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## Injection Drug Users (IDUs), Blood-Borne Diseases, and The Role of Needle Exchange Programs

Lilibeth Guzman

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INJECTION DRUG USERS, (IDUS), BLOOD-BORNE DISEASES, AND THE  
ROLE OF NEEDLE EXCHANGE PROGRAMS

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A Thesis  
Presented to the  
Faculty of  
California State University,  
San Bernardino

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Public Health

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by  
Lilibeth Guzman

May 2022

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## ABSTRACT

**Objective:** Needle exchange programs are designed to educate injection drug users of healthy drug behaviors and establish a controlled environment to prevent blood-borne diseases through clean needles and provide treatment to reduce blood-borne diseases and become drug-free. This study observed the prevalence of blood-borne diseases among injection drug users as well as the general population. The study used publicly available data of drug use to assess differences by race/ethnicity, and participation in needle exchange programs.

**Methods:** Quantitative methods were used with the 2019 National Survey on Drug Use and Health. Analysis began with descriptive statistics, followed by regression analyses to understand the association between (1) injection drug use and HIV/AIDs, (2) involvement in needle exchange programs and HIV/AIDs among injection drug users, and (3) race/ethnicity and HIV/AIDs among injection drug users. **Results:** Results demonstrated a positive relationship between injection drug use and HIV/AIDs as well as a positive relationship between HIV/AIDs and involvement in a needle exchange program. Race/ethnicity was not associated with HIV/AIDs among injection drug users. **Conclusion:** The results of the study highlight the need to further research injection drug users and how they may be at increased risk for blood-borne diseases such as HIV/AIDs. In addition, the results emphasize the importance of needle exchange programs as they may be the only source of care for injection drug users.

## ACKNOWLEDGEMENTS

I wish to thank my parents, husband, son, and the rest of my family for their love and support. Without their support and encouragement, I would have not been able to reach my goal during this educational journey. To the CSUSB professors, thank you for all the support and guidance you have given me. I am grateful and appreciative of every one of you.

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# CHAPTER ONE

## INTRODUCTION

### Problem Statement

Drug use is a complex behavior with multidimensional determinants, including social, psychological, cultural, economic, and biological factors. (Edlin, 2005) Substance use is one of the concerning major public health issues as substances can be misused and this use can ultimately lead to blood borne disease transmission due to poor health practices.

The 2002 National Survey on Drug Use and Health reported that 3.7 million Americans > 12 years have experimented with heroin use. (Edlin, 2005) An estimated 1.0-1.5 million Americans actively use illicit drugs by injection. (Edlin 2005) Substance use increases the likelihood individuals will contract blood-borne viral infections. Infections are transmitted when uninfected injection drug users (IDUs) use injection equipment, especially syringes, that have previously been used by an infected person. (Edlin, 2005)

In response to the HIV epidemic and overdose among IDUs, needle exchange programs provide necessary resources to IDUs by reducing the health and social harms associated with injection drug use. (Kerr, 2007) Among injection drug users (IDUs), high levels of HIV risk-associated behavior at the time of initiation of injection drug use has been reported: 213 (20%) participants reported their first injection was performed with a used syringe, and 796 (75%) participants reported they were injected by someone else during their first

injection. (Kerr, 2007) Illicit drug injection is a serious public health issue. Such empirical evidence highlights IDUs first injection experience as an act of risky behavior. There is a need for interventions to prevent initiation of injection drug use and programs that promote safer injecting practices among new injectors. (Kerr, 2007) More specifically, programs and interventions that assist with first time IDUs and current IDUs should focus on preventing addiction and blood-borne diseases in the future. Overall, the main goals of these programs should be to prevent the initiation of injection drug use and promote safer injecting practices. (Kerr, 2007). Substance use has led to disease transmission and substance use disorders. Although needle exchange programs can be controversial, findings indicate these programs can be beneficial. Needle exchange programs can be controversial because there are concerns of encouraging injection drug use. (Harris, 2016) However, research shows that needle exchange programs are beneficial because they allow IDUs to *shoot* (inject drugs intravenously), within a safe facility. (Kerr, 2007) The clinic provides drug paraphernalia (water, filters, spoons) to practice safe sterile preparation for individuals to safely inject drugs and prevent blood-borne disease transmission. Aside from providing sterile drug paraphernalia the clinic allows IDUs to receive effective care and treatment with health education. The information provided from scholarly articles indicate how needle exchange programs promote health education to individuals about disease transmission, provide helpful resources to

help individuals maintain the behavior change going forward, prevent relapse, and have the ability to seek help if relapse occurs.

