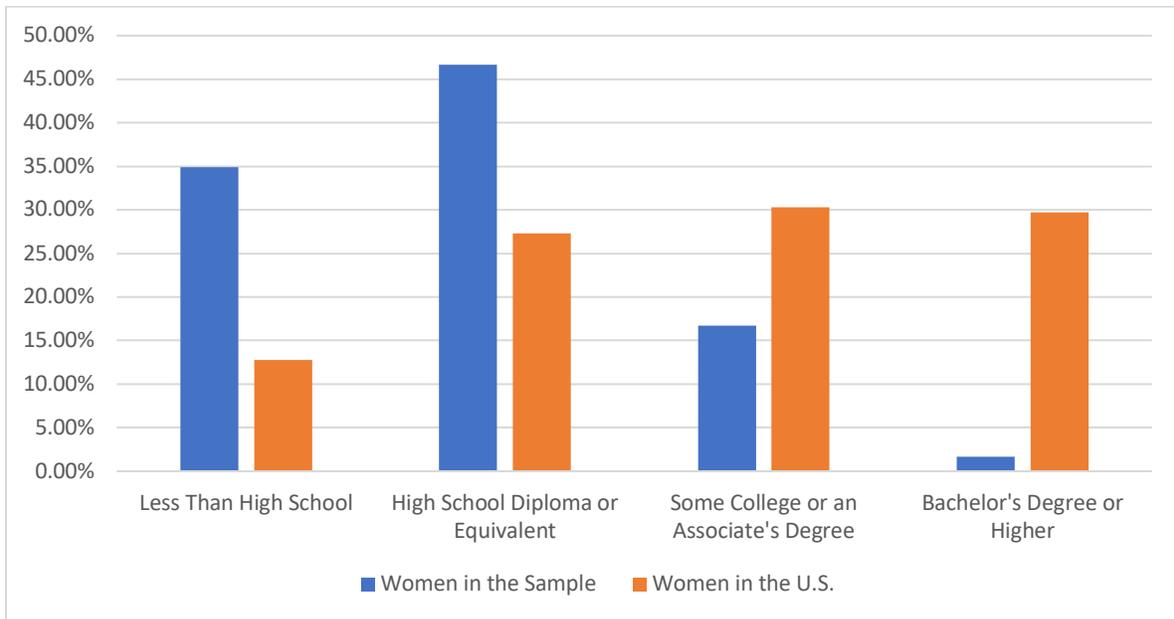


Figure 4²: Education of Female Meth Users in Sample and in U.S.

² <https://statusofwomendata.org/explore-the-data/poverty-opportunity/additional-state-data/highest-level-of-educational-attainment-of-women-and-men-by-state-2013/>

