Neighborhood Differences in Patterns of Syringe Access, Use, and Discard Among Injection Drug Users: Implications for HIV Outreach and Prevention Education

David Buchanan, Susan Shaw, Wei Teng, Poppy Hiser, and Merrill Singer

ABSTRACT *The article presents results from the Syringe Access, Use, and Discard: Context in AIDS Risk research project comparing two neighborhoods by (1) socioeconomic and demographic characteristics; (2) patterns of syringe access, use, and discard; and (3) encounters with a local human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) outreach project targeted to injection drug users (IDUs). The results show that IDUs in more economically advantaged neighborhoods were more likely to acquire syringes from a single source (rather than multiple sources), more likely to inject alone in their own residence (rather than public injection locales), and more likely to dispose of syringes in private garbage cans rather than alleys or dumpsters. These results are further associated with the likelihood of encountering street outreach workers, with IDUs in more affluent neighborhoods much less likely to have any such contacts. Based on the different patterns of access, use, and discard evident in each neighborhood, the results indicate that different and more carefully tailored local outreach and prevention strategies are urgently needed.*

KEYWORDS *HIV/AIDS, Injection drug use, Neighborhood characteristics, Socioeconomic status.*

INTRODUCTION

Although there has been a significant reduction in the acquired immunodeficiency syndrome (AIDS) incidence rate in the United States over the last decade, it has mainly been due to the introduction of more effective antiretroviral drug therapies, which have slowed the progression from human immunodeficiency virus (HIV) infection to full-blown AIDS cases. With growing evidence that the drop in the US AIDS rate has bottomed out and the AIDS rate may now even be increasing in certain cities,¹ further research to identify factors that both impede and facilitate prevention efforts is urgently needed.

As the populations affected and the distribution of disease have changed over

Dr. Buchanan and Ms. Hiser are with the School of Public Health and Health Sciences, University of Massachusetts, Amherst; Drs. Shaw, Teng, and Singer are with the Hispanic Health Council, Hartford, Connecticut.

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Correspondence: David Buchanan, DrPH, Professor, 306 Arnold House, School of Public Health and Health Sciences, University of Massachusetts, Amherst, MA 01003. (E-mail: Buchanan@schoolph.umass.edu)

time, intervention strategies need to evolve accordingly. Mounting evidence from ethnographic studies and other sources points to the importance of local neighborhood economic conditions in determining exposure to higher risk situations.²⁻⁵ Such information is essential to improve the quality of HIV outreach and prevention programs. Since AIDS contributes significantly to health disparities between African Americans and whites and because African Americans and Hispanics are at elevated risk for contracting AIDS through drug injection,⁶ improving the quality of HIV prevention programs for injection drug users (IDUs) is also critical to achieve the goal of eliminating health disparities laid out in *Healthy People 2010*.⁷

The purpose of the Syringe Access, Use, and Discard (SAUD): Context in AIDS Risk Research Project is to identify ecological factors that influence risk for contracting HIV and hepatitis C among IDUs. The main hypothesis of SAUD is to test whether the presence or absence of a syringe-exchange program (SEP) or a pharmacy that sells over-the-counter (OTC) syringes in targeted neighborhoods is associated with higher or lower levels of risk at the neighborhood level. The research is being conducted in three cities: New Haven and Hartford, Connecticut, and Springfield, Massachusetts. Eight neighborhoods in each city were purposefully selected to make comparisons among those that have both a pharmacy and an SEP; those that have just a pharmacy; those with an SEP alone; and neighborhoods with neither an SEP nor a pharmacy.*

Springfield, Massachusetts, is a comparison site because it has neither pharmacy access nor SEPs.⁸ Secondary hypotheses about other ecological factors that could possibly influence risk at the neighborhood level to be tested in this research included whether (1) the number and type of sources (e.g., diabetics, street dealers, etc.) for acquiring syringes would vary by neighborhood; (2) the cost of syringes would vary by neighborhood; (3) the place where IDUs inject and whether they inject alone there or with others would vary by neighborhood; and (4) the number and type of sites where IDUs discard used syringes would vary by neighborhood. The analysis presented here examined whether there are differences in the micro-contextual factors influencing syringe access, use, and discard that are associated with distinct sociodemographic characteristics of different neighborhoods in Springfield.

In the year 2000, Springfield, the 135th largest city in the United States (population 152,082), had the 11th highest AIDS rate in the nation.¹ In Springfield, the main form of HIV prevention directed to injection drug users currently is the Mobile Outreach Team (MORT). MORT distributes bleach kits, condoms, and educational pamphlets to IDUs on the streets and at injection locales. With funding secured by a local representative to the state legislature, MORT was set up to appease critics of the lack of action and to head off increasingly confrontational calls for opening a needle-exchange program in Springfield.

MORT has four outreach teams, which are based in four high-risk neighborhoods. The outreach teams have equal funding and staffing and are run out of four separate local neighborhood community agencies reflective of the racial/ethnic composition of the respective neighborhoods.

