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Racial Disparities in Syringe Exchange Program Access in Kentucky

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Racial Disparities in Syringe Exchange Program Access in Kentucky

CAPSTONE PROJECT PAPER

A paper submitted in partial fulfillment of the requirements for the degree of

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Abstract

Non-white Kentuckians use syringe exchange programs (SEPs) at lower rates than white Kentuckians. This analysis begins by documenting this disparity and then explores several potential causes. Access to SEPs is limited by law as only health departments may operate them. Areas of the state in which SEPs face political opposition are therefore underserved. A consequence of this legal limitation is distance to a SEP may be a barrier to access. Analysis of publicly available data indicates non-white drug users in Kentucky are located closer to syringe exchange programs in urban areas but farther away in rural areas. Proximity to a syringe exchange program does not appear to influence use as non-white representation at syringe exchange programs in Kentucky is low overall, for those clients whose race can be identified. It is recommended that education about the benefits of SEPs be increased in majority non-white communities. Policy recommendations would be to amend KRS 218A.500 to allow entities other than health departments to operate syringe exchange programs, and to allow for deployment of SEPs in the state of Kentucky through means not affiliated with health departments such as mobile units or syringe vending machines.

Keywords: Syringe exchange programs, opioid use disorder, geography

Table of Contents

Acknowledgements	2
Abstract	3
Keywords: Syringe exchange programs, opioid use disorder, geography	3
List of Abbreviations.....	5
I. Introduction	6
II. Materials & Methods	8
A. Software.....	8
B. Data Sources.....	8
C. Mapping – Creation of Census Tract Centroids & Geocoding Addresses	9
D. Mapping – Distance Determination in Miles using QNEAT3.....	9
E. Data Analysis in R	10
a. Data Preparation	10
b. KDPH Demographics Data	11
III. Results.....	13
Figure 1: Location of SEPs relative to White/Non-White Census Tracts.....	13
Table 1: Characteristics of Kentucky Census Tracts - Predominantly White vs Non-White, by Urban/Rural.....	14
Table 2: Racial Demographics of First-Time SEP Clients as of June 12, 2021, KDPH	14
Table 3: Average Percent Racial Makeup of First-Time SEP Clients by Urbanity-Rurality of SEP as of June 12, 2021, KDPH	15
IV. Discussion.....	16
V. Policy Implications	20
VI. References	21
VII. Biographical Sketch	24

List of Abbreviations

AIDS: Acquired Immuno-Deficiency Syndrome

GEOID: Geographic Identifier

HIV: Human Immunodeficiency Virus

KDPH: Kentucky Department of Public Health

O-D Matrix: Origin-Destination Matrix

RUCA: Rural-Urban Commuting Area

SEP: Syringe Exchange Program

I. Introduction

Injection drug use is more prevalent among non-white individuals compared to white individuals.¹ The negative consequences of injection drug use, therefore, differ by race. While injectable opioids are used more frequently by white individuals compared to black individuals in the United States, black individuals suffer opioid use-related deaths at higher rates compared to whites.² Black drug users also tend to be addicted for longer periods and suffer relapses more frequently compared to white drug users.¹

Evidence suggests that non-white drug users tend to suffer personally and socially when compared to white drug users. Negative social consequences, legal problems, and dependence symptoms are all reported at higher rates for non-white drug users compared to white drug users.³ Non-white drug users also tend to live in areas where the morbidity and mortality associated with injection drug use is worse compared to whites.⁴

Harm reduction refers to a broad set of “interventions aimed at reducing the negative effects of health behaviors without necessarily extinguishing the problematic health behaviors completely”.⁵ Syringe exchange programs (SEPs) are one example of harm reduction targeted specifically at mitigating the negative consequences of injection drug use, such as drug addiction and the spread of blood-borne diseases HIV and Hep C.⁶

Black individuals are less likely to initiate substance use disorder treatment compared to white individuals.⁷ Lower long-term engagement and retention rates with

substance use disorder treatment programs and harm reduction programs are reported for non-white individuals compared to white individuals.⁷ The low levels of engagement with these services may explain, in part, the higher rates of HIV/AIDS (Human Immunodeficiency Virus/Acquired Immuno-Deficiency Syndrome) seen in non-white populations. In the year 2018, for example, nearly 79% of new diagnoses of HIV occurred in non-white individuals who injected drugs.⁸

Access to SEPs remains a critical issue for mitigating the harms of injection drug use. Kentucky has 74 SEPs in operation as of June 2021. Current policy states that SEPs can be administered only by local health departments.⁹ This likely creates issues with equitable access to SEPs, with potential disparities by race. The aim of this project is to characterize the geographic distribution of SEPs, focusing especially on their proximity to majority white and non-white census tracts in the state of Kentucky. Based on study results, revisions to the current policy surrounding the operation of syringe exchange programs in the state, KRS 218A.500 (Senate Bill 192), are suggested.