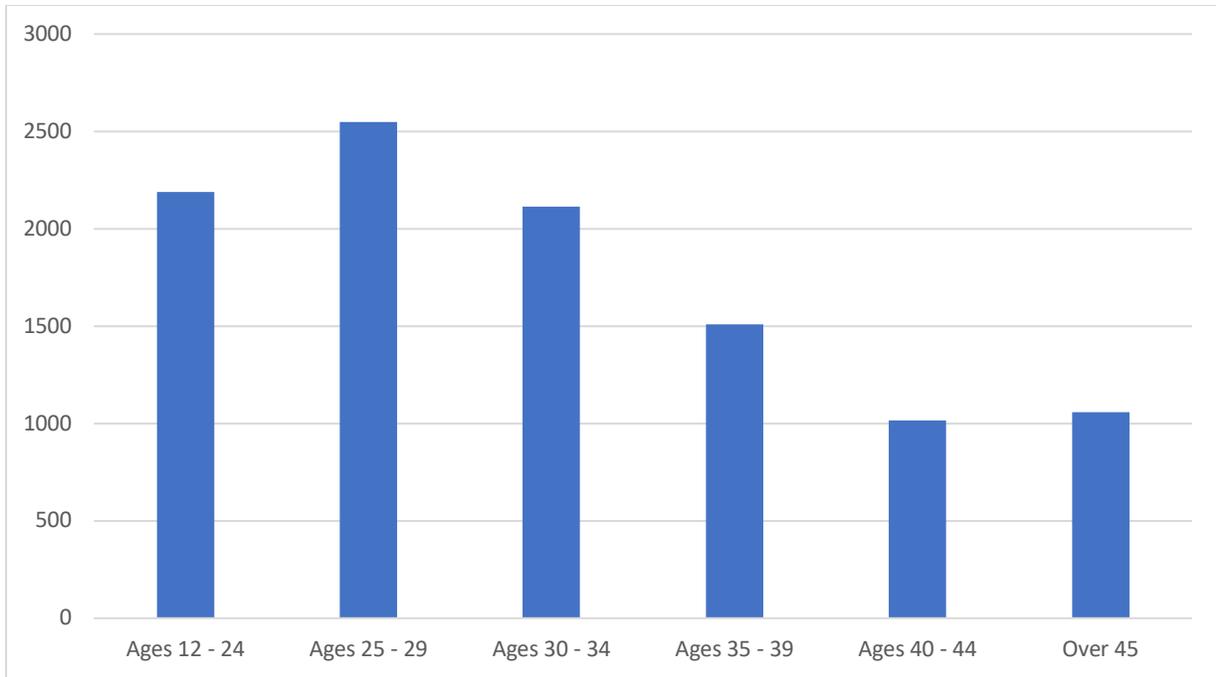


Figure 5: Age of Female, Justice-Involved Meth Users in Sample

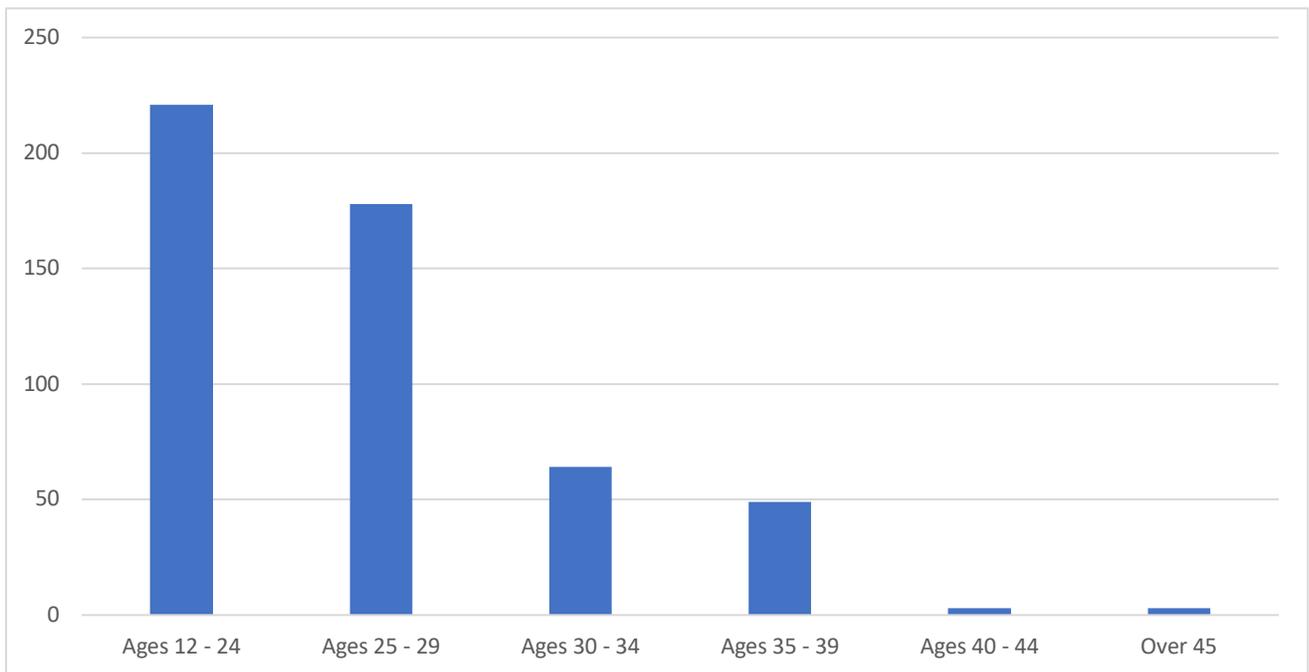


Figure 6: Female, Justice-Involved Meth Users Pregnant at Time of Treatment in Sample (By Age)

