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Law Enforcement Practices Associated with HIV Infection Among Injection Drug Users in Odessa, Ukraine

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Abstract Despite HIV prevention efforts over the past 10 years in Odessa, Ukraine, HIV rates among injection drug users (IDUs) remain high. We explored whether IDUs' experiences with the police and court system in Odessa were associated with HIV serostatus, after controlling for other factors. Qualitative methods, including semi-structured interviews with the police and members of court ($N = 19$), and focus groups with IDUs ($N = 42$), were employed to aid in developing a survey instrument for a larger quantitative phase and to assist in interpreting the findings from the quantitative phase, which included 200 participants who were interviewed and tested for HIV. Overall, 55 % tested positive for HIV. Negative experiences with the police were noted by 86 % and included having preloaded syringes taken (66 %), rushed injections due to fear of the police (57 %), police planting drugs (18 %), paying police to avoid arrest (61 %) and threatened by the police to inform on other IDUs (23 %). HIV positive participants were more likely than those who were negative to report these experiences. In a multiple logistic regression, the most significant correlate of HIV infection was rushed injections due to fear of the police. Police actions in Odessa may be contributing to the continued escalation of HIV among IDUs, underscoring the need for structural interventions.

Keywords Injection drug user (IDU) · Law enforcement · Ukraine

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Introduction

In the mid-90 s, Ukraine was characterized as a low HIV prevalence country by the WHO [1]. Within a year, however, all 25 regional capitals reported cases of HIV, fueled largely by injection drug use [2]. For example, in Odessa, HIV prevalence among injection drug users (IDUs) increased from 1.4 % in January 1995 to 13 % in August 1995 and to 31 % by January 1996 [3]. Initially, the epidemic was spread through heterosexual transmission, but by 1997 IDUs accounted for nearly 85 % of all infections [4].

The HIV epidemic in Ukraine continues to grow, with annual registered new cases reaching 16,094 in 2006 [5], 17,687 in 2007 [6] and more than 20,000 in 2009 [7]. In 2011, the HIV incidence rate was 46.2 per 100,000, the highest figure recorded since monitoring began in 1987 [8]. Official figures likely underestimate the actual size of the epidemic however, because they only reflect infections among those who have been in direct contact with official testing facilities [9]. The World Bank and International AIDS Alliance in Ukraine estimate that as many as 820,400 will be HIV-infected by 2014 and that 140 will die each

day, 75 % between 20 and 34 years of age and half women, due to an increase in sexual transmission to non-injectors [10, 11]. Moreover, the majority of HIV infections are among those in the most active reproductive age group (i.e., ages 20–34), which may cause the population to decrease up to 40 % by 2050 [12]. Estimates of the contribution of HIV/AIDS to labor force shrinkage by 2014 range from 20,000 in Nikolayev to 30,000 in Odessa, to 60,000 in Donetsk oblasts [10, 11].

At least two factors played an initial role in the Ukraine's HIV epidemic. First, the social and economic disintegration following the collapse of the Soviet Union in 1991 disrupted the social, economic and psychological fabric of the population [13–15]. The illicit economy was estimated to have tripled in the first five years following the collapse of the Soviet Union, accounting for more than 40 % of the gross national product in 1994 and 1995 [16]. Domestically produced opiates and amphetamines proliferated [14, 17], as did the number of substance users.

Second, the injecting practices of IDUs in Ukraine are extremely risky [18–20]. Street-recruited IDUs typically inject liquid poppy straw, sometimes mixed with Demerol, and pseudo-ephedrine [21, 22], an amphetamine-type stimulant. Liquid poppy straw is usually obtained either in pre-loaded syringes from Roma or from dealers who are typically injectors themselves [21]. Drugs purchased from dealers are extracted from a common container (e.g., jar) with the user's needle/syringe, or with the dealer's needle/syringe and front or backloaded into the user's syringe [21, 22]. In a single day, numerous needles could be used to extract the solution. Pseudo-ephedrine, known as "boltushka", "shirka," "vint" or "jeff," is purchased in pharmacies and also involves the use of shared drug mixing containers by networks of IDUs [23, 24].