The findings in this article have significant implications for improving the qual-

*In the final research design, we identified one neighborhood in New Haven with both an SEP and a pharmacy; two neighborhoods in New Haven and three neighborhoods in Hartford with just an SEP; four neighborhoods in each city with a pharmacy only; and one neighborhood in each city with neither an SEP nor a pharmacy.

ity of outreach and prevention programs for injection drug users, the population now at highest risk of becoming infected with HIV in Massachusetts, by tailoring the programs to distinct dynamics and characteristics of different neighborhoods.

PREVIOUS STUDIES

Ever since Zinberg's classic delineation of the triadic model of drug, set, and setting, researchers have known that the setting, or environment, profoundly affects the experience that users have with drugs.⁹ The parallels to the standard epidemiologic model of agent, host, and environment are self-evident. In seeking to explain the transmission of HIV among IDUs, one crucial research avenue is to identify those features or factors in the environment that affect risk. Unfortunately, the vast bulk of research to date on this issue has focused on the mind-set of the individual user (the host) and far less attention has been addressed to uncovering and understanding ecologic influences. The relatively few studies of macro- and microcontextual influences have, however, pointed to suggestive areas for further research.

Contextual variables have been studied in relationship to a variety of risk behaviors.^{10,11} Neighborhood characteristics have been linked to the number of alcoholic beverage outlets and levels of alcohol-related problems¹² and to domestic violence.¹³ Neighborhood characteristics—particularly differential socioeconomic conditions—have also been correlated with AIDS prevalence and incidence rates,^{14–18} to shape patterns of HIV transmission,^{5,19} and to produce intraethnic variations in HIV risk patterns.²⁰

A small but growing number of studies have begun to examine differences in HIV infection rates within cities at the neighborhood level.^{21–23} In examining differences between the Lower East Side and Harlem in New York City, Diaz and colleagues,²⁴ for example, found strong, statistically significant differences between neighborhoods in age, ethnicity, homelessness, sources of income, arrest record and imprisonment, and risk behaviors such as injecting with someone known to have hepatitis C.²⁴

Similarly, Kral and coinvestigators²⁵ found that IDUs were mainly young, white, and homeless in one neighborhood in San Francisco, while in an adjacent neighborhood, IDUs were primarily older, African American, and housed. The younger white IDUs were also more likely to have injected amphetamines and to have shared syringes in the past month.

Other researchers have found that poor and minority neighborhoods have more open drug scenes and public injection locales (“shooting galleries”) than neighborhoods that are more well off.^{2,3,26} Bluthenthal and coworkers⁴ likewise found that publicly accessible shooting galleries were not present in the relatively more affluent Fruitvale neighborhood in contrast to the poorer West Oakland neighborhood of Oakland, California.

Like shooting galleries, Friedman and colleagues²⁷ have shown that IDUs who use outdoor injection sites are at higher risk for HIV infection. Other researchers have found the use of outdoor injection sites to be associated with homelessness,^{28–31} and Song and colleagues³² found significant differences by age and ethnicity among homeless IDUs in Portland, Ore.

Our approach to these issues is rooted in what has been called multilevel or contextual analysis.³³ This perspective seeks to extend epidemiologic frameworks beyond the “individualization of risk” (i.e., the attribution of risk to behavioral, attitudinal, personality, or other traits of individuals) to environmental or social

context influences affecting populations.^{34–36} An important example of contextual analysis in HIV prevention research among IDUs is Kaplan and Heimer's^{37,38} *circulation theory*, which posits and has found evidence supporting the hypothesis that the shorter the time a syringe remains in circulation on the street, the less likely it will transmit HIV or hepatitis. Susser³⁹ has termed this type of approach a *mixed study* because it investigates the effects of independent context variables on individual-level dependent variables (e.g., HIV infection).

METHODS

To examine potential ecological influences on HIV risk among IDUs, we present findings from two primary sources of data in this article. The year 2000 US census data were used to characterize socioeconomic and demographic differences between neighborhoods that may be correlated with distinctive patterns of syringe acquisition, use, and discard. For the purposes of this article, two neighborhoods in Springfield (Mason Square and the North End) were purposely selected to highlight differences in the racial/ethnic and economic makeup of neighborhoods. While plainly not representative of the full range of neighborhoods with more heterogeneous composition, the selection of these particular neighborhoods was justified because they are representative of those poor and largely minority neighborhoods most severely impacted by the AIDS epidemic.⁴⁰ Similar sorts of differences between neighborhoods—racially segregated and relatively homogeneous in their demographic composition—can be found in all three project sites⁴¹ and in most cities in the United States.

After delineating the boundaries of the Mason Square and the North End neighborhoods by street based on the city planning department's official designations, we identified and aggregated the census blocks and census tracts defined by each neighborhood and analyzed the census data in these pooled constructions. The first section of the results presents data on socioeconomic and demographic differences between these neighborhoods and the city of Springfield as a whole.

