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Examining the association of police violence to syringe service program utilization in rural Appalachia

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Master of Science
Emory University
2019

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An abstract of

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A thesis submitted to the Faculty of the

Rollins School of Public Health of Emory University

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Abstract

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By Harris Greenwood

Background: Syringe service programs (SSPs) are a safe community-based prevention programs that provide a wide array of services to reduce harms people who use drugs face and are legally proliferating in rural Appalachia in tandem with the opioid epidemic. Police have interfered with SSP utilization in urban areas through crackdowns, arrests, harassment, and other forms of violence. This study examines the association of police violence to SSP utilization in 5 predominantly white, rural Kentucky counties heavily impacted by the opioid epidemic.

Methods: Cross-sectional surveys were conducted at baseline and at 6 months as part of the Rural Opioid Initiative. A logistic regression measured the association of police violence to the SSP utilization of 107 participants. Police violence was measured using 5 questions that assessed past-year frequencies of physical, psychological, neglectful, and sexual violence.

Results: 27% of the sample experienced some form of police violence. However, police violence was not statistically associated with SSP utilization among this rural sample after adjusting for sex/gender, age, homelessness in the past 6 months, HCV status at baseline, injection frequency in the past 30 days, destitution, and distance to the nearest SSP (aOR: 1.16, 95% CI=0.38, 3.51, p=.98). Those who could walk to the nearest SSP in 30 minutes or less had a 4.36 times higher odds visiting a SSP in the past 30 days compared to those who could not and this was statistically significant (aOR: 4.36, 95% CI= 1.18, 16.14 p=.02). Additionally, those experiencing destitution had a 0.20 times lower odds than those who do not (aOR: .20, 95%CI= 0.06, 0.60, p=.003).

Conclusions: This study is, as far as we know, the first to examine police violence and SSP use in a rural area. A lack of association among this rural and predominantly white sample may indicate that police violence functions differently in different geographies and that police violence among BIPOC populations in urban areas may be a form of anti-BIPOC structural racism that exacerbates the adverse effects of police violence.

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Chapter 1: Introduction

Problem Statement

Since 1999, age-adjusted rates of drug overdose deaths have increased in both urban and rural counties (Hedegaard & Spencer, 2021). Rates of drug overdose deaths involving natural and semisynthetic opioids in rural areas have been higher than or similar to urban areas since the mid-2000s and rates have been higher since 2012 for overdoses from psychostimulants with abuse potential (e.g. methamphetamine) (Noonan, 2017).

The opioid epidemic was greatly exacerbated by the COVID-19 pandemic. Rates of drug overdose deaths in urban counties grew by 38% and in rural counties by 55%. The opioid epidemic is also greatly tied to Hepatitis C. The prevalence of Hepatitis C in people under 30 in Appalachia grew 364% between 2006 and 2012 and has continued growing faster in rural areas than urban areas. This led the CDC to state in 2016 that the places most vulnerable to HIV and HCV outbreaks to be “overwhelmingly rural” (Van Handel et al., 2016; Zibbell et al., 2015).

Harm Reduction is one our best strategies to reduce the impact of the opioid epidemic. It's a practical, evidence-based way of dealing with the opioid epidemic. Briefly, Harm Reduction is a set of non-judgmental, non-coercive set of practices, services, and resources that acknowledges that drug use will continue and instead of trying to eradicate drug use, it aims to minimize harmful effects ("Principles of Harm Reduction,"). It works to establish a quality of life for people who use drugs and their communities by promoting the voice of people who use drugs and affirming them as the primary agents of reducing harm. It recognizes that poverty, class, racism, sex-based discrimination, and

other social inequalities affect both people's vulnerability to and capacity for effectively dealing with drug-related harm. Importantly it does not minimize the real and tragic harms that can be associated with drug use. One mode of harm reduction available in rural Appalachia are Syringe Service Programs (SSPs).

Syringe service programs are community-based prevention programs that provide a wide array of services, including testing for infectious diseases, access to sterile injection equipment and disposal of used equipment, and linkage to care for infectious diseases and substance use disorders ("Syringe Services Programs (SSPs)," 2019). They are proven to be safe and assist in reducing injection-related infections like HIV and HCV and they do not increase illegal drug use or crime.

SSPs in the US are gradually expanding into rural areas, following the expansion of drug-related epidemics outside the cities. As a result, SSPs have been legalized in many Appalachian states and have grown at a steady rate (Bixler et al., 2018). In Kentucky, which is a predominately rural state, SSPs were legalized in 2015 and there are now 74 SSPs operating in 63 Kentucky counties ("Syringe Exchange Programs," 2021). However, SSPs in Appalachia remain under-utilized despite this expansion and legality (Lancaster et al., 2020).

In urban areas where there are SSPs, police engage in crackdowns, arrests, harassment, and other forms of violence that interfere with the benefits of SSPs (Beletsky, Grau, White, Bowman, & Heimer, 2011; H. Cooper, Moore, Gruskin, & Krieger, 2005; H. L. Cooper et al., 2012; C. S. Davis, Burris, Kraut-Becher, Lynch, & Metzger, 2005; Martinez et al., 2007; Miller et al., 2008; Shannon et al., 2008; Wagner, 2013). Research conducted in cities has found that some people who inject drugs (PWID)

avoid SSPs due to fear of arrest, citing it as a “big problem” (Wagner, 2013). In fact, areas with better SSP access have been shown to actually have higher arrest rates (H. L. Cooper et al., 2012). The consequences of an arrest can be significant: incarceration, even if brief, can lead to painful withdrawal for people living with opioid use disorder, and upon release, PWID are at risk for overdose and HIV or HCV (Miller et al., 2008). Even a stop without an arrest can be disruptive: police may confiscate drug paraphernalia and engage in other forms of police violence during encounters, both of which have been associated with sharing drug use equipment in urban environments (Landsberg et al., 2016). Of course, sharing drug use equipment poses a great risk for the transmission of HIV and HCV.

