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Opioid Use Trajectories, Injection Drug Use and HCV Risk among Young Adult Immigrants from the Former Soviet Union Living in New York City

Honorio Guarino, Ph.D.¹, Lisa A. Marsch, Ph.D.², Sherry Deren, Ph.D.³, Shulamith L.A. Straussner, Ph.D., L.C.S.W.⁴, and Anastasia Teper, M.A.¹

¹National Development and Research Institutes, Inc., New York, NY

²Dartmouth Psychiatric Research Center, Department of Psychiatry, Dartmouth College, Hanover, NH

³Center for Drug Use and HIV Research, New York University College of Nursing, New York, NY

⁴Silver School of Social Work, New York University, New York, NY

Abstract

Available evidence suggests that young former Soviet Union immigrants in New York City have high rates of non-medical prescription opioid and heroin use, drug injection and injection-related risk behavior, making them vulnerable to hepatitis C virus (HCV)/human immunodeficiency virus (HIV) infection, overdose and associated harms. This group has been the focus of little research, however. This paper presents quantitative and qualitative data from 80 former Soviet immigrants (ages 18–29) to characterize their opioid use trajectories, injection risk behavior, HCV/HIV testing histories and self-reported HCV/HIV serostatus, and provides clinically meaningful data to inform tailored education, prevention and harm reduction interventions.

Keywords

former Soviet Union immigrants; prescription opioid misuse; drug use trajectories; transition to heroin; transition to injection; young injectors; injection risk behavior; HCV risk

INTRODUCTION

Since the dissolution of the Soviet Union, a major influx of immigrants from the former Soviet Union (FSU) have entered the U.S. Between 2005–2009, about 995,000 individuals born in the FSU were living in the U.S. New York City (NYC), the location of the present study, has the largest concentration of FSU immigrants in the country with over 185,000 FSU-born residents, most originating from Ukraine, Russia and Uzbekistan.¹

Although extant research is extremely limited, available evidence from NYC suggests that FSU immigrant young adults constitute a vulnerable population among whom the

prevalence of opioid use, injection drug use (IDU) and injection-related risk behavior may be high. To our knowledge, only two small, qualitative research studies have focused on substance use within FSU immigrant communities in the U.S.^{2,3} These reports, along with a handful of more general studies of drug use in NYC, indicate that heroin use and IDU began to be recognized as growing problems for young people in NYC's Russian-speaking communities in the mid-late 1990's, during the largest wave of immigration from the FSU to the U.S.^{4,5,6,7} Clinical evidence from NYC drug treatment providers confirms that a marked propensity for heroin injection (often used in tandem with cocaine and other drugs) has tended to distinguish FSU immigrant youth from other groups of young people in drug treatment for the past 15–20 years.⁸ During the earlier years of this period, some (albeit a minority of) FSU immigrants entering drug treatment had initiated opioid use in the high-risk drug-use environment of the FSU, characterized by widespread syringe-sharing and hyper-endemic HIV and hepatitis C virus (HCV), while in more recent years, this is increasingly rare, as most FSU immigrants who are young adults today immigrated to the U.S. in childhood or early adolescence and initiated drug use in the U.S.²

Data from these studies also suggest that young FSU immigrant injectors engage in a range of drug-use practices that place them at elevated risk for exposure to HIV and HCV,^{2,3} including injecting drugs in group settings, sharing injection equipment and drug solution, and use of public injection spaces.^{9,10} Although large-scale HIV or HCV prevalence data for U.S.-based FSU immigrants are unavailable, a community screening study found a background HCV prevalence of 28.3%¹¹ in NYC's general FSU-born population – a rate that far exceeds that of the U.S. population (1.3%¹²). Because FSU youth appear to preferentially inject drugs within networks of fellow FSU immigrants², a high community-wide HCV prevalence could potentially increase the HCV transmission risk of unsafe injection practices. Despite these concerning indicators, however, the drug use patterns and associated risk behaviors of FSU immigrants in the U.S. have yet to be systematically assessed.

The drug-use trends in NYC's FSU immigrant community have occurred within a larger social context characterized by a dramatic increase in the nonmedical use of prescription opioids (POs) over the past two decades, both in New York City¹³ and nationwide,¹⁴ and the recent emergence of a cohort of young people who inject drugs (PWID) who initiated opioid use with oral or intranasal (or, less commonly, inhalation) administration of POs and subsequently transitioned to heroin injection because of heroin's wider availability and cheaper price.^{15,16,17,18} This new cohort of PWID share distinct demographic characteristics that differentiate them from typical groups of PWID in previous decades; whereas IDU was previously concentrated in low-income, largely minority, urban populations, today's heroin injectors are more likely to be white residents of relatively affluent suburban or rural areas.¹⁹ It should be noted that although increasing rates of PO misuse and IDU among youth in rural and suburban areas have received the most attention in both the scientific and popular press, analogous phenomena are occurring in urban locations, including NYC.^{17,18}

