Detecting, Preventing, and Treating Sexually Transmitted Diseases Among Adolescent Arrestees: An Unmet Public Health Need

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Studies of detained and incarcerated adolescent offenders in the United States indicate that these juveniles have an elevated risk of sexually transmitted diseases (STDs). However, many more arrestees enter the ''front end'' of the juvenile justice system than are detained or incarcerated, and research into the STD risk profiles and service needs of this larger group is lacking. An expansion of STD testing (including of asymptomatic youths), prevention, and treatment is needed, as is improved knowledge about gender- and race-specific services. A pilot program in Florida has shown that juvenile justice and public health systems can collaborate to implement STD testing among new arrestees. With integrated linkages to treatment and prevention after release, this model could greatly reduce the STD burden in this underserved, high-risk population. (*Am J Public Health.* 2009;99:1032–1041. doi:10.2105/AJPH.2007.122937)

Adolescents in the US juvenile justice system have relatively high rates of health problems,[1–3] including elevated risks of the sexually transmitted diseases (STDs) chlamydia (*Chlamydia trachomatis*) and gonorrhea (*Neisseria gonorrhoeae*). Detained and incarcerated adolescent offenders, in particular, have high rates of STDs that make them a potentially important core subgroup of STD transmitters.[4–8] However, the STD risks and service needs of adolescent offenders before detention or incarceration (the largest adolescent offender population) or the organizational factors that limit access and service linkages for this population have been little discussed. Although most arrested youths quickly return to the community, we are unaware of any STD screening protocols at the initial stage of arrest. Models of STD transmission dynamics[9,10] suggest that reducing or preventing infections in core risk groups, such as in juvenile arrestees, can further reduce transmission in the community.[11]

A critical need exists to expand STD surveillance among young arrestees before detention or incarceration. Studies of the prevalence of STDs and their drug- and sex-related risk behaviors indicate a high risk of STDs among detained or incarcerated youths. However, numerous organizational and structural barriers and policy and implementation issues limit the expansion of STD testing and treatment at the initial stages of the juvenile justice process. Nevertheless, a promising voluntary STD testing and treatment program for newly arrested juveniles illustrates a collaborative partnership between the public health and juvenile justice systems that overcomes these barriers. This model provides immediate access to STD services for this high-risk and underserved population. (For ease of expression, we use the term *nonincarcerated* throughout to refer to youths who are in the community and are not in secure custody, whether detained pending adjudication or incarcerated after a finding of guilt).

THE JUVENILE JUSTICE SYSTEM

The juvenile justice system focuses primarily on public safety; it is neither organized to routinely identify or treat infectious diseases nor oriented toward increasing access to preventive health care.[3,12] The following is a basic description of how juvenile arrests (2.1 million in 2005, including all arrests of persons under age 18 years[13]) are processed, illustrating how most offenders are released from custody early in the process rather than being detained or incarcerated.

The first juvenile justice system stage after arrest is intake. At this time, juvenile probation officers can dismiss the case, process it informally (e.g., warning the youth or calling parents), or bring the case before a judge.[14–16] In some jurisdictions, centralized intake facilities such as juvenile assessment centers perform this function.[17] Most delinquency cases (57%) are formally convicted in juvenile court; the remainder are dismissed, diverted to community programs, or processed informally.[18] For nondiverted adolescent offenders, a prosecutor decides whether to detain the youth in a secure facility before adjudication; only 20% of these youths are detained.[14,15]

Convicted youths may be placed on juvenile probation (62%) or, in more serious cases, placed in a secure residential facility. Probation conditions may include a curfew, attending school, or participating in drug treatment or other services.[14–16] Some convicted youths are incarcerated in residential facilities (with a range of security levels), with some health care services available.[16] At discharge, youths are typically placed on 3 to 12 months of aftercare supervision[19]; this includes counseling, education, electronic monitoring, treatment, or community service referrals.[14] Juveniles violating aftercare conditions can have their aftercare status revoked and be returned to a secure institution.[14] Although, in principal, youths placed in the custody of juvenile justice agencies receive a medical evaluation and indicated care, the scope and quality of this care varies considerably.[1,20–22]

REASONS FOR SCREENING ADOLESCENT ARRESTEES

The strongest reasons for expanding STD services among juvenile arrestees include the high rates of STDs and drug and sex risk behaviors among young offenders, the asymptomatic nature of many chlamydia and gonorrhea infections, and the fact that most arrested youths are not detained or incarcerated.

