

The Social Geography of AIDS and Hepatitis Risk: Qualitative Approaches for Assessing Local Differences in Sterile-Syringe Access Among Injection Drug Users

ABSTRACT

While significant gains have been achieved in understanding and reducing AIDS and hepatitis risks among injection drug users (IDUs), it is necessary to move beyond individual-level characteristics to gain a fuller understanding of the impact of social context on risk.

In this study, 6 qualitative methods were used in combination with more traditional epidemiologic survey approaches and laboratory bioassay procedures to examine neighborhood differences in access to sterile syringes among IDUs in 3 northeastern cities. These methods consisted of (1) neighborhood-based IDU focus groups to construct social maps of local equipment acquisition and drug use sites; (2) ethnographic descriptions of target neighborhoods; (3) IDU diary keeping on drug use and injection equipment acquisition; (4) ethnographic day visits with IDUs in natural settings; (5) interviews with IDUs about syringe acquisition and collection of syringes for laboratory analysis; and (6) focused field observation and processual interviewing during drug injection.

Preliminary findings from each of these methods are reported to illustrate the methods' value in elucidating the impact of local and regional social factors on sterile syringe access. (*Am J Public Health*. 2000;90:1049–1056)

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The AIDS pandemic has been described as a set of overlapping local epidemics, each with its own configuration of risk factors, at-risk populations, incidence, and prevalence.¹ While most HIV/AIDS cases around the world are the result of sexual transmission, in several areas, such as the northeastern region of the United States, the majority of people who have been infected with HIV are injection drug users (IDUs).^{2,3} However, even within areas where drug injection is an important source of infection, specific risk behaviors, structural and situational factors that inhibit or promote viral transmission, actual seroprevalence levels, and the profile of people who have been infected with HIV/AIDS vary considerably.^{4,5} Significant variability, in fact, is now being described at the neighborhood level even within zones of relatively uniform ethnic and sociodemographic composition.^{6,7}

Existing research suggests 3 factors that are critical determinants of local and microenvironmental risk and infection patterns among IDUs: (1) the accessibility of both sterile syringes and auxiliary drug injection equipment (clean water for dissolving drugs, new cookers for dissolving drugs in water, new cottons to filter drugs to avoid clogging needles), (2) the array and condition of locations used for drug injection, and (3) subcultural drug injection practices (e.g., drugs in use, preparation practices, local social norms of injection).^{8–11}

Assessment of IDUs' access to sterile injection equipment has become a research area of growing significance as drug users have come to constitute an increasingly large percentage of AIDS cases and as alarming rates of hepatitis have been found in past and present drug injectors. Studies of syringe access indicate the importance of a variety of intersecting influences at the national level (e.g., degree of governmental support for syringe exchange programs), the regional level (e.g., state paraphernalia laws), and the local level (e.g., neighborhood differences in pharmacy sales of over-the-counter syringes, po-

lice practices, presence of syringe exchange programs, presence of on-the-street syringe sellers, and social networks of users that commonly provide links to syringe sources).^{12–15} Consequently, prevention efforts must be targeted at all of these levels.

However, because actual drug-user risk patterns are manifested locally, at the level of individuals, dyads, and small groups of interacting IDUs within specific microsocial contexts, there is a critical need for research methods that permit effective identification, systematic description, and detailed comparison and analysis of local drug-using populations, risk behaviors, and social influences on injection patterns. This type of highly contextual research^{16,17} allows the development of "grounded prevention efforts" that are specifically targeted toward empirically verified features and determinants of actual risk in given social environments.

In this article we report on a set of 6 qualitative methods that have been developed for use as part of a larger ethnoepidemiologic study of the acquisition, use, and discarding of injection equipment. The subjects are 960 IDUs in 24 neighborhoods in 3 northeastern US cities with high rates of drug-related HIV/AIDS (Hartford and New Haven, Conn, and Springfield, Mass). These methods, adopted to facilitate the collection of ethnographic field data for use in cross-site

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Editor's Note. All the names of participants used in the text are pseudonyms.

comparisons and in the development of grounded prevention programs, are as follows: (1) use of neighborhood-based IDU focus groups to construct social maps of local equipment acquisition and drug use sites, (2) ethnographic description of target neighborhoods, (3) IDU diary keeping on drug use and acquisition of injection equipment, (4) ethnographic day visits with local IDUs in natural settings and contexts, (5) interviews with IDUs about syringe acquisition and collection of syringes for laboratory analysis, and (6) focused field observations and informal interviewing during drug injection.