In addition to the census data, we collected both quantitative and qualitative data on factors that affect syringe access, use, and discard in all three study sites over a 2.5-year period ending in May 2002. Structured, quantitative interviews were completed with 332 active IDUs in Springfield regarding syringe acquisition, use, and discard practices; we used a modified and expanded AIDS Risk Assessment instrument. Questions were presented in structured, oral, face-to-face interview format, in English or Spanish at participant's preference.

Standard demographic data were collected on all respondents in a close-ended, forced-choice format. Questions on the source of syringes, where the individual injects, where individuals stash their syringes, and where they discard their syringes were precoded; an open, "other" category was filled in by the interviewer as needed. Questions on the number of sources and whether the individual injects alone were forced choice, with four categories each. The question on the cost of the syringe was open ended and asked the respondent what he or she "usually" paid for each syringe.

As a site-specific supplement to the standardized cross-site interview protocol, we added 20 questions regarding users' perceptions of the Springfield MORT and their recommendations regarding the logistics and operations of an SEP in Springfield, if it was ever initiated. Items selected for analysis were based on the hypotheses presented above.

All data were analyzed using SPSS. Categorical data were analyzed using chi-square equations; interval data (e.g., average [mean] cost of syringe) using F tests.

Qualitative methods included (1) ethnographic descriptions of the target neighborhoods; (2) syringe acquisition interviews, conducted in conjunction with collecting syringes naturalistically obtained by IDUs in the field, which we then subjected to laboratory analysis to determine if they were sterile or contaminated; (3) ethnographic field observations of discard sites and injection locales, also in conjunction with the collection of discarded syringes for later laboratory analysis; (4) participant observation and interviews during drug injection; (5) IDU diaries on their daily activities; (6) ethnographic “day visits” with IDUs in their natural settings; (7) syringe seller interviews; and (8) neighborhood-based IDU focus groups to construct social maps of local equipment acquisition and drug use sites.³³

Data were collected from a targeted sample, as defined in four separate publications.^{42–45} After ethnographically describing each neighborhood in the city and the drug users in them, we selected neighborhoods with higher densities of drug users; from those neighborhoods, we recruited street samples who reflected our ethnographic accounts of who the drug users were in those neighborhoods. Study participants were recruited by two outreach workers and one ethnographer at each site; they used standardized outreach protocols. The outreach workers were people in recovery from heroin addiction and are reflective of the race and ethnicity of populations at high risk in these cities. Participants were paid a small stipend for their participation. Of the 332 total interviews completed in Springfield, this article is based on the results of analyses of 164 IDU interviews from the North End and Mason Square neighborhoods.

RESULTS

In this section, we present results for (1) analyses of the census data on the demographic and socioeconomic characteristics of the two target neighborhoods; (2) an ethnographic description of the neighborhoods; (3) analyses parallel to the census data on the demographic and socioeconomic composition of the sample population from each neighborhood; (4) analyses of the distinctive patterns of syringe acquisition, use, and discard found in each neighborhood; and (5) analyses of encounters with the Springfield MORT.

Census Data

We start with the year 2000 census data on the demographic and socioeconomic composition of the populations living in the two neighborhoods described here compared to the city of Springfield as a whole. In Springfield, 49% of the total population is white (non-Hispanic), 27% Latino (predominantly Puerto Rican), 21% African American, and 2% other. In comparison, the Mason Square neighborhood is a predominantly African American neighborhood, with African Americans comprising 57% of the total population; 25% are Latino, 17% non-Hispanic white, and less than 1% are from all other racial and ethnic groups. In the North End, 85% of the total population is Latino, 8% non-Hispanic white, 6% black, and less than 1% are other groups (see Table 1). Thus, like many other cities in the United States, we find in Springfield two distinct, segregated, and relatively homogeneous populations living in different inner-city neighborhoods—one black, one Latino.

In terms of age distribution, 32.4% of the population of Springfield as a whole are aged 19 years or younger, and 19.7% are aged 55 years and older. In Mason

TABLE 1. Demographic and socioeconomic differences between the Mason Square and North End neighborhoods and the city of Springfield

	Mason Square, %	North End, %	Springfield, %
Race/ethnicity			
African American	57	6	21
Latino	25	85	27
White (non-Hispanic)	17	8	49
Other	1	1	2
Age, years			
0–19	39.5	42.8	32.4
20–54	46	41.7	47.9
55+	14.5	15.5	19.7
Housing			
Rental	53.9	81.8	50.1
Poverty level			
Individuals living in poverty	31.7	49.1	23.1

Source: US Census data, 2000.

Square, 39.5% are 19 years and younger, and 14.5% are aged 55 years and older. In the North End, 42.8% are aged 19 years or younger, and 15.5% are aged 55 years and older. As shown in Table 1, the populations in Mason Square and the North End are younger than the population of Springfield as a whole, with the North End having an even larger proportion of people 19 years and younger than Mason Square.

