Published in final edited form as:

J Sch Health. 2008 July ; 78(7): 382–388. doi:10.1111/j.1746-1561.2008.00318.x.

Sexually Transmitted Infection Among Adolescents Receiving Special Education Services

David S. Mandell, ScD^{a,b,c}, Catharine C. Eleey, BA^d, Julie A. Cederbaum, MSW^e, Elizabeth Noll, MA^f, M. Katherine Hutchinson, PhD, RN^g, Loretta S. Jemmott, PhD, RN, FAAN^h, and Michael B. Blank, PhDⁱ

David S. Mandell: mandelld@mail.med.upenn.edu; Catharine C. Eleey: cceleey@mail.med.upenn.edu; Julie A. Cederbaum: julieced@sp2.upenn.edu; Elizabeth Noll: lizn@mail.med.upenn.edu; M. Katherine Hutchinson: Hutchins@nursing.upenn.edu; Loretta S. Jemmott: jemmott@nursing.upenn.edu; Michael B. Blank: Mblank2@mail.med.upenn.edu

^aAssistant Professor, Center for Mental Health Policy and Services Research, Department of Psychiatry, University of Pennsylvania School of Medicine, 3535 Market St, 3rd Floor, Philadelphia, PA 19104

^bSenior Fellow, Leonard Davis Institute of Health Economics

^cAssistant Professor, Department of Pediatrics, University of Pennsylvania School of Medicine

^dStudent, University of Pennsylvania School of Medicine, 3400 Spruce Street, Philadelphia, PA 19104

^eStudent, University of Pennsylvania School of Social Policy & Practice, 3700 Walnut Street, Philadelphia, PA 19104

^fData Manager/Analyst, Center for Mental Health Policy and Services Research, Department of Psychiatry, University of Pennsylvania School of Medicine, 3535 Market Street, 3rd Floor, Philadelphia, PA 19104-3309

^gAssistant Professor, Center for Health Disparities Research, University of Pennsylvania School of Nursing, Fagin Hall, 418 Curie Blvd., Philadelphia, PA 19104-6096

^hProfessor, Center for Health Disparities Research, University of Pennsylvania School of Nursing, Room 239 Fagin Hall, 418 Curie Blvd., Philadelphia, PA 19104-6096

ⁱAssistant Professor, Center for Mental Health Policy and Services Research, Department of Psychiatry, University of Pennsylvania School of Medicine, 3535 Market Street, 3rd Floor, Philadelphia, PA 19104-3309

Abstract

BACKGROUND—To estimate the relative risk of sexually transmitted infections (STIs) among children identified as having learning disabilities through the special education system.

METHODS—This cross-sectional study used special education data and Medicaid data from Philadelphia, Pennsylvania, for calendar year 2002. The sample comprised 51,234 Medicaid-

eligible children, aged 12–17 years, 8015 of whom were receiving special education services. Claims associated with diagnoses of STIs were abstracted, and logistic regression was used to estimate the odds of STI among children in different special education categories.

RESULTS—There were 3% of males and 5% of females who were treated for an STI through the Medicaid system in 2002. Among females, those in the mental retardation (MR) category were at greatest risk (6.9%) and those in the emotionally disturbed or “no special education” category at lowest risk (4.9% each). Among males, STIs were most prevalent among those classified as mentally gifted (6.7%) and lowest among those in the MR category (3.0%). In adjusted analyses, males with specific learning disabilities and females with MR or who were academically gifted were at excess risk for STIs.

CONCLUSIONS—The finding that children with learning disabilities are at similar or greater risk for contracting STIs as other youth suggests the need to further understand their risk behaviors and the potential need to develop prevention programs specific to their learning needs.