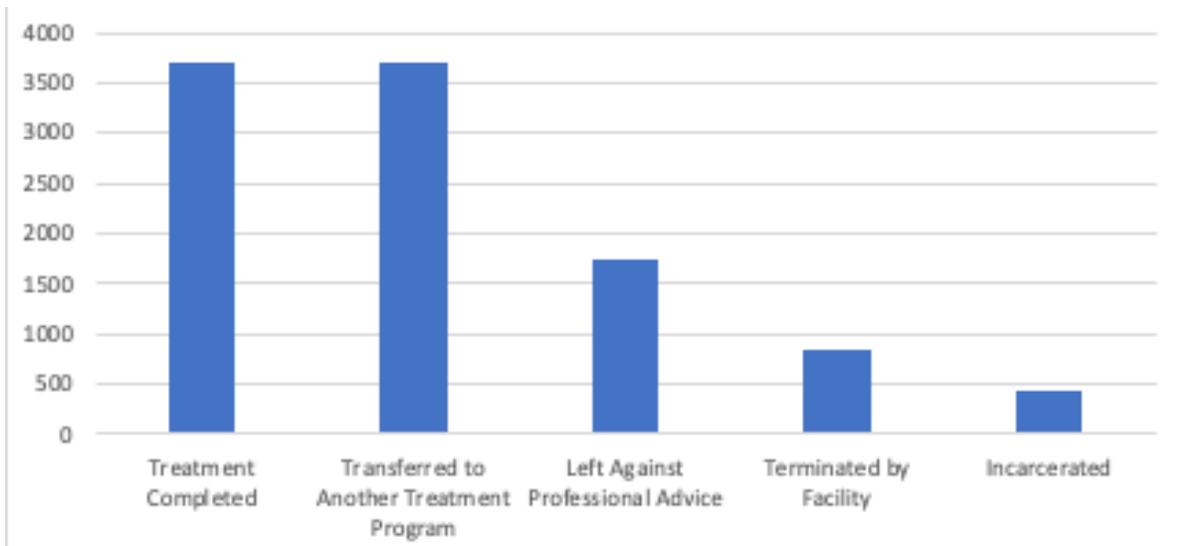


Figure 7: Treatment Outcomes among Sample

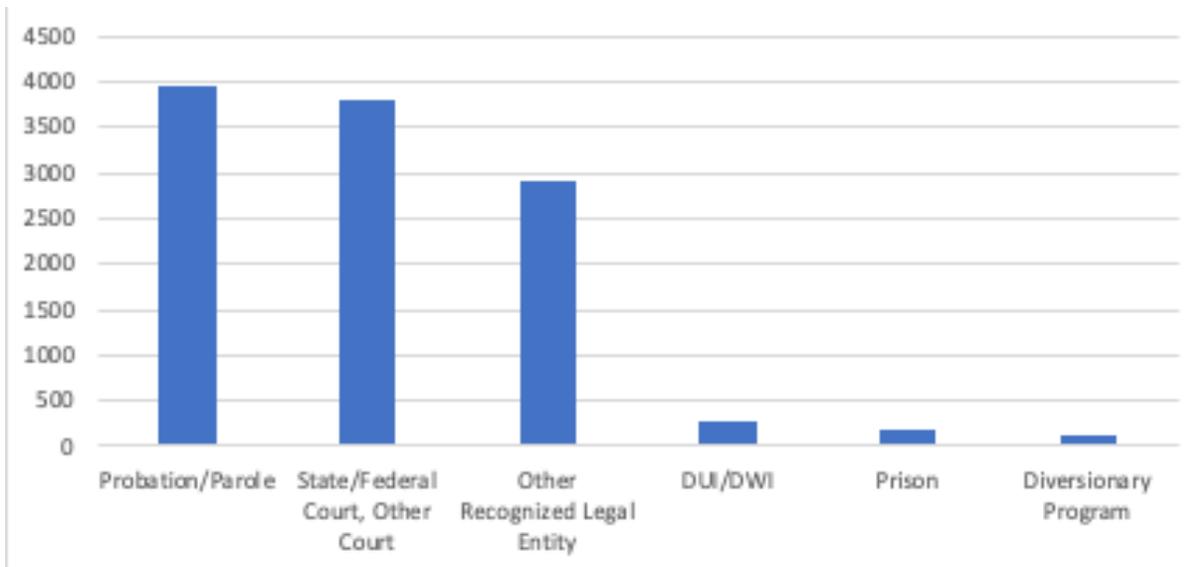


Figure 8: Criminal Justice Referral Types among Sample

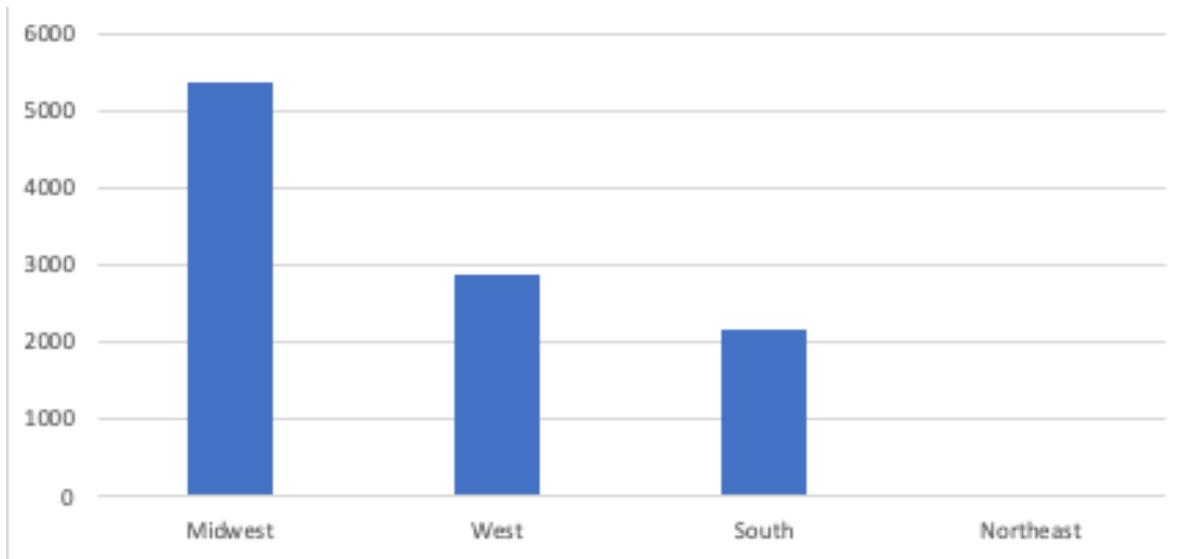


Figure 9: Regional Distribution of Sample

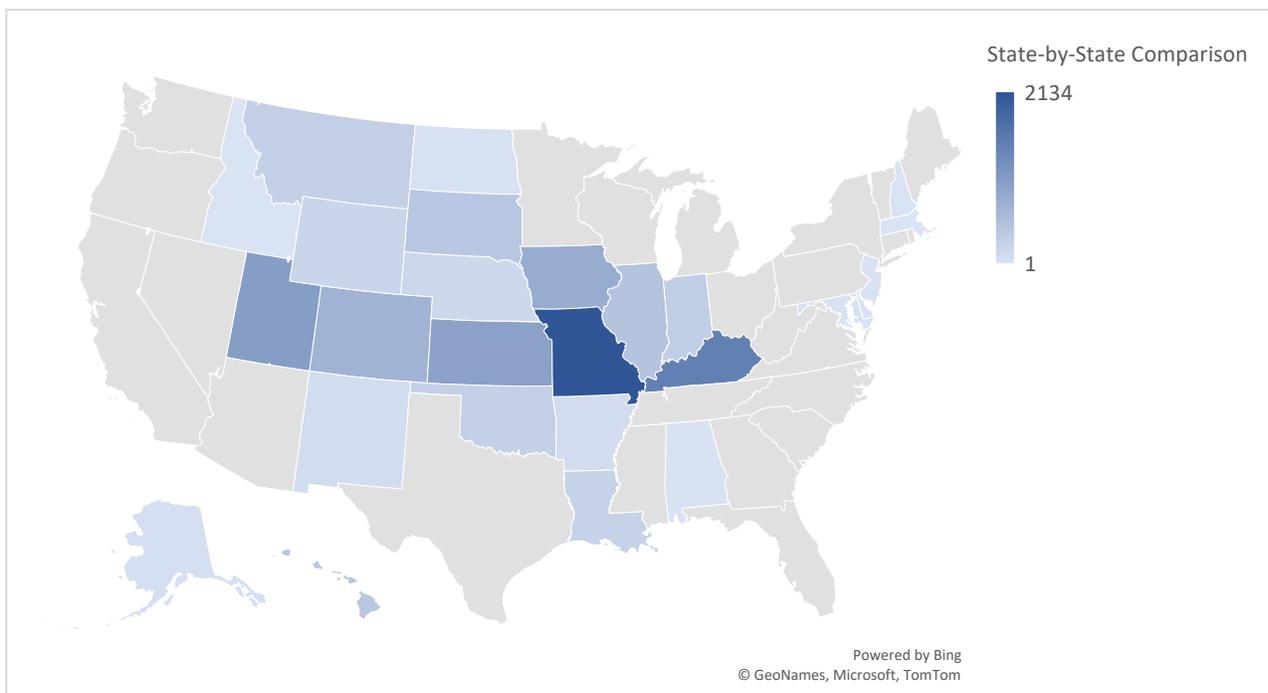


Figure 10: State-by-State Map Comparison of Sample Distribution

Inferential Statistics

Using treatment completion as the main predictor of treatment success, I ran a logit regression model to analyze factors that may contribute to treatment failure or adverse outcomes, while also comparing the outcomes non-white women experience to the outcomes white women experience, as detailed in Table 2. The analysis explores key demographic variables, including region of origin, race, employment status, prior convictions, and age, as well as ability to pay for treatment, measured by whether government assistance was required, and whether the woman had health insurance at the time of admission.

When controlling for region, need for government assistance, health insurance, employment, prior convictions, and age, white women in my sample realize better outcomes than non-white women at statistically significant levels. Age is not a strong predictor of treatment outcome among my sample. Region, on the other hand, may be – it appears that Southern women in my sample experience worse outcomes, as detailed in Table 2.

Table 2: Logistic Regression Model

	Model 1
	Co-efficient (SE)
Race/Ethnicity	
Non-White	-0.267 (.07)**
Referral Type	
