

these issues as well as those affecting younger adolescents was probably too ambitious an undertaking.⁸

In many cases, data on adolescents ages 10 through 18 are not available. Where necessary, OTA relied on data aggregated for age groups that included some or all of the ages that are the focus of this Report,

Organization of the Report

OTA's Adolescent Health Report has three volumes:

- Volume I, "Summary and Policy Options,"
- Volume II, "Background and the Effectiveness of Selected Prevention and Treatment Services," and
- Volume III, "Cross-Cutting Issues in the Delivery of Health and Related Services."

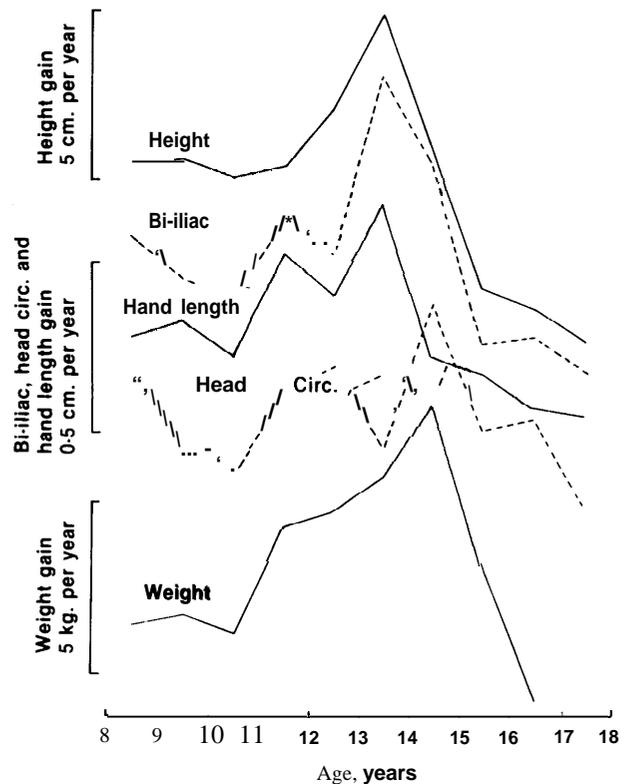
This volume, Volume I, summarizes the findings of OTA's Report and presents the policy options arising from OTA's analysis. First it presents the major findings and policy options. Then it summarizes specific findings and additional policy options from chapters in Volumes II and III of the Report. Finally, it presents a discussion of selected barriers to and opportunities for change. Extensive bibliographic citations and data sources for health problems and utilization of specific services are cited in the individual chapters in Volumes II and III. A table of contents listing the chapters and appendixes in each volume is included in appendix A, "Method of the Study."

Major Findings

Are American Adolescents Healthy?

OTA's analysis is based on a broad range of measures of adolescent health and a correspondingly wide variety of sources of data. OTA's analysis, described below, as well as analyses by other groups (8,29,148,150,153), suggests that the conventional wisdom that American adolescents as a group are so healthy that they do not require health and related services is not justified. On the other hand,

Figure 1-Growth Spurts During Adolescence



SOURCE: Figure 5 on p. 13 in J.M. Tanner, *Growth at Adolescence*, 2d ed. (Oxford, England: Blackwell Publications, 1962) based on L. Reynolds and G. Schoen, "Growth Patterns of Identical Triplets From 8 to 18 Years," *American Journal of Physical Anthropology* 5:165-200, 1947. Copyright © 1947 by John Wiley & Sons. Reprinted by permission of Wiley-Liss, a Division of John Wiley & Sons.

the seemingly contradictory conventional wisdom that adolescence is and should be a problem period—that to be normal is abnormal—is also unjustified.

Adolescence—roughly the second decade of life—is a period of profound biological, emotional, intellectual, and social transformation, unmatched perhaps by any other period in life. The physical changes are dramatic. One sees not only changes in height, weight, and head size (see figure 1), but also

⁸One should not interpret OTA'S decision to limit its focus to 10- through 18-year-olds as an indication that young people of college age have no health-related problems deserving of attention. Young people of college age have a number of concerns. For example, the health insurance status of individuals of college age is often ambiguous (159); employment opportunities for non college youth are minimal (330); and new health problems may begin to emerge (263).

