#1028

Analyzing Trends in HIV Risks for Injection Drug Users by Respondent Driven Sampling

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ABSTRACT

Background: The National HIV Behavioral Surveillance program (NHBS) is a structured interview project conducted in high-risk populations utilizing respondent-driven sampling. We analyzed three cycles of NHBS data among Injection Drug Users (IDUs) to determine predictors of sharing injection equipment among IDUs and to evaluate trends to illuminate both past successes and future potential means to reduce HIV incidence among IDUs.
Methods: Sharing any injection equipment in the past 12 months was the primary outcome. Data were weighted based on respondent's injection network size. A multivariate logistic regression model was constructed using predictors which were found to be significant in cycle specific models plus a variable for time. Additionally, a Cochran-Armitage test for trend was performed to determine significant changes in sharing behaviors over time.
Results: 483, 525, and 552 participants were interviewed in cycles 1-3, respectively. There was no statistically significant trend over time with 47.6%, 64.4% and 54.4% of participants reporting any sharing in the last 12 months. Tests for trends showed that sharing increased significantly in IDUs age 18-34 years (p=0.018), females (p=0.004) and those who obtained their needles from a dealer only (p<0.001). In the final multivariate logistic regression, blacks (OR 0.39, 95%CI: 0.30-0.51) and Latinos (OR 0.64, 95%CI: 0.44-0.92) were significantly less likely to share compared to whites. IDU that used a Needle Exchange Program were less likely to share than IDU whose source of needles were a dealer or multiple sources (p<.0001). Year, education and primary injection drug were also found to be significant predictors of sharing.
Conclusions: Further increasing the utilization of NEPs in persons of all races, females and IDU age 18-34 may reduce the likelihood of sharing any injection equipment and may help to further decrease HIV transmission. Surprisingly, we did not observe a declining trend in the sharing of injection equipment in IDU despite a decline in HIV incidence over the course of the NHBS cycles. Further analysis should focus on barriers to the use of NEPs and other risk behaviors that may influence HIV transmission among IDUs.

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INTRODUCTION

- In Philadelphia, nearly 30% of all HIV infections have occurred among injection drug users (IDU) and an additional 3.6% among MSM/IDU[1]
- Since 2006, there has been an 80% decrease of new HIV cases among IDUs in Philadelphia. By 2013, IDUs made up only 5% of new HIV cases in Philadelphia[1]
- National HIV Behavioral Surveillance (NHBS) utilizes Respondent Driven Sampling to collect risk behavior and HIV testing data on IDUs
- Data was collected by the Philadelphia Department of Public Health during the summers of 2005, 2009, and 2012 at field sites (storefronts, vans, RVs, etc.) strategically placed throughout the city

OBJECTIVES

- Utilize NHBS-IDU data to assess sharing behavior trends over time. Analysis of trends over time may lead to a better understanding of causes for the decrease in HIV incidence among IDUs since 2006.
- Identify barriers to the use of Needle Exchange Programs (NEPs) which may help inform community prevention efforts and further decrease HIV transmission among IDUs in Philadelphia and elsewhere.

Table 1. Demographics

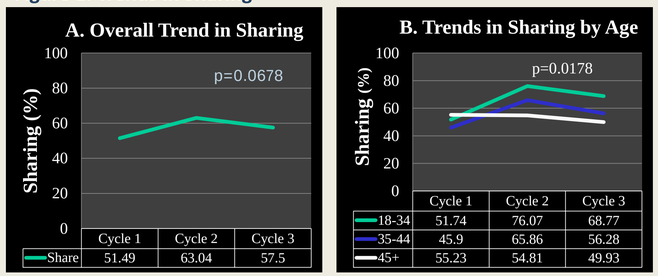
	2005	2009	2012
Variable	**Weighted %**	**Weighted %**	**Weighted %**
Age			
18-34	25.41	26.99	29.71
35-44	31.62	32.88	26.9
45+	42.96	40.12	43.4
Gender			
Female	32.64	34.42	33.98
Male	65.36	62.58	66.02
Ethnicity*			
White	28.61	44.87	57.1
Black	62.73	42.73	27.63
Latino	8.66	12.39	15.26
Education			
< HS	42.16	33.02	33.56
≥HS	57.84	66.98	66.44
Primary Drug*			
Heroin	53.16	90.03	74.41
Cocaine	16.00	3.33	6.89
Speedball	30.84	6.65	18.70
Share Any Works	47.57	64.35	54.43
Source of Needle*			
Exchange Program	29.01	13.83	15.64
Dealer	6.68	11.75	7.7
Multiple	42.99	66.49	68.22
Other	21.32	7.93	8.45

