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HIV/Sexually Transmitted Infection Risk Behaviors in Delinquent Youth With Psychiatric Disorders: A Longitudinal Study

Katherine S. Elkington, PhD, Linda A. Teplin, PhD, Amy A. Mericle, PhD, Leah J. Welty, PhD, Erin G. Romero, BS, and Karen M. Abram, PhD

Dr. Elkington is with the HIV Center for Clinical and Behavioral Studies, New York State Psychiatric Institute and Columbia University, New York, NY. Drs Teplin, Romero, and Abram are with Psycho-Legal Studies, Department of Psychiatry and Behavioral Sciences, Feinberg School of Medicine, Northwestern University, Chicago, IL. Dr Mericle is with the Treatment Research Institute, Philadelphia, PA, and Dr. Welty is with the Department of Preventive Medicine, Feinberg School of Medicine, Northwestern University, Chicago, IL

Abstract

Objectives—To examine the prevalence and persistence of 20 HIV/sexually transmitted infection (STI) sexual and drug use risk behaviors and to predict their occurrence in 4 mutually exclusive diagnostic groups of delinquent youth: (1) major mental disorders (MMD); (2) substance use disorders (SUD); (3) comorbid MMD and SUD (MMD+SUD); and (4) neither disorder.

Methods—At the baseline interview, HIV/STI risk behaviors were assessed in 800 juvenile detainees, aged 10 to 18 years; youth were reinterviewed approximately 3 years later. The final sample (n = 689) includes 298 females and 391 males.

Results—The prevalence and persistence of HIV/STI risk behaviors was high in all diagnostic groups. Youth with SUD at baseline were over 10 times more likely to be sexually active and to have vaginal sex at follow-up than youth with MMD+SUD (AOR=10.86, 95% CI=1.43–82.32; AOR=11.63, 95% CI=1.49–90.89, respectively) and four times more likely to be sexually active and to have vaginal sex than youth with neither disorder (AOR=4.20, 95% CI=1.06–16.62; AOR=4.73, 95% CI=1.21–18.50, respectively). Youth with MMD at baseline were less likely to have engaged in unprotected vaginal and oral sex at follow-up compared with youth with neither disorder (AOR=0.11, 95% CI=0.02–0.50; AOR=0.07, 95% CI=0.01–0.34, respectively), and with youth with SUD (AOR=0.10, 95% CI=0.02–0.50; OR=0.10, 95% CI=0.02–0.47, respectively). Youth with MMD+SUD were less likely (AOR=0.28, 95% CI=0.09–0.92) to engage in unprotected oral sex compared with those with neither disorder.

Conclusions—Irrespective of diagnostic group, delinquent youth are at great risk for HIV/STIs as they age into adulthood. SUD increases risk. Because detained youth are released after approximately 2 weeks, their risk behaviors become a *community* health problem. Pediatricians and child psychiatrists must collaborate with corrections professionals to develop HIV/STI interventions and ensure that programs started in detention centers continue after youth are released.

Keywords

HIV/STI; risk behaviors; substance use disorders; psychiatric disorders; delinquent youth

Adolescents in the United States are at serious risk for acquiring HIV, accounting for half of all new HIV infections in the United States each year.¹ Between 2001 and 2005, HIV/AIDS diagnoses increased more than 20% in persons aged 13 to 24 years,² and the proportion of those diagnosed with AIDS continues to increase³ (National Institute of Allergy and Infectious Diseases, 2006). Among youth, those involved in the juvenile justice system warrant special study for several reasons.

First, juvenile detainees report more HIV/sexually transmitted infection (STI) risk behaviors and initiate them at younger ages than youth in the general population.⁴ In a previous article, we found that nearly two-thirds of our sample of detained youth reported engaging in 10 or more HIV/STI risk behaviors related to sex or drug use prior to their detention.⁴

Second, youth involved in the juvenile justice system are disproportionately African American, a group that also is disproportionately represented in the HIV epidemic. Although African Americans comprise 13% of the US population,⁵ they comprise nearly 40% of youth in the corrections system⁶ and more than 40% of new diagnoses of HIV/AIDS among persons younger than 25 years².

Finally, psychiatric disorders -- which are associated with HIV/AIDS risk behaviors⁷⁻⁹ -- are substantially more common in youth involved in the juvenile justice system than in the general population.¹⁰ Among high-risk and general population youth, mental health symptoms (e.g., depression, suicidality, anxiety) in adolescence predict HIV/STI risk behaviors such as inconsistent condom use, prostitution, intravenous drug use, and sex with high-risk partners in adulthood.^{11,12} Moreover, studies of high-risk youth show that substance use in adolescence -- common among delinquent youth¹³ -- increases the likelihood of sexual risk behaviors in young adulthood.¹⁴⁻¹⁶

Despite its importance, to our knowledge, no longitudinal study has examined the effect of psychiatric disorders on HIV/STI risk behaviors in juvenile justice youth as they age into young adulthood. This omission is critical. During adolescence, many sexual and drug use risk behaviors develop that may persist into adulthood. Adolescence is an important period in which to intervene. Longitudinal studies are needed to guide the development of effective HIV/STI interventions for specific diagnostic groups, such as youth with major mental disorder (MMD) and substance use disorder (SUD).