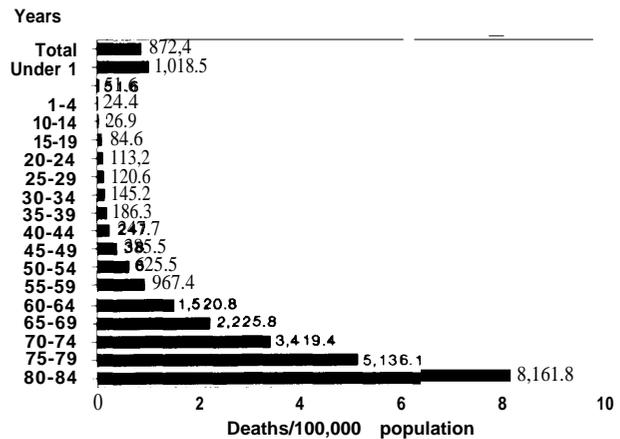


Photo credit: Education Week

Adolescence is a period of profound biological, emotional, intellectual, and social transformation.

changes in facial structure and facial expression and the ‘spectacular development of the reproductive system’ (202). There may be emotional upheavals. Intellectual capacity deepens, and adolescents gradually become capable of higher order thinking and reasoning. The expectations of the larger society and of family members, teachers, friends, and others in

Figure 2—Overall Death Rates Among the U.S. Population by Five-Year Age Groups, 1987a



^aAlthough this OTA report focuses on adolescents ages 10 to 18, the data here are for 5-year age groups and therefore include 19-year-olds.

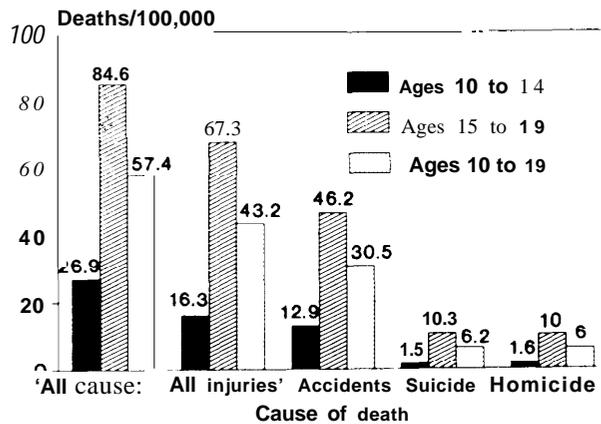
SOURCE: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished mortality data, Hyattsville, MD, 1990.

the adolescent’s immediate environment change, sometimes leading to confusion about issues of independence, conformity, and responsibility. These extraordinary events, though perhaps related, are typically discontinuous—they do not occur smoothly, predictably, or simultaneously. Furthermore, some adolescents are early and others are late ‘bloomers’ (62).

If, as an overview of adolescent development suggests, adolescence is often a somewhat turbulent period, it may be surprising that adolescents appear by some traditional measures—i. e., mortality rates—to be among the healthiest of Americans. Adolescents as a group have among the lowest overall death rates of all Americans in the United States (see figure 2).⁹The leading causes of death among adolescents are somewhat different from those of other age groups, however, with adolescents being more likely than younger and older Americans to die of injuries

⁹Adolescents also have the lowest number of outpatient visits to office-based physicians per person per year and are among the least likely to be hospitalized, but the implications that can be drawn from those statistics about adolescents’ needs for services are not entirely clear. Various factors may affect adolescents’ utilization of mainstream health services, and many of them are discussed below and in several chapters in Vol. III, specifically, ch. 15, ‘Major Issues Pertaining to the Delivery of Primary and Comprehensive Health Services to Adolescents’ ch. 16, ‘Financial Access to Health Services’ ch. 17, ‘Consent and Confidentiality in Adolescent Health Care Decisionmaking’; and ch. 18, ‘Issues in the Delivery of Services to Selected Groups of Adolescents.’

Figure 3-Death Rates Among U.S. Adolescents Ages 10 to 19,a by External Causes of Death, 1987



^aAlthough this OTA report focuses on adolescents ages 10 to 18, the data here are for 5-year age groups and therefore include 19-year-olds.

^bAll causes" includes injuries and diseases. The rates at which causes of death other than injuries occurs in the adolescent population are relatively small-e. g., malignant neoplasms, the next highest cause of death after injuries, occurs in 10- to 19-year-olds at a rate of 3.7 per 100,000 adolescents ages 10 to 19.

^cAll injuries" includes accidents, suicide, homicide, and other injuries.

SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1987 mortality rates, Hyattsville, MD, 1990.

(including accidental injuries,¹⁰ suicide, and homicide¹¹) (see figures 3 and 4).