In an interlinked trend, surveillance efforts during the past decade have identified outbreaks of new HCV infections among young PWID in multiple rural and suburban locations throughout the U.S., including upstate New York.^{20,21,22,23,24} In fact, after decreasing for

several years, the incidence of acute HCV infection among young adults (under age 30) is now increasing in most States, a resurgence that is attributed to increasing rates of IDU among youth.^{25,26} These HCV clusters are fundamentally associated with the recent surge in opioid (PO and heroin) use among youth, as the majority of young injectors newly diagnosed with HCV arrived at heroin (or PO) injection from oral or intranasal use of POs. Surveillance data from NYC reveal parallel trends, with most of the City's new HCV cases in individuals under age 30 occurring among non-Hispanic white PWID; particularly high rates have been reported in Staten Island and southern Brooklyn,²⁷ the latter an area with a high concentration of FSU immigrants. A critical factor facilitating HCV transmission among these young PWID is the nature of the hepatitis C virus itself which is hardier and more infectious than HIV; because HCV, in contrast to HIV, can survive on inanimate and even dry surfaces for a number of hours, it can be readily transmitted through the sharing of secondary injection equipment including drug-dilution water and water containers, cookers and cotton filters.^{28,29,30}

Research has demonstrated that recently-initiated injectors are at particularly high risk of acquiring HCV, with the first 3–5 years of an individual's injection career being the period of greatest risk for seroconversion.^{31,32} Although duration of IDU has been found to be a consistent predictor of HCV-positive status among PWID,³³ the incidence of new infections is highest during the first few years of injection, ranging from 8%–25% annually, making this a critical period for prevention interventions.¹² The increasing rates of IDU among youth, coupled with the high bar of safety that is required to avoid exposure to HCV via the parenteral route and the limited window of opportunity to prevent seroconversion among newly-transitioned PWID, reveal a pressing need for effective *HCV-specific* prevention interventions to be developed and delivered to young people early in their drug use trajectories.

To begin to address the paucity of research on drug use among FSU immigrants in the U.S., this study sought to better understand opioid use patterns and extent of involvement in IDU and injection practices that present risk for HIV/HCV transmission in a sample of FSU immigrant young adults (ages 18–29). Specific objectives were to: a) characterize participants' sociodemographic attributes and immigration histories; drug use trajectories; current patterns of opioid use; and injection networks; and b) assess their injection-related risk behavior; perceived vulnerability to HCV and HIV; and history of HCV and HIV testing. The overarching goal of the study was to help establish an evidence base to inform the development of culturally-sensitive prevention interventions for FSU immigrant youth who use opioids.

METHODS

Overview of Research Design

In this mixed-methods study, 80 opioid-using FSU immigrants (ages 18–29) in NYC, half of whom were currently in treatment for opioid use and half of whom were not in treatment, were recruited to complete structured assessments. Using theoretical sampling, a procedure which aims to create a sample representing major axes of difference within a population, a diverse sub-sample of 26 participants, balanced across drug treatment status, gender, age

subgroup (18–23 and 24–29) and country of origin, was then selected to participate in in-depth qualitative interviews. Prior to the commencement of field activities, all procedures were approved by the Institutional Review Board of National Development and Research Institutes.

Participant Eligibility and Recruitment

Eligible participants were: born in the former Soviet Union or in the U.S. to FSU-born parents; 18–29 years of age; and either currently using opioids (POs or heroin) or currently receiving treatment for opioid use. Current opioid use was defined as the use of heroin or the nonmedical use of POs once or more in the past 30 days, via any route of administration. The sample was stratified by drug treatment status, with half (n=40) currently participating in any form of treatment for problematic opioid use, such as medically-assisted treatment (MAT), drug-free outpatient counseling or regular attendance at 12-step/self-help group meetings, and half (n=40) not currently in treatment. Eligibility was confirmed by self-report using a verbal screening instrument.

Participants were recruited via a combination of purposive sampling^{34,35} strategies. Twenty-one young adults were referred to the study by local drug treatment and related service organizations and FSU community contacts, while the remaining 59 participants were recruited by chain-referral from previous participants. Referral sources included: an intensive outpatient therapeutic community (TC) for youth ages 13–24 (n=11); a drug-free outpatient counseling program for adults (n=1); a mobile Syringe Exchange Program (SEP) that maintains regular hours in two South Brooklyn neighborhoods with large numbers of FSU immigrant residents (n=5); and FSU immigrant community members familiar with drug use among youth (n=4). To encourage chain-referral, participants were asked to recruit interested peers to the study and received \$20 in compensation for each eligible referral who completed a structured assessment.

Data Collection Procedures and Assessments

All participants were asked to complete a 60-minute battery of structured, interviewer-administered assessments. Injection risk behavior and sources where syringes were obtained in the past 12 months were assessed with 20 items from the structured interview used by the National HIV Behavioral Surveillance (NHBS) study, a CDC-led project to monitor the prevalence and incidence of HIV, HCV and associated risk behavior in high-risk populations, including PWID, in multiple U.S. cities.³⁶ Participants' histories of HIV testing and degree of concern about contracting HIV in the future were assessed with items from the Risk Assessment Battery,³⁷ a validated survey instrument designed for drug-using populations; parallel items regarding HCV testing and concern about HCV were added by the Principal Investigator. The size and age and ethnic composition of participants' egocentric injection networks – namely, the number of different people in whose presence the participant injected drugs in the past 6 months, along with the age and ethnicity of these network members – were measured with items adapted from a social and risk networks questionnaire used by several previous studies of PWID in NYC.^{38,39,40} Items regarding participants' sociodemographic characteristics, immigration histories, drug use trajectories (including ages of key transitions between different drugs and routes of administration),

current opioids used and current modes of administration were constructed by the Investigator based on formative data collection, or where possible, adapted from the NHBS questionnaire. All participants provided written informed consent, and received \$40 in compensation upon completing the structured assessments.

