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Police violence among people who inject drugs in Baltimore, Maryland

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Abstract

Background: Police violence is a deleterious public health and criminal justice issue that disproportionately affects PWID. Studies documenting the prevalence and correlates of physical police violence in this population are rare. The aim of this study was to examine the correlates of past year physical police violence among an urban sample of PWID.

Methods: PWID participating in the 2015 wave of the National HIV Behavioral Surveillance (NHBS) system recruited in Baltimore City, Maryland completed a socio-behavioral survey. Multivariable logistic regression was used to detect the socio-demographic, place-based, law-enforcement and health behavior correlates of exposure to police violence as well as knowledge of violence directed towards other PWID.

Results: Enrolled PWID (N=570) were mostly male (72%), non-Hispanic black (77%) and daily heroin injectors (86%). Seven percent had experienced past year physical police violence (Respondent-Driven Sampling [RDS] weighted estimate: 4%), and a quarter (24%) knew someone who had experienced police violence in the past year (RDS-weighted estimate: 17%). Male gender, homelessness, arrest, drug paraphernalia confiscation, and receptive syringe sharing were independently associated with police violence. Knowing someone who had experienced police violence was independently correlated with selling drugs, arrest, and attending a syringe services program.

Conclusion: Population differences in the extent of police violence exposure indicate that experiences of police violence are not uniform among PWID. Violent encounters with police were associated with disruptions in harm reduction strategies that can prevent HIV and HCV transmission. This study adds to the small body of public health literature on police violence and highlights the importance of monitoring and addressing this critical issue.

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Introduction

Policing the drug trade is a deeply entrenched goal of many law enforcement agencies. Police practices, whether sanctioned or unsanctioned, often have a detrimental impact on the health of people involved in the drug trade, including people who inject drugs (PWID), Such practices range from high-frequency harassment and arrest, to police violence and killings (Beletsky, Grau, White, Bowman, & Heimer, 2011; Cooper, Moore, Gruskin, & Krieger, 2004; Csete et al., 2016; Hayashi, Ti, et al., 2013; Human Rights Watch, 2017; Kutsa et al., 2016; Landsberg et al., 2016; Sarang, Rhodes, Sheon, & Page, 2010). In the U.S. setting, the "war on drugs" has relied on racialized policies incentivizing the number of arrests at the expense of constitutional rights and justice, particularly among low-income Black and Latino communities (Alexander, 2012; American Public Health Association, 2016; Cooper et al., 2004; Lunze, Lunze, Raj, & Samet, 2015). Intensified police interactions include the "militarization" of policing, which can often result in violent encounters (Dansky, Bunting, Solon, & Bohm, 2014). Drug-related law enforcement activities have paradoxically been shown to increase community-level violence in the U.S. context (Werb et al., 2011).

Law enforcement practices constitute a key aspect of the "risk environment" of PWID, influencing their health and safety (Burris et al., 2004; Rhodes, 2002). In the U.S., almost a third of syringe services program (SSP) attendees experienced recent syringe confiscation by police (Beletsky et al., 2011), which is of concern given that fear of syringe confiscation by police is associated with higher likelihood of receptive syringe sharing (RSS), a major risk factor for HIV and HCV acquisition (Bluthenthal, Lorvick, Kral, Erringer, & Kahn, 1999; Maher & Dixon, 1999; Small, Rhodes, Wood, & Kerr, 2007). Police activity (including "crackdowns") that target people in the drug trade are also associated with reductions in access to SSPs, drug treatment and HIV testing programs (Davis, Burris, Kraut-Becher, Lynch, & Metzger, 2005; Gu et al., 2014; Rhodes et al., 2003; Ti et al., 2013); some of the practices may be coersive or violent in nature, and influenced by stigma and prejudice against drug addiction (Cooper, Moore, Gruskin, & Krieger, 2005; Hayashi, Small, Csete, Hattirat, & Kerr, 2013; Lunze et al., 2015; Maher & Dixon, 1999; Wood et al., 2017; Cooper et al., 2004; Wood, Taylor, Groff, & Ratcliffe, 2013). Specific correlates of exposure to physical police violence among PWID include male gender, younger age, homelessness, incarceration, compulsory drug detention, cocaine injection and syringe sharing (Hayashi, Ti, et al., 2013; Kutsa et al., 2016; Landsberg et al., 2016), however, no quantitative studies on this topic among PWID have been conducted in the U.S.

