## Chapter 9

# AIDS AND OTHER SEXUALLY TRANSMITTED DISEASES: PREVENTION AND SERVICES

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Chapter 9

# AIDS AND OTHER SEXUALLY TRANSMITTED DISEASES: PREVENTION AND SERVICES

## Introduction

Within the past decade, acquired immunodeficiency syndrome (AIDS) has emerged as a major national health problem. Although human immunodeficiency virus (HIV)--the virus associated with AIDS-is transmitted from an infected individual to another individual through methods that include the sharing of intravenous (IV) drug needles, one of the primary routes is through sexual intercourse. For this reason, AIDS is often characterized as a sexually transmitted disease (STD) (242).[1] Individuals with some of the more traditional STDs (i.e., chancroid, herpes, and syphilis) may be especially vulnerable to HIV infection (52,106,164,165,234); and for that and other reasons, there has been an increasing awareness of STDs as problems in themselves.

Adolescents who engage in sexual intercourse or use IV drugs are at risk of infection with HIV or an STD.[2] Although through August 1990, cases of AIDS among adolescents ages 13 to 19[3] represented under 1 percent (568 cases) of all AIDS cases in the United States (237a), AIDS was the sixth leading cause of death[4] for 15- to 24-year-olds (110). Given the estimated 10-year incubation period between HIV infection and the onset of AIDS, it is probable that many of the young adults who currently have AIDS acquired HIV infection during adolescence. Limitations in STD reporting requirements mean that the number of U.S. adolescents with some STDs is unknown, but STDs other than AIDS have been characterized as being among the most pervasive and costly communicable diseases threatening adolescents today (121 ,227,261). Until recently, however, efforts to control HIV infection and STDs have not focused on adolescents (209).

The physical, emotional, and psychological complications of HIV infection or STDs can be severe. There is still no cure for HIV infection, and HIV-related illnesses are eventually fatal. Unlike AIDS, many STDs can be cured (e.g., the bacterial STD syphilis) or their symptoms can be substantially controlled (e.g., the viral STD herpes); if left untreated, though, STDs other than AIDS can have extremely serious consequences, including infertility, ectopic pregnancy,[5] gonococcal arthritis, and sometimes death. Because of their common predominantly sexual origin, this chapter explores AIDS and STDs in the adolescent population together, focusing on the extent of the problem, prevention efforts, and services and interventions for treatment. The chapter concludes by considering major Federal policies and programs directed toward adolescents.

## Background on AIDS and Other STDs

Accurate reporting of cases of HIV infection, AIDS, and other STDs is important for determining the extent of infection among a particular population, for planning, implementing, and evaluating prevention and control activities, and for distributing Federal and other funds for HIV/AIDS and STD programs and treatment (28,41,229).

For reasons including those described in box 9-A, the precise number of adolescents with HIV infection and with many STDs is not known. The authority to require the reporting of communicable diseases by health professionals rests with the States, and State requirements with respect to the reporting by health care professionals of communi-

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[1] A *sexually transmitted disease*, formerly called **venereal disease (36), is an infectious disease transmitted chiefly** through sexual **intercoms or** genital **contact.**

[2] According to preliminary data **from** a 1989 survey **by the Centers for Disease Control within the** U.S. Department of Health and Human Services, *53* **percent of the Nation's high school students have had intercourse (72a). For further discussion see** ch. **10, "Pregnancy and Parenting: Prevention and Services" and** ch. **12, "Alcohol, Tobacco and Drug Abuse: Prevention and Services, ' in this volume.**

[3] The focus of **this** OTA report **for** reasons noted in Vol. I, and ch. **2** in this **volume, is on** 10- through 18-year-olds. Some **of the data presented in this chapter are for other age groupings, because data for** 10- **through** 18-year-olds **are not readily available. For information about Federal agencies' data collection activities related to adolescents, see** ch. **19, "The Role of Federal Agencies in Adolescent Health, " in Vol. III.**

[4] This ranking is based on 1987 data **fo,** AIDS deaths and 1986 **data for deaths due** to **other causes.**

[5] An *ectopic pregnancy* is a pregnancy **that occurs somewhere in the** body other than in the uterus.

### *Box 9-A—Limitations of Federal Data on the Prevalence and Incidence of HIV Infection, AIDS, and Other STDs Among U.S. Adolescents*

Various Federal sources publish data on the prevalence and incidence of reported cases of HIV infection, AIDS, and other STDs. [1] The Centers for Disease Control (CDC) within the U.S. Department of Health and Human Services (DHHS), for example, publishes such data in *its Morbidity andMortality Weekly Report (e.g., 235), its* **"HIV/AIDS Surveillance" report** *(236,237),* and in its *Sexually Transmitted Disease Statistics* report (241). Some of the data published by CDC are compilations of reported AIDS and STD cases from the States.

States have the authority to require health care professionals to report infectious diseases and to specify the conditions under which they are to be reported (e.g., the time for reporting, person responsible for reporting, and agencies to receive the reports) (5,41). Although CDC *recommends* that States report particular STDs (47), it does not have the authority to *require* States to report them (64,229). In the absence of a national reporting requirement, there is no uniformity in State reporting requirements for STDs. Currently, for example, all 50 States and the District of Columbia do require that health care professionals report AIDS cases to State health departments; but as of April 1990, only 32 States required that health care professionals report cases of HIV infection (65) (in July 1989 there were only 29 such States). [2] Similarly, while all 50 States do require that health care professionals report gonorrhea and syphilis, only 33 States require the reporting of chlamydial infections (41,229).

Even in those States that do require the reporting of certain communicable diseases reported in CDC's publications, data on STDs have several additional limitations. These are caused by incomplete reporting, by differences in reporting by public and private health sources, and by limitations in the specificity of diagnostic tests (17,125). In a number of States, including those with a high prevalence of HIV infection, there is evidence to suggest that AIDS cases may be underreported by as much as 20 percent (48,228). Reasons for undercounting of AIDS and other STDs are varied. One reason is that some individuals with STDs experience no symptoms and therefore do not seek a health evaluation or diagnosis (65). Other reasons include the lack of symptoms for some STDs, the use of differing criteria in diagnosing STDs, and the stigma associated with having an STD (133). Another problem is that because public health clinics tend to report STDs more completely than do private practitioners, biases are created by individuals attending public clinics (35).

In addition to providing compilations of reported AIDS and STD cases from the States, the Federal Government supports ongoing HIV seroprevalence surveys among national samples, such as the National Health and Nutrition Examination Survey, to monitor the spread of HIV infection and STDs (106,233). HIV seroprevalence surveys supported by the Federal Government focus on groups of individuals at risk of infection (e.g., homosexual and bisexual men, intravenous drug users), women in clinical settings and of childbearing age, college students, migrant and seasonal farmworkers, blood donors, military recruits, Job Corps entrants, and selected "sentinel" hospital patients (233). To avoid self-selection bias, some of the HIV seroprevalence surveys are conducted as anonymous surveys that cannot link individuals to HIV test results; other surveys interview survey participants to evaluate risk factors for HIV infection. Findings from HIV seroprevalence surveys supported by the Federal Government are generally not representative of the adolescent population. Some of these surveys (e.g., surveys from Job Corps residential entrants) probably overestimate the extent of HIV infection among adolescents, and others (e.g., surveys among military recruits) may underestimate the extent of such infection.

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[1] *Incidence* is a measure of the number of new cases of a disease or other condition occurring in a population during a given period of time. *Prevalence* is a measure of the number of individuals in a given population who have a specific disease or other condition at a designated time (or during a particular period).

[2] Eighteen States require that people with HIV be reported by name. Ten of these States, however, do allow for anonymous testing in certain circumstances (229).

cable diseases vary by disease and by State (see table 9-l). All 50 States and the District of Columbia do require that health care professionals report AIDS cases to State health departments, and all 50 States require reporting of gonorrhea and syphilis; as of April 1990, only 32 States required that health care professionals report cases of HIV infection (65), and as of March 1, 1989, only 33 States required the reporting of chlamydial infections (41,229). Evidence from selected samples suggest that certain segments of the adolescent population may be at particular risk of HIV infection and STDs.

## Table 9-1—State Reporting Requirements for Selected Communicable Diseases

| State | Human immunodeficiency virus (HIV)[b] | Acquired immunodeficiency syndrome (AIDS)[b] | Sexually transmitted diseases (STDs)[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Chancroid | Chlamydial infections | Gonococcal disease | Herpes simplex | Nonspecific urethritis | Pelvic inflammatory disease | Unspecified | Syphilis |
| Alabama | X[c] | X | X | — | X | — | — | — | — | X |
| Alaska | — | X | X | — | X | — | — | — | — | X |
| Arizona | X[c] | X | — | X[e] | X | X[f] | — | — | — | X |
| Arkansas | X[c] | X | — | — | X | — | — | — | — | X |
| California | — | X | X | X | X | — | X | X[o] | — | X |
| Colorado | X[c] | X | X | — | X | — | — | X[p] | — | X |
| Connecticut | — | X | — | X | X | X[g] | — | — | — | X |
| Delaware | — | X | X | — | X | — | — | — | — | X |
| District of Columbia | — | X | X | X | X | — | — | — | — | X |
| Florida | — | X | X | — | X | — | — | — | — | X |
| Georgia | X[d] | X | — | X[f] | X | — | X | — | X | X |
| Hawaii | — | X | X | X | X | X[g] | X | X[o] | X | X |
| Idaho | X[c] | X | X | X | X | X[f] | — | — | — | X |
| Illinois | X[d] | X | — | X | X | — | — | — | — | X |
| Indiana | X[c] | X | X | X | X | X[g] | — | X[o] | — | X |
| Iowa | X[d] | X | — | X | X | — | — | — | X | X |
| Kansas | — | X | X | X | X | — | X | — | — | X |
| Kentucky | X[d] | X | X | X | X | X[f] | X | — | — | X |
| Louisiana | — | X | X | — | X | X[g] | — | — | — | X |
| Maine | X[d] | X | X | X | X | — | — | — | — | X |
| Maryland | — | X | X | — | X | — | — | — | — | X |
| Massachusetts | — | X | X | X | X | X[g] | — | X[o, p] | — | X |
| Michigan | X[c] | X | X | — | X | — | — | — | — | X |
| Minnesota | X[c] | X | X | X | X | X[g] | X | — | — | X |
| Mississippi | X[c] | X | — | — | X | — | — | — | — | X |
| Missouri | X[c] | X | X | X | X | X[f] | X | — | — | X |
| Montana | X[d] | X | X | X | X | — | — | — | — | X |
| Nebraska | — | X | X | X | X | X[f] | — | — | — | X |
| Nevada | X[d] | X | X | X | X | — | — | X[o] | — | X |
| New Hampshire | — | X | — | X | X | X[k] | X | — | — | X |
| New Jersey | — | X | X | — | X | — | — | — | — | X |
| New Mexico | — | X | X | X | X | — | — | — | — | X |
| New York | — | X | X | — | X | — | — | — | — | X |
| North Carolina | — | X | X | X | X | — | X | — | — | X |
| North Dakota | X[c] | X | X | X | X | X[f] | — | — | — | X |
| Ohio | X | X | X | X | X | X[g, x, e] | X | — | — | X |
| Oklahoma | X[c] | X | — | X[g] | X | — | — | — | — | X |
| Oregon | X[d] | X | X | X | X | X[g] | — | X[q] | — | X |
| Pennsylvania | — | X | — | — | X | — | — | — | — | X |
| Rhode Island | X[d] | X | X | X | X | — | — | — | — | X |
| South Carolina | X[c] | X | X | — | X | X[f] | — | X[o] | — | X |
| South Dakota | X[c] | X | X | — | X | X[g, l, n] | — | — | X | X |
| Tennessee | — | X | — | X | X | — | X[m] | — | — | X |
| Texas | X[d] | X | — | X[h] | X | — | — | — | — | X |
| Utah | X[c] | X | X | — | X | — | — | — | — | X |
| Vermont | — | X | — | — | X | — | — | — | — | X |
| Virginia | X[c] | X | X | X | X | — | — | — | — | X |

*Continued on next page*

## Table 9-l—State Reporting Requirements for selected Communicable Diseases-Continued

| State | Human immunodeficiency virus (HIV)[b] | Acquired immunodeficiency syndrome (AIDS)[b] | Sexually transmitted diseases (STDs)[n] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Chancroid | Chlamydial infections | Gonococcal disease | Herpes simplex | Nonspecific urethritis | Pelvic inflammatory disease | Unspecified | Syphilis |
| Washington | — | x | x | x | x | X[g j] | x | X[q] | · | x |
| West Virginia | — | x | x | — | x | — | — | — | — | x |
| Wisconsin | X[c] | x | x | x | x | X[j] | x | x | — | x |
| Wyoming | X[c] | x | x | x | x | X[l] | — | — | — | x |

KEY: X = reporting required.
— = no reporting required.

[a]Current as of Mar. 1, 1989.
[b]Current as of July 1989.
[c]Reporting required with names.
[d]Reporting required WithOUt names.
[e]Reporting required for genital chlamydialinfection.
[f]Reporting required for females.
[g]Congenital and newborn reporting required.
[h]Laboratory confirmed cases required to be reported.
[i] Reporting required for genital herpes Simplex.
[j]Reporting required for primary e@@ of herpes simplex infection and for genital herpes simplex infection.
[k]Meningoencephalitis.
[l]Scromboid.
[m]Reporting required for number (C)r age and number) only.
[n]Optional.
[o]Unspecified.
[p]Gonococcal.
[q]Acute or newly diagnosed.

SOURCE: Office of Technology Assessment, 1991, based on the followingsources: HIV and AIDS data: Us. Department of Health and Human Services, Public Health Service, Centers fOr Disease Control, "HIV Reporting-United States," *Morbidity and Mortality Weekly Report* 38(28):496-499, July 21, 1989; (for Ohio) B. Kriss, Assistant with the STD Unit, Ohio Department Of Health, Columbus, OH, personal communication, May 31, 1990. STD data: T.L. Chorba, R.L. Berkelman, S.K. Safford, et al., "Mandatory Reporting of Infectious Diseases by Clinicians," *Journal of the American Medical Association* 262(21):3018-3026, 1989.

## Trends in the Prevalence and Incidence of HIV Infection and AIDS

HIV, the virus associated with AIDS, is transmitted chiefly from an infected person to another person through anal, vaginal, or oral sexual intercourse,[6] the sharing of IV needles, infected blood or blood products, and from an infected mother to her infant (233,235). The best estimate of the median interval between HIV infection and the onset of AIDS, which is characterized by a deficiency in the immune system, is approximately 10 years (233); the incubation period may vary depending on the route of HIV infection (90) and may be different for adolescents than for older individuals (81).

### Prevalence and Incidence of AIDS

As noted earlier, AIDS is the sixth leading cause of death for U.S. adolescents and young adults between the ages of 15 and 24 (1 10),[7] and there are grounds for believing that it will remain in this position in the future (51). In order to have an accurate description of the extent to which and the method by which adolescents with AIDS have acquired HIV infection, it is important to examine the Center for Disease Control's (CDC) monthly ''HIV/AIDS Surveillance" reports for data on 20- to 24-year-olds with AIDS and on 13- to 19-year-olds with AIDS. As of August 31, 1990, these data showed that adolescents ages 13 to 19 represented under 1 percent (568 cases) of all AIDS cases; when young adults ages 20 to 24 were included in the calculation, however, the number of AIDS cases rose to 6,740, or 4.6 percent of all AIDS cases (237a).

The method by which infected individuals transmit HIV to uninfected adolescents has relevance for the design, implementation, and targeting of appropriate services and behavioral interventions to adolescents (88). It is also important to consider the relevance of changing patterns in HIV transmission for future adolescents. In general, adolescents who currently have AIDS are less likely than adults ages 20 to 24 or adults over age 25 to have acquired HIV through male homosexual/bisexual contact or IV drug use; adolescents with AIDS are more likely than other individuals to have acquired HIV through the transfusion of contaminated blood and blood products for the treatment of hemophilia (see table 9-2). However, most observers expect that, with improvements in the safety of blood products used by hemophilia patients, adolescent males with hemophilia will no longer represent a large percentage of the adolescent male AIDS cases (90,267). Patterns such as those seen in New York City, where nonhemophilia cases predominate, are believed to be a better "crystal ball" for the Nation (90).

Still, among adolescents with AIDS, the transmission of HIV through sexual intercourse is an important route. For individuals ages 13 to 19, male homosexual/bisexual contact is the second most common route of HIV transmission (237). Furthermore, the percentage of 13- to 19-year-olds who have become infected with HIV through heterosexual intercourse (12 percent) exceeds the percentage of older adults who have become infected with HIV through heterosexual intercourse (5 percent) (234, 237,267). Transmission through heterosexual intercourse is particularly important as a route of HIV transmission for adolescent females. Forty-five percent of 13- to 18-year-old females with AIDS acquired HIV through heterosexual intercourse (255). In New York, where many adolescents with AIDS live, close to half of the adolescent female AIDS cases can be attributed to heterosexual spread, which is twice the adult female rate (88,267,290).

Another indication of the importance of heterosexual HIV transmission among adolescents is the male-to-female ratio of reported AIDS cases. For example, compared with the 10: 1 male-to-female ratio for adults in the United States over age 25, the adolescent male-to-female ratio of 4: 1 more closely resembles the 1:1 adult ratio in Africa, where the primary route of HIV transmission is through heterosexual intercourse (see figure 9-1) (165,237). Given the number of adolescents who engage in sexual intercourse, the higher proportion of heterosexual cases and the lower adolescent male-to-female ratio illustrate the need to include a variety of efforts for the prevention of HIV infection.

Most adolescent AIDS cases reported to date have occurred in urban areas (227). However, AIDS cases in rural and noncoastal areas are becoming increasingly common (77). Fifty-five percent of adolescent

[6]The risk of HIV infection is greatest for individuals engaging in unprotected (i.e., without a condom) receptive anal intercourse with an infected partner; the risk is lower for those engaging in oral intercourse and for those engaging in vaginal and insertive anal intercourse (142).

[7]This ranking is based on 1987 data for AIDS deaths and 1986 data for death due to other causes. Rankings for other age groups are as follows: 27th for children under age 1, 9th for 1- to 4-year-olds, and 12th for 5- to 14-year-olds (1 10).

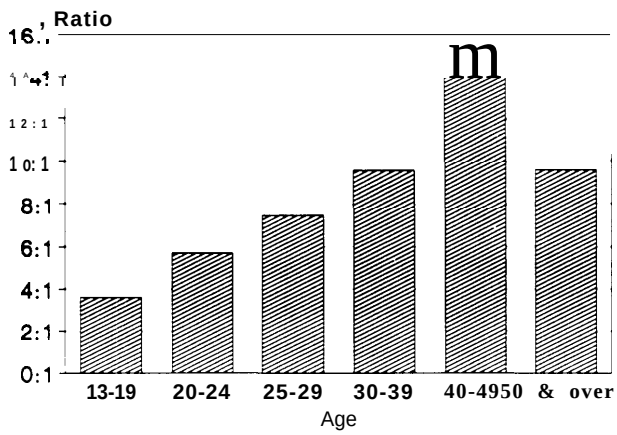
**Table 9-2—Cumulative AIDS Cases Among Adolescents and Young Adults in the United States, by Exposure Category, 1981-90[a]**

| | Cumulative AIDS cases by age | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 13 to 19 | | 20 to 24 | | ≥ 25 | | Total[b] | |
| Exposure category | No. | % | No. | % | No. | % | No. | % |
| Male homosexual/bisexual contact | 145 | (28%) | 3,254 | (57%) | 74,813 | (60%) | 78,212 | (60%) |
| Intravenous (IV) drug use (female and heterosexual male) | 59 | (12) | 903 | (16) | 26,880 | (21) | 27,842 | (21) |
| Male homosexual/bisexual contact and IV drug use | 23 | (4) | 534 | (9) | 8,391 | (7) | 8,948 | (7) |
| Hemophilia/coagulation disorder | 157 | (31) | 148 | (3) | 866 | (1) | 1,171 | (1) |
| Heterosexual contact[c] | 62 | (12) | 503 | (9) | 5,967 | (5) | 6,532 | (5) |
| Receipt of blood transfusion, blood components, or tissue | 38 | (7) | 86 | (2) | 2,995 | (2) | 3,119 | (2) |
| Other/undetermined[d] | 29 | (6) | 242 | (4) | 4,157 | (3) | 4,428 | (3) |
| Total[e] | 513 | (100%) | 5,670 | (100%) | 124,069 | (99%) | 130,252 | (100%) |

[a]Current as of Apr. 30, 1990.
[b]Includes three patients infected with HIV type 2.
[c]This exposure category includes those individuals who have had sex with an IV drug user, a bisexual male, a person with hemophilia, an HIV-infected transfusion recipient, or an HIV-infected person whose risk is not determined. In addition, the category includes individuals who are recorded as heterosexual cases because they were born in areas of central, eastern, and southern Africa, which have distinctive patterns of transmission (i.e., most cases of AIDS occur in heterosexuals and the male-to-female ratio is approximately 1:1).
[d]Other refers to two health care workers over age 25 who developed AIDS through occupational exposure to HIV. Undetermined cases include those individuals whose mode of HIV transmission is not known (i.e., individuals whose exposure category is being investigated, those whose category remains undetermined after investigation, and those who either died, refused to be interviewed, or were not followed up).
[e]This figure includes two health care workers who developed AIDS after occupational exposure to HIV.
[f]Because of rounding, percentages may not total 100 percent.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Infectious Diseases, Division of HIV/AIDS, "HIV/AIDS Surveillance," Atlanta, GA, May 1990.

**Figure 9-l—Male-to-Female Ratio for Reported AIDS Cases in the United States, by Age of Diagnosis[a]**




[a]Current as of Apr. 30, 1990.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for infectious Diseases, Division of HIV/AIDS, "HIV/AIDS Surveillance," Atlanta, GA, May 1990.

AIDS cases have been reported from New York, California, Florida, New Jersey, Texas, and Puerto Rico (227).

Finally, black and Hispanic adolescents represent a disproportionate share of adolescent AIDS cases in relation to their numbers in the population (206,237). In fact, blacks makeup a greater proportion of AIDS cases among adolescents than do blacks in other age groups (see table 9-3). Among adolescents, as among young and older adults. blacks make up a larger proportion of female AIDS cases than of male cases. Fifty-eight percent of the adolescent female AIDS cases are black, and 30 percent of adolescent male AIDS cases are black (237). The majority of AIDS cases among both black and Hispanic adolescents are transmitted through IV drugs or homosexual or heterosexual contact. For white adolescents, the primary mode of the transmission of AIDS is through blood product exposure (see figure 9-2) (253a).

## Prevalence and Incidence of HIV Infection

The prevalence of HIV infection may give a more accurate indication of the potential AIDS problem within the adolescent population than does the count of reported AIDS cases. Most seroprevalence studies have relied on samples of convenience (see table 9-4), and few have included adolescents (91). Thus far, the largest samples have come from active duty military personnel, military recruits, and Job Corps entrants, groups which are not representative of the adolescent population. Data from the military indicate that adolescents ages 17 to 19 have relatively low rates of HIV infection (31,224,225), but data

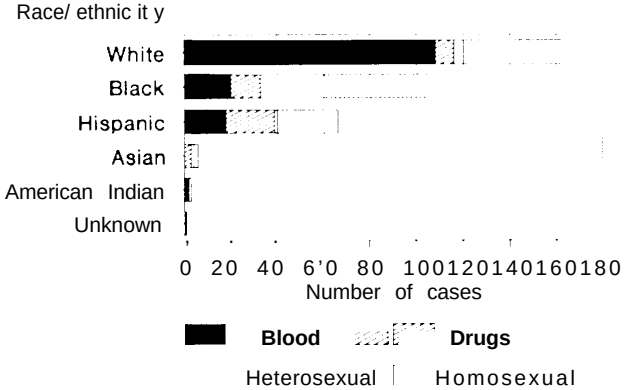
**Table 9-3—Cumulative AIDS Cases in the United States, by Age and Race/Ethnicity, 1981-908**

| | Cumulative AIDS cases by age at diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 13 to 19 | | 20 to 24 | | 25 to 29 | | >30 | | Total | |
| Race/ethnicity | No. | 0/0 | No. | 0/0 | No. | % | No. | % | No. | % |
| White, not Hispanic . . . . . 246 | (43°/0) | | 2,952 | (480/.) | 12,433 | (53%) | 64,943 | (57%) | 80,574 | (560/.) |
| Black, not Hispanic . . . . . 206 | (36) | | 2,001 | (32) | 6,731 | (29) | 30,923 | (27) | 39,861 | (28) |
| **Hispanic . . . . . 102** | (18) | | 1,159 | (19) | 4,066 | (17) | 17,005 | (15) | 22,332 | (16) |
| **Asian/Pacific Islander . . . . . 7** | (1) | | 30 | (0.5) | 118 | (0.5) | 731 | (1) | 886 | (1) |
| **American Indian/Alaskan Native. . . 6** | (1) | | 15 | (0.2) | 42 | (0.2) | 142 | (0.1) | 205 | (0.1) |
| **Total[b] . . . . . 568** | (I OO°/.) | | 6,172 | (IOO°/o) | 23,437 | (1 OOYO) | 114,044 | (I OO°/.) | 144,221 | (I 00%) |

[a]Current as of Aug. 30, 1990.
[b]Includes 363 persons whose race/ethnicit y is unknown.