IDUs in Ukraine continue to engage in high risk injection practices, despite widespread implementation of prevention interventions [25]. Based on focus groups with Ukrainian IDUs over the past 10 years and discussions with non-government organizations (NGOs), we felt that policing practices toward drug injectors in Odessa played a role in the perpetuation of the epidemic. As others have observed, law enforcement practices can have a major impact on HIV-related risk behaviors, including syringe sharing [26], syringe borrowing [27], injecting in shooting galleries [28], access to drug treatment [29] and health services [30], as well as adherence to HIV medication [31] and HIV-related risk behaviors [32]. In fact, there is evidence that legal repressiveness is associated with higher rates of HIV prevalence [33] and that, in Eastern Europe, legislation and policing practices have compromised the effectiveness of Global Fund HIV/AIDS programs intended to reduce HIV [34].

The present study applies qualitative and quantitative methods to better understand how ecological factors affect HIV prevention efforts among drug injectors in Odessa, Ukraine. It was designed to assess the extent to which experiences with the legal system (i.e., the police and courts) were correlated with HIV infection, after accounting for socio-demographics, drug use, and recent (30-day) needle-related risk behaviors.

All participants provided informed consent and were compensated for their participation. Study procedures for both phases were approved by the All Ukrainian Narcological Association, a Ukrainian Institutional Review Board, and the Colorado Multiple Institutional Review Board.

Methods

Qualitative Phase

The qualitative phase had 2 purposes: 1. through a series of focus groups, to learn about IDUs' experiences with the legal system to facilitate the subsequent development of a survey instrument for the quantitative phase; and, 2. using semi-structured interviews, to gain an understanding of the perspectives in which IDUs were regarded and treated by members of law enforcement and the courts (i.e., judges, prosecutors, defense attorneys) in order to aid in the interpretation of findings from the quantitative phase. Focus groups are useful in that they allow for a semi-structured methodology that does not have preconceived limits established, such as in quantitative surveys. They also provide information on the thoughts and feelings of individuals that can help researchers more fully understand the context of the target population's lives [35]. They can complement and verify other methods, including semi-structured interviews and surveys [36], thereby enhancing the validity of results. Items such as appropriate terms to use and questions to include in quantitative measures can be uncovered. Semi-structured, in-depth interviews are used to provide detailed, explanatory responses to previously unknown topics of interest. This methodology probes individual, environmental and social factors that influence behavior.

Semi-structured interviews were conducted in April and October, 2009 with 10 law enforcement officials and officers and 9 members of the legal establishment, all of whom interacted regularly with drug users. Those interviewed were selected by the Director of the NGO where the study was conducted, in consultation with the U.S. PI, and represented a broad spectrum of representatives in their field. Law enforcement personnel included Heads of District Offices (e.g., Criminal Investigation), investigators and

street police. Those from the legal establishment included judges, prosecutors and defense attorneys. All interviews were led by a Ukrainian professional specializing in the area of expertise of those interviewed, with a U.S. professional in that area present along with a translator. For example, a Ukrainian and U.S. attorney conducted all interviews with those from the legal establishment. Since tape recordings were not permitted, the U.S. investigator took detailed notes which were reviewed by the Ukrainian investigator following each interview. After obtaining informed consent, interviews of approximately one and a half hours were held in officials' private offices. All participants were offered the equivalent of $25.00 USD in compensation for their time.

During these same visits, focus groups with drug users were conducted by one of two moderators experienced in the field of substance abuse and in leading focus groups with drug users. The moderators alternated, with one directing the group and the other taking notes. A professionally trained Ukrainian translator fluent in English served as the translator for all groups. Sessions were tape-recorded, transcribed verbatim and the transcriptions compared with observer notes and edited when necessary. A total of six separate groups were held, including groups with seven HIV-infected women, eight HIV-infected men, seven HIV-negative women, eight HIV-negative men, three couples who were both HIV-infected and six female sex workers. Participants were recruited by the NGO's outreach workers who were familiar with them and their HIV status, as the NGO served as a "drop-in" center. Eligibility criteria included: 18 years of age or older; self-reported drug injection in the past 30 days; and not too impaired or otherwise dysfunctional to comprehend and provide informed consent. Following informed consent, focus groups of one and a half to two hours were conducted in a private room at the NGO. At the conclusion of each group, participants were compensated the equivalent of $10.00 for their time.