Baltimore city, with a population of about 620,000 faces many chronic social and economic and challenges that impact the drug epidemic and health of its residents. A quarter (24%) of the city's residents live at or below the poverty line, the city has over 20,000 vacant houses and over 10,000 people seek access to homeless shelters annually (Maryland's Interagency Council on Homelessness, 2016; U.S. Census Bureau, 2010). Policing is a challenging

task in a city where crime is rampant with over 9,500 violent crimes recorded in 2016, of which 318 were homicides (Baltimore Sun, 2017). A large and established drug market persists and subsequent encounters between police and people in the drug trade are frequent (Baltimore City, 2017; Beletsky et al., 2015). Frequent encounters between police and participants of the street drug economy are often manifestations of "zero tolerance" policing strategies (Collins, 2007), with officers "*often resorting to force—with minimal training and insufficient oversight from supervisors or through other accountability structures"* (pg. 5) (U.S. Department of Justice, 2016). Such frequent and severe constitutional violations when experienced, witnessed or discussed may shape community norms and expectations around police interactions, increase risk of psychological distress from secondary trauma, and fuel mistrust of the criminal justice system, particularly among racial/ethnic minorities (Alang et al., 2017; Collins, 2007; Cooper, 2015; U.S. Department of Justice, 2016), impairing effective policing and safety promotion (International Association of Chiefs of Police, 2006).

In order to address the current gaps in the literature, particularly on exposures to police violence among U.S. PWID, and the virtual absence of quantitative research on the phenomenon of knowing someone who has experienced police violence among PWID, this study assessed the magnitude and correlates of physical police violence among PWID recruited from Baltimore city. We modeled direct experiences of police violence as well as knowledge of violence directed towards other PWID peers, the latter is of specific interest given the influence of peers in shaping norms and health behaviors (Davey-Rothwell, Latkin & Tobin, 2010).

Methods

Data were from the National HIV Behavioral Surveillance (NHBS) system, which recruited PWID from August to December 2015. The procedures are described in detail elsewhere (German, Linton, Cassidy-Stewart, & Flynn, 2014; Villanti, German, Sifakis, Flynn, & Holtgrave, 2012). In short, PWID were recruited using respondent driven sampling (RDS), a chain referral sampling technique that is suitable for recruiting "hard-to-reach" populations (Heckathorn, 1997). Nine seeds diverse in age, sex, race/ethnicity, and area of residence were selected through random street encounters and outreach at local organizations. Upon study enrollment, all seeds were given five coupons to refer other participants. Subsequent eligible recruits were provided 3–5 coupons.

Following the standardized national protocol, eligible participants were (1) aged 18 years and above; a Baltimore-Columbia-Towson metropolitan area resident (which includes Baltimore city and Baltimore county); and (3) reported injection drug use (Buckley, Calvert, Lapidus, & Morris) in the past 12 months. Seeds were eligible if they met the prior criteria and identified as male or female. Participants completed informed consent procedures and provided oral consent prior to study participation. The anonymous study visit included a 45-minute interviewer-administered computer assisted personal interview (CAPI) survey, which consisted of the 2015 NHBS core questionnaire and local survey items. Together, these incuded questions on socio-demographics, sources of income, area of residence (including ZIP code), housing, drug use behaviors, police interactions and violence, and network size.

Participants were compensated 25 USD for completing the survey and 10 USD for each eligible recruit who completed study procedures. The study was approved by Institutional Review Boards at the Johns Hopkins Bloomberg School of Public Health and Maryland Department of Health.

A total of 592 participants were eligible; participants were excluded from the analytic sample if they were seeds (n=10); did not inject within the last year (n=5), had missing values for either outcome (n=7). The analytic sample included 570 participants.

Measures

i. Outcomes—The physical police violence outcomes were included in the local survey as a potential structural factor influencing HIV transmission risk and defined using items adapted from the Revised Conflict Tactic Scale (Strauss et al, 1996). Self-reported direct experiences of violence were captured by the following question: “In the past 12 months, has a police officer slapped, punched, shoved, kicked, shaken or otherwise physically hurt you?” Knowledge of others’ experiences with violence were captured by a second question that asked whether they knew someone who had experienced the same physical assaults described in the previous question.

ii. Individual-level characteristics—Demographic and behavioral variables included in the analysis were measured using questions included in the NHBS core questionnaire. Demographic characteristics included: gender, age, race/ethnicity, sexual orientation, highest level of educational attainment, current employment and health insurance status. Behavioral variables had a reporting period of the past year and included: police confiscation of drug injection paraphernalia, IDU, RSS, with at least one person, and selling drugs versus other sources of income, location where participants injected, and attendance of an SSP. Life events, including past year arrest and past year homelessness (e.g., living on the street, in a shelter, in a Single Room Occupancy hotel) were also measured.

iii. Injection network characteristics—PWID network size measured the total number of PWID who participants personally knew and had seen in the past 30 days, categorized into tertiles due to high skewness of data.

iv. Place-based characteristics—ZIP code of residence was self-reported during the survey and was used to link place-based characteristics to individual-level participant data. Place-based vulnerability indicators were generated by obtaining ZIP code-level race/ethnicity data from the U.S. Census 2010 Demographic Profile Data (U.S. Census Bureau, 2010) and calculating the upper quartile of percent black/African-American in our sample (≥86.9%) and creating a binary indicator of being in the highest quartile (yes/no). Percent in poverty at the ZIP code-level was obtained using the 2011–2015 American Community Survey 5-Year Estimates and a cut-off of >20% poverty based on previous research (Cooper et al., 2016) was used to create an indicator for high vs low poverty. The survey also included a self-reported item that measured current city/county of residence.

