

Predicting Substance Abuse among Youth with, or at High Risk for, HIV

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Abstract

This paper examines data from 4,111 young men and 4,085 young women participating in 10 HIV/AIDS service demonstration projects. The sample was diverse in age, gender, ethnicity, HIV status, and risk for HIV transmission. Logistic regression was used to determine the attributes that best predict substance abuse. Men who were younger, were HIV-positive, were homeless, were criminal justice system-involved, had a sexually transmitted disease (STD), engaged in survival sex, and participated in risky sex with men, women, and drug injectors were most likely to have a substance abuse history. For young women, the same predictors were significant, with the exception of STD. Odds ratios as high as 6-to-1 were associated with the predictors. Information about sexual and other risk factors is also highly predictive of substance abuse issues among youth.

Predicting Substance Abuse among Youth with, or at High Risk for, HIV

Substance abuse is a major issue for many young people who are living with, or at high risk for, HIV. Much of the literature in this area focuses on substance abuse as a risk factor for HIV infection among young adults (e.g., Edlin, Irwin, & Farvoue, 1994; Elifson, Boles, & Sweat, 1993; Hou & Basen-Engquist, 1997). For example, research has examined the effects of adolescent drug use on the likelihood of participation in risky sexual behaviors such as condom non-use (Hingson, Strunin, & Berlin, et al., 1990; King, Delaronde, Dinoi, & Forsberg, 1996; Shrier, Emans, Woods, & DuRant, 1997) and multiple partners. Rates of injection drug use and needle sharing are especially high among youth living on the streets, thereby putting them at particularly high risk for HIV infection (Kipke, Unger, Palmer, & Edgington, 1996). In general, substance abuse has been shown to be a key factor in health-related risk for youth (Brindis, Wolfe, McCartner, & Ball, 1995).

Less attention, however, has been paid to the issue of how being at risk for HIV impacts the prediction of substance abuse in youth. In the healthcare service system, a young person's substance abuse history may not be fully identified, especially when he or she first presents for care (e.g., Fendrich & Xu, 1994; Rogers & Kelly, 1997), and self-reports of substance abuse behaviors may be relatively unreliable among youth (e.g., Fendrich & Mackesy-Amiti, 1995). Underreporting of substance abuse involvement may be especially prevalent among youth of color (Kipke, Montgomery, Simon, & Iverson, 1997).

Just as many factors – such as unprotected sexual behaviors and substance abuse – place an individual at increased risk for HIV infection, many of those same issues are part of a generalized constellation of problem behaviors that place a youth at risk for substance abuse

(Brook, Cohen, Whiteman, & Gordon, 1992; Glantz, 1992). Adolescent substance abuse may reflect underlying psychosocial issues, such as low self-esteem, poor family relationships, and poor academic performance (Clayton, 1992). Other factors in a multiple risk factor model of substance abuse include being from an ethnic-racial (e.g., Stiffman & Davis, 1990; Scheier, Botvin, Diaz, & Ifill-Williams, 1997) or sexual minority (e.g., Rosario, Hunter, & Gwadz, 1997; Winters, Remafedi, & Chan, 1996), being homeless or a runaway (e.g., Kipke et al., 1997), having been involved with the criminal justice system (e.g., Latimer, Winters, & Stinchfield, 1997), and having mental illness (e.g., Piazza, 1996). In a multiple risk factor model of substance abuse (Thomas & Schandler, 1996), no single specific influence can be said to “cause” substance abuse; rather, these factors combine to produce a generalized susceptibility to substance abuse.