Semi-structured, digitally audio-recorded qualitative interviews (60–90 minutes' duration) were conducted by the Investigator. Topical domains addressed in interviews related to the study aims, and included: participants' perceptions of opioid use among FSU immigrant youth and normative attitudes towards drug users within the Russian-speaking community; their personal substance use trajectories, from initiation of opioid and other drug use to current patterns and practices; the contexts surrounding key transitions within these trajectories, such as first injection events; their injection practices and networks; use of harm reduction services; and knowledge of HIV and HCV transmission dynamics. Open-ended questions were presented in a flexible format, allowing participants to introduce topics and elaborate on issues, as relevant to their experiences. Participants were compensated \$50 for completing a qualitative interview.

Data Analysis

For all structured assessment data, descriptive statistics summarizing participants' responses were prepared in Excel. These quantitative findings are intended to systematically characterize the study's sample of FSU immigrant young adults and document their patterns of opioid use and potential modes of exposure to HCV and HIV.

Audio recordings of qualitative interviews were transcribed verbatim. For the present analysis, the Investigator conducted focused coding of interview transcripts for salient themes related to the study's key aims and topical foci. A comparative analysis explored connections between key themes and participants' experiences, attending to the most commonly voiced themes, as well as inconsistencies in participants' accounts. Findings from this qualitative analysis were then triangulated with the quantitative findings to cross-validate both forms of data and form an integrative interpretation. Although space limitations preclude the inclusion within the manuscript of direct quotations from participants' interviews, qualitative findings are presented in summary form, as relevant, to elucidate participants' perspectives on contextual factors shaping their drug use, as well as their motivations for engaging in particular behaviors. Qualitative data are also used to provide information about topics for which no structured data were collected (e.g., participants' level of HCV-related knowledge).

RESULTS

Participant Characteristics

Select socio-demographic characteristics of participants are presented in Table 1. The sample was predominantly male (74%), with a mean age of 23.34 years. Participants were well-distributed across the 18–29 year-old eligibility range, with 36% between the ages of 18–21, 34% between ages 22–25, and 30% between ages 26–29. The overwhelming majority (90%) were born in the FSU – primarily in Ukraine (48%), Russia (19%), and

Uzbekistan (10%) – while 10% were born in the U.S. to FSU immigrant parents. Most foreign-born participants immigrated to the U.S. as young children (mean age of arrival=6.55 years) in the late 1990's during the major wave of post-Soviet immigration, and settled with their parents, and often other close family members, in the southern areas of Brooklyn.

A strong majority of the sample (84%) was single (never married), and most (70%) continued to reside with parents and/or other family members, including siblings, grandparents, and occasionally aunts and uncles. In comparison to other groups of PWID, the sample was well-educated, with over half (55%) having completed at least some college and the vast majority (88%) having at minimum a high school diploma or GED. Notably, 61% reported parents or other close family members as their primary source of financial and material support.

Although, as per the study's purposive sampling strategy, 40 sample members were currently receiving treatment for opioid use, 19 (48%) of these in-treatment youth reported that they continued to use illicit opioids on a regular basis. The 40 in-treatment individuals were participating in the following treatment modalities: outpatient counseling (n=13), primarily at an intensive TC for youth; methadone maintenance treatment (n=11); buprenorphine (Suboxone) provided by a private physician (n=8); regular attendance at Russian-language Narcotics Anonymous (NA) meetings (n=6); a residential TC (n=1); and naltrexone implantation (n=1). The strong representation of the youth-focused TC and the Russian NA group within the sample is in part an artifact of the study's recruitment strategy, as members of both programs served as key referral sources; however, formative ethnographic research indicated that these programs typically serve substantial numbers of FSU immigrant youth.

Initiation of Opioid Use

Key variables regarding participants' opioid use trajectories are presented in Table 2. On average, participants' first nonmedical use of opioids occurred in their mid-teen years (mean age=17.75 years), with 54% initiating such use before age 18. Unsurprisingly, given that most immigrated to the U.S. in early childhood, virtually all participants initiated opioid use in the U.S., typically in the Brooklyn neighborhoods where they were raised post-immigration and continued to reside. Only one participant, a male who immigrated to the U.S. at age 16, initiated opioid use in the FSU; when he was 13, he began injecting heroin with a small circle of friends in Moscow.

In keeping with recent national trends, the vast majority of participants (85%) were introduced to opioids via the nonmedical use of POs, while a small minority (15%) initiated opioid use with heroin. By far the most common PO used at initiation was immediate-release (IR) oxycodone (65%), followed by extended-release oxycodone (16.2%), hydrocodone (13%) and a smattering of other POs such as codeine, oxymorphone and hydromorphone (n=4, 5.9%). Only two participants first used opioids (heroin, in both cases) by injection; the most common route of administration at initiation was oral ingestion of POs (56%), followed by intranasal use of crushed POs or heroin (34%) and, less frequently, inhalation of crushed POs (6%).

As revealed in qualitative interviews, all but three participants initiated opioid use nonmedically. Initiation typically occurred within a social setting with high school peers, many of whom were fellow FSU immigrants. Several participants reported being introduced to opioids by groups of older Russian-speaking youth with whom they socialized in neighborhood venues such as public parks. During this early phase of use, POs were frequently obtained from household supplies, such as a grandparent's unused prescription, or given to participants by friends with similar sources. In some cases, POs (or heroin) used at initiation were purchased from friends or acquaintances who were dealing, but this mode of acquisition generally took on greater prominence after opioid use had progressed to become a regular habit.