### Purpose of Study

The purpose of this study is to assess the prevalence of blood-borne diseases among IDUs as well as the role of needle exchange programs to help eliminate the epidemic of HIV infections among IDUs.

### Research Questions

1. Do IDUs have a higher risk of blood-borne diseases compared to those that do not inject drugs?
2. Do IDUs that participate in needle exchange programs have a lower risk of contracting blood-borne diseases compared to IDUs who do not participate in needle exchange programs?
3. Does the prevalence of blood-borne diseases among IDUs vary by race/ethnicity?

### Significance to Public Health

Substance use is a relevant topic in the field of public health in order to prevent morbidity and mortality. Evaluating the role of needle exchange programs is critical to address the needs of IDUs, such as providing adequate resources to IDUs to understand their options for medical and psychological help, and ultimately preventing disease transmission from occurring.

The proposed thesis will meet several public health accreditation standards. Selected data from appropriate scholarly journals. This method will collect the data from educational resources and statistical data collected from publicly available de-identified data collection through the 2019 National Survey on Drug Use and Health (NSDUH). First, selecting quantitative and qualitative data collection methods appropriate for a given public health context. This standard will be met by using publicly available de-identified data collection through the 2019 National Survey on Drug Use and Health (NSDUH). Second, analyzing quantitative and qualitative data using biostatistics, informatics, computer-based programming, and software, as appropriate. This standard will be met by assessing the relationships between the variables of interest using SPSS to carry out the analyses. Third, interpreting results of data analysis for public health research, policy, or practice. This standard will be met by discussing the results of the study findings in the written thesis and oral defense. Fourth, the communication of appropriate public health content through writing and defending the thesis to a professional audience will meet this standard. Overall, these standards will be achieved by integrating knowledge from multiple scholarly sources along with the present study. Ultimately, the present study has the potential to support health education initiatives that address substance use within needle exchange programs among IDUs.

## CHAPTER TWO

### LITERATURE REVIEW

What are Health outcomes and Structural Interventions of NEPs

Needle exchange programs (NEPs) also referred as syringe exchange programs (SEPs) provide services to injection drug users (IDUs) such as substance use treatments, health screenings, medical care, and educational resources for safer injection practices to decrease HIV infection rates. Injection drug use is one of the most efficient modes of transmission of human immunodeficiency virus (HIV) and other blood-borne diseases. (Abdul-Quader, 2013). Injection drug users are at high risk for blood-borne diseases as they engage in risky behaviors such as sharing injection equipment and drug supplies. (Abdul-Quader, 2013). Needle exchange programs provide the opportunity for drug users to decrease infection rates and encourage sobriety. Compelling evidence increases that the availability and utilization of sterile equipment given among IDUs, helps reduce HIV infection rates. These programs are in place to provide sterile needles, syringes, and additional paraphernalia to IDUs and protect IDUs as a whole. The purpose of this literature review is to provide a summary of the current literature on needle exchange programs.

#### What is a Needle Exchange Program?

Needle exchange programs are community-based prevention programs that provide a range of resources and medical services. Needle exchange programs have been implemented in cities, regions, and countries worldwide to

address HIV and hepatitis infection among IDUs. (Abdul-Quader, 2013) These programs provide safe needle disposal, emergency overdose response, HIV and Hepatitis testing including bacterial and fungal treatments, vaccines, drug detoxification, counseling, health education, and sterile syringe distribution. They have been shown to be beneficial in reducing risky behaviors and factors that influence virus transmission. (Abdul-Quader, 2013). Drug and virus transmission can affect any person of any age, race/ethnicity, and social status, but this public health issue can be tackled with the implementation of needle exchange programs to fight against substance abuse and blood-borne diseases among individuals who inject drugs. These needle exchange programs are safe, effective, and cost-saving, do not increase illegal drug use or crime among drug users and the community, and play an important role in reducing the transmission of viral blood-borne diseases such as HIV and Hepatitis. This is a program that is used strategically within public health as an intervention for possible harm reduction among injection drug users.