SOURCE: U.S. Department of Health and Human Services. Public Health Service. Centers for Disease Control. Center for Infectious Diseases. Division of HIV/AID'S, "HIV/AIDS Surveillance, " AtlantaGA, September 1990.

**Figure 9-2—AIDS Cases Among U.S. Adolescents Ages 13 to 19, by Race and Exposure Category, 1988**




SOURCE: U.S. Department of Health and Human Services, Public Health Service, **Health Resources and** Services **Administration, Bureau of Maternal and Child** Healt **h and Resources Development, Off Ice of Maternal and Child Health,** *Child Health* **Day** *USA,* **'89, DHHS Pub, No.HRS-MCH8915** (Rockville, **MD: October 1989),**

from Job Corps entrants (who are primarily economically disadvantaged 16- to 21-year-olds) suggest that these adolescents and young adults have a greater risk of HIV infection, though still a relatively low risk (228). Among military recruits ages 17 and 18, the male-to-female HIV prevalence ratio is 0.9:1 (31).

Data from smaller samples suggest that certain groups of adolescents, including runaway and homeless adolescents attending STD clinics, may have an appreciable risk of HIV infection (30,164,192,192a, 224,225,233,267 ).8 Among runaway and homeless adolescents age 18 staying at the Covenant House in New York, for example, 3.4 percent tested positive for HIV (192a).[9] Survey data from anonymously screened patients at Baltimore STD clinics show that HIV seroprevalence rates for adolescents ages 15 to 19 were relatively high and nearly equal for males and females (2,5 and 2 percent, respectively) (165).

HIV prevalence rates among adolescents vary by race, and blacks bear a disproportionate share of HIV cases. Even among male military recruits, who appear to have a relatively low risk of infection, black male recruits ages 17 and 18 were more than four times as likely to be HIV infected as white male recruits (31). Additionally, data from the Job Corps show that black adolescents ages 16 to 18 have a male-to-female ratio for HIV infection of approximately 1: 1, suggesting an important role for heterosexual transmission among economically disadvantaged black adolescents (190).

For adolescents of all races combined, HIV seroprevalence rates are higher in the Northeast and South than in other regions of the country (190). For white adolescents, however, rates are highest in the West (190). Screening data from 1985-87 military recruits, 82 percent of whom were under age 25, suggest that HIV is increasingly spreading to low prevalence **areas,** particularly among young black males (77).

## *Trends in the Prevalence and Incidence of STDs*

Sexually active adolescents are at risk for contracting all types of STDS (see table 9-5), but because of variable State reporting (see table 9-1)

[8]For a general **discussion** of **the** health **problems of runaway and homeless adolescents. see** ch.14, **"Hopelessness: Prevention and Services, " in this volume.**

[9]During **the period October 1987 to December 1989, about 2 percent of 15-to** 16-year-olds, **about 3 percent of** 17-year-olds, **and 7.4 percent of** 19-**to** 20-year-olds tested **positive for HIV in this sample (192a).**

**Table 9-4-Selected Studies of Human Immunodeficiency Virus (HIV) Seroprevalence Involving Adolescent Groups**

| Group | Date of data collected | Age (years) | Percent HIV positive | Number tested |
|---|---|---|---|---|
| Active duty military personnel | 1/87-4/88 | 17-19 | 0.0170 | 322,506 |
| | | 20-24 | 0.12 | 568,920 |
| | | 25-29 | 0.21 | 366,156 |
| Civilian applicants for military service | 10/15/85-3/31/89 | <20 | 0.03'?40 | 1,141,164 |
| | | 17-18 males | 0.02 | 763.872 |
| | | 17-18 females | 0.03 | 112;604 |
| | | <20 black | 0.10 | 215,869 |
| | | <20 white | 0.02 | 837,544 |
| | | <20 Hispanic | 0.03 | 55,630 |
| Job' Corps residential entrants | 3/87-5/89 | 16-21 | 0.41% | 84,089 |
| College students[a] | NA | College age | 0.20/0 | 12,000 |
| Mothers of newborns screened in New York | 11/30/87-1 1/30/88 | <20 upstate New York | 0.13% | 12,344 |
| | | 20-29 upstate New York | 0.17 | 83,055 |
| | | <20 New York City | 0.72 | 1C,871 |
| | | 20-29 New York City | 1.3 | 67,818 |
| Incarcerated youth in Los Angeles County | 2187-8187 | 16-17 | 0.2"/0 | 1,878 |
| Runaway and homeless youth in Covenant House, New York City | 10/87-1 2/89 | 15-16 | 2.2% | 312 |
| | | 17 | 2.9 | 340 |
| | | 18 | 3.4 | 591 |
| | | 19-20 | 7.4 | 1,403 |
| Sexually transmitted disease (STD) clinic patients | 212187-4130187 | 15-19 females | 2.5% | 434 |
| | | 15-19 males | 2.0 | 509 |
| | | 20-24 females | 3.4 | 385 |
| | | 20-24 males | 3.8 | 840 |
| | | 25-29 females | 2.9 | 239 |
| | | 25-29 males | 6.9 | 598 |
| Adolescents in an adolescent clinic in Washington, DC | 10/87-1/89 | 13-18 | 0.37%[b] | 3,520 |
| | | 13-15 | 0.11 | |
| | | 15-18 | 0.69 | |

KEY: NA = not available.
[a]Majority of cases come from males.
[b]This represents only 46 percent of all positive adolescents seen during the 15-month study interval.

SOURCE: Office of Technology Assessment, 1991, based on the following sources: Active-duty military personnel: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "Prevalence of Human Immunodeficiency Virus Antibody in U.S. Active Duty-Military Personnel, April 1988," *Morbidity and formality* Weekly *Report* 37(30):461-463, Aug. 5, 1988. Civilian applicants: D.S. Burke, J.F.Brundage, M. Goldenbaum, et ai., "Human Immunodeficiency Virus infections in Teenagers: Seroprevalence Among Applicants for U.S. Military Service," Journal *of the American Medical Association 263(1* 5):2074-2077, *1990.* Job Corps, college students, Incarcerated youth: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for infectious Diseases, "AIDS and Human Immunodeficiency Virus Infection in the Unitad States: 1988 Update," Morbidity and *Mortality* Weekly *Report* 38(S-4):1-38, May 12,1989. Mothers of newborns: L.F. Novick, D. Berns, R. Stricof, et ai., "HIV Seroprevalence in Newborns in New York State," Journal *of the* American *Medical* Association 261(12):1745-1750, 1989. Runaway and homeless youth: R. Stricof, J. Kennedy, T.C.Nattell, et al., "HIV Seroprevalence of Adolescents in a Facility for Runaway and Homeless Adolescents," *American Journal* of *Public Health* 81( Supplement) :50-53, 1991. STD clinic patients: T.C. Quinn, D. Glasser, R.O. Cannon, et al., "Human Immunodeficiency Virus Infection Among Patients Attending Clinics for Sexually Transmitted Diseases," New *England Journal of Medicine* 318(4):197-203, *1988.* Adolescent clinic patients: L. D'Angelo, P. Getson, N. Luban, et ai., "HIV Infection in Adolescents: Can We Predict Who Is at Risk," poster presentation at the Fifth international Conference on AIDS, "The Scientific and Social Challenge," Montreal, Quebec, Canada, June 4-9, 1989.

and the reticence of private physicians to report STDs,[10] it is impossible to estimate national incidence and prevalence rates for STDs other than gonorrhea and syphilis. STD surveys are similar to HIV seroprevalence studies in that they are typically based on small samples of convenience (see table 9-6). Still, the available data indicate that chlamydia infection and other STDs are much more common in

[10]Less than 20 percent of STD reports come from private physicians; approximately 80 percent come from public STD clinics (82). Two-thirds of gonorrhea cases are reported from public health clinics (241). Younger adolescents ages 10 to 14 of both sexes and older fernale adolescents ages 15 to 19 have approximately the same ratio of case reporting from public and private facilities.

**Table 9-5—Overview of Selected Sexually Transmitted Diseases and Syndromes**

| Agent | Disease or syndrome | Typical presenting signs and symptoms | Examples of potential complications/ sequelae |
|---|---|---|---|
| **Bacterial Agents:** | | | |
| *Neisseria gonorrhoeae* | Gonorrhea | Abnormal vaginai or penile discharge, abdominai pain; may be asymptomatic | Disseminated gonococcal infection (e.g., septicemia), PID, infertility, epididymitis |
| *Gardnerella vaginalis* | Nonspecific vaginitis | Vaginal inflammation, abnormal discharge; may be asymptomatic | Recurrent infection |
| *Chlamydia trachomatis* | Chlamydial infections: Nongonococcal urethritis | Dysuria, urinary frequency, abnormal penile discharge; may be asymptomat ic | Urethrai stricture, prostatitis, epididymitis |
| | Mucopurulent cervicitis | Abnormal endocervicai discharge; may be asymptomatic | Endometritis, salpingitis, infertility, adverse obstetric outcomes |
| *Treponema pallidum* | Primary syphilis | Chancre | Late (tertiary) syphilis and sequelae, neurosyphilis |
| | Secondary syphilis | Skin rash, mucous patches, lymphadenopathy, condyloma iata | |
| *Hemophilus ducreyi* | Chancroid | Genital ulceration, often painfui, accompanied byadenopat hy | Secondary infections of lesions, phimosis |
| *Shigella* sp. | Shigellosis | Diarrhea, tenesmus, abdominal cramping | Rectal prolapse, dysentery |
| **Viral Agents:** | | | |
| **Herpes** simplex **virus** (HSV) **1** | Nongenital herpes | Blisters on eyes or otherfacial regions | Aseptic meningitis, recurrent HSV infection |
| Herpes simplex virus (HSV) 2 | Genital herpes | Blisters, genital ulcers, stomatitis, and orai iesions | Disseminated infection, recurrent HSV infection |
| Human papillomavirus (HPV) | Condyloma acuminatum | Warty lesions in genital or anal area | Genital dysplasia, carcinoma |
| Hepatitis B virus. | Hepatitis | Malaise, jaundice, vomiting; may be asymptomatic | Cirrhosis, liver failure, arthritis, death |
| Cytomegaiovirus | Heterophil negative mononucleosis | Malaise, lymphadenopathy | Congenital cytomegalic inclusion disease |
| Human immunodeficiency virus (HIV) | HIV infection | Generalized lymphadenopathy, weight loss, night sweats, intermittent fever, malaise, diarrhea; may initially be asymptomatic | **Full-blown** AIDS |
| | Acquired immunodeficiency syndrome (A IDS) | Symptoms of opportunistic infections such as pneumocystic pneumonia, or kaposi's sarcoma | Death |
| **Mycopiasmai Agents:** | | | |
| *Ureaplasma urealyticum* | Nongonococcal urethritis | Dysuria, urinary frequency, abnormal peniie discharge; may be asymptomatic | Urethrai stricture, prostatitis, epididymit is |
| **Protozoa:** | | | |
| *Trichomonas vaginalis* | Trichomoniasis | Vaginai inflammation, abnormal discharge, nongonococcal urethritis; may be asymptomatic | |
| **Fungi:** | | | |
| *Candida albicans* | Genital candid iasis | **Vaginal inflammation,** abnormal discharge, vulval inflammation; may be asymptomatic | Secondary excoriations, recurrent candidiasis |

SOURCE: Office of Technology Assessment. 1991, based on U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "Sexually Transmitted Disease Summary: 1990," Atlanta, GA, June 1990.

## Table 9-6-Selected Studies Demonstrating Prevalence Rates of Sexually Transmitted Diseases (STDs) Among U.S. Adolescents

| | | | | | STD and percent of study group infected | | | |
|---|---|---|---|---|---|---|---|---|
| study' | Population | Age | Location | Number tested | Gonorrhea (*Neisseria gonorrhoeae*) | Chlamydia (*Chlamydia* tradromatis) | Trichomaniasis (*Trichomonas vaginalis*) | Other STD |
| Alexander-Rodriguez and Vermund, 1987 | Adolescent male and female entrants into the New York City Juvenile Detention Center | 9-18 | New York City, NY | 2,521 | 4.8% (males: 3.O%; femalas: 18.3%) | — | — | Syphilis (*Treponema Pallidum*): 0.83% males: 0.63%; females: 2.5%) |
| Bell, Farrow, Stamm, et al., 1985 | Female detainees in a juvenile detention center | 12-18 | Seattle, WA | 100 | 18% | 20% | 48% | Bacterial vaginosis[a]: 25%. |
| Chacko and Lovchik, 1984 | Urban sexually active young males and females | | Baltimore, MD | 280 | 3% | 22% | 16% | — |
| D'Angelo, Mohla, Sneed, et al., 1987 | Adolescents seen in the Adolescent and Young Adult Clinic of the Children's National Medical Center | — | Washington, DC | 567 | 18.5% | — | — | — |
| Eager, Bead-r, Davidson, et al., 1985 | Sexually active females attending three ethnically diverse urban Department of Health and Hospitals adolescent clinics[b] | 12-18 | Denver, CO | 396 | 7 % (blacks: 16%; Hispanics: 4%; whites: 2%) | 21% (blacks: 28%; Hispanics 23%; whites: 14%) | 6% (blacks: 20%; Hispanics: 2%; whites: 1 %) | — |
| Fraser, Rettig, and Kaplan, 1983 | Indigent girls | | Oklahoma City, OK | 125 | 3.8% | 15.3% | – | — |
| Hardy, Hardy, Nell, *et* al., 1984 | Low-income pregnant, predominantly black, females receiving Prenatal care in the Johns Hopkins Adolescent Pregnancy Program | 13-17 | Baltimore, MD | 115 | 10.40/' | 370/0 | 34% | Candidiasis (Candida *albicans*): 38?/.; *Mycoplasma hominis: 70%; Ureaplasma urealyticum: 90%* |
| Jaffe, Siqueria, Diamond, et al., 1986 | Low-income sexually active black and Hispanic females attending the Adolescent Health Center of Mount Sinai Hospital | 14-20 | New York City, NY | 95 | 8.4% | 26.30/0 (blacks: 28.6%; Hispanics: 24.1%) | – | — |
| Johnson, Nahmias, Magder, et al., 1989 | Participants in the National Health and Nutrition Examination Survey | 1-74 | United States | 4,201 | — | | — | Herpes (Herpes simplex virus type 2): <1% under age 14 |
| Martinez, Smith, Farmer, et al., 1988 | Sexually active adolescent females, who are primarily black and from low-income communities, attending an adolescent clinic of the University of Maryland Hospital | 13-19 | Baltimore, MD | 89 | — | — | — | Condyloma acuminatum (Human papillomavirus): 13% |

**Table 9-6—Selected Studies Demonstrating Prevalence Rates of Sexually Transmitted Diseases (STDs) Among U.S. Adolescents-Continued**

| | | | | | STD and percent of study group infected | | | |
|---|---|---|---|---|---|---|---|---|
| study[a] | Population | Age | Location | Number tested | Gonorrhea (*Neisseria gonorrhoeae*) | Chlamydia (*Chlamydia trachomatis*) | Trichomaniasis (*Trichomonas vaginalis*) | Other STD |
| Neinsteln and Rabinovitz, 1988 | All adolescents having a chlamydia culture at the Teenage Health Center at Children's Hospital | 12-21 | Los Angeles, CA | 184 | 6.5% | 20.1 % | — | — |
| Oh, Feinstein, Soileau, et al., 1989 | Inner-city low-income adolescent females seeking contraceptive counseling at the Teen Accent Clinic | 12-18 | Birmingham, AL | 376 | 6.8% | 1 9.4% | — | Trichomoniasis (Trichomonas *vaginalis): 13.6%;* Herpes (Herpes simplex virus): 1.1% |
| Saltz, Linnemann, Brookman, et al., 1981 | Low- and middle-income sexually active adolescent females from urban areas attending the Adolescent Clinic of the Children's Hospital Medical Center | — | Cincinnati. OH | 100 | 30/0 | 220/0 | 16% | Candidiasis (Candida *albicans);* 26%; Group B streptococci: 60% |
| Shafer, Beck Blain, et al., 1984 | Sexually active adolescent females from working class and impoverished inner-city families attending the University Hospital Teen Clinic or the San Francisco General Teen Family Planning Clinic | 13-21 | San Francisco, CA | 366 | 3.80/0 (blacks: 7.6%; Hispanics:1.4%; whites: 2.1%) | 1 5.3% (blacks: 23.3%; whites:10.3%) | 8% (blacks:1 3.6%; Hispanics 2.9%.; whites:8.O%) | — |
| Shafer, Schachter, Moscicki, et al., 1989 | Sexually active asymptomatic adolescent males attending teen and detention clinics[c] | 13-19 | San Francisco, CA | 948 | 9% | 3% | — | — |

KEY: — = no data provided; s = significant difference.
[a] Full citations are listed at the end of this chapter.
[b] Two of the clinics served primarily low-income black and Hispanic adolescents. The third clinic served primarily white adolescents from low- to middle-income families.
[c] Teen clinics included a university and health maintenance organization-based adolescent clinic. The detention clinic was a general clinic for incarcerated adolescents. Excluded from the study were adolescent males who had symptoms of urethritis, had taken antibiotics within the past 3 weeks, had a systemic disease, or identified themselves as homosexual.
[d] This includes multiple organisms.

SOURCE: Office of Technology Assessment, 1991.

the adolescent population than HIV infection is. In fact, if the number of sexually active adolescents is used as the denominator in calculating rates instead of the entire adolescent population, overall STD prevalence rates are even higher (88).

In general, STD rates appear to vary by sex and race, there being more STDs reported among adolescent females than males and more among nonwhites than among whites (86,194,201,240). The overrepresentation of females may be explained in part by the fact that sexually active females seeking family planning services are frequently screened for common sexually transmitted infections regardless of the presence or absence of symptoms (10). Sexually active male adolescents have no such formal access to reproductive health care. The high reported STD rates among black and Hispanic adolescents may reflect the tendency of these adolescents, who are disproportionately of low socioeconomic status, to use public health clinics, which report STDs more completely than do private practitioners (17,125,287). An additional reason may be the higher rate of sexual intercourse among black adolescents (145).[11]

### Prevalence and Incidence of Chlamydia Infection

The bacterium *Chlamydia trachomatis* is the agent that causes chlamydia infection, the most common type of STD infection among adolescents (9,55,176,180,182,201). Infected individuals, especially females, often experience no symptoms or signs of chlamydia infection (240). It is important to note, however, that chlamydia infection can lead to pelvic inflammatory disease (PID) in females and epididymitis[12] in males (36), both of which may result in involuntary infertility.

Although national surveillance of chlamydia infection is based on pilot projects (35), data from selected studies of adolescent females attending various types of clinics (i.e., STD clinics, juvenile detention clinics, and adolescent clinics) suggest that chlamydia infection appears to be highly prevalent among certain subgroups of sexually active adolescents, particularly among black inner-city adolescents from low socioeconomic backgrounds (see table 9-6) (15,67, 103,151,176,180,181, 182,240). This observation may reflect the fact that many STD clinics are located in large metropolitan areas.[13] Chlamydia infection rates vary from 3 to 37 percent depending on the surveyed population. One study of ethnically diverse sexually active females ages 12 to 18 attending three urban adolescent health clinics in Denver found significant differences among black (28 percent), Hispanic (23 percent), and white (14 percent) adolescents' rates of chlamydia infection (67).

### Prevalence and Incidence of Gonorrhea

The bacterium *Neisseria gonorrhoeae is the* agent that causes gonorrhea, the second most common STD among adolescents (55). As table 9-6 shows, female adolescents who attend health clinics and juvenile detention centers and are from racial or ethnic minority groups may be at particular risk of *Neisseria gonorrhoeae* infection, with prevalence rates ranging from 3 to 18 percent (4,15,39,54,67,73, 103,129,149,151,176,180,1 81). Black adolescent females ages 13 to 21 who attended a teen and family planning clinic in San Francisco were more likely to test positive *for Neisseria gonorrhoeae (7.8* percent) than either their white *(2.* 1 percent) or Hispanic (1.4 percent) peers (85,180).

Because reporting of gonorrhea cases is required in all 50 States (see table 9-l), a more reliable indicator of the extent to which *Neisseria gonorrhoeae* has occurred in the adolescent population may be the number of reported gonorrhea cases among adolescents (239) (see figure 9-3).

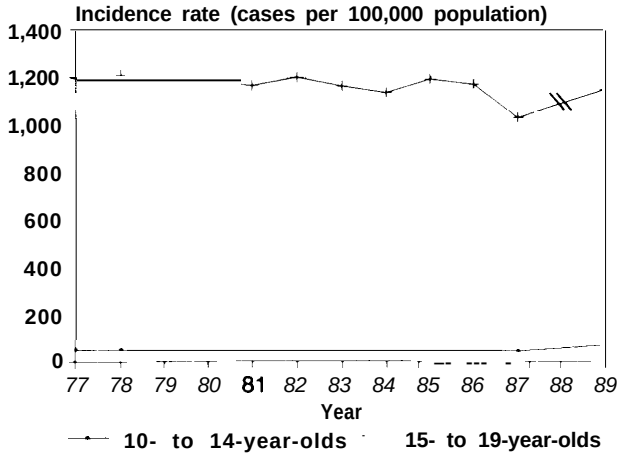
In 1989, the most recent year for which data on gonorrhea rates are available, the incidence of gonorrhea in adolescents ages 10 to 14 was 69.7 cases per 100,000 (equal to 11,820 cases) and the incidence rate in adolescents ages 15 to 19 was 1,145.4 cases per 100,000 (204,023 cases) (13a). Adolescents ages 10 to 19 accounted for 29.4 percent of newly reported gonorrhea cases in 1989 (13a). Although various factors may make year-by-year comparisons unreliable, it is disturbing to note that the incidence rate of gonorrhea jumped 63 percent among 10- to 14-year-olds between 1987 and 1989. Gonorrhea incidence rates have hovered around 1,200 cases per 100,000 adolescents for

[11] Adolescents' sexual activity rates are discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

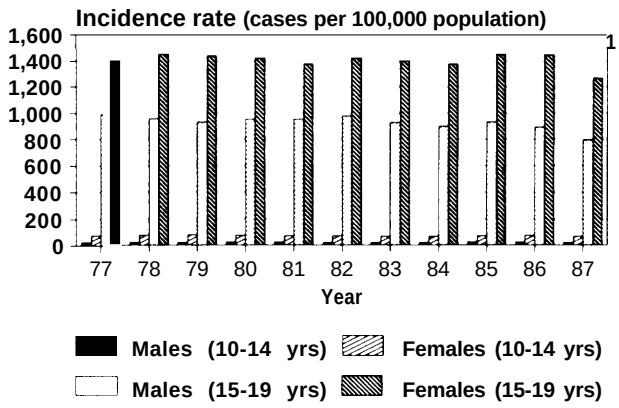
[12] *Pelvic inflammatory* disease is the inflammation of any female pelvic organ. *Epididymitis is the* inflammation of the epididymis.

[13] In some cases, individuals from smaller communities attend these clinics because they perceive them as Offering better services and greater confidentiality (122).

**Figure 9-3--Gonorrhea Incidence Rates Among U.S. Adolescents, 1977-89**




Gonorrhea Incidence Rates for 10- to 19-Year-Olds, 1977-89




Gonorrhea Incidence Rates for 10- to 19-Year-Olds by Sex, 1977-87'

[a]Note incidence rates by sex were not available for 1988 and 1989 as this report was being written

SOURCES: F. Barnes, Education Specialist, Center for Prevention Services, Centers for Disease Control, personal communication, Atlanta, GA, Feb. 28, 1991. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division of Sexually Transmitted Diseases, *Sexually Transmitted Disease Statistics: 1987,* Issue No. 146 (Atlanta, GA: October 1988); and U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division of Sexually Transmitted Diseases, *Sexually Transmitted Disease* Statistics: 1985, Issue No. 145 (Atlanta, GA: August 1987).

15- to 19-year-olds. There are marked differences in rates of reported cases by sex. The reported gonorrhea incidence rate is higher in adolescent females than in adolescent males. For females ages 10 to 14, the rate in 1989 was over three times that of males, and for females ages 15 to 19, the rate was approximately 1.5 times that of males (see figure 9-3).[14] It is important to note that, if the proportion of sexually active adolescents were to be used as the denominator, the gonorrhea rates would be higher (90). The proportion of sexually active 10-to 14-year-olds is unknown.

### Prevalence and Incidence of Condyloma Acuminatum

Human papillomavirus (HPV), which often results in condyloma acuminatum (exophytic warty lesions) has also been associated with cervical and anal cancer. As shown for other STD agents, the prevalence of HPV may be high within certain adolescent subgroups. For example, data from a small, selected sample of predominantly black adolescent females attending a Baltimore adolescent clinic indicate that 13 percent were infected with HPV (129).