In the United States, chlamydia and gonorrhea rates continue to be highest among adolescents and young adults in the general population. In 2006 the highest age-specific rate of reported gonorrhea cases in women was among adolescents aged 15–19 years (648 per 100 000); for men the highest rate was among those aged 20–24 years (454 per 100 000).[23] The highest age-specific rates of reported chlamydia cases were found among the same groups of adolescent girls (2862 cases per 100 000) and men (857 per 100 000).[23] An estimated 60% of annual incident gonorrhea and 54% of incident chlamydia cases are among youths and young adults aged 15–24 years.[24] A recent national study of chlamydia prevalence found that 4.6% of adolescent girls aged 14–19 years were infected, the highest proportion of any age group.[25] Among young women aged 16–24 years entering the National Job Training Program (which targets high-risk, low-income youths), the median chlamydia prevalence within states was 13.1% (range 4.9% to 20.0%); among adolescent boys, the median chlamydia prevalence was 7.9% (range 1.8% to 12.4%).[23]

Young offenders are at even higher risk. Two decades ago, Bell et al. suggested that "adolescent detainees may be disproportionately important as core-group transmitters of STD."[26(p33)] Several subsequent studies of detained and incarcerated adolescents established a high STD prevalence in this population (Table 1). Among incarcerated or detained adolescent boys, chlamydia positivity ranged from 5.9% to 14.4% and gonorrhea positivity from 0.6% to 6.7%. For adolescent girls, the percentage positive for chlamydia ranged from 9.5% to 32.5% and that for gonorrhea from 5.1% to 23.4%.

Several studies also have found high STD prevalence among nonincarcerated offenders. One comparison between incarcerated youths and those in alternative facilities in Washington, DC, found positive test rates of 9.2% for both chlamydia and gonorrhea, with most cases in the alternative setting; the authors suggested screening and treatment when youths enter the system.[34] A study of African American adolescents in Atlanta, Georgia (average age 18.5 years), compared self-reported STD diagnosis (chlamydia, gonorrhea, or trichomoniasis) for those with or without a history of conviction.[35] Lifetime history of an STD was much higher for convicted adolescents (31.6% vs 16.2%), and current STD infection was about 3 times higher (10.1% vs 3.2%). In Hillsborough County in Tampa, Florida, we found a high percentage of STDs among newly arrested youths aged 12–18 years entering the county's juvenile assessment center. Overall, 19.2% of adolescent girls and 10.5% of

TABLE 1—Review of Studies of Chlamydia and Gonorrhea Diagnoses Among US Adolescent Offenders

Authors	Sample	Location	Period	Gender	% Positive for Chlamydia	% Positive for Gonorrhea
Bell et al. (1985)[26]	Detainees, new admissions (N = 100)	King County, WA	1981	Female	19.8	18.4
Broussard et al. (2002)[27]	Detainees, processed (N = 5558)	Cook County, IL	1998–1999	Male	12.9	4.3
				Female	32.5	13.6
Canterbury et al. (1995)[4]	Detainees, intake records (N = 1215)	Unknown state	NA	Male	8.6	0.6
				Female	9.5	5.4
Kahn et al. (2005)[5]	Detainees in 14 detention centers, cross-sectional sample (N = 131,915 chlamydia and 71 074 gonorrhea tests)	Alameda County, CA; Los Angeles, CA; San Francisco, CA; Atlanta, GA; Maryland; New York, NY	1997–2002	Male	5.9	1.3
				Female	15.6	5.1
Katz et al. (2004)[28]	Detainees, admissions on selected screening dates (N = 101)	Hawaii	2000–2001	Female	13.9	5.9
Lofy et al. (2006)[29]	Detainees, 4 detention centers (N = 3593)	Washington	1998–2002	Female	13.7	NA
O'Brien et al. (1988)[30]	Detainees (N = 98)	Seattle, WA	NA	Male	10.9	5.5
Oh et al. (1998)[7]	Detainees, consecutive admissions (N = 263)	Jefferson County, AL	1996–1997	Male	8.8	2.8
				Female	28.3	13.1
Pack et al. (2000)[31]	Detainees, consecutive admissions (N = 284)	Birmingham, AL	May–November 1997	Male	14.4	6.7
Risser et al. (2001)[8]	Detainees, consecutive admissions (N = 589)	Harris County, TX	June–August 1998	Male	9.6	6.7
			January–May 1999	Female	28.1	23.4
Robertson et al. (2005)[32]	Detainees (N = 763)	Unknown southern city	2002-2003	Male	8.1	1.5
				Female	24.7	7.3
Shafer et al. (1993)[33]	Detainees (N = 269)	NA	NA	Male	10.7	6.6