Prison	0.551 (.17)**
Probation/Parole	-0.354 (.05)**
Region	
West	0.076 (.57)
South	-1.333 (.58)*
Midwest	-0.229 (.57)
Reliant on Government Assistance to Pay for Treatment	-0.410 (.06)**
No Health Insurance	0.348 (.05)**
Unemployed	-0.305 (.05)**
No Prior Convictions	-0.379 (.05)**

Age	
Under 24	
Under 30	-0.015 (.07)
Under 40	-0.199 (.06)**
	-0.056 (.06)
Education	
At least high school	
At least some college	0.105 (.05)*
	0.136 (.06)*
Has a Diagnosed Psychiatric Condition	
Pregnant	-0.275 (.05)**
Also Dependent on Alcohol	0.155 (.11)
	0.163 (.05)**
<i>Observations</i>	<i>n = 9,094</i>
** <i>p</i> < 0.01	* <i>p</i> < 0.05

As outlined in Table 2, non-white women are less likely than white women in my sample to complete treatment, at statistically significant levels. However, it appears that non-white women in my sample experienced better outcomes in prison – particularly Black women, as illustrated in Table 3. In contrast to my second hypothesis, however, it appears that women in my sample who are on probation or parole – both white and non-white – experience worse outcomes than those who are incarcerated in terms of completing drug treatment. White women and American Indian women, specifically, who are on probation and parole appear to be less likely to complete treatment than other racial or ethnic groups in my sample, at statistically significant levels. These conflict with my original hypothesis that women on probation or parole would experience better outcomes than those behind bars, as it appears that the exact reverse is more likely.

Completing at least a high school level of education – the equivalent of twelve years of formal schooling – increases the likelihood that a woman in my sample experiences positive outcomes in treatment. Additionally, being co-dependent on alcohol is related to more positive outcomes in treatment, particularly for Hispanic women in my sample, as shown in Tables 2 and

3. It is possible that women with a high level of education, or who are also reliant on alcohol, will benefit more from behavioral treatment; both in terms of level of comprehension, and the ancillary benefits of treating underlying mental health conditions. By contrast, women with diagnosed psychiatric conditions appear to be less likely to complete treatment, in support of my first hypothesis that those with psychiatric conditions would experience worse outcomes in treatment.

Variables concerning financial status appear to be strong predictors of success or failure in treatment among women in my sample. White, Hispanic, and Native Hawaiian or other Pacific Islander women who are reliant on government assistance to pay for drug treatment are less likely to complete treatment. By contrast, white women without health insurance appear to be more likely to complete treatment at statistically significant levels. Unemployment, however, is associated with failure to complete treatment across all racial and ethnic groups in my sample. These findings largely support my first hypothesis that low-income women would experience worse outcomes in treatment.