The semi-structured and focus groups guides were based on earlier focus groups with Ukraine IDUs [21], feedback from NGO staff, and a comprehensive literature review of U.S. and international studies in the areas of policing practices, the legal establishment and risk behaviors among drug users. Members of the legal establishment and drug users were asked a series of identical questions (e.g., "Some drug users have stated that they had been beaten by the police because they are drug users. Have you heard of this happening?"; "Have you heard of the police receiving payment from drug users for drugs they confiscated?"). Other questions were specific to the group interviewed (e.g., drug users—"Have you ever been forced to have sex by the police?"; legal system—"Are drug injectors treated differently than others who come in contact with the legal system?"; "Is police brutality toward drug injectors an area of concern? Do drug injectors exaggerate the level of brutality?").

Quantitative Phase

Following the qualitative phase, 200 drug injectors were recruited and interviewed. The interview schedule was administered using an audio computer administered self-interview (ACASI) and included an adapted version of the risk behavior assessment (RBA), developed by a NIDA grantee consortium during the Cooperative Agreement in the 1990s, and a measure of drug users' lifetime experiences with law enforcement in Odessa. Following transcription and coding of interviews in qualitative phase, described below, 11 specific events emerged that informed the development of a structured questionnaire to assess drug users' lifetime experience with the legal system. The RBA was modified based on a series of focus groups we conducted when we first began work in Odessa in 2001 [21], as well as feedback from colleagues and NGO staff in Ukraine, and translated into Russian. Following its initial adaptation, it was reviewed by NGO outreach workers who were former IDUs themselves, and modified further. Translation accuracy was verified through back-translation by Ukrainians fluent in Russian and English and adjustments were made as required. Reliability and validity assessments of the RBA support its use for this type of research with IDU communities [37, 38]. It assesses demographics, drug use, health history, involvement in the criminal justice system, employment and income, and sex and drug-related risk behaviors. Instruments were translated by an IRB-certified Russian translator in Denver. Interviews were conducted by staff trained in the research protocol and comfortable working with drug users.

Drug users were recruited through street outreach by NGO outreach workers, all of whom were former drug injectors, over a six-month period beginning in November 2009. Areas were targeted for recruitment based on NGO staff's knowledge about where IDUs congregated. Recruitment was spread throughout the city to obtain as generalizable a sample as possible. In addition to the eligibility requirement for focus groups, participants were required to verify their injection drug use through visual inspection for recent venipuncture, agree to be interviewed for approximately 1-h and to be tested for HIV antibody (receipt of test results was encouraged but not required). Interviewers made the final determination of eligibility. Following the interview, participants were provided free testing using the HIV I + II one-step test finger-stick rapid HIV test produced in Israel by Zer Hitech and approved for use in Ukraine by the Ministry of Health.

Data Analysis

Qualitative Analysis

Semi-structured interview data were recorded in written notes while data from the focus groups were tape-recorded and also available in written notes. Written notes collected during the focus groups aided in transcription when there was background noise or other reasons that the tape was not sufficient. Notes and transcripts were coded based on a scheme developed by the authors after initial review of the sessions. The method employed consisted of abstracting and contrasting, according to the informant type (i.e., police; courts; users), perceptions each had of the various topical areas queried (e.g., users beaten by the police; drugs planted on users). A grounded theory approach was used to inductively code and analyze each individual transcript. A two-step process was developed for both semi-structured interviews and focus groups. First, the U.S. investigators independently read each interview transcription to identify broad explanatory themes. Next, the interview themes were further coded into more specific sub-topics. Once the transcripts were coded, the U.S. investigators met as a team to reach consensus. The interviews and codes were then sent to the Ukrainian investigators for review to facilitate a process uncovering patterns of law enforcement practices and the attitudes of those in the legal establishment, as well as those of drug users. Analysis of qualitative, textual data involved searching for patterns in the data and looking for ways to explain those patterns in the context of the research questions, specifically, what experiences did drug injectors have with the legal system that might impact their ability to adhere to safer injecting practices and how might the legal system be contributing to the problem.

Quantitative Analysis

The outcome variable of interest was HIV antibody status. Independent variables assessed for their relationship to HIV included: age, sex, drug use (years injected, times injected last 30 days, drugs injected last 30 days, perceived self to be a safe injector); injection-related risk behaviors in the last 30 days (injected with a pre-loaded syringe, front or backloaded with others, front or backloaded with a dealer, drew drug from a common container with others, used dirty works); and, lifetime experiences with the police (e.g. avoided carrying clean syringes due to fear of police; rushed injection due to fear of police; police planted drugs; beaten/tortured by police; forced to buy back needle/syringe by police). The police variables were developed based on the findings from the qualitative phase.