Turning to housing conditions, 50.1% of the total housing stock in Springfield is renter occupied. The Mason Square neighborhood has a slightly higher rate of renter-occupied housing at 53.9%, yet fully 81.8% of the available housing stock in the North End is renter occupied. The rate of renter-occupied housing is thus more than 50% higher in the North End than in Mason Square.

Finally, the percentage of individuals living in poverty is 23.1% in Springfield as a whole, while it is 31.7% in Mason Square and 49.1% in the North End. The percentage of individuals living in poverty is then 50% higher in Mason Square and more than twice as high in the North End compared to the city as a whole. Furthermore, the percentage of African American individuals in Mason Square living in poverty is 26.4%, while the percentage of Latinos in Mason Square living in poverty is 50.9%. (No such differences were found in the North End.) Because their respective economic conditions differ substantially in the Mason Square neighborhood, we present data for this neighborhood as a whole and for African Americans alone in the analyses below.

Ethnographic Description of the Target Neighborhoods

The Mason Square area is the historical center of Springfield's African American community, a tight-knit neighborhood that is home to a thriving black middle class, a sizable Caribbean population, and a small historic home district. Like many eastern cities, Springfield was once home to a growing black middle class in the 1950s and 1960s before changes in the economy displaced better-paying manufacturing jobs from the area, and urban redevelopment programs rewrote the landscape.⁴⁶

Evidence remains of this petit bourgeoisie in two small strip malls that form the commercial center of the Mason Square neighborhood.

Scattered throughout Mason Square are small convenience stores and restaurants, many featuring soul food and southern cooking. Much of the neighborhood has a run-down and neglected appearance. Abandoned buildings are common in certain areas of Mason Square, and about 17% of the housing units are substandard, compared to 6% citywide. Mason Square is also home to a small, well-preserved historic housing district and to a sizable Caribbean population that includes Dominicans, Jamaicans, and Haitians. Many local residents look to the newly constructed Early Childhood Center and elementary school as signs of improvement in the neighborhood.

The Winchester Square mall is the primary hangout and copping area in Mason Square for African American IDUs. It has a McDonald's, several shops, agencies like the Urban League, a library, and a neighborhood health center. Career junkies in their late 40s and 50s can be seen hanging out in the parking lot most of the time, weather permitting. Younger users are seldom seen; they seem to live a more indoor existence. An abandoned rail line runs through the center of Mason Square. Informants say that the wooded areas adjacent to the tracks were used as injection sites some 10 years ago; now, there appears to be little, if any, drug activity in them.

The North End is composed of two "official" neighborhoods, Brightwood and Memorial Square, as designated by the city's planning department. But, in common parlance, this section of the city is referred to as the North End by most residents. The two neighborhoods are divided by Interstate 91, and the North End as a whole is separated from the central downtown area by I-291, which runs east-west. The North End transitioned from a mixed to a predominantly Puerto Rican working class neighborhood in the wake of 1960s redevelopment programs that displaced many black homeowners.

The North End is dominated by Main Street, the main commercial zone and drug-copping area that runs the length of the neighborhood. Traveling north from downtown, the North End is entered by passing under a railway bridge and by the Greyhound bus station, a noted hangout for prostitutes and pill sellers. Main Street continues north, passes under I-291, and comes into the main historic area, which is dominated by a large Greek Orthodox church. An old building opposite the church houses one of Springfield's two methadone clinics.

Further up Main Street, there are Spanish food stores, small boutiques, car repair shops, restaurants, and rows of brick apartment buildings. The whole neighborhood has a distinctive Puerto Rican flavor, with salsa blasting from buildings and cars, people greeting each other in Spanish on the street, and scents of fried fish and fresh bread in the air. It has the feel of a tight-knit community in which most people are known to each other.

IDUs often buy drugs on several Main Street corners and, if they do not have access to a more private space, move a couple blocks away to one of the many vacant lots to a concealed spot to inject themselves. Vacant lots covered with brush are scattered throughout the North End in the wake of an aggressive city policy of tearing down abandoned buildings reported as refuges for the homeless and injection drug users.

Demographic Characteristics of Sample Population

Mirroring the census data, there are significant differences in the racial and ethnic compositions of the study participants from the different neighborhoods. A break-

down of the sample population shows that 94% of the participants from the North End are Latino, 5% African American, and 1% white. In contrast, 64% of the participants from Mason Square are African American, 31% Latino, and 4% white (Pearson's $\chi^2 = 72.23$, $P < .0001$). (There was only one participant from other racial or ethnic groups in both neighborhoods combined.) As reflected in both the census and the sample data, the target neighborhoods are much more distinctly homogeneous than the city as a whole, although the Mason Square neighborhood is more racially and ethnically diverse than the North End (see Table 2).

