The Social Course of Drug Injection and Sexual Activity Among YMSM and Other High-Risk Youth: An Agenda for Future Research

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ABSTRACT *The cumulative epidemiologic literature indicates that many injecting drug users (IDUs) initiate injection as a mode of drug administration during late adolescence or early adulthood. Recent studies have shown that IDUs are often exposed to viral infections relatively early in the course of injection, highlighting the importance of understanding this initiation process for both epidemiology and prevention. Epidemiologic evidence similarly suggests that at least some youth populations, most notably young men who have sex with men (YMSM), are at substantial risk for exposure to HIV and other sexually transmitted diseases (STDs) from early sexual activity. Despite the importance of this issue for both epidemiology and prevention, however, surprisingly little information is available on the social course of injection initiation, including the individual, social, or ecological factors that might mitigate or exacerbate transmission risks within the critical phase of early injection drug use. Similarly, we know little about the ways that YMSM and other high-risk youth understand risk, the kinds of exchanges and relationships in which they participate in the context of initiating sexual activity, or how drug use is operant in these exchanges and early sexual experiences. In this article, we explore key dimensions of the early initiation of injection and sexual risk, and discuss how a social network approach might be instrumental in understanding the social course of drug injection and sexual activities among youth and young adult populations.*

KEYWORDS *High risk youth, IDUs, Sexual risks and injection initiation, YMSM, HIV infection, Social and sexual networks, Social course of drug injection.*

INTRODUCTION

Viral infections most commonly transmitted in the course of injecting drug use include human immunodeficiency virus type 1 (HIV-1), hepatitis B (HBV), and hepatitis C (HCV).¹ Since the HIV epidemic began, high-risk drug injection practices have directly or indirectly accounted for more than one third of AIDS cases in the United States and are among the leading risk factors associated with new infections.^{2,3} HBV, another viral pathogen prevalent among injecting drug users (IDUs), may be transmitted through sharing of injection paraphernalia as well as through sexual contact with an infected partner, and is nearly endemic in some IDU popula-

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tions in the United States, particularly in older IDUs. HCV is also transmissible by blood and is one of the most common chronic blood-borne infections in the United States, with an estimated 25,000 new infections in 2001 (compared to a peak of 291,000 new infections diagnosed in 1989), and is a major cause of liver disease.⁴⁻⁶ Transmission of these types of viral pathogens among IDUs is associated with reuse and sharing of syringes and multiperson use of drug preparation paraphernalia such as cookers and rinse water.^{7,8}

Clearly, initiation of drug-injecting practices among youth and young adult populations is a significant issue for public health and for public health research. Since drug injecting is subject to social stigma and in some contexts to legal sanction, youth and young adults who inject drugs are often difficult to identify, recruit, and engage in research studies. New methods are needed to reach injectors and understand injection practices in their natural settings, including physical environments and social groups. Currently, much of the available epidemiologic information on drug injection among youth and young adult populations comes from treatment samples and cross-sectional designs. As a result, the data lack the kind of temporal depth that can only be derived from longitudinal methodologies, which limits our ability to understand the complex interactions among social, behavioral, and environmental processes. By following new injectors prospectively, it may be possible to document the evolution of these processes and to situate them within the context of life course challenges that may be critical to formulating prevention and treatment strategies.

The objective of this article is to identify key issues related to the onset and initiation of injecting drug use and sexual risk behaviors among youth and young adults, and to suggest directions and approaches for addressing existing gaps. We begin by reviewing recent epidemiologic evidence on increases in the use of various kinds of illegal drugs among youth and young adult populations, including heroin, crack cocaine, and a class of so-called club drugs, and trends in the use of injection as a mode of administration of these drugs. We then review evidence on the interaction between drugs and sexual risk among youth and young adults, highlighting research on young men who have sex with men (YMSM) to illustrate the types of epidemiologic complexity that must be anticipated in future intervention research. Finally, we review developments in social network analysis that hold promise for contributing to future epidemiologic research on injection and sexually mediated risk among youth and young adult populations, and to improvements in HIV prevention interventions.