II. Materials & Methods

A. Software

The following software were used in this analysis: QGIS version 3.18.2 “Zürich”¹⁰, Google Maps, US Census Geocoder¹¹, R version 4.0.4 (The R Foundation for Statistical Computing, 2021).

B. Data Sources

Self-reported racial identity of syringe exchange program users was obtained from the Kentucky Department of Public Health REDCAP database of first-time SEP users.^{12,13} A shapefile of Kentucky census tracts was obtained from the US Census Bureau.¹⁴ Road centerline data was obtained from the Kentucky Department of Transportation.¹⁵ The list of syringe exchange programs (SEPs) in Kentucky was obtained from the Kentucky Department of Public Health (KDPH)¹⁶.

Census tract population counts and census tract counts of individuals identifying as white were obtained from the 2019 American Community Survey (ACS).¹⁷ These data were used to calculate the number of white and non-white individuals in each census tract.

United States Department of Agriculture Rural-Urban Commuting Area (RUCA) codes were obtained from the Economic Research Service.¹⁸ To facilitate analysis these ten categories were collapsed into two: codes related to metropolitan or micropolitan areas

were re-classified as “urban”, and codes related to small town or rural were re-classified as “rural”.¹⁹ These re-classified codes were assigned to census tracts.

The percentage of individuals indicating they had an income below the federal poverty level in 2018 (the latest data available in the 2019 ACS), the percentage of individuals with more than a high school education, the Gini coefficient of income inequality, and the social vulnerability index (SVI) score for each census tract in Kentucky were obtained from the American Community Survey. These covariates were chosen as poverty²⁰, education²¹, income distribution²² and social vulnerability²³ have all been associated with drug use.

C. Mapping – Creation of Census Tract Centroids & Geocoding Addresses

The shapefile of census tracts in Kentucky was loaded into QGIS. The centroid for each census tract was calculated in QGIS using a built-in function. The list of syringe exchange programs obtained from KDPH was submitted to the US Census Geocoder. Addresses for which either exact or non-exact matches were obtained were considered successfully geocoded (38/74). The remaining addresses (n = 36) were manually input into Google Maps and the coordinates obtained manually.

D. Mapping – Distance Determination in Miles using QNEAT3

A map was created overlaying the census tract centroids and point coordinates of the Kentucky syringe exchange programs on the road network. The QNEAT3 plugin was

used to calculate the distance from each census tract centroid to each syringe exchange program.²⁴

In the QNEAT3 plugin, the network was set to the layer representing the roads. The origin was set to the layer representing the census tract centroids. The destination was set to the layer representing the SEP locations. The shortest path was calculated using an ellipsoidal entry cost. Topology tolerance was set to zero. QNEAT3 calculates distances in meters and these values were converted to miles. 82,510 origin-destination pairs representing the distance in miles from each census tract centroid to each syringe exchange program in the state of Kentucky were calculated.

E. Data Analysis in R

a. Data Preparation

The network analysis function in QNEAT3 produces an origin-destination matrix (O-D matrix), a table containing the geolocation of each census tract centroid related to the geolocation of each SEP. The O-D matrix was loaded into R and the geographic entity code (GEOIDs) for the census tracts was added. The addition of GEOIDs was done to facilitate later merging of covariates from the American Community Survey and other data sources. The counties of each census tract and the addresses of the syringe exchange programs were added to facilitate identification. This data set was then filtered to obtain the SEP closest to each census tract centroid, resulting in 1,115 origin-destination pairs.