Note. NA = not available.

adolescent boys tested positive for chlamydia, gonorrhea, or both. The highest prevalence was among African Americans (26.9% among adolescent girls, 15.4% among adolescent boys), Hispanic girls (25.0%), and those aged 15–18 years (22.1% among adolescent girls, 12.8% among adolescent boys).[36]

Given these high STD risk levels, and because most arrestees are never detained or incarcerated,[15] increased testing is needed before detention or incarceration. Moreover, such screening should not be symptom based, because most of these infections are asymptomatic.[37,38] One study found that 77% of female adolescents in Baltimore, Maryland, with chlamydia and 45% with gonorrhea were asymptomatic.[39] Young male detainees in Birmingham, Alabama, had low rates of urogenital symptoms while testing positive for gonorrhea (9.8%), chlamydia (2.3%),[4] or either disease (13.7%).[31] Moreover, most adolescent offenders currently are never detained or leave detention quickly before any testing is done. In the few facilities that offer routine STD screening, specimens may be collected 2 to 7 days after intake, by which time many adolescents are released. The elevated STD rates for this population and asymptomatic nature of these diseases increase the urgency of expanding STD testing and treatment to the largest possible segment of the juvenile justice population.

SUBSTANCE USE, SEX, AND OTHER RISK FACTORS

Drug and alcohol use, risky sexual behaviors, and other risk factors are common among adolescent offenders, which increases the likelihood of contracting STDs, indicating a need for expansion of risk reduction and substance abuse prevention and treatment services for these youths.

Drug and Alcohol Use

An estimated 35% of a national sample of arrested adolescents had alcohol involvement, (were using alcohol at the time of arrest or reported alcohol-related problems) 70% had drug involvement (were using drugs at the time of arrest or reported drug-related problems), and 75% had either drug or alcohol involvement.[40] In 9 US jurisdictions in 2003, from 42% to 55% of adolescent boys tested positive for an illegal drug, as did 26% to 65% of adolescent girls.[41] The incidence and prevalence of both substance use[42,43] and sex risk behaviors increase with age, making it important to intervene early with substance abuse and health promotion interventions.[44] Because of the elevated infection risk associated with substance use, improved treatment access can have an indirect effect on infection dissemination. Limited access to drug treatment for adolescent offenders[45] increases the likelihood of their continued drug use and escalation to more severe drug involvement and related risk behaviors.[46]

Risky Sexual Behaviors

The confluence of high-risk sexual and drug use behaviors places adolescent offenders at elevated STD risk.[33] Canterbury et al. found that 76% of incarcerated adolescents in 1 state reported having 3 or more sexual partners.[4] In a survey of youths in 39 US juvenile detention facilities, the adjusted risk of having an STD history was 2.3 times higher for those with 2 to 10 sexual partners, 1.9 times greater for those with a history of sexual abuse, and 1.8 times greater for those with a history of alcohol use.[2] Only 25% of female detainees and 32% of male detainees reported condom use at last intercourse. Compared with high school youths, detained male offenders had a higher rate of sexual intercourse, double the STD incidence rate, and a lower rate of condom use at last sexual intercourse.[33] Among detained youths in a Southern city, 62% consistently used condoms, yet 20% tested positive for either chlamydia or gonorrhea.[47]

STD risk among adolescent boys in detention is significantly increased by multiple sexual partners and inconsistent condom use.[33] High rates of risk behaviors have been found among detained juveniles in Cook County, Illinois: 61% of detained adolescent boys had had more than 1 partner in the past 3 months, 35% of adolescent boys and 41% of adolescent girls had had recent unprotected vaginal sexual intercourse, and 68% of adolescent boys and 52% of adolescent girls reported having had sexual intercourse while high.[48] Finally, adolescents in Atlanta with a conviction were significantly more likely to engage in risk sexual behaviors, including early sexual initiation, multiple sexual partners, sexual intercourse with an infected partner, or use of drugs or alcohol during sexual intercourse, than were those never convicted.[35]