The association of HIV antibody status with the above independent variables was assessed using Chi square tests (or Fisher's exact test) for categorical variables and *t* tests for continuous variables. Variables with $p < 0.25$ in univariable analyses were considered as candidate variables in a forward stepwise multiple logistic regression, in which variables were individually tested for entry into the model. The most significant candidate was entered into the model at each step, and variables already in the model were then tested for possible removal. As variables were added to the model, the corresponding likelihood values for that model were estimated by taking the negative of the log likelihood value and multiplying the result by 2 (-2 log L). The difference between the -2 log L estimate corresponding to a step containing a new variable and the previous step comprises a likelihood ratio test of model adequacy. The final model was produced when no additional variables met entry ($p < 0.05$) or removal ($p > 0.1$) criteria. Several models with alternative variables were further examined to check stability of the final regression model, including backwards stepwise regression modelling. The Nagelkerke R^2 is reported as a measure of amount of variation in the outcome variable that is explained in the logistic regression model [39]. Additionally, the Hosmer–Lemeshow goodness-of-fit test and c-index (area under the receiver operating characteristic (ROC) curve) were used to assess model fit and power to discriminate [40–42].

Results

Qualitative Research Findings

Through double-coding and discussions between the American and Ukrainian investigators, several key themes emerged, including police beatings and taking drugs from users and selling them back to them. Illustrative quotes from these themes are shown below.

Police

The 10 law enforcement officials interviewed in this phase included the Heads of District Officers, Departments and Investigations, as well as lower level Supervisors and Inspectors. They averaged 11.4 years of drug-related police work and each felt Odessa had a serious drug problem (e.g., "I believe that 60–70 % of people arrested with criminal charges are drug involved"). When asked about drug users being beaten by the police, a Deputy Head of Investigations stated "I am not aware of this. It might happen because police are unique. If the drug user fights back or runs away the police can use force, it is legal." A Head of Illegal Drug Traffic Control noted, "Drug users will invent a story for 100 Hryvna (about $20). Addicts are liars. There are no sadistic people working in the militia who want to

beat up addicts." According to a 17-year veteran of the police force, "Beating is restricted… Drug dealers fight back so we must use force." A supervisor for road police said "The facts are that police beatings are greatly exaggerated… I have never seen a person beaten because he was a drug user… In the process of arresting a drug user if they fight back or attempt to get away, the police will use force to hold them; this may be interpreted as a beating." One the other hand, a veteran of 7 years stated "Yes, I have heard of the beatings. The police have a hatred for drug users and are not tolerant. They are superstitious about drug users and dislike them."; a Criminal Investigator replied "I have heard about drug users being beaten. The reason they are beaten is that they are a 'socially vulnerable' group and many police have beliefs that view the drug user, from a moral viewpoint, as 'bad' people… Also, sometimes abusers are beaten in order to get confessions from them. Police use psychological and physical techniques for the purpose of obtaining confessions."

Courts

We interviewed three judges, two defense attorney, three prosecutors, a prison psychologist and a Deputy Head of Social Education and Work for the Ukraine prison system. They averaged 9.9 years of work in the criminal justice system. When asked about police brutality toward drug users, a District Court Judge with a lifetime appointment to the bench replied, "The police treat IDUs the same as everyone else but they are hated a bit more. IDUs exaggerate the level of police brutality. There are some arrest quotas, but there are limits on them. I have heard that police take money from IDUs then return drugs to the users. The police who work the Department of Illegal Drug Trafficking are often drug users and drug dealers. Police do have a room where those who are apprehended are interrogated. IDUs don't have to be tortured, just take their drugs from them and they will confess. Police do use electrical shock and a gas mask and withhold air as part of their interrogation tactics." One prosecutor stated, "People who are apprehended can provoke police brutality. Police brutality occurs but is difficult to prove. In order to prove police brutality there is a special procedure that must be followed which requires doctors to certify that the brutality was caused by the police. The police control the special procedure. I know for a fact that police sell drugs back to IDUs and drug dealers. Police have an 'on-call' list of drug dealers. When they confiscated drugs from IDU's they call one of the dealers on the list and sell the drugs to them." According to a defense attorney, "There is no police brutality to IDUs. If there are some negative attitudes by the police, it is just a case-by-case example and is not wide spread. The officer may have a personal bias or something. I don't know if the police receive payment for confiscating drugs. There are some planned quotas. There are specific number of arrests and types of arrests (drugs, weapons, etc.). Data on arrests are reviewed and this information is looked at by regions so there is some pressure to meet quotas. If arrest numbers drop, it can appear as though the police are not working hard enough. These quotas do lead to planting drugs on IDUs and working with drug dealers to help get arrest rates up."