In the sample data, there also are significant differences in the age range of the participants from the two target neighborhoods. Whereas 40.1% of the study

TABLE 2. Demographic and socioeconomic differences between the Mason Square and North End neighborhoods

	Mason Square (total) (N = 80), n (%)	Mason Square (African American only) (N = 51), n (%)	North End (total) (N = 84), n (%)
Race/ethnicity			
African American	51 (64)		4 (4.8)
Latino	25 (31)		78 (92.9)
White (non-Hispanic)	3 (4)		1 (1)
			$\chi^2 = 72.23$, $P < .0001$
Age, years			
Younger than 34	16 (20)	7 (13.7)	22 (26.2)
35–44	32 (40)	14 (27.5)	57 (67.9)
Over 45	32 (40)	30 (58.8)	5 (6)
			$\chi^2 = 33.19$, $P < .0001$
Income			
<\$1,000 per month	53 (66.3)	30 (58.8)	75 (89.3)
>\$1,000 per month	27 (33.8)	21 (41.2)	7 (8.3)
			$\chi^2 = 22.97$, $P < .028$
Working full time			
Yes	17 (21.3)	14 (27.5)	7 (8.3)
			$\chi^2 = 7.65$, $P < .022$
Housing conditions			
Own house or apartment	32 (40)	17 (33.3)	40 (47.6)
Relative's place	27 (33.8)	20 (39.2)	7 (8.3)
Rent room	5 (6.3)	1 (2)	21 (25)
Other	14 (17.5)	11 (21.6)	14 (16.7)
			$\chi^2 = 42.55$, $P < .0001$
Housing tenure			
Less than 1 year	16 (20)	6 (11.8)	39 (46.4)
1–5 years	37 (46.3)	21 (41.2)	40 (47.6)
Longer than 5 years	27 (33.8)	24 (47.1)	5 (6)
			$\chi^2 = 32.46$, $P < .0001$
Other living arrangements			
Stayed somewhere else in last 30 days ("yes")	12 (15)	5 (10)	22 (26.2)
			$\chi^2 = 2.99$, $P < .08$

Source: Syringe Access, Use, and Discard data.

participants from Mason Square are older than 45 years of age, only 6% of the study population from the North End population are older than 45. If one looks at African Americans only in the Mason Square neighborhood, 58.9% are aged 45 years and older. (In Springfield as a whole, 31.2% of the total population is older than 45 years of age.) Conversely, only 20% of the Mason Square study participants are under the age of 34 years (compared to 54.3% of the population of Springfield as a whole), while 26.2% of the participants living in the North End are younger than 34 years (Pearson's $\chi^2 = 33.19$, $P < .0001$). Among African Americans in Mason Square, only 13.7% are younger than 34 years of age. Hence, we found a significantly older (primarily African American) population of IDUs living in the Mason Square neighborhood compared to a younger (predominantly Latino) population of IDUs living in the North End.

Turning to economic differences, Table 2 shows that 34% of the Mason Square participants have incomes of more than \$1,000 per month, yet only 8.6% of the North End population takes in that much money each month. Among African Americans living in Mason Square, 41.2% take in more than \$1,000 each month. Conversely, while 66.3% of the Mason Square sample population (58.8% of African Americans there) have an income of less than \$1,000 per month, fully 91.4% of the North End sample have such extremely low incomes (Pearson's $\chi^2 = 22.97$, $P < .028$). Similarly, 21.3% of the Mason Square respondents—and 27.5% of African Americans living there—claim to be working full time, compared to only 8.3% of participants from the North End. These results indicate that the sample of IDUs living in the Mason Square neighborhood is significantly better off economically than the sample population of IDUs living in the North End.

In terms of housing conditions (see Table 2), we found that four times as many North End residents stated that they rent a room compared to participants recruited from the Mason Square neighborhood (25.6% vs. 6.4%, respectively). These rented rooms are generally severely run-down, single-room occupancy accommodations that rent for about \$60 per week. Only one African American living in Mason Square stated that he lived in a rented room. Conversely, Mason Square IDUs are four times more likely to say that they are living at a relative's place (typically, a home owned by their grandmother) than North End IDUs (34.6% vs. 8.5%, respectively; Pearson's $\chi^2 = 42.55$, $P < .0001$). That is, IDUs living in the North End are much more likely to be living in relatively unstable, transitory housing arrangements than IDUs from the Mason Square neighborhood.

Further illustrating differences in the relative stability of these population groups, the results of our standardized questionnaire found that 33.8% of the Mason Square population reported having lived in their current place of residence for more than 5 years, yet only 6% of the North End population reported having lived in the same place for 5 years (see Table 2). Among African Americans living in Mason Square, the percentage rose to 47.1% who had lived in the same residence for longer than 5 years. On the other hand, almost half of the North End population (46.4%) stated that they had lived in the current housing arrangement for less than 1 year, compared to 20% of the Mason Square population (Pearson's $\chi^2 = 32.46$, $P < .0001$). These findings provide further evidence that IDUs living in the North End are living in relatively unstable, transient living arrangements at significantly higher rates than IDUs living in the Mason Square neighborhood.