A very small minority of participants (two males and one female) reported iatrogenic initiation of opioid use. Each of the three had either experienced a serious injury from a car accident or underwent surgery after which they were prescribed heavy dosages of POs for pain – one was prescribed transdermal fentanyl as a first-round treatment for his back pain, while the other two received IR oxycodone. Yet being introduced to POs in the context of legitimately-indicated medical use did not protect these youth from the risks associated with regular opioid intake; instead, all three reported that intensifying nonmedical use of POs and physical dependence ensued within less than a year of their initial prescription.

Opioid Use Trajectories and Transitions

For all participants, early experimentation with POs (or heroin) led to regular – and, for most, daily – use, a progression that generally occurred within about one year of initiation (mean age at first regular opioid use=18.96 years). As their opioid intake intensified in both frequency and amount, most of those who were using POs began to experiment with heroin; correspondingly, the lifetime prevalence of heroin use in the sample is remarkably high (79%).

While some participants tried heroin out of curiosity or to seek a more intense high, most reported being motivated by pragmatic reasons – specifically, heroin's greater availability and lower street price relative to POs. Participant reports indicate that NYC-area street markets for POs vs. heroin have become increasingly polarized in terms of cost and availability in recent years, as markets for diverted POs have rapidly constricted amid widely publicized concerns about epidemic rates of PO misuse and opioid overdose. Motivated by such factors, 64% reported transitioning from POs to heroin on a long-term basis. On average, participants reported first using heroin at 19.38 years of age, or about five months after they began using opioids on a regular basis and about 1.5 years after initiating opioid use. About one-quarter of the sample (26%) evinced accelerated trajectories, initiating heroin use before the age of 18.

Findings (summarized in Table 2) provide strong evidence that the predominant trajectory within the sample is a *transition* from POs to heroin use, with heroin displacing POs as the primary opioid used, as opposed to evolving co-use of heroin and POs, for example. Whereas 85% initiated opioid use with POs and only 15% with heroin, by the time of their study participation, the proportion who deemed heroin their primary opioid had risen to 53% while the proportion who considered POs their primary opioid had fallen to 15%. A minority

of participants, however, displayed alternative trajectory patterns that are worthy of note. Twenty-one percent never used heroin on a regular basis, but continued to use POs as their primary opioid, generally because they disliked the effects of heroin or sought to avoid escalating their opioid dependence. These participants typically had access to a reliable supply of POs through sources such as grandparents with long-standing prescriptions or dealers who maintained a steady supply of 30 mg IR oxycodone pills (the only PO that reportedly remains widely available through street sources) or were no longer using opioids at the time of their assessment. Five participants reported using POs and heroin interchangeably, according to the drugs' availability (although each was able to identify either POs or heroin as their preferred drug of choice). Finally, one individual displayed a reverse transition from heroin to PO use, while two others cycled between phases of PO use and phases of heroin use; in all three cases, participants' transitions away from heroin were motivated by a desire to better manage their opioid use – in an effort to stop injecting, for example.

Both qualitative and quantitative data reveal the extent to which heroin use is intimately linked to injection as a primary route of administration. Although the heroin currently available in NYC is powdered and generally of sufficiently high purity to be effectively used via the intranasal route, the dominant mode of administration for most heroin-using participants was injection, with 69% (n=29) of the 42 current heroin users in the sample reporting injection as their usual route of administration and the remainder reporting intranasal use. Transition to heroin was also strongly associated with transition to injection. The lifetime prevalence of injection drug use was 76%, virtually identical to the lifetime prevalence of heroin use (79%), differing only by two participants who were exclusive heroin sniffers. Participants' mean age at initiation of IDU was 20.43 years, or about a year on average after first heroin use. A substantial minority of ever-injectors (18%) initiated IDU before the age of 18. Qualitative interviews confirmed that most participants first used heroin by sniffing it, but adopted the practice of injection soon thereafter in an effort to maximize the effects of the drug and cost-effectiveness. Sixty-six percent of participants reported either currently being a regular injector or having been a regular injector in the past; 8 participants had experimented with drug injection but never transitioned to injection as their primary mode of administration.

Importantly, given the high HCV incidence typically seen in groups of new injectors, 16 participants were very recently initiated to injection, having transitioned to this primary route of heroin administration no more than six months (mean=2.47 months; range=2 weeks to 5 months) prior to either their participation in the study or entry into drug treatment (for those who were in treatment and not currently using). Overall, the 53 regular injectors in the sample reported a wide-ranging duration of IDU – from 2 weeks to 10 years (mean=26.33 months).

Injection-related Risk

For the 48 participants who reported being current injectors, syringe sources and injection risk behavior in the past 12 months are reported in Table 3. A large majority of these participants (73%) reported obtaining syringes from pharmacies (available since 2001 under

New York State's Expanded Syringe Access Program), while only 40% reported using a Syringe Exchange Program (SEP) in the past year, the same proportion as reported obtaining syringes from fellow injectors. Qualitative interview data helps to elucidate this finding, as participants pointed to the extreme stigmatization of drug users that is common within the FSU immigrant community as a major barrier to their utilization of drug-related services. Many reported being reluctant or unwilling to use the mobile SEP in their neighborhood for fear of being 'outed' as a drug injector within the wider FSU community, an occurrence they felt would render their identity permanently spoiled, even socially dead, in the view of many community members. Additionally, participants who obtained syringes at pharmacies unanimously reported that no information regarding HIV/HCV prevention, safer injection techniques or overdose prevention is provided in conjunction with a purchase of syringes.