Discussion

This thesis uses drug treatment discharge data from SAMHSA to evaluate mitigating factors in treatment success for women with methamphetamine dependence who are referred into drug treatment through the criminal justice system. In my first model, comparing the outcomes for non-white women compared to white women, I saw that non-white women are less likely to complete treatment. In that analysis, I reviewed several factors that could impact treatment success: race, age, region of origin, comorbidities, such as alcohol dependence and psychiatric diagnoses, employment status, and other indicators of financial status, such as ability to pay for treatment, need for government assistance, and whether a woman has health insurance. In my

second model limiting the sample by race and ethnicity, namely white, Hispanic, American Indian, Asian, Black, Native Hawaiian or other Pacific Islander, other single race, and two or more races, I was able to more closely examine treatment success by racial and ethnic group.

It appears that treatment for methamphetamine use disorder is less successful for women who need government support to pay for treatment, who are unemployed, or who have a diagnosed mental illness. Additionally, it appears that non-white women — despite less likely to use methamphetamine — have less successful outcomes in treatment than white women.

Additionally, across most racial and ethnic groups, it appears that women who undergo treatment while under community supervision – on probation or parole – are less likely to complete treatment than those who are incarcerated, in direct contrast to my second hypothesis. This could be attributed to the challenges of falling back into old patterns of behaviors or experiencing the same socioeconomic or familial stresses that led into addiction in the first place. On the other hand, the lack of access to methamphetamine while incarcerated, as well as the ability to essentially corner a person into treatment, may also lead to higher rates of treatment completion behind bars.

Based on other findings from my analysis showing how financial and environmental factors are associated with adverse outcomes, I likely underestimated environmental factors that may encourage continued methamphetamine use, including job stress, family dynamics, financial pressures, lack of access to treatment, other social dynamics, drinking, etc. Additionally, I may be underestimating the benefits of reduced access to drugs and reduced exposure to environmental factors, behind bars, which may increase the likelihood of treatment completion.

Policy Implications

Given that methamphetamine use disorder is best treated through cognitive behavioral therapy, policymakers should consider the crossover benefits of treating diagnosed psychiatric conditions or other addictions alongside methamphetamines addiction itself. My analysis suggests that women with mental illness have less success in completing drug treatment than those who do not; if state-funded drug treatment facilities offered additional mental health support, it may improve outcomes for those patients. The same is true for women who rely on government assistance, including Medicare and Medicaid, to complete treatment — if drug treatment is made more affordable, as well as mental health support, it may increase the rate of program completion for women who need one or both.

The stark difference between positive outcomes among incarcerated women who receive drug treatment in prison and those on probation or parole who receive drug treatment under community supervision suggests that additional support is needed to ensure treatment success for those who are not behind bars. Given the role of socioeconomic and family stresses in increasing the likelihood of recidivism and relapse, additional support in the way of money, childcare, or job placements will likely improve outcomes for women seeking to overcome methamphetamine addiction. Outcomes are particularly worse for women who are unemployed, so policymakers should consider creating job placement programs or state employment opportunities to ensure consistent employment, access to insurance, and paycheck stability for women in treatment.

Furthermore, there is significant regional variability in treatment completion for non-white women, which is particularly notable in considering existing racial disparities in the criminal justice system and the fact that white women are the predominant users of methamphetamine. While it could be argued that the difference in policies and laws across state

lines, as well as the different approaches to addressing drug-related crimes, would explain that variability, it is noteworthy that non-white women appear to experience worse outcomes in treatment than white when controlling for most other factors, including education, financial status, region, age, and mental health conditions.

Given existing research that suggests outcomes improve for individuals with methamphetamine addiction when provided mental health support, during treatment and afterward, policymakers should consider making mental health support more accessible and affordable (McKetin et al., 2017).

Limitations

There is significant opportunity at hand for follow-on research, particularly when it comes to regional issues associated with methamphetamine use. States like California, Oregon, and Washington, which have historically experienced higher rates of methamphetamine use – and have taken different approaches than other states to supporting individuals recovering from addiction – are not included in my sample. Additionally, rural regions of the country typically see more methamphetamine use and high rates of methamphetamine-related crime; the urban-rural dynamics should be explored further. Another limitation of my analysis is in the breakdown of why women were unable to complete treatment, or why they may have been terminated, transferred, or incarcerated. Follow-on research should explore the dynamics of failures to complete treatment and what factors lead to those failures.