Social Mapping Focus Groups

One of the first concerns of our research initiative was to get an emic, or inside, view of the drug scene at the microsocial or neighborhood level. Previous research with IDUs suggested that indigenous maps, created by IDUs who live, buy drugs, acquire injection equipment, and inject in neighborhoods of interest, would allow us to learn about the locations and spatial relationships of people, places, and structures that influence HIV and hepatitis risk. We realized that a neighborhood map from the perspective of an IDU might be quite different from the map of a city planner or even that of neighborhood residents who do not use drugs. Social mapping has an advantage over one-on-one methods because, as a group process, it promotes productive thought-provoking dialogue and encourages consensus building among peers. These are features that have the potential to foster an enhanced level of interest and involvement among participants in public health research and interventions.

Participatory research methodologies, developed in the 1960s to facilitate agricultural development in international communities, have evolved considerably and are today used by researchers in various disciplines to investigate a range of public health issues and related social concerns. The term *participatory rural appraisal*, for instance, describes a growing family of approaches and methods that enable local people to share, enhance, and analyze their knowledge of life and conditions, to plan and to act.¹⁸ The use of *participatory action research* in social struggles and workers' movements has been documented by researchers in Latin America and in the United States.^{19,20} Many researchers are attracted to participatory action research because it both involves the participants and unites research with focused community action to address social concerns.²¹ We decided that participatory methods would add considerably to developing an un-

derstanding of urban injection drug use and help in generating intervention models that are harmonious with actual, on-the-ground beliefs and behaviors of IDUs.

One of the main participatory methods now in use involves asking participants to create a map of their community, a procedure termed *participatory mapping* or *social mapping*. Participants are encouraged to include in the map any elements they consider relevant and important.²² Desirable elements—such as homes, local resources, community networks, boundaries, and barriers to health care—and the spatial relationships between these elements are elucidated through discussion and probing during the mapping process. This interaction integrates elements of participatory social mapping with elements of focus group interviewing.

From 5 to 12 individuals were recruited in each of the targeted neighborhoods. These neighborhoods were selected on the basis of prior research on injection drug use, input from key informants who knew the local drug scene in each city, and street observations of local drug use activities. Research team members in each city used standard city maps and official neighborhood boundaries; our previous experience in Hartford indicated that these were meaningful boundaries for many residents. Street outreach, an approach that has been widely used in recruitment of IDUs in HIV interventions and prevention research,^{23–25} was used to select social mapping participants. Team members in each city had experience with this approach to finding, engaging, and recruiting out-of-treatment IDUs.

Participants in each social mapping group were usually recruited from one neighborhood. When participants from 2 or 3 neighborhoods were included in the same group, they were recruited from adjacent neighborhoods of similar ethnic and sociodemographic composition. Social mapping groups were intended to be as homogeneous as possible so that areas of consonance among participants could be located.

Focus group facilitators (usually 2 per group, with one as lead and the other serving as a note taker and assistant) from the research teams in each city used a data collection guide to move through the mapping activity, ensuring that every group addressed all of the questions of interest, namely (1) What kinds of people influence injection drug use in this neighborhood? (2) What are the kinds of places where public injection drug use occurs? and (3) What equipment is required for injection drug use? Several free list solicitations (involving asking participants to list all of the items they could think of that were associated with a particular cultural domain)

were conducted within the groups to elicit items related to each of these questions before participants were asked to draw a map of the neighborhood. Follow-up questions asked after the free listing allowed facilitators to probe for details related to specific items and to encourage in-depth discussions among participants.

Once exhaustive topical lists were obtained, the participants were given mapping materials (poster boards [4 ft×6 ft], markers, and highlighters) and were asked to draw a map, working together, of their neighborhood as they saw it, using as map features the items they had listed in the first part of the session. We experimented with using maps that were partially completed, with boundaries and main streets shown, before being given to participants, and with blank sheets that allowed participants to define all features of the mapped neighborhood, including major thoroughfares and boundaries.

As the maps evolved within each group (see Figure 1 for an example), the dialogue among participants gave researchers and participants alike the opportunity to better understand each participant's perspective of the neighborhood within the context of the surrounding city. The finished maps included illicit-drug shooting galleries, sterile-syringe exchange sites (syringe exchange van stops), drug "copping" (buying) sites, pharmacies that sold over-the-counter syringes, underground syringe-seller locations, syringe discard sites, and sites where drug paraphernalia (e.g., cookers, cotton, water, bleach) could be acquired. Such maps, and related discussions, enable us to better comprehend the distances and pathways that IDUs cover over the course of a day, as well as the type and spatial relationships of places of interest to IDUs.