Keywords

child and adolescent health; children with disabilities; human sexuality; reproductive health; risk behaviors

The purpose of this study was to examine the risk of contracting a sexually transmitted infection (STI) among children with learning disabilities. Nearly 7 million students in the United States experience cognitive, emotional, or behavioral problems with learning that result in the use of special education services, almost 50% of whom are between the ages of 12 and 18 years.¹ These youth contend with academic, social, and emotional difficulties, many of which first become apparent or are amplified during adolescence. Adolescents with special education needs are more likely than their peers to drop out of school,^{2,3} have lower self-esteem,^{4,5} experience greater loneliness and emotional distress,^{6–8} and develop mental disorders.^{9,10} Many youth with problems that affect learning also are more vulnerable to exploitation and peer pressure due to higher levels of dependency on others and reduced social and communication skills.¹¹

Due in large part to these increased stressors, adolescents with learning difficulties participate more frequently in activities that carry significant health risks, including engaging in risky sexual behaviors.^{12,13} The consequences of these behaviors may be exacerbated by a health-related knowledge deficit; adolescents with learning difficulties often possess low levels of accurate sex-related knowledge and gross misconceptions about reproduction and STIs.^{14,15}

This higher prevalence of risk behaviors suggests that there may be an increased risk for STIs among adolescents receiving special education services. The few studies investigating the prevalence of STIs among these youth suggest different relative risks associated with disability type, although analyses have been conducted only among children with a few types of disabilities. For example, adolescents with conduct disorder or hyperactivity are more likely to contract an STI than their peers.^{16,17} In contrast, individuals with severe cognitive impairments are at decreased risk for contracting most STIs.^{18–20} Findings, however, largely come from studies of individuals in residential settings; it is possible that

the prevalence of STIs is higher for cognitively impaired individuals who are better integrated into their communities.

While these studies address sexual health risks among adolescents in 2 of the most common special education categories—emotional disturbance (ED) and mental retardation (MR)—to date, no published study has investigated the prevalence of STIs among youth in the largest special education category: those with learning disabilities (LD). Adolescents in LD comprised 57% of all adolescents receiving special education services in 2004. MR and ED, while the second and third largest categories, respectively, together comprised only 22% of adolescent special education students in 2004.¹ Adolescents with LD might be expected to be at high risk for contracting STIs because of deficits in executive functioning that interfere with making healthy choices.²¹ For example, these adolescents can have difficulties connecting actions to consequences, can have poorer planning abilities, and tend to be more impulsive than other adolescents.^{22–24}

If adolescents with various disabilities are at greater risk for contracting STIs, it may have important implications for intervention development, with unique interventions required for children with specific impairments. To begin to address this issue, we examined the treated prevalence of STIs among youth receiving special education services.

METHODS

Data Sources and Sample

The School District of Philadelphia provided information on special education eligibility for all children in Philadelphia, Pennsylvania (calendar year 2002), who were between the ages of 12 and 17 years on January 1, 2002. These data were merged with Pennsylvania Medicaid eligibility and health care claims data for the same period using name, birth date, and sex to create a unique identifier. The sample comprised 51,234 Medicaid-eligible children aged 12–17 years on January 1, 2002. University of Pennsylvania and City of Philadelphia institutional review board approval was obtained prior to analyses.

Variables

Receipt of Special Education Services—Special education eligibility was coded based on the following 13 mutually exclusive categories that are used by the US Department of Education: autism, hearing and visual impairment, emotionally disturbed, hearing impairment, multiple disabilities, MR, other health impairment, orthopedic impairment, specific learning disability, speech/language impairment, traumatic brain injury, visual impairment, or mentally gifted (MG).²⁵ These 13 categories were collapsed into 6 mutually exclusive categories so that all children were labeled as receiving no special education services, specific LD, MR, ED, MG, or other special education category. Unlike many states, Pennsylvania requires that school districts identify gifted students and provide them with individualized education programs (22 Pennsylvania Code, chapter 16). Although children in the MG category do not constitute a group with learning disabilities, they provide an important comparison group. Learning problems may be quite prevalent in an urban, relatively impoverished, sample, even among those who are not receiving special education

services. Those in the MG category may be more likely to comprise an academically successful group of adolescents without accompanying learning problems.