With regard to injection-related behaviors that pose a risk for transmission of blood-borne viruses, one-third of the current injectors (33%) reported receptive syringe-sharing (i.e., using a syringe that had previously been used by someone else) in the past 12 months. In all cases, participants reported sharing syringes with one – or less commonly two – other individuals; qualitative data reveals that these syringe-sharing partners are typically sex partners and/or close friends. A significantly greater proportion – nearly half (46%) of the current injectors – reported receptively sharing secondary (i.e., non-syringe) injection paraphernalia, including cookers, cotton filters, drug-dilution water and water containers, most (77%) with one or two people, but a few with five or more individuals. Interviews indicate that, while syringe sharing tends to occur almost exclusively within romantic/sexual partnerships or friendship dyads (often male-male dyads), sharing of other injection paraphernalia, in contrast, can also occur within larger groups of three or more individuals who form a close-knit injection network, frequently purchasing and using heroin together. There are some differences in the number of injectors who reported sharing the various pieces of non-syringe paraphernalia in the past 12 months; specifically, fewer participants reported sharing cotton filters (31%) as compared to the other items (42% for cookers and 40% for water/water containers). With regard to the frequency of receptive sharing in the past year, most participants reported engaging in these behaviors rarely (which, for these items, means less than half the time), while a small number (3–10 individuals, depending on the specific piece of equipment) reported doing so half the time or more.

Social network data reveal that participants have extensive injection networks (i.e., PWID who were present on any occasion when the participant injected drugs in the past 6 months). Participants reported a mean injection network size of 13.7 individuals (SD=43.8; range=0–300), about half of whom are FSU immigrants (mean=6.3 people; SD=12.9; range=0–75) and most of whom are young adults between the ages of 18–29 (mean=9.88 people; SD=23.06; range=0–150). Qualitative data extend and add nuance to these findings, suggesting that, for many participants, the core members of their injection networks, with whom they have the closest ties and interact and use opioids most frequently, are more likely to be fellow FSU immigrants, while the non-FSU members are more likely to be at the periphery of these networks.

HCV and HIV – Level of Concern, Testing History and Self-reported Serostatus

Despite these reports of recent injection risk behavior, injection drug-using participants' level of concern about contracting HCV in the future was low overall. Among the 48 current injectors, 69% reported being "not at all worried" or only "slightly worried" about getting HCV in the future. This low level of concern is likely related to participants' limited – and in some cases, virtually nonexistent – knowledge of the hepatitis C virus and its transmission dynamics. In contrast to their knowledge of HIV which was generally strong, with the vast majority well aware that HIV can be transmitted through syringe-sharing, a significant proportion of the sample had incomplete knowledge of HCV. A particularly common knowledge gap among these young adults, as revealed in qualitative interviews, concerns the transmission risk associated with the sharing of non-syringe injection equipment (behaviors which present a far greater risk for the transmission of HCV than for HIV). A number of participants, including current injectors, were surprised and dismayed to learn that HCV can be transmitted through the use of contaminated cookers, cottons and drug-dilution water. A smaller group of participants (all with limited or no experience with drug injection) had heard of HCV and were vaguely aware that it was somehow connected to IDU, but had no further knowledge.

Most participants (64% of the total sample; 69% of current injectors) reported having been screened for HCV antibodies in the past 12 months. Yet a significant minority (24% of the total sample; 23% of current injectors), indicated that they had *never* been screened for HCV. Self-reported HCV prevalence was 9% (n=7) in the total sample; all 7 HCV-positive individuals were current injectors, bringing the prevalence rate up to 15% in that segment of the sample. In comparison, participants' self-reported rate of HIV testing – like their HIV-related knowledge – was markedly higher; only 10% (n=8) of the total sample and 10% (n=5) of current injectors reported never having been tested for HIV. No participants reported HIV-positive serostatus.

DISCUSSION

The present study is, to our knowledge, the first to collect systematic, structured data on drug use trajectories and infectious disease risk from a U.S.-based population of immigrant youth from the FSU. In light of the recent resurgence of heroin use and associated negative health consequences, including increasing rates of IDU, HCV and overdose, among young people in the U.S., these results contribute to a growing body of research characterizing this phenomenon by providing rich, quantitative and qualitative information about an often overlooked, yet significant, group of young opioid users in NYC.

In terms of demographics, the present sample is notable for its high proportion (74%) of males. Although the study's sampling design limits the generalizability of the results, this finding is consistent with earlier research on FSU immigrant drug users in NYC.³ While historically an over-representation of males has also been characteristic of young heroin-using populations, this demographic composition has shifted in recent decades such that nearly equal numbers of women are now seeking treatment for opioid use.¹⁹ Nevertheless, males continue to comprise about a 55–65% majority in research samples of prescription drug misusers^{17,18,41,42} and an even stronger majority (approximately 70%) in samples of

young PWID.^{43–45} Further research with larger samples is necessary to establish whether a more marked preponderance of males among opioid-using youth may be a distinctive attribute of FSU immigrants.