### Prevalence and Incidence of Herpes

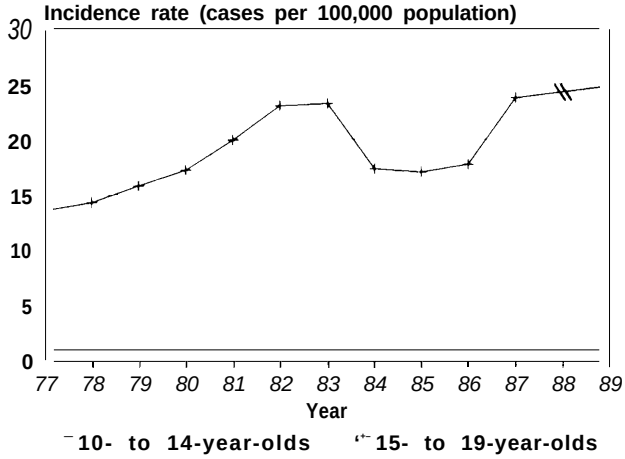
Herpes simplex virus (HSV) causes herpes, usually producing small, sometimes painful blisters on the skin or mucous areas of the body. HSV 1 infections are usually nongenital (e.g., herpes labialis); HSV 2 infections are usually limited to the genital region (e.g., herpes genitalia). Few adolescents have tested positive for HSV infection. According to results from the National Health and Nutrition Examination Survey conducted between 1976 and 1980 (NHANES II), for example, less than 1 percent of adolescents under age 15 were infected with HSV 2 (106). Because of the large number of subclinical infections and because symptoms occur in less than 40 percent of HSV infections detected serologically (106), however, these rates may underestimate the extent of infection within the adolescent population.

### Prevalence and Incidence of Syphilis

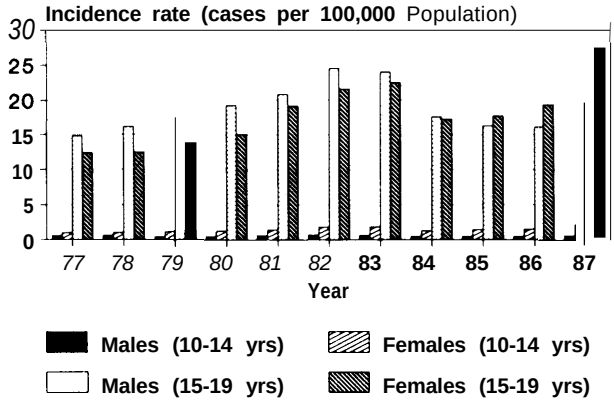
Syphilis is caused by the bacterial organism *Treponema pallidum. The* first two stages of the infection, primary and secondary syphilis, are followed by a period of latency. Without treatment, some individuals may eventually develop tertiary syphilis. Because tertiary syphilis usually takes many years to develop, individuals between the ages of 10 and 18 are not likely to develop this stage of infection during adolescence.

[14]The data *Provided* by CDC **are not broken down by** race and age.

**Figure 9-4-Syphilis Incidence Rates Among U.S. Adolescents, 1977-89**




Primary and Secondary Syphilis Incidence Rates for 10- to 19-Year-Olds, 1977-89




Primary and Secondary Syphilis Incidence Rates for 10- to 19-Year-Olds by Sex, 1977-87[a]

[a]Note incidence rates by sex were not available for 1988 and 1989 as this Report was being written.

SOURCES: F. Barnes, Education Specialist, Center for Prevention Services, Centers for Disease Control, personal communication, Atlanta, GA, Feb. 28, 1991. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division of Sexually Transmittal Diseases, *Sexually Transmitted Disease Statistics.' 1987*, Issue No. 146 (Atlanta, GA: October 1988); and U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Prevention Services, Division of Sexually Transmitted Diseases, *Sexually Transmitted Disease Statistics: 1985*, Issue No. 145 (Atlanta, GA: August 1987).

primary and secondary syphilis incidence rates among adolescents ages 15 to 19 in the 50 States have increased substantially since 1977 (see figure 9-4).[15] For all age groups (including adolescents), the increases appear to be largely among heterosexuals and among individuals living in California, Florida, and New York City (220).[16] For 10- to 14-year-olds, the 1987 syphilis prevalence rate of 1.4 cases per 100,000 population was the highest reported in over 30 years and represents a 75-percent increase from 1977; the 1989 rate was 1.27 per 100,000 (13a). For 15- to 19-year-olds, the 1987 rate (23.7 per 100,000) was the highest since 1965 (220,240); the 1989 rate was 24.74 per 100,000. Most of the increase in syphilis morbidity is accounted for by the large increase in the reported rate among female adolescents. Between 1977 and 1987, the incidence rate for adolescent females ages 10 to 14 and 15 to 19 increased approximately 120 percent, while the syphilis prevalence rate for 10- to 14-year-old males stayed almost constant, and the rate for 15- to 19-year-old males increased 33 percent (see figure 9-4) (240).

## Prevalence and Incidence of Chancroid

Chancroid is a highly contagious, local ulcer caused by infection with the bacterium *Haemophilus ducreyi.* Internationally, chancroid is more common than syphilis (for all ages combined) (42). With just under 5,000 cases reported in 1987, chancroid is currently uncommon in the United States (125,240). Cases have been reported in 23 States with the highest rates reported in New York, Florida, and Georgia (240). The proportion of adolescents currently infected with chancroid is not known, and accurate reports are difficult to obtain (179).

## Prevalence and Incidence of Pelvic Inflammatory Disease (PID)

PID is caused by *Neisseria gonorrhea, Chlamydia trachomatis,*[17] and other organisms and is the most common consequence of STD infection for women (29,221,240,270,276). Forty-three percent of women hospitalized with PID are under age 25 (240). Between 1975 and 1981 approximately 16 percent of over 260,000 women ages 15 to 44 experiencing an episode of PID were between the

[15]The CDC data are not broken down by race and age. Among Native Americans of all ages (including adolescents) in eight reservation States, the primary and secondary syphilis rate was 26.5 per 100,000 in 1985, more than three times the overall rate (7.1 per 100,000) for those States. The U.S. incidence rate for primary and secondary syphilis was 11.4 per 100,000 (101).

[16]The cities with the highest rates are Atlanta, Miami, Tampa, Memphis, Washington, DC, and New York City (241).

[17]Approximately 40 percent of all PID cases in the United States are caused by *Chlamydia trachomatis* (240).

ages of 15 and 19 (271). In general, black adolescent females are reported to have received treatment for PID more frequently than are whites (240,271). The reason for this is unclear. It may be that socioeconomic status accounts for the difference in incidence and thus treatment episodes; for example, white females, or middle-class females in general, could be misdiagnosed or given a different diagnosis because of the social stigma attending an STD *(90).*

## *Factors Associated With HIV and STDs*

All STD agents and HIV can be transmitted from an infected person to another partner through sexual intercourse--oral, anal, or vaginal (149,175,211, 223).[18] Increasingly, HIV infections have been linked with the sharing of contaminated needles used to inject illicit drugs and intercourse between infected IV drug users and their sexual partners (233,235,242). The use of crack cocaine, because of its association with increased levels of sexual intercourse, is thought to have contributed to enhanced HIV and STD levels in a number of States, such as New York, New Jersey, and Georgia (154).

The adolescent population is heterogeneous, and the risk of HIV infection and STDs varies for different groups of adolescents (89). For adolescents who have not had sexual intercourse at all or who have had few partners, and who do not use IV drugs, the risk of HIV or STD infection is low. At higher risk are adolescents who do one or more of the following:

- engage in sexual intercourse at early ages (136, 153);
- engage in unprotected anal intercourse;
- engage in male-to-male sexual relations (167);
- have several sexual partners (234);
- have sex with IV drug users;
- do not use condoms during sexual intercourse (222,234);
- use drugs that can be administered intravenously, such as cocaine, amphetamines, steroids, and heroin (88,144,168,212,214,227).

Statistically, members of racial and ethnic minority groups with low socioeconomic status may be at particular risk of both HIV infection and STDs (234).

### Sexual and Drug-Using Behaviors[19]

Some adolescents engage in sexual or drug-using behaviors that put them at risk for HIV infection or STDs.

Sexual Behavior—By age 18, 47 percent of adolescent females and 65 percent of adolescent males have engaged in sexual intercourse (127); furthermore, data from California, Michigan, and San Francisco suggest that between 16 and 35 percent of adolescents in those areas have had intercourse before age 15 (33,226). Black adolescents are more likely than whites and Hispanics to report having had sexual intercourse (96,127, 139,140,185,284). This holds true at every age,

Although some adolescents do not have sexual intercourse until after age 18, some adolescents engage in risky sexual behaviors that increase their chances of infection. Data on particularly risky sexual behaviors, such as anal intercourse, are very sparse for adolescents. Two studies with very small samples, however, do suggest reason for concern. One study, by Goodman and Cohall, found that 8 percent of sexually active racial and ethnic minority adolescents attending a comprehensive clinic in a New York City public high school reported participation in anal intercourse (83). It is not clear from this study whether condoms were used during anal intercourse. Jaffe and colleagues reported that 26 percent of adolescent females in a clinic population had had anal intercourse (102).

The most effective way to prevent the transmission of HIV and other STD agents is to abstain from sexual intercourse. For individuals who do engage in sexual intercourse, however, the most effective way to prevent transmission is to prevent the exchange of blood, semen, or vaginal fluid. Various studies among adults found that the use of latex condoms lubricated with nonoxynol-9 is effective in lowering, but not eliminating, the risk of STD and HIV infection (46,69,74,107,172,222,234). The actual effectiveness of condoms in preventing transmission of HIV infection and STDs among adolescents is not known (273), because most data collected on adolescent condom use are from studies that have investi-

[18] In addition, HIV and most STD agents can be passed perinatally from mother to child (233,234,235).

[19] For a discussion of adolescents' sexual practices, see ch. 10, "Pregnancy and Parenting: Prevention and Services." For a discussion of the use of drugs by adolescents, see ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," also in this volume.

gated condom use as a method of contraception and not as a method of protection from STDs.[20]

Most adolescents do not use any method of contraception at first intercourse (45,195,288), and they often delay contraceptive use up to a year after they have become sexually active (285,288). Among adolescents who do use contraception at first intercourse, however, condoms are one of the most commonly used methods of contraception (161,185, 195,285,288).[21] For adolescents who use condoms, there appear to be important racial, ethnic, and age differences. One study found that white adolescent females are more likely than either black or Hispanic adolescent females to have intercourse with partners who use condoms (195). Another study among a small, selected sample of sexually active inner-city black and Hispanic adolescent females found that some of these adolescents were less likely to use condoms during anal intercourse than during vaginal intercourse, although anal intercourse is believed to be more risky than either oral or vaginal intercourse in transmitting HIV (102). A study in Minnesota found that 9th graders were significantly less likely than 12th graders to use condoms (138).

Drug Use--As a group, adolescents are less likely to engage in drug-using behaviors that put them at risk for HIV and STDs than they are to engage in sexual behaviors that put them at risk. In recent statewide surveys in Massachusetts, for example, only 0.1 percent of adolescents reported engaging in IV drug use (95). Nevertheless, there are some adolescents who do use IV drugs and probably share IV needles, who exchange sex for drugs, or engage in sexual intercourse without condoms because of drug- or alcohol-induced disinhibitions and loss of judgment. Adolescents at highest risk may be adolescents who have been abused,[22] adolescents who are homeless or runaways,[23] adolescents who have engaged in prostitution, and adolescents who have been locked up in a juvenile detention facility[24] (4,57,152,167,192,250). One Texas study found that 7 percent of 213 runaways ages 11 to 16 reported injecting illicit drugs (98). However, surveys of high school students by CDC have found considerable geographic variation in IV drug use (226,231).

Although the use of drugs such as heroin among adolescents is not widespread, the use of alcohol and some other drugs is more prevalent and may, in fact, encourage risky sexual behavior that results in the transmission of HIV and STDs (35).[25]

### Lack of Information

In general, American adolescents have a fairly high level of factual knowledge regarding HIV transmission and methods of preventing its transmission (226). Data from the 1987 National Adolescent Student Health Survey suggest, however, that many American adolescents lack information or are misinformed about many aspects of transmission, prevention, and treatment of other STDs (see table 9-7).[26] Approximately 30 percent of a nationally representative sample of 8th and 10th graders did not know that most STDs are acquired through sexual intercourse, and a substantial minority did not know or were unsure that a sore on the sex organs (33 percent) and discharge of pus from a sex organ (44 percent) were signs of STD infection. Those adolescents who were female or older had more accurate information.

Although the National Adolescent Student Health Survey found that students, particularly 10th graders, seem to know more about HIV transmission and prevention than about STDs, a large minority of students continued to be misinformed about specific sexual behaviors that put them at risk of HIV infection (7). While over 90 percent of the students, both 8th and 10th graders, knew that HIV could be transmitted through sexual intercourse, for example,

[20]The use of condoms to prevent pregnanc, among adolescents is discussed inch. 10, "Pregnancy and Parenting: Prevention and Services,' in this volume.

[21]In 1988,47 percent of U.S. females ages 15 to 19 used a condom at first intercourse (72a). Twenty percent of sexually active females ages 15 to 19 reported current use of condoms as a method of contraception (140a).

[22]For a discussion of adolescents who have been maltreated, see ch. 3, ''Parents and Families' Influence on Adolescent Health,'' in this volume.

[23]For a discussion of homeless and runaway adolescents, see ch. 14, "Homelessness: Prevention and Services," in this volume.

[24]For a discussion of the health of adolescents in juvenile detention facilities, seed. 13, "Delinquency: Prevention and Services," in this volume.

[25]For a discussion of the use of alcohol and other drugs by adolescents, see ch. 12 ''Alcohol, Tobacco and Drug Abuse: Prevention and Services," in this volume.

[26]It is important t. note that the National Adolescent Student Health Survey did not include out-of-school youth, a group that may be at particular risk for contracting STDs.

**Table 9-7—Eighth and Tenth Grade Students' Knowledge Regarding STDs, by Grade and Sex, 1987**

| | Total | Grade | | Sex | |
|---|---|---|---|---|---|
| | | 8th | 10th | Male | Female |
| **Transmission of STDs:** | | | | | |
| **How do most people get STDs?** | | | | | |
| Objects | 4.5% | 5.5% | 3.5% | 4.5% | 4.5% |
| Kissing | 3.5 | 4.0 | 3.1 | 4.2 | 2.8 |
| ● Sex | 69.6 | 58.9 | 79.2 | 68.6 | 70.6 |
| Don't know | 22.4 | 31.6 | 14.1 | 22.7 | 22.2 |
| **Method of preventing STDs:** | | | | | |
| **Not having sex:** | | | | | |
| ● Very effective | 57.5 | 48.6 | 65.8 | 56.8 | 58.4 |
| Somewhat effective | 14.1 | 14.7 | 13.4 | 14.3 | 13.8 |
| Slightly effective | 6.6 | 7.5 | 5.8 | 7.9 | 5.2 |
| Noneffective | 11.1 | 14.1 | 8.3 | 10.8 | 11.3 |
| Don't know | 10.7 | 15.2 | 6.6 | 10.2 | 11.2 |
| **Going to the bathroom after having sex:** | | | | | |
| Very effective | 3.3 | 3.9 | 2.7 | 4.0 | 2.5 |
| Somewhat effective | 8.6 | 9.6 | 7.6 | 9.7 | 7.4 |
| ● Slightly effective | 12.5 | 12.0 | 12.9 | 13.4 | 11.6 |
| ● Noneffective | 41.3 | 33.2 | 48.8 | 39.3 | 43.4 |
| Don't know | 34.3 | 41.2 | 28.0 | 33.6 | 35.1 |
| **Taking birth control pills:** | | | | | |
| Very effective | 7.0 | 8.9 | 5.3 | 7.4 | 6.5 |
| Somewhat effective | 11.8 | 13.3 | 10.4 | 11.6 | 12.0 |
| Slightfly effective | 10.2 | 11.4 | 9.0 | 10.0 | 10.3 |
| ● Non effective | 45.5 | 34.1 | 55.8 | 44.0 | 47.1 |
| Don't know | 25.6 | 32.3 | 19.5 | 27.0 | 24.1 |
| **Washing after sex:** | | | | | |
| Very effective | 6.6 | 7.0 | 6.3 | 7.1 | 6.2 |
| Somewhat effective | 13.0 | 12.3 | 13.7 | 16.5 | 9.5 |
| Slightly effective | 18.7 | 14.6 | 22.4 | 19.4 | 18.0 |
| ● Non effective | 32,7 | 29,5 | 35.6 | 30.5 | 35.0 |
| Don't know | 29.0 | 36.6 | 22.0 | 26.6 | 31.4 |
| **Having sex with steady partner** | | | | | |
| ● Very effective | 23.6 | 19.2 | 27.6 | 26.8 | 20.2 |
| 'Somewhat effective | 28.9 | 23.7 | 33.6 | 29.9 | 27.8 |
| Slightly effective | 14.7 | 16.5 | 13.1 | 12.4 | 17.1 |
| Noneffective | 14.7 | 16.3 | 13.2 | 14.0 | 15.5 |
| Don't know | 18.1 | 24.3 | 12.5 | 16,9 | 19.3 |
| **Using condoms:** | | | | | |
| ● Very effective | 43.7 | 38.2 | 48.8 | 47.8 | 39.5 |
| *Somewhat effective | 24.5 | 21.8 | 27.0 | 23.4 | 25.7 |
| Slightly effective | 6.9 | 8.1 | 5.8 | 5.6 | 8.3 |
| Noneffective, | 11.1 | 12.2 | 10.1 | 11.2 | 11.0 |
| Don't know | 13.7 | 19.7 | 8.2 | 12.1 | 15.4 |
| **Signs of STDs:** | | | | | |
| **Lower abdominal pain in females:** | | | | | |
| ● Is a sign | 44.9 | 39.3 | 49.9 | 40.5 | 49.4 |
| Is not a sign | 7.1 | 7.7 | 6.6 | 6.7 | 7.7 |
| Don't know | 48.0 | 52.9 | 43.5 | 52.8 | 42.9 |
| **Nausea and vomiting:** | | | | | |
| Is a sign, | 27.8 | 25.0 | 30.3 | 26.3 | 29,4 |
| *Is not a sign | 14.6 | 13.1 | 15.9 | 15.0 | 14.1 |
| Don' t know | 57.6 | 61.8 | 53.7 | 58.7 | 56.4 |
| **Discharge of pus from sex organs:** | | | | | |
| ● Is a sign | 56.4 | 44.8 | 67.1 | 53.4 | 59.7 |
| Is not align | 3.7 | 4.6 | 2.9 | 4.0 | 3.4 |
| Don't know | 39.8 | 50.6 | 30.0 | 42.6 | 36.9 |
| **Sore on sex organs:** | | | | | |
| ● Is a sign | 67.0 | 56.4 | 76.6 | 64.1 | 70.1 |
| Is not a sign | 2.2 | 3.1 | 1.3 | 2.8 | 1.5 |
| Don't know | 30.8 | 40.4 | 22.1 | 33.1 | 28.5 |

*Continued on next page*

**Table 9-7—Eighth and Tenth Grade Students' Knowledge Regarding STDs, by Grade and Sex, 1987—Continued**

| | Total | Grade | | Sex | |
|---|---|---|---|---|---|
| | | 8th | 10th | Male | Female |
| **Pain when going to the bathroom:** | | | | | |
| ● Is a sign | 59.3 | 49.2 | 68.5 | 56.6 | 62.2 |
| Is not a sign | 4.5 | 5.3 | 3.7 | 4.8 | 4.1 |
| Don't know | 36.2 | 45.4 | 27.8 | 38.6 | 33.7 |
| **Appropriate responses to possible STD:** | | | | | |
| **Wait to see if signs go away:** | | | | | |
| Helpful | 8.3 | 11.5 | 5.5 | 9.1 | 7.5 |
| ● Harmful | 56.6 | 47.8 | 64.6 | 51.1 | 62.4 |
| No effect | 12.9 | 13.6 | 12,3 | 15.4 | 10.3 |
| Don't know | 22.1 | 27.1 | 17.6 | 24.4 | 19.7 |
| **Take leftover medicine for similar problem:** | | | | | |
| Helpful | 8.6 | 9.8 | 7.4 | 10.1 | 7.0 |
| ● Harmful | 59.9 | 56.2 | 63.3 | 54.5 | 65.6 |
| No effect | 8.6 | 8.1 | 9.0 | 8.5 | 8.8 |
| Don't know | 22.9 | 25.9 | 20.3 | 27.0 | 18.7 |
| **Get tested for STD:** | | | | | |
| "Helpful | 88.2 | 84.6 | 91.5 | 84.8 | 91.8 |
| Harmful | 0.6 | 0.7 | 0.5 | 0.8 | 0.4 |
| No effect | 1.6 | 2.2 | 1.0 | 2.2 | 1.0 |
| Don't know | 9.6 | 12.5 | 6.9 | 12.2 | 6.8 |
| **Do not have sex:** | | | | | |
| ● Helpful | 67.2 | 63.4 | 70,6 | 64.7 | 69.8 |
| Harmful | 3.0 | 3.2 | 2.8 | 3.4 | 2.6 |
| No effect | 13.7 | 13.4 | 13.9 | 13.9 | 13.4 |
| Don't know | 16.1 | 20.0 | 12,6 | 18.0 | 14.2 |
| **Tell sex partner:** | | | | | |
| ● Helpful | 76.5 | 68.7 | 83.6 | 74.1 | 79.0 |
| Harmful | 2.3 | 3.5 | 1,3 | 3.1 | 1.5 |
| No effect | 7.3 | 9.2 | 5.5 | 7.5 | 7.0 |
| Don't know | 13.9 | 18.7 | 9,6 | 15.3 | 12.5 |
| **Take medicine only until signs go away:** | | | | | |
| Helpful | 24.4 | 24.3 | 24.6 | 28.1 | 20.6 |
| ● Harmful | 31.8 | 26.5 | 36.7 | 27.3 | 36.6 |
| No effect | 9.8 | 10.2 | 9,4 | 10.9 | 8.7 |
| Don't know | 33.9 | 39.0 | 29.3 | 33.8 | 34.1 |
| **Treatment for STDs:** | | | | | |
| **Public health department informs parents of STDs in minors:** | | | | | |
| True | 40.1 | 47.1 | 33.7 | 39.7 | 40.4 |
| ● False | 24.3 | 16.4 | 31.4 | 25.6 | 22.9 |
| Don't know | 35.7 | 36.5 | 34.9 | 34.7 | 36.7 |
| **Most clinics require parental permission for treatment of minors:** | | | | | |
| True | 43.8 | 50.7 | 37.6 | 45.1 | 42.4 |
| ● False | 21.1 | 15.0 | 26.7 | 21.9 | 20.4 |
| Don't know | 35.1 | 34.3 | 35.8 | 33.0 | 37.2 |

KEY: ●- Correct response. In some cases, more than one response was considered correct.

SOURCE: American School Health Association, Association for the Advancement of Health Education, and the Society for Public Health Education, Inc., *The National Adolescent Student Health Survey: A Report on the Health of America's Youth*, a cooperative project of the National Institute on Drug Abuse, Alcohol, Drug Abuse, and Mental Health Administration; the Centers for Disease Control; and the Office of Disease Prevention and Health Promotion, Public Health Service, U.S. Department of Health and Human Services (Oakland, CA: Third Party Publishing Co., 1989).

close to *20* percent of the students were not aware that having multiple sexual partners, a male having sexual intercourse with another male, or having sexual intercourse with someone who has had several partners increased an individual's chances of getting HIV infection (7). Data from State and local surveys confirm that students are also misinformed about factors that do not increase risk, but which raise fear and have public policy implications, such as donating blood (see table 9-8).

Misperceptions about effective STD and HIV prevention methods persist, The National Adolescent Student Health Survey found that the majority of students were not aware that taking birth control pills (55 percent) or washing after sex (67 percent) were ineffective methods of protection from STDs (see table 9-7). Almost a quarter of the national student sample did not know that abstaining from sexual intercourse lowered their risk of infection and 20 percent did not know that not using a needle[27] while taking drugs lowered the risk (7). One local sample reported that 19 percent of 657 Connecticut junior and senior high school students believed that not kissing an HIV-infected person on the cheek was an effective method of prevention (92). Although most of the students surveyed in the National Adolescent Student Health Survey (86 percent overall) knew that the use of condoms during sexual intercourse decreases their risk of getting HIV infection (7), earlier data from 14- to 18-year-old San Francisco students suggest that there may be significant racial differences in this knowledge, whites (71.7 percent) having more knowledge than blacks (59.9 percent) and Latinos (58.3 percent) (62).