This article is part of a series that examines the HIV/STI sexual and drug use risk behaviors of participants in the Northwestern Juvenile Project, a longitudinal study of health needs and outcomes of detained youth. Our first article on psychiatric disorders and HIV/STI risk behaviors reported findings from only the baseline interview, when youth were aged 10 to 18 years.⁸ Youth were asked about their behaviors prior to detention. Youth with SUD or comorbid MMD and SUD (MMD+SUD) were more likely to have engaged in HIV/STI risk behaviors than those with MMD alone or neither disorder. In the current article, we use newly available longitudinal data to compare 4 mutually exclusive diagnostic groups: youth with MMD; youth with SUD; youth with MMD+SUD; and youth with neither. We address three questions: (1) Prevalence: What proportion of youth reported each risk behavior at the baseline and follow-up interviews? (2) Persistence: Among youth who reported a specific risk behavior at baseline, what proportion persisted in that behavior at follow-up? (3) Prediction: Which diagnostic groups at baseline were associated with risk behaviors at follow-up?

METHODS

Sampling and Consent Procedures

Data are from the Northwestern Juvenile Project.^{4,10,17} We recruited a stratified random sample of 1829 youth who were arrested between November 20, 1995, and June 14, 1998, and detained at the Cook County Juvenile Temporary Detention Center (CCJTDC) in Chicago, IL, prior to the final disposition of their case. Consistent with juvenile detainees nationwide, nearly 90% of detainees at CCJTDC were male and most were racial/ethnic minorities. To ensure adequate representation of key subgroups, we stratified our sample by age (10–13 years or ≥14 years), gender, race/ethnicity (African American, non-Hispanic white, and Hispanic), and legal status (processed as a juvenile or an adult). Additional information on our methods has been published elsewhere.^{4,10,17} All consent procedures were approved by the Institutional Review Boards of Northwestern University, the Centers for Disease Control and Prevention, and the US Office of Protection from Research Risks.

Participants

Collection of HIV/STI baseline data began when funding became available, 15 months after baseline data collection began for the larger study, from February 1997 through June 1998. Among the youth sampled during this period, 3.9% ($n = 41$) refused to participate. There were no significant differences in refusal rates by gender, race/ethnicity, or age. The final number of youth who received the HIV/STI baseline interview was 800; of these, 769 (96.1%) were interviewed at follow-up: 12 (1.5%) died before the follow-up; 3 (0.4%) withdrew from the study; and 16 (2.0%) could not be located for follow-up.

Eighty of the 769 participants were excluded from these analyses: 5 (0.7%) did not receive the HIV/STI risk behavior assessment at follow-up (because of time constraints or interviewer error); 36 (4.7%) were missing diagnostic information at baseline; and 39 (5.1%) received their follow-up interview more than 4.5 years after their baseline interview.

The final sample size for these analyses is 689 (391 males and 298 females): 379 African Americans, 185 Hispanics, and 125 non-Hispanic whites. At baseline, youth were aged between 10 to 18 years (mean [SD] age, 14.8 [1.4] years; median, 15.0 years). At follow-up, participants were aged 13 to 22 years (mean [SD] age, 18.0 [1.4] years; median, 18.0 years). Time to follow-up for the final sample was 2.9 to 4.5 years (mean [SD] time to follow-up, 3.2 [0.3] years; median, 3.0 years).

Data Collection Procedures

At the baseline interview, face-to-face, structured interviews were conducted at the detention center in a private area; most interviews took place within 2 days of intake. At the follow-up interview, 65.0% of the 689 participants were interviewed in the community, 27.0% in correctional facilities, and 2.6% at residential placement facilities. Nonincarcerated youth who lived more than 2 hours away by car were interviewed by telephone (5.4%). Baseline and follow-up interviews took 2 to 4 hours to complete.

Measures

HIV/STI Risk Behaviors—We examined behaviors associated with increased risk for HIV/STI, including sexual risk behaviors and injection risk behaviors (sharing needles or “works” for drug injection, piercings, or tattoos)^{18–22} using the National Institute on Drug Abuse (NIDA) Risk Behavior Assessment (RBA), a reliable and valid measure of drug use and sexual risk behaviors.^{23–25} We supplemented the RBA with items measuring the participant’s knowledge and attitudes about HIV from the Adolescent Health Survey from NIDA’s Study of Street Youth at Risk for AIDS²⁶ and Yale’s AIDS Risk Inventory.²⁷ At the baseline

interview, HIV/STI risk behaviors that participants engaged in one or more times (y/n) were assessed over the lifetime, in the past three months, or in the past month, depending on the question. At the follow-up interview, behaviors engaged in one or more times (y/n) were assessed for the period since the last interview, in the past three months, or in the past month, depending on the question. Specific time frames for each question are noted in Tables 1–3.