INITIATION OF INJECTION RISK AMONG YOUTH AND YOUNG ADULTS

Injecting drug use accounts for a substantial portion of poor health outcomes among youth and young adults, including new HIV and other blood-borne infections. Heroin use has risen dramatically in the United States over the last decade and is now the primary drug treatment problem in several major cities.⁹ This phenomenon has been particularly pronounced among young adults.¹⁰ Indeed, some studies have suggested that heroin is more likely to be the first drug injected among new injectors.^{11,12} One recent study indicates first use of heroin to occur at mean ages between 17 and 19 years.¹³

Recent increases in the supply of heroin entering the United States have been noted.⁹ At the same time, the purity of heroin available in certain regions of the

country has increased and the price per unit has decreased, thus making heroin use potentially more appealing and affordable to young people. In parallel with increased drug purity have been increases in the numbers of drug overdoses associated with heroin, as well as in the number of other community-level indicators that suggest younger heroin users are transitioning from sniffing to injection.¹⁴ Although some have suggested that increased drug purity has driven new heroin users to sniff rather than inject, other considerations suggest a more complex picture. High-quality heroin powder is not uniformly available across the United States.¹⁴ Given that the type of heroin typically sold in the United States volatilizes poorly, injection represents a more efficient and economical use of the drug than smoking or sniffing.^{15,16} In addition, there have been notable demographic changes in who is initiating heroin use. While much of the heroin use over the last three decades was concentrated among low-income African American and Latino males living in urban centers, recent trends suggest that new heroin users include working- and middle-class young white men and women.^{17,18}

Injection as a mode of administration among young drug users is not limited to heroin. In the mid-1990s, a number of reports noted the emergent use of crack cocaine by injection, with the first published report of crack injection appearing in the United States in 1996.¹⁹ Subsequently, crack injection has been reported in diverse US cities and subpopulations as well as in drug-using populations outside the United States, especially among younger age cohorts.^{20,21} The resurgence of methamphetamine (speed) use across the United States^{22,23} as well as internationally may have implications for recent trends in new HIV infections, particularly among YMSM.^{22,24} Comparatively little is known about the use of speed and, indeed, the broad class of “club drugs” that have become especially prevalent in some youth venues. Available data indicate that injection of one of the most popular of these club drugs, ketamine, is increasingly prevalent among various high-risk youth populations.²⁵

New injectors often have limited control over the street economy in which illegal drugs are purchased, and much less control over the process of drug division and drug sharing. Moreover, even if new injectors have sufficient economic resources to purchase drugs, they may lack the information and skills needed for accessing them and may instead seek drugs from high-risk settings and groups with experienced injectors. New injectors may often find themselves last in line in the drug division and injection process, and end up sharing the drug solution from cookers or syringes that may have already been used by earlier injectors. Risk for potential contamination of the injection paraphernalia increases with each participant who has used it, and those at the end of the sharing sequence bear a disproportionately high cumulative risk. New injectors, women, YMSM, and members of other socially or economically marginalized groups are likely to occupy subordinate positions in the drug acquisition, preparation, and division process, and may remain in subordinate roles for an extended period of time.

The preparation and injection of drug solutions is a complex process, one that varies for different types of drugs and in relation to the injection setting. The process of preparing the drug requires greater technical knowledge and skill than is perhaps apparent in the epidemiologic literature. Novice injectors do not easily master this process on their own, and are likely to depend on more experienced (and often older) injectors during their initial drug injection events. These more experienced injectors are likely to control the preparation and injection of drug

solutions and hence control the distribution of risk for potential transmission of HIV and other blood-borne pathogens.