Studies have found associations among substance use, risk sexual behaviors, and STDs among adolescents.[49–52] Youth Risk Behavior Survey data indicate that alcohol-using adolescents are twice as likely, and drug-using adolescents 3 times as likely, to have had 4 or more sexual partners in their lifetime than are those who do not drink or use drugs.[53] A recent study among rural STD clinic patients in Pennsylvania found higher infection rates for those with a substance use disorder.[54]

Other Risk Factors

Drug-involved young offenders also have high rates of physical health, mental health, social, and family problems, which increase STD risk.[55–59] Only 6.4% of incarcerated youths in Maryland had "excellent" or "good" health profiles (compared with 34.2% of adolescent boys in school).[1] In addition, many adolescent offenders also have antisocial and drug-involved peers,[60,61] poor family functioning,[40,62–64] and lower self-esteem and resilience.[65–67] These factors increase high-risk behaviors and reduce the effects of risk-reduction interventions.

ORGANIZATIONAL AND STRUCTURAL BARRIERS

Despite juvenile arrestees' elevated risk of chlamydia and gonorrhea, significant barriers exist to implementing STD services for this high-risk group. These barriers must be understood to more effectively expand interventions.

Health Care Access

Programs that address the health care needs of adolescent offenders must take into account that many of these youths come from poor, minority, and socially disadvantaged communities and face significant challenges to accessing health care services, especially after release into the community.[3,12] Research into the social and economic factors relating to adolescent health and health care access indicates that lower social class is associated with poorer health profiles, lower health literacy, and lack of access to preventive and treatment services.[20,68] In 2004, 8.5 million American youths younger than 18 years old had no medical insurance; African Americans and Hispanics were less likely than were Whites to be insured.[69]

Low-income adolescents are 4 times as likely as middle- or high-income youths to not have a usual source of health care, and 7 times as likely to have unmet medical needs[20] despite eligibility for Medicaid or the State Child Health Insurance Program. Most racial/ethnic health care studies have found disparities for African American and Hispanic youths in primary care services.[21] Given the overrepresentation of racial/ethnic minorities in the juvenile justice system, health care access is a particularly problematic issue.

Impediments to implementing routine health screening and referral and other public health interventions in the juvenile justice system include a lack of shared goals and philosophies by the juvenile justice and public health systems, resource constraints, lack of information sharing, mutual mistrust, organizational "inertia," and separate funding and oversight mechanisms. These systems must be willing to innovate in order to overcome these barriers to expanding and integrating health care access. But public-sector treatment and other health services can be slow to incorporate innovations into daily practice.[70–72] Research and theory on innovation diffusion suggest several organizational, individual, and social factors that facilitate or impede implementation of these innovations in specific organizational settings or in collaborative efforts between systems.[73–76] To create policies that increase service access for young offenders, it is important that policymakers understand how the factors just noted operate. Coordination is needed among different providers (e.g., social services, medical facilities, and treatment facilities) serving youths infected with STDs.[77–79]

Barriers to Implementing Services for Adolescent Offenders

Several barriers prevent linkage of adolescent offenders to STD services. Willingness to be tested for STDs can be influenced by privacy and confidentiality concerns.[80,81] A study of beliefs about chlamydia among those aged 16 to 21 years found several obstacles to testing: fearing disclosure that they had been tested, discovering that they have an STD, and being HIV-positive.[80] These findings are consistent with previous studies examining youths' attitudes toward STD screening.[81]

Structural and social barriers to STD treatment access include transportation problems,[21,82] language barriers,[20] low health literacy,[83] lack of knowledge about treatment or testing locations,[84] lack of insurance,[20] long clinic waiting times,[84] perceived discrimination and lack of empathy on the part of health care staff,[84] feelings of shame and stigma,[84–86] use of urethral specimen collection methods,[84] and inconvenient clinic hours.[84] Distance from services also affects access, and adolescent offenders often lack transportation.[87–89] Lack of STD knowledge also can serve as a barrier to seeking treatment, particularly among adolescent African American girls,[84] which suggests that subpopulations within the juvenile population require special attention.

Although more research is needed on the STD prevention service needs of adolescent offenders, especially new arrestees and those under community supervision, many barriers exist to implementing these interventions. With relatively low levels of community and school connectedness,[40,90,91] adolescent offenders as a population are less influenced by social norms supporting less risky drug and sexual behaviors and may not be receptive to normative peer- or school-based curricula. Adolescent offenders also have elevated school dropout and truancy rates and are likely to be placed in alternative schools, thus reducing their exposure to school-based interventions.[92] Academic problems and low school and community attachment are risk factors for delinquency and substance abuse[40,93,94] A relative lack of social connectedness means that for many high-risk adolescent offenders, their best opportunity to be linked to health and STD prevention services may be through the juvenile justice system.