Receipt of STI Treatment—Use of Medicaid-reimbursed health care services for STIs was coded using the following diagnostic codes from the *International Classification of Diseases*, 9th Edition.²⁶ Diagnoses included herpes (054); hepatitis B (070.2, 070.30, 070.31, 070.32, and V026.1); other hepatitis, not including hepatitis C (070.59, 070.9, and V026.9); chlamydia (077, 078, and 079); human immunodeficiency virus (042, V08, and 795.71); syphilis (091 through 097); gonorrhea (098 and V027); trichomoniasis (131); or other venereal disease (099 and V028). Candida and hepatitis C were not included because of the unknown probability of transmission through means other than sexual contact in this population. Children were coded as having received treatment for an STI if they had at least 1 Medicaid claim associated with any of these diagnoses. The small proportion of youth receiving any given diagnosis (see Table 1) precluded analysis of risk associated with each diagnostic category.

Demographics—Age, sex, and race/ethnicity were abstracted from the Medicaid eligibility files and the special education database. In the few instances in which there were conflicting values, the most commonly occurring value in the data set was used.

Data Analyses

Analysis of variance for continuous variables and chi-square tests for categorical variables were used to compare demographic characteristics across special education categories. The percentage of children receiving an STI diagnosis was calculated for each category of special education, stratified by sex. Because potential interactions between special education category and sex were observed, logistic regressions were conducted separately for males and females to determine adjusted associations between special education category and the presence of a treated STI, adjusting for age and ethnicity.

RESULTS

Table 1 presents the demographic characteristics for children in each category of special education. Differences in the mean age across groups were small but statistically significant ($F = 121.6$, $df = 5$, $p < .001$). There was a significant association between special education category and sex such that a greater proportion of males were classified as ED and a smaller proportion classified in the “other” category ($\chi^2 = 1613.6$, $df = 5$, $p < .001$). There was a statistically significant association between race/ethnicity and special education placement ($\chi^2 = 616.2$, $df = 20$, $p < .001$). A greater proportion of African Americans were in the ED category and a smaller proportion in MG. A greater proportion of whites were in the “other” category and a smaller proportion received no special education. The percentage of children treated for an STI ranged from 3.9% of those receiving no special education services to 5.6% of those in the MG category ($\chi^2 = 22.9$, $df = 5$, $p < .001$).

Table 2 presents the prevalence of each STI among children receiving and not receiving special education services. Columns sum to more than the total percentage of infected individuals because children could be diagnosed with more than 1 STI. Chlamydia was by

far the most common STI in both groups; it was present in more than 3.5% of adolescents in both groups and accounted for 85% of infected individuals in each group. Herpes was the next most common STI, present in 0.19% of children not in special education and 0.32% of children in special education and accounted for 4.6% and 7.1% infected individuals in each group, respectively.

Figure 1 presents the percentage of youth in each special education category diagnosed with an STI, stratified by sex. All sex differences were statistically significant at $p < .01$. Among females, those classified as MR were at greatest risk for STIs (6.9%) and those classified as ED or in the “no special education” category at least risk (4.9% each). Among males, STIs were most prevalent among those classified as MG (6.7%) and least prevalent among those classified as MR (3.0%).

Table 3 presents the results of the 2 logistic regression analyses estimating the adjusted association between special education category and receiving an STI diagnosis. The reference groups comprised African American 12-year-old children who were not receiving special education services. For males, being classified as LD was associated with a 36% increase in the odds of having an STI. Latinos (odds ratio [OR] = 1.41), whites (OR = 1.72), and those in the “other” ethnicity category (OR = 1.79) were at increased risk compared with African Americans.