In summary, injection as a mode of drug administration is becoming increasingly prevalent among youth and young adults, a fact that portends continuing spread of viral infections and their medical consequences in IDU populations. Yet, in some respects, rapid seroconversions among young IDU populations, notably of HCV infection, are somewhat counterintuitive. Increases in these infections would ordinarily follow an age gradient, with increased likelihood following the rising slope of person-years at risk. Instead, evidence suggests substantial levels of early exposure and rapid seroconversion among youth and young adults who have recently initiated injection. In other words, injection initiation itself—compared to risks associated with a long drug injection career—seems to present an important “new” risk for rapid seroconversion.

EPIDEMIOLOGY OF DRUG AND SEXUAL RISK AMONG YMSM

In New York City, with its large and fluid drug markets, there may be significant mixing of age (and other) characteristics among IDU groups, influencing younger injectors' risk for HIV exposure from older drug and sex cohorts that typically have higher levels of seroprevalence. Age discrepancies are not uncommon in cases of injection initiation, where the person guiding the new injector through the injection process is often older. Injecting drugs or having sex with older partners has been implicated in greater risk for HIV and HCV seroconversion,^{26,27} which highlights injection initiation and sexual partner selection as major components of risk among young IDUs. Understanding the nature and degree of interaction between new injectors, who are likely to be HIV and HCV negative, and older injectors, who are likely to have much higher rates of HIV and HCV seroprevalence, is crucial to our understanding of the spread of blood-borne pathogens in new injector populations. The same is true for understanding sexual relationships of young injectors, especially as these relationships may ultimately serve as bridges for transmission to noninjecting populations.

Although great strides have been made in reducing risk among adult MSM, recent research indicates that the spread of HIV and other STDs continues at an alarming rate among YMSM cohorts. In the early 1990s, studies of gay-identified YMSM found disturbing levels of seroprevalence, especially in view of the relative youth of the samples. For example, in San Francisco, a seroprevalence rate of 5% was identified among YMSM ages 18 to 23 years; in New York City, a seroprevalence rate of 9% was identified among YMSM ages 18 to 24.²⁸⁻³¹ These trends have become even more pronounced in the last several years. Recent data indicate that over half of YMSM sampled report engaging in unprotected anal intercourse,³² and urban MSM populations report high rates of alcohol and recreational drug use, including stimulant use.³³ HIV prevalence rates vary extensively, with the highest prevalence rates observed among stigmatized populations—African Americans, injection drug users, heavy noninjection drug users, and low-socioeconomic status MSM.³⁴ In New York City, HIV seroprevalence was 18% among African Americans, 16.7% among persons of mixed race, 8.8% among Latinos, and 3.1% among white men.³⁰

These findings suggest that prevention efforts targeted to YMSM are ineffec-

tive. We may not as yet understand these populations well enough to know how to design effective new approaches. Up to now, the study of drugs–sex connections among MSM drug users has been largely confined to the demonstration that sexual orientation is related to serostatus among male IDUs.³⁵ Studies are needed that approach both sexual and drug-related risk with equal emphasis, and within the same general framework. Moreover, data about the YMSM population itself are limited, including the kinds of drugs they use and how they use them, the kinds of sexual behaviors in which they engage or with whom, or the interaction between drug and sexual risk in the early social course of identity and relationship formation.

There are a number of reasons to investigate the relationships of sex and drugs among YMSM separately from the existing studies of drugs and sex among gay men. The life-course perspective³⁶ provides an analytic framework that posits, among other things, that many practices are subject to socially constructed expectations related to age. Little is understood about how sexual practices and drug use are informed by age-related contexts. However, even more complex may be the differences in the interaction between YMSM drug use and sexual practices across the life course. Youth and late adolescence as a life stage are generally characterized by uncertainty and experimentation in many spheres, including sexual and drug behavior. Adolescence and youth are times of relatively high levels of sexual activity and experimentation, as well as of the evolution of a stable sexual orientation and identity. YMSM today are distinctive in that they have reached sexual maturity during a period when the HIV epidemic has reshaped the risk equation in sexual decision making, heightening the risk associated with sexual experimentation and at the same time increasing the stigma associated with illicit sexual practices.