Incarcerated youths face additional challenges because the organizational culture of correctional facilities may deemphasize health care, and there is insensitivity to privacy and confidentiality issues.[95] Inmates in correctional institutions have a legal right to the same standard of health care that is available in the community; however, the mandate for care operates within a system where security takes priority over health care.[95,96] For juvenile detention and correctional facilities, short lengths of stay and restricted inmate movement also create barriers to effective STD treatment and intervention.[95,97] Finally, confidentiality concerns are often a barrier in juvenile justice system settings: privacy is extremely limited and disclosure of an STD to correctional staff and other adolescents may place the infected youth at risk of harm.[95] These factors suggest that STD services for offenders in the community may face fewer challenges for establishing or improving linkages between the juvenile justice and public health systems.

POLICY AND IMPLEMENTATION ISSUES

As discussed in the previous section, a need exists for new and creative policies to promote linkages between the juvenile justice and public health systems, especially for newly arrested youths diverted to the community, placed on probation, or released from detention, correctional, or secure residential facilities.[3, 12, 98] However, several policy and service implementation issues must be overcome to achieve this goal.

Policy and Legal Barriers

Expansion of STD services in the juvenile justice system is complicated by policy and legal constraints. State and federal laws protect the confidentiality of juvenile records and adolescent health information, which complicates the exchange of information across agencies. Responsibility for parental notification, partner notification, disclosure to health care providers, and mandatory infectious disease reporting are roles with which juvenile justice system personnel may be neither comfortable nor familiar.

Despite its potential value for detecting hidden STDs, broad testing protocols for new arrestees can be difficult to implement. Concerns center on costs, legal constraints placed on the amount of time available to process arrested youths through intake facilities, and the availability of laboratory or staff resources to collect and process biological specimens. However, the recent availability of noninvasive, highly accurate urine-based nucleic acid amplification tests for chlamydia and gonorrhea greatly facilitates testing access by eliminating the need for more intrusive and time-consuming urethral or vaginal swabs.[31,33,99] Because many admission protocols and community supervision requirements include regular urine screening tests for illegal drugs, adding urine-based STD screening is relatively easy to implement. Our

recent experience in Hillsborough County, Florida (discussed in the section, "A Promising Model"), illustrates the potential for such a screening model.

Gender- and Race-Specific Services

Higher rates of STDs and unique health service needs among female and minority adolescent offenders raise particular issues for expanding STD-related services.

Female adolescent offenders. As male arrest rates have decreased,[15] adolescent girls have become a growing proportion of the juvenile justice population.[15,100] In addition to a substantially higher likelihood of STDs, female offenders have high rates of drug involvement and more extensive health and social problems than do boys.[100] Among detained female adolescent offenders, 95% lacked a stable home environment.[101] Female adolescent offenders in Los Angeles County were 3 times as likely as other adolescent girls to have clinical depression or anxiety symptoms.[102] Female juvenile detainees in Cook County, Illinois, had significantly higher rates of anxiety (31% of adolescent girls vs 21% of adolescent boys) or affective disorders (28% vs 19%, respectively).[103] Other studies found high rates of sexual victimization[104] and physical abuse[105] among young female offenders, both of which are associated with mental health problems,[106] substance abuse,[107] and risky sexual behaviors.[108–110] Adolescent girls who abuse substances have been found to have higher rates of posttraumatic stress disorder than adolescent boys who abuse substances.[65,111] More generally, urban, poor, and minority women have relatively high risks of STDs[112] but lower rates of condom use.[113] The high levels of drug use, STD risk, and health and social problems among female adolescent offenders suggest a need to disseminate knowledge about STDs and risk behaviors and to develop gender-specific interventions. Screening adolescent girls in detention facilities for chlamydia was designated a key performance measure under the Centers for Disease Control and Prevention's 2005 Comprehensive STD Prevention Systems program announcement.[114]