Drug Users

Of the IDU participants in the six focus groups, including 19 men and 23 women, the vast majority injected and preferred opiates, with stimulants a distant second. When asked about police beatings, a female user replied, "The police took my hands and taped them together. They beat me with a stick so bad I had blood in my urine. They did this because I would not talk about another drug user". Another stated: "Sometimes they beat people when drug users don't have any information. Users will make up an answer to stop the beating"; and "I know someone who died from the police. After the police killed him at the station they put him in a car with a syringe in his hand to make it look like an O.D." Concerning whether or not the police make money off of drug users, a male participant stated, "They (the police) get money from dealers as they are in collusion. Police control all drug sale points; they get money when they take drugs from users; all dealers are on collusion with the police."; and, "The police extort money from drug users. They can search the user at any time. They will take money even if the person doesn't have drugs. Police plant drugs on drug users because they have quotas to fill… they work with drug dealers to make money for themselves." Regarding police activity near pharmacies, where it is legal to purchase syringes without a prescription, a male participant stated, "Police wait near the pharmacy until the drug user leaves, then they stop the IDU and search them. Police force you to pay money even if the syringe is in the package and unused… It happens if you have drugs too—you can pay to keep the drugs." Interestingly, when asked if the police also stop IDUs at needle exchanges, every participant answered 'no'. "It makes no sense. The police know that IDUs at needle exchange locations don't have the money to buy syringes so why arrest them, they couldn't pay the 'police fine' so they don't have any interest. They only look for users near pharmacies and drug sale points." When asked about substitution therapy, one male user said, "The police will oppose it because they will lose their source of income provided by us. That is why they are against it".

Findings from this first phase of the study were used to develop a survey instrument addressing drug users' experiences with the police.

Quantitative Research Findings

The 200 surveyed participants averaged 36.8 years of age (SD = 6.6), 43 % were female, 84 % had completed at least secondary education, 33 % were married or living as married, 48 % indicated they worked at least occasionally and their mean reported monthly income was 1,515.1 (SD = 1,145.3) Hryvna (approximately $190.00). They began injecting at an average age of 23.5 (SD = 5.0) and had been injecting for an average of 13.3 years (SD = 5.1) when interviewed.

In the 30 days prior to the interview, 41 % reported injecting liquid poppy straw, 53 % injected an amphetamine-based stimulant, and 19 % injected liquid poppy straw mixed with a sedative to enhance potency. An average of 40.0 (SD = 39.1) injections were reported in the past 30 days, 47 % had gotten drugs from pre-loaded syringes, 37 % had front or backloaded with a dealer, 15 % front or backloaded with another injector, 6 % had drawn drugs from a common container and 3 % used dirty injection equipment. Only 25 % indicated they never injected with others while 45 % injected with others at least half the time. Overall, 82 % reported engaging in at least one of these injection-related risk behaviors in the past 30 days. Slightly more than 70 % said they were a "safe" injector most or all of the time and 75 % (of 132 who had previously been given information on AIDS by community workers) felt they were informed or well-informed about HIV/AIDS. At the interview, only 14.5 % were aware that they had HIV and, among those unaware, 71 % felt they had less than a 50 % chance of getting infected. HIV test results revealed that 55 % were antibody-positive.

According to experiences with the police: 13 % had new syringes taken from them; 11 % had been arrested for carrying syringes; 17 % didn't buy new syringes due to fear of the police; 24 % avoided carrying syringes due to fear of the police; 57 % rushed their injection due to police presence; 66 % had preloaded syringes taken from them; 31 % had to buy back syringes taken by the police; 18 % had been arrested after the police planted drugs on them; 61 % had paid the police to keep from getting arrested; 23 % were threatened with violence to pay the police; 23 % were threatened by the police to inform on other users; 35 % had been held at the police station and not arrested or charged; and, 24 % reported having been beaten or tortured. Overall, 86 % indicated that they had experienced at least one of these situations with the police.

