

Drug Use and HIV Risks Among African-American, Mexican-American, and Puerto Rican Drug Injectors

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Abstract-*This article documents the prevalence of injection-related HIV risk behaviors among a sample of 758 Mexican- American, Puerto Rican, and African-American drug injectors derived from the National Institute on Drug Abuse Cooperative Agreement database. The results show that the two Hispanic subgroups had higher injection-related risks than the African- American group. Further, among Hispanics, Puerto Ricans had higher rates of drug injection than Mexican- Americans, but Mexican-Americans had higher rates of sharing injection paraphernalia than Puerto Ricans. The research suggests that more aggressive HIV/AIDS intervention efforts be targeted to minority injection drug users, especially those that are contextualized by the racial/ethnic group targeted.*

Keywords-*African-Americans, Hispanics, HIV/AIDS, injection drug use, Puerto Ricans*

Since the beginning of the HIV/AIDS epidemic, people of color have been disproportionately represented in reported AIDS case rates (Curran et al. 1988). This situation has not changed. Infact, for the year 1996-1997 people of color accounted for half of the total male adult/adolescent AIDS cases, three-fourths of the total female adult/ adolescent AIDS cases, and over 80 percent of the total pediatric AIDS cases (Centers for Disease Control 1997). In the transmission category of injection drug use, people of color (men and women) represented three-fourths of al AIDS cases during this same time period. Moreover, from 1989 through 1996 the percentage of AIDS cases attributed to injection drug use increased by over 120% for Hispanics and African-Americans. Clearly, among people of color, injection drug use will continue to be a major HIV transmission category well into the future, especially if aggressive HIV risk-reduction interventions are not specifically targeted to these groups now.

Several studies have characterized risk behaviors associated with HIV transmission among drug injectors (Estrada 1998; Koester, Booth & Zhang 1996; Montoya et al. 1996; Robles et al. 1996; Jose et al. 1993; Booth et al. 1991; Raymond 1988; Des Jarlais & Friedman 1987; Marmour et al. 1987; Ginzberg 1984). Briefly, these risk behaviors include the frequency of drug injection, the frequency and proportion of injection with used needles, the number of needle/syringe sharing partners, injection with specific drugs like heroin, cocaine, or cocaine and heroin mixtures (speedballs), and indirect sharing of drug injection equipment like cookers, cotton, and the rinse water. An issue that has not received as much research is how racial/ethnic groups differ with respect to these HIV risk behaviors and their relationship to HIV transmission and seroprevalence rates.

Estrada (1991) reported on the prevalence of HIV risk behaviors in the Southwest region of the U.S.; this study compared border-area Hispanics (those residing in Arizona, California and Texas), non border-area Hispanics, non-Hispanic whites, and African-Americans using the National AIDS Demonstration Research (NADR) national database (n=10,446). The findings indicated that border-area Hispanics were most likely to share needles with two or more persons (74%), followed by non-Hispanic whites (65%), African-Americans (59%) and non border-area Hispanics (58%). Border-area Hispanics were also less likely than African-Americans and non border-area Hispanics to have always used a clean needle. Moreover, border-area Hispanics was less likely to use bleach and water as a disinfectant than the other three groups. Using a composite

needle risk index, 76% of border-area Hispanics could be classified in the high-risk group compared to 63% of non border-area Hispanics, 62% of African-Americans, and 71% of non-Hispanic Whites. Similarly, using a sexual risk index, 11% of border-area Hispanics could be classified as high-risk compared to 13% of African-Americans, 17% of non-Hispanic Whites and 11% of non border-area Hispanics.

In another study examining HIV risk behaviors among people of color, Friedman and colleagues (1992) classified 19 NADR project cities into three groups: multicultural- African-American/ White/Puerto Rican (which included Hartford, Jersey City, Newark, New York, and Philadelphia); multicultural-African-American/White/Mexican-origin (which included Houston, Long Beach, San Antonio, San Francisco and Tucson); and biracial-African-American/ White (which included Cincinnati, Cleveland, Columbus, Dallas, Dayton, New Haven, New Orleans, Portland, Oregon and Washington, D.C.). The investigators found drug injection frequency to be highest among Puerto Ricans in the multicultural-African- American/White/Puerto Rican cities, and highest among Mexican-origin IDUs in multicultural-African-American/White/Mexican-origin cities. Additionally, Puerto Ricans were more likely to borrow used needles than others in the multicultural-African-American/White/Puerto Rican cities. Mexican-origin IDUs were also more likely to borrow used needles than others in multicultural-African-American/White/Mexican-origin cities. Moreover, Mexican-origin IDUs were less likely than others to use bleach or alcohol to disinfect needles. A study comparing African-American and Puerto Rican drug injectors using NIDA's Cooperative Agreement database also found higher rates of injection-related risks among Puerto Ricans than among African-Americans (Robles et al. 1996).