To conclude our analysis of socioeconomic differences, we found that the North End population was almost twice as likely to have stayed in some other housing arrangement in the last 30 days than the Mason Square population (26.5%

vs. 15.4%, respectively; Pearson's $\chi^2 = 2.99$, $P < .08$; Table 2b). Among African Americans living in Mason Square, only 10% stayed somewhere else in the last 30 days. That is, IDUs living in the North End were much more likely to have slept or spent the night at some place besides their primary living abode in the last 30 days than IDUs living in the Mason Square neighborhood. These data are again indicative of the relatively transient living patterns of the respective population groups living in different neighborhoods.

We now examine how these social structural differences are associated with patterns of syringe access, use, and discard.

Syringe Acquisition, Use, and Discard Practices

Acquisition Regarding syringe acquisition, we present data on the primary source of syringes (i.e., which source did used most often in the past 30 days), the number of sources used in the last 30 days, and the average cost of each syringe.

Starting with differences in the source of syringe acquisition, we found that 88.1% of participants from the North End stated that they buy their syringes from diabetics versus 56.4% of participants from Mason Square. Among Mason Square African Americans, only 44% buy from diabetics. In contrast, 26.9% of the Mason Square IDUs (38% of African Americans there) stated that they buy their syringes from a dealer on the street, compared to only 2.6% of North End IDUs (Pearson's $\chi^2 = 46.94$, $P < .0001$) (see Table 3).

Furthermore, 39.8% of the North End IDUs acquired their syringes from more than one source during the last 30 days, compared to 28.8% of all IDUs from Mason Square and only 15.7% of African Americans living in Mason Square. In contrast, 71.5% of all IDUs from Mason Square and 84.3% of all black Mason Square IDUs stated that they had used only one source in the last 30 days, compared to 60.2% of North End IDUs (Pearson's $\chi^2 = 8.76$, $P < .013$).

In terms of the average cost of acquiring a new syringe, IDUs of the Mason Square neighborhood paid almost half again as much for their syringes as IDUs from the North End (\$3.85 vs. \$2.23, respectively; $F = 31.34$, $P < .0001$). Among African American IDUs living in Mason Square, the average costs jumped to \$4.57, nearly twice the price of syringes in the North End (see Table 3).

Use Turning to patterns of syringe use, findings on the IDUs' usual injection locale, where users keep their syringes, and how often they inject alone are shown next.

We also found significant differences in the places IDUs use as injection sites. Only 8.8% of users from Mason Square (2% of African Americans there) said that they frequently inject in abandoned buildings, but almost one-third (32.1%) of North End IDUs stated that they frequently inject in abandoned buildings (Pearson's $\chi^2 = 13.59$, $P < .001$). Similarly, while only 26.3% of Mason Square IDUs—and only 19.6% of African Americans there—stated that they use public bathrooms frequently to inject, 48.8% of North End IDUs said that they do so (Pearson's $\chi^2 = 12.05$, $P < .002$) (see Table 3).

Users from Mason Square were also much more likely to inject alone than IDUs from the North End. Of Mason Square IDUs, 57% (60% of African Americans) stated that they injected alone “most of the time” or “always” during the last 30 days, compared to 38% of IDUs from the North End (Pearson's $\chi^2 = 18.99$, $P < .015$) (see Table 3b).

TABLE 3. Syringe acquisition, use, and discard by neighborhood

	Mason Square (total) (N = 80), n (%)	Mason Square (African American only) (N = 51), n (%)	North End (total) (N = 84), n (%)
Acquisition			
Source			
Diabetic	44 (55)	22 (43.1)	74 (88.1)
Street dealer	21 (26.3)	19 (37.3)	2 (2.4)
Other	13 (16.3)	9 (18)	8 (9.5)
			$\chi^2 = 46.94, P < .0001$
Number of sources			
Only one	57 (71.3)	43 (84.3)	50 (59.5)
More than one	23 (28.8)	8 (15.7)	33 (39.3)
			$\chi^2 = 8.76, P < .013$
Cost, mean	\$3.85	\$4.57	\$2.23
			$F = 31.34, P < .0001$
Use			
Where frequently inject			
Abandoned buildings	7 (8.8)	1 (2)	27 (32.1)
			$\chi^2 = 13.59, P < .001$
Public bathrooms	21 (26.3)	10 (19.6)	41 (48.8)
			$\chi^2 = 12.05, P < .002$
Inject alone			
Never/sometimes	34 (43)	20 (39.2)	51 (60.7)
Most of time/always	45 (56.3)	30 (58.8)	32 (38.1)
			$\chi^2 = 18.99, P < .015$
Where stash syringes			
In their own place	25 (31.3)	24 (47.1)	10 (11.9)
			$\chi^2 = 9.295, P < .01$
Discard			
Site			
Street or alley	8 (10)	2 (3.9)	27 (32.1)
			$\chi^2 = 10.84, P < .004$
Dumpster	28 (35)	11 (21.6)	50 (59.5)
			$\chi^2 = 9.5, P < .009$
Total number of discard sites	6		15
Number of syringes retrieved	10		107