In this paper, we examine the characteristics of youth served in 10 national demonstration projects on HIV/AIDS services for youth and ask which behaviors and other characteristics predict a history of substance abuse.¹ Because substance abuse will significantly impact the service usage patterns for these youth (Huba, Melchior, Panter, Feudo, Schneir, Trevithick, Wright, Martinez, Woods, Sturdevant, Remafedi, Greenberg, Tierney, Wallace, Goodman, Tenner, Marconi, Brady, & Singer, under review), it is important for youth service providers to be able to identify those youth who are likely to have a history of substance abuse so that appropriate services may be tailored to their needs. Such tailoring may be more subtle and sophisticated than simply referring a young person to a substance abuse program; youth with a history of substance abuse or active substance abuse may need special social supports to either help them refrain from high risk for HIV transmission behaviors or to adhere to treatments for HIV, if they are identified as having contracted the disease. Similarly, youth living with, or at risk for HIV infection, who also have concomitant addiction issues have distinctive needs that

will need to be addressed or accommodated in substance abuse treatment (Center for Substance Abuse Treatment, 1999; Reulbach, 1991).

Method

Cross-cutting evaluation instruments and design. As part of their involvement as grantees, 10 projects agreed to participate in a cross-cutting evaluation of their activities.² The cross-cutting evaluation includes five single-page forms, four of which are administered to track activities of individual clients (Huba, Melchior, Panter, Brief, Lee, Hodgins, Woods, Kipke, Feudo, Vining-Bethea, Lothrop, Wallace, Sturdevant, Remafedi, Greenberg, Burch, Tenner, Singer, Brady, & Marconi, 1997a, b, c). These forms utilize a fax-in system that allows data to be transmitted via fax from project sites in the field to a central data computer (Huba, Brown, & Melchior, 1995; Huba & Melchior, 1995). The data presented in this paper were collected using the Contact Form (Huba, Melchior, & the HRSA SPNS Program Adolescent Care Projects, 1994). Contact Forms were used to document the characteristics of individuals reached by the adolescent care projects, including patterns of HIV risk behaviors. The forms were completed in the context of outreach, program enrollment, or to change or update information previously documented for individuals served by the projects. The Contact Form codes a variety of information about the individual, as well as information about the contact itself, such as the date and length of the contact, reason for the contact, location, topics discussed, items provided during the contact, and service referrals made. Demographic information collected includes gender, age, ethnicity, and highest grade completed. Note that because many youth in the project catchment areas identify themselves as multi-racial, the Contact Form permitted multiple ethnicities to be indicated. Self-identified sexual orientation was coded, in addition to specific sexual behaviors related to HIV risk. A set of 12 HIV-related “behaviors” was coded using a

system in which it was noted if the youth was known to have engaged in the behavior in the last 30 days, prior to the last 30 days, or never. Behaviors coded in this way included having sex with males, unprotected sex with males, sex with females, unprotected sex with females, sex with an injection drug user, survival sex, sex with an HIV-positive partner, a sexually transmitted disease, a substance abuse history, an injection drug use history, and needle sharing. Note that substance abuse was broadly defined, and it was not possible to identify specific types of abuse (e.g., alcohol as opposed to other drugs). Furthermore, a set of ten additional characteristics were dummy-coded (dichotomously) if they were known to characterize the young person, including whether he or she was homeless, a runaway, involved in the criminal justice system, involved in the mental health service system, transgendered, pregnant, a hemophiliac, in secondary school, in college, or had “partner issues” that included any therapeutic issue (broadly defined) related to a sexual partner. These indicators were coded for their potential relevance to risk for HIV infection, transmission, and related issues. In completing the Contact Form, data collectors (program staff) were instructed to use their best clinical judgement in coding an individual’s risk behaviors.³

Participants. The data for these analyses were collected between December 1993 and March 1998. Analyses are based on data from 4,111 males and 4,085 females contacted by the 10 projects for whom complete data on the predictors were available. The males included 370 individuals known to be HIV-positive and 3,741 young men of unknown HIV status. The females included 157 young women known to be HIV-positive and 3,928 young women of unknown HIV status. Men tended to be older (mean = 19.1 years; standard deviation = 3.0 years) than women (mean = 18.4 years; standard deviation = 2.8 years), ($t(8194) = 10.06$; $p < .001$). Of the young men, 36.9 percent were African American, 3.3 percent were Asian American, 26.8

percent were Caucasian, 26.7 percent were Hispanic/Latino, 1.0 percent were Native American, 2.7 percent were multiracial, and 2.7 percent had an “other” or unknown ethnicity. Of the young women, 32.6 percent were African American, 3.7 percent were Asian American, 28.9 percent were Caucasian, 27.2 percent were Hispanic/Latina, 1.0 percent were Native American, 3.4 percent were multiracial, and 3.1 percent had an “other” or unknown ethnicity.⁴