Statistical analysis

We selected socio-demographic, place-based, law enforcement and health factors hypothesized to be associated with exposure to police violence based on existing research (Beletsky, Grau, White, Bowman, & Heimer, 2011; Cooper, Moore, Gruskin, & Krieger, 2004; Cooper et al., 2016; Hayashi, Ti, et al., 2013; Kutsa et al., 2016; Landsberg et al., 2016), and the framework posited by Burris and colleagues (Burris et al., 2004). These *a priori* specified covariates were compared across each outcome (i.e., experienced physical police violence and knowing someone who experienced physical police violence in the past 12 months) using Pearson's chi-square tests with $p < 0.05$ indicating statistical significance. Polychoric correlations between covariates were also examined to understand the relationships between the main covariates. RDS-weighting was conducted in RDSAT (www.respondentdrivensampling.org) to calculate population proportions (and 95% confidence intervals) of police violence and generate weights, which were exported to Stata/SE version 14.2 (College Station, Texas).

Covariates significant at the $p < 0.15$ level from chi-square testing were retained for subsequent logistic regression analysis after excluding two transgender PWID who were too few to be analyzed. Bivariate logistic regression models assessed unadjusted associations between each covariate and outcome. Three multivariable logistic regression models were built to examine the correlates of police violence (outcome 1: direct exposure of violence; outcome 2: knowledge of violence directed towards other PWID peers). First, we examined socio-demographic and place-based covariates, then we modeled law enforcement correlates adjusted for key (significant) socio-demographic and place-based covariates, and in the final step, we examined health behaviors after adjusting for the same covariates. In order to test whether the interpretation of the associations differed after RDS-weighting, all six multivariate models were re-run with weights incorporated. Complete case analysis was used. Uncentered Variance Inflation Factors (VIF) of final models were run to assess collinearity. Regression analyses were conducted in Stata.

Results

Participant characteristics

Among the 570 participants included in this analysis, the majority of the sample were male (72%), ages 50 years and above (57%), Black/African-American (77%) heterosexual/straight (86%), and high school/GED educated (61%), as shown in Table 1. One-third (33%) of the sample had a PWID network size of 15 or fewer. Most participants (94%) currently resided in Baltimore City.

Participants had injected for a median of 29 years (17–37). The majority (89%) injected drugs daily. Injecting heroin was the most common (93%) followed by "speedball" (heroin and cocaine together) (71%), cocaine alone (47%), and prescription "pain killer" opioid pills (13%) (prevalence in the past year). One-quarter (25%) were currently homeless, about half (53%) were unemployed or had a disabililty and were unable to work (30%), and 14% did not have health insurance. One in five (21%) had been arrested in the past 12 months, of whom 22% had been specifically arrested or cited for drug injection paraphernalia. Thirteen

percent of PWID had drug injection paraphernalia confiscated by police in the past 12 months. A quarter (26%) of the sample lived in a ZIP code with predominantly Black residents and high poverty levels. Sixty-five percent of the sample attended a SSP in the past 12 months.

Physical police violence

Seven percent (n=42) had experienced physical police violence in the past 12 months, 30% of whom had not been arrested or had syringes confiscated in the same period. The RDS-weighted prevalence of the outcome was 4% (95% CI: 2–5%; homophily=0.029) mostly as a function of network size; those who had experienced police violence had almost double the number of PWID in their network so were more likely to be recruited. Men were more likely to experience physical police violence than women (9% vs 3%, p=0.004). PWID who experienced physical police violence resided in a range of Baltimore city ZIP codes (19/39 ZIP codes from Baltimore city were represented).

A quarter (24%) of respondents knew someone who had experienced physical police violence in the past 12 months; the RDS-weighted prevalence was 17% (95% CI: 13–22%; homophily=0.08). PWID who had experienced police violence were more likely to also know someone who had experienced physical police violence compared to PWID who had not experienced police violence (81% vs. 20%, $p<0.001$).