Theoretical Framework

Andersen's Behavioral Model for Vulnerable Populations was developed to understand "why do people use health services?" It postulates that use is a function of predisposition, enabling factors, and people's needs for care while also acknowledging that factors which cause vulnerability may affect both their health status and their use of services. [CITATION]

Purpose Statement

The purpose of this study was to explore one possible reason why SSP utilization remains low despite access, legality, and necessity: police violence. Exploring this aspect of the war on drugs provides a necessary understanding of a significant harm reduction impediment.

Research Question

What is the association of police violence to syringe service program utilization in rural Appalachia?

Significance Statement

As SSPs proliferate in rural areas in response to the opioid epidemic, it becomes necessary to understand impediments to utilization. War on drugs policing has also emerged in rural areas in the forms of mass incarceration and stigma against people who use drugs. While it is documented that police violence impedes utilization of SSPs in urban areas, research on the impact of police violence on SSP utilization in rural areas is nascent. As far as we are aware, this is the first study of police violence and SSP utilization in rural areas.

Chapter 2: Literature Review

Syringe service programs (SSPs) are community-based prevention programs that provide a wide array of services, including testing for infectious diseases, access to sterile injection equipment and disposal of used equipment, and linkage to care for infectious diseases and substance use disorders ("Syringe Services Programs (SSPs)," 2019). They are proven to be safe and assist in reducing injection-related infections like HIV and HCV without increasing illegal drug use or crime. However, in urban areas where there are SSPs, police engage in crackdowns, arrests, harassment, and other forms of violence that interfere with the benefits of SSPs (Beletsky et al., 2011; H. Cooper et al., 2005; H. L. Cooper et al., 2012; C. S. Davis et al., 2005; Martinez et al., 2007; Miller et al., 2008; Shannon et al., 2008; Wagner, 2013). Research conducted in cities has found that some people who inject drugs (PWID) avoid SSPs due to fear of arrest, citing it as a "big problem" (Wagner, 2013). In fact, areas with better SSP access have been shown to have higher arrest rates (H. L. Cooper et al., 2012). The consequences of an arrest can be significant: incarceration, even if brief, can lead to painful withdrawal for people living with opioid use disorder, and subsequent overdose and HIV/HCV risk upon release (Miller et al., 2008). Even a stop without an arrest can be disruptive: police may confiscate drug paraphernalia and engage in other forms of police violence during encounters, both of which have been associated with sharing drug use paraphernalia in urban environments (Landsberg et al., 2016).

Individuals who report being victimized by police, as well as those who expect future victimization, are more psychologically distressed and depressed than other members of their communities (DeVylder et al., 2017). People who report increased

police contact also report increased trauma and anxiety symptoms in association with how many stops they report, the intrusiveness of those stops, and their perceptions of police fairness. This leads to higher PTSD prevalence among Black people in urban areas (Geller, Fagan, Tyler, & Link, 2014). This is especially concerning as depression and anxiety can be a reason people do not seek health services, including attending SSPs.

SSPs in the US are gradually expanding into rural areas, following the expansion of drug-related epidemics beyond metropolitan areas. From 1999 to 2019, age-adjusted rates of drug overdose deaths have increased in both urban and rural counties. This increase was exacerbated with the COVID-19 pandemic with rates in urban and rural areas increasing by 38% and 55% respectively (Friedman et al., 2021; Hedegaard & Spencer, 2021). Rates of drug overdose deaths involving natural and semisynthetic opioids in rural areas have been higher than or similar to urban areas from the mid-2000s to 2019 and rates were higher from 2012 to 2019 for overdoses from psychostimulants with abuse potential (e.g. methamphetamine)(Hedegaard & Spencer, 2021; Noonan, 2017). Likewise, the prevalence of Hepatitis C in people under 30 in Appalachia grew 364% between 2006 and 2012 and has continued growing faster in rural areas than urban areas, and the CDC determined in 2016 that the places most vulnerable to HIV and HCV outbreaks to be “overwhelmingly rural” (Van Handel et al., 2016; Zibbell et al., 2015).

As a result, SSPs have been legalized in many Appalachian states and have grown at a steady rate(Bixler et al., 2018). In Kentucky, a predominately rural state, SSPs were legalized in 2015 and there are now 74 SSPs operating in 63 Kentucky counties ("Syringe Exchange Programs," 2021). However, SSPs in Appalachia remain under-utilized despite this expansion (Lancaster et al., 2020).

Research on the possible impact of police encounters on SSP utilization in rural areas is nascent. Fear of arrest for carrying needles is a major concern among those who use the SSPs in rural Appalachia (S. M. Davis et al., 2019). Testifying to the importance of expanding research on police violence and SSPs to rural areas, war on drugs strategies are emerging in rural areas in the forms of mass incarceration and stigma against people who use drugs (H. L. Cooper et al., 2020; Kang-Brow & Subramanian, 2017). Analyses of 12 rural Kentucky counties reveal that between 1983 and 2014, prison admissions increased by 1,259% and between 1983 and 2012, the prison-based incarceration rate increased by 1,241%, with both rates declining slightly thereafter. These rates have been higher than those of the 12 most populous U.S. counties since 2012. Similarly, jail-based incarceration and detention rates have been higher in the 12 rural counties than the 12 urban centers since 2000/2002 (H. L. Cooper et al., 2020).