#### Health Outcomes of Injection Drug Users

Needle exchange programs are used to tackle the HIV epidemic among injection drug users (IDUs). Needle exchange programs provide reliable resources and consist of fixed-site specialist services to address the needs of drug users. Services in needle exchange programs include HIV and HCV testing and counseling, methadone maintenance treatment, drug detoxification services, needle and syringe distribution, and health care related to infections associated

with injection and substance abuse. (Abdul-Quader, 2013). These programs will also include medical staff supervision for an emergency overdose response if needed. Needle exchange programs may have the ability to lower blood-borne infection rates among people who inject drugs and provide interventions to stop drug use. The health consequences of people who inject drugs can be blood-borne diseases, mental health disorders, poverty, and homelessness. If IDUs continue treatment within the program the risky behaviors such as needle sharing may slowly decrease.

Not all injection drug users (IDUs) remain in the same circumstances when they begin attending a needle exchange program. Some IDUs may improve their behaviors, such as stopping injection drug use, or minimize the harm done by drugs. For example, an evaluation of the Insite needle exchange program showed that the program was meeting its objectives of reducing public disorder, infectious disease transmission, and overdoses and was successfully referring individuals to a range of external programs, including detoxification and addiction treatment programs. (Kerr, 2017). Additionally, reducing the risk behaviors of people who inject drugs who also visit structural level needle-syringe programs can have a partial “herd immunity” effect that can protect the local injection drug use population as a whole. (Abdul- Quader, 2013). Needle exchange programs may improve the health of IDUs and impact the health of the community.

### Structural Interventions That Influence Needle Exchange Programs

(NEPs). Drug use and syringe sharing is not new, but the rate of syringe sharing is different from previous years due to law changes in legislation. The law Assembly Bill No. 2077 changed in 1992 to allow the legal sales of needles/syringes and as a result syringe-sharing among people who inject drugs (PWID) decreased significantly. (Abdul-Quader, 2013) Such laws, regulations, and policies can influence injection drug users' behaviors by addressing external factors. External factors determine structural interventions. Structural interventions include physical, social, cultural, organizational, community, economic, legal and policy factors and promote or impede health. (Abdul-Quader, 2013). Structural interventions focus on factors that influence risky behaviors, which frame the implementation of needle exchange programs. Structural interventions are defined as those interventions where changes in policy and legal environment have facilitated an increased availability of sterile syringes which subsequently led to population-level changes in HIV and HCV/HBV prevalence or incidence. (Abdul-Quader, 2013). Needle exchange programs are a framework of structured interventions that facilitate behaviors with supporting injection drug users (IDUs). Needle exchange programs may be beneficial to tackle this public health issue; however, these programs experience a lack of resources/funding. Reforms are urgently needed to facilitate the integration of assisted injection and safer smoking interventions into supervised injection facilities (SIFs) and reduce challenges in access to these facilities



stemming from gender, disability, and polysubstance use. (Kerr, 2017). If these facilities are implemented, they may also decrease the stigma associated with injecting drugs. Needle use stigma and discrimination act as barriers among people who inject drugs in addition to certain characteristics such as gender, homelessness, ethnic minority status, and migrant status. Needle exchange programs will provide a safe place for IDUs.

## CHAPTER THREE

### METHODS

#### Study Design

This study is based on a quantitative assessment of secondary data. The original cross-sectional study collected data on demographics, substance use, mental health, and other health variables among individuals over the age of 12. Details on the study design have been published and explained elsewhere, such as in the codebook. SAMHDA. 2019.

#### Data Source and Collection

The present study used 2019 data from the National Survey on Drug Use and Health (NSDUH) conducted through the Substance Abuse and Mental Health Services Administration (SAMHSA). The sample is largely diverse representing Hispanic, White, African American, and Asian populations. The present study is an annual survey of the civilian, noninstitutionalized population of youths aged 12 to 17 and included the responses of adults or those over 18.

NSDUH included questions around drug use, blood-borne diseases, needle exchange programs and individuals receiving or seeking treatment.

## Measures and Data Analysis

### Dependent Variables

HIV/AIDS was assessed by asking respondents if they were told they have HIV/AIDS. Respondents were asked and answers were: Yes or No.