Early STD detection and treatment is also important to prevent other chronic, long-term health sequelae, especially pelvic inflammatory disease.[86] Adolescent girls have the highest age-specific rates of pelvic inflammatory disease among sexually active females,[23] and between one fourth to three fourths of young women with acute pelvic inflammatory disease have been found to have chlamydia or gonorrhea.[115] Delay in the diagnosis and treatment of chlamydia or gonorrhea is a major risk factor for pelvic inflammatory disease.[116]

Racial/ethnic minorities. National data indicate that African Americans and Hispanics are at elevated risk of HIV and other STDs[117–120]; these populations are disproportionately represented among adolescent offenders.[100] Although only 12% of the population, African Americans accounted for 49% of new HIV/AIDS diagnoses in the United States in 2004.[117] Between 1999 and 2004, 47% of newly diagnosed HIV cases in 29 US states involved non-Hispanic Black women.[118] African Americans also are at high risk of gonorrhea, with a rate 18 times greater than that in Whites in 2006.[117] Overall, the prevalences of chlamydia and gonorrhea are highest in African Americans in US juvenile detention centers.[5]

These data suggest an urgent need to expand culturally specific risk reduction interventions for minority adolescent offenders. Recent meta-analyses of behavioral interventions for African Americans and Hispanics suggest that these interventions can reduce risk behaviors and incident STDs.[119–121] Few of the reviewed studies, however, included adolescents, and none involved adolescent offenders.

Expanding Surveillance and Prevention

Given the increased HIV infection risk for STD-positive youths, the Centers for Disease Control and Prevention has recommended HIV prevention through early detection and screening of other STDs, calling for (1) "establishing STD screening in non-medical settings where persons at high risk for HIV and curable STDs are encountered" and (2) "expanding screening based on prevalence of infections detected in pilot screening efforts."[122(p11)]

It is estimated that only one third of incident STD infections are identified each year; accordingly, routine screening at the front end of the juvenile justice system can identify many undetected and untreated infections.[39,87,123] Similarly, STD prevention and education services should be expanded through collaborations between the public health and juvenile justice systems. Because most newly arrested youths spend less than 24 hours in custody before being released back into the community,[15] front-end prevention services need to be fairly brief and implemented within a few hours of arrest. Data from recent trials of brief computer-assisted risk-reduction interventions for adolescents[124,125] are encouraging and offer a promising model. Research on brief interventions for other risky health behaviors (e.g., drug and alcohol use) indicates that brief, theoretically driven behavioral change interventions can be effective.[126,127] However, brief, educational, nonskills-based classes are not likely to reduce STD risk.[128] We recognize that such brief interventions cannot address the multiple health needs of this population, but protocols for new arrestees could be designed to facilitate linkages to more extensive services later in the process.

Several studies have found that adolescent HIV/STD risk-reduction interventions can reduce risky sexual behaviors among other high-risk populations,[129] including adolescents in residential drug treatment,[52] HIV-positive youths,[130] high-risk students,[92] low-income African American middle school students,[131] and adolescent African American girls.[132] However, few of these interventions have been tested among adolescent offenders.[22] In a review of 15 randomized clinical trials of HIV risk reduction interventions, 10 studies found positive effects on condom use. No significant effects on risky sexual behaviors were found in the 4 studies targeting adolescent offender or incarcerated populations.[133]

Finally, the importance of implementing broader routine testing and treatment of chlamydia and gonorrhea for young arrestees is driven by STD transmission dynamics. STD transmission involves a circular pattern of sexual exposure to an infected person, acquisition of infection, and transmission of the infection to a susceptible partner. Sustained prevention efforts during this cycle can drive an infection toward extinction in the entire population, especially when these interventions focus on the core groups with the highest transmission rates.[9,10]

Expanded STD screening and related services must be sensitive to the special needs of

female and minority youths and should make use of urine-based testing, perhaps those linked to extant drug-testing protocols.

A PROMISING MODEL

To address STD surveillance and service gaps, new models of collaborations between the juvenile justice and public health systems are needed to increase STD screening for new arrestees, the largest group of young offenders. Between June and December 2006, we implemented a successful pilot collaborative effort involving the Hillsborough County, Florida, Juvenile Assessment Center (HJAC; a centralized intake facility for arrested juveniles), the Florida Department of Health Bureau of Laboratories, Tampa Branch (DOH), the Hillsborough County Health Department (HCHD), and the Florida Department of Juvenile Justice. The protocol involved 3 key steps: (1) HJAC assessors were trained to provide brief STD precounseling to newly arrested juveniles, (2) HJAC assessors asked arrested juveniles to voluntarily provide a urine sample for drug testing (part of existing standard protocol) and to voluntarily consent to having their urine specimen split and tested for chlamydia and gonorrhea, and (3) communication and coordination were established among HJAC staff, DOH staff, and HCHD disease intervention specialists to facilitate treatment for infected youths. Youths processed through the HJAC received a full assessment that was used for discharge placement planning. About 60% of all arrested youths processed through the HJAC agreed to be assessed.