Significantly, the young adults in this study display an array of apparent protective factors that distinguish them from many other groups of young drug users and PWID,^{17,18,28,46} including a high level of education (which may reflect the value placed on educational achievement in FSU culture), close relationships with parents and other relatives, financial support from parents and stable housing with family members in relatively affluent households. Similar clusters of sociodemographic characteristics, which represent elements of social and material capital, have been documented in other communities of recent immigrants and found to exert a protective effect on the development of health-related risk behavior among youth.^{47–49} As such, these attributes may also serve as potential sources of resilience upon which culturally-tailored prevention interventions may fruitfully draw. A cultural factor that appears to play a countervailing role in shaping these youths' drug use, however, is the stigmatization of drug users which, as reported by participants in qualitative interviews, is pervasive within the FSU immigrant community; present evidence suggests that this stigma not only functions as a barrier to young people's use of drug-related services, but also, to the extent that it positions drug use as a taboo subject for open and frank discussion, may perpetuate a general ignorance about drugs and addiction common among both adults and youth in the FSU immigrant community.

With regard to participants' opioid use trajectories, the dominant pattern parallels nationwide trends: the majority of participants (who generally immigrated to the U.S. in early childhood and began using opioids in the past decade, during the height of this country's PO-misuse epidemic) initiated nonmedical PO use via oral or intranasal administration and later transitioned to the use of heroin, usually by injection. These FSU immigrants can thus be considered a subgroup of the larger cohort of predominantly white, middle-class, PO-initiated youth, with certain distinctive cultural attributes that help shape their drug use patterns. In spite of participants' material and social resources, as noted above, the lifetime prevalence of both heroin use (79%) and IDU (76%) was remarkably high. This is consistent with earlier research conducted with FSU immigrants in NYC,^{2,3} as well as with historical patterns of drug use in the Soviet Union and the FSU. It is therefore possible that the endurance of these patterns in a new generation of youth who remain closely connected to the FSU immigrant community reflects a long-standing cultural norm.

Although it has been suggested in the limited available literature that FSU immigrant youth in NYC may show evidence of accelerated opioid use trajectories, characterized by earlier initiation of heroin use and faster progression to IDU than comparable groups of native-born youth,³ present data do not support this hypothesis. Other recent studies of young people's opioid use pathways have reported varying mean ages at which participants initiated PO misuse (ranging from 15.3 to 17.9 years) and reached key transition points such as first use of heroin (ranging from 16.6 to 22.9 years) and first injection (ranging from 17.5 to 20.43 years).^{17,18,19,43} The FSU immigrants in the current study – who, on average, first used POs at age 17.75, followed by first heroin use at age 19.38 and first injection at age 19.3 – do not deviate from, but rather appear to exemplify these broader trends. This discrepancy with

prior research may reflect the maturation of the FSU immigrant community in NYC given that 15–20 years have now elapsed since the major wave of FSU immigration to the U.S. Participants in the present study represent a generation of youth who largely immigrated to U.S. as young children; accordingly, they have spent most of their lives in the U.S. and began using drugs in this country. Their opioid use patterns may therefore differ from those of the earlier generation of FSU immigrant opioid users who were the focus of prior research, many of whom immigrated to the U.S. in adulthood, and who may have been less acculturated to drug use patterns typical of young people in NYC.

Other noteworthy findings related to participants' patterns of opioid use include the presence within the study sample of a small but significant sub-group of very recently initiated injectors who had been injecting drugs for less than six months. Research studies have often been challenged to reach this segment of the young PWID population whose injection careers are just beginning to be established, yet they are a critical target for prevention interventions given evidence demonstrating their vulnerability to health-related harms such as HCV. Results also indicate that those participants who inject drugs are situated within sizable networks of PWID that include a significant proportion of fellow FSU immigrant youth; this finding is supported by the success of the study's peer-referral recruitment strategy and suggests that opioid-using FSU immigrant youth are a highly networked population.

Participants reported worrisome rates of injection risk behavior that place them at significant risk of infection with HCV (and, to a lesser extent, HIV), with one-third of current injectors reporting receptive syringe-sharing in the past 12 months and 40–46% reporting the sharing of secondary injection equipment. Again, these rates appear comparable to, and in the middle range of, those reported in the recent literature for other groups of young PWID which have found syringe-sharing rates ranging from 23%–49% and rates of secondary equipment sharing ranging from 35%–67%.^{28,41,44,46} In this literature, as in present sample, rates of secondary equipment sharing typically exceed rates of syringe-sharing, and cookers appear to be the most frequently shared piece of injection paraphernalia.^{28,41,44,46} Another concerning finding is participants' low rate of SEP utilization which appears to differentiate the present sample from many other groups of PWID, such as the street-based, often homeless youth who are the focus of much existing research on young injectors^{43,44}. For example, whereas 88% of young San Francisco PWID in the long-running UFO study reported using SEP services in the past month, only 40% of FSU injectors reported using an SEP in the past year, the same proportion as reported obtaining syringes from fellow injectors.⁵⁰ Although PWID in NYC have access to sterile syringes through the large number of ESAP-participating pharmacies located throughout the City, no prevention information or education is routinely provided along with syringes in these venues. Many young PWID in the sample studied were woefully uninformed about basic HCV transmission facts and safer injection practices.

Although most participants reported having been screened for HCV antibodies on at least one occasion, nearly one-quarter of current injectors indicated that they had never been tested for HCV. While this HCV screening rate is within the range of those reported by other samples of young PWID (e.g., 78–88%^{43,45}), it is cause for concern, particularly when

considered alongside participants' low level of knowledge about HCV transmission dynamics (especially with regard to the transmission risk associated with the sharing of secondary injection equipment), low level of concern regarding future exposure to HCV and significant rates of injection risk behavior.