Univariable Analyses

Comparisons of selected characteristics between HIV-positive and HIV-negative participants and odds ratios (OR), with associated 95 % confidence intervals (CI), are shown in Table 1. Those who tested HIV-positive were: older ($p < 0.05$); they had been injecting longer $p < 0.001$; they injected more often in the past 30 days ($p < 0.0001$); were less likely to have never injected with others ($p < 0.001$) and less likely to consider themselves a safe injector most or all of the time ($p < 0.0001$) than those who tested negative. Regarding injection-related risks, HIV-positive injectors were more likely to have gotten drugs from preloaded syringes as well as front or backloaded with a dealer in the 30 days prior to their interview ($p < 0.0001$ and $p < 0.05$, respectively).

In terms of lifetime experiences with the police, those testing HIV-positive were: more likely to have had new syringes taken from them ($p < 0.001$); not bought syringes due to fear of the police ($p < 0.01$); avoided carrying syringes due to fear of the police ($p < 0.05$), rushed injections due to police presence ($p < 0.0001$), had pre-loaded syringes taken from them ($p < 0.001$); had to buy back syringes taken by the police ($p < 0.01$); been arrested after the police planted drugs ($p < 0.01$); and, been beaten or tortured by the police ($p < 0.01$). Not buying syringes due to fear of the police was highly correlated with avoiding carrying syringes due to fear of the police (Spearman correlation = 0.77, $p < 0.0001$). Since rushed injections due to police presence and having pre-loaded syringes taken from them were also highly correlated (Spearman correlation = 0.57, $p < 0.0001$), we avoided entering these variables simultaneously into multiple logistic regression models.

Multiple Logistic Regression

Factors independently associated with HIV serostatus are presented in Table 2. Experiencing rushed injections due to fear of police presence was strongly associated with HIV infection (AOR: 12.6), although the CI was wide (95 % CI: 5.4–29.3). Other factors that remained independently associated with HIV infection were getting drugs from preloaded syringes (AOR = 5.8), front or backloading with a dealer (AOR = 2.8) and number of times injected in the last 30 days (10 % increase for every 10 times). Perception of oneself as a safe injector most or all the time was protective (AOR = 0.4). The model had good fit ($p = 0.44$ for Hosmer–Lemeshow test) and exhibited excellent ability to discriminate ($c = 0.90$) as well as having high predictive power (Negelkerke R-square = 0.61).

Discussion

While a number of previous studies have found associations between policing approaches and health-related

Table 1 Selected characteristics by reported HIV serostatus among 200 injection drug users

Variable	HIV positive ($n = 109$) % or Mean (SD)	HIV negative ($n = 91$) % or Mean (SD)	p Value	Odds ratio	95 % CI
Demographics					
Age (years)	37.9 (6.9)	35.5 (6.1)	**<0.05**	**1.06**	**1.01–1.11**
Female gender	42.2	42.9	0.93	1.0	0.6–1.7
Drug use					
Years injected	14.5 (5.0)	12.0 (4.9)	**<0.001**	**1.1**	**1.0–1.2**
Times injected*	49.6 (44.9)	28.5 (26.7)	**<0.0001***	**1.02**	**1.01–1.03**
Most of or all the time thought to be safe injector	53.2	91.2	**<0.0001**	**0.11**	**0.05–0.25**
Injection risks					
Injected with a pre-loaded syringe	65.1	25.3	**<0.0001**	**5.5**	**3.0–10.2**
Front/back loaded with dealer	44.0	27.5	**<0.05**	**2.1**	**1.1–3.8**
Front/back load with others	11.0	19.8	0.08	0.5	0.2–1.1
Drawn drug from a common container	4.6	6.6	0.54	0.7	0.2–2.3
Used dirty works**	3.7	2.2	0.69**	1.7	0.3–9.5
Police actions					
Had new syringes taken by police	20.2	4.4	**<0.001**	**5.5**	**1.8–16.6**
Arrested for carrying syringes	14.7	6.6	0.07	2.4	0.9–6.5
Didn't buy syringes due to fear of police	23.9	8.8	**<0.01**	**3.3**	**1.4–7.6**
Avoided carrying syringes due to fear of police	30.3	16.5	**<0.05**	**2.2**	**1.1–4.4**
Rushed injections due to police presence	85.3	22.0	**<0.0001**	**20.6**	**10.0–42.7**
Had pre-loaded syringes taken	78.0	50.5	**<0.001**	**3.5**	**1.9–6.4**
Police forced you to buy back syringe	41.3	19.8	**<0.01**	**2.9**	**1.5–5.4**
Arrested for planted drugs	24.8	9.9	**<0.01**	**3.0**	**1.3–6.8**
Given money to keep from being arrested	64.2	56.0	0.24	1.4	0.8–2.5
Held at police station without arrest/charge	38.5	30.8	0.25	1.4	0.8–2.5
Beaten/tortured by police	32.1	13.2	**<0.01**	**3.1**	**1.5–6.5**