A table of frequency weights was created with two entries for each census tract: one entry for the number of white individuals and the second entry non-white individuals (1,115 pairs).

b. KDPH Demographics Data

i. Classification of SEP county as urban-rural

Each county was associated with its constituent census tracts. Each census tract was classified as “urban” or “rural” using the recategorized RUCA codes. The number of urban and rural census tracts was tabulated for each county and counties were classified as predominantly urban or predominantly rural based on whether the majority of census tracts were classified as urban or rural. In cases where counties had equal numbers of urban and rural census tracts, an Economic Research Service map was consulted and the designation on the map used as a tiebreaker.¹⁹

The list of SEP addresses provided by KDPH often, but not always, included the county in which the syringe exchange program was located. In cases where this was true, the named county was taken as the county of the syringe exchange program. In cases where this was not true (i.e., district health departments) the address of the district health department was obtained and the county where the district health department was located was used. County characteristics were then associated with each SEP (e.g., predominantly urban vs predominantly rural county).

ii. Percentage of first-time SEP clients who are white or non-white by urban-rural

To calculate the average percentages of first-time SEP clients by race and urban/rural, the KDPH SEP data was loaded into R and filtered to first-time clients for each syringe exchange program. The client-reported race was classified as either “white”, “non-white”, or “unknown”. Racial categories of Black/African American, Asian, Native Hawaiian and other Pacific Islander, two or more races, and American Indian/Alaska Native were collapsed into “non-white” and the percentage of each class per SEP calculated.