Research is needed to understand how these factors and contexts influence YMSM drug use and sexual practices over the life course. Some studies have found high levels of sexual activity and risk behavior among YMSM.^{28,37} However, the samples are often recruited from specifically gay-oriented settings, which may not represent the full spectrum of YMSM. This limitation of YMSM sampling has significance for both epidemiology and prevention, as it suggests that some potentially critical subpopulations of YMSM may be missed in samples recruited through gay-identified sources.²¹ Even the San Francisco Young Men's Study,²⁸ which used a behavioral sampling technique and sampled for young men ages 18 to 29, conducted recruitment in heavily gay-identified neighborhoods. This is a serious limitation of other studies as well.³⁸ Moreover, it is not clear how much younger MSM, who have not experienced the losses of earlier cohorts, see the epidemic and the question of prevention as relevant to them. Such considerations underscore the importance of examining the range of different YMSM subpopulations with regard to behavior, sexual networks, concepts and perceptions of sexual risk, and knowledge and access to HIV services.

DYADIC CONTEXTS: PARTNERING PRACTICES AND PARTNER CHARACTERISTICS

Much of the available data on sexual risk behavior is derived from survey research on individuals' practices. However, partnerships are the natural unit of analysis for sexual behavior, as both members of the pair contribute (perhaps differentially) to the outcome.³⁹ The composition of the sexual and/or drug partnerships of YMSM is important because partner type is related to risk behavior. A growing body of

research has demonstrated the association of partner or relationship type with risk behavior. These associations have been found in both sexual and drug risk. Among adult IDUs, for example, condom use is far more common among casual than regular partners.³⁹ Accumulating research among both older and younger gay men shows that unprotected anal sex is far more likely among regular or close partners, regardless of serostatus.^{28,40–45} Sexual partnering is an epidemiologic as well as social phenomenon, as it represents the mechanism by which infections make their way across sexual and social networks and age cohorts.⁴⁶ Partner type is also relevant to YMSM because types of partnerships change by age.^{39,47} Younger men tend to be less involved in regular partnerships, although many YMSM in our prior research expressed a desire for a regular partner. Partner type is also potentially related to seroincidence. HIV infection risk is a function of transmission-related behavior (activities that influence the probability of transmission) and of the presence of infection in the environment (which dictates whether there is any infection to be transmitted). Particularly in a high-prevalence city such as New York, the age of YMSM's partners could have major influences on YMSM's exposure to HIV transmission from older cohorts with higher seroprevalence. Some studies of YMSM have shown that nearly two thirds of their sexual partners are older,⁴⁸ which highlights the importance of examining partner characteristics and partner selection processes as major components of sexual and drug risk.

A sexual encounter may be conceptualized as involving at least three elements—two people plus the relationship between them. Part of the outcome is based on the resources and constraints each person brings to the encounter. This general perspective can be applied to any sexual exchange or partnering,⁴⁷ such as linking transactions (for example sex) between two people to the transactions both have separately with some domain (for example, institutions, economic resources, or practices such as injection drug use) outside the relationship.⁴⁹ This leads to the question of sexual networks—how people are partnered, how sexual roles and expectations are established (i.e., what are the consequences for scripts and choices), and what the consequences are for discrete patterns of HIV risk. A recent study of YMSM aged 15 to 25 years found that drug and alcohol use are associated with unprotected receptive anal intercourse with nonmain partners.⁵⁰ Negotiating safer sex is partly an individual skill, but it is always done within some kind of relationship. Even if the relationship is with a relatively unknown partner, the form that sexual practices will take will be influenced by the expectations that each partner brings to the encounter, including the relative amounts of power that each brings to bear in fulfilling his or her own expectations of the encounter. Specifically, how do the partner and the partnering process affect the ability to negotiate safer sex? These questions are especially important, given that young men have been shown to engage in unprotected anal sex at rates comparable with those of adult men.⁵¹ As noted, the question of relative age is of considerable importance, particularly among YMSM. Given that YMSM are likely to be partnered with someone the same age or older, their partners may have an advantage in resources—experience, money, the veneer of age-related authority—and thus of greater ability to influence the relationship and the specific behaviors within it.