t Tests for continuous variables and Chi square tests for categorical variables were used to compare characteristics between HIV positive and HIV negative participants, except * t test for unequal variances and ** Fisher's exact test. p Values <0.05 were bolded. Odds ratios and 95 % confidence were bolded if CI did not contain 1

Table 2 Multiple logistic regression of factors independently associated with HIV serostatus ($n = 200$)

Variable	Adjusted OR	95 % CI	p Value
Ever rushed injection due to police presence	12.6	5.4–29.3	<0.0001
Gotten drug solution from pre-loaded syringe, last 30 days	5.8	2.5–13.8	<0.0001
Front/back loaded with dealer, last 30 days	2.8	1.1–6.8	0.02
Most of or all the time perceived self to be a safe injector	0.4	0.1–1.0	0.04
Times injected, (for every 10 times)	1.1	1.0–1.3	0.048

harms, including the risk of HIV, only a few have found direct, independent associations between policing practices and HIV infection as observed here [32]. Indeed, the correlation noted between rushed injections and having preloaded syringes confiscated by the police underscores the threat drug users in Ukraine perceive from the police.

Although the injection practices of study participants were at least partially responsible for the high HIV prevalence observed, they do not provide a complete account of why prevalence continues to be so high, particularly in this sample of relatively young injectors. The "risk environment" [43] faced by IDUs in Odessa may provide a more thorough answer. In Odessa, as observed elsewhere, human rights violations, especially those associated with drug laws and police enforcement practices, have created an atmosphere of anxiety and trepidation leading to increased HIV-related risks [44]. Earlier research has shown that the behavior of IDUs is shaped by their experiences and perceptions of police actions [26, 43, 45]. Regarding rushed injections specifically, these studies have reported that drug injectors will rush the injection process in an effort to avoid

drug confiscation prior to consumption [46, 47]. Users with fewer resources, such as those included in this research, will rush to inject in order to minimize the amount of time spent at risk of police-related harms, thus increasing their vulnerability to injection-related health problems [48]. Fear of interruption while injecting due to police intervention, leading to rushed injections, has been associated with reduced adherence to safety and hygiene practices [49] which may increase risks for HIV infection as well as well as vascular damage and bacterial infection [50, 51]. Beletsky et al. [52] found that policing practices, such as syringe confiscation, was associated with HIV infection and injecting in public. In their seminal review of the health and social consequences of drug market enforcement, Kerr et al. [53] offer compelling evidence that not only does drug enforcement have little impact on drug availability and use, but such practices intensify health and social harms.

In our study, significant associations between HIV infection and negative experiences with the police were observed on eight of the 11 questions posed and in the same direction on all questions. Fewer than 15 % reported they had not had a negative experience with the police and, in multivariate analyses, the most important factor associated with HIV infection was rushing to inject due to fear of the police.

Police practices are an important influence shaping the HIV risk environment. Werb et al. [27] studied the effects of police confiscation of drugs and syringes in Vancouver, Canada and reported that these actions have the potential to increase syringe borrowing. In St. Petersburg, Russia a recent report by Samet et al. [54] noted similar police actions to what we observed in Odessa, including having syringes taken by the police (50 %), not purchasing syringes from pharmacies due to fear of the police (44 %), arrested after the police planted drugs (43 %), extortion by the police (74 %), and forced sex with the police (12 %). In many settings, police appear to have wide discretion to apply tactics designed to control elements in society they deem unfit or objectionable [46, 55], in spite of what laws exist on the books [44]. Police activity has also been associated with accidental drug overdose, as witnesses may be deterred from calling for medical assistance [56], and IDUs select sites away from police surveillance to inject [57].