In research exclusively focused on Hispanics, several studies have noted a higher HIV seroprevalence among Puerto Ricans than among Mexican-Americans (Diaz et al. 1993; NIDA 1992; Selik et al. 1988). Additionally, these studies have shown that the predominant transmission category for Puerto Ricans is injection drug use, while the predominant transmission category for Mexican-Americans is male-to-male sex. In the southwestern United States (California, Arizona, Colorado, New Mexico and Texas) the percentage of Hispanic AIDS cases (the majority of whom are Mexican-American) attributed to injection drug use ranges from a low of 7% in California to a high of 13% in Arizona (COSSMHO 1991). Further, the highest rates for Hispanic AIDS cases attributed to the transmission category of injection drug use and male-male sex are in the southwestern United States. As Battles and colleagues (1989) note, introduction of HIV among IDUs in low-seroprevalence areas (like the Southwest) is enhanced by risky needle/syringe sharing practices by gay or bisexual drug injectors. Thus, if we find that Mexican-Americans have injection risk behaviors similar to those of Puerto Ricans, then the potential for increased rates of HIV infection among Mexican-Americans remains high, especially given the prevalence of bisexuality among Mexican-origin males (Carrier 1988). Nevertheless, this potential relationship is mitigated by the current low HIV seroprevalence rates in the Southwest. Aggressive intervention approaches targeted to high-risk groups like injection drug users- especially in low-HIV seroprevalence areas-have the potential to keep seroprevalence rates low and thereby curtail the HIV/AIDS epidemic in these areas (Des Jarlais et al. 1995).

The purpose of the present study is to examine several risk factors associated with injection drug use among a sample of Hispanic (differentiated by Mexican-American and Puerto Rican subgroups) and African-American drug injectors.

METHODS

Data for this study were derived from the National Institute on Drug Abuse's Cooperative Agreement database. This database contains information on out-of-treatment injection drug users (IDUs) and crack cocaine users recruited from 16 cities during the years 1991 to 1995 as part of a national HIV risk-reduction program. Sampling in each city was accomplished using targeted sampling procedures (Watters & Biernacki 1989). To be eligible, subjects had to be at least 18 years of age, could not have received drug abuse treatment in the last 30 days, must live or buy drugs in the targeted areas, and have reported use of injection drugs in the 30 days prior to the baseline interview and/or use of crack cocaine within the last 48 hours. Verification of drug use included visual inspection for signs of recent venipuncture in IDUs and/or urinalysis for crack smokers, using Abuscreen ONTRAK (Roche Diagnostic systems).

The sample size for the present study was 758, derived from a total database sample of over 10,000 IDUs and crack cocaine users. The sample was generated using the following selection criteria: subjects were African American, Mexican-American, or Puerto Rican; they had completed a baseline and follow-up interview; and they had completed NIDA's Standard Intervention (NIDA1992).

TABLE 1
Sociodemographic Characteristics: Race/Ethnicity (n=758)

	African-American	Mexican-American	Puerto Rican
Characteristic	(n = 542)	(n = 138)	(n = 78)
Gender			
Male	72.5%	73.9%	67.9%
Female	27.5%	26.1 %	32.1 %
Age*			
18-24	1.1%	8.0%	3.8%
25-34	15.7%	39.1%	39.7%
35-44	55.7%	40.6%	48.7%
45 +	27.5%	12.3%	7.7%
Education*			
<High school	41.0%	63.8%	62.8%
High school or more	59.0%	36.2%	37.2%
Income (monthly)*			
< 500	53.5%	58.7%	45.5%
500-999	28.7%	23.2%	26.0%
1000-1999	10.7%	11.6%	16.9%
2000+	7.0%	6.5%	11.7%
Employment Status*			
Unemployed	81.9%	73.9%	96.2%
Employed	18.1 %	26.1 %	3.8 %
Homeless			
No	73.2%	76.1%	72.7%