When asked where they keep (or “stash”) their syringes, IDUs in Mason Square were three-to-four times more likely to say that they keep them in their own place than users from the North End. In Mason Square, 31.3% of all users and 47.1% of African American users stashed their syringe in their own residence, compared to only 11.9% of North End IDUs (Pearson’s $\chi^2 = 9.295, P < .01$; in Table 3).

Discard Turning to patterns of discard, the results cover where IDUs reported that they discard their used syringes and, from our ethnographic fieldwork, the number of injection locales that have been identified in each neighborhood and the number of syringes recovered from these sites (see Table 3).

North End IDUs were much more likely to get rid of their used syringe in public places than Mason Square IDUs. While one-third (32.1%) of North End

users said that they threw away their syringe in a street or alley, only 10% of all users from Mason Square and less than 5% of all African American users from Mason Square said that they have similarly done so (Pearson's $\chi^2 = 10.84$, $P < .004$). Likewise, North End users were almost twice as likely to have thrown away their syringe in a public dumpster than users from Mason Square (59.5% vs. 36.4%, respectively; Pearson's $\chi^2 = 9.5$, $P < .009$). Among African American users in Mason Square, only 22.9% reported discarding their used syringes in dumpsters (see Table 3).

In ethnographic fieldwork, we identified 15 public injection locales in the North End, from which we recovered 107 discarded syringes in one-time visits. In contrast, we were able to find only six public injection locales in the Mason Square neighborhood, from which we recovered a total of only 10 syringes. With two exceptions, all of these sites were outdoor sites, mostly vacant lots, areas next to the railroad tracks, and brushy wooded areas next to raised highways; only two were indoor sites in abandoned buildings. (The city of Springfield has made a concerted effort to board up abandoned buildings with its community-oriented policing strategies program.) As these results indicate, many more injection locales are much more actively used in the North End than in Mason Square.

Encounters With the Mobile Outreach Team

Findings of the experiences of IDUs from the respective neighborhoods with the Springfield MORT conclude the results section. Specifically, we look at whether study participants had ever had contact with the MORT, the frequency of their contact (once a week, etc.), where they encountered the MORT, and whether they had ever told anyone about the work of MORT. As noted in the Introduction, there are two separate outreach teams, with staff reflective of the respective neighborhoods, assigned to Mason Square and to the North End and run by local non-profit human service agencies with deep ties to the community.

As can be seen in Table 4, almost four of five (78.8%) IDUs from the North End said that they had contact with the MORT, compared to only one in five (22.5%) IDUs from the Mason Square neighborhood (Pearson's $\chi^2 = 50.87$, $P < .0001$). Among African American IDUs from Mason Square, the percentage who had contact with the MORT drops to 15.7%. Furthermore, while 30% of North End IDUs stated that they had contact with the MORT about once a week, only 10% of all Mason Square IDUs and 2% ($n = 1$) of African American IDUs from Mason Square said that they had contact that often. Similarly, while 27.5% of users from the North End stated that they had contact with MORT about once a month, only 7.5% of users from Mason Square stated they had contact with MORT that frequently. In short, well over half (57.5%) of users in the North End reported having regular contact with MORT, compared to only 17.5% of all users and 11.8% of black users from Mason Square. Another 16% of North End users encountered MORT about once every 6 months, while only 2.5% of Mason Square IDUs have.

When asked where they have had contact with the MORT, the most frequent place where respondents reported having had contact with the MORT was the North End (cited by 44% of all participants); only 5% of the participants said that they had contact with the MORT in the Mason Square neighborhood. Finally, only 30% of Mason Square IDUs referred someone that they know to the MORT, and less than 20% of black users from that neighborhood did so, compared to 75% of the North End IDUs (Pearson's $\chi^2 = 32.61$, $P < .0001$).