The planning process benefited from R.D.'s established relationships with HJAC administrators and community agencies, long-term experience with HJAC operations, and experience with the HCHD on a previous pilot STD-testing project. These relationships and support among community and government stakeholders (including the County Sheriff's Office and the Department of Juvenile Justice) facilitated implementation. Providing access to free HCHD treatment for STD-positive youths was a critical factor in achieving community stakeholder buy-in and overcoming typical barriers to interagency collaborative efforts in the juvenile justice system. Project planning involved a series of meetings with key agency stakeholders aimed at establishing an efficient and effective flow of information that also maintained confidentiality. We successfully pilot-tested the protocol in May 2006 and it was fully implemented on June 16, 2006. A brief summary of the procedures follows.

To comply with the requirements of the Department of Health and Human Services Office for Human Research Protections and the project institutional review boards, project research staff could not have direct contact with the youths. In addition, Florida state law protects the confidentiality of youths 12 years and older who are tested for STDs, even from their parents, and parental consent for an STD test is not required. After receiving human subjects certification from the National Institutes of Health, HJAC staff were trained by us to (1) conduct STD pretest counseling of eligible youths, (2) obtain consent to split the youths' urine specimens for STD testing, (3) complete a supplemental contact form on consenting youths (to assist HCHD Disease Intervention Specialists in locating infected youths for treatment), and (4) administer a supplemental risk behavior assessment. In addition to the Office for Human Research Protections approval, all recruitment and consent procedures were reviewed and approved by the relevant institutional review boards.

Eligible youths were those 12 years and older, arrested for a delinquent offense, who consented to giving a urine sample for drug testing. A separate consent was given to have the urine sample split at the DOH and tested for chlamydia and gonorrhea. The recruitment period was extended for adolescent girls to obtain a roughly equal number of participants of each gender. The HJAC assessed 1393 youths between June 16 and December 31, 2006, of whom 83% agreed to provide a urine specimen for drug testing; 86.5% of these additionally agreed to the STD testing. Overall, 72% of all screened youths agreed to the STD testing, which indicates the feasibility of front-end STD testing. No significant gender or race differences were found in STD test consent rates (adolescent girls, 72.7%; adolescent boys, 70.5%. Whites: 71.6%; African Americans, 71.8%; Hispanics, 69.6%).

The STD pretest counseling protocol was developed in consultation with the HCHD and the DOH and included the following topics: (1) getting tested for chlamydia or gonorrhea is very important; (2) these diseases are spread through unprotected sexual intercourse or during birth; (3) the urine specimen already provided for drug testing can also be tested for chlamydia and gonorrhea; (4) the test requires written permission and is completely voluntary; (5) the test is strictly confidential—the youth's family, school, judge, or probation officer will not be informed of the test results; and (6) if the test is positive, the HCHD will contact the youth personally and confidentially to provide free treatment with antibiotics. All youths, whether or not they consented to the STD test, were also given written DOH materials with information about protecting themselves from STDs, getting tested, and finding out more about STDs. Posttest counseling was given by the Disease Intervention Specialists at the time of treatment follow-up.

STD testing used the FDA-approved nucleic acid amplification test (Aptima Combo 2, Gen-Probe, San Diego, CA).[99] A DOH technician transferred urine from the drug specimen cup to a Gen-Probe urine collection vial via pipette, per Gen-Probe protocol. The vial was taken to an in-house Gen-Probe testing machine for analysis. Batch analyses were performed 2 to 3 times per week, with an approximate 48-hour turnaround time from specimen collection to test results. Testing costs were $15 per screen for the 2 diseases.