The prevalence of experiencing physical police violence in the past 12 months was significantly higher among PWID who were male, younger, non-Black/Hispanic/Latino, homeless, or sold drugs, currently lived outside of the central city, arrested in the past 12 months, specifically arrested or cited for possession of drug injection paraphernalia, had drug injection paraphernalia confiscated by police in the past 12 months and engaged in RSS in the past 12 months($p<0.05$). Knowing someone who had experienced physical police violence was higher among PWID who sold drugs, were arrested, injected in a shooting gallery, or attended a SSP in the past 12 months ($p<0.05$).

As shown in Table 2, the strongest covariate correlations occurred between older age and racial minority (rho=0.61), younger age and RSS (rho=−0.58), followed by arrest and having syringes confiscated (rho=0.53)

Correlates of experiencing physical police violence

As displayed in Table 3, the odds of physical police violence was higher in bivariate analysis among PWID who were male (OR: 4.0, 95% CI: 1.4–11.3), younger (OR: 1.0, 95% CI: 0.9–1.0), non-minority race (OR: 0.5, 95% CI: 0.2–0.9), homeless (OR: 2.2, 95% CI: 1.2–4.3), sold drugs (OR: 3.0, 95% CI: 1.4–6.6), resided outside of Baltimore city (OR: 2.9, 95% CI: 1.0–8.0), arrested (OR: 4.9, 95% CI: 2.5–9.4), experienced confiscation of drug injection paraphernalia (OR: 5.1, 95% CI: 2.6–10.1), and engaged in RSS (OR:2.5, 95% CI: 1.3–4.7).

Model A revealed that experiencing physical police violence was independently associated with homelessness (OR: 2.1, 95% CI: 1.1–4.2), selling drugs (OR: 2.5, 95% CI: 1.1–5.7), and residing outside of Baltimore city (OR: 3.2, 95% CI: 1.2–8.8), controlling for age and race/ethnicity. Model B demonstrated that the odds of experiencing physical police violence

was higher among PWID who had been arrested in the past 12 months (aOR: 3.1, 95% CI: 1.5–6.2) or had drug injection paraphernalia confiscated in the past 12 months (aOR: 3.1, 95% CI: 1.5–6.6) after adjusting for homelessness, selling drugs and area of residence. In Model C, experiencing physical police violence was independently associated with RSS (OR: 2.1, 95% CI: 1.1–4.1) after adjusting for homelessness, selling drugs and area of residence. After incorporating RDS-weights, selling drugs and residing outside of the city were no longer statistically significant across all three models; the interpretation of the other covariates remained unchanged.

Correlates of knowing someone who experienced physical police violence

In bivariate analysis, knowing someone who had experienced physical police violence was associated with selling drugs (OR: 4.0, 95% CI: 2.3–7.0), being arrested (OR: 1.9, 95% CI: 1.2–3.0), injecting in a shooting gallery (OR: 1.6, 95% CI: 1.1–2.4) and attending a SSP (OR: 1.7, 95% CI: 1.1–2.7). Knowing someone who experienced physical police violence was independently associated with: selling drugs (OR: 4.0, 95% CI: 2.3–7.0) in Model D after adjusting for network size; with arrest (aOR: 1.7, 95% CI: 1.0–2.7) after adjusting for network size, selling drugs and paraphernalia confiscation in Model E; and with SSP attendance (OR: 1.7, 95% CI: 1.1–2.6) after adjusting for network size, selling drugs, RSS and injecting in a shooting gallery (Model F). After RDS-weighting and removing network size as a covariate to avoid over-adjustment, SSP attendance was no longer statistically significant from Model F but the interpretation of other covariates remained unchanged.

Discussion

This study is among the first to examine the correlates of physical police violence among U.S. PWID. The prevalence of experiencing physical police violence in the past year was 7% among this urban sample of PWID (and 4% after RDS-weighting), which is consistent with estimates observed internationally (3–14%) (Hayashi, Ti, et al., 2013; Kutsa et al., 2016; Landsberg et al., 2016). Moreover, one in four PWID were socially connected to someone who had recently experienced physical police violence, which may generate negative attitudes and mistrust of police officers even among those who do not directly experience police violence. Police violence was associated with male gender, homelessness, and arrest, as well as drug paraphernalia confiscation and RSS, placing PWID at higher risk of HIV and HCV acquisition. Addressing this complex public health and criminal justice issue will require strengthening monitoring systems and accountability mechanisms for illegal and unconstitutional policing. The implementation of evidence-based strategies targeting police officers, institutional policies and the law may be required.