Psychiatric Diagnoses—To determine psychiatric diagnoses, we used the *Diagnostic Interview Schedule for Children (DISC)*, Version 2.3, the most recent English and Spanish versions available when the Northwestern Juvenile Project began in 1995. The *DISC* is highly structured, contains detailed symptom probes for *DSM-III-R* diagnoses, and has acceptable reliability and validity.²⁸ It provides a screen for psychosis and diagnoses for all other disorders. As in previously published articles,⁸ we defined any MMD as a diagnosis of major depressive episode, manic episode, or psychosis in the past 6 months. At baseline, 13.4% (n=92) of the sample reported major depressive episode; 2.3% (n=16), manic episode; and 1.3% (n=9), psychosis. We defined SUD as having alcohol, marijuana, or other SUD in the past 6 months. At baseline, 28.7% (n=198) had alcohol use disorder; 45.1% (n=311), marijuana use disorder; and 7.1% (n=49), other SUD. Additional information on our diagnostic procedures has been published elsewhere.^{4,10,17}

Missing Data

Missing Cases—To assess the effect of attrition on the generalizability of our findings, we compared participants who provided follow-up data with those who did not. There were no significant differences except (1) males were more likely than females to have died ($p < .05$), and (2) those lost to follow-up were more likely to be non-Hispanic white or Hispanic ($p < .05$) and were less likely to have had sex with more than 1 partner ($p < .05$). Potential bias from demographic differences in attrition was adjusted by weighting the statistical analyses by sampling strata (see the *Data Analysis* subsection).

Missing Data from Participants who did not Receive the Psychiatric Diagnostic Interview at Baseline—Comparing participants included in our analyses (n=689, 89.6% of participants who received the follow-up interview) with those who did not receive the psychiatric interview at baseline (n=36, 4.7% of participants who received the follow-up interview) revealed no significant differences by gender, race/ethnicity, age, or prevalence of baseline HIV/STI risk behaviors. There was 1 significant difference in prevalence of HIV/STI risk behaviors at follow-up: subjects missing diagnoses at baseline were less likely to have had anal sex at follow-up ($p < .05$).

Missing Data from Interviews Conducted by Telephone—Participants interviewed by telephone (n=37, 5.4%), a shorter interview, were missing the following variables at follow-up: types of sex with a high-risk partner, sex and unprotected sex while drunk or high, and trading sex and drugs.²⁹ Comparing participants interviewed by telephone with those interviewed face-to-face, we found no significant differences by gender, race/ethnicity, age, or prevalence of other baseline or follow-up HIV/STI risk behaviors.

Data Analysis

All data were weighted to reflect CCJTDC's population. Because selected strata were oversampled to obtain information on key subgroups (females, non-Hispanic whites, youth aged 10–13 years, and youth processed as adults), we used sample weights, based on CCJTDC's demographic characteristics, to estimate descriptive statistics and model parameters that reflect CCJTDC's population. Taylor series linearization was used to estimate standard errors.^{30,31} Only statistically significant findings with an alpha level of $p < .05$ are noted in the text.

Changes in the prevalence of HIV/STI risk behaviors between the baseline and follow-up interviews were assessed using paired differences with an adjusted Wald F statistic (Table 1).³² We fit multiple logistic regression models to assess differences by diagnostic group in the persistence of HIV/STI risk behaviors at follow-up (Table 2) and to examine which diagnostic groups at baseline were associated with HIV/STI risk behaviors at follow-up (Table 3). Independent variables were MMD (y/n), SUD (y/n), and an interaction between MMD and SUD. Because prior analyses found that age, gender, and incarceration status were related to HIV/STI risk behaviors (Romero et al., 2007), we include these variables as covariates in the multiple logistic regression models. When examining which disorders at baseline were associated with each HIV/STI risk behavior at follow-up, we also included the baseline HIV/STI risk behavior as a covariate to control for previous level of risk (Table 3). We tested for differences between specific diagnostic groups (e.g., MMD versus SUD) only when the model with the disorder variables (MMD, SUD, and their interaction) fit significantly better than the model without.

RESULTS

Prevalence of HIV/STI Risk Behaviors at Baseline and Follow-up

Table 1 compares differences in the prevalence of HIV/STI risk behaviors at baseline and at follow-up in the 4 diagnostic groups.