*Significant change (p ≤ 0.05) in distribution across cycles

METHODS AND MATERIALS

- Sharing any injection equipment—including needles, water, cotton, or any works—in the past 12 months was the outcome of interest
- Weights were calculated in RDSAT using injection network sizes and referral chains to determine population proportions for variables of interest. Predictor variables included race/ethnicity, age, education (< or ≥ high school), primary injection drug (heroin, cocaine or both), insurance status, use of non-injection drugs in the past 12 months, needle source (only needle exchange program (NEP), only dealer, multiple or other), self-reported HIV status, contact with a health care provider in the past 12 months, and enrollment in a drug treatment program in the past 12 months
- Weight values for the primary outcome of sharing were trimmed to a maximum ratio of 10:1 between the highest and lowest weight[2] (Table 1)
- Cochran-Armitage test of trends was used to assess the presence of an association between predictor variables and time
- Univariate analysis was conducted on potential predictors of sharing any injection equipment. Multivariate logistic regression models were constructed for each cycle individually
- All three cycles were combined into one dataset with a new time variable
- A multivariate logistic regression model of the combined dataset was constructed using predictors which were found to be significant at the p ≤0.05 level in all three cycles

Figure 1. Trends in Sharing



RESULTS

- There was a significant change in the weighted distribution of ethnicity, primary drug, and source of needle across the three cycles (Table 1)
- Surprisingly, despite a significant decrease in HIV incidence over time, overall sharing of any injection works has not changed significantly during the first three cycles of NHBS-IDU (p=0.0678) (Figure 1A)
- Analysis of subgroups show that there has been a significant increase in sharing among 18-34 year olds (p=0.0178) and women (p=0.0041) between 2005 and 2012 (Figure 1B&C)
- Whites shared more often than Latinos and blacks across all three cycles, although no trend was present (Figure 1D)
- Year, Race/Ethnicity, education, primary injection drug, and source of needle are significant predictors of sharing in the full logistic regression (Table 2)
- Although minorities bare a larger burden of HIV infection, they engage in risk behaviors less frequently (Figure 1D; Table 2)
- NEP clients were significantly less likely to share injection equipment compared to IDU who obtained their needles from another source (Table 2)

Table 2. Significant Predictors of Sharing†

	Weighted Total (%)	AOR (95%CI)	p
Year ‡			
2005	30.9	1.0	
2009	33.6	1.32(0.99-1.76)	0.0595
2012	35.5	0.90(0.68-1.19)	0.4574
Ethnicity**			
White	39.1	1.0	
Black	49.2	0.39(0.30-0.51)	<.0001
Latino	11.7	0.64(0.44-0.92)	0.0164
Education**			
<HS	36.0	1.0	
≥HS	64.0	0.64(0.51-0.81)	<0.0001
Primary Drug**			
Heroin	73.3	1.0	
Cocaine	7.5	0.93(0.61-1.42)	0.7501
Speedball	19.2	1.43(1.07-1.90)	0.0151
Source**			
NEP	18.3	1.0	
Dealer	9.3	1.64(1.07-2.51)	0.0235
Multiple	61.7	1.98(1.48-2.65)	<0.0001
Other	10.7	0.87(0.58-1.31)	0.5117

†Age, gender, insurance status, HIV status, contact with a health care provider in the past 12 months, and enrollment in a drug treatment program in the past 12 months were all analyzed but not included in the full model because they were found to be insignificant in at least one cycle
‡Overall effect of year was significant at p ≤ 0.05 level
**Significant at p ≤ 0.05 level in cycle specific models and in full model

LIMITATIONS

- Data collected in 2005 is limited due to a robbery interrupting data collection and cutting short some referral chains
- No HIV testing was completed in the 2005 cycle so HIV prevalence could not be evaluated as part of the model

CONCLUSIONS

- As the demographics of the Philadelphia IDU population shift, so too must risk-reduction strategies
- Race plays an important role in use of NEPs and sharing practices, with blacks and Latinos accessing NEPs less frequently than whites while also sharing injection equipment less frequently than whites
- Further increasing the utilization of NEPs in persons of all races, females and IDU age 18-34 may reduce the likelihood of sharing any injection equipment and may help to further decrease HIV transmission
- Source of needles is an important predictor of sharing; NEPs reduce the likelihood of sharing any injection equipment
- Geo-Racial analysis may shed light on how to maximize the impact of NEPs
- Future research should focus on the race specific predictors of needle source choice, and completion of a multi-site NHBS analysis for increased generalizability of results

REFERENCES

1. AIDS Activities Coordinating Office (AACO) Surveillance Report, 2013.
2. Potter, F.J. (1993). The Effect of Weight Trimming on Nonlinear Survey Estimates. Proceedings of the American Statistical Association, Section on Survey Research Methods, 758.763.