We have alluded to the importance of partner type as a determinant of practice. However, sexual activity itself may be related to either injection or sexual transmission. Studies that have analyzed diaries of sexual episodes of gay men, for example, have found that there were characteristic sequences of activity, and that sexual acts are conditioned by the nature of the relationship.⁵² To summarize, then, the

importance of the issue of partner seeking and partner selection is that of an environmental influence: the outcome determines potential exposure to risk and infection, by virtue of partner type and possibly by the influences of partner type on actual sexual practice.

INTERACTION OF SEXUAL RISK AND DRUG USE-RELATED RISK

Youth and adolescence are prime periods for experimentation with drugs, alcohol, and sex. A number of studies have identified associations between drug use and unsafe sex among MSM.⁵³ Unfortunately, the relationship of drugs to unsafe sex is beset with conceptual confusion. Several studies have found associations between histories of unsafe sex and histories of drug and/or alcohol abuse. Some studies have done this at the level of the individual event, others by stressing associations of drug use with unsafe sex over some period. Ostrow and McKirnan⁵³ have categorized possible reasons for the apparent relationships of drug use and sexual behavior found in many studies among MSM, including: (1) direct pharmacologic effects (such as physical effects, disinhibition); (2) simple association or co-occurrence (presence of drugs and risk takers in the same environment, thus yielding an apparent correlation); (3) social learning (learned associations of drugs with pleasurable activities); and (4) coping mechanism (to dampen stress or anxiety). Most research has examined simple associations, in a limited range of samples, and most attention has been directed to the role of drugs in actual sexual risk behavior or practice.

A neglected area is the roles of drugs in partner selection and settings where sex is either carried out or arranged, as well as in the use of drugs as a resource in sexual partnering or exchange. Moreover, few studies have attempted to differentiate the function, effects, and interrelationships between different types of drugs, but in fact these are critical questions. Studies have indicated a number of reasons for drug use, often linked to type of drug, which may in turn have consequences for the role of drugs in sexual activity. Some reasons are social: drugs may serve as a means to acceptance among certain peer groups among youth.⁵⁴ Some reasons are practical: our studies among IDUs and homeless youth have observed the frequent use of cocaine among sex workers to stay awake and alert, for safety, and for enhancing attractiveness to potential customers.⁵⁵

Many studies²¹ have shown the association of drug abuse with unsafe sexual practice. However, these studies are subject to several limitations in terms of their generalizability to other samples and utility for prevention. We know relatively little about the interactions of sex and drugs in relation to sexual risk among MSM generally, and almost nothing about this relationship among YMSM. Even among older MSM, available data focuses on the co-occurrence of drugs and unprotected sex in the risk practices of an individual, rather than including ways in which drugs and sex may be intertwined in partner seeking and selection, as well as in strategies for retaining partners over the long term. Moreover, risks apparently related to drugs may actually be attributable to the ways drugs are embedded in different kinds of relationships. Morris et al.,³⁹ for example, found that use of alcohol proximate to sexual activity lowered the probability of condom use, but did so to different degrees with casual versus regular partners, suggesting that the role of alcohol is more complex than that of a simple physiologic disinhibitor. These findings point to the importance of examining the way drugs may be implicated in risk, not solely

at the point of sexual contact itself, but also in the ways that partnering is sought, selected, arranged, and maintained.

While studies of MSM sexual risk rarely differentiate different types of drugs or the ways in which drugs and sex are intertwined, studies of drug users pay almost no attention to sexual orientation, and most simply describe associations between use of drugs (frequently of unspecified type) and risk practices. However, drugs can be implicated in major aspects of the sexual transaction in several ways: (1) the partnering process, (2) relationship exchange and negotiation, and (3) actual sexual activity and practices. The effects of drugs themselves can also usefully be broken down into (1) the specific drug and its pharmacologic effects; (2) the user's expectations—and thus motivations—about using it; and (3) the social and physical context in which it is used. The intersection of these frameworks suggests a number of lines of inquiry, such as how the pharmacologic effects of a particular drug are linked to sexual practices and risk behavior, how motivations for use are part of the partnering process, or how the characteristics of other drug users influence sexual exchange and practice.