Overall, 70.3% (MMD) to 98.3% (SUD) of youth were sexually active at baseline, and 73.5% (MMD) to 98.6% (SUD) were sexually active at follow-up. Among youth with MMD, the prevalence of all risky behaviors was not significantly different from baseline to follow-up. Among youth with SUD, significantly more engaged in anal sex, including that with a high-risk partner, at follow-up than at baseline. Significantly fewer youth with SUD had multiple partners at follow-up than at baseline (>1 partner and >3 partners). Among youth with MMD+SUD, the prevalence of risk behaviors at baseline and follow-up was not significantly different except that fewer reported being tattooed at follow-up. Among youth with neither MMD nor SUD, significantly more youth reported oral sex, sex while drunk or high, and unprotected sex while drunk or high at follow-up than at baseline.

Persistence of HIV/STI Risk Behaviors

Next, we examined only those youth who reported a risk behavior at baseline and determined what proportion of them *persisted* in that behavior at follow-up. Table 2 presents the persistence of HIV/STI risk behaviors in the 4 diagnostic groups.

In all diagnostic groups, risk behaviors associated with injection drug use and needle sharing were uncommon at baseline and did not persist at follow-up. Among youth with MMD, the most persistent behaviors were tattooing (97.3%), unprotected sex while drunk or high (82.5%), and vaginal sex with a high-risk partner (74.4%); none persisted with oral (0.0%) and anal (0.0%) sex with a high-risk partner (both uncommon behaviors at baseline). Nearly all youth with SUD persisted in being sexually active (98.6%), having vaginal sex (98.5%), and having sex while drunk or high (90.5%); none persisted in anal sex with a high-risk partner (an uncommon behavior at baseline), and few youth persisted in unprotected anal sex (11.7%). Among youth with MMD+SUD, all participants (100%) who reported having anal sex with a high-risk partner at baseline persisted in this uncommon behavior, 77.0% persisted being sexually active, 76.3% persisted in vaginal sex, and 70.5% persisted in engaging in sex while drunk or high; none persisted in unprotected anal sex, and 1.5% persisted in trading sex and drugs. Among youth with neither disorder, the most persistent behaviors were being sexually active (93.7%), having vaginal sex (93.3%), and having sex while drunk or high (96.2%); no

participants persisted in unprotected anal sex, anal sex with a high-risk partner, or trading sex and drugs.

Due to the small number of youth in two of the diagnostic groups (MMD and MMD+SUD) and the low prevalence of some behaviors at baseline, we compared persistence between only the two larger diagnostic groups (SUD and neither disorder). Youth with SUD were more than five times as likely to persist in having anal sex than youth with neither MMD nor SUD (adjusted odds ratio [AOR]=5.58, 95% confidence interval [CI]=1.01–30.77). There were no other differences in the persistence of HIV/STI risk behaviors.

Predicting HIV/STI Risk Behaviors at Follow-up

Finally, we examined which disorders at baseline were associated with HIV/STI risk behaviors at follow-up. Table 3 shows AORs comparing risk behaviors at follow-up among diagnostic groups. Youth with MMD at baseline were significantly less likely to have engaged in unprotected vaginal and oral sex at follow-up compared with youth with neither disorder (AOR=0.11, 95% CI=0.02–0.50; and AOR=0.07, 95% CI=0.01–0.34, respectively) and compared with youth with SUD (AOR=0.10, 95% CI=0.02–0.50; and AOR=0.10, 95% CI=0.02–0.47, respectively).

Youth with SUD were over four times more likely to be sexually active at follow-up than youth with neither disorder (AOR=4.20, 95% CI=1.06–16.62) and over 10 times more likely compared with youth with MMD+SUD (AOR=10.86, 95% CI=1.43–82.32). Youth with SUD were significantly more likely to have engaged in vaginal sex at follow-up than youth with neither disorder (AOR=4.73, 95% CI=1.21–18.50) or those with MMD+SUD (AOR=11.63, 95% CI=1.49–90.89).

Youth with MMD+SUD were less likely to have engaged in unprotected oral sex at follow-up compared with those with neither disorder (AOR=0.28; 95% CI=0.09–0.92).

DISCUSSION

Three years after their detention, delinquent youth, irrespective of diagnostic group, had high prevalence rates of many HIV/STI sexual risk behaviors. One-quarter to one-half of youth reported engaging in unprotected vaginal sex at baseline *and* follow-up interviews. At baseline, over two-fifths of the sample reported engaging in sex while drunk or high, and almost two-thirds of the sample reported this behavior at the follow-up interview.

Our findings are difficult to compare with general population studies, such as the Youth Risk Behavior Survey (YRBS) and National Longitudinal Survey of Adolescent Health (ADD Health), because they define risk behaviors differently. We asked about behaviors in the past three months; the YRBS and ADD Health asked respondents about their *last* sexual intercourse. In the general population, approximately 9% to 12% of youth use substances during sexual intercourse.^{11,33,34} In our sample, the prevalence of this behavior was much higher -- 33% to 92% -- depending on the diagnostic group. For some risk behaviors, the *direction* of the differences between our sample and general population studies varied by diagnostic group. For example, in our sample, fewer youth with MMD (10%) than general population youth (22% to 35%) reported not using a condom in past three months^{2,34}; however, the prevalence of this behavior in our sample of youth with SUD (49%) or with MMD+SUD (62%) was substantially higher than general population rates.