Within a relatively short period of time, PWID were affected directly and indirectly by physical police violence, and the burden was not evenly distributed. The prevalence observed in the current study is similar to that observed in a previous study that examined the issue among a general urban population (DeVylder et al., 2017). Male PWID were more likely to experience physical police violence than female PWID, which has been shown among PWID in Canada, Ukraine and Thailand (Hayashi, Ti, et al., 2013; Kutsa et al., 2016; Landsberg et al., 2016). One previous study from Ukraine has shown that male

PWID are more like to be stopped on the way to drug treatment, bribed, pressured into diclosing information, and detained without an official charge compared to female PWID (Kutsa et al., 2016). In our study, male gender was not correlated with our limited set of law enforcement variables (arrest and syringe confiscation). Future studies could examine the role of gender dynamics between PWID and police officers to help elucidate these findings. Other unmeasured forms of violence (e.g., sexual violence), may disproportionately impact female PWID and require separate investigation (Kutsa et al., 2016).

Syringe confiscation and arrest were prevalent and emerged as types of police encounters that were independently correlated with increased odds of police violence exposure. Results from a qualitative study from Thailand showed that police violence against PWID most often occurs during drug-related searches, arrest and interrogation (Hayashi 2013). More studies are needed to examine the contextual factors surrounding police violence experiences in U.S. settings. While not measured in this study, tactics such as “stop and frisk”, “warrant checks” and “racial profiling” have historically been a part of policing the drug trade in the U.S., which elevate the number of arrests and often result in the violation of constitutional rights (Sarang et al., 2010; U.S. Department of Justice, 2016). Some authors have suggested that decriminalizing drug possession would systemically alter PWID’s risk environment (Debeck et al., 2017). Further research is warranted to evaluate whether such changes could reduce risk of violent encounters between police and PWID.

We noted several direct and indirect implications of police violence on health; PWID who experienced police violence in our study had a twice higher odds of RSS, a key HIV and HCV risk factor, corroborating findings from previous comparable research (Hayashi, Ti, et al., 2013). Other studies examining relationships between police encounters and health have documented that fear of police and arrest can drive unwillingness to carry sterile syringes, rushed drug injection, RSS and HIV infection as well as posing a barrier to accessing SSPs (Beletsky et al., 2011; Bluthenthal et al., 1999; Booth et al., 2013; Maher & Dixon, 1999; Rhodes et al., 2003; Sarang et al., 2010; Werb et al., 2008). Police violence can also fuel institutional mistrust posing a further barrier to accessing services (Beletsky et al., 2015; Cooper, 2015; Hayashi, Small, et al., 2013; U.S. Department of Justice, 2016). There are substantial immediate and chronic impacts of physical trauma documented elsewhere, including the risk of death (Cooper et al., 2004; Cooper, 2015; Human Rights Watch, 2017; Krieger, Chen, Waterman, Kiang, & Feldman, 2015; Sarang et al., 2010). The potential for psychological harms from experiencing or witnessing violence, and being told about a traumatic experience, is concerning given that PWID commonly have histories of trauma (El-Bassel, Gilbert, Witte, Wu, & Chang, 2011; Shaw et al., 2016). A recent study of urban U.S. residents showed higher odds of suicide attempts among victims of police violence; the mental health ramifications of police violence should also be addressed (DeVylder et al., 2017).

Police violence was higher in the lives of PWID who sold drugs; they were twice more likely to experience police violence, and three times more likely to know a peer who had experienced police violence. Law enforcement often intervenes to disrupt the drug trade with the intent to reduce crime, however, a systematic review has suggested that such interventions may paradoxically escalate community violence (Werb et al., 2011). Further

research will be required to better understand this dually criminalized and underrepresented subpopulation who may at higher risk of negative interactions with police. We also found that older PWID were less likely to experience police violence though this finding did not remain significant in multivariate modeling. It is plausible that older PWID, particularly lifelong residents, were more likely to underreport police violence due to having a higher perceived threshold for violence reflecting desensitization to institutional racism and chronic intensive policing strategies; this finding will require further exploration. We did not observe an association between police violence and place-based characteristics, i.e., ZIP code level racial composition and poverty. This may be due to lack of variability between the ZIP codes that PWID reside in, lack of statistical power, and the possibility that residents are searched or arrested outside of their ZIP code of residence. ZIP codes are administrative boundaries established for mail delivery and may not adequately reflect the activity spaces and environmental features that increase vulnerability to violent interactions with police. While the finding that White PWID were more likely to report recent police violence than PWID who are racial minorities is counterintuitive based on the literature, this finding may reflect a mechanism through which neighborhood racial segregation increases the likelihood of White PWID being perceived as outsiders in predominantly Black neighborhoods where drug-related law enforcement is frequently targeted as observed in Philadelphia (Rosenblum et al., 2014).