For females, being classified as MR was associated with a 37% increase in the odds of having an STI and being classified as MG was associated with a 10% increase in odds. Again, those in the white (OR = 1.56) and “other” ethnicity category (OR = 1.41) were at increased risk relative to African American females. Asian females had one third the odds of being diagnosed with an STI compared with African American females. Unlike among males, older age was associated with increased risk for an STI among females.

DISCUSSION

This study found that 3% of Philadelphia public middle and high school Medicaid-eligible adolescent males and 5% of females were treated for an STI in 2002. In comparison, national estimates of reported cases of all STIs for all youth aged 10–19 years were less than 2% for males and less than 3% for females. Screening efforts in school-based clinics in 2002, however, found the median rate of chlamydia, the most common STI, to be 13% for adolescent females.²⁷ These comparisons suggest that the current findings represent a relatively high treated prevalence but are most likely an underestimation of the community prevalence of STIs. The finding of higher prevalence among females is in line with previous research.^{28–31}

This study also found that students in some—but not all—categories of special education were at increased risk for having a diagnosed STI than their peers. In adjusted analyses, females in the MR and MG categories were more likely to receive an STI diagnosis than their peers, while males in the specific learning disability category were also at increased risk.

The finding regarding females in the MR category stands in contrast to research on institutionalized individuals with cognitive impairment.^{18,20} Prevalence may be higher in this sample because these females are likely to be more integrated into their communities than females in residential care, allowing for more opportunities either to engage in risky behavior or to be coerced or exploited. Related research demonstrated that sexually active teenage females with low cognitive abilities were more than twice as likely to contract an STI or to become pregnant than their sexually active peers.³² There are also higher rates of sexual abuse and exploitation among cognitively impaired children, particularly among females,³³ which may contribute to increased STIs. It is also possible that the true prevalence of STIs is not greater among cognitively impaired females, but they are more likely to be diagnosed because of increased contact with health and social service systems.

A surprising finding was that academically gifted females also showed significantly increased rates of treated infection. Research suggests that intellectually precocious females are more socially and sexually precocious as well and are more likely to have older sexual partners.³⁴ This in turn could put them at greater risk for contracting STIs.³⁵ Academically gifted females may also have greater health knowledge than their peers, leading to increased symptom recognition and treatment when they acquire an STI.³⁶

Males in the specific learning disability category were significantly more likely to be treated for an STI than males not receiving special education services. This finding, while not reported previously, is logical, given the prevalence of executive functioning deficits, social vulnerabilities, and decreased health knowledge associated with a variety of learning disabilities.^{22–24} In contrast, females in this category did not have a significantly increased risk. This difference may be due to the fact that males with learning disabilities are identified more often than females due to their disruptive behaviors that bring them to the attention of teachers.³⁷ This differential ascertainment would result in a greater proportion of females with learning disabilities receiving no special education services, biasing the observed associations. It also is possible that learning disabilities increase the risk of STIs more for males than for females due to these associated behaviors. Males with LD more frequently have comorbid conditions, such as attention deficit hyperactivity disorder (ADHD) and conduct disorder, which may contribute to greater risk-taking behavior and subsequently increased infection risk.³⁸

Effects associated with age and ethnicity also are notable. Older age was associated with increased risk for females but not for males. Older females may be more likely than younger females to have initiated sex and to have older partners.^{29,35} Older females also may be more likely to receive gynecological care and be tested, while older males may be no more likely to seek sexual health care than younger males.

Compared with African American males, white and Latino males were more likely to be treated for an STI. Among females, Asians were less likely and whites more likely to have a diagnosed STI than African Americans. While the finding regarding Asian adolescents is in line with previous research,³⁰ the finding regarding African American youth stands in contrast to recent research suggesting relatively higher prevalence of STIs.^{29,35,39,40}

We were surprised to find no excess risk associated with children in the ED category, given that risky behaviors often are associated with emotional and behavioral disturbances. It may be that this type of difficulty is the least recognized among children in public schools,⁴¹ therefore attenuating the observed risk. It also may be that children with STIs in this category are less likely to be treated, which would have important implications for screening.