### Independent Variables

Injection drug use. Respondents were asked if in the past 12 months they have ever utilized injection drugs. Answers were: Yes or No.

Needle exchange programs. Respondents were asked if they are currently receiving treatment or counseling. Possible answers were: Yes or No.

Race/ethnicity is measured by individuals identifying themselves within their race groups as listed 1-7. Racial/ethnic categories included: 1- White, 2- African American, 3 - Native American, 4 - Pacific Islander, 5 - Asian, 6 - multi-ethnic and 7 - Hispanic. The categories provided the analysis of the prevalence among IDUs race/ethnicity diagnosed with HIV/AIDS.

Analyses began with descriptive statistics. Bivariate associations were assessed for Pearson correlations and linear regressions. Research question one was analyzed using correlations. Research question two and three both analyzed data by conducting linear regression.

### Ethics

This study was done retrospectively. Secondary data was used from existing data approved by the CSUSB Institutional Review Board.

## CHAPTER FOUR

### RESULTS

The results of this study are divided in relation to each research question:

#### HIV Risk among Injection Drug Users (IDUs)

The first research question was: Do IDUs have a higher risk of blood-borne diseases compared to those that do not inject drugs? In order to address this research question, the analyses focused on evaluating the relationship between injection drug use and blood-borne diseases, specifically HIV/AIDS. Table 1 shows the correlation between injection drug users and HIV/AIDS. The Pearson correlation of 0.014 indicates there is a small correlation between injection drug use and HIV/AIDS. Further, this relationship is significant at the  $p=0.001$  level.

Table 1. Association Between HIV/AIDs and Injection Drug Use among US Adults (Unweighted). National Survey on Drug Use and Health 2019

<b>Correlations<sup>c</sup></b>			
		EVER TOLD HAD HIV OR AIDS	EVER USED NEEDLE TO INJECT ANY OTHER DRUG
EVER TOLD HAD HIV OR AIDS	Pearson Correlation	1	.014 **
	Sig. (2-tailed)		.001
	Sum of Squares and Cross-products	105980371	114542.637
	Covariance	1887.955	2.040

### The Role of Needle Exchange Programs

The second research question was: Do IDUs that participate in needle exchange programs have a lower risk of contracting blood-borne diseases compared to IDUs who do not participate in needle exchange programs? In order to address this research question, the analyses focused on evaluating the relationship between participation in needle exchange programs and HIV/AIDs among injection drug users. Table 2 shows the findings from conducting regression analysis. There is a positive association between participation in a needle exchange program and HIV. Further this relationship is significant at the 0.006 level.

Table 2. Association Between Involvement in a Needle Exchange Program and HIV/AIDs among US Adult Injection Drug Users (Unweighted). National Survey on Drug Use and Health. 2019

**Coefficients<sup>a,b</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	42.754	3.513		12.170	<.001
	CURRENTLY RECEIVING TRMT/COUNSELING FOR TXFILL1	.112	.041	.096	2.760	.006

a. RC-EVER USED NEEDLE TO INJECT DRUGS = Yes

b. Dependent Variable: EVER TOLD HAD HIV OR AIDS

#### Differences by Race/Ethnicity

Research question 3 states: Does the prevalence of blood-borne diseases among IDUs vary by race/ethnicity? Analysis focused on assessing the relationship between race/ethnicity and HIV among IDUs. Table 3 and Table 4 shows that race/ethnicity is not significantly associated with HIV/AIDs.

Table 3. Association Between Race/Ethnicity and HIV/AIDs among US Adult Injection Drug Users Bar Graph. National Survey on Drug Use and Health. 2019