Reducing the number of negative encounters between police and PWID are achievable. Strategies recommended by the American Public Health Association include reversing the militarization of police and addressing the social and structural determinants of crime and police encounters, including homelessness, unemployment, racial discrimination and the criminalization of drug use (American Public Health Association, 2016). Our survey was conducted in 2015 following the death of Freddie Gray and the highly-publicized Baltimore City protests, and prior to the completion of the Department of Justice investigation of the Baltimore City Police Department (BCPD). Sweeping reforms built on the tenets of community-oriented policing are underway at BCPD, including the pilot of a Law-Enforcement Assisted Diversion (LEAD) program (Rouhani et al., under review); continued monitoring will be necessary to assess whether violent encounters are reduced as a result of these changes.

Decreasing police violence against PWID has been shown to be possible in other settings; the prevalence of past 6 month police violence against PWID in Vancouver decreased from 14% to 3% over the span of ten years following the implementation of a harm reduction informed policing strategy (Landsberg et al., 2016). Arrest as behavioral deterrence may not be effective for addiction (Wood et al., 2013) and the decriminalization of drug use and possession is likely to have a substantial impact on the likelihood of human rights abuses experienced by PWID, particularly at the hands of police (American Public Health Association, 2016; Csete et al., 2016). Currently, drug possession for personal use” and drug paraphernalia convictions can result in four years of incarceration and drug possession with “intent to distribute” carries a sentence of up to 20 years of incarceration (Md. Ann. Code § 5–619; Md. Ann. Code § 5–601, 5–402, et. seq.). Continued research (e.g., population-based surveys) will play an important role in monitoring the progress made through structural change.

This study is subject to some limitations. Our prevalence may be an underrepresentation of the true prevalence of police violence due to survivor and healthy participant bias. Given the low representation of transgender PWID in the sample, there is certainly a need for similar research among transgender communities where risk of negative police interactions is also high (U.S. District Court for the District of Maryland, 2017). Future studies are needed to assess better methods of reaching transgender PWID and examine whether the nature of police encounters are different among this dually stigmatized and marginalized community. Our analysis approach was somewhat limited by the small number reporting the main outcome (n=42). Studies of larger sample size may help to further elucidate the relationship between police violence and individual and contextual factors, as well as health outcomes. The definition of police violence used in this study should be distinguished from excessive or intentional force as further contextual data are necessary to deepen our understanding of the findings. We did not capture other forms of police violence including sexual and psychological violence, and witnessing violence; we do not know the circumstances of any reported violent encounters. The cross-sectional design does not allow assessment of temporality. Survey data may be subject to recall and social desirability bias. The strengths of this study are that this is the most representative sample of PWID available in the greater Baltimore area and that RDS permits us to engage highly marginalized and vulnerable population in research. Future epidemiologic studies could incorporate a more comprehensive measure of police violence and mental health effects that are measured longitudinally.

These findings add to the growing literature demonstrating police encounters as an integral component of the risk environment of PWID that may directly and indirectly influence public health goals. Alongside enhanced research, comprehensive social, cultural, structural and legal reforms will be necessary in reducing the burden of police violence among PWID.

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Table 1:

Socio-demographic, behavioral, law enforcement and place-based characteristics, and recent police violence among people who inject drugs (PWID) recruited in Baltimore City, Maryland, 2015

	Total	Experienced physical police violence, past 12 months			Know someone who experienced physical police violence, past 12 months		
	(N=570)	Yes (N=42)	No (N=528)	p[+]	Yes (N=139)	No (N=429)	p[+]
	n (%)	n (%)	n (%)		n (%)	n (%)	
Socio-demographic							
Gender							
Male	406 (71.2)	37 (90.2)	369 (69.8)		98 (71.5)	307 (71.6)	
Female	162 (28.4)	4 (9.8)	158 (29.9)		39 (28.5)	122 (28.4)	
Transgender	2 (0.4)	0 (0.0)	2 (0.4)	0.004*	2 (1.4)	0 (0.0)	0.913
Age (years)							
18–34	51 (8.9)	8 (19.0)	43 (8.1)		11 (7.9)	41 (9.6)	
35–49	194 (34.0)	17 (40.5)	177 (33.5)		50 (36.0)	144 (33.6)	
≥50	325 (57.0)	17 (40.5)	308 (58.3)	0.02*	78 (56.1)	244 (56.9)	0.779
PWID network size tertiles							
0–15	189 (33.3)	10 (23.8)	179 (34.0)		36 (26.5)	153 (35.4)	
16–49	182 (32.0)	12 (28.6)	170 (32.3)		51 (37.5)	131 (30.3)	
≥50	197 (34.7)	20 (47.6)	177 (33.7)	0.167	49 (36.0)	148 (34.3)	0.12
Race/ethnicity							
Black/Hispanic/Latino	454 (79.7)	28 (66.7)	426 (80.7)		110 (80.3)	344 (79.5)	
Other	116 (20.4)	14 (33.3)	102 (19.3)	0.03*	27 (19.7)	89 (20.6)	0.830
Sexual orientation							
Heterosexual/straight	484 (85.2)	35 (85.4)	449 (85.2)		123 (88.5)	359 (84.1)	
LGBT/other	84 (14.8)	6 (14.6)	78 (14.8)	0.977	16 (11.5)	68 (15.9)	0.204
Educational level							
Less than high school	220 (38.6)	15 (35.7)	205 (38.8)		53 (38.7)	167 (38.6)	
High school diploma or equivalent	241 (42.3)	16 (38.1)	225 (42.6)		57 (41.6)	184 (42.5)	
College, some college or technical degree	109 (19.1)	11 (26.2)	98 (18.6)	0.481	27 (19.7)	82 (18.9)	0.966
Currently homeless[#]	145 (25.4)	18 (42.9)	127 (24.1)	0.01*	42 (30.2)	104 (24.2)	0.161