Given the expansion of SSPs and the war on drugs into rural areas, here we analyze the relationship of experiencing police violence to SSP use among PWID in five Appalachian counties at the heart of the US rural opioid epidemic.

Chapter 3: Student Contribution

This quantitative analysis was performed with data from the Rural Opioid Initiative provided by Dr. Hannah Cooper. I had suggested to Dr. Cooper that I was interested in researching police violence and she suggested I use dataset based in Appalachian Kentucky that she was affiliated with.

I pulled data from the Kentucky Care2Hope site, which is the only site that queried police violence. Given that the questionnaires had already been written and employed to gather data, my role in this research was to comb the baseline and 6-month questionnaires in search of questions that I could use to construct variables of interest via past literature, theory, and personal interest.

I recoded around 30 variables to account for missing data. Many variables were turned into binary variables from ordinal or numeric variables.

Each section of the manuscript was written by me. I began with outlines which Dr. Cooper gave comments on. Then I wrote drafts and received comments back. This was repeated to satisfaction. The introduction, literature review, methods, results, and discussion were all written by me while implemented feedback from Dr. Cooper.

Likewise, all analysis was performed by me. I used SAS 9.4 to combine datasets, recode variables, conduct bivariate analyses, run a logistic regression, and create tables. When I ran into a “complete separation of data” error, Dr. Cooper suggested limiting the variables for parsimony and helped select which variables would be ran in the final regression. This was done according to the theory Dr. Cooper helped me choose as well.

Chapter 4: Manuscript

Introduction

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Research on the possible impact of police encounters on SSP utilization in rural areas is nascent. Fear of arrest for carrying needles is a major concern among those who use the SSPs in rural Appalachia (S. M. Davis et al., 2019). Testifying to the importance of expanding research on police violence and SSPs to rural areas, war on drugs strategies are emerging in rural areas in the forms of mass incarceration and stigma against people who use drugs (H. L. Cooper et al., 2020; Kang-Brow & Subramanian, 2017). Analyses of 12 rural Kentucky counties reveal that between 1983 and 2014, prison admissions increased by 1,259% and between 1983 and 2012, the prison-based incarceration rate increased by 1,241%, with both rates declining slightly thereafter. These rates have been higher than those of the 12 most populous U.S. counties since 2012. Similarly, jail-based incarceration and detention rates have been higher in the 12 rural counties than the 12 urban centers since 2000/2002 (H. L. Cooper et al., 2020).

Given the expansion of SSPs and the war on drugs into rural areas, here we analyze the relationship of experiencing police violence to SSP use among PWID in five Appalachian counties at the heart of the US rural opioid epidemic.

Methods

Data were used from the Rural Opioid Initiative (ROI), a multi-site cross-sectional survey of drug use, HIV, HCV, and other co-morbidities among people who use drug in eight U.S. rural regions. From January 2018 to March 2020, participants were recruited across rural areas in ten states: Illinois, Kentucky, North Carolina, Massachusetts, Vermont, New Hampshire, Ohio, Oregon, Wisconsin, and West Virginia.

This analysis focuses on data gathered in Kentucky's CARE2HOPE site, because that site's survey queried police violence.

Inclusion criteria at the Kentucky sites were the following: being aged 18 years or older; living in one of five rural Appalachian Kentucky counties heavily impacted by the opioid epidemic; and having either used opioids to get high or injected any drug to get high in the past 30 days. Respondent driven sampling methods were used to identify locally representative "seed" participants who agreed to recruit within their peer networks. Individuals were invited to take part in a cohort study in which they would be re-interviewed every 6 months.

The analytic sample was further reduced to include only individuals who reported injecting drugs within the last 30 days.

After consenting, individuals participated in a baseline survey that queried demographic characteristics, drug use behaviors, sexual and drug-related risk behaviors, consequences of drug use, HIV/HCV screening and treatment, substance use disorder treatment utilization, and utilization of healthcare services. In Kentucky specifically, data on exposure to police violence were also collected. Participants were invited to return every 6 months for a follow up survey and were compensated with $20 for each survey completed. Participants could recruit up to 3 individuals and were given $10 for each participant recruited.

Exposure to any police violence in the past year was the primary exposure of interest.

Police violence was assessed using items adapted from DeVylder's "Police Practices Inventory" which uses 13 items to assess the number of past-year incidents of

physical, psychological, neglectful, and sexual police violence as well as the number of certain positive incidents like providing information about drug treatment resources. We dichotomized responses to these 13 variables to place participants in one of two groups: those who had experienced any police violence in the last year and those who had not experienced police violence in the last year. The outcome of interest for this study was acquiring syringes/needles in person at an SSP in the last 30 days. Participants were asked if they had got syringes/needles at an SSP in the last 30 days and they could answer no, yes, or refuse to answer. Data were pulled from the 6-month follow up survey, as this is when items evaluating exposure to police violence were added to the survey, following suggestions from the local PWUD advisory board of the CARE2HOPE study.

To inform the selection of potential confounding variables, we drew on Andersen's model of vulnerability and previous research about police violence, drug use, and drug-related health service use. Within these Andersen domains, predisposing characteristics included gender, age, educational attainment, marital status, houselessness in past six months, history of arrest in past six months, and depression in the past week. Enabling characteristics included income in past 30 days, insurance status, destitution, possession of a telephone with active service, distance to SSP, ability to get to medical appointment, and which county they have slept in the most during the last 30 days. The Need domain included HCV status and history of overdoses in past six months. The Health Behaviors domain included injection frequency in past thirty days, years since their first injection, and their drug of choice.