### Other Concerns

To change behaviors that put them at risk for HIV infection or STDs or to maintain safe behaviors, adolescents must perceive that they could become infected (104). For AIDS prevention efforts, this poses a particular problem. Given the estimated 10-year latency period between HIV infection and diagnosis with AIDS, it is unlikely that most adolescents now know or encounter another adolescent who has AIDS.[28,29]

Furthermore, even though adolescents are developing the cognitive abilities to perceive risks accurately,[30] some observers believe that adolescents often do not weigh relevant risks in making decisions (131,137). In not weighing relevant risks, adolescents may be no different from adults (70,197).[31] Even though many adolescents worry about getting infected (83,138), they, like adults, may be more concerned about satisfying needs (e.g., peer acceptance, having a sexual relationship, being attractive to members of the opposite sex) than about preventing possible HIV or STD infection. As a result, they may try to prevent HIV infection through inappropriate or ineffective means (87). In addition, however, STD prevention during adolescence may be constrained by ambiguities in the social status of American adolescents.[32] While adolescents are bombarded with messages from commercial media that are likely to encourage them to engage in sexual intercourse, their level of realistic information about effective means to prevent HIV infection and STDs may be limited by external forces (e.g., school boards) (147,147a, 204). As discussed throughout this Report, there are many barriers that restrict adolescents' access to health care, including barriers to obtaining information. Even when information about treatment is available, there may be legal barriers (e.g., requirements for parental consent),[33] financial barriers,[34] and a scarcity of appropriately trained health care professionals.[35] Thus, in considering strategies for reducing the burden of HIV infection and STDs on adolescents, it is important not to "blame the victims" of these health conditions (91 b). General strategies for reducing barriers to care, and for establishing a more effective approach to health promotion and disease prevention for adolescents are discussed in Vol. I of this Report (205a). A critique of existing prevention and

[27]The National Adolescent Student Health Survey did not explicitly mention sharing IV needles but asked students if not taking illegal drugs with a needle lowered their chance of getting AIDS.

[28]This observation may not hold true, however, for adolescents in areas where adolescents are likely to have sex early; adolescents with older, infected partners; or adolescents who use IV drugs early.

[29]There are virtually no data on the number of adolescents who know someone with AIDS. The National Health Interview Survey conducted by the National Center for Health Statistics in the Department of Health and Human Services asks individuals over age 18 whether they know someone with AIDS, but it does not collect comparable data on adolescents.

[30]Adolescents' cognitive development is discussed in ch. 2, "What Is Adolescent Health?" in this volume.

[31]For a discussion of several studies of the decisionmaking abilities of adolescents, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[32]See ch. 2, "What Is Adolescent Health?" in this volume.

[33]See ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in Vol. III.

[34]See ch. 16, "Financial Access to Health Services," in Vol. III.

[35]See ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

**Table 9-8-Percentage of Correct Responses Among U.S. High School Students for Questions Related to HIV Transmission Routes, by Selected States and Cities, 1989**

| Site | Sample size[a] | Student response rate (%) | Percentage of correct responses concerning HIV transmission routes: Donating blood does not | Insect bites do not | Using public toilets does not | Having a blood test does not |
|---|---|---|---|---|---|---|
| **state** | | | | | | |
| Alabama[b] | 6,702 | 90 | 61.1 | 43.2 | 67.5 | 76.9 |
| Arkansas[b] | 303 | 86 | 63.3 | 44.0 | 68,9 | 72.5 |
| California[b c] | 1,858 | 41 | 55.6 | 42.3 | 72.2 | 70.8 |
| Colorado[c d] | 1,908 | NA | 52.0 | 45.6 | 82.6 | 69.8 |
| Delaware[e] | 2,414 | NA | 71.6 | 49.6 | 69.1 | 77.2 |
| District of Columbia[e f] | 1,077 | 66 | 49.0 | 44.2 | 70.9 | 68.3 |
| Georgia[d] | 421 | 68 | 57.0 | 45.3 | 73.0 | 68.5 |
| Hawaii[e] | 4,908 | 78 | 51.7 | 64.0 | 82.5 | 72.5 |
| Idaho[d] | 1,008 | NA | 54.3 | 43.3 | 75.5 | 67.4 |
| Iowa[e] | 1,463 | 90 | 60.9 | 45.3 | 79.2 | 74.2 |
| Kansas[d] | 1,101 | 83 | 64.7 | 58.0 | 80.1 | 72.8 |
| Kentucky[e] | 1,458 | 84 | 62.3 | 54.8 | 71.0 | 74.6 |
| Louisiana[b] | 6,013 | 70 | 58.2 | 50.1 | 66.8 | 71.2 |
| Massachusetts[c e] | 2,043 | 81 | 66.5 | 54.3 | 76.6 | 76.3 |
| Michigan[b] | 873 | 90 | 66.1 | 48.0 | 72.1 | 76.4 |
| Missouri[b] | 1,201 | NA | 63.3 | 44.2 | 73.9 | 73.4 |
| New Jersey[c d] | 2,153 | 88 | 61.4 | 50.6 | 73.2 | 73.1 |
| New Mexico[d] | 770 | NA | 55.9 | 50.7 | 75.2 | 72.0 |
| New York[c d] | 3,026 | NA | 56.0 | 58.4 | 81.3 | 74.6 |
| North Carolina[d] | 10,279 | NA | 52.8 | 57.6 | 75.7 | 75.3 |
| North Dakota[d] | 2,924 | NA | 63.7 | 57.6 | 84.2 | 80.3 |
| Ohio[d] | 4,341 | NA | 64.1 | 50.2 | 75.1 | 73.8 |
| Oklahoma[d] | 2,521 | 43 | 60.2 | 55.6 | 76.1 | 75.5 |
| Oregon[b] | 2,895 | 74 | 68.6 | 47.5 | 72.4 | 75.8 |
| Pennsylvania[c e] | 4,548 | 82 | 71.9 | 54.8 | 76.4 | 77.7 |
| Rhode Island[b] | 7,076 | 77 | 69.9 | 63.9 | NA | 80.3 |
| South Dakota[e] | 1,392 | 87 | 60.9 | 48.4 | 80.1 | 72.1 |
| Tennessee[d] | 2,098 | NA | 65.3 | 43.2 | 66.6 | 74.6 |
| Utah[d] | 4,174 | NA | 54.7 | 48.8 | 70.1 | 69.1 |
| Washington[c d] | 1,176 | NA | 74.5 | 66.5 | 84.3 | 82.4 |
| **city** | | | | | | |
| Chicaga[b] | 1,171 | 90 | 39.9 | 41.9 | 70.5 | 64.8 |
| Dallas[e] | 3,483 | 87 | 54.1 | 55.5 | 76.4 | 74.1 |
| Fort Lauderdale[d] | 861 | 90 | 49.0 | 45.2 | 66.7 | 67.7 |
| Jersey City[e] | 493 | 70 | 32.4 | 43.9 | 59.0 | 63.2 |
| Los Angeles[d] | 3,030 | 90 | 37.9 | 29.0 | 52.1 | 58.5 |
| Miami[e] | 1,192 | 83 | 42.1 | 45.6 | 70.3 | 68.6 |
| New York City[d] | 1,135 | NA | 33.6 | 52.9 | 71.0 | 64.2 |
| San Diego[d] | 317 | 61 | 61.8 | 58.7 | 84.9 | 79.4 |
| San Francisco[d] | 793 | NA | 47.7 | 41.7 | 68.8 | 63.4 |
| Seattle[b] | 1,374 | 67 | 56.4 | 48.5 | 75.7 | 70.7 |

KEY: NA - not available.
[a]Schools and students were not randomly assigned.
[b]Probability sample, unweighted data.
[c]Surveys did not include students from the largest Cities.
[d]Nonprobability sample, unweighed data.
[e]Probability sample, weighted data.
[f]The District of Columbia is categorized as a State for CDC funding purposes.

SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "HIV-Related Beliefs, Knowtedge, and Behaviors Among High School Students," Morbidity and Mortality *Weekly* Report 39(23):385-397, June 15, 1990.

treatment systems, and specific strategies related to HIV infection and STDs, are included below.

## Prevention of AIDS/HIV Infection and Other STDs

In the absence of a cure, preventing initial infection is the best method for controlling the spread of some STDs and is the only way to effectively control the spread of HIV (234). As suggested by the recent rise in syphilis rates among adolescents, prevention efforts directed at changing risky sexual and drug-using behaviors will continue to be necessary even if a cure for certain STDs and HIV infection is found (24). Given that adolescents have differing levels of risk for infection, prevention efforts can take many forms. For low-risk individuals, for example, efforts can be limited to education and counseling to prevent initial STD and HIV infection. For those at higher risk, prevention efforts may include the detection of infection among asymptomatic and symptomatic adolescents and their sex partners and the effective treatment of those who are already infected (234).

An alternative goal may be the modification, rather than the elimination, of risky sexual and drug-using behaviors. As noted by the National Academy of Sciences, it is often easier to modify an existing behavior than to eliminate it (143). For adolescents who engage in sexual intercourse, modifications may include using condoms, avoiding multiple partners, and knowing the sexual and drug history of sexual partners and acting on that information. For adolescents who have been using drugs, modifications may include using sterile needles to inject drugs, not sharing needles, or using bleach to clean injection equipment.[36]

Until recently, HIV prevention efforts have not been focused on adolescents (209). Currently, however a wide range of educationally based preventive interventions target adolescents of varying ages within and outside schools, including school-linked health centers, and community-based youth services agencies (e.g., The Door in New York City, Bridge Over Troubled Waters in Boston, and El Puente in Brooklyn) .37 It is important to note that preventive interventions are not—and should not be-limited only to didactic presentations to adolescents. They include teen theater, television and radio campaigns, ''rap contests, poster contests, street outreach workers, peer counselors, role-playing activities, interactive computer-based information dissemination systems, and STD and AIDS hot lines, but they also include services that may require more intensive efforts on the part of the clinical services system, such as condom distribution programs, needle exchange and bleach programs, and testing for HIV and STDs.

Systematic evaluation of the effectiveness of preventive interventions is rare (26), particularly in the case of interventions targeting adolescents at increased risk of infection (e.g., minority adolescents, gay adolescents, runaways, and homeless adolescents) (201 ,209). Furthermore, many preventive interventions are not based on a clear theoretical framework (72). Thus, little is currently known about what interventions are successful in preventing the spread of HIV or STD infections among adolescents.

The need for effective HIV and STD preventive interventions for adolescents at higher risk is clear. Although most recent data suggest that some adolescents have taken steps to reduce their risk of HIV infection (83,95,155), many adolescents are not consistently adopting safer sex practices. In a 1988 Massachusetts telephone survey, for example, only 19 percent of the sexually active adolescents ages 16 to 19 reported adopting condom use because of AIDS (95). Low proportions of condom users were also observed among a group of adolescent males with hemophilia (31 percent; N = 26) and a New York City minority adolescent population (39 percent; N = 196) (83,155). In the Massachusetts survey, only half of those reporting condom use used condoms all the time (95). In a study in New York City, 32 percent of the sexually active minority adolescents reported engaging in intercourse without condoms during their last sexual encounter (83).

[36]OTA did not review the effects of using bleach as preVentiOn against infection.

[37]Having access t. a school-linked health center may help adolescents reduce the time between exposure to STD infection and seeking medical care (35). For a discussion of school-linked health centers, see ch. 15, "Major Issues Pertaining to the Delivery of primary and Comprehensive Care to Adolescents," in Vol. III.

## Problems in Evaluating the Effectiveness of AIDS and STD Prevention Programs

Over the past several years, various approaches have been developed for the prevention of HIV infection and other STDS. The preventive programs undoubtedly vary in quality, but their effectiveness has been difficult to assess.[38]

Numerous obstacles impede evaluations of the effectiveness of AIDS and STD prevention programs--limited funds or time, the need for technical expertise, and certain methodological difficulties (e.g., separating the effects of the environment from the intervention, ethical issues of using control groups, parental concern about particular behavior-related questions) (1 17,256).

Limited funds, time, or other factors often force evaluators to choose between process evaluation and outcome evaluation (1 17).[39] The most accurate evaluation of a program's success involves both process and outcome evaluations (1 17). Unfortunately, however, many interventions for the prevention of HIV infection and STDs among adolescents have undergone process evaluation alone (203). Evaluation of an intervention's effectiveness is difficult when no definite link has been established between the process and desired outcomes.

Adolescents are not a homogeneous group, so preventive interventions should have differing goals depending on the subgroup being targeted--e. g., the subgroup of adolescents who are not sexually active and do not use drugs (especially younger adolescents) v. subgroups of adolescents who engage in sexual intercourse or use drugs. Unfortunately, many HIV and STD prevention efforts do not have clear goals. Most programs are probably seeking to reduce the rates of HIV and STD infection among adolescents, but measuring infection rates is difficult because of the asymptomatic nature of many STDs, the hesitancy of adolescents to seek treatment, and many adolescents' concerns about confidentiality (144), and the cost and intrusiveness of population-based testing. Furthermore, the initial base rates of HIV infection and STDs are low, so determining the effectiveness of a preventive program is difficult if success is measured in terms of decreasing infection rates.

For these and other reasons, most evaluators use outcomes other than HIV or STD infection rates to determin e a preventive intervention's success. Such measures typically include cognitive outcomes (beliefs, attitudes, behavioral intentions) or self-reported behavioral outcomes that bear directly on the transmission of HIV infection and STDs (144).

Some AIDS and STD prevention programs seek to increase adolescents' factual knowledge and to change their attitudes related to HIV and STD prevention, although increases in individuals' factual knowledge and changes in attitude do not necessarily lead to changes in behavior (95,109,155). Other prevention programs attempt to influence behaviors that eliminate or reduce an individuals' risk of infection or protect against infection. Many AIDS and STD prevention programs do not measure the outcomes they seek to maintain or modify, however, so no information about the impact of the preventive intervention is developed.

Another problem in evaluating the effectiveness of HIV and STD prevention efforts is that few prevention programs use experimental designs (63, 144,203). Subjects are often volunteers in convenient settings without regard to an appropriate control group. Also, parents may exempt their adolescent children from participating in HIV/AIDS and STD educational activities in the schools (147). Only rarely are subjects assigned randomly to an intervention, and many preventive interventions use ''before and after' evaluation designs[40] with virtually no long-term followup, making it impossible to see if program effects are maintained. The length of time subjects spend in an intervention and the period between completion of an intervention and posttest are not standardized.

## Education-Based AIDS and STD Prevention Efforts

OTA and the U.S. General Accounting Office (GAO) have each identified elements of health education models that theoretically should be rele-

[38] Central to any type of evaluation of STD/AIDS intervention is the accuracy of self-report data on sexual and drug behaviors and attitudes. These concerns are addressed in ch. 12, ''Alcohol, Tobacco, and Drug Abuse: Prevention and Services, ' in this volume.

[39] *Process evaluation* involves the evaluation of aspects of a program's implementation and operation (e.g., number of pamphlets distributed); *outcome evaluation* measures an intervention's results (e.g., increased knowledge, changed behavior).

[40] Before and after comparisons of an evaluation may be informative when no change occurs and might be useful in future program designs (144).

vant to designing education-based AIDS and STD prevention interventions that are effective in changing risky behaviors (199,203). Taken together, these elements include the following:

- using a credible source to reach an intended audience by acknowledging the audience's beliefs and values;
- making individuals understand that they may be at risk of infection so that they will be motivated to change risky behaviors;
- developing skills among individuals to overcome physical and psychological barriers to behavioral change;
- stressing positive aspects of an intervention, but still acknowledging the negative aspects, so as to increase individuals' belief in the credibility of the source;
- gaining the approval of friends and the community to increase individuals' intentions to change; and
- using role models (e.g., opinion leaders and peer counselors) to change risky behavior,

Some education-based AIDS and STD prevention efforts target all adolescents, including adolescents who experiment with risky sexual and drug-using behaviors, by seeking to increase their knowledge about modes of HIV and STD transmission and ways to avoid HIV and STD infection. Other education-based AIDS and STD prevention activities seek to build adolescents' decisionmaking skills and strategies to resist real and perceived peer pressure. Other education-based prevention efforts, which include traditional sex education, and drug education programs, are discussed in other chapters of this Report.[41]

Education-based AIDS and STD prevention efforts that focus specifically on adolescents are discussed below. Some of these education-based prevention efforts involve families, some take place in schools, and some take place in community settings.

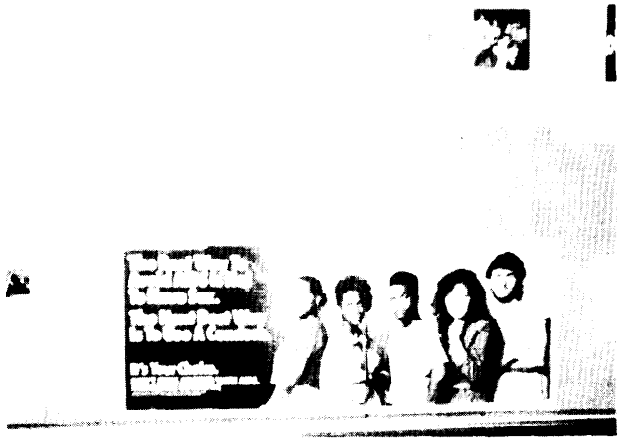


*Photo credit: Office of Technology Assessment*

**Posters such as this one in a high school offer an opportunity to remind adolescents of the dangers of AIDS. It is unclear whether this kind of education effort is enough to change adolescents' behavior, however.**

## Education-Based Prevention Efforts That Involve Families

Generally, individuals are more likely to act on information if the person or agency providing the information is credible (203). Many, if not most, adolescents have been found to perceive physicians, peers, and parents as credible sources of information (45,95,155,274). Adolescents from racial or ethnic minority groups who view the extended family as an important social support system (13,126,210) may see members of the extended family as credible deliverers of health information.[42]

Family interventions may have paticular promise in helping adolescents delay sexual intercourse and avoid drug use, because most adolescents live at home. Often, however, parents do not discuss sexuality-related topics, including homosexuality and prostitution, with their adolescent children (95,204,248); and many adolescents report having a difficult time discussing such topics with their parents (45,174,204). For illustration, although adolescents were not specifically targeted to receive CDC's brochure "Understanding AIDS,"[43] CDC hoped they would be reached by promoting discus-

41 Sex education is discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," and drug education is discussed in ch. 12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," both in this volume.

42 For a discussion of parental influences on adolescent decisionmaking, see ch. 3, "Parents and Families' Influence on Adolescent Health," in this volume. For a discussion of issues in the delivery of services to racial and ethnic minority adolescents, see ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Vol. III.

43 The brochure, which describes the modes of HIV transmission and methods of prevention, was mailed to all households and residential pOSt OffiCe boxes in the United States between May 26 and June 30, 1988 (223).

sions of AIDS within families (223). Provisional data from the 1988 National Health Interview Survey conducted by the National Center for Health Statistics in the U.S. Department of Health and Human Services (DHHS) showed that while 35 percent of the parents reported discussing the brochure with their 10- to 17-year-olds, the remainder (over 60 percent) did not discuss it (244,245). The quality of the discussions among those who did discuss the brochure is not known.[44]

Currently, few of the adolescent HIV or STD prevention efforts that are being carefully evaluated target families. The Office of Minority Health within DHHS, under its Minority HIV Education/ Prevention Grant Program, is funding a project in Salt Lake City, Utah, that provides HIV education and prevention in the homes of Mexican American adolescents who are engaging or may engage in risky behaviors associated with HIV transmission.[45] Social service workers try to foster family communication, strengthen family relationships, and build skills to support less risky behaviors (22).

One major drawback of family interventions is that family interventions are unable to reach runaway, throwaway, homeless, and incarcerated adolescents who may engage in behaviors that place them at increased risk of infection.[46] Prevention efforts other than those that are family-based are necessary to reach these populations.

### Education-Based Prevention Efforts in Schools

The **vast** majority of American adolescents, particularly younger adolescents, attend school (206). For that reason, some observers have suggested that culturally sensitive and age-appropriate prevention programs in schools maybe one of the most practical ways to influence the spread of HIV infection and STDs (63,82,209,280). In fact, most students report wanting to learn about AIDS and, presumably, STDs, at school (92). Studies of education-based AIDS and STD prevention efforts in schools are summarized in table 9-9.

Even though most States encourage STD or AIDS education in schools, many students, particularly younger adolescents, are apparently not receiving any STD or AIDS education (3,7). Among the public secondary schools that reported providing sex education, 95 percent reported offering at least one class on STDs (3). Nevertheless, 68 percent of the students surveyed in the National Adolescent Student Health Survey in 1987 reported either not knowing whether they had had STD instruction or never receiving such instruction (7).[47] Additionally, 65 percent of the students surveyed reported either not having or not knowing if they had had AIDS education, with relatively no difference between older and younger students (7). This information is confined by the National Association of State Boards of Education, which reported in 1989 that only 28 States and the District of Columbia required HIV/AIDS education (147).[48]

The Federal Government supports AIDS and STD education primarily through monetary support and technical assistance to States. The scope and content of the AIDS and STD educational messages developed with Federal assistance are determined at either the State or local level. CDC had cooperative agreements with State and local education agencies totaling over $19 million in program years 1989-1990, to support developmentally appropriate HIV/AIDS education in the schools (118,227). In addition, CDC has been working with State education departments to develop a method for monitoring changes in students' knowledge, attitudes, and behaviors (118,147,226). According to CDC, AIDS and STD education may be most effective within a comprehensive school health education program (232,238). Only 19 States, however, require that HIV/AIDS education be taught within either a

[44]CDC's National AIDS Information and Education Program's analysis of cross-tabulations of knowledge questions with those adults who said they had children between 10 and 17 years of age (183) may provide some information about whether parents gave their children accurate information,

[45]For a discussion of issues pertaining to the delivery of services to adolescents from Hispanic and other racial or ethnic minority groups, see ch. 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in vol. III.

[46]For a discussion of the problems of runaway, throwaway, and homeless adolescents, see ch. 14, "Hopelessness: Prevention and Services,' in this volume. Incarcerated adolescents are discussed in ch. 13, "Delinquency: Prevention and Services," in this volume.

[47]Only 18 percent of the 8th graders reported receiving instruction on STDs as compared with 44 percent of the 10th graders (7).

[48]The 28 States are Alabama, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, and West Virginia (147).

[49]The State of Washington requires that HIV/AIDS education be added to the STD requirement (147).