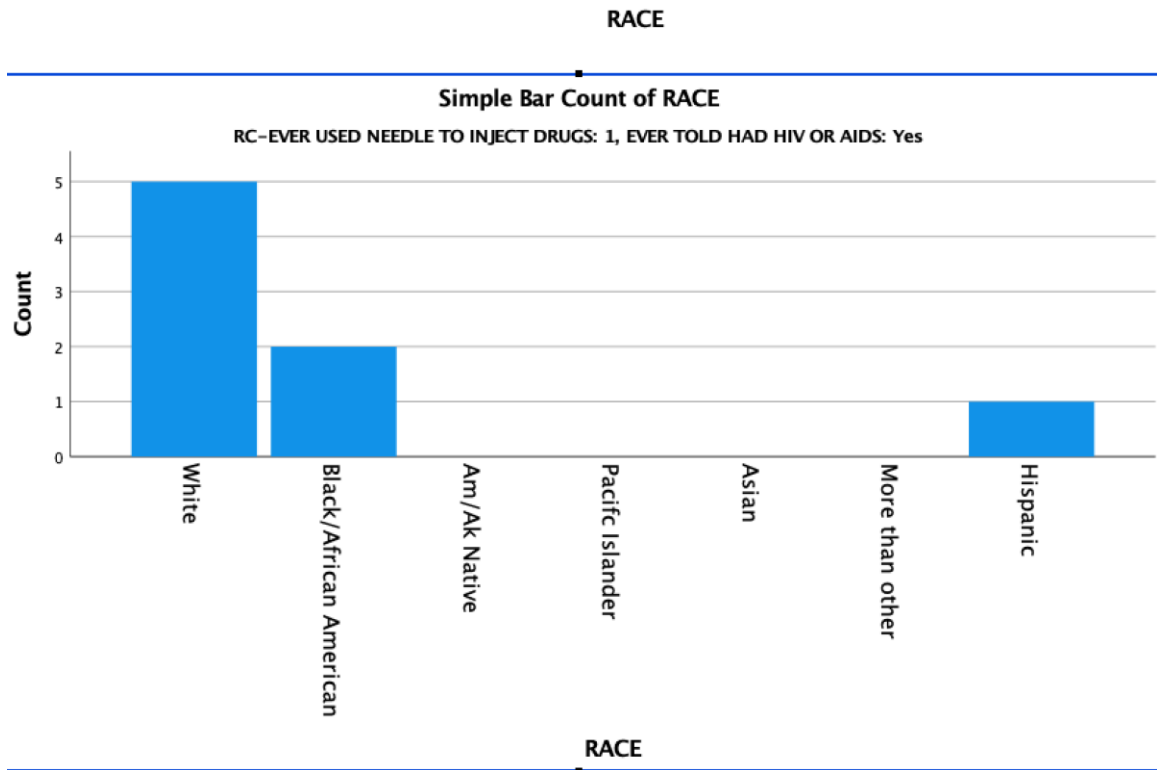


Table 4. Association Between Race/Ethnicity and HIV/AIDs among US Adult Injection Drug Users (unweighted). National Survey on Drug Use and Health. 2019

**Coefficients<sup>a,b</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	51.823	1.915		27.059	<.001
	BLACK Race 2	-7.986	8.192	-.034	-.975	.330
	Native Race 3	9.869	9.693	.036	1.018	.309
	PACIFIC RACE 4	40.177	34.313	.041	1.171	.242
	ASIAN RACE 5	14.010	19.872	.025	.705	.481
	MORE THAN ONE RACE 6	4.382	8.527	.018	.514	.607
	HISPANIC RACE 7	-9.551	5.844	-.057	-1.634	.103

a. RC=EVER USED NEEDLE TO INJECT DRUGS = 1

b. Dependent Variable: EVER TOLD HAD HIV OR AIDS



## CHAPTER FIVE

### DISCUSSION

The purpose of this study was to investigate the relationship between injection drug use, HIV/AIDS, needle exchange programs, and whether there are disparities by race/ethnicity. The present study used data from the 2019 NSDUH. There appears to be a small correlation between injection drug use and HIV/AIDS as expected. HIV infections are transmitted when uninfected injection drug users (IDUs) use injection equipment, especially syringes, that have previously been used by an infected person. (Edlin, 2005) Studies have shown uninfected IDUs generally become infected at rates of 10%-20% per year. (Edlin, 2005) This is consistent with the literature that shows injection drug users are at higher risk of blood-borne diseases. However, there was a positive association between participation in a needle exchange program and HIV/AIDS. This is contrary to what was expected. The purpose of needle exchange programs is to enhance the understanding of injection drug use, blood-borne diseases, risky behaviors, and substance use thus preventing HIV/AIDS. However, it is possible that participation in a needle exchange program increased access to health services which allowed IDUs to get tested for HIV/AIDS. It is possible that IDUs that did not participate in needle exchange programs did not have access to health care services thus many may have been undiagnosed. Lastly, there did not appear to be any differences by race/ethnicity in the relationship between injection drug use and HIV/AIDS. The impact of inject drug use on HIV/AIDS

appears to cut across all racial/ethnic groups, but very much across the white community. Despite this, disparities in access to services persist.