Because police violence research in rural areas is still relatively nascent, bivariate associations were assessed via Pearson's Chi-squared test between getting clean needles

at a syringe service program and participant characteristics, including their predisposing (age and gender), enabling (homelessness), needs (HCV status), and health behaviors (injection frequency) as theorized in Andersen's Behavioral Model for Vulnerable Populations. Due to the small sample size, parsimony dictated that only the above controls be selected from Andersen's theory. VIF tables were compiled to check for multicollinearity.

We used a logistic regression model to calculate prevalence odds ratios after adjusting demographics and RDS referral chains. All analyses were conducted in SAS 9.4. Due to the exploratory nature of the research, we decided that a p-value <.1 indicated statistical significance.

Results:

Three hundred thirty-eight people completed the baseline survey and 229 of those completed the 6-month follow up. After excluding those who had not injected any drugs in the last 30 days, 110 people remained in sample. After considering missing data, 107 were included in the final regression. Over half indicated they were male (56.07%) and 43.93% indicated that they were female (Table 1). About a quarter (28.04%) were 20-29 years old, the modal age group. About a quarter (28.97%) said they had experienced houselessness at any point in the past 6 months. A little more than three quarters (81.31%) self-reported having HCV at baseline. Less than a quarter (16.82%) indicated they injected less frequently than daily during the past 30 days while the rest indicated they injected at least once a day during the past 30 days. More than half (59.81%) reported getting clean needles or syringes at an SSP in the past 30 day. A little over a quarter (27.10%) had experienced some form of police violence in the past year.

Bivariate analysis (Table 2) exploring the relationship between visiting an SSP in the past 30 days and experiencing police violence in the past year indicated that those who experienced police violence had 0.72 times lower odds of visiting a SSP in the past 30, but this was a non-significant relationship (OR: .72, 95% CI = 0.30, 1.74, p=.39). Bivariate analyses between the outcome and other variables included in the regression indicated a significant relationship regarding destitution (OR: .27, 95% CI = 0.11, 0.63, p = .002) and ability to walk to a SSP (OR: 3.80, 95% CI = 1.31, 11.01, p = .01) enabling factors according to Andersen's theory, but no others.

Our logistic regression model (Table 3) regressed SSP use on history of police violence controlling for sex/gender, age, homelessness in the past 6 months, HCV status at baseline, injection frequency in the past 30 days, destitution, and distance to the nearest SSP. Those who experience police violence had a 1.16 times higher odds of visiting a SSP in the past 30 days (aOR: 1.16, 95% CI=0.38, 3.51, p=.98) and this was determined to be not significant. Controlling for the other variables decreased the level of significance from p=.46 to p=.98 and altered the direction of the effect estimate from 0.72 to 1.16. Among the predisposing characteristics, neither gender nor age were found to be significant variables. Females had a 2.04 times higher odds of visiting a SSP in the past 30 days than men (aOR: 2.04, 95% CI= 0.67, 6.21, p=.54). Among the enabling characteristics, those experiencing destitution had a 0.20 times lower odds than those who do not (aOR: 0.20, 95%CI = 0.06, 0.60, p=.003). This was nearly identical to the bivariate analysis. Those experiencing houselessness in the past 6 months had a .77 times lower odds of visiting a SSP in the past 30 days (aOR: .77, 95%CI= 0.24, 2.46, p=.78) but this was determined to be not significant. Those who could walk to the nearest SSP in

30 minutes or less had a 4.36 times higher odds visiting a SSP in the past 30 days compared to those who could not and this was statistically significant (aOR: 4.36, 95% CI= 1.18, 16.14 p=.02). HCV status, a Need characteristic according to Andersen's theory, was significantly associated with visiting a SSP in the past 30 days in our exploratory analyses which set the threshold at $p<0.10$. Those with HCV had a 3.62 times higher odds of visiting a SSP in the past 30 days (aOR: 3.62, 95% CI= 0.89, 14.79, p=.09). This is an increase in the odds from the bivariate analyses and a switch from being non-significant. Finally, injection frequency, a Health Behavior in Andersen's theory, was not a significant variable in the analysis. Those who injected at least daily had a .40 times lower odds (95% CI= 0.12, 1.32) of visiting a SSP in the past 30 days than those who injected less than daily, but this was determined to be not significant (p=.13).

Discussion

This is, as far as we know, the first analysis of police violence and SSP use in a rural area. This research is important given that the war on drugs is escalating in rural areas, including in Kentucky, in the forms of mass incarceration and stigmatization against people who use drugs. Likewise, as SSPs proliferate in rural settings, it becomes important to identify barriers to usage. Past literature has demonstrated that police can be a barrier to SSP utilization in urban areas by engaging in crackdowns, arrests, and harassment (Beletsky et al., 2011; H. Cooper et al., 2005; H. L. Cooper et al., 2012; C. S. Davis et al., 2005; Martinez et al., 2007; Miller et al., 2008; Shannon et al., 2008; Wagner, 2013). In this sample, 60% of participants had visited a SSP in the last 30 days, 40% had not. 27% had experienced some form of police violence in the past 6 months

and 73% had not. In this sample, experiences of police violence were not associated with SSP use.