Overall, behaviors with the highest prevalence at baseline were most likely to persist at follow-up. In all diagnostic groups, the most persistent behaviors were being sexually active, having vaginal sex, engaging in sex while drunk or high, and having unprotected sex while drunk or

high. Of particular concern is the persistence of sexual behaviors involving substance use. These youth, regardless of their diagnosis, place themselves at risk for contracting HIV/STIs through use of drugs or alcohol.

As delinquent youth age, which diagnostic groups predict HIV/STI risk behaviors three years later? Compared with other diagnostic groups, SUD at baseline increases subsequent risk of engaging in sexual risk behaviors: unprotected vaginal sex, oral sex, and sex with multiple partners. Approximately three-quarters of youth with SUD at baseline engaged in 5 or more sexual risk behaviors at follow-up compared with about one-half of those with MMD. This pattern is consistent with previously published findings from the study's baseline interview; SUD was then the disorder most strongly associated with HIV/STI sexual risk behaviors reported prior to detention.⁸

Taken together, these findings suggest that substance use is both directly and indirectly related to HIV/STI risk behaviors, a relationship that continues as youth age. Intoxication can increase the likelihood of unplanned sexual activity, and sex while drunk or high can decrease the likelihood of using condoms and impair one's ability to negotiate safe sex practices.³⁵ Alcohol and drugs are indirectly related to HIV/STI risk behaviors because their use increases exposure to deviant peers and risky sexual partners.^{36,37} Moreover, addiction may cause persons to engage in risky sexual behavior to obtain substances.

Some of our findings do not replicate those of other cross-sectional and longitudinal studies that show youth with mental illness engage in higher rates of HIV/STI risk behaviors.^{11,12,38-41} Our findings may differ for two reasons. First, unlike prior longitudinal studies -- which examined only psychiatric *symptoms*^{11,12,38} -- we focused on *disorders*. The relationship between MMD and HIV/STI risk behaviors may be substantially different. Second, prior longitudinal studies^{11,12,42} conflated mental illness and comorbid SUD. In contrast, the current study differentiated youth with only MMD from those with comorbid MMD *and* SUD. The higher rates of HIV/STI risk behaviors among youth with mental illness found in prior studies may be a result of comorbid SUD, not MMD.

For many high-risk behaviors -- such as sex with high-risk partners, unprotected anal sex, or unprotected sex while intoxicated -- there were no significant differences by diagnostic category. This may reflect that, especially in these vulnerable populations, other variables -- a history of sexual abuse, sexual orientation, the lack of parental involvement, and delinquent peer groups -- may play a more important role in determining HIV/STI risk behaviors.

The study has several limitations. Our findings, drawn from one site (CCJTDC), are generalizable to youth who were detained during adolescence in urban detention centers of similar demographic composition. We examined HIV/STI risk behaviors during only 2 periods of our subjects' lives. The study does not address causal mechanisms underlying HIV/STI risk, nor does this study examine the impact of treatment or other services during the years between assessments. Risk behaviors were assessed according to a dichotomous variable denoting presence or absence of the behavior; no data are available on changes in the frequency or intensity of behaviors. When examining changes in prevalence rates between the baseline and follow-up interviews (Table 1), there were too few incarcerated youth to examine simultaneously the effects of incarceration *and* diagnostic group. The MMD group (n=34) and the MMD+SUD group (n=72) may have been too small to detect some differences. The MMD group was composed primarily of youth with a major depressive disorder because other MMDs were uncommon. The group with neither MMD nor SUD may have had other psychiatric disorders -- such as posttraumatic stress disorder -- which may have elevated the group's prevalence of risk behaviors. Finally, the data are subject to the limitations of self-reporting.

Despite these limitations, this study has implications for future research and for improving the treatment of youth involved with the juvenile justice system. We recommend research in the following areas:

1. Longitudinal studies of patterns of *multiple* substances used and HIV/STI risk behaviors. Prior studies have examined the effects of *specific* substances (e.g., alcohol, marijuana, cocaine) on HIV/STI risk behaviors.^{34,43} The effects on HIV/STI risk behaviors vary by the type of substance used and the amount used over time.⁴⁴ Far fewer investigations examine how concurrent and sequential use of multiple substances (e.g., alcohol and marijuana) affect HIV/STI risk behaviors as high-risk youth age into adulthood. Longitudinal studies will identify the patterns of use that are associated with the highest-risk behaviors.
2. Studies of SUDs and HIV/STI risk behaviors. Most studies of adolescent and young adults examine substance use; far fewer studies examine SUDs. Studies examining only substance use are problematic because definitions vary widely across studies, often not differentiating experimentation from problem use. Moreover, compared with substance use, SUDs have different developmental sequences, different risk and protective factors, and worse outcomes^{45–47}.
3. Studies of the context of HIV/STI risk behaviors. HIV/STI risk behaviors were common in our sample, irrespective of diagnostic group. The next generation of research must address how risk and protective factors moderate and mediate the relationships among mental disorders, SUDs, and HIV/STI risk behaviors. To successfully intervene, we must understand the mechanisms and context of environmental risk.⁴⁸
4. Comprehensive longitudinal studies of psychiatric disorders and HIV/STI risk. To date, most prior longitudinal studies^{11,14,15,38} have examined psychiatric symptoms or a limited number of disorders such as depression and substance use. Yet, the related cross-sectional literature suggests that other disorders such as eating disorders and antisocial personality disorder are also associated with elevated rates of HIV/STI risk behavior.^{9,40} Studies are needed of youth at high risk for HIV (e.g., homeless youth, youth in treatment) as well as youth in community.

Our findings also have important clinical and policy implications. It is essential to provide HIV/STI preventive interventions for delinquent youth when they are detained *and* after they return to their communities. We recommend that the pediatric and psychiatric communities address the HIV epidemic in the following ways:

1. Include HIV/STI preventive interventions in mental health and substance abuse treatment programs. More than one-half of participants had SUD, MMD, or both. HIV/STI interventions integrated into treatment programs can decrease HIV/STI risk behaviors in youth and adults.^{49,50} In addition, incorporating targeted HIV/STI preventive interventions in detention centers and in the community is a powerful and cost-effective tool to prevent the spread of HIV and other STIs.⁵¹
2. Provide innovative interventions and outreach in the community. To reach the more than 90% of detained youth who do not receive needed mental health services after their release into the community,⁵² we must provide outreach and prevention efforts in settings where these youth are more likely to be found: free clinics, hospital emergency departments, and juvenile homeless shelters.^{53–55} Interventions must include information on the risk of using drugs or alcohol within a sexual context. Providing on-site education, preventive interventions, HIV/STI testing services, pretest and posttest counseling, and condoms to youth in these settings may reduce HIV/STI risk behaviors.

In conclusion, HIV/STI risk behaviors in delinquent youth are prevalent and persist as youth age into adulthood. Substance use disorders increase sexual risk behaviors. Because detained youth have a median stay of approximately 2 weeks, their HIV/STI risk behaviors subsequently become a *community* health problem. Pediatricians and child psychiatrists must collaborate with corrections professionals to develop HIV/STI interventions and ensure that programs started in detention centers continue after youth are released into the community.

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Table 1
Prevalence of HIV/STI Risk Behaviors at Baseline and Follow-up: Differences by Diagnostic Group (n=689)^a

HIV/STI Risk Behavior	MMD only (n=34)			SUD only (n=280)			MMD + SUD (n=72)			No MMD or SUD (n=303)		
	Base- line ^b %	Follow- up ^c %	p	Base- line ^b %	Follow- up ^c %	p	Base- line ^b %	Follow- up ^c %	p	Base- line ^b %	Follow- up ^c %	p
Sexually active	70.3	73.5	0.93	98.3	98.6	0.72	96.3	77.8	0.27	82.2	93.0	0.06
Multiple partners: >1 in past 3 months	38.5	28.7	0.78	79.2	41.7	0.00	62.2	46.2	0.57	38.1	25.8	0.21
Multiple partners: >3 in past 3 months	31.2	3.1	0.18	44.2	19.8	0.01	33.3	3.1	0.06	19.8	12.6	0.33
Vaginal sex	69.8	71.8	0.96	98.2	98.5	0.63	96.3	77.2	0.26	82.2	92.4	0.08
Recent (past 3 months) unprotected vaginal sex	10.3	6.1	0.40	49.2	54.8	0.60	61.7	39.9	0.21	24.3	42.6	0.07
Vaginal sex with high-risk partner ^e	12.0	47.9	0.20	31.0	39.9	0.41	32.5	21.4	0.57	17.9	36.8	0.10
Oral sex	35.3	38.6	0.93	55.3	57.0	0.86	40.6	52.2	0.69	29.4	63.0	0.00
Recent (past 3 months) unprotected oral sex	31.7	2.9	0.18	41.5	41.6	0.99	38.4	18.4	0.26	20.2	35.1	0.07
Oral sex with high-risk partner ^e	1.2	29.9	0.21	7.8	9.9	0.71	3.2	12.3	0.06	9.8	19.8	0.23
Anal sex	29.7	29.8	1.00	4.8	24.6	0.00	3.9	11.2	0.07	12.4	19.8	0.40
Recent (past 3 months) unprotected anal sex	0.0	0.0	---- ^d	1.7	9.4	0.12	0.8	3.8	0.29	5.2	5.6	0.95
Anal sex with high-risk partner ^e	3.0	26.4	0.30	0.7	3.1	0.03	1.0	3.6	0.16	4.2	6.0	0.76
Sex while drunk or high	33.0	40.6	0.84	82.8	90.2	0.32	91.7	71.7	0.26	45.6	74.8	0.00
Unprotected sex while drunk or high	6.4	37.6	0.15	45.0	59.6	0.08	60.0	44.3	0.39	25.6	53.8	0.00
Traded sex and drugs	0.0	0.0	---- ^d	1.6	10.3	0.09	22.7	4.2	0.28	0.8	5.5	0.24
Injected drugs	0.4	0.0	---- ^d	0.2	0.1	0.54	0.8	0.2	0.49	0.0	0.0	---- ^d
Tattooed	32.2	35.3	0.38	39.7	48.0	0.33	83.3	44.6	0.04	43.1	41.0	0.79
Used needles in a risky location ^f (injection drug use or tattooing)	0.0	0.0	---- ^d	3.1	0.0	---- ^d	0.0	0.0	---- ^d	0.0	0.0	---- ^d
Shared needle(s) or equipment (injection drug use or tattooing)	0.4	0.0	---- ^d	3.5	0.3	0.31	0.0	0.0	---- ^d	4.2	0.5	0.32
Shared needle(s) without cleaning (injection drug use or tattooing)	0.4	0.0	---- ^d	3.1	0.1	0.33	0.0	0.0	---- ^d	0.0	0.0	---- ^d