Measurement of HIV-related behaviors. Eight behavioral indicators were created from the Contact Form data. Sexual behaviors were coded into two indicators: Risky Sex with Men and Risky Sex with Women. Both indicators were derived from a combination of information as to whether and how recently the individual had engaged in sex and whether and how recently he or she had engaged in unprotected sex. Other HIV-related behaviors and markers included Sex with an Injection Drug User (IDU), Survival Sex, Sex with an HIV-Positive Partner, Having a Sexually Transmitted Disease (STD), and Substance Abuse. Each of these indicators was coded dichotomously, where a value of 1 indicated the risk was present and 0 if it was not known to be present.

It should be noted that in assessing the youth’s substance abuse history, it was not possible to obtain a detailed history in the context of the initial contact or enrollment when these data were collected. Two major caveats should be noted in the data concerning substance abuse history. First, the extent of substance abuse behaviors (substance abuse in general, injection drug use, and needle sharing) may have been underreported. Often in the course of working with this population, substance abuse may not be discovered by program staff or disclosed by the young person early in the course of his or her involvement with the program and, thus, may not be fully captured in the Contact Form data. In addition, because of time constraints during the initial contact, very limited substance abuse history data were available and information about the use

of specific drugs (e.g., heroin, cocaine, amphetamines), the route of administration of specific drugs (that is, it was known only whether the individual has injected drugs, but not which drugs), the frequency of substance abuse, the age of onset, or other similar indicators of interest were not available in this data set. In this study, substance abuse risk was coded as present if the youth was observed or reported to have ever abused alcohol or other drugs. It was not possible to separate alcohol from other drug abuse in these data. A total of 43.7 percent of the males and 34.5 percent of the females had drug history coded. Note that 18.2 percent of the male drug abusers and 17.7 percent of the female drug abusers were also known injection drug users.

Data Analytic Approach

To determine the contribution of various sets of variables to the prediction of substance abuse history, logistic regression analyses were performed. Logistic regression assesses how well independent variables (e.g., HIV status, homelessness, runaway) predict a dichotomous dependent measure, which in the case used here was a dichotomously-coded variable of whether or not the client had a history of substance abuse. Analyses were conducted using SPSS for Windows, Version 8.0.

Results

Table 1 shows the relationship of HIV status, as well as the behavioral indices to whether the youth were known to have history of substance abuse. As can be seen in Table 1, in nearly every case, these indices differentiated youth with a history of substance abuse from those who did not have substance abuse coded. For all indicators (except for mental health system involvement among young women), youth who were known to have a history of substance abuse had a higher rate of the problem or behavior than youth who were not known to be substance abusers.

 Insert Table 1 About Here

Predicting substance abuse. We conducted – separately for young men and young women – logistic regression analyses in which the dependent measure was whether or not the client was identified as having had a past or current history of substance abuse. We used six risk behaviors as predictors (risky sex with men, risky sex with women, sex with an injection drug user, survival sex, sex with an HIV-positive partner, and sexually transmitted diseases) and four additional client characteristics (being a runaway youth, homelessness, involvement with the criminal justice system, and involvement with the mental health system), as well as HIV status, age, and ethnicity. All predictors were entered into the regression simultaneously. Table 2 summarizes the results.

 Insert Table 2 About Here

The logistic regression models were statistically significant for males ($\chi^2(18, N = 4,111) = 736.78, p < .001$) and for females ($\chi^2(18, N = 4,085) = 822.90, p < .001$). In a prediction sense, 43.3 percent of the substance using young men were correctly identified using the prediction equation (or odds ratios) implied by Table 2, and 86.6 percent of the non-substance using young men were correctly identified. Similarly, 37.1 percent of the substance using young women were correctly identified, and 93.7 percent of the non-substance using young women were correctly identified from the factors. Thus, a weighting scheme based on the characteristics used as

independent variables in the analyses of Table 2 may prove to be useful in screening youth entering services for substance abuse.