Conclusion

Methamphetamine use is on the rise among women in the United States. As policymakers begin to explore more progressive options for treating addiction and addiction-related crime, it bears recognizing that women who are addicted to methamphetamine and involved in the

criminal justice system can access vastly different options and outcomes depending on their financial status and their region. There is clearly a gap in U.S. drug policy between supply-side and demand-side approaches, which has resulted in a mass incarceration crisis in the United States, one that disproportionately impacts low-income and minority communities, as well as mothers and their children. Disparities in treatment success among white and non-white women, and those who are low-income, from rural communities, have psychiatric diagnoses, or struggle financially, suggest that additional support is needed from government to ensure treatment success for addiction, particularly as supply-side interventions are explored to curtail drug use.

Appendix

Table 3: Treatment Outcomes – Limiting Sample by Race/Ethnicity

Race/Ethnicity	White	Hispanic	American Indian	Asian	Black	Native Hawaiian/ Other Pacific Islander	Other Single Race	Two or More Races
	Co-efficient (SE)	Co-efficient (SE)	Co-efficient (SE)					
Referral Type								
Prison	0.967 (.19)**	1.168 (.47)*	0.341 (.69)	N/A	2.90 (1.4)*	-0.566 (1.2)	N/A	N/A
Probation/ Parole	-0.256 (.05)**	-0.119 (.20)	-0.746 (.25)**	-1.034 (.71)	-0.174 (.63)	-0.053 (.34)	-0.296 (.34)	-0.014 (.52)
Reliant on Govt Assistance to Pay for Treatment	-0.459 (.06)**	-0.425 (.21)*	0.479 (.27)	-0.059 (1.1)	-0.254 (.86)	-2.468 (.68)**	-1.413 (.46)**	-0.399 (.56)
No Health Insurance	0.502 (.05)**	0.172 (.18)	0.032 (.25)	0.672 (.68)	-1.209 (.70)	0.288 (.35)	-0.268 (.32)	-0.434 (.51)
Unemployed	-0.219 (.06)**	-0.577 (.22)**	0.234 (.28)	-3.543 (1.5)*	-2.544 (.90)**	0.569 (.67)	-0.721 (.36)	-0.113 (.74)
No Prior Convictions	-0.594 (.05)**	-0.206 (.18)	-0.567 (.26)*	-0.901 (.80)	-0.496 (.68)	-0.949 (.38)*	0.880 (.33)**	1.229 (.58)*
Age								
Under 24	0.103 (.08)	-0.034 (.25)	-0.284 (.32)	-0.148 (1.1)	-0.311 (.80)	0.073 (.53)	0.419 (.45)	0.309 (.68)
Under 30	-0.244 (.07)**	-0.082 (.22)	-0.321 (.31)	2.068 (.93)*	0.775 (.81)	-0.199 (.46)	-1.258 (.39)**	-0.306 (.74)
Under 40	-0.129 (.07)	-0.134 (.25)	0.278 (.33)	-2.141 (.93)*	-2.635 (1.1)*	0.221 (.44)	0.841 (.45)	-0.780 (.77)
Education								
At least high school	0.141 (.06)*	-0.209 (.18)	-0.396 (.26)	-1.214 (.89)	1.263 (.80)	-0.046 (.37)	0.325 (.33)	0.305 (.55)
At least some college	0.131 (.07)*	0.536 (.28)	-0.521 (.32)	2.444 (1.1)*	-1.767 (.95)	0.196 (.69)	0.255 (.48)	-0.660 (.77)
Has a diagnosed psychiatric condition	-0.280 (.05)**	-0.462 (.17)**	-0.409 (.23)	0.722 (.68)	-0.379 (.64)	-0.054 (.35)	0.119 (.33)	-1.102 (.48)*
Pregnant	0.112 (.11)	-0.124 (.53)	-0.427 (.54)	N/A	N/A	-0.699 (1.1)	-0.007 (.96)	1.660 (1.2)
Also dependent on alcohol	0.260 (.10)	0.522 (.17)**	0.414 (.27)	-0.219 (.71)	0.852 (.72)	-0.339 (.33)	0.065 (.31)	-0.212 (.50)
Observations	n = 7,937	n = 687	n = 350	n = 89	n = 92	n = 275	n = 223	n = 113
	* p < 0.05	** p < 0.01						

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