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Association between injection in public places and HIV/HCV risk behavior among people who use drugs in Ukraine

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ABSTRACT

Background: In Eastern Europe and Central Asia new HIV infections occur at a high rate among people who inject drugs (PWID). Injection risk behavior may be associated with injecting in public places. However, there is a lack of studies exploring this association in Ukraine, which has an HIV prevalence 21–42% among PWID.

Methods: Data came from a baseline survey of PWID recruited to participate in a behavioral HIV prevention intervention. The association between HIV/HCV injection risk behavior and place of injection (private vs. public) was assessed using multivariable Poisson regression with robust variance estimate.

Results: Most of the sample was male (73%), > 30 years (56%), and reported opioids as their drug of choice (55%). One in six participants (15.8%, $n = 57$) reported using a syringe after somebody, and 70% ($n = 253$) reported injecting in public places within last 30-days. In the adjusted model, injection risk behavior was associated with injecting in public places (PrR: 4.24, 95% CI: 1.76–10.20), unstable housing situation (PrR: 2.46, 95% CI: 1.26–4.83), higher than secondary education (PrR: 1.82, 95% CI: 1.04–3.16), injecting with a sex partner day (PrR: 2.13, 95% CI: 1.28–3.56), and injecting with a stranger (PrR: 1.47, 95% CI: 0.93–2.31).

Conclusions: Injecting in a public place is associated with increased prevalence of risky behavior. Therefore, understanding and addressing place-based context should be part of the national strategy to fight HIV and HCV in Ukraine. National programs would benefit from expanding models to include contextual and structural determinants of health.

1. Introduction

In Eastern Europe and Central Asia (EECA) new HIV infections occur at a high rate among people who inject drugs (PWID) (UNAIDS, 2016), with 51% of new infections being registered among PWID. Moreover, PWID account for most hepatitis C (HCV) cases in EECA (Degenhardt et al., 2016). In Ukraine, a country of 42 million people (StateStatisticsService, 2017), there are estimated 347,000 PWID (Berleva and Sazonova, 2017), with 1.1% estimated prevalence of injection drug use among the adult population (UNODC, 2017). Among PWID in Ukraine, HIV prevalence is estimated to range from 21% to 42% (Alliance for Public Health, 2015; Balakirieva et al., 2014; Mathers et al., 2007; Ministry of Health, 2013), while HCV prevalence estimated to be as high as 60% (Alliance for Public Health, 2015). Estimated yearly cumulative HIV (1.8%) and HCV (9.3%) incidence among PWID continue to fuel the epidemics of these infectious diseases in Ukraine (Barska et al., 2016). Furthermore, a study limited to the three most affected cities in Ukraine reported HIV incidence rate among PWID as high as 31.8 cases per 100 person-years (Booth et al., 2016).

Research has demonstrated that sharing used and contaminated injection equipment such as needles and cookers increases risk of HIV (Abdala et al., 2001; Baggaley et al., 2006; Des Jarlais et al., 1988; Patel et al., 2014), and HCV (Eckhardt et al., 2017; Garfein et al., 1998; Tseng et al., 2007) transmission. A recent research report based on the results of a 2 year follow-up of a cohort of 2157 PWID in Ukraine indicated that the most prevalent injection risk practice was using already prefilled syringe (50.8%), and using common paraphernalia for cooking and splitting the drug (46%) (Barska et al., 2016). Based on program data for implementation of harm reduction efforts in Ukraine, a recent study demonstrated decreases in sharing needles/syringes and cooking paraphernalia between 2007 and 2013. However, there were no changes in using prefilled syringes (Makarenko et al., 2017).

Globally and in Ukraine, behavioral and structural interventions have been used successfully to promote safer injection practices that decrease or prevent transmission of HIV and HCV infections (Degenhardt et al., 2014; Gilchrist et al., 2017; Ompad et al., 2017). One of the most common and well-studied structural interventions to address HIV risk through contaminated needles are needle/syringe

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exchange programs (Abdul-Quader et al., 2013; MacArthur et al., 2014). These programs, however, often do not address the context in which people obtain, prepare and use drugs (Rhodes et al., 2006, 2007) even though it has been demonstrated before that injection risk behavior may be associated with injecting in public places (Darke et al., 2001; Latkin et al., 1994; Rhodes et al., 2006, 2007). The mechanisms by which injecting in public places may increase risky behavior include decreased control of the environment (DeBeck et al., 2012; Roy and Arruda, 2015), concentration of high-risk individuals (DeBeck et al., 2012), lack of access to clean needles and running water (Navarro and Leonard, 2004; Rhodes et al., 2006), and increased influence of situational norms and power dynamic relations (Janulis, 2016; Macintyre et al., 2002; Tobin et al., 2010). Furthermore, injecting in public places, including injecting on the streets, in abandoned buildings, and in public toilets, has been associated with increased odds of violence, robbery, police interference, and potentially stimulating rushed and less safe injection practices (Marshall et al., 2010; Rhodes et al., 2006). Moreover, normalization of high-risk injection behavior may be facilitated by the social network characteristics of those who inject in public spaces (Tobin et al., 2010).