Tape recorders were used to capture the dialogue as group members discussed the intricacies of specific neighborhood locales while creating the map. These tape recordings were transcribed and served, along with the free lists and actual maps, as part of the database for the social mapping activity. In addition, when possible, the focus group assistant took written notes about nonverbal cues and other behaviors that could not be captured on an audiocassette. In one group, for instance, as the group discussed syringe location sites, a participant demonstrated how one might be able to differentiate between a new and a used syringe by testing the syringe plunger.

For the most part, group participants seemed eager to share what they knew about their neighborhoods in a manner that was less traditional than they might have experienced in other community-based research projects. However, some participants voiced

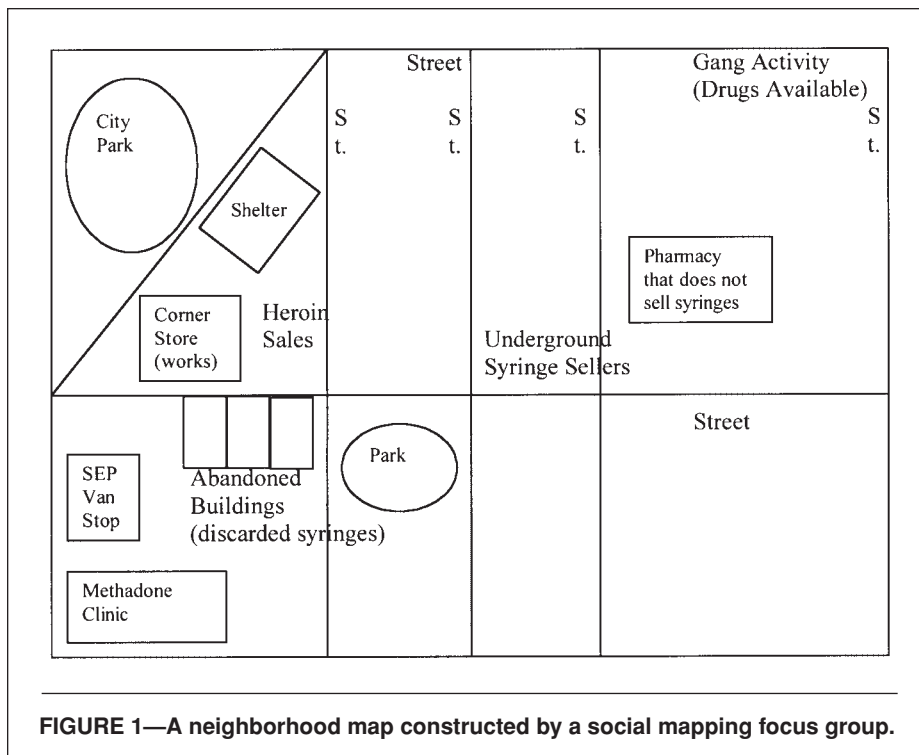


FIGURE 1—A neighborhood map constructed by a social mapping focus group.

concern about the maps, fearing that the information in them might be used to inform the police or other authorities. Consequently, we deleted the street names on maps once they were completed.

Giving some groups maps on which the main boundaries and roads had already been drawn helped participants to quickly focus on an area of interest and to comprehend the scale of the area they were being asked to map, and they found the street references helpful in placing specific items on the maps. It is important to mention, however, that the use of partially completed maps may decrease the autonomy of participants and lead to the creation of maps that highlight neighborhoods from a perspective more similar to that of a city planner than to that of an IDU.

In sum, the use of social mapping (1) facilitated rapid familiarity with neighborhood structures and locations that influence syringe access, use, and discard in each of the targeted neighborhoods; (2) provided a rapid learning experience for research team members who were new to drug use and AIDS research; (3) aided new researchers in becoming known on the street and having their role defined by street IDUs; (4) helped to establish a group of IDUs in each target neighborhood as local cultural experts and helped researchers to form relationships with them, both of which facilitated further qualitative and ethnographic research in the neighborhood; and (5) provided an emic perspective on the target neighborhoods, which was applied in the con-

struction of the core epidemiologic survey that was used in the project as well as in the adoption of additional qualitative methods.

Ethnographic Descriptions of Target Neighborhoods

In an effort to understand how injection drug use and its associated HIV risk is mediated by social and environmental factors, we explored neighborhood-specific dynamics. Specific factors of interest included sites where syringes were available (such as pharmacies that sold syringes over the counter, syringe-exchange van stops, and the areas where individuals who sell syringes on the street were active), drug availability, syringe use, methods of discarding syringes, location of police substations and the frequency and regularity of police patrols, and location and density of abandoned buildings. More general factors, such as economic activity or decay, housing abandonment or construction, and community-based or citywide political initiatives, were also noted.²⁶ Structured ethnographic observation was used to describe syringe acquisition patterns, environmental relationships within neighborhoods, and drug injection activity specific to each neighborhood. All neighborhood observations were recorded on a standard neighborhood description form.