**Table 9-9—Studies Evaluating Education-Based AIDS and STD Prevention Efforts in Schools**

| Study' | Goal(s) | Intervention(s) and outcome measure(s) | Research design | Study population, sample size, and year data collected | Results |
|---|---|---|---|---|---|
| Brown, Fritz, and Barone, 1989 | Improve knowledge, attitudes toward future behaviors and tolerance for people with AIDS, and coping strategies | *Intervention:* Two 45-minute classes on AIDS taught by health teachers. About half of each session **was a film presentation and the remaining time was an open class discussion.** *Outcome measure:* Performance on knowledge, attitude, and coping survey | Pretest/posttest design, no comparison group | *Study population:* Predominantly white, suburban, middle class Rhode Island 7th **and** 10th graders *Sample size:* 7th grade: 174 10th grade: 139 *Year data collected:* NA | Knowledge test scores increased significantly for both grades. Students in both grades reported a greater likelihood to engage in safer behaviors. 7th graders changed their attitudes for **risk behaviors and tolerance for people with AIDS. Only the former changed significantly** for 10th graders. 7th grade males and 10th grade females reported being more tolerant. 7th **graders reported endorsing wishful thinking and self-criticism coping strategies less frequently, and 10th graders reported endorsing social withdrawal less frequently and problem-solving-coping strategies** more frequently. |
| DiClemente, Pies, Stoner, et al., 1989 | Improve AIDS knowledge, decrease misconceptions, and Increase tolerance toward individuals with AIDS | *Interventiom* Three **class** period AIDS prevention curricula presented on consecutive days ***Outcome measure:*** Performance on knowledge questionnaire | Pretest/posttest control **group design** | *Study population:* **Middle and** high school students in the San Francisco Unified School District *Sample size:* High school: 254 Middle school: 385 *Year data collected: 1986* or 1987 | Intervention group showed statistically significant knowledge gains and fewer misconceptions. Middle school students demonstrated more knowledge gain (mean of 4.8) than high school students (mean of 3.5), and both groups had more knowledge than the nonintervention group. Students in the intervention group showed less fear about having a student with AIDS in the classroom. |
| Hernandez and Smith, 1990 | Compare the effects of three primary prevention education programs with differing philosophies: abstinence, condom use, delaying sex, and considering alternatives | */intervention:* One-hour multimedia presentation *Outcome measure:* Performance on attitudes, intentions, and behavior questionnaire. | Pretest/posttest design with control group | *Study population:* Students **ages 18** to 21 from two Southeastern State universities *Sample size: 388* students completed both a pretest questionnaire and posttest questionnaire 6 weeks later. *Year data collected: 1988* | No significant effects of programs on any cognitive (e.g., sexual motivation, intended condom use) or behavioral items (e.g., condom use, number of sex partners). The abstinence program did not **lead** to an increase in abstinence, nor did explicit condom use information lead to condom use. However, those in the decisionmaking group which stressed condom use were significantly more likely to use condoms after the program than were those in the group which stressed all alternatives including delaying sex. |

*Continued on next page*

**Table 9-9-Studies Evaluating Education-Based AIDS and STD Prevention Efforts in Schools--continued**

| study' | Goal(s) | Intervention(s) and outcome measure(s) | Research design | Study population, sample size, and year data collected | Results |
|---|---|---|---|---|---|
| Huszti, **Clopton, and Mason, 1989** | Increase **AIDS knowledge and improve attitudes toward people with AIDS and increase practice of preventive behaviors** | ***Intervention:*** **45-minute AIDS educational program using either a lecture or film** *Outcome measure:* Performance on knowledge and attitude questionnaire | Pretest/posttest/l month followup design. Volunteer subjects were randomly assigned to 1 of 3 conditions: lecture, film, or no program. | *Study population:* 10th grade students ages 14 to 17 attending 2 suburban Oklahoma City area public schools *Sample size:* *448* students completed pretest, posttest, and followup Year ***data collected:*** NA | Intervention groups' knowledge scores increased significantly from pretest to posttest and decreased significantly at 1 -month followup although scores were still higher than at pretest. Students hearing the lecture had significantly higher knowledge scores than either film or no program groups at both posttest and followup. Students watching the film had significantly higher scores than the no program group. In addition, intervention groups had significantly more positive attitudes toward people with **AIDS and preventive behaviors than the no program group.** However, these attitudes decreased significantly 1 month **later. Students' attitudes toward preventive behaviors were not significantly different than at pretest. Females had significantly higher levels of knowledge and more positive attitudes toward people with AIDS at all measurement times and more positive attitudes toward preventive behaviors than males at posttest and followup.** **Remark:** **Students' initialty** high **positive attitudes toward preventive behaviors may have created a ceiling effect.** |
| **Miller and** Downer, 1987 | **Improve AIDS knowledge** and attitudes | *Intervention:* 50-minute multimedia, AIDS program *Outcome measure:* Performance on knowledge and attitude survey | Pretest/posttest design, no comparison group | *Study population:* **Seattle high** school students *Sample size:* 114 students completed pretest 1 month prior to and 1 week after educational program. 53 students completed a posttest 8 weeks later Years *data collected: 1986-87* | **Students' knowledge test scores increased from 78% to 90%.** The percentage who thought they might get AIDS did not decrease significantly. The 8-week posttest showed retention of knowledge. |
| Sroka, **1986** | **Improve knowledge and** modify attitudes and **behavioral intentions** | *Intervention:* 5 days of **STD education** **Outcome** *measure:* Performance on knowledge, **attitudes, and behavioral intentions survey** | Pretest (1 week before)/ posttest (1 week after) design, involving a control group. Teachers were also asked to evaluate what they perceive to be significant gains in students' knowledge, attitudes, **and** behavioral intentions. | *Study population:* 9th grade students in an urban inner-city area *Sample size:* Intervention group: 67 (completed pretest and posttests Control group: 87 (completed pretest **and posttests)** **Year** *data collected:* 1986 | Knowledge, attitudes, and behavioral intentions improved in the intervention group **compared with the control** group (although significance was not determined). In general, a large proportion of teachers felt that substantial gains had been made in students' knowledge (98%), attitudes (81%), and behavioral intentions (77%). **Remark:** **Teachers surveyed were located in only 3 States. Results may not be generalizable to other populations.** |

**Table 9-9-Studies Evaluating Education-Based AIDS and STD Prevention Efforts in Schools-Continued**

| Study" | Goal(s) | Intervention(s) and outcome measure(s) | Research design | Study population, sample size, and year data collected | Results |
|---|---|---|---|---|---|
| Stout and Rivara, 1989b | This study reviewed five earlier studies of junior and senior high school-based sex education programs. | Intervention:School-based sex education programs<br>*Outcome measure:* Sexual activity, contraceptive behavior, and pregnancy | Variety of research designs. Three were cross-sectional using national survey data. One was a longitudinal survey. The final study was a case-control of exemplary sex education programs. | *Study population: Age*of participants varied: 15-to 16-year-olds sampled in the 1981 National Survey of Children; 15- to 19year-old females; nationally representative sample of 14- to22-yearddsin1979; nationally representative sample of 15- to 19-year-olds living in households; and elementary through high school students<br>*Sample size:* Varied from 500 to 12,069<br>***Years** data collected:* Varied from mid-1970s to mid-1980s | Three studies found no effect on sexual activity. One study showed lower prevalence rates for those who had taken a class while the other found a weak positive relationship. There appeared to be little effect on use of effective methods of birth control. No measurable impact was found on pregnancy rates except in one study where a lower rate among 15-to 17-year-old females was observed.<br>Remark:<br>Studies did not have control groups, and all were retrospective. The quality of the programs could not be determined. |
| Yarber, 1986 | Improve students' knowledge and attitudes related to preventive behaviors related to STDs | *Intervention:* Five class periods (250 minutes) of a CDC-sponsored STD curriculum, *STD: A Guide for Today's Young Adults*<br>*Outcome measure:* Performance on knowledge and attitude survey. | Quasi-experimental design involving experimental (CDC curriculum) and 2 control groups (schools' standard STD educational program of 2 to 6 class sessions and no STD instruction). Pretest and posttests immediately following instruction and 6 weeks later. Students were not randomly assigned. | *Study population:* Junior high and high school students ranging in age from 12 to 19 in 6 school districts (3 suburban, 2 urban, 1 rural) in Eastern and Central States<br>*Sample size:*<br>**CDCSTD curriculum: 566**<br>**School STD curriculum: 161**<br>**No** STD education: 387<br>*Year data collected: 1985* | **CDC** curriculum improved students' STD knowledge. However, increases in knowledge decreased at 6-week followup. Intentions to engage in healthy behaviors increased, but not as much as beliefs and feelings about such behaviors. Six weeks later, scores were not significantly different than at pretest. |

**KEY: NA = not available.**

[a]Full citations are listed at the end of this chapter.

[b]This study reviewed the following five school sex education studies: Dawson, 1986; Furstenberg, 1985; Kirby, 1984; Marsiglio and Mott, 1986; and Zelnick and Kim, 1982. Full citations for these studies are listed at the end of this chapter.

SOURCE: **Office of Technology Assessment, 1991.**

comprehensive health or family life education curriculum (147).49

Given the fact that risky sexual and drug-using behaviors are directly related to the transmission of HIV and STDs, the ultimate goal of education-based AIDS and STD prevention efforts is to increase the use of preventive behaviors (35,99). As the programs listed in table 9-9 illustrate, education-based AIDS and STD prevention programs in schools often attempt to influence students' behavior by increasing knowledge about AIDS and, to a lesser extent, knowledge about STDs (including methods of transmitting and preventing infection); by changing students' attitudes; and by modifying their behavioral intentions with respect to preventive behaviors (3,27,63,99,1 12,135,147,187,280). There is little evidence to suggest that increased knowledge alone will result in behavioral change ( 14,203). Behavioral intentions are believed to be more closely related to behavioral change (2). Very few studies have evaluated how educational interventions affect risky behavior related to the transmission of STDs and HIV infection (203,280). Thus, very little is known about the effectiveness of education-based STD and AIDS prevention efforts in schools. Only 11 States include an evaluation component in their ~/AIDS education programs, and most of those are insufficient to measure the educational program's effectiveness (147).

Some available evidence suggests that brief educational instruction can significantly increase adolescents' knowledge about HIV and STD infection. A study evaluating the impact of a 3-hour AIDS prevention curriculum taught in San Francisco middle and high school classes (63), for example, found that students receiving the curriculum (including knowledge that condoms could reduce the risk of HIV transmission during sexual intercourse) showed significantly more knowledge than students who received no instruction. Because students' knowledge was not assessed after a longer period of time, however, it is possible that the increases in knowledge may not have remained strong. One study demonstrated that students' knowledge about STDs increased significantly immediately following a CDC-sponsored STD curriculum and then decreased 6 weeks later (280).

The method by which AIDS and STD information is presented may be important in students' ability to retain knowledge they have gained, although the evidence is unclear. Traditionally, STD education classes have consisted of didactic biomedically oriented lectures (35), although videotapes and films are becoming more popular. By using a 50-minute videotape, Miller and Downer demonstrated that Seattle students retained their increase in knowledge 8 weeks later (135).[50] In contrast, one study involving 10th grade Oklahoma City students found that a lecture increased students' knowledge more than watching a film (99). Both the film and lecture were more effective than having no program. A month later, knowledge gains remained significantly greater than at pretest (99).

Data from education programs for the prevention of adolescent pregnancy[51] and programs for the prevention of smoking suggest that effective AIDS and STD prevention efforts must go beyond the transferring of knowledge to helping adolescents deal with real and perceived peer pressures in negotiating safer sex and drug use behaviors with unwilling or ambivalent partners by building decisionmaking and communication skills (23,1 11,126, 178,199,203). So far, most education-based AIDS and STD prevention programs have not gone beyond disseminating knowledge and have not attempted to provide adolescents an opportunity to build skills for the prevention of HIV infection and STDS (27,63,99, 135,187,280). Changing behaviors without providing opportunities to build skills appears to be most difficult (280).

Two currently popular educational programs being used to teach students about the behavioral aspects of STDs, including AIDS, provide information about STD prevention and treatment and encourage educators to teach skills, such as resisting peer pressure, reducing risky behaviors, and negotiating safer sex (188,189,280). Neither program measures changes in students' actual behaviors, however, so it

[49] The State of Washington requires that HIV/AIDS education be added to the STD requirement (147).

[50] The videotape was entitled ''Sex, Drugs, and AIDS" (135). A recent study of 5S4 California college students demonstrated that videotapes differ in their ability to improve knowledge. Students who viewed the "Sex, Drugs, and AIDS" videotape and those who viewed "AIDS: What Everyone Needs to Know" evidenced significantly greater knowledge gains than did students who viewed ''AIDS: Acquired Immune Deficiency Syndrome' and "Beyond Fear: The Virus" (170).

[51] For a discussion of the prevention of adolescent pregnancy, see ch. 10, "Pregnancy and Parenting: Prevention and Services, " in this volume.

is not clear that students are using these skills (189,280).

In a 1984 evaluation of 14 promising sex education programs, many of which provided STD information, Kirby concluded that most of the programs had little impact on the number of times adolescents reported intercourse or on adolescents' use of birth control (1 11).52 Stout and Rivara, on the basis of a review of five studies that evaluated the effect of junior and senior high school-based sex education programs, confirmed Kirby's findings that sex education programs appear to have no effect on the levels of adolescents' sexual activity (191).

With Federal demonstration grant money provided by the DHHS Office of Population Affairs under the Public Health Service Act Title XX Adolescent Family Life (AFL) Program, the Arkansas Family Life Education Project has developed a 24-day abstinence curriculum for junior high and high school students; this curriculum is aimed at developing students' skills in decisionmaking, peer pressure reversal, and communication (281). In various components of the high school curriculum, for example, students discuss the advantages and disadvantages of avoiding getting an STD and why STDs receive no media attention. Classroom volunteers receive scripts of different life situations and must try to persuade a peer ''decisionmaker' to accept their perspective on life options. Preliminary data indicate that junior high students who participated in the program report decreased intentions of engaging in premarital intercourse (281). Data for the high school program curriculum was field tested during 1989-1990 in eight schools.

Education-based AIDS and STD prevention activities in schools can be expected to reach most adolescents, but a major limitation of efforts that occur in schools is that they overlook school dropouts. In "Guidelines for Effective School Health Education To Prevent the Spread of AIDS,' CDC noted that the needs of hard-to-reach adolescents, such as out-of-school adolescents, non-English-speaking adolescents, physically impaired adolescents, and learning disabled adolescents, should be addressed (11 8,232). A 1989 survey by the National Association of State Boards of Education found, however, that only Minnesota had addressed the need to target hard-to-reach adolescents in its State policy regarding HIV/AIDS education (147).

Another important limitation of AIDS and STD prevention programs in schools is that they may fail to target homosexual and bisexual adolescents—a group that is at particular risk of HIV infection. One promising program for homosexual and bisexual adolescents is the University of Minnesota Youth and AIDS project (169). This program uses school personnel, social groups, and peer referrals to reach homosexual and bisexual males ages 14 to 21 so that they can receive individualized counseling on risk reduction, peer education, or referrals for psychosocial and medical services, and regular followup visits.

According to a 1990 evaluation of public school HIV education programs, the U.S. General Accounting Office (GAO) concluded that "CDC-led nationwide education efforts are not yet commensurate with the [HIV] epidemic's potential for disaster' (262a). GAO noted that, while two-thirds of the Nation's public school districts reported providing some formalized HIV education for students in the 1988-89 school year, such education was not offered at every grade level, ''especially the upper grades, where the probability of sexual activity is highest' (262a). One of five HIV teachers surveyed by GA0[53] received no training; the training that teachers did receive was judged by GAO to be "often insufficient, that is, too brief and with limited coverage of important topics (262a). GAO found that CDC provided no guidance to districts on the appropriate length of teacher training in HIV topics, and that CDC-funded education departments did not collect from students essential planning and monitoring information needed to set program priorities and evaluate success (262a). Consistent with findings throughout this Report and elsewhere (e.g., 147a), the scarcity of monitoring information was held to be due to "a lack of staff and difficulty in obtaining community support to collect sensitive sexual and drug use data' (262a).

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[52] An important limitation of Kirby's study was that adolescents were not randomly assigned to sex education programs and control groups (111). In addition, results from the programs Kirby evaluated cannot be generalized to all sex education programs.

[53] The response rate for GAO's survey of 9,800 HIV teachers was 45 percent, with the highest response rate coming from nurses (262a). It is uncle whether non-nurse respondents received more training than nurse respondents; one would expect that nonrespondents would have received less training and been less involved in HIV education than respondents.

### Education-Based Prevention Efforts in Community Settings

Education-based AIDS and STD prevention efforts in community settings are more likely than efforts in families or schools to reach adolescents who are out of school or on the streets; furthermore, efforts in community settings can support and reinforce prevention messages introduced within the schools (203).

A large number of education-based AIDS and STD prevention efforts involving health care practitioners, peers, churches, national and local organizations, and the media have been undertaken by many local communities throughout the country. Specific activities include teen street theater, ''rap' and poster contests, distribution of print material, STD and AIDS hotlines, individual and group counseling, and media campaigns. The Latin American Youth Center in Washington, DC, distributed bumperstickers, had a poster contest, and enlisted adolescents to talk to other adolescents on radio programs (130). Several community-based AIDS education projects that target students and street youth have received Federal funds from the National Institute on Drug Abuse and CDC (240).

Very few of the large number of education-based AIDS and STD prevention activities in communities have been systematically evaluated to identify effective approaches and methods for preventing HIV infection and STDs among adolescents. Teen street theater (e.g., the Teen Teatro AIDS Prevention Project of the East Los Angeles Rape Crisis Center, El Teatro Juvenile De La Comunidad in McAllen, Texas), [54] "rap" contests, and comic books, for example, are often viewed as useful approaches for targeting racial and ethnic minority adolescents and runaway and homeless youth (22,34,126,128,130,173). Although these approaches may be especially effective because they involve adolescents as deliverers of the prevention message, no systematic evaluations have been completed. Measures of the success of these programs are limited to process measures (e.g., the number of adolescents who participate).

It is possible to use community settings to deliver intensive educational interventions. For example, Rotheram-Borus and her colleagues engaged 63 **runaways** and gay male adolescents in 4 New York City community agencies in a 10-session educational program that was based on cognitive-behavioral theory (e.g., the sessions were participatory and focused on specific behaviors) (175a). The intervention was more successful in increasing self-reported condom use during anal, oral, and vaginal intercourse than was the ''state-of-the-art' 2-session intervention used as a comparison (175a). The intervention was only effective in the short term (i.e., 3 months) in reducing levels of sexual activity (175a). A brief one-time AIDS-specific education session with females in adolescent medical clinics was effective in increasing knowledge, but generally not effective in changing attitudes or increasing condom acquisition, except among those females who had already been using condoms and who were exposed to a videotape on condom use as well as a lecture by a health professional (17 la). In this study condom acquisition was both encouraged and measured by providing participants with a coupon to exchange for a free condom at a local pharmacy; it did not measure actual condom use, but acquisition of a condom is a necessary precursor to use (171a).

*Photo credit: Los Angeles Free Clinic*

**Approaches to AIDS education such as teen theater may be particularly effective because they involve adolescents as deliverers of the prevention message. However, there have been no systematic evaluations of their effectiveness.**

[54] In teen street theater productions, adolescent actors typically present a play that illustrates a difficult social situation that is overcome by using appropriate peer refusal and communication skills. Usually, the play is followed by a question-and-answer period between the audience and the actors.

Because many adolescents learn about public health problems such as drugs and AIDS through the media (135,163) and because the media appear to have played an integral part in changing people's behaviors in antismoking efforts, the reduction of cardiovascular disease, and the control of syphilis (203), many organizations have suggested that an expanded use of the media might be an effective approach in preventing HIV infection and STDs among adolescents (142,162,203).

Since 1987, CDC's National AIDS Information and Education Program has been conducting a major multimedia AIDS prevention effort, ''America Responds to AIDS' (219). This multimedia effort targets the general population and various subgroups, including women at risk of AIDS and sexually active adults with multiple partners (219). One phase of CDC's AIDS prevention campaign, begun in May 1989, targets parents and adolescents who are racially and ethnically diverse and are of different age ranges (e.g., late-elementary and middle-school aged and junior- and senior-high-school aged) (183,21 8). This phase aims to promote communication between adults (including parents) and adolescents about HIV and AIDS, to encourage adolescents to adopt and maintain less risky sexual and drug use behaviors, and to make the public aware that certain adolescents are at risk for contracting HIV (183,218). English and Spanish television, print, and radio public service announcements were pretested on focus groups of parents and youth, ages 10 to 20 years. Additionally, CDC has developed an "AIDS Prevention Guide' to be distributed to adults having contact with adolescents (2 17,218). This guide provides facts about HIV and AIDS and ways for parents and other adults to talk comfortably with adolescents of all ages about HIV infection and AIDS (217).

For several reasons, including the difficulty of isolating the effects of any media campaign, the impact of CDC AIDS prevention campaign on adolescents and their parents is not clear. Evaluation components include measuring the increase in the number of phone calls to the National AIDS Hot Line and the National AIDS Clearinghouse and testing adults' and students' knowledge, attitudes, and behaviors (134,183). As of May 28, 1990, over 1.1 million copies of the "AIDS Prevention Guide" had been distributed, and over 1 million calls to the AIDS hot line had been made (269). Unfortunately, information specialists at the AIDS hot line and clearinghouse are not permitted to ask callers' ages nor to ask whether callers have children (134,183, 269).[55] Furthermore, because the National Health Interview Survey does not survey most adolescents directly, it is not clear how many adolescents heard or saw the public service announcements.

Not surprisingly, individuals who have analyzed the effectiveness of mass media campaigns suggest that changing people's drug- and sex-related knowledge and attitudes is easier than changing risky behaviors (71,268). In order to be effective, messages must be repetitive, consistent, understandable, and supported by the community (71,268). In spring 1989, CDC's National AIDS Information and Education program established the Applied Communication Research and Evaluation Branch to help evaluate future phases of the CDC's AIDS prevention campaign (134,183).

There are few mass media campaigns directly targeting adolescents for the prevention of STDs, as opposed to AIDS. Burroughs Wellcome Co., a pharmaceutical company based in North Carolina, in conjunction with several medical organizations,[56] began an innovative multimedia advertising campaign in July 1989 targeting sexually active adults (25,32). This campaign encourages sexually active adults ages 18 to 49 to check for the signs and symptoms of STDs (e.g., chlamydia, genital herpes, gonorrhea, genital warts, and syphilis) using a genital self-examination (25,32). Because the campaign was designed and tested to address the STD epidemic among the adult population, however, it is likely that a different program would be required to

[55] CDC considers the hot line and the Clearinghouse as services to the general public, not as sources of research (134). Recently, information specialists have been completing passive report forms after speaking to a caller. For example, hot line operators fill out forms based on information volunteered by the caller. In addition, operators may estimate various other types of information, for example, the caller's age (269). CDC is in the planning stages to get an Office of Management and Budget clearance to ask callers general questions related to particular campaigns, for example, have you seen the Public Service Announcements, and what part of the Public Service Announcements do you remember most? (269).

[56] The medical organizations are the American Academy of Dermatology, the American Academy of Family Physicians, the American College of General Practitioners in Osteopathic Medicine and Surgery, and the American Osteopathic Association (32).


*Photo credit: Centro del Control de las Enfermedades de los* **Estados** *Unidos*

**This poster is one of few efforts to focus on the prevention of STDs overall, in addition to the prevention of HIV transmission.**

meet adolescents' needs (25).[57] Local media campaigns, such as Terrific, Inc. 's Teen AIDS Prevention and Risk Reduction Program in the District of Columbia, involve adolescents in community radio broadcasts as a method to encourage other adolescents to change risky sexual and drug-using behaviors (22,195). These campaigns have not yet been evaluated .58

One limitation in using television media for AIDS and STD prevention is that while certain adolescents identify television as their first and major source of AIDS information (135,163,274), others, such as runaway adolescents, homeless adolescents, dropouts, and hemophilia patients, either do not have access to television or view information presented on television as "biased and superficial" (155). For these groups of adolescents, other approaches are necessary.

### *AIDS and STD Prevention Efforts Other Than Those That Are Education-Based*

Education-based AIDS and STD prevention efforts alone are a fairly passive approach to prevention. Such efforts rely totally on the recipient of the prevention message to initiate the suggested behavior change (e.g., abstinence, safer sex). Some education-based efforts are more informative than others, of course, but many are somewhat vague about effective courses of action. Vagueness sometimes arises because of limitations in time and space (e.g., on a poster), but sometimes prevention messages may be less than explicit in order to avoid offending some perhaps unintended recipients of a message (e.g., about specific safer sex practices). This section describes several prevention interventions that are designed to provide selected means for preventing AIDS or other STDs. These means include condom distribution, needle exchanges, and early diagnosis and treatment.

The prevention efforts described in this section can also be distinguished from the adolescent-specific education-based AIDS and STD prevention efforts described above in that they are directed at those individuals who are already engaged in activities that may put them at risk of HIV infection or STDs. Thus, they can be considered secondary prevention efforts.[59]

It is important to note that while prevention efforts such as those described below are designed to

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[57] An interesting feature of the Burroughs Wellcome **Campaign is the buying of commercial air time to show a 30-second genital self-examination commercial during afternoon programming in the 2 to 4 p.m. time slot and certain evening programs airing after 9:00 p.m. (25). In the past, OTA suggested that paying networks for air time may be an effective method for reaching a targeted audience for HIV prevention (203), However, because the primary method of evaluating the campaign focuses on the total distribution of genital self-examination instruction booklets (25), it will be difficult to determine if paid advertising is more effective in reaching an intended audience for HIV or STD prevention than public service announcements which rely on networks' volunteering air time.**

**58** Grandma's House, a division of **Terrific,** Inc., is working with a consulting firm **to develop future evaluation instruments for its HIV prevention efforts (196).**

[59] *Secondary prevention* interventions are those that strive to **shorten the course of an illness or condition by early identification and rapid intervention, Targets for secondary prevention interventions typically include populations at high risk of a particular problem.**

provide the means to help individuals at risk avoid contracting a disease or condition, targeted individuals still have to find out about the preventive measure and be motivated to use it. Thus, educational efforts designed to improve knowledge and change attitudes and behavior are a necessary component of a full prevention effort.[60]

For adolescents who are not abstaining from sexual intercourse or experimentation with drugs, the goal of AIDS and STD prevention efforts maybe the elimination of risky sexual and drug-using behaviors.[61]

### Condom Distribution Programs

Although the most effective method for preventing the transmission of HIV and STDs is to abstain from sexual intercourse, many U.S. adolescents do not abstain from sexual intercourse. For adolescents who cannot be persuaded to refrain from sexual intercourse, the use of latex condoms lubricated with nonoxynol-9 is the most effective method to lower the risk of HIV and STD infection (46,74,107, 148,172,180,222,234).[62]

In general, U.S. adolescents' knowledge about the effectiveness of condoms in preventing the transmission of HIV is substantial (7,83,95,155). Many adolescents' knowledge regarding the effectiveness of condoms in preventing STD infection, however, is minimal (see table 9-7).

Despite their high level of knowledge about the efficacy of condoms in preventing the spread of HIV, adolescents continue to be inconsistent condom users (94,95,109,155). The reasons include both perceived and real barriers to the use of condoms (38,43,94,95,17 1,265). Condom instructions written at high reading levels, for example, pose particular problems for adolescents who cannot read at those levels. Adolescents who do not regularly carry condoms or who believe that condoms reduce pleasure or are embarrassing to buy or use are highly likely to avoid using them (94,1 15). Another possible barrier to use maybe adolescents' belief that their friends are not as supportive of condom use as they are themselves (7). Among 10th grade students surveyed in the National Adolescent Student Health Survey, for example, 94 percent agreed that sexually active people should use condoms. Somewhat fewer—8 1 percent—thought that their peers would agree. A study conducted by adolescents with the assistance of the Center for Population Options in 1988 found that it was difficult for adolescents, particularly females, to buy condoms at drug stores located in the Washington, DC area because of physical barriers (i.e., condoms are in places not readily located in stores, such as behind pharmacy counters) and unhelpful and judgmental store clerks (37). Because of these barriers and the inconsistent use of condoms by adolescents who are engaging in sexual intercourse, the actual effectiveness of condoms in preventing transmission of HIV and STDs may be lower than what is theoretically possible (273).[63]

CDC recommends that condoms and spermicides be available in any facility providing STD services, but the CDC guidelines do not specifically address the availability of condoms to adolescents (234). Currently, free condoms are being distributed to adolescents through various methods and at diverse locations, including clinics, sports areas, emergency rooms, bathrooms, bars, and service centers. In some places, condoms are placed in easily accessible locations so adolescents need not even ask for them (e.g., at Three-for-Free program sites in Maryland, Children of the Night in Hollywood, California, and at Condom Sense in Atlanta) (12,87,1 13,264). Two

[60]Another broad strategy for prevention is called *health protection*. *Health protection* strategies are interventions related to environmental or regulatory measures that confer protection on large population groups. They do not require educational efforts to increase knowledge or change attitudes or behaviors. For example, limiting the overall spread of a disease through public health efforts can be considered a health protection strategy for the prevention of HIV infection and STDs among adolescents, This Report does not consider the effectiveness or potential effectiveness of strategies such as these on the adolescent population.