Differences between current study findings and those of previous studies may relate to the fact that the current sample comprised Medicaid-eligible youth in 1 city; racial variation in sexual risk behavior may differ depending on socioeconomic status and regionally determined factors. Low-income African American and Asian adolescents in Philadelphia may have safer sexual behaviors than low-income youth who are white or Latino, may engage in similarly risky behaviors but among networks with lower rates of STIs, or may be less likely to seek health care than other adolescents.⁴²

Limitations

First among the limitations are that the analyses relied on special education categorizations of the School District of Philadelphia; disabilities may have been underrecognized or misclassified, potentially attenuating the observed risk. An equally important limitation is that Medicaid claims were used to identify STI cases. This strategy introduces 2 potential problems discussed in detail in previous studies using similar data.^{43,44} First, it most likely underestimates the number of adolescents with STIs and therefore should not be considered a true prevalence estimate. More germane to the purpose of this study, if infected adolescents in different special education categories have different likelihoods of receiving Medicaid-reimbursed treatment for STIs, it may introduce considerable ascertainment bias. Individuals who come to the attention of the health or education system for other problems may be more likely than their peers to receive testing for STIs. A related limitation is that many public high school campuses in Philadelphia have health centers where STIs are treated without a fee. Children in different special education categories may have different likelihoods of using this service.

Implications

Despite these limitations, there are important implications related to these results. If children with learning disabilities are at greater risk for contracting STIs, then understanding the risk behaviors and risk reduction needs of this group is critical. More sophisticated studies investigating the prevalence of STIs in special education populations are needed to elucidate the true impact of cognitive and emotional impairments on sexual health. Specific correlates of risk behavior and malleable factors among children with impairments also should be examined, as they may differ from the risk factors among other children.

There are important implications even if true prevalence is assumed to be the same across groups and the observed associations related to the probability of treatment. In this case, the results suggest that some groups are at significant risk of not receiving treatment, which could result in increased disability and spread of infection. Even if the prevalence of STIs is similar for adolescents with learning disabilities and their peers, however, there is still a

need for appropriate, effective preventive interventions tailored to the needs of children with disabilities. Often, special education students are not given the option to participate in health or sex education programs in the schools,⁴⁵ and when they are, the materials are not always appropriate to their needs. A small number of sexual health education programs have been developed specifically for students with special needs, but they have not been rigorously evaluated and are not widely used.^{45,46} Studies evaluating the appropriateness and effectiveness of existing prevention programs for disabled youth are needed. If necessary, new intervention programs that take into account the cognitive needs of disabled youth should be developed.