Finally, present findings provide some indication that the prevalence of HCV may be significantly lower among opioid-using FSU immigrant young adults relative to other groups of PWID, including youth. Only 9% of the total sample and 15% of current injectors reported being HCV antibody-positive (with the important caveat that, since these rates are based on self-report, they are likely to be an underestimate). By way of comparison, a meta-analysis assessed the mean fitted HCV prevalence among PWID in developed countries post-1995 to be 32% after one year of IDU and 53% after 5 years of IDU.³³ Studies of specific groups of PWID in various U.S. cities (including both studies that relied on self-report and those that verified HCV status through serology) have found similar prevalence rates, ranging from 26% to 45%.^{43,45,50} Although an explanation for participants' unusually low HCV prevalence rate cannot be determined from the present study, it may relate to FSU youths' social network patterns. Study results suggest that membership in participants' injection networks is heavily in-group, such that they tend to inject most frequently with other young FSU immigrants. A relatively low degree of network-mixing with other groups of NYC PWID among whom HCV prevalence is higher would exert a protective influence on the risk of viral transmission as long as HCV prevalence within FSU injection networks remains low. While such a scenario would have a protective effect, it is not likely to endure. To the contrary, given the rates of injection risk behavior reported by participants, HCV is liable to spread rapidly in networks of young FSU immigrant injectors once introduced. Participants' low self-reported HCV prevalence also contrasts with the results of the community screening study cited in the Introduction which found a high background HCV prevalence of 28.3% in a sample of middle-aged FSU immigrants; these divergent findings may reflect a generational difference in HCV prevalence rates within the FSU immigrant community whereby HCV is concentrated in older generations, many of whom acquired HCV in the Soviet Union or FSU pre-immigration, often through exposure in health-care settings.¹¹

Limitations

Given the study's non-probability sampling method and modest sample size, the findings presented above must be interpreted with caution and cannot be considered representative of the larger population of young, opioid-using FSU immigrants in NYC. Nevertheless, efforts were made to recruit a diverse sample of FSU immigrant youth with different ages, countries of origin within the FSU, modalities of drug treatment and other characteristics. In addition, the study's mixed-methods research design allowed for the triangulation of findings between the quantitative and qualitative datasets which served as a validity check on both forms of data and increases confidence in the validity of the results.

Other limitations relate to the measurement of behavioral and epidemiological variables. All variables were assessed by self-report in interviewer-administered interviews and are thus subject to the usual limitations of memory and social desirability bias. Retrospective data on

participants' initiation of opioid use and evolving opioid use trajectories may be particularly limited by recall error. Self-report data regarding HCV testing history and HCV serostatus may also be limited by participants' lack of awareness of the specific tests that were conducted during medical visits for HIV testing. A few participants commented that, while they assumed an HCV test had been conducted in conjunction with a known HIV test, they did not actually receive confirmation of this HCV test or its results. In these cases, the participant's HCV test result was coded as "unknown", but it is possible that other participants made similar assumptions but simply declined to mention it during their assessments. Results regarding HCV and HIV prevalence are also limited by the possibility of outdated test results. A final measurement-related limitation is the lack of quantitative data assessing participants' HCV-related knowledge. Because the sample's limited knowledge of HCV transmission dynamics was unanticipated at the start of the study, a standardized test of HCV knowledge was not included within the battery of structured assessments; as a result, we were unable to precisely measure this construct in a way that would allow for comparisons with other groups of young PWID.

Implications for Prevention Efforts

These findings demonstrate the urgent need for a range of effective prevention and harm reduction interventions to be developed and delivered to FSU immigrant youth, from interventions to prevent initiation of nonmedical PO use, escalation of opioid use and transition to riskier forms of use, to HCV/HIV prevention interventions for youth who inject drugs. More specifically, results showed that participants' opioid use tends to progress rapidly through a series of predictable stages. This underscores the importance of reaching youth early in their drug use careers, as well as the need for prevention interventions tailored to an individual's current stage of drug use. For example, content can be targeted to youth who have recently transitioned to injection to train them in safer injection techniques necessary to avoid HCV infection and to youth who are at risk of transitioning to injection, such as intranasal heroin users and daily opioid users, to prevent them from transitioning to injection. Indeed, the willingness of a number of very recently initiated young injectors to participate in this research supports the feasibility of such trajectory-targeted efforts.

Because results suggest that HCV prevalence remains fairly low among young FSU immigrant injectors relative to other groups of young PWID, the opportunity to avert a major outbreak of HCV within this population likely exists, provided effective, comprehensive prevention strategies are rapidly implemented. Evidence from other groups of young PWID showing that HCV incidence increases rapidly after initiation of IDU strongly suggests, however, that this window of opportunity is limited in duration.^{32,33} An effective HCV intervention strategy for injection drug-using FSU immigrant youth, as for young injectors in general, would include the following key elements: education about transmission risks; widespread and frequent HCV antibody screening; a strong behavioral risk-reduction component; structural interventions to expand access to sterile injection equipment and MAT; and treatment component for youth who are HCV-positive (which may also serve as treatment-as-prevention). Additional intervention approaches, culturally-tailored for FSU immigrant youth, which are suggested by the present findings include: community-level education about drug use to help address the intense drug-related stigma

that appears to be widespread within the FSU community; and, given the centrality of peer networks in the development of youths' opioid use trajectories, programs to implement peer-delivered outreach and harm reduction education including peer-delivered syringe exchange.