In summary, the available research on drugs and sexual risk among MSM, especially YMSM, has pointed to a number of new and important questions. First, what are the major subpopulations of YMSM, and how are they distinctive with regard to partner type, partner negotiation, and sexual risk practice? Second, what drugs are used by which subpopulations, for what purposes, and to what effect? Third, what is the nature of the relationship between sexual risk and drugs today, in the third decade of HIV/AIDS, and in the spheres of partner selection, partner negotiation, and sexual activity itself?

SOCIAL NETWORKS OF NEW INJECTION DRUG USERS

As a communicable disease, HIV is spread through person-to-person contact, often through direct blood-to-blood or sexual contact, although also through indirect person-to-person contact (e.g., blood transfusions).^{56–58} Thus, the spread of HIV is largely shaped by the social organization of contact between infectious and susceptible individuals. Network analysis, which studies the forms, structures, and dynamics of social contact among populations and groups, is thus an especially appropriate methodology to study how HIV, and related infectious diseases such as HBV and HCV, are spread among drug users and their sexual partners, as well as other susceptible populations. Moreover, when the prevalence of infection in a population is low and the paths of transmission and spread are selective, such as among new IDUs, network analysis can be used to identify the social connections through which infectious pathogens are transmitted and spread. Since social networks also include interactions among network members that can involve the communication of values, beliefs, norms, and practices, network analysis can be used to identify social network factors, such as a high degree of social interaction (social cohesion) among network members, that shape drug use and sexual risk and protective behaviors. In addition, network analysis includes identifying social and sexual contacts of individuals through their linkages with one another. It is especially useful for identifying and recruiting hidden populations (populations that are elusive and difficult to identify, often because they are stigmatized and engage in illegal and sensitive activities). Since new IDUs can be very hidden, network analysis can be used in sampling this population for research studies, as well as for identifying and intervening with new IDUs to prevent infections.

Future research on high-risk youth needs to consider the clustering of risks in the years initially following injection initiation. Studies have shown that IDUs are at risk of becoming infected with HIV, HCV, and HBV within the first few years after they start to inject.^{59–63} Most studies of infection risk for these viruses among new IDUs have focused on their injecting risk behaviors.^{59,64} However, the prevalence of HIV infection among new injectors has remained substantially lower than among longer term injectors.^{60,61,65,66} In addition, while many new injectors engage in injecting (and sexual) risk behaviors, not all become infected. Even in the case of HCV, where transmission can be rapid, many remain uninfected for months or years after initiating injecting.

Variation in the risk of infection with these viruses among new IDUs may be linked to variation in the probability of exposure, which is likely to be a function of the background prevalence of these pathogens among new IDUs and their injecting and sexual partners, and in the composition, structure, and dynamics of the injecting and sexual contact patterns through which these pathogens are transmitted.^{58,67–71} Thus, new IDUs may be at increased risk of infection if the people with whom they use drugs or have sex, that is, their drug and sex risk networks, are at high risk.^{59–61,63} Among new IDUs, the risk of infection may be higher in egocentric risk networks (which include an index individual with other individuals) that are characterized by disassortative mixing patterns (i.e., relationships involving like with unlike, such as between younger, new IDUs and older, longer term IDUs). Disassortative mixing patterns are associated with bridge relationships, that is, relationships that span populations with different characteristics that are epidemiologically relevant, such as populations with high and low HIV prevalence.