Notwithstanding the limitations, the use of the data to report risk for HIV among a sample of IDUs is a major strength of our study and makes a contribution to our understanding of racial disparities in HIV and needle exchange programs.

Greater HIV prevalence in minority networks and neighborhoods means that risky behavior could result in transmission. Where people are located in relation to the risk and resources that surround them is an important aspect of understanding the effects of the environment on health and behavior (Williams, 2010). Certain geographic regions where communities are built are the areas where there is a concentration of liquor stores, crime, violence, and drug use.

The results of this study emphasize the importance of needle exchange programs particularly given the difference they can make to help decrease substance use and reduce HIV/AIDS transmission among IDUs to help eliminate this public health issue. Several benefits of needle exchange programs include helping to reduce HIV transmission, providing IDUs with treatment and supplying clean needles. Aside from providing treatment and supplies, needle exchange programs may help reduce or abolish income inequalities, racism, and other inequities to help eliminate this public health issue of substance use and blood-borne diseases among IDUs. (Lancaster, 2020). Of particular importance is access to health care services. As previously mentioned, it was expected that involvement in a needle exchange program would be negatively associated with

HIV/AIDS. Needle exchange programs may be IDUs only source of care given the stigma and discrimination they face. In 2021, the Biden administration released a model law (model syringe services program act) to help states ensure access to Needle exchange programs. Needle exchange programs through this new law are part of the efforts to reduce overdoses, HIV, as well as helping IDUs in accessing addiction treatments. (Knopf, 2021) IDUs who are not in these programs represent a vulnerable group. These individuals are the ones who are homeless, that are completely stigmatized and cut off from society and are not properly diagnosed or being treated. Homeless individuals likely do not have health insurance, given additional barriers to receiving health services and they may not know if they have HIV/AIDS. This law provides states with a framework to make sure syringe service programs are available wherever they are needed. (Knopf, 2021) We should consider the services needle exchange programs provide IDUs. Reducing new HIV infections will require translating evidence-based approaches to alleviate the risks associated with sharing injection equipment. (Lancaster, 2020). But we have the issue that the results of this study emphasize the importance of needle exchange programs and the support they provide to IDUs. The data aligned with the literature that supports the effectiveness of needle exchange programs and their immense impact among IDUs and the community.

## Strengths and Limitations

This study has some strengths and limitations. The limitations in the race/ethnicity population included samples being low due to the coefficient being negative and cross-sectional data cannot prove causality. The HIV diagnosis is something that can impact all races/ethnicities. There are certain groups that are particularly stigmatized. There are certain groups that have a higher prevalence of HIV/AIDS that are criminalized with drug use and have these culturally competent barriers from being able to access treatment programs but based on the data there wasn't any difference. Regardless of these limitations there are a lot of values and strengths in my analysis. This is a nationwide survey where there was a large number of respondents, so I was able to do a comprehensive analysis. With this being said the data found may be used as an external tool for further studies. Nevertheless, there are several strengths of this study. Both variables HIV and injection drug use in this study data exposed the multiple forms of drug use and the health risks IDUs are exposed to if not provided treatment within needle exchange programs. The focus group of IDUs included analyzing the relationship between drug treatment and race/ethnic groups. Although, there was a strong relationship between IDUs receiving drug treatment, but a weak relationship among the sample population based on race and ethnicity.

## Recommendations for Research and Practice

The present study emphasized the need to focus on IDUs and consider the role of needle exchange programs. Future studies should aim to get a better sense of how needle exchange programs are being utilized among IDUs. This understanding could help tailor programs that increase reach, reduce stigma, and improve awareness of HIV infections among IDUs (Lancaster,2020). Public health or medical agencies should consider innovative designs that account for the heterogeneity in needs and preferences among IDUs (Lancaster,2020). For example, programs should consider the healthcare services that people have access to as there are major barriers in this country. It is possible that for many IDUs needle exchange programs may be their only source of care. Additionally, while the present study did not find evidence of racial/ethnic disparities, future studies should continue to assess differences by race/ethnicity.