References

1. US Department of Education Office of Special Education Programs. Report of Children With Disabilities Receiving Special Education Under Part B of the Individuals With Disabilities Education Act. Washington, DC: U.S. Department of Education; 2004.
2. Kaufman, P.; McMillen, M.; Sweet, P. A Comparison of High School Dropout Rates in 1982 and 1993. Washington, DC: National Center for Education Statistics; 1996.
3. Wagner M, Blackorby J. Transition from high school to work or college: how special education students fare. *Future Child*. 1996; 6(1):103–120. [PubMed: 8689255]
4. Cosden, M.; Brown, C.; Elliott, K. Development of self-understanding and self-esteem in children and adults with learning disabilities. In: Wong, B.; Donahue, M., editors. *The Social Dimensions of Learning Disabilities: Essays in Honor of Tanis Bryan*. Mahwah, NJ: Lawrence Erlbaum; 2002. p. 33-51.
5. Gans A, Kenny M, Ghany D. Comparing the self-concept of students with and without learning disabilities. *J Learn Disabil*. 2003; 36(3):287–295. [PubMed: 15515648]
6. Al-Yagon M, Mikulincer M. Socioemotional and academic adjustment among children with learning disorders: the mediational role of attachment-based factors. *J Spec Educ*. 2004; 38(2):111–123.
7. Borowsky I, Resnick M. Environmental stressors and emotional status of adolescents who have been in special education classes. *Arch Pediatr Adolesc Med*. 1998; 152(4):377–382. [PubMed: 9559715]
8. Tur-Kaspa H, Weisel A, Segev L. Attributions for feelings of loneliness of students with learning disabilities. *Learn Disabil Res Pract*. 1998; 13(2):89–94.
9. Arnold E, Goldston D, Walsh A, et al. Severity of emotional and behavioral problems among poor and typical readers. *J Abnorm Child Psychol*. 2005; 33(2):205–217. [PubMed: 15839498]
10. Maag J, Reid R. Depression among students with learning disabilities: assessing the risk. *J Learn Disabil*. 2006; 39(1):3–10. [PubMed: 16512079]
11. Center for the Education of Children. HIV Prevention Education for Exceptional Youth: Why HIV Prevention Education Is Important. Reston, VA: Council for Exceptional Children;
12. Murphy K, Barkley R, Bush T. Young adults with attention deficit hyperactivity disorder: subtype differences in comorbidity, educational, and clinical history. *J Nerv Ment Dis*. 2002; 190(3):147–157. [PubMed: 11923649]
13. Shrier L, Harris S, Sternberg M, Beardslee W. Associations of depression, self-esteem, and substance use with sexual risk among adolescents. *Prev Med*. 2001; 33(3):179–189. [PubMed: 11522159]
14. Bat-Chava Y, Martin D, Kosciw J. Barriers of HIV/AIDS knowledge and prevention among deaf and hard of hearing people. *AIDS Care*. 2005; 17(5):623–634. [PubMed: 16036248]
15. Galea J, Butler J, Iacono T, Leighton D. The assessment of sexual knowledge in people with intellectual disability. *J Intellect Dev Disabil*. 2004; 29(4):350–365.
16. Barkley R, Fischer M, Smallish L, Fletcher K. Young adult outcome of hyperactive children: adaptive functioning in major life activities. *J Am Acad Child Adolesc Psychiatry*. 2006; 45(2):192–202. [PubMed: 16429090]