A 2018 American Public Health Association statement which acknowledged police violence as a public health issue stated that minority populations experience a disproportionate amount of police violence as an effect of structural racism ("New American Public Health Association policy statements address gun suicides, tuberculosis prevention, global food security and more," 2018). In 2016, people of color accounted for more than 50% of years of life lost due to legal intervention but accounted for just under 40% of the U.S. population. Police violence is then truly racist as Ruth Wilson Gilmore defines it: “the state-sanctioned or extralegal production and exploitation of group-differentiated vulnerability to premature death” (Gilmore, 2007). The police are part of a penal system that criminalizes communities of color and disproportionately arrest and fatally shoot Black people (Bailey et al., 2017; Mesic et al., 2018). Police slayings of unarmed Black men in a state have been associated with increased poor mental health days among Black adults in that same state while no association was found between the same slayings and White residents’ mental health (Bor, Venkataramani, Williams, & Tsai, 2018).

In this sample, 27% of the participants reported experiencing police violence in the past year. 14% reported experiencing physical violence without a weapon, 8.4% reported experiencing physical police violence with a weapon, 24.3% reported experiencing psychological violence, 2.80% reported experiencing neglectful violence, and 0% reported experiencing sexual violence. Our rural and predominantly white population generally experienced more police violence than urban and racially mixed

populations. Our population experienced more physical violence than the 7% of PWID in Baltimore who experienced physical police violence and more physical and psychological violence than the general population among a sample taken from Baltimore, Maryland and New York City (DeVylder et al., 2018; Park, Linton, Sherman, & German, 2019). Likewise, the women in the rural sample experienced a similar amount of physical violence, but less psychological, neglectful, and sexual violence than a sample of women from four major U.S. cities (Fedina et al., 2018).

A lack of association between SSP use and police violence, despite the high prevalence of police violence, may indicate the meanings of police violence among different racial groups and in different geographies. Research on police violence thus far has focused on urban BIPOC populations and thus we cannot separate rurality or urbanicity from race and ethnicity in this field of research. While police interference has hindered SSP utilization in urban settings, police violence, one form of interference, is not significantly associated with changes in SSP use in this sample. While the urban settings have included mixed race or primarily black populations, our rural setting is primarily white. Police violence may still be a dreaded reality in white rural areas, but it may also function differently than it does in predominantly BIPOC urban areas. In urban environments, police engage in routine racial/ethnic discrimination that disproportionately targets BIPOC people. Some of these practices, like stop and frisk, often involve use of force (Sewell & Jefferson, 2016). Given the absence of racial/ethnic discrimination among this sample the meaning of police violence would be different and likely less arbitrary for this predominantly white, rural sample. BIPOC people in urban

areas experience police violence as a form of anti-BIPOC structural discrimination and that in and of itself may exacerbate the adverse effects of this violence.

Our study had several limitations. The small sample size may have underpowered our analysis and may have been why we failed to reject the null hypothesis, that police violence has no effect on SSP utilization. Similarly, the small sample size may limit the generalizability of our study to similar rural areas. Additionally, generalizability to other rural areas is limited by the simple variation of rural areas. Many rural areas in the south are predominantly Black while some in the SW are predominantly Latinx, and in places like Oklahoma or New Mexico they are homes to reservations and thus primarily Native American. Additionally, the creation of a binary variable to measure police violence did not allow us to measure for variation between frequency of police violence or different types. It is likely that women suffer more sexual violence than men and this gender variation has been missed by our analysis. Further, it is possible that different forms of police violence deter victims to different extents.

Police violence is not significantly associated with changes in SSP utilization in this sample. However, the small sample size may have resulted in a type 2 error. It remains to be seen whether other forms of war on drugs policing interferes with SSP utilization in rural areas. More research should analyze police violence in white rural areas before findings can be generalized. Likewise, future research should examine police violence and SSP utilization in urban areas and other manifestations of war on drugs policing and SSP utilization in rural areas. While police violence was not associated with interferences in SSP utilization in our sample, the presence of police violence is still troubling, as it may be associated with other health effects. Public health can and should

play an instrumental role in modifying the presence of punitive structures and replacing them with evidence-based interventions that seek to reduce harms and affirm life.

Chapter 5: Public Health Implications

This is, as far as we know, the first analysis of police violence and SSP use in a rural area. This research is important given that the war on drugs is escalating in rural areas, including in Kentucky, in the forms of mass incarceration and stigmatization against people who use drugs. Likewise, as SSPs proliferate in rural settings, it becomes important to identify barriers to usage. Past literature has demonstrated that police can be a barrier to SSP utilization in urban areas by engaging in crackdowns, arrests, and harassment (Beletsky et al., 2011; H. Cooper et al., 2005; H. L. Cooper et al., 2012; C. S. Davis et al., 2005; Martinez et al., 2007; Miller et al., 2008; Shannon et al., 2008; Wagner, 2013). In this sample, 60% of participants had visited a SSP in the last 30 days, 40% had not. 27% had experienced some form of police violence in the past 6 months and 73% had not. In this sample, experiences of police violence were not associated with SSP use.

A 2018 American Public Health Association statement which acknowledged police violence as a public health issue stated that minority populations experience a disproportionate amount of police violence as an effect of structural racism ("New American Public Health Association policy statements address gun suicides, tuberculosis prevention, global food security and more," 2018). In 2016, people of color accounted for more than 50% of years of life lost due to legal intervention but accounted for just under 40% of the U.S. population. Police violence is then truly racist as Ruth Wilson Gilmore defines it: “the state-sanctioned or extralegal production and exploitation of group-differentiated vulnerability to premature death” (Gilmore, 2007). The police are part of a penal system that criminalizes communities of color and disproportionately arrest and

fatally shoot Black people (Bailey et al., 2017; Mesic et al., 2018). Police slayings of unarmed Black men in a state have been associated with increased poor mental health days among Black adults in that same state while no association was found between the same slayings and White residents' mental health (Bor et al., 2018).