For STD-positive youths, supplemental contact and STD test result forms were sent immediately by secure fax to HCHD Disease Intervention Specialists for follow-up contact and treatment that conformed with standard HCHD protocols for chlamydia and gonorrhea infections. Disease Intervention Specialists are required to clear STD-positive cases (e.g., treated, refused treatment, or unable to locate) within 14 days of detection, although most cases were cleared within 7 days. Upon contact, STD-positive youths in the community usually traveled on their own to the main HCHD clinic in downtown Tampa for treatment. For about 25% of the STD-positive cases, the Disease Intervention Specialist drove the youth to the clinic for treatment. For youths placed in one of Hillsborough County's 2 juvenile detention centers, a Disease Intervention Specialists would contact a designated person at each detention center to determine whether the

youth was still in custody. If so, the Disease Intervention Specialist would coordinate with the detention center's contact person to arrange for on-site treatment.

Treated youths were also asked by the HCHD Disease Intervention Specialists to provide a voluntary blood specimen to test for syphilis and HIV. During our project, this screening identified 1 HIV-infected youth and 3 youths with syphilis. STD-positive youths were also asked to identify and refer their sexual partners to the clinic for testing and treatment. Overall, 62.1% of STD-positive youths were treated (59.3% of cases among boys and 64.0% among girls). Among those in detention, 60% received treatment, compared with 69% of those released to the community.[6,38] Failure to treat was the result of Disease Intervention Specialists not being able to contact the youth; only 1 youth refused treatment once contacted by a Disease Intervention Specialist.

CONCLUSIONS

The value of early detection and routine surveillance of infectious diseases for identifying high-risk populations and geographic distributions of infections is well established.[9,38,122,134] Adolescent offenders at all stages of the juvenile justice system are at high risk of STDs, yet screening mainly occurs in detention or correctional facilities. Only a small percentage of young offenders are ever incarcerated or detained for any period of time. Most are quickly released back into the community after arrest, which suggests the need for screening protocols at the front end of the juvenile justice system. Public health officials have called for systematic collection of STD data in juvenile justice populations, while also recognizing that many barriers exist to developing and implementing such surveillance programs.[11]

Our analysis suggests an urgent public health need to extend STD testing, prevention, and treatment services to newly arrested young offenders. Additional research is also needed on (1) the epidemiology of STDs and risk behavior patterns among all adolescent offenders; (2) STD prevention service gaps; (3) strategies to facilitate access to testing, prevention, and treatment services; and (4) individual and organizational barriers to implementing broader disease surveillance and more effective gender- and race-specific STD services. With many high-risk arrested youths processed quickly through the system and released back into the community,[100] new data are needed among the broadest possible segment of the juvenile justice population.[135]

Our experience in Hillsborough County indicates that juvenile justice and public health systems can collaborate to implement STD surveillance among newly arrested youths and that most of these youths will voluntarily agree to urine-based STD testing. Based on the results of our project, the HCHD and HJAC implemented, effective August 27, 2007, a permanent, voluntary STD testing and treatment protocol for newly arrested youths processed through the HJAC. The HJAC serves a similar population and operates in a manner similar to other juvenile assessment centers serving metropolitan areas around the United States. Thus, our model may be transportable to other jurisdictions.

Such front-end screening coupled with rapid treatment linkages and expansion of effective risk reduction interventions at subsequent stages of juvenile justice system processing could greatly reduce STD incidence and prevalence in the community.[134] It is also likely to be cost-effective.[136] Although youths spend insufficient time in the arrest processing facility to implement full-scale risk reduction interventions, brief interventions (perhaps computerized) should be developed and tested in arrest processing centers to provide information about STDs and motivate arrested youths to seek sexual and reproductive health care services after their release back to the community. Improving access to substance abuse treatment after leaving the juvenile assessment center may also reduce STD risk as well as improve health and social functioning.[46,137]

Given the general health care needs of this population, the need for improved linkages between the juvenile justice and public health systems, and a need for integrated continuum of care as youths move through the juvenile justice system, an effective STD screening process could also facilitate linkages to health care by initiating the youths' contact with the local health department. Expanded STD surveillance can improve resource allocations and more targeted placement of STD prevention and treatment services.[138] Collaborative models involving public health and juvenile justice systems, as well as public health and intervention researchers, hold great promise for addressing STD risks and treatment needs among high-risk adolescent arrestees. ■

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S. Belenko originated and designed the study and wrote the article. R. Dembo assisted with editing and had major responsibility for design, oversight, and data collection for the model protocol. M. Rollie contributed to the literature searches. K. Childs assisted with literature searches and data collection and analysis for the model protocol. C. Salvatore assisted with literature reviews and editing.

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Human Participant Protection

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