In each of the 3 cities, 8 neighborhoods were described. We used information col-

lected from at least 4 sources, allowing the compilation of 4 interrelated databases. First, the neighborhood's physical and social characteristics were recorded, based on staff observations. The specific locations where drugs and syringes were acquired, used, and discarded were the primary focus. Additional concerns included the locations of abandoned buildings, community activities, local businesses, and social and municipal agencies. The identification of these locations provided a framework for mapping existing structures and infrastructures in each neighborhood. Second, informal interviewing of community members (both IDUs and non-IDUs) allowed social components, such as the drugs most frequently used and sold, locations of shooting galleries, zones of gang activity, and areas and levels of police activity, to be added to the physical description of the neighborhood. Locations of alternative sources of syringes could also be identified through this approach. Third, the local papers were scrutinized to identify and record daily events from each neighborhood. Events of interest included murders, drug arrests, community redevelopment, residents displaced by fire, and municipal initiatives that could affect neighborhoods of concern to the study. Finally, police reports were used to show the locations of calls to the police and the types of incidents reported by residents.

In maintaining these databases, project staff developed a sense of a neighborhood's unique characteristics as well as interrelationships among adjoining neighborhoods. For instance, data from New Haven suggest that although there is a fairly high density of IDUs living in all 8 target neighborhoods, 2 of the 8 predominate in terms of where drugs are purchased. Interestingly, heroin sales were found to be most common in 1 of these 2 neighborhoods and to occur most frequently during the morning hours. In the other neighborhood, crack cocaine sales predominated, occurring mostly after the 4:00 PM police shift change. Regularly scheduled visits to each neighborhood, combined with ongoing interviewing of participants, newspaper scrutiny, and analysis of police logs, permit the project staff to see neighborhood changes over time. In addition, relocations between neighborhoods of IDUs themselves can be explored longitudinally and relative to the larger structural and infrastructural changes occurring in these neighborhoods.

One final form that these data can take is the construction of citywide maps that chart changes in the neighborhoods in terms of drug use, victim crimes, economic vitality, housing, community participation, and municipal government activity. Over time, it will be impor-

tant to determine the extent to which these factors are associated with the changes in syringe availability and HIV risk as reported by the individuals recruited into our study.

Diary Keeping

Having study participants keep diaries is a research method that has been used to investigate a variety of behaviors, including eating, sexual risk behaviors, alcohol consumption, sexual activity among commercial sex workers, interactions between clients and health service providers, recovery from drug and alcohol abuse during pregnancy, migraine pain measurement, and medical compliance.²⁷⁻²⁹ The advantages of this approach, as noted by a number of researchers, include enhanced reliability of self-report data,^{30,31} an increase in participants' comfort about addressing highly sensitive information,³² and increased access to the unique "voices" of the study participants.³³

In our study, we ask IDUs to keep diaries so that we can learn about issues that might not otherwise be remembered or reported by participants on standardized 30-day-recall survey questionnaires. These issues include day-to-day variations in syringe acquisition and drug use patterns, social and contextual influences on these patterns, and variation across individuals, neighborhoods, and cities. Participants for the diary subsample ($n = 30$) were selected on the basis of previous interactions with project staff. We required that participants be reliable (e.g., in showing up for interview appointments) and willing and able to record their daily drug-related and survival activities. As these inclusion criteria suggest, the intention was not to develop a subsample that is representative of the larger epidemiologic sample, but rather to include a range of individuals across the target neighborhoods who would be able to provide an emic window on daily life as an IDU. Patterns and influences identified in the diary study can be used to generate questions to be examined with other qualitative strategies used in the project and issues to be investigated with the epidemiologic survey instrument.

Individuals who are selected to participate are given a brief training session in diary recording (e.g., topics, style) and provided with a pen and tablet to record their daily experiences. Participants record experiences for 5 to 7 days. Each weekday, at a prearranged time and place that is convenient for the participant, the participant meets with a member of the project staff to turn in and review information entered into the diary, an approach used by other researchers.³⁴ The staff person asks probing questions to assist the participant in

clarifying and amplifying information in the diary. This information is added to the diary record for use in cross-site comparisons and in implementing grounded prevention programs.

We have found that the diaries provide a wealth of important data that are highly relevant to understanding the situational factors that influence HIV risk. For example, the diaries have provided detailed information about IDUs' coping strategies. Thus, one participant reported the following in his diary concerning a time when the local syringe exchange was closed and he had no transportation to get to a pharmacy to purchase a syringe: "7 PM. Syringe broke before shot. Rubber stopper at bottom came off. Used crazy glue and it sealed. Got one shot."