III. Results

Figure 1: Location of SEPs relative to White/Non-White Census Tracts

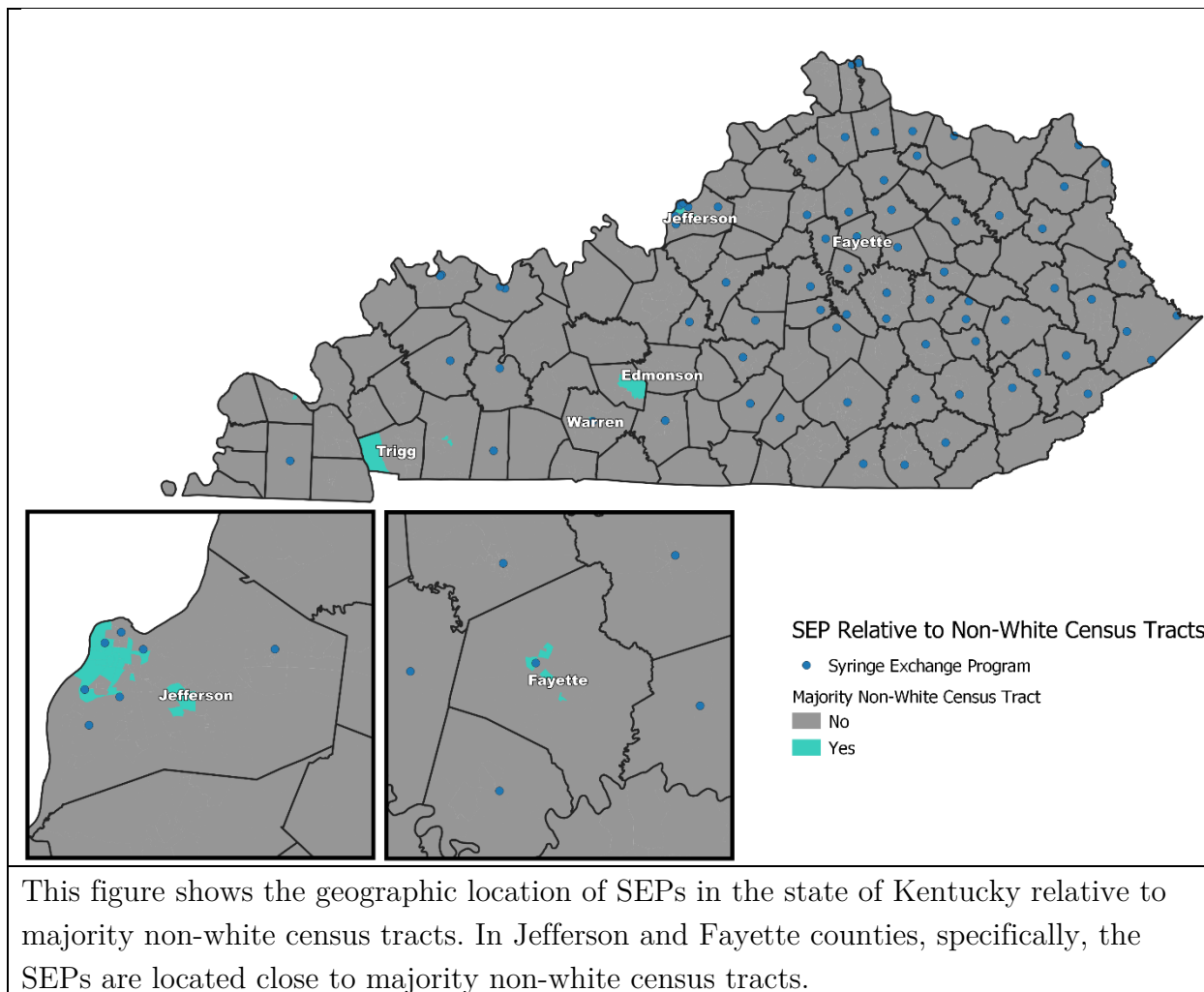


Table 1: Characteristics of Kentucky Census Tracts - Predominantly White vs Non-White, by Urban/Rural

Variables	Urban		Significance*	Rural		Significance*
	White	Non-white		White	Non-white	
Distance (miles)**	10.24 (7.97)	7.35 (7.10)	$p < 0.01$	17.08 (10.98)	17.77 (11.99)	$p < 0.01$
% Highschool grad	88.27 (7.17)	87.04 (7.62)	$p < 0.01$	78.44 (7.17)	80.40 (7.12)	$p < 0.01$
% Poverty	15.21 (10.78)	20.79 (14.41)	$p < 0.01$	24.32 (8.89)	23.78 (9.57)	$p < 0.01$
Gini Index†	0.43 (0.06)	0.42 (0.07)	n.s	0.46 (0.06)	0.46 (0.05)	n.s.
SVI‡	0.42 (0.28)	0.58 (0.30)	$p < 0.01$	0.66 (0.22)	0.70 (0.21)	$p < 0.01$

*:Statistical significance based on weighted t-test (continuous variables) and weighted chi-squared test (proportions)

**: Distance from census tract centroid to the nearest syringe exchange program

†: The Gini Index ranges from 0 to 1 – closer to 1 indicates more income inequality.

‡: The Social Vulnerability Index (SVI) ranges from 0 to 1 – closer to 1 indicates more social vulnerability.

In urban areas, majority white census tracts tended to be farther away from the nearest SEP compared to majority non-white census tracts. The opposite was found in rural areas in that majority white census tracts tended to be closer to the nearest SEP compared to majority non-white census tracts. Urban areas overall tended to fare better than rural areas, in terms of higher high school graduation rates, lower poverty rates, less income inequality, and less social vulnerability.

Table 2: Racial Demographics of First-Time SEP Clients as of June 12, 2021, KDPH

Race	Persons	Percentage
White	11,605	69.77
Non-white	354	2.13
Unknown*	4,672	28.09

*SEP clients are not mandated to report their race

These data suggest that first-time SEP clients in Kentucky are more likely to be white, although a large number of non-reports make these data difficult to interpret.

Table 3: Average Percent Racial Makeup of First-Time SEP Clients by Urbanity-Rurality of SEP as of June 12, 2021, KDPH

	White	Non-white	Unknown*
Rural SEP	81.83 (29.07)	1.17 (1.55)	17.00 (29.41)
Urban SEP	73.77 (30.86)	2.09 (3.39)	24.14 (30.53)

*SEP clients are not mandated to report their race

Rural SEPs appeared to service more white first-time clients while urban SEPs serviced slightly more non-white first-time clients. This was consistent with the racial composition of rural and urban areas in Kentucky.²⁵

IV. Discussion

This analysis suggests that access to SEPs in urban and rural areas differs by race. In urban areas, non-white users of SEPs were located closer to the programs, while in rural areas white users of SEPs were located closer to the programs (Figure 1, Table 1). Consistent with this pattern, urban SEPs serviced slightly more non-white users as compared to rural SEPs (Table 2). Overall, however, use of syringe exchange programs by non-white individuals in Kentucky appeared to be low (Table 3). This finding may be partially explained by the racial makeup of the state in that Kentucky is nearly 87% white according to the latest census data.²⁶ It is also possible the SEP user data undercounted non-white populations due to a large amount of missing/unknown responses.