In this sample, 27% of the participants reported experiencing police violence in the past year. 14% reported experiencing physical violence without a weapon, 8.4% reported experiencing physical police violence with a weapon, 24.3% reported experiencing psychological violence, 2.80% reported experiencing neglectful violence, and 0% reported experiencing sexual violence. Our rural and predominantly white population generally experienced more police violence than urban and racially mixed populations. Our population experienced more physical violence than the 7% of PWID in Baltimore who experienced physical police violence and more physical and psychological violence than the general population among a sample taken from Baltimore, Maryland and New York City (DeVylder et al., 2018; Park et al., 2019). Likewise, the women in the rural sample experienced a similar amount of physical violence, but less psychological, neglectful, and sexual violence than a sample of women from four major U.S. cities (Fedina et al., 2018).

A lack of association between SSP use and police violence, despite the high prevalence of police violence, may indicate the meanings of police violence among different racial groups and in different geographies. Research on police violence thus far has focused on urban BIPOC populations and thus we cannot separate rurality or urbanicity from race and ethnicity in this field of research. While police interference has hindered SSP utilization in urban settings, police violence, one form of interference, is

not significantly associated with changes in SSP use in this sample. While the urban settings have included mixed race or primarily black populations, our rural setting is primarily white. Police violence may still be a dreaded reality in white rural areas, but it may also function differently than it does in predominantly BIPOC urban areas. In urban environments, police engage in routine racial/ethnic discrimination that disproportionately targets BIPOC people. Some of these practices, like stop and frisk, often involve use of force (Sewell & Jefferson, 2016). Given the absence of racial/ethnic discrimination among this sample the meaning of police violence would be different and likely less arbitrary for this predominantly white, rural sample. BIPOC people in urban areas experience police violence as a form of anti-BIPOC structural discrimination and that in and of itself may exacerbate the adverse effects of this violence.

Mariame Kaba wrote that "other kinds of harms are foreclosed when we use terms like police brutality and violence. This is not an issue of police brutality. And police violence is a misnomer. It's actually redundant because policing is violence. In and of itself. It is" (Kaba, Nopper, & Murakawa, 2021). When thinking about policing through the lens of racial capitalism or structural racism, it becomes clear that the types of police violence discussed here are really just corollaries to the fact that the ontological core of the police is racist and thus violent.

This is not to say that police violence does not pose its own set of unique public health problems. Certainly, it does and its harms, fatal and non-fatal, are becoming well documented within the public health literature. However, when we note that police violence does not impact access to care for white people the way it does for black people,

we might be beginning to see that it's not necessarily the active violence of the police but the mere presence, the mere existence of the police that causes harms.

Future public health research around police violence should always consider a lens of racial capitalism that understands that racism is an inherent part of capitalism and that the police play an administrative role in the enforcement of that.

However, this is not to say that police violence against white people in rural areas should not continue to be studied. War on drugs policing and mass incarceration are indeed spreading into rural environments and this is and should remain unacceptable. SSP use in these rural areas should continue to be promoted and police interference in these efforts should resisted.

Qualitative data from PWID in rural Appalachia could be greatly beneficial to understanding their own reactions to police violence and what deters their SSP utilization. Likewise, police violence research should continue to be pursued as a public health topic. This sample was small and research with greater sample sizes are needed. More research on rural areas is deeply necessary especially among all the different sorts of rurality that exist.

To test the hypothesis presented here, a larger sample size is needed.

Future policy and action should adopt the divest/invest strategy that is gaining popularity. this entails divesting from police and investing in communities. Efforts should be made to roll back the war on drugs and police violence. These things may have other adverse effects in rural areas which we did not find. Finally, public health should work towards decriminalizing drugs and paraphernalia and increasing SSP use.

Our study had several limitations. The small sample size may have underpowered our analysis and may have been why we failed to reject the null hypothesis, that police violence has no effect on SSP utilization. Similarly, the small sample size may limit the generalizability of our study to similar rural areas. Additionally, generalizability to other rural areas is limited by the simple variation of rural areas. Many rural areas in the south are predominantly Black while some in the SW are predominantly Latinx, and in places like Oklahoma or New Mexico they are homes to reservations and thus primarily Native American. Additionally, the creation of a binary variable to measure police violence did not allow us to measure for variation between frequency of police violence or different types. It is likely that women suffer more sexual violence than men and this gender variation has been missed by our analysis. Further, it is possible that different forms of police violence deter victims to different extents.

Police violence is not significantly associated with changes in SSP utilization in this sample. However, the small sample size may have resulted in a type 2 error. It remains to be seen whether other forms of war on drugs policing interferes with SSP utilization in rural areas. More research should analyze police violence in white rural areas before findings can be generalized. Likewise, future research should examine police violence and SSP utilization in urban areas and other manifestations of war on drugs policing and SSP utilization in rural areas. While police violence was not associated with interferences in SSP utilization in our sample, the presence of police violence is still troubling, as it may be associated with other health effects. Public health can and should play an instrumental role in modifying the presence of punitive structures and replacing them with evidence-based interventions that seek to reduce harms and affirm life.