Changes in network characteristics can be as important as changes in risk behavior in affecting the course of the HIV epidemic among drug users, as well as the course of other epidemics of communicable diseases, such as HBV and HCV. Stable networks, at least in terms of the actual membership, cannot be assumed to be the norm. Low stability in egocentric IDU networks may be linked to an increased risk for becoming infected with HIV, as was suggested by research conducted among IDUs in New York City, Washington, DC, and Chicago.^{72,73} In addition to the role of new IDU risk networks in structuring their risk of viral exposure, the individuals with whom new IDUs have close social contact may influence their risk and preventive behaviors. Risk behaviors, such as receptive syringe sharing,^{72,74,75} and protective behaviors, such as consistent condom use,⁷⁶ have both been shown to be associated with the character of relationships between two people. Injectors with a high proportion of non-IDUs in their egocentric networks have been found to engage in less injection risk behavior,⁵⁶ while networks with overlap between kin and injecting risk network members may be associated with high levels of needle risk.⁷⁷

Conclusion

This article has reviewed recent evidence on the use of injection as a mode of drug administration among youth and young adult populations, highlighting how the early course of drug injection may convey particular vulnerability for exposure to viral pathogens prevalent in IDU populations, including HIV infection. While evidence suggests that this period represents high risk, there is surprisingly little information about the nature of the process itself. We suggest that additional research on the early course of drug injection is critical in the identification of emerging trends in the epidemiology of HIV, HBV, and HCV infection in youth and young adult populations as well as in the formulation of effective prevention and educa-

tion programs. Social networks are particularly relevant for studying infectious disease epidemiology among new IDUs and YMSM.

Like YMSM, most new IDUs are young. They are initiated into sexual risk and injecting drug use behaviors by individuals who are socially influential in shaping behavioral and attitudinal norms that influence risk behaviors and practices. A better understanding of young drug users and YMSM will help to identify opportunities for interventions to reduce risk behaviors and prevent the spread of new infections. For example, research has shown that drug users and their networks are heterogeneous in a number of ways, but few studies have been conducted to understand how networks may differ by sexual orientation. Network factors, such as turnover and the existence of “core groups,” can provide a useful basis for understanding the potential for sudden outbreaks of STDs among YMSM. In addition, many new IDUs are geographically and socially mobile. Research on new IDUs’ networks should examine the extent to which risk and social network change is associated with changes in the rates of infection and in risk behaviors, as well as with the factors that give rise to network change.

The relationship of ecological structures to network and behavioral risks is an important emerging area of research. One aspect of this research is to examine the influence of neighborhood characteristics, including both the physical and social environment, on infection risk,⁷⁸ as well as the structural context, that is, the social, economic, and political environment that may influence health outcomes at both the individual level and the community and societal levels.⁷⁹ For example, in Eastern and Central Europe, dramatic social change and instability may have influenced risk behaviors as well as social mixing patterns associated with the rapid spread of HIV among young new IDUs since the late 1980s.⁸⁰ Greater understanding of the impact of macroecological factors on network and behavioral risk among new IDUs may help to inform interventions addressing the effects of structural changes on infection risk among drug users.

We emphasize the need for a synthetic, ethnoepidemiologic approach in future research on new injectors and YMSM. Specifically, research that combines an ethnographic interest in partner selection practices and the interaction of sexual behavior and drug use with a social network approach to documenting new IDU networks has the potential to map the social course of HIV-related risk behaviors among YMSM. Despite its importance for epidemiology and prevention, however, there remains surprisingly little detailed information about what we might call the social course of initiation into injection drug use. Future work focused on YMSM who are themselves new injectors will help identify themes that interact across currently discrete literatures on sexual risk and risks associated with injection drug use. The interplay of stability and change—for example, stability and fluidity of sexual identity and stability and flux of IDU networks—remains to be explored in relation to risk and protective practices among YMSM. Ethnoepidemiologic and mixed-methods approaches will help to inform our understanding of the network characteristics and dynamics of YMSM, the influence of ecological factors on the formation of new YMSM networks, and the best strategies for improving HIV prevention interventions for high-risk youth and young adult populations.

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