Community composition may impede access to syringe exchange programs by race in urban areas as higher dispersion of income (as quantified by the Gini Index) and increased social vulnerability (as quantified by the Social Vulnerability Index) may be indicative of larger systemic issues affecting a community. While urban areas generally enjoy better access to SEPs,²⁷ non-white community may have specific issues impacting their ability to utilize them. Predominantly non-white communities tended to have higher degrees of income inequality and social vulnerability (Table 1), and this has been associated with worse health outcomes.^{28,29} Predominantly non-white communities also

tend to have more issues with access to transportation.³⁰ This may explain the findings of this analysis, in part, as non-white users of drugs looking to access an SEP may not be able to physically reach an SEP in both urban and rural areas. This finding should be interpreted cautiously given that first-time clients of SEPs are not mandated to report their race, and it is possible that some of the first-time clients characterized as “Unknown” may indeed be non-white individuals.

The idea of residential segregation, the notion that the “races are physically separate in residential contexts”³¹, may also factor into the findings of this project. Residential segregation shapes socioeconomic conditions for non-white individuals at the individual, household, neighborhood, and community levels.³¹ While metrics of segregation (e.g. the dissimilarity index) have decreased slightly over time in the Southern and Western regions of the United States³² non-white individuals tend to be clustered in high-poverty areas, and this has been associated with poor health outcomes.³³ Majority non-white communities tend to harbor negative views of health services³⁴ and this may further exacerbate barriers to access.

Black communities have a historically negative view of harm reduction programs. When syringe exchange programs were first piloted in New York City in 1988, the Black community at that time decried the program as “genocide”.³⁵ A 1990 survey by the Southern Christian Leadership Conference bolsters this negative view: of 1,056 Black

church members polled in five metropolitan cities, 35% of the respondents believed that AIDS “is a form of genocide”, 44% of respondents believed that the “government is not telling the truth about AIDS” and 34% of respondents believed that “AIDS is a manmade virus.”³⁶ More recent (c. 2015) surveys found that harm reduction programs are both praised and vilified in the Black community.³⁷ Latino communities, in contrast, have a more nuanced view of harm reduction practices. One church-based survey of 1,235 individuals found that “Latino stigma surrounding drug addiction decreases with acculturation but remains higher among the most acculturated Latinos compared to African-Americans.”³⁸ Harm reduction interventions are, however, generally not available in Latin American countries.³⁸

This capstone project suggests that predominantly non-white census tracts tend to be located closer to syringe exchange programs in urban areas and farther away from them in rural areas. Non-white census tracts appeared to be worse off in terms of income and social inequality compared to white census tracts, and this may have influenced their ability to access SEPs. Proximity to a syringe exchange program did not appear to be associated with increased non-white individuals’ utilization of the programs as percentages of first-time non-white individuals was low across both urban and rural SEPs among those respondents whose racial identity is known. The findings of this capstone project should be interpreted cautiously as a high proportion of the racial classification for first-time SEP

clients was unknown. Further study on the racial makeup of syringe exchange program
utilizers is warranted.

V. Policy Implications

Access to SEPs appears to be a necessary, but not sufficient condition, for SEP use among non-white populations. Practical recommendations from this project would be to educate communities about the benefits of syringe exchange programs and target more education about the benefits of syringe exchange programs at non-white communities. Policy recommendations from this project would be to amend KRS 218A.500 to allow for organizations that are not health departments to operate syringe exchange programs or to facilitate the increased deployment of mobile units or syringe vending machines.³⁹

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VII. Biographical Sketch

Dr. Ankur Bhargava is a preventive medicine resident and Master of Public Health Student concentrating in Health Systems & Policy Analytics at the University of Kentucky. His undergraduate degree was in Psychology/Neuroscience from Boston College and his medical school training was completed at Saint George's University. He has prior clinical experience in internal medicine and neurology. He is currently pursuing board certification in general preventive medicine.

Dr. Bhargava's prior research experience is in clinical informatics, in which he has been co-author on four published scientific manuscripts and presented a scientific poster at IDWeek 2020 in Washington, D.C. While at the University of Kentucky, Dr. Bhargava has been heavily involved with local and state health departments on the front lines of the COVID-19 pandemic and has the Lexington-Fayette County Health Department by providing clinical expertise at their syringe exchange program.