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Tables

Table 1: Demographic Characteristics of 107 people who inject drugs (PWID) in the Gateway2Health Cohort

Domain	Variable	Level	N	Overall	Have not experienced police violence in past year N=78	Have experienced police violence in past year N=29
Outcome	Got clean needles/syringes from a SSP in last 30 days	No	107	43 (40.19%)	33 (42.31%)	10 (34.48%)
		Yes		64 (59.81%)	45 (57.69%)	19 (65.52%)
Predisposing	Gender/Sex	Female	107	47 (43.93%)	43 (55.13%)	4 (13.79%)
		Male		60 (56.07%)	35 (44.87%)	25 (86.21%)
	Age Group	20-29	107	30 (28.04%)	22 (28.21%)	8 (27.59%)
		30-39		47 (43.93%)	35 (44.87%)	12 (41.38%)
		40-49		25 (23.36%)	17 (21.79%)	8 (27.59%)
		50+		5 (4.67%)	4 (5.13%)	1 (3.45%)
	Race/Ethnicity	American Indian	107	1 (0.93%)	1 (1.28%)	0 (0%)
		Black		1 (0.93%)	1 (1.28%)	0 (0%)
		Mixed Race		2 (1.87%)	2 (2.56%)	0 (0%)
		White		103 (96.26%)	74 (94.87%)	29 (100%)
	Educational Attainment	Less Than Highschool	107	39 (36.45%)	27 (34.62%)	12 (41.38%)
		Highschool or GED		40 (37.38%)	30 (38.46%)	10 (34.48%)
		More than Highschool		28 (26.17%)	21 (26.92%)	7 (24.14%)

Domain	Variable	Level	N	Overall	Have not experienced police violence in past year N=78	Have experienced police violence in past year N=29
	Depression in past 7 days	Depressed	105	44 (41.90%)	33 (42.86%)	11 (39.29%)
		Not Depressed		61 (58.10%)	44 (57.14%)	17 (60.71%)
	Been houseless at any point in last 6 months	No	107	76 (71.03%)	56 (71.79%)	20 (68.97%)
		Yes		31 (28.97%)	22 (28.21%)	9 (31.03%)
	Been arrested and booked in past 6 months for breaking the law	No	107	77 (71.96%)	65 (83.33%)	12 (41.38%)
		Yes		30 (28.04%)	13 (16.67%)	17 (58.62%)
	Marital status	Married or living with partner	107	43 (40.19%)	30 (38.46%)	13 (44.83%)
		Never married or in a relation		34 (31.78%)	24 (30.77%)	10 (34.48%)
		Widowed, divorced, or separate		30 (28.04%)	24 (30.77%)	6 (20.69%)
Enabling	Income in past 30 days	$0	104	30 (28.85%)	20 (26.32%)	10 (35.71%)
		$1-499		29 (27.88%)	18 (23.68%)	11 (39.29%)
		$500-999		22 (21.15%)	22 (28.95%)	0 (0.00%)
		$1000-6500		23 (22.12%)	16 (21.05%)	7 (25.00%)
	Currently have health insurance or health care coverage	No	107	17 (15.89%)	10 (12.82%)	7 (24.14%)
		Yes		90 (84.11%)	68 (87.18%)	22 (75.86%)

Domain	Variable	Level	N	Overall	Have not experienced police violence in past year N=78	Have experienced police violence in past year N=29
	Receives public benefits	No	107	34 (31.78%)	27 (34.62%)	7 (24.14%)
		Yes		73 (68.22%)	51 (65.38%)	22 (75.86%)
	Do you have a cell phone with active service now?	No	107	37 (34.58%)	23 (29.49%)	14 (48.28%)
		Yes		70 (65.42%)	55 (70.51%)	15 (51.72%)
	Can you walk to the nearest SSP in 30 minutes or less from where you live?	No	107	80 (74.77%)	59 (75.64%)	21 (72.41%)
		Yes		27 (25.23%)	19 (24.36%)	8 (27.59%)
	Have a way to get to medical appointments	Maybe	107	35 (32.71%)	25 (32.05%)	10 (34.48%)
		No		9 (8.41%)	5 (6.41%)	4 (13.79%)
		Yes		63 (58.88%)	48 (61.54%)	15 (51.72%)
	County slept most in in past 30 days	Bath	107	18 (16.82%)	15 (19.23%)	3 (10.34%)
		Elliott		7 (6.54%)	6 (7.69%)	1 (3.45%)
		Menifee		4 (3.74%)	4 (5.13%)	0 (0.00%)
		Morgan		3 (2.80%)	2 (2.56%)	1 (3.45%)
		Rowan		58 (54.21%)	40 (51.28%)	18 (62.07%)
		Other		17 (15.89%)	11 (14.10%)	6 (20.69%)
Need	Did participant test positive for HIV at baseline	No	107	107 (100.00%)	78 (100.00%)	29 (100.00%)

Domain	Variable	Level	N	Overall	Have not experienced police violence in past year N=78	Have experienced police violence in past year N=29
	Did participant test positive for HCV at baseline	No	107	20 (18.69%)	13 (16.67%)	7 (24.14%)
		Yes		87 (81.31%)	65 (83.33%)	22 (75.86%)
	Have you overdosed in the past 6 months	No	107	89 (83.18%)	65 (83.33%)	24 (82.76%)
		Yes		18 (16.82%)	13 (16.67%)	5 (17.24%)
Health Behavior	How often injected any drug in last 30 days	At least once a day	107	89 (83.18%)	65 (83.33%)	24 (82.76%)
		Less than daily		18 (16.82%)	13 (16.67%)	5 (17.24%)
	How long since first injection	Within last 5 years	107	29 (27.10%)	24 (30.77%)	5 (17.24%)
		6-14 years ago		60 (56.07%)	43 (55.13%)	17 (58.62%)
		15+ years ago		18 (16.82%)	11 (14.10%)	7 (24.14%)