In Ukraine, injection risk behavior has been addressed through increased coverage of harm reduction programs such as needle/syringe distribution programs (Alliance for Public Health, 2016), consultations, peer-based behavior change interventions (Booth et al., 2016), and group-level interventions (Booth et al., 2009b). Few of them mention, let alone address, issues related to the role that environment plays in the production of risk (Rhodes, 2002; Rhodes et al., 2005). It has been previously described that drug dealing and drug use in Ukraine may occur in the open spaces between state and private housing, where drug solution would be ‘front-loaded from a dealer’s pre-filled syringe’ (Rhodes, 2002; Rhodes et al., 1999). Further, the injection would occur without access to running water out of fear of being caught by police or the public. Injection in public places could be determined by the need for rapid transactions between consumers and dealers and ease of splitting liquid drug (Rhodes et al., 1999). However, there has been a gap in the literature regarding context-specific environmental factors and their association with injection risk behaviors in Ukraine after reports based on the initial stages of HIV epidemic in Ukraine. This gap extends to the whole region of EECA as epidemiological and contextual data exploring links between place type, and negative health outcomes have largely been collected in North America, Australia, and Western Europe (Darke et al., 2001; Rhodes et al., 2006, 2007). Therefore, this analysis aims to examine associations between type of place where injection occurs and injection risk behavior among a sample of PWID in Ukraine.

2. Methods

2.1. Setting and sample

Data for the current study comes from a baseline survey of $N = 684$ participants who were recruited from 4 sites as part of a study to develop and assess the effectiveness of HIV prevention interventions for PWID in Ukraine (MICT project, the names are the translation of Ukrainian word ‘bridge’) (Owczarzak et al., 2014). Detailed protocol and results of the first three phases of the study have been previously described (Owczarzak et al., 2014, 2016). Each site as part of the evaluation phase enrolled at least $N = 130$ participants for the baseline assessment. Each site combined strategies of direct contact, participant referral, and street-based outreach to recruit individuals. Eligibility criteria included being at least 18 years old and injected drugs within last 30-days

The baseline assessment instrument was based on the Risk Behavior Assessment (RBA) (Johnson et al., 2010; Owczarzak et al., 2014) and included basic sociodemographic characteristics (age, sex, education, marital status, income, housing situation), health history, drug use,

injection and sex-related risk behaviors and places where they injected. The instrument was self-administered in Russian through the web-based online platform Qualtrics (Qualtrics, 2014) at the agency venue in a private environment. Site staff was available during the assessment to troubleshoot technical problems with the instrument. Participants were compensated 120 UAH (~5 USD) for completing the assessment. Study protocol and materials were reviewed and approved by the Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health and the ethics committee of the Sociological Association of Ukraine.

2.2. Measures

The outcome measure is HIV/HCV injection risk behavior defined as reporting using needles/syringes after someone within last 30-days. The main exposure of interest is the place of injection within last 30-days: private if a person reported always injecting at home or someone else’s home versus public if a person reported at least once injecting either on the street, during a party in clubs or bars, at a park, or cemetery.

Additional measures included in the analysis were age (defined as younger vs. older than a median of 31 years old), sex (male vs. female), education level (higher than secondary education vs. lower than secondary education), unstable housing defined as living on the street, in abandoned or vacant building, staying in shelter or multiple places vs. stable housing defined as living with family, sex partner, with acquaintances or in own apartment.

Injection characteristics also included in the analysis were drug of choice, defined as three binary variables (opioids, stimulants, and ‘other’); binary variables describing whether participant injected with family member, friend, stranger, or ‘other’ person within the last 30-days; always injecting with others (yes vs. no); and obtaining new sterile needles within the last 30-days (yes vs. no).

2.3. Statistical analysis

Fisher’s exact test was used to compare the frequencies of categorical variables. Multivariable Poisson regression with robust variance estimate was conducted to examine independent associations with injection risk behavior ($n = 361$) (McNutt et al., 2003). The final model was selected based on the best subset variable selection according to the Akaike information criterion (AIC). We tested whether unstable housing or injecting partner modifies the association between injection in public places and using syringe after somebody by fitting models that contain main effects and interaction terms and testing a nested model without interaction terms using Log-likelihood ratio test. Our results suggested no evidence of such interactions. Therefore, the interaction was not included in the final model. The final model fit was checked using goodness-of-fit Hosmer-Lemeshow test (Hosmer et al., 1988). We used the results of crude and adjusted regressions to calculate probabilities of injection risk behavior by private vs. public injection place. Statistical analyses were performed using STATAv.14 (2014) (StataCorp, 2015).

3. Results

Table 1 presents project MICT participants characteristics by reported injection risk status. The majority of the sample were male (73%), older than 30 years (56%), with higher than secondary education (64%) and reported opioids as their drug of choice (55%). One in every six participants reported using a syringe after somebody else within the last 30-days (16%, $n = 57$) and 70% ($n = 259$) reported injecting in public places within the same recall period. The majority (89%, $n = 321$) reported injecting with a friend within the last 30-days.

In binary analysis, using syringe/needle after somebody was associated with injecting with a sex partner (64.9% vs. 40.5%, p -value - 0.001), stranger (42.1% vs. 25.7%, p -value - 0.016), and in public places during last 30-days (91.2% vs. 66.1%, p -value - 0.003). Table 2

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