Conclusions

The findings presented above provide an ethnographically-informed and clinically meaningful portrait of drug use and injection risk patterns in the understudied population of young adult immigrants from the FSU who use opioids. This study contributes to our growing knowledge about the recent epidemic of PO use among young people in the U.S. and emerging evidence that substantial numbers of youth who engaged in early nonmedical use of POs are now developing long-term opioid dependence and transitioning to heroin use and IDU. It also serves as a reminder of the importance of considering intra-group variation in efforts to characterize and intervene with the new population of young opioid users. Although this new cohort of youth share several common demographic features, such as Caucasian race and middle-class socioeconomic status,¹⁹ it is not monolithic, but includes many sub-populations with distinctive social and cultural attributes. In order to be maximally effective, credible and acceptable, prevention efforts will need to understand these differences to craft intervention approaches that are sensitive to each group's particular lived realities.

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Table 1**Participant Sociodemographic Characteristics**

Characteristic (n=80)	
Age (M, Range, SD)	23.34, 18–29, 3.45
Gender % (n)	
Male	74 (59)
Country of Birth % (n)	
Ukraine	48 ⁺ (38)
Russia	19 (15)
U.S.	10 (8)
Uzbekistan	10 (8)
Belarus	6 (5)
Latvia	4 (3)
Other FSU country	4 (3)
Age at Immigration (M, Range, SD)	
(arrived in U.S.)	6.55, 0–16, 4.15
Marital Status % (n)	
Single/Never married	84 (67)
Religious Affiliation % (n)	
Russian Orthodox	28 (22)
Jewish	25 (20)
Other	6 (5)
None	41 (33)
Living Situation % (n)	
With parents &/or other family	70 (56)
With spouse/partner	14 (11)
With friends/roommates	6 (5)
Alone	6 (5)
Drug treatment facility	4 (3)
Highest Level of Education % (n)	
Did not complete high school	13 (10)
High school graduate/GED	33 (26)
Some college	48 (38)
College graduate or higher	8 (6)
Employment Status % (n)	
Employed (F/T or P/T)	45 (36)
Primary Source of Support	
Parents or other family	61 (49)
Employment (your own)	26 (21)
Public assistance/SSI	4 (3)
Illegal activities	6 (5)
Other	3 (2)

⁺ Percentages may total >100 due to rounding.

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Table 2**Participants' Opioid Use Characteristics**

Characteristic (n=80; 40 in drug treatment, 40 not in drug treatment)	
Age at 1 st Opioid Use (M, Range, SD)	17.75, 12–27, 3.33
First opioid used % (n)	
Heroin	15 ⁺ (12)
Rx opioid	85 (68)
Oxycodone (immediate-release)	55 (44)
OxyContin	14 (11)
Hydrocodone	11 (9)
Other Rx opioid	5 (4)
ROA at 1 st Opioid Use % (n)	
Oral	56 (45)
Intranasal	34 (27)
Smoking	6 (5)
Injection	3 (2)
Transdermal	1 (1)
Age at 1 st Regular Opioid Use (M, Range, SD)	18.96, 12–28, 3.18
Ever Used Heroin % (n)	79 (63)
Age at 1 st Heroin Use (M, Range, SD)	19.38, 12–28, 3.18
Primary Opioid (Current) % (n)	
Heroin	53 (42)
Methadone	4 (3)
Buprenorphine	3 (2)
Other Rx opioid	15 (12)
Not currently using (in drug treatment)	26 (21)
Ever Injected % (n)	76 (61)
Age at 1 st Injection (M, Range, SD)	20.43, 13–27, 3.25
Duration Regular Injection (months) (M, Range, SD)	26.33, .5–120, 29.62
Primary ROA (Current) % (n)	
Oral	13 (10)
Intranasal	18 (14)
Smoking	8 (6)
Injection	36 (29)
Not currently using (in drug treatment)	26 (21)

⁺ Percentages may not add up to 100 due to rounding

Table 3

Past 12 Months Syringe Sources, Injection-related Risk Behavior and Level of Concern about HCV

Behavior (n=48 Participants Reporting Past 12 Months IDU)	
Syringe Sources % (n)	
Pharmacy/drugstore	73 (35) ⁺
Friend, relative or sex partner	40 (19)
Syringe exchange program	40 (19)
Number of People Shared Syringes with (Receptive Sharing) % (n)	
0	67 (32)
1	27 (13)
2	6 (3)
Number of People Shared Other Injection Equipment with (Receptive Sharing) % (n)	
0	54* (26)
1	27 (13)
2	8 (4)
3 or more	10 (5)
Frequency of Receptive Syringe Sharing % (n)	
Never	67 (32)
Rarely	27 (13)
About half the time	4 (2)
Most of the time	2 (1)
Always	0
Frequency of Receptive Sharing of Cookers % (n)	
Never	58 (28)
Rarely	21 (10)
About half the time	15 (7)
Most of the time	4 (2)
Always	2 (1)
Frequency of Receptive Sharing of Cottons % (n)	
Never	69 (33)
Rarely	19 (9)
About half the time	6 (3)
Most of the time	4 (2)
Always	2 (1)
Frequency of Receptive Sharing of Water or Water Containers % (n)	
Never	60 (29)
Rarely	21 (10)
About half the time	10 (5)
Most of the time	4 (2)
Always	4 (2)
Level of Concern about Future Exposure to HCV % (n)	
Not at all worried	40 (19)

Behavior (n=48 Participants Reporting Past 12 Months IDU)	
Slightly worried	29 (14)
Moderately worried	6 (3)
Considerably worried	8 (4)
Extremely worried	15 (7)

⁺ For this item only, numbers total >48 because multiple responses were allowed.

^{*} Percentages may be <100 or due to rounding.