TABLE 4. Encounters with Mobile Outreach Team (MORT) by neighborhood

	Mason Square (total) (N = 80), n (%)	Mason Square (African American only) (N = 51), n (%)	North End (total) (N = 84), n (%)
Ever had contact with MORT			
Yes	18 (22.5)	8 (15.7)	63 (75) $\chi^2 = 50.87, P < .0001$
Frequency of contact			
Once a week	8 (10)	1 (2)	24 (28.6)
Once a month	6 (7.5)	5 (9.8)	22 (26.2)
Once every 6 months	2 (2.5)	1 (2)	13 (15.5)
Once a year	1 (1.3)	1 (2)	1 (1.2)
Where had encounter with MORT			
North End	9 (11.3)	0 (0)	62 (73.8)
Mason Square	8 (10)	6 (11.8)	0
South End	5 (6.3)	0 (0)	8 (9.5)
Had ever referred anyone to MORT			
Yes	23 (28.8)	10 (19.6)	59 (70.2) $\chi^2 = 32.61, P < .0001$

DISCUSSION

The data presented in this article show clear differences in patterns of syringe access, use, and discard by neighborhood. The distinct patterns in how syringes are acquired, how they are used for drug consumption, and how they are discarded are associated with the distinct demographic and socioeconomic factors that characterize each neighborhood. Consequently, these findings have significant implications for localized outreach and prevention efforts at the neighborhood level.

The results of this research show that the Mason Square neighborhood is both more stable and more affluent than the North End. As other studies of African Americans in other cities have found,^{24,25} the predominantly black population in the Mason Square neighborhood is an older population that has lived in the same place for a greater length of time. They tend to have one trusted source from whom they acquire their syringes compared to the younger, more transitory, predominantly Latino users in the North End. With their relatively higher incomes, the older black population apparently prefers to stick to one reliable source for their syringes, even when it means that they may have to pay more than twice as much to acquire each syringe. Often, they have known these people since childhood. Conversely, the younger and poorer Latino population in the North End appears to do more hustling in seeking out syringe sellers with the lowest price, which consequently means putting themselves at higher risk in buying from sources who are less well known.

As these younger Latinos living in the North End are generally less likely to own their own home and more likely to live with other family members, their social structural situation leaves them little choice but to use public injection locales much more frequently than their black counterparts in the Mason Square neighborhood. Users from Mason Square are significantly more likely to inject alone in the security of their own residence rather than use public injection sites. Users from Mason

Square are also more likely to keep (or stash) their syringes in their own place, again most likely because their living situation better affords them the opportunity to do so than the younger, poorer users from the North End, who more often share a living space with other family members.

Furthermore, participants from the North End are much more likely to discard their syringe in public places, like alleys and dumpsters, than the participants from the Mason Square area. This is not too surprising since they are much more likely to be injecting in public places, and it is reflective of their unstable housing arrangements.

While direct links are difficult to demonstrate, the microcontextual factors that press toward riskier syringe access, use, and discard practices in the economically disadvantaged North End are reflected in current prevalence data that show that Latinos comprise 52% of all AIDS cases in Springfield, while African Americans comprise only 29%.

Finally, we found that IDUs in the North End are much more likely to have seen and used materials distributed by the Springfield Mobile Outreach Team than IDUs from Mason Square.

Based on the different patterns of access, use, and discard evident in each neighborhood, our conclusion is that different and more carefully tailored local outreach and prevention strategies are urgently needed. Currently, in Springfield, the major HIV outreach and prevention activities are based on distributing bleach kits in known injection locales. The problem with this approach is that it reaches those people who are the least likely to be able to use these materials (because of their public exposure, the threat of police surveillance, and the need to get in and out these outdoor public injection locales as quickly as possible) and fails to reach those whose living conditions afford them the greatest opportunity to put safe injection practices into use (namely, those who are injecting in their own homes in situations where they are less likely to be hassled and more likely to have the time to use safer injection practices, such as rinsing their syringe three times with bleach and then with water before and after each use). Hence, current efforts do not appear to be the most effective use of resources.

The data presented in this article point to the need for new and more creative outreach efforts. Because of the dearth of public injection locales in the predominantly black Mason Square neighborhood, African American IDUs in Springfield are much less likely to have encountered the MORT team. If IDUs living in identifiable neighborhoods do not use public injection locales, then relying virtually exclusively on leaving materials to clean injection works at public injection locales to prevent HIV transmission is not a particularly effective outreach strategy.

As one suggestion, a new generation of programs could enlist and train syringe sellers—quite commonly diabetics who are not users themselves, but elderly poor people seeking to earn extra money—to distribute bleach kits and educational materials, including testing and treatment referral information.⁴⁷ For a small stipend, they probably could be trained and enlisted as lay health workers.

Another more controversial suggestion would be to open safe havens for injection in neighborhoods where the current social structural conditions do not afford IDUs the opportunity to inject in private homes without fear of intrusion. These could be merely one room located off the main area of existing drop-in centers, which would then also provide the opportunity for additional educational and referral interactions.

Such experiments have already been initiated in Australia,⁴⁸ but clearly, at a

minimum, such operations would require at least the tacit cooperation of the local police department, perhaps an unlikely prospect given the hostile attitude of most government officials toward IDUs. The initiation of a visible, vibrant needle-exchange program and a change in policies regarding over-the-counter syringe sales at pharmacies are other more effective alternatives. Given that Springfield has the 11th highest AIDS rate in the nation, it is apparent that current efforts are not working.

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