As this example suggests, when a syringe breaks, IDUs do not always try to acquire a new one. Consequently, the street life of syringes can be extended, a factor that may increase the possibility that they will be used by more than one person and, as a result, play a role in transmitting HIV. Conversely, further research may reveal that fixing broken syringes may play a protective role in prolonging the life of a syringe that is clean, or at least one's own (thus decreasing the need for syringe sharing when a syringe breaks).

Significantly, we found evidence that the data recorded in the diaries are unlikely to be captured by other methods. For example, the following exchange, concerning an event recorded in a participant's diary, occurred between the diarist and a project staff member:

Interviewer: "Would you remember this in 6 months?"

Diarist: "No way, I can barely remember what I did last week."

Similarly, the role of local context factors (in this case, the patrol patterns of the police) in influencing the specific drug acquisition and use patterns of participants was captured in the following diary entry: "Went to cop on Chapel Street. Different copping spot than earlier in the day. The police shift is at 4:00 o'clock. The night shift for copping area one (morning spot) is a lot more visible and active near spot. The other side of the neighborhood is easier after 4:00 PM. Bought two dimes of crack, and one bag of heroin."

Coordinating the diary substudy generates a number of challenges for the project. One participant was arrested while in possession of his diary, which contained potentially incriminating information. This led us to change our procedures to retain each day's diary entry and to request participants to delete specific locational references, which can be filled in during the daily meetings between participants and staff. Owing to the chaotic lifestyle that typically characterizes

street drug use, meeting every day with an IDU requires considerable flexibility on the part of the staff. We have had incidents in which participants have lost their diaries, necessitating reconstruction of the previous day's events in an interview format. Finally, legibility and literacy limitations have added their own complications. Despite these issues, the diary approach has proven to be a very productive research strategy, and preliminary findings suggest that the act of keeping a diary is influencing some participants to reconsider their risk and drug use behaviors and has led to several requests for assistance in lowering risk and entering into drug treatment.

Ethnographic Day Visits

The day visit was adopted as a technique for understanding the spatial relationships, activities, and movements of IDUs within their own neighborhoods or between neighborhoods. Building on traditional ethnographic immersion techniques for the study of drug users,³⁵⁻³⁸ this method consists of (1) spending approximately 5 hours with an active IDU in his or her neighborhood as the IDU goes about normal, day-to-day activities, such as hustling, copping drugs, getting needles and other injection paraphernalia, and injecting; (2) closely and systematically observing behaviors and interactions; (3) asking informal questions in a conversational tone about ongoing activities and more general issues; and (4) writing a detailed record of statements, activities, and events, with special attention paid to the acquisition and use of syringes and other injection equipment. Having a precise goal (collecting "snapshots" of injection-related behaviors within a local social context) and a circumscribed time frame, the day visit shares features with rapid participant observation techniques. By collecting and comparing accounts of day visits with multiple participants, we are able to develop an understanding of ranges of IDU behavior and of the uniformity and diversity of behaviors at the individual, dyad, small group, neighborhood, and city levels, thus allowing for comparability across study sites.

To protect the safety of both the researcher and the IDU, the researcher enters into an agreement with the IDU (which is explained in our consent form), prior to the initiation of data collection, about which activities will be witnessed and which ones avoided during the day visit. While it is expected that the researcher's presence will have some initial impact on typical behaviors, it is our experience that this impact tends to diminish over the course of the visit.

As IDUs see that they are not being negatively judged, they tend to relax and return to normal routines. Additionally, IDUs' chemical dependency and need for drugs serve to some degree to prevent deviation from regular drug-getting and drug-using routines. It is also recognized that the day visit puts the researcher at heightened risk of harassment from police and/or involvement in the violence that sometimes erupts in local drug scenes. These issues are addressed through an ongoing training and debriefing of researchers on risk avoidance and response.

One strength of this method is that it allows researchers to experience firsthand how IDUs perceive the spatial layout of their neighborhoods and other neighborhoods in the city that they frequent or avoid. It also has the potential to provide insight into the nature and frequency of crisis events that may lead to risky practices in the daily life of an IDU. Detailed and contextually situated information on these issues would be nearly impossible to capture through recall in a survey that occurred, as they commonly do, weeks or months after the event. The day visit also allows for extensive observation of how IDUs interact with other individuals and/or agencies or institutions in their neighborhoods. This also would be difficult to measure with a survey approach. It is important to understand these interactions as part of an effort to develop HIV interventions that are fitted to the specific neighborhoods where IDUs live and spend time.