Yes	26.8%	23.9%	27.3%
Marital Status			
Single	43.5%	42.8%	38.5%
Married	21.6%	25.4%	19.2%
Divorced/widowed/separated	34.9%	31.9%	42.3%
Drug Subgroup			
IDU	16.2%	23.9%	15.4%
Crack user	0.9%	1.4%	0.0%
Both	82.7%	74.6%	84.6%

*p < .0001, using Chi-square test

The independent variable was membership in one of the three-racial/ethnic groups. The dependent variables included:

- the number of times injected common IV drugs (heroin, cocaine, and speedballs);
- the proportion of times used bleach to clean needles;
- the intensity of common IV drug injection as well as the intensity of injecting cocaine, heroin and speedballs (with intensity defined as the number of injections in the prior 30 days divided by the number of days injected in the prior 30 days);
- the number of times injected drugs;
- the number of times known to have used "works";
- the number of times used works without cleaning them;
- the number of times used supplies used by others;
- the number of times gave used works to others; and the proportion of times gave used works that had previously been used by others.

Methods of analysis include one-way analysis of variance (ANOVA), paired T-tests, and analysis of covariance (ANCOVA). Analysis of covariance was used to examine changes over time, controlling for the baseline measure and a categorical covariate derived from the frequency of injection variable.

The final sample of 758 included 542 African-Americans, 138 Mexican-Americans, and 78 Puerto Ricans. The sample consisted of 28% women and 72% men; 52% were between the ages of 35 and 44; 47% had less than a high school education; 43% had never been married; and almost one-fourth of the sample considered themselves homeless.

TABLE 2
Baseline (RBA) Needle Risk Behaviors Among Racial/Ethnic Groups

Risk Behavior	African-American X 95% Confidence	Mexican-American X 95% Confidence	Puerto Rican X 95% Confidence
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		Interval	Interval	Interval
Interval				
Times injected*	53.70 (48.5-58.8)	76.70 (57.9-95.6)	128.90 (99.1-158.6)	
Times know used used works*	5.20 (3.3-7.1)	19.20 (10.5-27.9)	5.70 (1.4-9.9)	
Times used works without cleaning	0.50 (.01-.98)	1.10 (-.06-2.2)	0.14 (-.02-.30)	
Times used supplies used by others**	11.50 (8.7-14.2)	23.80 (14.7-32.9)	27.30 (6.0-48.9)	
Times gave used works to others	3.70 (2.2-5.3)	7.80 (4.5-11.2)	5.40 (1.6-9.3)	
Times injected				
common IV drugs	56.00 (50.4-61.6)	77.80 (58.4-97.1)	133.90 (101.0-166.7)	
Intensity of cocaine injection*	1.20 (1.0-1.4)	2.60 (1.8-3.4)	1.60 (1.1-2.1)	
Intensity of heroin injection	1.40 (1.2-1.5)	1.50 (1.3-1.8)	2.40 (1.9-2.9)	
Intensity of speedball injection	0.72 (.62-.82)	0.87 (.63-1.1)	2.00 (1.4-2.5)	
Intensity of common IV drug injection*	2.10 (2.0-2.3)	2.70 (2.2-3.2)	3.30 (2.8-3.7)	
Proportion of time used bleach	0.49 (.42-.57)	0.35 (.24-.46)	0.46 (.25-.67)	
Proportion of time sharing*	0.10 (.08-.12)	0.25 (.18-.31)	0.07 (.02-.12)	

*p < .0001.

**p < .005, using F-test.

RESULTS

Sociodemographic characteristics were compared for the three groups and presented in Table 1. The racial/ethnic groups differed on three sociodemographic characteristics: age (with African-Americans generally being older than either of the two Hispanic groups); educational attainment (with African-Americans having a higher level of education than the two Hispanic groups); and employment status (with Mexican-Americans having higher rates of employment than the other two groups).