	Total	Experienced physical police violence, past 12 months			Know someone who experienced physical police violence, past 12 months		
	(N=570)	Yes (N=42)	No (N=528)	p[+]	Yes (N=139)	No (N=429)	p[+]
	n (%)	n (%)	n (%)		n (%)	n (%)	
Employment status							
Unemployed	303 (53.2)	24 (57.1)	279 (52.8)		77 (56.2)	226 (52.2)	
Employed full-time or part-time	46 (8.1)	3 (7.1)	43 (8.1)		11 (8.0)	35 (8.1)	
Disabled and unable to work	170 (29.8)	13 (31.0)	157 (29.7)		39 (28.5)	131 (30.3)	
Student and other	51 (8.9)	2 (4.8)	49 (9.3)	0.855	10 (7.3)	41 (9.5)	0.824
No health insurance	79 (13.9)	72 (13.6)	7 (16.7)	0.584	60 (13.9)	19 (13.9)	1.0
Sold drugs^	61 (10.7)	10 (23.8)	51 (9.7)	0.009*	31 (22.5)	29 (6.8)	<0.001*
Place-based							
Live in high poverty and predominantly racially black ZIP cod##	144 (25.7)	12 (30.0)	132 (25.4)	0.52	40 (29.6)	104 (24.5)	0.232
Area of residence							
Baltimore city	538 (94.4)	36 (85.7)	502 (95.1)		131 (94.2)	406 (94.6)	
Outside of Baltimore city (Baltimore county and other areas)	32 (5.6)	6 (14.3)	26 (4.9)	0.024*	8 (5.8)	23 (5.4)	0.859
Law enforcement							
Arrested^	119 (20.9)	22 (52.4)	97 (18.4)	<0.001*	39 (28.1)	76 (17.8)	0.009*
Arrested or cited for possession of syringes or other drug injection paraphernalia^	31 (5.4)	6 (14.3)	25 (4.7)	0.009*	6 (4.3)	27 (6.3)	0.386
Police confiscated drug injection paraphernalia^	75 (13.2)	17 (40.5)	58 (11.0)	<0.001*	22 (15.8)	54 (12.6)	0.330
Health behaviors							
Daily injection drug use	500 (89.0)	38 (92.7)	462 (88.7)	0.430	125 (91.9)	375 (88.0)	0.208
Receptive syringe sharing^	143 (25.2)	19 (45.2)	124 (23.6)	0.002*	43 (30.9)	102 (23.9)	0.098
Injected in a shooting gallery^	216 (38.5)	18 (45.0)	198 (38.0)	0.381	64 (47.4)	152 (35.7)	0.015*
Attended SSP^	372 (65.3)	30 (71.4)	342 (64.8)	0.501	101 (73.7)	271 (62.6)	0.018*
Accessed drug treatment^	311 (55.4)	22 (55.0)	289 (55.5)	0.954	82 (60.7)	229 (53.8)	0.155

*p<0.05

^in the past 12 months

[+] Categories with cell size of 0 were excluded from chi-square testing

[#] living on the street, in a shelter, in a Single Room Occupancy hotel (SRO), or in a car

[##] ≥87% Black/African-American (upper quartile) and poverty >20%

Table 2:

Polychoric correlation matrix of key correlates of experiencing physical police violence among people who inject drugs (N=562) recruited in Baltimore City, Maryland, 2015