Discussion

The present findings indicate that among HIV-positive and at-risk youth recruited to be in these projects because they would have a high likelihood of testing positive for HIV, several noteworthy characteristics are predictive of substance abuse. Youth who were HIV-positive, younger, Hispanic, or multi-racial were more likely to have a substance abuse problem. Among the young women, those who were Native American were also more likely to be substance abusers. In terms of other related risk behaviors, both young men and women who were noted to have risky sex with men, risky sex with women, sex with an injection drug user, survival sex, or those who were homeless or involved in the criminal justice system were more likely to also be substance abusers. Among the men, those with a history of a sexually transmitted disease and having an HIV-positive sex partner were also more likely to be substance abusers, as were young women who were not involved with the mental health service system.

In examining the odds ratios from these analyses, some interesting patterns emerged by gender. Among the young men, the greatest differentiation of substance abusers from non-users was predicted by involvement in the criminal justice system (CJS), with CJS-involved young men 3.75 times more likely to be substance abusers than non-CJS involved men. In addition, young men who were sex partners of injection drug users were about three and a half times more likely to be substance abusers themselves compared to those who were not identified as sex partners of injection drug users. Among young women, however, the risk behaviors most associated with substance abuse were survival sex and sex with an injection drug user. Young women who were involved in survival sex were more than six times as likely to be identified as

substance abusers as compared to women not known to be engaging in survival sex, and those who were sex partners of IDUs were more than four times as likely to be substance abusers than women who were not known to be sex partners.

The results of this study may prove useful in that it may be desirable to screen for youth who are likely to present substance abuse issues when they are seeking HIV services (e.g., Mason & Adger, 1997). Although the measures of substance abuse in this study are somewhat limited and brief, they are typical of the kind and level of information available from young people at the time they are enrolling in community-based services, such as those represented by the 10 adolescent care projects. By screening for potential substance abuse issues among youth entering care for HIV or related health issues, appropriate interventions and/or referrals may be targeted to the young people who may be most in need of those services. Reserving more time-consuming, detailed assessments for those youth most likely to have concomitant substance abuse problems may improve the efficiency with which services are delivered to HIV-positive and at-risk youth and preserve limited staff resources for other important issues. Although there is no substitute for a direct dialog with youthful clients about substance abuse, the ability to predict the likelihood of addictive behavior from other related psychosocial indicators may provide a useful guide to identifying such issues. As youth may not always disclose their substance abuse initially, the presence of these other factors may be useful in suggesting directions for further assessment and exploration.

It is important to remember that these data come from a population of youth identified as likely to have acquired HIV. Within such a group, substance abuse history is predictable from many of the indicators that make the clients likely to have HIV.

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Footnotes

¹ The HRSA SPNS Program National Demonstration for Adolescent Care Projects. This investigation uses data from a large sample of youth who participated in a special group of projects targeted to individuals infected with, or at high risk for, HIV. Through its Special Projects of National Significance (SPNS) Program, the Health Resources and Services Administration (HRSA) funds national demonstration projects for HIV/AIDS services. The intent of this national demonstration program is to develop innovative, validated service models for HIV/AIDS care that can be adapted and applied in a number of settings. In 1993, HRSA awarded 10 grants to projects targeting HIV/AIDS services to adolescents and youth. These 10 projects were relatively heterogenous but shared their target populations, specifically, adolescents and youth who were either already infected with HIV or at high risk to become so, and their aim of building programs with the potential for wide replication throughout the United States. A cross-cutting evaluation (see Huba & Melchior, 1998) tracked the characteristics of the programs and their outcomes. Descriptions of the service models for the 10 adolescent care projects are given in a special issue of the Journal of Adolescent Health (see Huba & Melchior, 1998; Woods, 1998). The adolescent care projects include those at: Bay Area Young Positives (San Francisco, California), Boston HAPPENS/Children's Hospital Boston (Boston, Massachusetts), Childrens Hospital Los Angeles (Los Angeles, California), the Greater Bridgeport Adolescent Pregnancy Project (Bridgeport, Connecticut), Health Initiatives for Youth (San Francisco, California), the Indiana Department of Health (Statewide throughout Indiana), the University of Alabama at Birmingham (Birmingham, Alabama), the University of Minnesota Youth and AIDS Projects (Statewide throughout Minnesota), Walden House (San Francisco, California), and YouthCare (Seattle, Washington).