[61]Drug treatment programs for adolescents are discussed in ch. 12, "Alcohol, Tobacco and Drug Abuse: Prevention and Services." The effectiveness of pregnancy- and drug-prevention efforts taking place in school-linked health centers (e.g. Lanier Clinic in Jackson, Mississippi), the community (e.g., The Door in New York City and Bridge Over Troubled Waters in Boston) and family planning clinics are discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume and in ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III.

[62]Data relating condom use to particular sexual practices such as anal and oral sex are very limited. Data from a small sample of sexually active, inner *city* black and Hispanic adolescent females attending an adolescent health center suggest that at least some adolescent females are less likely to use condoms during anal intercourse than during vaginal intercourse (102).

[63]For a discussion of adolescents' use of various birth control methods, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.


Photo credit: Off&of Technology Assessment

**There are a number of reasons why adolescents maybe inconsistent or inefficient users of condoms, including lack of knowledge about how to use condoms, rest, and physical and social-psychological barriers to purchasing or otherwise obtaining condoms. In 1988, only about half of adolescent females ages 15 to 1.9 and their partners used condoms at first intercourse, and only one in five reported "current" use of condoms during sexual intercourse.**

other efforts include a condom giveaway in the rock magazine *Spin* and free mail-order condoms to a small study sample of adolescent males ages 16 to 17 (80,1 13). Both of these programs were time-limited. The number of high schools distributing condoms through health services centers appears to be increasing, with distribution in selected school-linked health centers in high schools reported in Cambridge (Massachusetts), Los Angeles, and Miami (Florida) (123a). Following an impassioned debate in the city and among board of education members, New York City's public high schools are to begin distributing condoms on request to students (13a,69a). Some high schools in Canada have installed condom machines on school premises (46a).[64] In general, however, the distribution of free condoms to adolescents, even to those who are sexually active, appears to be the exception rather than the rule.[65]

Parents may be a more effective and appropriate source of condom information and distribution than schools, but it is not known how many parents provide condoms or discuss the need for them with their sexually active adolescent children.

To OTA's knowledge, few studies have evaluated the success of condom distribution programs. Very little is known regarding the impact of condom distribution programs on adolescents' attitudes or behavior. No evaluations of condom distribution programs to date have used reductions in the incidence of HIV infection and STDs as outcome measures (see table *9-10).* Many factors (e.g., media, families, friends) may influence condom use, so evaluating the effect of condom distribution programs is particularly difficult.

A fear that facilitating access to condoms may encourage adolescents to have sex may make some people reluctant to support condom distribution. One recent study of 16- to 17-year-old males found that a pamphlet discussing STDs and pregnancy and the offer of free condoms did not increase adolescents' levels of reported sexual activity (1 13). That study also found that the offer of free condoms had no apparent impact in terms of changing the adolescents' attitudes related to sexual behavior or the use of condoms. It is important to note, however, that the offer of free condoms was made through the mail and through telephone followup. This seems a

[64] Apart from the controversy surrounding introducing condoms into the schools (13a,46a), anecdotal information from the Canadian experience suggests that making condoms available is not as simple an answer tSTD and pregnancy prevention as it may seem afirst. School officials in Canada debated about the tradeoffs in quality and cost of the condoms to be made available in the schools, and at least one student informed school officials that she had become pregnant, ostensibly because of a tom condom, raising concerns about liability in the minds of the officials, As discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume, adolescents typically experience contraceptive failure rates (in terms of unintended pregnancy) higher than the theoretical failure rates expected among women who rely on contraception consistently and correctly during each act of intercourse: for U.S. females under age 20 who participated in the 1982 National Survey of FamiGrowth, the percentage who experienced an unintended pregnancy in the first year of using condoms was 13.3 percent for whites and 22.3 percent for nonwhites; this compares to a theoretical failure rate for condoms among women who use them perfectly of only percent (see table 10-7 in ch. 10 in this volume). The failure rate of condoms in terms of preventing STDs has not been calculated for adolescents. 'l'he evidence on unintended pregnancies and the Canadian experience with condom distribution suggests that education about condom use is essential to making condoms an effective contraceptive or STD-protection device. In New York, condoms are to be distributed in a' 'health resource center' containing information on HIV and AIDSTDs, and other health issues (69a). The health resource site is to be staffed at least 10 periods each week at a variety of times during the school day (69a).

[65] Systematic data are unavailable. For example, in its surveys of school-based clinics, the Center for Population Options collects information about the number of schools that dispense birth control methods, but the survey does not ask specifically about dispensing condoms (see ch. 15, "Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents," in Vol. III).

**Table 9-10-Studies Evaluating Selected Condom Distribution Programs for the Prevention of HIV Infection and Other STDs Among Adolescents**

| study" | Study population | Intervention(s) and Outcome measure(s) | Research design and year data collected | Results |
|---|---|---|---|---|
| Arnold, 1973 | NA | *Interventions:* Condoms were distributed in pool halls, barber shops, **a** restaurant, and a grocery store through a summer youth program. More condoms were distributed during the week than on the weekends. Participants went to sites near their homes.<br>Outcome measures: Female fertility rates and number of distributed condoms | *Research design:* Descriptive. Male outreach workers in North Carolina organized condom sites. Fertility rates of target area and nontarget areas were compared. Condom use over the study year was tracked.<br>Year *data collected:* Late 1960s | Fertility rate of black adolescent females ages 10 to 19 declined 190/. compared with no decrease in nontargeted areas. Site of condom distribution did not appear to make a difference. |
| Kirby, Harvey, Claussenius, et al., 1989[b] | Low-income 16- to 17-year-old males | *Intervention:* A cover letter, pamphlet discussing STDs and pregnancy and methods of birth control, and an order coupon for free condoms were mailed to adolescent males throughout the country. Targeted males could order free condoms.<br>*Outcome measures:* **Performance on knowledge, attitude, and behavior telephone survey** | *Research design:* Experimental design. Males were randomly assigned to an intervention (N = 984) or control (N = 1,033) group. 1,000 males from both groups were randomly selected to be contacted by telephone 5 weeks after the intervention; those who had ordered condoms were telephoned again 7 months later. Adolescents from Mountain and Pacific States were underrepresented. Completion rate for the interviews **was** *53* percent. | Of those receiving the material, 9 out of 10 said they read the pamphlet, and half discussed the pamphlet with their parents. Knowledge score increases were small but significantly higher for the intervention group (83% compared with 80%). Pamphlet and offer of free condoms appeared to have no impact on changing attitudes related to sexual behavior. The offer of free condoms did not appear to increase levels of sexual intercourse or increase the possibility of using condoms. |
| **Kirby,** Was* and Zegler, 1989 | Students attending school-based clinics at 1 of 6 sites around the country | *Intervention:* School-based clinic available in the school<br>*Outcome measures:* Use of condoms | *Research design:* Quasi-experimental involving comparison groups for **4** schools and pre-post surveys (before and 2 years after clinic opening) for the remaining 2 clinics. Pre- **and post-use of condoms specifically compared in only one site.**<br>**Year** *data collected:* *1989* | Condom use increased from **26% to 48%.**<br>**Remark:** **Numerous factors** could have accounted for the increase in condom use: location in a city at high risk for HIV-infection, intensive AIDS education programs in the school, use of sports and health physicals to talk about condom use, distribution coupons for free condoms. |

*Continued on next page*

**Table 9-10-Studies Evaluating Selected Condom Distribution Programs for the Prevention of HIV Infection and Other STDs Among Adolescents-Continued**

| Study[a] | Study population | Intervention(s) and Outcome measure(s) | Research design and year data collected | Results |
|---|---|---|---|---|
| Kjoller, Hansen, and Segest, 1989 | 28 9th grade classes in Copenhagen, Denmark | *Intervention:* None; students questioned about desirability of condom distribution, and about current condom use<br>**Outcome** *measures:* Performance on a structured attitude and behavior questionnaire | *Research design:* Classes were selected by means of a lottery.<br>***Year data collected:*** November-December 1987 | 34% of the students had had sexual intercourse. 90% wanted to receive free condoms, and half preferred getting condoms from the pharmacy, school, or their own doctor. 40% of the students had not used a condom during their last sexual intercourse experience. |
| University of Maryland, no date | Sexually active general population | *Intervention:* Over 170 sponsors distributed condoms along with directions for proper use in quantities of 3 to 15 in 371 sites.<br>*Outcome measure* Number of condoms distributed | *Research design:* The Three-for-Free program of the Division of Family Planning, Maryland State Department of Health and Mental Hygiene is sponsored by county health departments, college and university health centers, community clinics, the Boys and Girls Club, and the Baltimore City Health Department. Program participants pick up condoms in an anonymous fashion without being questioned. Counseling or discussion with a health educator was not required.<br>Year *data collected:* 1986-88 | In 1988, approximately 1,870,000 condoms were distributed around the State compared with close to 386,000 in 1987 and 33,230 in 1986. |

KEY: NA = not available.
[a] Full citations are listed at the end of this chapter.
[b] The clinics are located in Gary, Indiana; Muskegon, Michigan; Jackson, Mississippi; Dallas, Texas; Quincy, Florida; and San Francisco, California.
SOURCE: Office of Technology Assessment, 1991.

rather indirect way to distribute condoms, although the study and program designers did have the advantage of being able to followup participants.

The results of a Danish study suggest that some adolescents may need more than easy access to condoms for them to use condoms (1 16). Kjoller and her colleagues found that while students thought that the availability of free condoms would increase use, many wanted condoms available where they could get advice and individual guidance (116). Given that the mere availability of condoms may not increase use, innovative educational programs may be needed to address adolescents' ultimate decision to use condoms.

Programs seeking to increase condom use among adolescents must address the barriers that adolescents perceive as sufficient to affect their decision to use condoms. Networks will agree to air radio public service announcements about the effectiveness of condoms in preventing AIDS (143), but they have been reluctant to allow commercial advertising of condoms, particularly advertising targeted to adolescents (1 13). In countries other than the United States, social marketing techniques have been used to advertise condoms for STD prevention.[66]

### Needle Exchange and Bleach Distribution Programs for Adolescents Using IV Drugs[67]

Virtually nothing is known about whether adolescents who use IV drugs have changed their behavior in response to AIDS. Several studies show that many adult drug users modified aspects of their drug behavior to avoid getting AIDS even prior to the implementation of official AIDS prevention programs (60,203). In fact, *adult* IV drug users appear to be changing their drug use behaviors more frequently than they are changing risky sexual behaviors (58,203).[68] These data from adults, however, cannot be generalized to adolescent IV drug users.

Currently, there are two major types of programs for the prevention of HIV infection among IV drug users: needle exchange programs and bleach distribution programs. Forty-four States and the District of Columbia prohibit the use, sale, or distribution of hypodermic devices, and 21 States regard the finishing of such devices to adolescents under age 18 as a felony (277). Despite strict laws, three cities (New York City; Boulder, Colorado; and Tacoma, Washington) have established needle exchange programs (277).[69] Needle exchange and bleach distribution programs appear to complement each other (60,143). However, the available evidence suggests that these adult programs are being used by older, more experienced drug users and not by younger, less experienced drug users (60,158,266).

It is not only IV drug use that presents an AIDS risk for adolescents. Use of other drugs may lower adolescents' (and adults') inhibitions about engaging in sex. Because drug use has been associated with sexual activity (141), it is particularly important for adolescents that efforts for the prevention of AIDS and STDs address both risky sexual and drug-using behavior,

### Early Diagnosis of Adolescents With HIV Infection and STDs

**An** important component of controlling the spread of HIV and STDs among the adolescent population is effective diagnosis and treatment of those adolescents infected with HIV or with STD agents who are either symptomatic or asymptomatic (234). One of the major obstacles for adolescents seeking immediate treatment is that many adolescents do not know and do not understand that people infected with HIV or STD agents may be asymptomatic for a period of time (18,67,88,149,176,234).

Some STDs (e.g., herpes) and HIV infection are not curable (234). Nevertheless, early treatment for all STD and HIV infections is necessary for several

[66]Kotler and Zaltman define *social marketing* as "the design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communications, distribution and marketing research" (119). Black and Farley note that social marketing is different from health education because specific products, such as condoms, rather than abstract ideas (e.g., disease prevention) are promoted (19).

[67]For a discussion on the number of adolescents who are currently using IV drugs, see ch.12, "Alcohol, Tobacco, and Drug Abuse: Prevention and Services," in this volume.

[68]It is not clear why few IV drug users practice safe sex practices (59,143). Among other reasons immediately related to drug effects, some have suggested that IV drug users have difficulty in discussing sexual relationships because they fear the breakup of the relationship (58,59,203).

[69]Under New York's public health laws, the State Health Commissioner can authorize groups or individuals to possess needles if he deems such possession necessary for the public health (166,277). New York City's needle exchange program was limited to one distribution site, and was discontinued after a short time.

reasons. First, many STDs (e.g., chlamydia) can be cured with appropriate treatment (176), but if left untreated, can result in infertility, ectopic pregnancy, PID, urethritis, gonococcal arthritis, chronic pelvic pain, mental retardation, and even death[70] (18,177,272,234). Second, early treatment of HIV infection with zidovudine[71] has been shown to prolong the lives of patients who are seropositive for HIV and have not yet developed symptoms (193). (In fact, one important argument in support of testing people for HIV infection is that more HIV-infected people may be able to participate in clinical trials of experimental treatments (67).) Finally, given the high rate of sexual activity among the adolescent population, early treatment can prevent the spread of STDs to sexual partners.

Almost all States have enacted legislation specifically authorizing minors to consent (without parental approval) to health services related to STDs or ''venereal diseases. ' '[72] Forty-two States have statutes allowing minors of any age to consent to STD services.[73]74 Despite the availability of STD treatment services, adolescents are slow to seek treatment for several reasons. First, they may not be aware of STDs or their symptoms and may not believe that they could be infected (7,186,160). Data from the National Adolescent Student Health Survey indicate that from 40 to 60 percent of 8th and 10th grade adolescents did not recognize various signs and symptoms of STDs (see table 9-7).[75] Further, many adolescents indicate they would avoid health services if parental involvement were required for care (88). A large proportion of 8th and 10th grade adolescents in the 1987 National Adolescent Student Health Survey (76 percent) incorrectly believed that the public health department would inform their parents of their infection with an STD, and most (79 percent) thought that parental permission would be required for minors to be treated in clinics[76] (see table 9-7). This level of misinformation was higher among younger adolescents (7).

Shame and embarrassment may be factors in avoiding care. Students in the National Adolescent Student Health Survey were more concerned about their friends finding out they had an STD than about their parents finding out (74 and 49 percent, respectively) (7). Other reasons why adolescents are slow to seek treatment for an STD include lack of transportation, difficulty in paying for treatment, and not knowing where to go for medical care (7).

Many adolescents may not be aware that treatment for STDs is free in certain locations, such as in some public health clinics. Some public health programs use a sliding fee scale, so that adolescents' charges will be based on their personal income, not on their families' income (10). Although data on the availability of services for STDs are scarce, available information suggests that, in some communities, adolescents' concerns about the unavailability of free treatment services may be well founded. A 1990 survey by the National Association of County Health Officials (NACHO) found that 27 percent of local public health departments do not actively provide STD services (146a) .77 Generally, local health departments serving smaller populations, and having fewer full-time employees, were less likely than larger local health departments to provide STD services (146a). The availability of STD services varied by region, as well. Only 20 percent of local health departments in DHHS Public Health Service

[70]Generally, PID and syphilis account fo the most deaths due to STDs (84). However, the latest national data available indicate that no adolescents between the ages 10 and 19 have died of syphilis (243). No numbers are provided for PID.

[71]This drug was formerly called azidothymidine (AZT) *(289).* It is also called Retrovir®.

[72]For a discussion Of minors' rights, see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking,'' in this volume.

[73]A few States, which have no statute authorizing a minor to consent to health services for STDs, have a statute authorizing minors to consent to diagnosis and treatment for "infectious, contagious, communicable, and reportable" diseases or some variant thereof (see ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking," in vol. m).

[74]For further discussion of Cement in adolescent health care decisions, see ch. 17, ''Consent and Confidentiality in Adolescent Health Care Decisionmaking," in vol. III.

[75]Proportions include those who responded incorrectly as well as those who answered "Don't know.''

[76]The type of clinic (e.g., STD or public health) is not defined in the National Adolescent Student Health Survey (7).

[77]A relatively broad definition of a local public health department was used by NACHO: "an administrative or service unit of local or State government, concerned with health, and carrying some responsibility for the health of ajurisdiction smaller than the State.' J.meal health departments were identified using three sources, including the U.S. Conference of Local Health Officers and NACHO mailing lists, and contacts with each State health agency. In total, 2,932 such departments were identified and surveyed. The overall response rate of 77 percent (2,258 departments) was quite respectable for such a survey, but 11 States had response rates between 50 and 80 percent of surveyed departments, and 5 States had response rates of under 50 percent of surveyed departments (146a).

Region 1 (Connecticut, Maine, Massachusetts, New Hampshire[78]) reported providing STD services, compared to almost 100 percent providing STD services in Regions 3 (District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia[79]), Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee), and Region 9 (Arizona, California, Nevada[80]) (146a). The findings of the NACHO survey should be viewed with some caution, however. I.meal health departments were only queried as to whether they were ''active' in providing STD services to individuals; the level and type of such activity was not requested (146a) .81

Photo credit: Education Week

**In a recent set of guidelines for prevention and management of pelvic inflammatory disease, the Centers for Disease Control (CDC) recommended that "any health care program that serves adolescents should either provide STD evaluation and treatment or should be able to refer teenagers rapidly to a facility that offers such care." CDC further suggested that clinics located in schools can provide "effective, convenient STD clinical services for sexually active adolescents."**

## Services and Interventions for the Treatment of AIDS and Other STDs

CDC has developed guidelines for treating and screening people infected with STDs and recommends that appropriate care for treating STDs include obtaining a medical and behavioral risk assessment (including questions regarding same gender sexual contact), doing a physical examination, laboratory diagnostic services, counseling and education (appropriate to age, race, sex, socioeconomic status, and interpersonal skills), and identify--ing sex partners (65,234,242a,263). CDC also recommends that people seeking health care unrelated to STD infection be assessed for STD risk. If an individual reveals that he or she has STD symptoms, that individual should undergo a physical exam and appropriate laboratory tests (234). Recommended treatment regimens vary depending on the STD, and some regimens dictate that clients take medication several times a day for up to a week (234). Although the CDC guidelines note that those people who are under age 25 are at greatest risk of infection, they do not provide specific guidelines (e.g., appropriate dosages, length of time) for treating STD-infected adolescents.

CDC did include specific mention of adolescents in its April 1991 guidelines for prevention and management of PID (242a). In CDC publication, adolescent-specific guidelines spoke to the organization of STD services for adolescents, rather than to the clinical management of PID. These new CDC recommendations note that adolescents are "highly vulnerable' to acquiring STDs. Thus, CDC recommends that ''any health-care program that serves adolescents should either provide STD evaluation and treatment or should be able to refer teenagers rapidly to a facility that offers such care" (242a). Further, it suggests that ''school-based clinics can provide effective, convenient STD clinical services for sexually active adolescents" and recommends that regular, consistent use of condoms by all sexually active adolescents be encouraged by health care providers and presumably by others (242a).

The development of STD treatment guidelines specifically for adolescents is important for several reasons. Because adolescents and adults metabolize drugs differently, adolescents may require different dosages (90,184). Adolescents who receive adult

[78]Rhode Island and Vermont are also part of Region 1, but they had no local health departments as defined in the NACHO report.

[79]Delaware is also part of Region 3, but Delaware had no local health departments as defiied in the NACHO report.

[80]Hawaii, the U.S. Trust Territories, American Same% Guam, and the North Mariana Islands are also part of Region 9, but Hawaii had no local health departments as defined in the NACHOreport, and the scope of the report was limited to the continental United StatesAlaska, and Hawaii.

81 Fifty-seven percent of local public health departments responding to the NACHO survey reported that they provided counseling and testing for AIDS (146a). Although more local public health departments reported providing STD services than AIDS testing and counseling, the same pattern with respect to size of the population served and number of full-time employees that was found fSTD services was found for AIDS testing and counseling (146a).

dosages of drugs to treat STDs maybe undertreated in some cases and overtreated in others. The end result of underdosage may be the evolution of resistant strains of STD organisms (278). Although adolescent compliance rates with STD treatment regimens have not been studied extensively (16), it has been suggested that health care providers consider the record of poor compliance and low return visits with other therapies in choosing an STD therapy (10,152). A study from Baltimore determined that only 54 percent of female adolescents and 33 percent of male adolescents kept their followup appointments for STD care (40). This finding may reflect medical practitioners' failure to provide clear, explicit instructions to patients to return for a visit in more than half of observed encounters (122).

Attitudinal studies of adolescents have suggested, that clinician friendliness, understanding, and willingness to take their time are important to adolescents' appointment-keeping behavior and compliance with an STD treatment regimen. In one study, patients who expressed satisfaction were much more likely to keep future medical appointments than were patients who were dissatisfied (124). In another study, clinicians who were skilled in interacting with adolescents promoted better patient compliance (10). On the basis of their clinical experience, Bell and Hein suggest that single dose regimens work best for adolescents because they ensure compliance as well as confidentiality (16). For some STDs, chlamydia for example, only multiple dosage regimens are possible (117).

As of 1989, zidovudine was the only drug approved for the treatment of AIDS and HIV infection (21,50), although dideoxyinosine (DDI) has been approved under special circumstances for use in adolescents (78). Little is known about how zidovudine works in adolescents compared to adults or children (90,209). Still, many clinicians prescribe zidovudine to adolescents with AIDS or HIV infection (90).[82] There are currently no specific guidelines available on treating adolescents with HIV infection or AIDS (e.g., guidelines on appropriate drug dosages, how often drugs should be administered, toxicity levels, appropriate laboratory and neuropsychological assessments) (90,184).

Clinical trials of new drugs are sponsored by the Federal Government, drug companies, or private research organizations to test potentially effective drugs in volunteers, who include people with HIV infection but no symptoms, AIDS-related complex, or people with AIDS. Traditionally, the Food and Drug Administration has required that drugs be tested in three sequential phases before others outside the trials can receive the treatment (see table 9-1 1) (260). AIDS clinical trials were originally established for adults over age 18 and then for children and early adolescents ages birth through 13 years (91a). Adolescents between the ages of 13 and 17 have only recently been made eligible for enrollment in clinical trials for all kinds of drugs, including zidovudine (90,184,254). Often, adolescents are included in clinical trials for adults over age 18 (258). As of August 16, 1989, adolescents in various age groups could participate in 115 Federal clinical trials (259).[83] In almost half of these trials, however, only 18-year-olds were eligible to participate (259). Adolescents are also eligible to participate in over 35 nonfederally-funded trials (8).

Eligibility for trials, however, does not ensure access. Because adolescents tend not to use the traditional health care system and because consent and confidentiality issues are central,[84] adolescents are not actively sought to be included in trials (90,184). As of October 5,1989, only 47 adolescents ages 12 to 21 having various stages of infection were involved in federally sponsored AIDS clinical trials (see table 9-12).[85] Of the 47 participants, 44 (94 percent) were male, and 3 (6.4 percent) were female. Forty-three (92 percent) were white (254).

Many legal issues surface regarding adolescents and their involvement in clinical trials. Currently, adolescents under age 18 must get permission from a parent, legal guardian, or person with power of attorney before entering federally sponsored trials (259). While emancipated minors can give consent for participation in trials (75), the issue of consent is

[82]Until the Food and Drug Administration approved zidovudine for use in children and adolescents, clinicians faced liability concerns (75), Such concerns may recur if another drug is found to be effective in treating HIV infection and AIDS.

[83]These trials are not adolescent specific but group adolescents and adults or adolescents and children together.

[84]For further discussion of these topics, see ch. 15, ''Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents" and ch. 17, "Consent and Confidentiality in Adolescent Health Care Decisionmaking, " in Vol. III.

[85]Anecdotal evidence indicates that most parents of infected adolescents found out about trials through their physicians (75).