HIV/STI Risk Behavior	MMD only (n=34)		SUD only (n=280)		MMD + SUD (n=72)		No MMD or SUD (n=303)	
	Base- line ^b %	Follow- up ^c %	p	Base- line ^b %	Follow- up ^c %	p	Base- line ^b %	Follow- up ^c %

^aThis table uses cases that have baseline and follow-up data. Data are weighted to reflect the demographic characteristics of the Cook County Juvenile Temporary Detention Center (Chicago, IL).

^bUnless otherwise noted, baseline prevalence is based on “lifetime” occurrence.

^cUnless otherwise noted, follow-up prevalence is based on the period measured “since the last interview.”

^dTests were not conducted on these behaviors due to zero prevalence at baseline and/or follow-up.

^e“High-risk partners” include: persons who have ever worked as a prostitute, persons with HIV/AIDS, persons who inject drugs, and persons whose sexual history is not well known.

^fRisky locations include: parks, streets, alleys, abandoned buildings, cars, public bathrooms, crack houses, and shooting galleries.

Abbreviations: MMD, major mental disorder; STI, sexually transmitted infection; SUD, substance use disorder.

Table 2Persistence of HIV/STI Risk Behaviors at Follow-up: Differences by Diagnostic Group (n=689) ^{a, b, c}

HIV/STI Risk Behavior	MMD only (n=34)	SUD only (n=280)	MMD + SUD (n=72)	No MMD or SUD (n=303)
	%	%	%	%
Sexually active	64.5	98.6	77.0	93.7
Multiple partners: >1 in past 3 months	6.0	48.6	35.9	29.6
Multiple partners: >3 in past 3 months	5.0	26.2	9.3	25.7
Vaginal sex	64.0	98.5	76.3	93.3
Recent (past 3 months) unprotected vaginal sex	18.4	58.0	51.3	53.2
Vaginal sex with high-risk partner ^f	74.4	49.8	28.2	37.2
Oral sex	20.5	67.6	39.9	80.7
Recent (past 3 months) unprotected oral sex	1.6	64.2	26.0	71.9
Oral sex with high-risk partner ^f	0.0	18.9	31.6	48.4
Anal sex ^e	10.6	35.2	69.0	15.8
Recent (past 3 months) unprotected anal sex	n/a ^d	11.7	0.0	0.0
Anal sex with high-risk partner ^f	0.0	0.0	100.0	0.0
Sex while drunk or high	16.0	90.5	70.5	96.2
Unprotected sex while drunk or high	82.5	77.8	54.7	76.3
Traded sex and drugs	n/a ^d	33.1	1.5	0.0
Injected drugs	0.0	0.0	0.0	0.0
Tattooed	97.3	65.5	45.0	65.3
Used needles in a risky location ^g (injection drug use or tattooing)	n/a ^d	0.0	n/a ^d	n/a ^d
Shared needle(s) or equipment (injection drug use or tattooing)	0.0	1.4	n/a ^d	0.0
Shared needle(s) without cleaning (injection drug use or tattooing)	0.0	0.0	n/a ^d	n/a ^d

^aThis table uses cases that have baseline and follow-up data. Data are weighted to reflect the demographic characteristics of the Cook County Juvenile Temporary Detention Center (Chicago, IL).