² The cross-cutting evaluation was coordinated by The Measurement Group and was developed in collaboration with the 10 adolescent care projects and HRSA. These forms are available in various reports on these projects (Huba et al., 1997a, b, c) and are also available on the Internet at www.themeasurementgroup.com/adolspns/adolspns.htm along with full instructions for use.

³ Human Subjects Protection Committees at each site determined if informed consent for participation in the evaluation was required, or if the data were collected as part of the usual quality improvement process, and hence exempt. All data collection at all sites was voluntary for clients and providers and, as a result, these data do have certain non-random patterns of missing observations.

⁴ Note that because many outreach contacts are brief and relatively anonymous, it was not always possible for project staff to obtain unique identifier information about the youth contacted; thus, the number of unique individuals may over- or under-represent the actual number of unduplicated youth in the sample.

Table 1

Characteristics by Gender and History of Substance Abuse

	Percent of Males		Percent of Females	
	No history of substance abuse (N = 2,316)	History of substance abuse (N = 1,795)	No history of substance abuse (N = 2,674)	History of substance abuse (N = 1,411)
HIV status				
Unknown	92.7%	88.7%	97.0%	94.5%
Positive	7.3%	11.3%	3.0%	5.5%
	$\chi^2(1, N=4,111)=19.75, p<.001$		$\chi^2(1, N=4,085)=16.55, p<.001$	
Risky sex with men				
No known risk	78.6%	70.5%	24.0%	11.1%
Prior or current risk	21.4%	29.5%	76.0%	88.9%
	$\chi^2(1, N=4,111)=35.92, p<.001$		$\chi^2(1, N=4,085)=96.95, p<.001$	
Risky sex with women				
No known risk	37.4%	20.2%	90.1%	74.3%
Prior or current risk	62.6%	79.8%	9.9%	25.7%
	$\chi^2(1, N=4,111)=142.24, p<.001$		$\chi^2(1, N=4,085)=178.67, p<.001$	
Sex with injection drug user				
No known risk	98.7%	85.9%	97.6%	82.6%
Prior or current risk	2.2%	14.1%	2.4%	17.4%
	$\chi^2(1, N=4,111)=208.86, p<.001$		$\chi^2(1, N=4,085)=297.96, p<.001$	
Survival sex				
No known risk	96.9%	86.1%	98.1%	78.7%
Prior or current risk	3.1%	13.9%	1.9%	21.3%
	$\chi^2(1, N=4,111)=164.51, p<.001$		$\chi^2(1, N=4,085)=442.60, p<.001$	
Sex with an HIV-positive partner				
No known risk	94.3%	87.5%	97.5%	92.3%
Prior or current risk	5.7%	12.5%	2.5%	7.7%
	$\chi^2(1, N=4,111)=59.58, p<.001$		$\chi^2(1, N=4,085)=60.91, p<.001$	

(Table continues)