**Table 9-1 l—Steps in AIDS Drug Testing**

| Type of trial | Range in number of patients | Length | Purpose | Method |
|---|---|---|---|---|
| Phase 1 . . . . | 20 to 100 | Several months | To see if drug Is safe | All patients get the drug being tested. |
| Phase 2 . . . . | Up to several hundred | Several months to 2 years | To test effectiveness and short-term safety | In phases 2 and 3, doctors compare results for two randomized groups; the first gets the drug |
| Phase 3 . . . . | Several hundred to several thousand | 1 to 4 years | To test safety, effectiveness, dosage level | being tested; the second gets another drug, or no drug (placebo).[a] |

[a]Currently, very few clinical trials of experimental AIDS drugs use Placebos.

SOURCES: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases, "AIDS Clinical Trial: Talking It Over," NIH Pub. No. 89-3021, Bethesda, MD, August 1989; U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Allergy and Infectious Diseases, "Where Do AIDS Drugs Come From?" Bethesda, MD, no date.

**Table 9-12—Sex, Race, and Ethnicity of the 47 Patients Ages 12 to 21 Involved in Federally Sponsored AIDS Clinical Trials, October 5, 1989**

| Patients | Percent | Count |
|---|---|---|
| *Sex*[a] | | |
| **Male** | **93.6%** | **44** |
| **Female** | **6.4** | **3** |
| **Race** | | |
| White | 91.5 | 43 |
| Black | 6.5 | 3 |
| Other | 2.1 | 1 |
| **Ethnicity** | | |
| **Hispanic** | **17.0** | **8** |
| **Non-Hispanic** | **83.0** | **39** |

[a]The large proportion of males is due primarily to the large proportion of adolescent males with hemophilia involved in clinical trials.

SOURCES: **U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, Bethesda, MD,** unpublished **data on patients involved in federally sponsored** AIDS clinical trials, Bethesda, MD, October 1989; and DSondheimer, Coordinator, Adolescent and Maternal **AIDS Branch, Center for Research for Mothers and Children, National Institute of Child Health and Human Development, National Institutes of Health, Public Health Service, U.S. Department of Health and Human Services,** Rockville, **MD, personal communication, Dec. 28, 1989.**

not clear regarding young people involved in the foster care, child welfare, and prison systems. Although no systematic data have been collected, these adolescents rarely seem to participate in clinical trials (75).

As discussed throughout this Report, there are not many health centers that are geared to the needs of adolescent patients in general.[86] According to Hein, there is in addition a serious shortage of health personnel knowledgeable about adolescents' HIV infection and a scarcity of programs serving high-risk and HIV-infected adolescents (91a). Two programs, funded as part of the Pediatric AIDS Health Care Demonstration Project of the Health Resources and Services Administration in DHHS, are developing new standards for comprehensive medical and social services for HIV-infected adolescents (91a). In the Montefiore Adolescent AIDS program in New York City, a multidisciplinary team provides a comprehensive range of medical and psychosocial evaluation and services for individuals age 13 to 21 (91a). The program reaches out to bring at-risk and infected individuals in for services; in turn, the program refers patients out of the program to agencies that can provide nonmedical services such as housing or coordinate care for adolescents who are being cared for by multiple agencies (91a). The program is also developing and evaluating new strategies for behavior change in at-risk and infected adolescents (91a). A similar pediatric AIDS health care demonstration project is funded by DHHS to serve high-risk and infected adolescents in Los Angeles (91a). As Hein notes, although these programs are located in high-risk areas for adolescent HIV infection, together they touch only some of the at-risk and HIV-infected adolescents in the United States (91a).

The number of adolescents diagnosed with AIDS at present is small, but the apparent inadequacy of prevention efforts may mean an increase in the number who become HIV infected. This makes the existence of barriers to treatment such as the lack of

[86]See especially, ch. IS> **"Major Issues in the Delivery of Primary and Comprehensive Health Services to Adolescents, " in Vol. III.**

clinical trials specific to adolescent dosages, and the limited access to AIDS clinical trials by adolescents generally (especially by black and female adolescents), exceedingly important to address. Unfortunately, no mechanism has been set up so that adolescent health care practitioners can participate in the AIDS Clinical Trials Group, which is the consortium of federally sponsored centers carrying out trials (90,157).

## Major Federal Programs Related to HIV Infection, AIDS, and Other STDs

All levels of government-Federal, State, and local-have taken on some responsibility for controlling the spread of HIV infection, AIDS, and STDs within the adolescent population. Within the Federal Government, the primary responsibility rests with DHHS, particularly the Public Health Service. Federal support for AIDS- and STD-related activities is provided through block grants to the States and through funding for research and demonstration projects.

Federal support to States for AIDS- and STD-related activities is provided through block grants under Title V of the Social Security Act (maternal and child health services block grants) and Title XX of the Social Security Act (social services block grants). States are given wide discretion in determining what services to support with block grant money and in determiningg which groups should be eligible for services. States use portions of their block grant money to support AIDS- and STD-related services for all age groups, including adolescents, although the exact amounts are difficult to determine. Reporting requirements from the States to DHHS are minimal.[87]

DHHS funds demonstration and research projects related to AIDS and STDs. DHHS' HIV/AIDS and STD-related projects that included or targeted adolescents 1989-90 are listed in table 9-13. Most of the projects include adolescents as part of a larger population, but some target adolescents specifically.

According to information collected in OTA's survey of Federal agencies involved in adolescent health,[88] the Public Health Service and other agencies within DHHS typically spend no more than 10 percent of their budgets on adolescent-specific activities. Most of the funds for adolescent-specific activities are spent on programs and projects related to the consequences of adolescent sexual intercourse. As table 9-13 illustrates, DHHS agencies generally give greater emphasis to projects related to HIV infection and AIDS than to projects related to traditional STDs. This emphasis is not surprising given the fact that DHHS has identified AIDS as the Nation's highest health priority (214). According to OTA's survey, DHHS agencies spent over $150 million in fiscal year 1990 supporting AIDS- and STD-related efforts—including research, prevention, service, and treatment activities--that target adolescents (207,208,214,227,25 1,257,258).

AIDS and STD prevention, treatment, and research activities that include or target adolescents and are being supported by DHHS are discussed further below.

### *Federal Programs Related to AIDS and STD Prevention*

DHHS supports numerous preventive intervention and research efforts to control the spread of HIV infection and STDs among a larger, more general population receiving Federal funds. This approach may increase the types of AIDS and STD preventive interventions available to adolescents but limit the appropriateness and usefulness of these interventions for adolescents. The National Institute on Drug Abuse within the Alcohol, Drug Abuse, and Mental Health Administration, for example, has supported many studies of preventive interventions for HIV infection relative to drug use and sexual behaviors; however, few studies of preventive interventions have focused on drug use and sexual behaviors among adolescents, and data from mostly adult participants cannot be generalized to adolescents (215). The Division of Sexually Transmitted Diseases and HIV Prevention within CDC's Center for Prevention Services supports partner notification efforts and screening for STDs at various locations (e.g., family planning clinics, outpatient obstetrics-gynecology clinics) as major approaches for identifying people who are potentially infected with STDs (117). If issues in partner notification efforts for

[87]Until recently, for ~-pie, States were required only t. report intended use of Title XX social services block grant funds to the Secretary of DHHS (200). The Family Support Act of 1988 (Public Law 100-485) required States to begin to report detailed information on services actually funded.

[88]For a more in-depth discussion of the Federal Government's activities related to adolescent health and a description of OTA's survey, see ch.19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

**Table 9-13--U.S. Department of Health and Human Services HIV/AIDS- and STD-Related Projects and Grants That Include or Target Adolescents, 1989-90[a]**

| Agency | Demonstration or research project grants that include or target adolescents | Includes adolescents | Targets adolescents |
|---|---|---|---|
| **Off Ice of Human Development Services (OHDS)** | *HIV Prevention:* | | |
| | Interagency agreement with the Public Health Service to mobilize national resources for youth with HIV infection and AIDS-related complex. | | x |
| **Public Health Service (PHS)** | | | |
| **Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA):** | | | |
| • **National Institute on Drug Abuse (NIDA)** | *HIV Prevention and Related Research:* | | |
| | 1. Five grants focusing on HIV preventive intervention strategies that promote changing risk-related behaviors in minority, adolescent, and homeless women (213). | | x |
| | 2. AIDS Comprehensive Community Outreach Demonstration Projects: develop effective preventive strategies for reaching IV drug users not in drug treatment and their sexual partners (203). | x | |
| | 3. AIDS **Targeted Outreach Demonstration Contracts: focusing on IV drug users (203).** | x | |
| | **4. Eleven Prevention-Intervention Studies ranging from on-the-street contact to multiple skills training sessions (213).** | x | |
| | **5. Multimedia Cocaine Abuse Prevention Campaign: radio, print and television public service announcements to help prevent cocaine use among older adolescents and young adults (213).** | | x |
| | **6. AIDS and Its Behavioral Causes: Children's Knowledge and Emotions: research that is developmentally based and studies 6-to 12-year-old children's knowledge, attitudes and feelings related to AIDS, sexuality, and substance abuse (see NIMH and NICHHD also) (262).** | x | |
| • National Institute of Mental Health (NIMH) | *HIV Prevention and Related Research:* | | |
| | 1. AIDS extramural grants to the HIV Center for Clinical and Behavioral Studies and the Centerfor AIDS Prevention Studies: HIV prevention efforts targeting adolescent students, sex offenders, runaways, and sexually active adolescent females ages 14 to 20 (203). | | x |
| | 2. Multisite, multipopulation studies: test behavioral interventions to stop the spread of HIV infection (1). | x | |
| | 3. AIDS and its Behavioral Causes: Children's Knowledge and Emotions: research that is developmentally based and studies 6-to 12-year-old children's knowledge, attitudes and feelings related to AIDS, sexuality, and substance abuse (see NIDA and NICHHD also) (262). | x | |
| Centers for Disease Control (CDC): | | | |
| • Center for Chronic Disease Prevention and Health Promotion | | | |
| —Division of Adolescent and School Health | *HIV Prevention:* | | |
| | 1. Cooperative agreements with 20 national, 55 State, and 16 local education agencies: help implement effective programs of school health education to prevent the spread of HIV (227). | | x |
| | 2. Technical assistance to State, territorial, and local departments of education: development and implementation of an anonymous self-administered questionnaire to high school students about their HIV-related knowledge and behaviors (231). | | x |
| | *HIV and STD Prevention:* | | |
| | Assisting the Division of Reproductive Health within CDC's Center for Chronic Disease Prevention and Health Promotion in developing the Youth Risk Behavior Surveillance System: will periodically measure changes in health risk behaviors, including drug use and sexual intercourse that can result in AIDS and STDS (108,227,231). | | x |

*Continued on next page*

**Table 9-13--U.S. Department of Health and Human Services HIV/AIDS- and STD-Related Projects and Grants That Include or Target Adolescents, 1989-90[a]--Continued**

| Agency | Demonstration or research projects/grants that include or target adolescents | Includes adolescents | Targets adolescents |
|---|---|---|---|
| . Center for Infectious Diseases —Division of HIV)AIDS | *HIV Prevention and Related Research:* Research and prevention projects: study HIV prevalence and risk factors for adolescents attending clinics in Bronx, New York, and Washington, DC (227) | | x |
| . Center for Prevention Services —Division of Sexually Transmitted Diseases and HIV Prevention | *HIV Prevention:* 1. AIDS Community Demonstration Projects: evaluate strategies for preventing HIV transmission (5 out of 7 target school-aged youth) (240). | | x |
| | 2. Cooperative Agreements for Minority Community-Based Human Immunodeficiency Virus (HIV) Prevention Projects. | x | |
| | *STD Prevention and Related Research;* 1. Partner notification and screening efforts to reach infected individuals, including adolescents, at risk for STDs (117). | x | |
| | 2. Development and review of STD curricula in the schools (1 17). | | x |
| | 3. Grants and cooperative awards to 10 STD Prevention/Training Centers: train professionals, physicians-in-training, and other staff of STD Control and HIV Prevention Programs in diagnosis, management, prevention, patient counseling, and standards of care for STDs and HIV infection (55 FR 7570,227). | x | |
| | 4. National STD Hotline (1 17). | x | |
| | 5. Preventive Health Services-Sexually Transmitted Diseases Research, Demonstration, and Public Information and Education grants: develop, improve, and evaluate innovative approaches to the clinical care of STDs **and study the role of health behaviors in transmitting STDs (55** FR 17308). | x | |
| . National AIDS Information and Education Program (NAIEP) | H/V **Prevention** **1. Multimedia "America Responds to AIDS" campaign phase targeting adolescents and parents: promote communication about HIV** and AIDS between adults and adolescents, encourage adolescents' adoption of less risky behaviors, and increase **the general public's awareness of adolescents and AIDS (1 83,21 8).** | | x |
| | **2. National AIDS Hotline.** | x | |
| | **3. National** AIDS **Clearinghouse.** | x | |
| Health Resources and Services Administration (HRSA): | | | |
| • Bureau of Maternal and Child Health | *AIDS Treatment and Related Research:* 1. Subacute Care Demonstration Project Grants: provide medical care and treatment to HIV infected individuals (55 FR 12918). | x | |
| | 2. AIDS Regional Education and Training Centers. | x | |
| | 3. Community and migrant health centers. | x | |
| | 4. Pediatric AIDS Health Care Services Demonstration Projects: meet the needs of HIV infected children and adolescents by providing comprehensive services through the collaboration of community agencies (100). | x | |
| | 5. Pediatric AIDS Comprehensive Center Demonstration Projects: form a consortia to provide services, conduct research, and provide training to professionals, volunteers, and other individuals working with pediatric AIDS populations (100). | x | |
| | 6. National Issues of High Priority in Pediatric AIDS (100). | x | |
| | 7. Special Projects of Regional and National Significance (SPRANS) grants? fund Hemophilia Diagnostic and Treatment Centers that provide comprehensive care to children and adolescents with chronic illness (252). | x | |

**Table 9-13--U.S. Department of Health and Human Services HIV/AIDS- and STD-Related Projects and Grants That Include or Target Adolescents, 1989-90a-Continued**

| Agency | Demonstration or research projects/grants that include or target adolescents | Includes adolescents | Targets adolescents |
|---|---|---|---|
| National Institutes of Health (NIH): | | | |
| • National Cancer Institute (NCI) | *Research Related to AIDS Treatment*<br>Expanded eligibility criteria to include HIV-infected adolescents with hemophilia in AIDS treatment protocols (257). | | x |
| • National Center for Research Resources | *Research Related to HIV Prevention:*<br>Biomedical research support grant program: HIV Center for Clinical and Behavior Studies used the funds to conduct pilot interviews with adolescents living on the streets and 10th grade public high school adolescents to increase understanding of their attitudes and knowledge regarding AIDS prevention (159,257). | | x |
| • National Institute of Allergy and Infectious Diseases (NIAID) | *Research Related to AIDS Treatment*<br>1. **AIDS vaccine evaluation units (282).**<br>**2. AIDS clinical trials units.**<br>**3. Cooperative agreements: increase the participation of individuals from racial and ethnic minority groups in clinical trials.**<br>*Research Related to STD Treatment*<br>1. Research forthedevelopment of vaccines for gonorrhea, chlamydia, syphilis, and herpes simplex virus type 2.<br>2. Research on the natural history and therapy of the human papillomavirus. | <br>x<br>x<br>x<br><br>x<br>x | |
| • National Institute of Child Health and Human Development (NICHHD) | *Research Related to AIDS Prevention and Treatment*<br>1. AIDS and its Behavioral Causes: Children's Knowledge and Emotions: research that is developmentally based and studies 6-to 12-year-old children's knowledge, attitudes and feelings related to AIDS, sexuality and substance abuse (also see NIDA and NIMH) (262).<br>2. Research on the transmission of HIV from mothers to children (258).<br>*Research Related to STDs*:<br>Research on pelvic inflammatory disease (258).<br>*Research Related to AIDS and STDs*:<br>Research on the relationship between STDs, including AIDS, and fertility related behavior (258). | <br>x<br>x<br><br>x | |
| Office of Population Affairs (OPA) | *AIDS and STD Treatment*<br>Demonstration projects under Title X (Family Planning Services and Population Research Act of 1970 [Public Law 91 -572]) of the Public Health Service Act and Title XX (Adolescent Family Life Demonstration Projects) of the Public Health Service Act: direct services related to AIDS and STDs. | | X |
| Office of Minority Health (OMH) | *HIV Prevention*<br>Minority HIV Education/Prevention Grant Program to 4 national and 23 community-based minority organizations: expand innovative education/prevention activities to racially and ethnically diverse populations (22). | x | |

[a]Based primarily on OTA's survey of Federal agencies involved in adolescent health.
[b]Numbers in parentheses are references to citations. Full citations are listed at the end of this chapter.
[c]SPRANS grants are supported through a 10- to 15-percent Federal set-aside from the Maternal and Child Health Services block grant appropriation each fiscal year (249).

SOURCE: Office of Technology Assessment, 1991.

adolescents differ from the issues for adults, they may receive inadequate attention.

As shown in table 9-13, some federally supported AIDS and STD prevention projects do target adolescents. Often, though, young adolescents either do not receive the preventive intervention or receive the same intervention as older adolescents. There is little recognition of adolescents' differing developmental perspectives and needs. The Division of Sexually Transmitted Diseases and HIV Prevention within CDC's Center for Prevention Services, for example, is supporting cooperative agreements for prevention projects for racial and ethnic minority communities; this effort is not adolescent-specific, but the development of activities for adolescents living on the streets is considered a priority (55 FR 9955). In the grant announcement for the projects, however, no mention is made of the differing needs of younger and older adolescents who live on the streets. A 10-year-old is unlikely to require the same types of interventions as an 18-year-old.

The Division of Adolescent and School Health within CDC's Center for Chronic Disease Prevention and Health Promotion focuses *solely* on adolescents unlike the other DHHS agencies. In fiscal year 1990, the Division of Adolescent and School Health awarded over $24 million in cooperative agreements to 20 national, 55 State, and 16 local education agencies to develop effective programs of school health education to prevent the spread of HIV *(227).* In fiscal year 1989, the Division of Adolescent and School Health awarded 5-year contracts to IOX Assessment Associates, Macro Systems, Inc., and Westat, Inc. to perform evaluation and survey research pertaining to HIV and AIDS (227). The Division of Adolescent and School Health has also provided technical assistance to State and local departments of education to develop and implement an annual school-based survey of 9th to 12th grade students in public and private schools (227,231); during 1989, the survey questionnaire focused on students' HIV-related knowledge, beliefs, and behaviors. Finally, the Division of Adolescent and School Health has worked with State and local departments of education and other Federal agencies to develop a surveillance system--the Youth Risk Behavior Surveillance System-that will periodically measure changes in adolescents' high-risk behaviors, including sexual activity resulting in the transmission of HIV infection and STDs, between 1991 and 2000 (108,227,231).[89] The system will provide comparable data across national, State, and local populations of adolescents.

As this Report was going to press, CDC was hoping to issue requests for proposals to fund coalitions to identify and provide outreach and preventive services to adolescent populations at high risk of HIV infection and other health problems, such as out-of-school youth (272a). Under this program, coalitions would be funded in 3 cities with the highest caseloads of HIV infection (272a). One city would be named a training and demonstration site which would bring together individuals from organizations working with adolescents (e.g., local education agencies, local health agencies, detention centers, runaway shelters). These individuals would then be trained in AIDS/HIV prevention methods and encouraged to build coalitions in their city. (272a).

Three Federal agencies that do support research on young adolescents are the National Institute of Child Health and Human Development within the National Institutes of Health and both the National Institute of Mental Health and the National Institute on Drug Abuse within the Alcohol, Drug Abuse, and Mental Health Administration. These DHHS agencies support research that is developmentally based and studies 6- to 12-year-olds' knowledge, attitudes, and feelings related to AIDS, sexuality, and substance abuse (262).

From responses to OTA's Federal agency survey and the list in table 9-13, it is clear that HIV prevention efforts among adolescents receive much more emphasis at the Federal level than do STD prevention activities (207,208,214,227,25 1,257,258). Even the one division within CDC that in the past was devoted to STD control is now called the Division of Sexually Transmitted Diseases and HIV Prevention and has as one of its current priority areas the reduction of HIV infection (227). Since 1985, HIV prevention efforts have received a larger share of financial and personnel resources than have STD prevention efforts at both the Federal and State levels (240). In fiscal year 1990, for example, CDC's Division of Sexually Transmitted Diseases and HIV

[89] The prevalence of other health risk behaviors that will be measured include drug use, alcohol use, tobacco use, dietary patterns, inadequate physical activity, and behaviors resulting in accidental injuries (231).

Prevention, received an estimated $23.7 million for adolescent STD and HIV activities; the Division of Adolescent School Health, where most funds are being used to support the development of effective HIV education for adolescents, received over $36.5 million (108,1 18,227).

DHHS may be emphasizing the prevention of HIV/AIDS among adolescents for several reasons. First, although STDs other than HIV infection are more prevalent in the adolescent population, HIV infection has potentially greater consequences for affected individuals, their families, and society. There is no cure for AIDS, and AIDS is a fatal and often costly disease; most STDs, on the other hand, are curable. An additional reason for DHHS emphasis on AIDS prevention rather than STD prevention is that Congress has earmarked funds for AIDS prevention. For example, although the mission of the Division of Adolescent and School Health in CDC is broad in relation to adolescent health, most of the Division's funding has been provided specifically to help schools prevent HIV infection among adolescents (108,227).

It is important to note that the methods that individuals adopt for preventing the sexual transmission of HIV infection and STDs are virtually identical-abstainin g from sexual intercourse or modifying sexual or drug-using behaviors that put one at risk of infection. While federally supported STD educational curricula incorporate AIDS information, the importance of STDs other than AIDS tends to be ignored in most HIV educational curricula (1 17). Federally supported surveys often question adolescent students about their knowledge and attitudes related to AIDS but do not ask similar questions about their knowledge and attitudes related to STDs. An exception was the National Adolescent Student Health Survey; this survey—supported by DHHS through the Office of Disease Prevention and Health Promotion, CDC, and the National Institute on Drug Abuse--did ask adolescents in school questions about their knowledge of both AIDS and STDs (7).

Generally, most of the money from DHHS that supports AIDS and STD prevention projects for adolescents goes to projects that are located in the schools and in major metropolitan areas. This focus is reasonable because most adolescents are in school and metropolitan areas have had the highest reported prevalence rates of AIDS and STDs. On the other hand, prevention activities in schools will not reach out-of-school adolescents who are at increased risk of infection, such as runaway and homeless adolescents, and prevention efforts concentrated in metropolitan areas will not reach adolescents in rural and other areas that are not yet reporting high rates of infection.

As directed by Congress, most funds for HIV prevention efforts by the Division of Adolescent and School Health in CDC are directed to adolescents in schools. CDC guidelines state that HIV prevention efforts should be consistent with community and parental standards (232) so State and local school boards of education have control over the scope and content of HIV and STD preventive messages in the schools. The role of the Division of Adolescent and School Health in determining the content of educational messages about AIDS and STDs to adolescents in school is quite limited. In some communities, teachers are not permitted to discuss condoms as a method of protection against HIV and STDs for fear that such discussion promotes sexual activity. Thus, students in those communities, who do engage in sexual intercourse, may not receive basic information about how to protect themselves against HIV infection or STDs. A recent survey by the National Association of State Boards of Education found that only three States actually had policies indicating that condom use should be discussed as either a recommended or unreliable method of protection (147).

Increasingly, agencies within the Public Health Service are targeting money for prevention efforts to out-of-school adolescents (e.g., dropouts, runaways) who may be at increased risk of infection. As shown in table 9-13, CDC's Division of Sexually Transmitted Diseases and HIV Prevention is supporting the evaluation of strategies for preventing HIV transmission through seven AIDS community demonstration projects. Five of the seven demonstration projects target school-aged adolescents, particularly those who are on the streets (240). In addition, the National Institute of Mental Health (within the Alcohol, Drug Abuse, and Mental Health Administration) and the National Center for Research Resources (within the National Institutes of Health) are supporting AIDS extramural grants to the HIV Center for Clinical and Behavioral Studies for HIV prevention efforts targeting specified groups of adolescents, including runaways and sex offenders (159,203,216,257). Finally, the National Institute on Drug Abuse (within the Alcohol, Drug Abuse, and

Mental Health Administration) provided $715,486 in fiscal year 1989 for an AIDS Community Outreach Demonstration Project in San Antonio, Texas, targeting AIDS education to adolescent runaways (214), and the National Network of Runaway and Youth Services in fiscal year 1989-90 received $156,000 from the Division of Adolescent and School Health in CDC to ensure that its youth-serving agencies throughout the United States operate AIDS prevention and education programs (209,227).