The prevalence of injection drug use and associated HIV risk behaviors ascertained at the baseline interview are presented in Table 2. The Risk Behavior Assessment (RBA) and the Risk Behavior Follow-up Assessment (RBFA) were used to ascertain HIV risk behaviors. Puerto Ricans had injected more times than Mexican-Americans and African-Americans, while Mexican-Americans had injected more times than African-Americans ($F=30.33$, $p<.0000$). Puerto

Ricans also injected more common IV drugs (heroin, cocaine, or speedball) than Mexican-Americans and African-Americans, while Mexican-Americans injected more common IV drugs than African-Americans ($F=28.08$, $p<.0000$). Puerto Ricans and Mexican-Americans more frequently used supplies previously used by others than African-Americans ($F=6.63$, $p<.005$).

TABLE 3
Pre- and Post-Test Comparisons of Needle Risk Behaviors for the Three Racial/Ethnic Groups

Risk Behavior	African-American RBA X RBFA X		Mexican-American RBA X RBFA X		Puerto Rican RBA X RBFA X	
Times injected drugs	53.70	31.80	76.70	47.10	128.90	81.40
Times know used used works	5.20	1.30	19.20	7.50	5.70	1.20
Times used works without cleaning	0.50	0.12	1.10	2.70	0.14	0.10
Times used supplies used by others	11.50	4.50	23.80	12.70	27.30	12.00
Times gave used works to others	3.70	1.30	7.80	6.70	5.40	0.73
Times injected common IV drugs	56.20	33.10	77.80	43.80	134.80	79.80
Proportion of times used bleach	0.60	0.69	0.32	0.35	0.62	0.50
Proportion of times sharing needles	0.09	0.06	0.24	0.20	0.06	0.05
Intensity of common IV drug injection	2.12	0.62	2.70	0.84	3.30	1.10
Intensity of cocaine injection	1.20	0.57	2.60	0.85	1.60	0.99
Intensity of heroin injection	1.40	0.90	1.50	1.20	2.40	1.10
Intensity of speedball injection	0.72	0.57	0.87	0.79	2.00	1.40

Regarding intensity of drug injection, Puerto Ricans were significantly more likely to inject heroin and speedballs on a daily basis than Mexican-Americans or African-Americans ($F=14.57$, $p<.0000$ and $F=27.53$, $p<.0000$, respectively). However, Mexican-Americans were significantly more likely to inject cocaine on a daily basis than either Puerto Ricans or African-Americans ($F=13.96$, $p<.0000$).

In terms of HIV risks associated with sharing of injection equipment, Mexican-Americans were found to have knowingly used works that had been previously used by others with significantly greater frequency than either Puerto Ricans or African-Americans ($F=12.24$, $p<.0000$ and $F=16.52$, $p<.000$, respectively). Both Puerto Ricans and Mexican-Americans used supplies that had been used by others more frequently than African-Americans had ($F=6.63$, $p<.005$).

There were no significant differences found between the three groups at baseline related to the number of times they used works without cleaning them, the number of times they gave used works to others, or the proportion of times they used bleach to clean needles. It is worth noting that African-Americans used bleach 49% of the time, Puerto Ricans used bleach 46% of the time, while Mexican-Americans used bleach only 35% of the time.

An important issue regarding HIV risk reduction is whether the desired change was produced after the intervention. An examination of this issue was accomplished by performing a series of paired T-tests for each of the racial/ethnic groups. Table 3 presents the results of this analysis. For African-American IDUs, there were significant reductions in all but two areas—the number of times used works without cleaning them, and the proportion of times used bleach—but almost all changes were in the desired direction. Among Mexican-Americans, significant reductions were observed in all areas except for the intensity of heroin and speedball injection, the proportion of times used bleach, the proportion of times using used needles, the number of times used works without cleaning them, and the number of times gave used works to others. Although most changes were in the desired direction, they were not statistically significant. Puerto Ricans also change their injection risk behaviors in the desired direction, though no significant pre/post-intervention differences were found for the proportion of times used bleach, the proportion of times using used works, the number of times used works without cleaning them, or the number of times used supplies that had been used by others.

While the previous results are sufficient to detect behavior change within each of the racial/ethnic groups, another issue related to intervention efficacy is whether the groups differ in post-intervention risk behaviors after controlling for their baseline risk behaviors. Further, two important questions are if there is a significant relationship between race/ethnicity and level of HIV risk (defined as the frequency of drug injection at baseline), and do race/ethnicity and level of risk exert major effects on behavior change? The answers to these questions may impact the success of the intervention delivered, and may suggest that interventions should target specific types of injection risk behaviors and/or be delivered in a culturally appropriate manner specific to the subgroups targeted.