Domain	Variable	Level	N	Overall	Have not experienced police violence in past year N=78	Have experienced police violence in past year N=29
	What is your drug of choice?	Buprenorphine, Methadone	107	12 (11.21%)	10 (12.82%)	2 (6.90%)
		Cocaine, Crack, Methamphetamine, Crystal Meth, or Amphetamine		48 (44.86%)	33 (42.31%)	15 (51.72%)
		Gabapentin, Prescription Anxiety Drugs, and Others		7 (6.54%)	3 (3.85%)	4 (13.79%)
		Heroin, Street Fentanyl, or Carfentanil Powder		29 (27.10%)	22 (28.21%)	7 (24.14%)
		Opiate Painkillers		11 (10.28%)	10 (12.82%)	1 (3.45%)

Table 2: Bivariate Analysis of Syringe Service Program utilization and covariates

Variable	Category	N(%)	Have not gotten clean needles from an SSP in past 30 days N=43 (%)	Have gotten clean needles from an SSP in past 30 days N=64 (%)	Odds Ratio	95% CI	P-Value
Gender/Sex	Male	60 (56.07%)	22 (51.16%)	38 (59.38%)	Ref	Ref	Ref
	Female	47 (43.93%	21(48.84%)	26 (40.63%)	1.40	(0.64, 3.04)	0.40
Age Group	20-29	30 (28.04%)	11 (25.58%)	19 (29.69%)	Ref	Ref	Ref
	30-39	47 (43.93%)	20 (46.51%)	27 (42.19%)	1.28	(0.50, 3.28)	0.61
	40-49	25 (23.36%)	10 (23.26%)	15 (23.44%)	1.15	(0.39, 3.43)	0.80
	50+	5 (4.67%)	2 (4.65%)	3 (4.69%)	1.15	(0.17, 7.99)	0.89
Been houseless at any point in last 6 months	No	76 (71.03%)	33 (76.74%)	43 (67.19%)	Ref	Ref	Ref
	Yes	31 (28.97%)	10 (23.26%)	21 (32.81%)	0.62	(0.26, 1.49)	0.29
Did participant test positive for HCV at baseline	No	20 (18.69%)	6 (13.95%)	14 (21.88%)	Ref	Ref	Ref
	Yes	87 (81.31%)	37 (86.05%)	50 (78.13%)	1.73	(0.61, 4.93)	0.31
How often injected any drug in last 30 days	Less than daily	18 (16.92%)	10 (23.26%)	8 (12.50%)	Ref	Ref	Ref
	At least once a day	89 (83.18%)	33 (76.74%)	56 (87.50%)	0.47	(0.17, 1.31)	0.15

Variable	Category	N(%)	Have not gotten clean needles from an SSP in past 30 days N=43 (%)	Have gotten clean needles from an SSP in past 30 days N=64 (%)	Odds Ratio	95% CI	P-Value
Destitution	No	34 (31.78%)	21 (48.84%)	13 (20.31%)	Ref	Ref	Ref
	Yes	73 (68.22%)	22 (51.16%)	51 (76.69%)	0.27	(0.11, 0.63)	.002
Can you walk to the nearest SSP in less than 30 minutes?	No	82 (75.23%)	38 (88.37%)	44 (66.67%)	Ref	Ref	Ref
	Yes	27 (24.77%)	5 (11.63%)	22 (33.33%)	3.80	(1.31, 11.01)	0.01
Have you experienced police violence in the past year?	No	78 (72.90%)	33 (76.74%)	45 (70.31%)	Ref	Ref	Ref
	Yes	29 (27.10%)	10 (23.26%)	19 (29.69%)	0.72	(0.30, 1.74)	0.46

Table 3: Logistic Regression of Syringe Service Program utilization and covariates (n=107)

Variable	Category	Odds Ratio	95% CI	P-Value	P-Value (Total)
Gender/Sex	Male	Ref	Ref	Ref	0.54
	Female	2.04	(0.67, 6.21)	0.21	
Age Group	20-29	Ref	Ref	Ref	.95
	30-39	1.06	(0.30, 3.70)	0.93	
	40-49	1.02	(0.25, 4.25)	0.98	
	50+	0.46	(0.05, 4.35)	0.50	
Been houseless at any point in last 6 months	No	Ref	Ref	Ref	0.78
	Yes	0.77	(0.24, 2.46)	0.66	
Did participant test positive for HCV at baseline	No	Ref	Ref	Ref	.09
	Yes	3.62	(0.89, 14.79)	0.07	
How often injected any drug in last 30 days	Less than daily	Ref	Ref	Ref	0.10
	At least once a day	0.37	(0.10, 1.32)	0.12	
Destitution	No	Ref	Ref	Ref	0.003
	Yes	0.20	(0.06, 0.60)	.005	
Can you walk to the nearest SSP in less than 30 minutes?	No	Ref	Ref	Ref	0.02
	Yes	4.36	(1.18, 16.14)	0.03	
Have you experienced police violence in the past year?	No	Ref	Ref	Ref	0.98
	Yes	1.16	(0.38, 3.51)	0.79	

Table 4: Frequencies of 5 types of police violence

Type of police violence	**N(%) of 107**
Physical violence without a weapon	15 (14.02%)
Physical violence with a weapon	9 (8.41%)
Psychological Violence	26 (24.30%)
Neglectful violence	3 (2.80%)
Sexual violence	0 (0%)