17. Bardone A, Moffitt T, Caspi A, et al. Adult physical health outcomes of adolescent females with conduct disorder, depression, and anxiety. *J Am Acad Child Adolesc Psychiatry*. 1998; 37(6):594–601. [PubMed: 9628079]
18. Cramp M, Grundy H, Perinpanayagam R, Barnado D. Seroprevalence of hepatitis B and C virus in two institutions caring for mentally handicapped adults. *J R Soc Med*. 1996; 89(7):401–402. [PubMed: 8774540]
19. Cunningham S, Cunningham R, Izmeth M, Baker B, Hart C. Seroprevalence of hepatitis B and C in a Merseyside hospital for the mentally handicapped. *Epidemiol Infect*. 1994; 112(1):195–200. [PubMed: 7509754]
20. Richman S. Mentally handicapped institutionalized patients: a five-year review of gynecologic examinations performed under general anesthesia. *Conn Med*. 2002; 66(2):73–75. [PubMed: 11908190]
21. Committee on Children with Disabilities, American Academy of Pediatrics and American Academy of Ophthalmology, American Association for Pediatric Ophthalmology and Strabismus. Learning disabilities, dyslexia, and vision: a subject review. *Pediatrics*. 1998; 102:1217. [PubMed: 9794958]
22. Donfrancesco R, Mugnaini D, Dell’Uomo A. Cognitive impulsivity in specific learning disabilities. *Eur Child Adolesc Psychiatry*. 2005; 14(5):270–275. [PubMed: 15981139]
23. Gioia G, Isquith P, Kenworthy L, Barton R. Profiles of everyday executive function in acquired and developmental disorders. *Child Neuropsychol*. 2002; 8(2):121–137. [PubMed: 12638065]
24. Willcutt E, Pennington B. Comorbidity of reading disability and attention-deficit/hyperactivity disorder: differences by gender and subtype. *J Learn Disabil*. 2000; 33(2):179–191. [PubMed: 15505947]
25. U.S. Department of Education. Twenty-Fifth Annual Report to Congress on the Implementation of the Individuals With Disabilities Education Act. Jessup, Md: Bureau of Special Education; 2003.
26. Medicode. International Classification of Diseases. 9. Salt Lake City, Utah: Med-Index Publications; 1987.
27. Centers for Disease Control and Prevention. Trends in Reportable Sexually Transmitted Diseases in the United States, 2003. Atlanta, Ga: Centers for Disease Control and Prevention; 2003.
28. Bauer H, Chartier M, Kessle E, et al. Chlamydia screening of youth and young adults in non-clinical settings throughout California. *Sex Transm Dis*. 2004; 31(7):409–414. [PubMed: 15215695]
29. Ford C, Pence B, Miller W, et al. Predicting adolescents’ longitudinal risk for sexually transmitted infection: results from the national longitudinal study of adolescent health. *Arch Pediatr Adolesc Med*. 2005; 159:657–664. [PubMed: 15997000]
30. Harris K, Gordon-Larsen P, Chantala K, Udry J. Longitudinal trends in race/ethnic disparities in leading health indicators from adolescence to young adulthood. *Arch Pediatr Adolesc Med*. 2006; 160:74–81. [PubMed: 16389215]
31. Plitt S, Garfein R, Gaydos C, et al. Prevalence and correlates of chlamydia trachomatis, neisseria gonorrhoeae, trichomonas vaginalis infections, and bacterial vaginosis among a cohort of young injection drug users in Baltimore, Maryland. *Sex Transm Dis*. 2005; 32(7):446–453. [PubMed: 15976603]
32. Cheng M, Udry J. Sexual experiences of adolescents with low cognitive abilities in the US. *J Dev Behav Pediatr*. 2005; 17(2):155–172.
33. Horner-Johnson W, Drum C. Prevalence of maltreatment of people with intellectual disabilities: a review of the recently published research. *Ment Retard Dev Disabil Res Rev*. 2006; 12(1):57–69. [PubMed: 16435331]
34. Ford K, Sohn W, Lepkowski J. American adolescents: sexual mixing patterns, bridge partners, and concurrency. *Sex Transm Dis*. 2001; 29(1):13–19. [PubMed: 11773873]
35. Maleer C, Shafer M, Pollack L, et al. Sociodemographic markers and behavioral correlates of sexually transmitted infections in a nonclinical sample of adolescent and young adults women. *J Infect Dis*. 2006; 194:307–315. [PubMed: 16826478]
36. Bracha H, Bracha A. Knowledge of chemical abuse and AIDS among gifted junior high school students in Little Rock. *J Ark Med Soc*. 1992; 84(4):177–178. [PubMed: 1400090]

37. Donovan, M.; Cross, C., editors. *Minority Students in Special and Gifted Education*. Washington, DC: National Academy Press; 2002.
38. Santrock, J. *Life-Span Development*. 10. Madison, Wis: McGraw Hill; 2006.
39. Joesoef M, Mosure D. Prevalence of Chlamydia in young men in the United States from newly implemented universal screening in a national job training program. *Sex Transm Dis*. 2006; 33(10):636–639. [PubMed: 16641824]
40. Joesoef M, Mosure D. Prevalence trends in chlamydial infections among young women entering the national job training program, 1998–2004. *Sex Transm Dis*. 2006; 33(9):571–575. [PubMed: 16543862]
41. Bussing R, Zima B, Belin T, Forness S. Children who qualify for LD and SED programs: do they differ in level of ADHD symptoms and comorbid psychiatric conditions? *Behav Disord*. 1998; 23(2):85–97.
42. Guevara J, Mandell D, Rostain A, Zhao H, Hadley T. Disparities in the reporting and treatment of health conditions in children: an analysis of the Medical Expenditure Panel Survey. *Health Serv Res*. 2006; 41(2):532–549. [PubMed: 16584463]
43. Blank MB, Mandell DS, Aiken L, Hadley TR. Co-occurrence of HIV and serious mental illness among Medicaid recipients. *Psychiatr Serv*. 2002; 53(7):868–873. [PubMed: 12096171]
44. Rothbard A, Metraux S, Blank M. Cost of care for Medicaid recipients with serious mental illness and HIV infection or AIDS. *Psychiatr Serv*. 2003; 54(9):1240–1246. [PubMed: 12954940]
45. O'Donnell L, Stueve A, San Doval A, et al. The effectiveness of the reach for health community youth service learning program in reducing early and unprotected sex among urban middle school students. *Am J Public Health*. 1999; 89(2):176–181. [PubMed: 9949745]
46. Reed N, Edwards L, Naughton S. An AIDS prevention program for adolescents with special learning needs. *J Sch Health*. 1992; 62(5):195–197. [PubMed: 1522702]