For each of the dependent post-intervention measures an ANCOVA (analysis of covariance) was produced controlling for the comparable baseline measure and employing race/ethnicity (Puerto Rican, Mexican-American, African-American) and frequency of injection (divided into low, moderate, and high risk) as covariates (data not shown). Significant main effects were found for race/ethnicity and the proportion of times used bleach, the proportion of times using used works, the number of times knowingly used works, the number of times used works without cleaning, the number of times used supplies used by others, and the number of times gave used works to others. Significant main effects were found for level of risk and frequency of injecting common

IV drugs, intensity of cocaine use, intensity of speedball use, intensity of common IV drug use, frequency of knowingly using used works, frequency of using used works without cleaning them, frequency of using supplies used by others, and the frequency of giving used works to others. Significant racial/ethnic and HIV risk interactions were found for the proportion of times using used works, the frequency of knowingly using used works, frequency of using used works without cleaning them, and the frequency of giving used works to others.

DISCUSSION

As with most research on "hidden populations" the sample of injection drug users analysed here may not be truly representative of the universe of injection drug users. Estimates of the total number of out-of-treatment drug injectors used in the present analyses was derived from a national database which included 16 different cities that had consistently employed the same standardized intervention and similar recruitment procedures.

Another issue is whether this sample of standard intervention completors is significantly different from those minorities IDUs who did not complete the standard intervention. In comparing the two groups (completors versus noncompletors), it was found that noncompletors had significantly greater HIV risk behaviors related to frequency of injection, intensity of drug injection, and giving used works to others. Additionally, when this comparison was conducted within each of the racial/ethnic groups, similar variances in risk behavior were found for African- Americans and Puerto Ricans, but not for Mexican-Americans. Given these results, it can be concluded that the sample of African-American and Puerto Rican drug injectors who completed the standard intervention are different in important ways related to injection risk behaviors from their counterparts who did not complete the standard intervention. However, the Mexican-American completor sample appears to be no different from Mexican-Americans who did not complete the standard intervention.

The above caveats notwithstanding, three major findings emerged from this study. First, subgroup racial ethnic differences were observed, with Puerto Ricans generally exhibiting greater HIV risk behaviors related to injection frequency than either Mexican-Americans or African- Americans. Puerto Ricans also tended to inject more common drugs like heroin, cocaine and speedballs than the other two groups. Mexican-Americans were more likely to share (receive and give) injection equipment, and less likely to clean injection equipment prior to or after its use. African- American drug injectors consistently reported fewer injection risk behaviors than either of the Hispanic subgroups. The data suggest that Puerto Rican and Mexican- American IDUs have similar patterns of risk engagement, but that these risks may be more closely linked to their drug using social networks than is true for African- Americans.

Second, it was found that although there was significant risk reduction in most measures of injection risk, the rate of decrease varied within each racial/ethnic group. Additionally, the level of risk associated with each of the behaviors examined remained highest in those groups that were initially high at baseline.

Third, when the authors controlled for baseline risk level of risk, measures and introduced main effects for race/ethnicity, risk, there were still significant differences observed for some of the post-intervention measures.

Taken together, the findings indicate that there are varying levels of risk for each of the three racial/ethnic groups examined at baseline, and that this impacts the level or risk after exposure to an HIV risk-reduction intervention.

The fact that Puerto Ricans had higher prevalence rates of certain types of injection risk behaviors than the other groups both at baseline and follow-up, and the fact that Mexican-Americans also had higher prevalence rates of certain needle risk behaviors than African-Americans, and that both facts appear to be related to injection frequency, suggests that more intensive efforts are needed within both Hispanic subgroups that specifically target the most prevalent risk behaviors in each. African-American drug injectors, in comparison to their Hispanic counterparts, appear to be at lowest risk given the prevalence shown in both baseline and follow-up risk measures. It could also be concluded that African-Americans have better outcomes as a result of the standard intervention than Mexican-Americans or Puerto Ricans. Alternatively, it may not be ethnicity per se, but rather the degree of risk that one brings to the intervention that determines the degree and extent of behavior change, irrespective of race/ethnicity. This would suggest that special "culturally appropriate" interventions may be warranted, especially those that aggressively target specific types of risk behaviors associated with particular racial/ethnic groups, and that they may be more cost-effective and efficient in reducing HIV needle risks among minority IDUs.

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