Another advantage of this method is that in accompanying an IDU through his or her neighborhood and other parts of the city, the researcher has an opportunity to assess the status of the IDU in the drug subculture through his or her interactions with a wide variety of individuals. The day visit also confers insight into the nature of IDUs' knowledge of their neighborhoods and the people in them. Most important, the day visit, to a degree, allows the ethnographer an opportunity to walk in an IDU's shoes and to experience some of an IDU's day-to-day realities from an emic perspective.

The nature of day-visit activities and events is seen in the following excerpt from the day-visit field notes of one of our project ethnographers:

[By spending] so much time with John, [I could see] the complexity of choices made in the street. He was living in a homeless shelter located near the North End, so [he] had no secure place to go to stash needles or get high. He therefore had developed a whole assortment of outdoor and indoor needle stashing sites that include: under the sink at McDonald's, under the porch of a building off of Main St., in the top of a fence at an outdoor shooting site, on the

sides of dumpsters, under the snow in another outdoor shooting site (where I observed him), and behind the chairs at the Peter Pan bus station. He recalled once having stashed a needle under some leaves near an auto body shop and then coming back moments later and being unable to find it. As we walked the streets he was constantly aware of the police movement. He knew many of the undercover cops by face and kept track of where they were driving. He also had an excellent record in his head of where the recent busts had been, and would avoid those places—whether they be the bus station or an apartment where drugs were sold.

As soon as he had a needle, John would immediately want to use it and then stash it. As soon as he bought drugs, he would go through his itinerary of stashes and decide which would be closest and have the least police activity. He would also get nervous with a dirty cooker on him because it could be tested for remnants of drugs. Once on our way to buy a needle, he stashed the cooker in the snow with an imperceptible swipe of his hand and retrieved it on our way to a shoot-up site. . . . He was also aware of who owed him money, who he owed money, and had a variety of financial contingency plans such as who would lend him drugs, who would be most likely to give him money at the bus station, where to do the best panhandling and at what time of day.

As this excerpt suggests, the day visit points to a variety of contingencies that shape IDUs' behavior and related HIV risk, as well as the ways that IDUs plan for and adapt to these contingencies to achieve their objectives. The day-visit strategy reveals the IDU as an active information collector, decision maker, and planner, traits that must be considered in constructing interventions that fit the characteristics of the target population. In addition, as revealed in this excerpt from an ethnographer's field notes after a day visit, this method exposes the researcher to the rapid shifts between social suffering and brief escape that characterize the life experience of the street drug user:

Carmen lives on Jefferson Street in a semi-abandoned building. The water has frozen in the pipes. So the toilet and shower don't work. . . . We push open the front door of the building. To the right of the staircase someone has discarded chicken bones and the remains of a meal. Carmen complains later that the "super" doesn't do anything to keep the place up. She points to chunks of ice on the sidewalk. I am more struck by the chicken parts. On the second floor three rooms are occupied, just rooms. There is a kind of kitchen but it is empty with a lot of sunlight spilling in. There are empty beer boxes against the wall. A few dishes sit in the sink that don't look like they've been used in over a year.

Carmen and the other inhabitants stick to their rooms. Carmen complains

that she has left her key inside and pushes open the door. On the way over to her place, she tells me she's worried about what I'm going to think. Do I mind seeing a messy room? I tell her no. The room is small—with clothes bordering each wall, like mountains. . . . I get a sense that Carmen is self-destructive. She despairs over her addiction. Says in a lowered voice, "I want help." "Did you hear that . . ." and looks up at me. "I want help." I suggest some of the other factors that might have been a problem in her life. She comes back to the issue of addiction. She reviews them, addiction to dope [heroin], addiction to crack, and then adds addiction to sex. At one point she throws out, "Sometimes I wonder if there would be a way just to end it all." But it's only a momentary thought that slips by. Now that I'm remembering the moment I don't know how we moved onto another topic. But we did.

Syringe Acquisition

From the main epidemiologic sample of our study, we identify a subsample of 5 study participants from each of the 24 target neighborhoods (n=120) for an examination of syringe acquisition behavior. Individuals in this subsample are known, on the basis of their answers to structured interview questions in our survey instrument, to acquire at least some of their syringes from "street sources" (i.e., sources other than the syringe exchange and pharmacies, such as diabetics, shooting galleries, drug dealers, friends or associates, street injection equipment vendors, and retrieval from discarded syringes on the street). In working with participants in this subsample, we request that they acquire 5 syringes from their regular street sources. Acquisitions are made one source at a time to avoid contamination. If possible, an ethnographer accompanies the participant to the source and observes the acquisition. If this is not possible (e.g., because the IDU says that the presence of the ethnographer, who is unknown to the source, will interfere with the acquisition process), the ethnographer accompanies the participant to the general area of the source and awaits the participant's return.