There are several limitations in the study to be considered. First, due to the temporality issue in the cross-sectional analysis (i.e., HIV serostatus and experiences with law enforcement are lifetime experiences while risk behaviors addressed the past 30 days), we are examining correlates rather than true HIV risk factors. However, the primary finding in the study was the association between rushed injections due to fear of the police and HIV infection, both of which were lifetime events. Further, the variable reflecting rushed injections due to fear of police was also associated with more proximal risk behaviors occurring in the last 30 days. Nevertheless, it is possible that other uncontrolled factors contribute both to increased risk for encounters with police and elevated HIV risks.

Second, drug users were recruited through street outreach by NGO outreach workers, all of whom were former drug injectors, with areas were targeted for recruitment based on their knowledge about where IDUs congregated. The sampling plan was designed to access IDUs from areas throughout Odessa in order for the results to be representative of street-based drug injectors in the city. Although this approach is preferable to convenience sampling, it is not known how representative the cohort was of IDUs in the city. Due to the nature of recruitment, it is also not possible to know the exact number of IDUs that refused to participate, although outreach workers reported few refusals. Because of the street-recruitment approach used, the sample likely over-represents IDUs willing to spend the time necessary to participate in the research and motivated by the modest stipend. Thus, this study may not generalize to all IDUs, but to a relatively representative street-recruited sample that is likely more impoverished and in worse health than other drug users in Ukraine. Finally, other than HIV test results, the data reported here were based on self-reports, which potentially could be biased both due to recall errors and social desirability. Recall error should have been diminished by the relatively brief time period respondents were asked to remember (i.e., 30 days). As IDU in Ukraine are less familiar with research practices than IDU in the U.S. and elsewhere, it is unclear what influence social desirability might have played. While social desirability cannot be ruled out, it is unlikely that the main findings were influenced by this factor. In addition, prior studies have shown that drug users' self-reports are sufficiently valid for this type of research [58, 59].

Conclusions

With the fall of the Soviet Union in 1991, the number of drug injectors in Ukraine grew rapidly followed shortly after by an epidemic rise in HIV. Both the economic, legal and economic collapse and the risky injecting practices of IDUs that occurred likely fueled the epidemic that began 15 years ago. Today, the epidemic is largely sustained by the lack of government resources devoted to the problem, the continued risky drug using practices of injectors and, perhaps most importantly, by the risk environment surrounding drug users. In 2006, the World Bank suspended disbursement of the U.S. 60 million Tuberculosis and HIV/AIDS Control Project in Ukraine because of the lack of progress in implementing the program. After three years, only 2 % of the 60 million available had been distributed by the government. Not surprisingly, since 2000, new HIV

cases have more than doubled annually, including nearly a third of diagnoses among those aged 15–24 [6, 60]. Unfortunately, non-governmental organizations, which should be in an ideal position to conduct HIV prevention efforts, suffer from a lack of financial resources, governmental indifference and the stigma associated with HIV [61]. The need to address human rights violations is paramount if the HIV epidemic in Ukraine and elsewhere is to be stemmed. Interventions must address the legal and political context is which violations occur.

There have been a number of suggestions regarding changing policing practices in order to reduce the harms associated with drug enforcement activities. As noted by Kerr et al. [53], these include greater use of problem solving and discretion [46, 62], offering harm reduction training for police officers [44, 63] and forming partnerships between police and health agencies [64, 65], among others. A somewhat more radical approach is safer injecting environment interventions where space is provided to minimize police interference with injecting. safer injecting facilities (SIF) or drug consumption rooms (DCR) have been associated with improved needle hygiene [66, 67], reductions in drug overdose [68] and reduced public injecting and discarded syringes [66]. Rushed injections would be virtually eliminated and time allowed for safer needle practices with the provision of such environments.

Unfortunately, the likelihood of any of these steps occurring in Odessa is unlikely. As reported here, the majority of police and court officials we interviewed did not feel that drug users were beaten, extorted or mistreated, yet every focus group participant reported such activities occurring, and on a regular basis. Strathdee et al. [69], using a modeling approach with some of our earlier data from Odessa, estimated that 4–19 % of new HIV infections could be prevented in Odessa by 2015 with the elimination of the most egregious police practices, (i.e., police beatings of IDUs). How this could occur is, at this point, unclear.

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