^bUnless otherwise noted, persistence is based on the period measured “since the last interview.”

^c“Persistence” is defined as follows: among youth who reported engaging in that behavior at the baseline interview (the denominator), what proportion persisted in that behavior at the follow-up interview?

^dBecause the prevalence of the behavior at baseline was 0.0%, persistence was not calculated.

^e**Boldface** indicates a significant difference between SUD and neither MMD or SUD groups ($F=3.90$, $df=1, 569$; $p<.05$); tests of significance were only conducted to contrast differences between SUD only and neither MMD or SUD groups. Tests of significance are adjusted for age, gender, and incarceration status. Depending on the time frame of the question, participants were coded as incarcerated (yes/no) if they reported being incarcerated “most of the time in the past 3 months” or “most of the time since the last interview.”

^f“High-risk partners” include: persons who have ever worked as a prostitute, persons with HIV/AIDS, persons who inject drugs, and persons whose sexual history is not well known.

^gRisky locations include: parks, streets, alleys, abandoned buildings, cars, public bathrooms, crack houses, and shooting galleries.

Abbreviations: MMD, major mental disorder; STI, sexually transmitted infection; SUD, substance use disorder.

Table 3
Prediction of HIV/STI Risk Behaviors at Follow-up: Differences by Diagnostic Group (n= 689) ^a

Adjusted ORs for Risk Behaviors ^b													
	Overall Test Contrasting Disorders			MMD only vs No MMD or SUD		MMD only vs SUD only		MMD only vs MMD + SUD		SUD only vs MMD + SUD		MMD + SUD vs No MMD or SUD	
	<i>p</i>	<i>F</i>	<i>df</i>	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
HIV/STI Risk Behavior^c													
Sexually active	0.03	3.10	3 675	0.47	(0.03–6.54)	0.11	(0.01–1.57)	1.20	(0.05–28.08)	4.20	(1.06–16.62) *	10.86	(1.43–82.32) *
Multiple partners: >1 in past 3months	0.20	1.54	3 672										
Multiple partners: >3 in past 3months	0.10	2.13	3 672										
Vaginal sex	0.02	3.38	3 611	0.48	(0.04–6.36)	0.10	(0.01–1.36)	1.18	(0.05–27.07)	4.73	(1.21–18.50) *	11.63	(1.49–90.89) *
Recent (past 3 months) unprotected vaginal sex	0.02	3.14	3 608	0.11	(0.02–0.50) **	0.10	(0.02–0.50) **	0.18	(0.03–1.26)	1.02	(0.34–3.09)	1.72	(0.41–7.31)
Vaginal sex with high-risk partner ^e	0.49	0.81	3 525										
Oral sex	0.67	0.52	3 615										
Recent (past 3 months) unprotected oral sex	0.00	4.41	3 610	0.07	(0.01–0.34) **	0.10	(0.02–0.47) **	0.24	(0.05–1.30)	0.69	(0.26–1.84)	2.43	(0.78–7.58) *
Oral sex with high-risk partner ^e	0.53	0.74	3 543										
Anal sex	0.34	1.13	3 611										
Recent (past 3 months) unprotected anal sex	---- ^d												
Anal sex with high-risk partner ^e	0.54	0.72	3 563										
Sex while drunk or high	0.27	1.30	3 630										
Unprotected sex while drunk or high	0.62	0.60	3 626										
Traded sex and drugs	---- ^d												
Injected drugs	---- ^d												
Tattooed	0.63	0.58	3 672										
Used needles in a risky location ^f (injection drug use or tattooing)	---- ^d												
Shared needle(s) or equipment (injection drug use or tattooing)	---- ^d												
Shared needle(s) without cleaning (injection drug use or tattooing)	---- ^d												

^aThis table uses cases that have baseline and follow-up data. Data are weighted to reflect the demographic characteristics of the Cook County Juvenile Temporary Detention Center (Chicago, IL).

^bThese analyses are adjusted for age, gender, incarceration status, and sexual risk behavior at baseline. Depending on the time frame of the question, participants were coded as incarcerated (yes/no) if they reported being incarcerated “most of the time in the past 3 months” or “most of the time since the last interview.”

^cUnless otherwise noted, risk behaviors are based on the period measured “since the last interview.”

^dBecause prevalence rates at follow-up were low, statistical tests comparing diagnostic groups were not conducted.

^e“High-risk partners” include: persons who have ever worked as a prostitute, persons with HIV/AIDS, persons who inject drugs, and persons whose sexual history is not well known.

^fRisky locations include: parks, streets, alleys, abandoned buildings, cars, public bathrooms, crack houses, and shooting galleries.

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; MMD, major mental disorder; STI, sexually transmitted infection; SUD, substance use disorder;

* p<.05.

** p<.01.