Once syringes are acquired, the ethnographer interviews participants about the acquisition process (e.g., the source, specific circumstances of acquisition, problems encountered, cost and stability of price, forms of payment, characteristics of syringes, stability of syringe supply, proximity of syringe sources to sites of drug purchase and drug use, and trust that acquired syringes are sterile), following an approach developed for the study of syringe acquisition in Puerto Rico.³⁹ Answers are recorded on project syringe acquisition forms.

Acquired syringes are deposited by the study participants in puncture-proof sharps containers. Containers are transported to a laboratory, where the syringe contents are extracted and the extracts are subjected to procedures to isolate and purify DNA. The presence of human DNA in the extract is detected by polymerase chain reaction amplification, targeting a portion of the gene that codes for human β -globin. The test specifically amplifies these sequences and is sufficiently sensitive to detect as few as 32 cells, equivalent to approximately 0.005 μ L of blood.⁴⁰ The β -globin DNA product can be identified visually and corroborated by Southern blot. The presence of human DNA indicates that the syringe has already been used and was not completely stripped of contaminating material. Testing data are analyzed to estimate the frequency of risk—that is, the rate at which individuals are using syringes used by another person prior to their acquisition, and the prevalence of human DNA in the syringes as a function of neighborhood.

By combining participant interviewing in the field with bioassay procedures in the laboratory, we are able to empirically establish the distribution of used syringes from various sources by neighborhood. By analyzing neighborhood data on the availability of sterile-syringe sources (e.g., the presence of a syringe exchange site or of one or more pharmacies that sell syringes without a prescription) and interview data on participants' most common sources of syringe acquisition, we are able to characterize the relative likelihood of acquiring previously used syringes in each of our 24 target neighborhoods.

Field Observation and Processual Interviewing During Drug Injection

Rigorous analysis of intersite and intrasite variation in injection practices, associated risk, and key context variables that shape local and microenvironmental IDU risk behavior remains an important arena of HIV prevention research. Despite a number of field studies in recent years,⁴¹ as McCoy et al.⁴² stress, we need to investigate local variation in “the potential populations [at risk] and their injection practices, patterns, and cultures.” Socioenvironmental differences across regions and even across neighborhoods appear to be associated with behavior differences in drug injection practices and risk levels.^{43,44} In addition, it is important to note that drug use is never a static behavior.^{45,46} Injection practices change over time as new drugs, new drug combinations, and

new routes of consumption are introduced (e.g., the initiation in recent years of crack cocaine injection). Emergent behaviors often create new risks. Sustained direct ethnographic field monitoring of injection and other drug use practices, consequently, has emerged as a critical tool for HIV prevention research.

In our study, ethnographic observation and recording of natural syringe-use behaviors is conducted with a subsample of the individuals recruited for participation in the epidemiologic survey component of the study. In each of the 24 neighborhoods under study, project outreach workers and ethnographers select 2 participants (a man and a woman) for our ethnographic subsample ($n=48$). Selection is also guided by an attempt to include individuals who represent the range of ethnic identities found among IDUs in the target cities. In addition, participants are selected who are known to inject different drugs (heroin, cocaine, speedball). Selected individuals are asked if they are willing to be observed injecting, a request that some IDUs decline because they do not feel comfortable being observed in this way but that others readily accept. Project ethnographers accompany consenting participants to their regular injection sites.

Following and expanding on the methodology developed in the Needle Hygiene Study,^{47,48} beginning with the drug mixing process (and focusing on previously identified potential direct and indirect sharing behaviors), the ethnographers record the drug use sequence (chronology of events): who mixes the drugs, how they mix, equipment used, drawing of drug solution into the syringe, quantities of drugs consumed, arguments over amounts of drugs taken, squirting back, back loading (injecting drugs into the back end of the syringe) and front loading (removing the needle and injecting drugs into the front end of the syringe), cotton sharing, drawing up previously used rinse water, syringe cleaning behaviors, where rinse water is squirted, “booting” (moving the drug mixture and blood back and forth between a user's syringe and the vein), transfer of syringes to other injectors, bleaching or use of other cleaning agents, duration of syringe cleaning, body injection location, injecting of others, duration of injection process, and postinjection behaviors. For each syringe that is loaded or reloaded in the scenario during the observation period, this process of data collection is repeated.

Other drug use (e.g., smoking of marijuana, cocaine, or heroin) or alcohol consumption during the observation is also recorded. The ethnographers record any other behaviors that appear to hold potential HIV

transmission risk, as well as the topics of conversation of participants while they inject. Finally, the ethnographers ask and record the answers to questions that help clarify observed behaviors (e.g., What determines injection order when several individuals inject together? Why do some people share syringes here while others do not?). Ideally, these questions are asked processually, during the course of the injection scenario, as the behaviors in question are being performed. If necessary, they are asked at a later time.