Figure 1.
Percentage of Youth Aged 12–17 Years Treated for an STI by Sex and Special Education Category

Table 1

Sample Description by Special Education Category (n = 51,234)

	Special Education Category					
	None (n = 43,219)	ED (n = 928)	MR (n = 1008)	LD (n = 4604)	MG (n = 938)	Other (n = 537)
% with treated STI [*]	3.9	3.2	4.7	4.5	5.6	4.8
Age in years (SD) [†]	14.8 (1.7)	14.5 (1.6)	14.8 (1.7)	14.4 (1.6)	14.4 (1.6)	14.6 (1.7)
% male [*]	48.2	80.2	55.5	63.8	43.6	42.0
% black [*]	67.0	72.2	70.3	67.9	56.3	63.1
% white	13.9	17.2	15.2	15.2	15.0	19.1
% Latino	6.0	4.0	6.9	6.6	6.7	5.6
% Asian	5.0	0.3	1.2	1.5	9.9	3.4
% other ethnicity	8.0	6.2	6.4	9.0	8.0	4.8

LD, specific learning disability.

^{*} Test of difference conducted using Pearson's chi-square.[†] Test of difference conducted using analysis of variance.

Table 2

Prevalence of Treated STIs (n = 51,234)

	In Special Education, % (n = 8015)	No Special Education, % (n = 43,219)	p Value
Herpes	0.19	0.32	.001
Hepatitis B	0.02	0.03	.778
Other hepatitis	0.01	0.00	.604
Chlamydia	3.61	3.91	.032
Human immunodeficiency virus	0.10	0.15	.107
Syphilis	0.02	0.03	.224
Gonorrhea	0.07	0.07	.869
Trichomoniasis	0.04	0.03	.648
Other venereal disease	0.12	0.11	.987
Any STI	4.10	4.53	.014

Table 3Logistic Regression Predicting the Odds of a Treated STI, Stratified by Sex^{*}

	Males		Females	
	OR	95% CI	OR	95% CI
Special education category				
ED	1.02	0.65–1.58	0.95	0.48–1.86
MR	1.12	0.68–1.82	1.37	1.01–1.88
Specific learning disability	1.36	1.10–1.67	1.20	0.97–1.48
MG	1.12	0.99–1.26	1.10	1.01–1.19
Other	1.08	0.97–1.21	1.03	0.92–1.16
Race/ethnicity				
Asian	1.03	0.71–1.49	0.33	0.21–0.53
Latino	1.41	1.07–1.86	1.11	0.87–1.42
White	1.72	1.43–2.08	1.36	1.17–1.58
Other	1.79	1.41–2.26	1.41	1.18–1.70
Each addition year of age	0.99	0.95–1.04	1.14	1.10–1.18

CI, confidence interval.

* OR significant at $p < .05$ are presented in bold typeface. The reference groups comprised African American 12-year-old children who were not receiving special education services.