## Conclusion

The study's results indicate that IDUs may have a greater risk of HIV/AIDs. If IDUs receive treatment by attending needle exchange programs this can increase their knowledge of safe drug use. Evidently, it is essential IDUs are able to practice safe drug injection use as well as receive education on blood-borne disease risks, mental illness, disparities, and decrease drug consumption. The study literature and variables confirmed that needle exchange programs play a role in health education and access to health care services and reveal how different races/ethnicities can be negatively impacted. This represents a

challenge and opportunity; public health and needle exchange programs need to ensure they are putting forth effective strategies to educate the community and IDUs on this issue.

APPENDIX A

TABLES

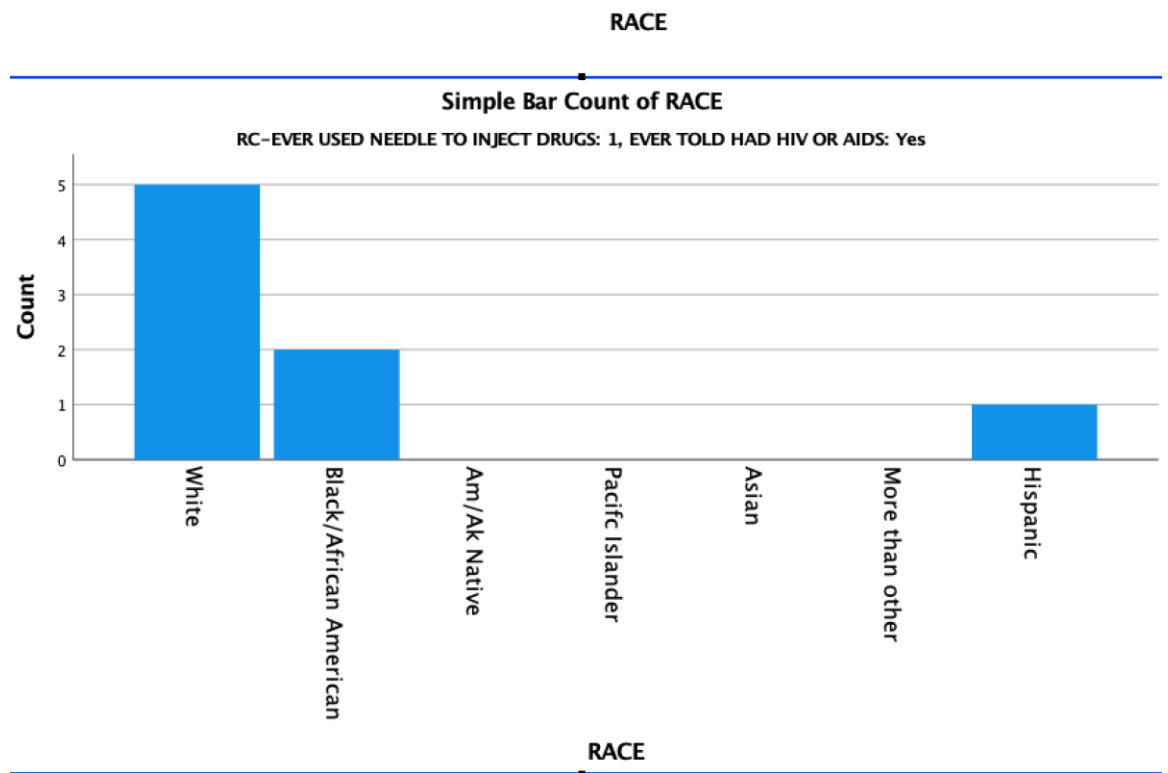
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	CURRENTLY RECEIVING TRMT/COUNSELING FOR TXFILL1	.112	.041	.096	2.760	.006

a. RC-EVER USED NEEDLE TO INJECT DRUGS = Yes

b. Dependent Variable: EVER TOLD HAD HIV OR AIDS





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Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
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	HISPANIC RACE 7	-9.551	5.844	-.057	-1.634	.103

a. RC-EVER USED NEEDLE TO INJECT DRUGS = 1

b. Dependent Variable: EVER TOLD HAD HIV OR AIDS

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