Observations and note taking on drug use practices in our study are guided by the Drug Use Observational Frame, an instrument developed in this project. The frame directs researchers' observations and record keeping during each observational event toward the following: (1) demographic information on the identified project participant and all others present at the injection scenario; (2) nature and characteristics of the physical setting, including detailed descriptions of the setting, ownership and organization of the setting, and time of day and week of year of the injection event; (3) the drug(s) being consumed; (4) the social roles and behaviors of all who are present at any time during the event; (5) injection equipment present (syringes, cookers, cotton, rinse water, etc.) and who brings and controls the equipment; (6) details of the preparation and handling of the drug solution; (7) interaction and relations among coinjectors, and proxemics (spatial arrangement) of event participants; (8) specific drug injection practices, injection behaviors, and all uses of injection equipment; (9) transfer of equipment between participants; and (10) disposition of syringes following injection event, including specific rinsing, sterilization, hiding, and discarding behaviors. This information, as well as all other qualitative data collected in the project, is computer entered as textual data and coded (following a project coding scheme developed around the key issues of concern for the study) for qualitative analysis by means of the NUD*IST (Qualitative Solutions and Research Pty Ltd, Victoria, Australia) text management and analysis software program.

The value of direct observation of injection behavior and processual interviewing during injection is seen in the following account recorded by a project ethnographer:

The spot Don has picked to inject strikes me as very open. I can see people walking by a grocery store on the other side of the street (and they can see us if they choose to). . . . But Don says he's fast. He puts his back to the wall and crouches down. I crouch with him. There is debris around us, plastic bottle caps, bottles, and the part that you pull to open them, condom wrappers (Don explains that prostitutes bring their

tricks here), dope bags, all in a heap at the other end of the landing. Someone it seems has tried to do some tidying up here and pushed “everything” into a corner. Don pulls out his syringe from a back pocket of his jeans. He cleans it a little with the water he scooped up from the mound of snow on his way here. He can’t use much because it was only a capful.

He picks up another bottle cap from the floor and wipes the inside out with his shirt sleeve. I ask if it looks like it’s been used before, he says yes, because it had the residue still in it. He tears open the dope bag and pours the powder in the cap. First he just pours it straight, then he tilts the bag to make sure he’s gotten all of the powder. . . . Once it’s all in, he draws up a small amount of water. He says he likes to use 10 [units of water] and adds it to the dope. He tells me he got the syringe from a street seller, a guy who gets them from the [syringe exchange] van and resells them for three bucks.

Don crushes the heroin with the other end of the syringe. This takes a few seconds, as the stuff doesn’t dissolve immediately. Then he quickly snaps a piece of cigarette off of the one he has laying next to him. I hadn’t noticed until this point that he has placed the box and cigarette at his side. Again, it’s a very rapid motion, too quick for most people to notice. He places the sliver of filter in the mixture and moves the syringe around to various places in the cooker in order to get every part of the mix. By the time he places the cooker back down it is clean. Don flicks at the syringe a couple of times, presses slightly on the plunger and a few drops of water fly out, then he rolls up his sleeve. . . . Don just presses the needle in, notices blood enter the syringe, pushes down the plunger and pulls out. Then he puts his hand to the spot, a little pressure to try to stop bleeding and he is done.

Described in this account are several risk behaviors, including use of a previously used cooker picked up from the floor of a shooting gallery (a behavior that could transmit hepatitis), use of a syringe purchased on the street (said to be from the syringe exchange, which may or may not be true), and use of a finger to stem the flow of blood at the injection site (which, if the IDU is infected with hepatitis, would make even shaking hands with him potentially risky).

Conclusions

Individually, none of the qualitative methods described above can confer a complete picture of the life and risk behavior of IDUs. Consequently, we have incorporated all of these approaches simultaneously, with the goal of triangulating findings across methods (i.e., matching and contrasting finding from one method with those of other

methods and using various methods to increase the reliability of any particular finding). Together, this set of qualitative strategies offers a rigorous methodology for directing attention to the importance of local context on IDU risk behavior; disentangling the complex set of local context factors that promote transmission of HIV and other bloodborne diseases; comparing and contrasting risk-influencing features across microenvironments; and improving the targeting of interventions to the precise configuration of risk-enhancing characteristics of specific local settings. □

Contributors

M. Singer, K. Khoshnood, and R. Heimer conceptualized the study. All of the authors contributed different portions of the drafts. T. Stopka, C. Siano, K. Khoshnood, and R. Heimer revised the final draft, and M. Singer prepared the submitted manuscript.

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