	Violence	Know violence	Male	Older age	Minority	Homeless	Dealer	Outside city	Arrested	Confiscated	RSS
Violence	1.00										
Know violence	0.72	1.00									
Male	0.35	−0.01	1.00								
Older age	−0.24	−0.02	0.22	1.00							
Minority	−0.22	0.01	−0.05	0.61	1.00						
Homeless	0.26	0.12	0.23	−0.20	−0.34	1.00					
Dealer	0.30	0.43	0.05	−0.18	−0.07	0.14	1.00				
Outside city	0.30	0.06	0.20	−0.20	−0.30	−0.11	−0.14	1.00			
Arrested	0.46	0.21	0.08	−0.29	−0.33	0.28	0.22	0.12	1.00		
Confiscated	0.48	0.10	0.10	−0.31	−0.37	0.32	0.17	0.17	0.53	1.00	
RSS	0.29	0.13	−0.02	−0.42	−0.58	0.24	0.19	0.18	0.15	0.39	1.00

RSS = receptive syringe sharing

Table 3:

Correlates of experiencing physical police violence in the past 12 months among people who inject drugs (N=562) recruited in Baltimore City, Maryland, 2015

	Unadjusted	*Socio-demographic and place-based correlates (Model A)*	*Law enforcement correlates adjusted for key covariates (Model B)*	*Health behavior correlates adjusted for key covariates (Model C)*
	OR (95% CI)	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**
Socio-demographic and place-based				
Male gender (vs. female)	4.0 (1.4–11.3)*			
Age (per year increase)	1.0 (0.9–1.0)*	1.0 (0.9–1.0)		
Black/Hispanic/Latino	0.5 (0.2–0.9)*	1.0 (0.4–2.4)		
Currently homeless	2.2 (1.2–4.3)*	2.1 (1.1–4.2)*	1.7 (0.8–3.4)	2.2 (1.1–4.2)*
Sold drugs^	3.0 (1.4–6.6)*	2.5 (1.1–5.7)*	2.5 (1.1–5.7)*	2.7 (1.2–6.0)*
Resides outside of Baltimore city	2.9 (1.0–8.0)*	3.2 (1.2–8.8)*	3.3 (1.2–9.3)*	3.5 (1.3–9.4)*
Law enforcement				
Arrested^	4.9 (2.5–9.4)*		3.1 (1.5–6.2)*	
Confiscated drug injection paraphernalia^	5.1 (2.6–10.1)*		3.1 (1.5–6.6)*	
Health behaviors				
RSS^	2.5 (1.3–4.7)*			2.1 (1.1–4.1)*

^ Past 12 months

* $p<0.05$

Variables that were significant in bivariate logistic regression at $p<0.05$ were entered into each of the three multivariate models. Gender was excluded from multivariate models due to small cell sizes ($n<6$).
AOR = adjusted odds ratio; CI = confidence intervals; OR = odds ratio; REF = reference group; RSS = receptive syringe sharing.

Table 4:

Correlates of knowing someone who experienced physical police violence in the past 12 months among people who inject drugs (N=559) recruited in Baltimore City, Maryland, 2015

	Unadjusted	*Socio-demographic and place-based correlates (Model D)*	*Law enforcement correlates adjusted for key covariates (Model E)*	*Health behavior correlates adjusted for key covariates (Model F)*
	OR (95% CI)	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**
Socio-demographic and place-based				
Male gender (vs. female)	1.0 (0.6–1.5)			
Age (per year increase)	1.0 (1.0–1.0)			
PWID network size (tertiles)				
0–15	1.0 (REF)	1.0 (REF)	1.0 (REF)	1.0 (REF)
16–49	1.7 (1.0–2.7)*	1.7 (1.0–2.8)*	1.7 (1.0–2.8)*	1.6 (1.0–2.7)
≥50	1.4 (0.8–2.2)	1.4 (0.8–2.2)	1.3 (0.8–2.2)	1.2 (0.7–2.1)
Black/Hispanic/Latino	1.1 (0.7–1.7)			
Currently homeless	1.2 (0.8–1.8)			
Sold drugs^	4.0 (2.3–7.0)*	4.0 (2.3–7.0)*	3.8 (2.2–6.6)*	4.0 (2.3–7.1)*
Law enforcement				
Arrested^	1.9 (1.2–3.0)*		1.7 (1.0–2.7)*	
Confiscated drug injection paraphernalia^	1.3 (0.7–2.2)		1.0 (0.6–1.9)	
Health behaviors				
RSS^	1.4 (0.9–2.2)			1.2 (0.8–2.0)
Injected in a shooting gallery	1.6 (1.1–2.4)*			1.4 (0.9–2.1)
Attended an SSP	1.7 (1.1–2.7)*			1.7 (1.1–2.6)*

^ Past 12 months

* $p<0.05$

Variables that were significant in bivariate logistic regression at $p<0.05$ were entered into each of the three multivariate models. AOR = adjusted odds ratio; CI = confidence intervals; OR = odds ratio; RSS = receptive syringe sharing; PWID = people who inject drugs; REF = reference group; SSP = syringe service program