Table 1

Characteristics by Gender and History of Substance Abuse

	Percent of Males		Percent of Females	
	No history of substance abuse (<u>N</u> = 2,316)	History of substance abuse (<u>N</u> = 1,795)	No history of substance abuse (<u>N</u> = 2,674)	History of substance abuse (<u>N</u> = 1,411)
Sexually transmitted diseases				
No known risk	88.6%	75.8%	83.1%	70.3%
Prior or current risk	11.4%	24.2%	16.9%	29.7%
	$\chi^2(1, \underline{N}=4,111)=117.12, p<.001$		$\chi^2(1, \underline{N}=4,085)=89.49, p<.001$	
Homeless				
No	95.0%	84.5%	94.1%	83.6%
Yes	5.0%	15.5%	5.9%	16.4%
	$\chi^2(1, \underline{N}=4,111)=130.57, p<.001$		$\chi^2(1, \underline{N}=4,085)=116.24, p<.001$	
Runaway				
No	96.5%	94.6%	95.8%	92.7%
Yes	3.5%	5.4%	4.2%	7.3%
	$\chi^2(1, \underline{N}=4,111)=8.87, p<.01$		$\chi^2(1, \underline{N}=4,085)=18.45, p<.001$	
Criminal justice system-involved				
No	95.6%	83.4%	96.5%	87.5%
Yes	4.4%	16.6%	3.5%	12.5%
	$\chi^2(1, \underline{N}=4,111)=172.90, p<.01$		$\chi^2(1, \underline{N}=4,085)=120.08, p<.01$	
Mental health system-involved				
No	91.0%	87.8%	88.1%	87.0%
Yes	9.0%	12.2%	11.9%	13.0%
	$\chi^2(1, \underline{N}=4,111)=10.94, p<.001$		$\chi^2(1, \underline{N}=4,085)=1.06, \underline{n.s.}$	

Table 2

Logistic Regression of Substance Abuse History as Predicted by Client Characteristics

Independent Variable	Males (<u>n</u> = 4,111)					Female (<u>n</u> = 4,085)				
	Odds Ratio	95% Confidence Interval for Odds Ratio	Wald Statistic	B	R	Odds Ratio	95% Confidence Interval for Odds Ratio	Wald Statistic	B	R
Age	.95	.93-.98	13.59***	-.05	-.05	.96	.94-.99	7.68**	-.04	-.03
HIV status	1.55	1.12-2.13	7.01*	.44	.03	1.71	1.07-2.73	5.11*	.54	.02
Asian American	.81	.54-1.21	1.05	-.21	.00	1.27	.86-1.88	1.48	.24	.00
Caucasian	1.14	.94-1.39	1.86	.13	.00	.98	.81-1.20	.03	-.02	.00
Hispanic	1.24	1.05-1.47	6.26*	.22	.03	1.55	1.29-1.86	21.68***	.44	.06
Native American	1.19	.57-2.46	.21	.17	.00	2.72	1.31-5.66	7.15**	1.00	.03
Multi-racial	2.03	1.29-3.20	9.48**	.71	.04	1.73	1.13-2.63	6.47*	.55	.03
Unknown/Other	.78	.50-1.23	1.13	-.24	.00	1.04	.67-1.63	.04	.04	.00
Risky sex with men	1.40	1.15-1.70	11.86***	.34	.04	2.34	1.90-2.88	63.77***	.85	.11
Risky sex with women	2.79	2.33-3.33	127.37***	1.02	.15	2.70	2.19-3.33	87.02***	.99	.13
Sex with IDU	3.54	2.49-5.03	49.69***	1.26	.09	4.18	3.00-5.82	71.94***	1.43	.12
Survival sex	2.88	2.09-3.96	42.28***	1.06	.08	6.19	4.43-8.64	113.88***	1.82	.15
Sex with an HIV-positive partner	1.41	1.00-2.00	3.86*	.35	.02	.92	.57-1.47	.13	-.09	.00
Sexually transmitted diseases	1.50	1.23-1.82	16.19***	.40	.05	1.10	.91-1.32	1.00	.09	.00
Homeless	2.27	1.75-2.96	37.01***	.82	.08	1.75	1.35-2.27	17.81***	.56	.05
Runaway	.85	.59-1.23	.76	-.17	.00	1.15	.81-1.63	.58	.14	.00
CJS-involved	3.73	2.91-4.78	107.44***	1.32	.14	2.53	1.88-3.42	36.87***	.93	.08
MHS-involved	1.07	.85-1.37	.35	.07	.00	.75	.59-.95	5.69*	-.29	-.03

Note: *p < .05, **p < .01, ***p < .001; ethnicity effects are contrasted to those for African American youth.