Because of limited funds and higher reported prevalence rates of HIV infection and STDs within major metropolitan areas, most Federal funds are directed to urban areas. CDC's Division of Sexually Transmitted Diseases and HIV Prevention, for example, provides grants and cooperative agreements to 10 STD Prevention/Training Centers, all of which are located in large metropolitan areas such as Newark, Baltimore, Chicago, Dallas, Denver, and Seattle (227) (54 FR 8828; 55 FR 7570). This Division also supports two demonstration projects, one in New York City and one in San Francisco (227). Recently, CDC has provided funding for community-based education in several cities through the U.S. Conference of Mayors, including New York, San Francisco, and Los Angeles, in addition to providing money to the States to distribute to localities (198). The U.S. Conference of Mayors received $857,000 in 1991 and planned to award grants to 17 nonprofit, nongovernmental, community-based organizations (198a). Out-of-school youth and racial and ethnic minorities are two priority groups receiving education from these community-based efforts. Given that overall AIDS cases are becoming increasingly common in rural and noncoastal areas (77), direct funding of efforts in these areas as well may help prevent further transmission of infection into yet uninfected populations.

The most effective way for adolescents to avoid acquiring an HIV infection or STD is to abstain from sexual intercourse. For adolescents who do not abstain from sexual intercourse, however, the proper use of condoms is the most effective method to reduce the chances of infection (222). Few federally supported projects are studying adolescents' attitudes toward condoms in relation to the prevention of HIV and STDs. CDC's Division of Sexually Transmitted Diseases and HIV Prevention is supporting applied research projects that not only will study people's attitudes toward condom use but will evaluate strategies using condoms for controlling syphilis, but those projects are not adolescent-specific (54 FR 8828). In addition, during fiscal year 1987-88, the National Institute of Health's National Institute of Child Health and Human Development made the development of safe, more effective contraceptives that would help to prevent the transmission of HIV infection and STDs one of its priorities. The reason for the lack of Federal support for HIV and STD prevention projects related to adolescents and condoms is unclear, but it may bean unintended result of the Federal Government nearly exclusive emphasis on getting adolescents to abstain from sexual intercourse. Some of the limitations of relying exclusively on abstinence to control the spread of HIV and STDs among adolescents were noted earlier in this chapter.

DHHS is increasingly directing money for HIV and STD prevention efforts to members of racial and ethnic minority groups at increased risk of HIV and STDs. As directed by Congress in fiscal year 1988, for example, the Office of Minority Health in the Public Health Service awarded approximately $1.4 million to 4 national and 23 community-based minority organizations for HIV prevention and education efforts directed at racial and ethnic minority populations, including adolescents (22). Five of these HIV prevention projects specifically address the needs of racial and ethnic minority adolescents; interventions include a peer teen HIV prevention program for black youth in Los Angeles and family-based HIV prevention strategies for a Hispanic community in Salt Lake City. In addition, CDC's Division of Sexually Transmitted Diseases and HIV Prevention has made street outreach programs to assist adolescents on the street get HIV and AIDS risk-reduction counseling a priority activity in its Cooperative Agreements for Minority Community-Based HIV Prevention Projects (55 FR 9955). These projects may increase understanding as to how to most effectively target interventions to adolescents in racial and ethnic minority groups with high reported prevalence rates of HIV and STDs.

### Federal Programs Related to AIDS and STD Treatment

Primarily because relatively few adolescents are diagnosed with AIDS, federally funded AIDS treatment services are rarely specific to adolescents. Most AIDS treatment and treatment-related research

efforts include adolescents within populations of adults or children. The primary agencies within DHHS that provide AIDS treatment services or AIDS treatment-related research are the Bureau of Maternal and Child Health in the Health Resources and Services Administration and the National Institute of Allergy and Infectious Diseases in the National Institutes of Health. Both the Health Services and Resources Administration and the National Institutes of Health are components of the Public Health Service.

The Bureau of Maternal and Child Health of the Health Resources and Services Administration funds various AIDS treatment-related activities that include adolescents. As shown in table 9-13, these include subacute care demonstration projects, pediatric AIDS health care services demonstration projects (as described above), pediatric AIDS comprehensive center demonstration projects, and national issues of high priority in pediatric AIDS (100,249).

The Bureau of Maternal and Child Health also administers the maternal and child health block grants to States. As discussed at the beginning of this chapter, however, services funded with these grants are determined by the States receiving the grants. The Federal Government's ability to target block grant funds for AIDS or other services is limited to the 15 percent of the block grants that is set aside to fund "special projects of regional and national significance (SPRANS). Through SPRANS, the Bureau of Maternal and Child Health supports hemophilia diagnostic and treatment centers, which have been recognized by the DHHS Secretary's Workgroup on Pediatric AIDS as models for comprehensive care for children and adolescents with chronic illness[90] (90,209,252). An interdisciplinary team of professionals provide medical and dental care, physical therapy, orthopedic care, psychosocial care, vocational counseling, and genetic counseling in inpatient and outpatient settings in the context of an adolescent's family (209). With the help of a $6.2 million transfer from CDC, the 25 regional hemophilia centers will focus on the serious AIDS-related problems of hemophiliacs and their families (253).

The National Institute of Allergy and Infectious Diseases within the National Institutes of Health recently made adolescents eligible to participate in adult AIDS clinical trials by dropping the age of eligibility from 18 to 13.[91] Because adolescents are not actively sought to participate in trials, however, many eligible adolescents are not involved (90,91a, 184). To encourage the participation of individuals from racial and ethnic minority groups who are underrepresented in clinical trials, the Institute has set aside $3.6 million for cooperative agreements, but these agreements are not specific to adolescents (283). The National Institute of Allergy and Infectious Diseases also supports research efforts to study potential vaccines and treatments for STDs (e.g., gonorrhea, chlamydia, syphilis, and herpes simplex virus type 2).

Adolescents can receive services for family planning and STD-related services through the 4,000 family planning clinics supported by Federal funds under Title X of the Public Health Service Act (Family Planning Services and Research Program [Public Law 91-572]). These grant programs are administered by the Office of Population Affairs within the Public Health Service of DHHS. Among the current priority areas for Title X monies are STDs, AIDS, the involvement of families, and abstinence (207).[92] Adolescents can receive STD-related services through some demonstration projects funded under Title XX (Adolescent Family Life Program) of the Public Health Service Act (as amended by Public Law 97-35). Title XX of the Social Security Act, as amended by Public Law 97-35, authorizes funds to be provided to States for the provision of social services, including family planning services (207). The Federal Government's emphasis on encouraging abstinence from sexual activity and the requirement that organizations not provide abortion services (207) may have the effect of limiting sites providing STD and AIDS services to adolescents. Adolescents who continue to engage in sexual intercourse despite the Federal Government's emphasis on abstinence, therefore, may be placed at unnecessary risk for HIV infection and STDs because access to appropriate STD and AIDS services may be limited.

[90]For a discussion of adolescents with chronic illness, see ch. 6, "Chronic Physical Illnesses: Prevention and Services," in this volume.

[91]The institutes of the National Institutes of Health provide services only in conjunction with their research efforts.

[92]For further discussion of Titles X and XX of the Public Health Service Act, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume, and ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

Recently, the Federal Government passed the Ryan White Comprehensive AIDS Resources Emergency Act (Public Law 101-381), which authorizes $4.4 billion in Federal funding to metropolitan areas hardest hit by the AIDS epidemic. The Health Resources and Services Administration and CDC within DHHS are the agencies primarily responsible for the implementation various aspects of the act (198b).

## Conclusions and Policy Implications

AIDS and other STDs are important adolescent health concerns. Although AIDS can be classified as an STD,[93] it has sometimes been distinguished from other such diseases for reasons related to risk factors, consequences of the diseases, strategies for prevention, research, and implications for the delivery of treatment services.

Perhaps the most compelling difference between AIDS and other diseases that can be transmitted sexually is that AIDS is almost inevitably fatal.[94] This almost certain fatality, paired with the long period between initial infection and the appearance of symptoms of AIDS (now thought to be 8 to 10 years), during which time an infected person can unknowingly transmit the virus to others, makes it a particularly frightening disease. Thus, AIDS has been designated the Nation's number one health priority by DHHS.

Concern about HIV infection and AIDS among *adolescents* seems to have lagged behind. Perhaps one reason for the lag is that the long latency period means that few adolescents (568 cases, or less than 1 percent of AIDS cases in the United States through August 31, 1990)[95] were among those actually diagnosed as having AIDS.

The fact that few adolescents have been diagnosed with AIDS, however, may result in a false sense of security. Small samples of adolescents whose blood has been tested for HIV suggest that the rate of HIV infection may be as high as 3.4 percent for runaway and homeless adolescents seen in New York City. Even more disturbing is the finding that people who are diagnosed with AIDS in their early twenties make up 4 percent of AIDS cases in the country, suggesting that HIV infection may be higher than currently known in adolescents.[96] For these reasons, AIDS among adolescents should be of critical concern to the Nation's health policymakers.

If one uses prevalence and ease of transmission as benchmarks, paired with long-term implications for infertility and other serious chronic health problems, some diseases other than AIDS that can be transmitted sexually should also be a critical concern. Yet another basis for concern about traditional STDs is that the presence of some STDs may facilitate the transmission of HIV. Available data, incomplete though they are, suggest that the rate of STDs among adolescents is high. Rates for chlamydia infection, the most prevalent STD among adolescents, varies from 3 to 37 percent depending upon the population surveyed (see table 9-6). Rates for gonorrhea vary from 3 to 18.5 percent and would probably be higher if the rates were based on the number of sexually active adolescents rather than the entire adolescent population (239,240). Given the asymptomatic nature of many STDs, diverse State laws for reporting, adolescents' lack of knowledge about STD symptoms and about the availability of and confidential treatment, the picture of STDs among the adolescent population may be even worse than it appears.

Efforts to prevent both HIV infection and other STDs are stymied by a lack of information about adolescent behaviors. Unfortunately, little is known about the extent of risky sexual practices among adolescents (including nonuse of condoms and sexual intercourse with older, perhaps infected, individuals) or about adolescents' perceived or actual access to preventive and treatment services.

[93] Although the virus that causes AIDS (HIV) can be, and usually is, transmitted sexually in adolescents, there are other modes Of transmission, such as through IV drug use and through the transfusion of contaminated blood and blood products for the treatment of hemophilia, that arc not common to many other STDs although they may occur. Thus, prevention strategies for AIDS must entail efforts directed at other means of transmission such as blood transfusions.

[94] As of May 1990, 61 percent of the 130,252 cumulative AIDS cases reported among adults and adolescents ages 13 and over had died (237).

[95] Cases are through Aug. 31, 1990, and represent adolescents ages 13 to 19 (237a).

[96] The fact that older adolescent and young adult men are likely to engage in sexual intercourse with younger females (see Ch. 10, "Pregnancy and Parenting: Prevention and Services") and, apparently, males provides additional cause for concern. Fortunately, female-to-male sexual transmission appears to be more difficult than male-to-female transmission so that females who in turn have sexual intercourse with adolescent mates around their own age are probably not as likely to continue the chain of transmission. Sexual practices involved in male-to-male transmission however, make AIDS a health problem of extreme concern for sexually active homosexual adolescents.

Given the heterogeneity of the population and the current levels of infection already present in the population, controlling the spread of HIV infection, AIDS, and other STDs within the entire adolescent population has proven difficult. Despite the current ongoing efforts, more remains to be done for adolescents who are already infected and for those who are not.

## Prevention of HIV Infection, AIDS, and Other STDs in Adolescents [97]

As noted throughout this chapter, the most effective way for adolescents to avoid acquiring an HIV infection or other STD is to abstain from sexual intercourse and IV drug use.[98] For those adolescents who do not to abstain, however, the only way to prevent infection is to adopt safer practices, such as the use of condoms and the refusal to share IV drug needles. Most education-based AIDS and STD prevention efforts are designed to convince adolescents to change their behaviors so they do not get infected at all; additionally, most efforts are directed at changing adolescent sexual behavior rather than behaviors related to IV drug use. To OTA's knowledge, most prevention efforts focus on HIV and AIDS and do not address other STDs, though an HIV prevention course would clearly provide a good opportunity to discuss STDs.

Conclusions and policy implications related to the design of effective prevention programs for HIV infection and STDs are difficult to draw. For many reasons, including time and fiscal restraints, few careful evaluations of AIDS and STD prevention projects for adolescents have been conducted. Most programs use measures other than infection rates, such as measures of knowledge and attitudes, to determine an intervention's success. The use of measures other than infection rates may be due, in part, to the relatively infrequent occurrence of STDs and especially HIV within a targeted adolescent population. With the evidence that is available, however, several conclusions about STD and HIV prevention can be drawn.

For adolescents, particularly younger adolescents, who have not yet initiated sexual intercourse, evidence from pregnancy prevention programs indicates that interventions begun before the initiation of sexual intercourse have been effective in delaying sexual intercourse.[99] The most effective interventions may be those that combine a variety of approaches, including discussions of responsible sexuality. Pregnancy prevention programs that delay the initiation of sexual intercourse probably indirectly affect the rates of HIV and STDs, although their effect on HIV and STDs has not yet been demonstrated.

Evidence that some adolescents lack accurate information about HIV and STDs suggests that, at a minimum, adolescents-especially older adolescents who are sexually active-need information about condoms and other methods of protecting themselves from infection. When STD and HIV education programs in the schools have been provided, they have proven useful in increasing adolescents' knowledge over short periods of time. Over longer periods of time, however, increases in knowledge seem to disappear. Because education-based prevention efforts in the schools are often of limited duration, it is not surprising that knowledge increases are not maintained especially given the amount of time adolescents spend outside of school in other activities and with other people who may provide inaccurate and often conflicting information.

Education-based AIDS and STD prevention programs in the schools that appear to be particularly promising are those that are implemented before adolescents engage in risky sexual and drug-using behaviors. Thus, educational approaches that address HIV infection and other STDs may be most effective if they are begun in elementary and middle school rather than in high school when such behaviors may have already occurred. Efforts are underway to develop age-appropriate and culturally relevant messages, but to OTA's knowledge, they have not been evaluated for their effectiveness.

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[97] Because AIDS is caused by infection with HIV, efforts often focus on preventing the initial infection of HIV. Therefore, activities in this section are referred to HIV prevention efforts rather than AIDS prevention efforts.

[98] This chapter focused specifically on preventing transmission through sexual intercourse and IV drug use. Other routes of transmission% including the transfusion of contaminated blood and blood products for the treatment of hemophilia, require different prevention efforts, such as blood donor screening, which are not discussed here.

[99] For a discussion of pregnancy prevention programs, see ch. 10, "Pregnancy and Parenting: Prevention and Services," in this volume.

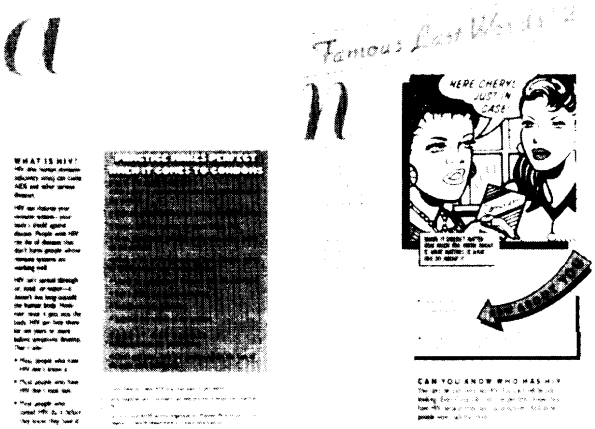


*Photo credit: Planned Parenthood Federation of America® Published with permission.*

**Some AIDS booklets, such as this one for sexually active young teenagers, use a comic-book-sized, colorful format. The booklet includes instructions for condom use, scripts to use in negotiating condom use, comparisons of risks related to alternative sexual behaviors, and basic facts about the human immunodeficiency virus (HIV). The booklet was designed for adolescents reading as low as the third-grade level.**

Given **that most** adolescents live **at** home and **that** adolescents often view their parents **as** credible sources of information, AIDS and STD preventive interventions within families may be promising, at least for adolescents with strong familial bonds. Few family-based efforts related to HIV prevention have been evaluated **to** date, and virtually no activities have been directed to families for the prevention of STDs.

Conclusions related to the effectiveness of education-based prevention efforts in modifying the behaviors of adolescents who have already begun engaging in sexual intercourse and IV drug use are not encouraging. It does appear that some adolescents report adopting preventive behaviors as a result of a fear of AIDS. Despite recent HIV and STD education efforts by schools, however, most adolescents have not consistently adopted safe sex or needle practices.

Few studies have specifically looked at adolescents and their attitudes toward condom use as a method of HIV and STD prevention. There is some evidence to suggest that adolescents who perceive that condoms reduce pleasure or are embarrassing to buy or use are highly unlikely to use them. Although adolescents can obtain free condoms in a few locations, little is known regarding the impact of these programs on adolescents' attitudes, behavior, and incidence of HIV and STDs. Additionally, because most prevention efforts aimed at IV drug users target adults, little remains known about effective prevention programs for adolescents.

Innovative approaches, such as distributing condoms through vending machines and by individuals who deliver them directly to a person's door, are currently taking place on college campuses and universities in the United States for young adults and in high schools in other countries, such as Canada (44,123). More innovative condom distribution programs such as these may be needed in order to control the spread of HIV infection and other STDs among adolescents who choose not to abstain from sexual intercourse. These programs may be most appropriate for older adolescents who are more likely to be sexually active than younger adolescents. It seems reasonable to expect that the more effective programs will be those that address adolescents' perceptions related to the difficulty in using condoms. Limited access to condoms because of inconvenient dispensing locations may be an additional barrier to adolescents who want to practice safer sex.

Given that adolescents' sexual and drug-using behaviors are tied intricately with adolescents' personal values, perceptions of peers' attitudes, feelings about themselves, perception of risk, comfort in discussing and negotiating less risky behaviors, and community norms-behaviors that have evolved throughout adolescence-it may be unrealistic to expect that a small number of classes, a pamphlet, or a public service announcement will dramatically change an adolescent's sexual and drug-using behaviors. Preliminary evidence suggests that the most promising approaches to changing behavior may be those that combine role playing exercises and involve other same-aged adolescents to improve decisionmaking and communication skills that deal with real and perceived peer pressures in negotiating safer sex and drug-use behaviors with unwilling or ambivalent partners.

Many AIDS and STD prevention efforts have been unable to or have not reached runaway, homeless, and incarcerated adolescents, groups which may be at increased risk of infection because of high levels of sexual activity and low consistent use of

contraception (262b).[100] It seems reasonable to expect that for these adolescents, the most successful approaches may be those that address other additional concerns, concerns that these adolescents perceive as more important, such as shelter and food.

### Treatment of AIDS and STDs in Adolescents

For adolescents who are already infected with HIV or STDs, clearly the best treatment is treatment that is given early (early treatment of HIV with zidovudine has been shown to reduce symptoms and prolong individuals' lives). For many reasons, including the fact that STDs are often asymptomatic, however, adolescents tend to delay treatment. Active and flexible approaches to encourage adolescents with HIV infection or other STDs to seek treatment and return for followup care are needed. For example, despite the fact that States have waived parental consent requirements for treatment of STDs because of serious public health concerns, three-quarters of adolescents are unaware of the availability of free, confidential treatment (7). Clinicians who are responsive to adolescents and their health problems and who are perceived by adolescents to be friendly, understanding, and willing to take their time may be the most effective in getting adolescents to return for care. Additionally, because single dose regimens ensure compliance and confidentiality, clinical experiences suggest that therapies involving single-dose regimens rather than multiple-dose regimens may be more effective in treating adolescent STDs. Treatment for some STDs, including chlamydia infection, however, is only effective using multiple doses, so continued research is needed to develop therapies that may be more effective in treating AIDS and STDs in adolescents.

Relatively few adolescents are enrolled in federally sponsored AIDS clinical trials. Access to these trials appears particularly difficult for those adolescents who do not have regular access to the health care system. Typically, parents find out about clinical trials through physicians, but those adolescents at greatest risk may not be living with their parents. Research protocols may need to be more adolescent-specific to increase adolescents' participation in clinical trials. Often, for example, adolescents are included with adults up to age 99. Many adolescents do not use the traditional health care system; therefore, eligible adolescents may need to be recruited through agencies and other systems, such as the child welfare system. The National Institute of Allergy and Infectious Diseases of the National Institutes of Health in DHHS has set aside $3.6 million for cooperative agreements to encourage the participation of individuals from racial and ethnic minority groups who are underrepresented in clinical trials; these agreements are not specific to adolescents (283).

Data from the Health Resources and Services Administration's hemophilia diagnostic and treatment and Pediatric AIDS Health Care Demonstration Project centers may provide essential information for appropriate comprehensive care for children and adolescents with serious AIDS-related problems and their families.

### Federal Agencies' Role in Prevention and Services

Responsibility for controlling the spread of HIV infection, AIDS, and other STDs within the adolescent population rests with Federal, State, and local governments. Within the Federal Government, several agencies of DHHS are playing a major role in attempts to control the spread of HIV infection, AIDS, and STDs. Whether their activities are sufficient, and specific enough, in relation to adolescents, however, is open to question. The requirements for reporting HIV, AIDS, and STDs, for example, are determined at the State and local level. In order to more clearly define the extent of the HIV, AIDS, and STD problem within the adolescent population and more appropriately target preventive interventions, the Federal Government may want to support more thorough research related to epidemiology and the differences in the occurrence of disease between younger and older adolescents; homosexual, bisexual, and heterosexual adolescents; in-school and out-of-school youth; and among various socioeconomic groups. Additionally, although reporting requirements are determined at the State level, the Federal Government may want to more strongly encourage States to collect and report additional demographic data, such as smaller age breaks, socioeconomic status, and race, to CDC.

Typically, the Federal Government provides technical and limited monetary support for prevention and research activities to States, localities, and

[100] See ch. 14, "Homelessness: Prevention and Services," in this volume

organizations serving adolescents. Given the heterogeneity of the adolescent population, prevention strategies need to address the sexual and drug-using behaviors within the entire adolescent population and in certain subgroups, such as homosexual and bisexual adolescents, racial and ethnic minority groups, homeless adolescents, and incarcerated adolescents in order to control the transmission of HIV and STDs within the adolescent population. While most of the content and message of prevention efforts is determined at the State level, CDC's guidelines for effective school health education to prevent HIV do not address the actual sexual and drug-using practices of adolescents and have been slow to include prevention education address efforts for out-of-school adolescents. In addition, the Federal Government's general emphasis on abstinence and restrictions on support for programs that maybe perceived as encouraging homosexuality may have the effect of limiting the more effective activities for controlling the spread of HIV, AIDS, and STDs among adolescents who are most at risk of infection, namely those adolescents who choose to remain sexually active. It is encouraging, however, that the CDC has recently stated that sexually active adolescents should be encouraged to use condoms.

Most federally supported educational prevention activities for adolescents are limited to students and adolescents living in metropolitan areas. Few address adolescents' differing developmental needs, and most include younger and older adolescents together. More specifically, adolescents who are homosexual and bisexual, adolescents who are not in school (such as runaway and homeless youth), and adolescents who live in rural areas receive relatively little Federal financial support. Although the number of Federal AIDS prevention activities reaching racial and ethnic minorities of all ages has increased recently, only a few projects specifically target adolescents from minority groups. Finally, there are few federally supported prevention efforts targeting adolescent IV drug users.

To increase funding to these adolescent groups who receive little Federal support, the Federal Government may want to consider providing set-asides in the social services and maternal and child health services block grants to the States. There is precedent for this type of funding. For example, because Members of Congress became concerned about child sexual abuse, Congress appropriated a $25 million increase in the Title xx Social Services Block Grant program finding in fiscal year 1985 for use by the States in providing training and other related activities to child day care staff (200). Additionally, in order to reach adolescents in low prevalence areas, the Federal Government needs to do more than fund cities with high prevalence of HIV, AIDS, and STDs.

Because DHHS has made AIDS the Nation's number one health priority, the importance of STDs other than AIDS as a public health problem and the money allocated to control them has been directly affected. In fact, HIV efforts have received a larger share of financial and personnel resources than have STD prevention efforts since 1985 at both the Federal and State levels (240). Given that more adolescents have other STDs than have AIDS, that adolescents may perceive themselves at greater risk for STDs than for HIV infection, and that the presence of STDs may facilitate the transmission of HIV, the Federal Government as well as State governments may want to ensure the integration of STDs into HIV educational efforts. Federal and State governments could require that STD education be incorporated within HIV education as a condition for funding at the local school level. Additionally, Federal funding for HIV-related activities targeting out-of-school adolescents and racial and ethnic minorities could also be made contingent upon the incorporation of STD with HIV/AIDS information.

DHHS also provides financial assistance for the treatment of AIDS and STDS. While the Federal Government has developed guidelines for treating certain STDs, however, many of the guidelines are not specific to adolescents, and neither are the guidelines for treating adolescents with AIDS.

Because adolescents receive many, often conflicting, messages from the media, peers, adults, and the Federal Government, interventions need to provide unambiguous yet developmentally and culturally appropriate messages to adolescents who are not yet engaging in sexual intercourse or drug use and those who are. Unless more creative approaches are found . to control HIV, AIDS, and STDs among adolescents who are not yet infected and those who are already infected, adolescents will continue to contract HIV infection and STDs. Prevention of infection is the most effective approach to control, but careful evaluations are needed and much more remains to be done to make adolescents as well as society aware of

the risk of HIV infection, AIDS, and STDs to adolescents.

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