Up-to-date information on U.S. adolescents' health is often unavailable or deficient. This problem is discussed further in appendix C, "Issues Related

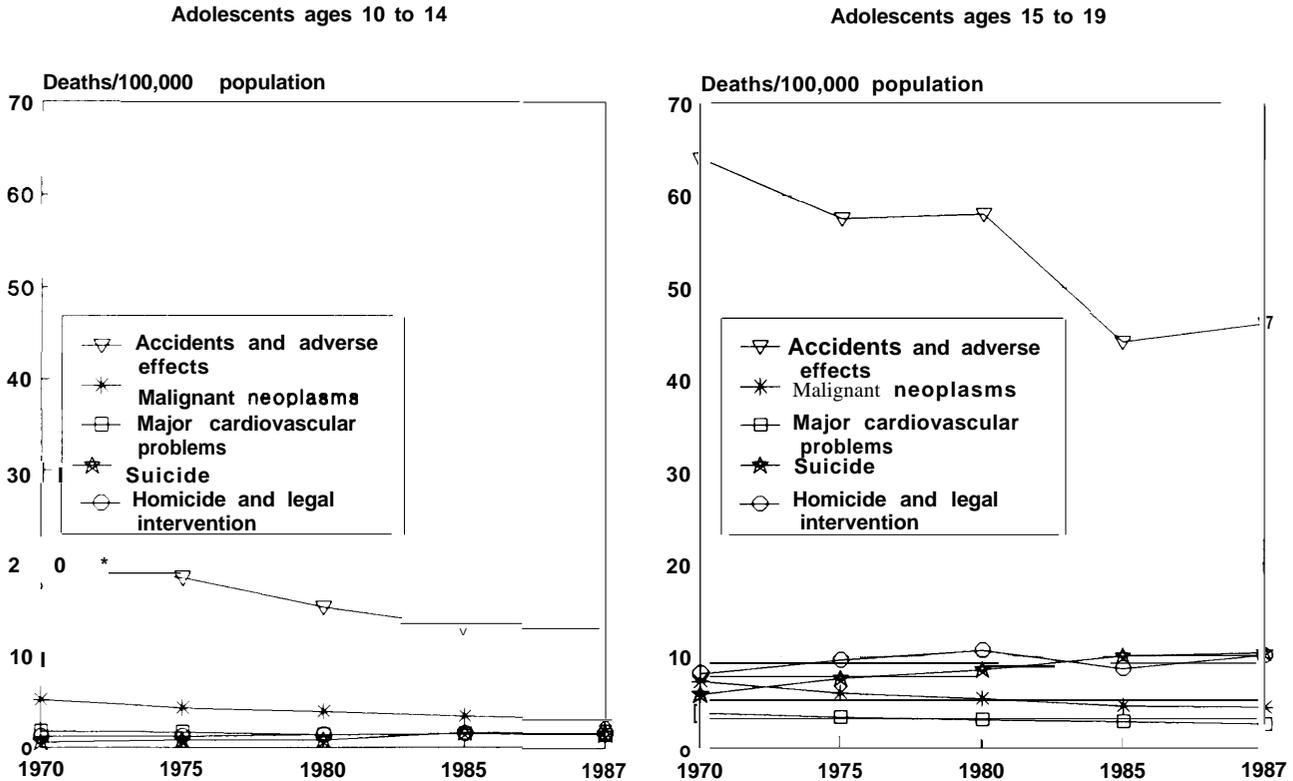
to the Lack of Information About Adolescent Health and Health and Related Services." Nevertheless, available data indicate that American adolescents have a number of health problems that should be-and many have been--of intense national concern.

- Family problems--Some adolescents come from homes with high levels of stress or conflict and have experienced physical, sexual, or emotional abuse. In 1985, an estimated 120,000 adolescents were in foster care (330). The rate of maltreatment (defined as physical, emotional, or educational neglect, or physical, emotional, or sexual abuse) is believed to be higher among adolescents than among younger children (8,259). Data from the U.S. Department of Health and Human Services (DHHS) National Center on Child Abuse and Neglect's national incidence study suggest that between 620,000 and 700,000 adolescents ages 10 to 17 were maltreated in 1986 (259). The consequences of abuse include depression and other psychological difficulties during adolescence and adulthood and may include delinquency (329) and hopelessness (259).
- School problems--On average, 12.6 percent of 16- to 24-year-olds living in households report not having completed a high school education (the so-called status dropout rate (250)); the proportion is higher among Hispan-

¹⁰To make this Report more accessible to the lay reader and for other reasons, OTA has chosen to use the term **accidental injury** in this Report. The term preferred by those in the injury prevention community, however, is unintentional injury (e.g., 184). Those who prefer the term unintentional injury believe that the term accidental injury implies that injuries cannot be prevented, whereas the term unintentional injury implies that while an individual may not have consciously intended to hurt him or herself, some action taken or not taken may have prevented the injury. Perhaps to overstate this perspective somewhat, all injuries are thus avoidable. The position that true 'accidents' do not occur (that is, by chance, entirely without cause) correctly brings attention to injuries as a public health problem to which additional preventive interventions can and should be applied, but it seems to be unprovable. Use of the term "unintentional" also may have the unfortunate effect of placing the onus of causation (and responsibility for precautions) exclusively on the person who is injured, although in fact unintentional injuries may be caused, although unintentionally, by persons, organizations, or systems other than the victim.

¹¹The balance between injury-related deaths (often called 'external' causes) and deaths resulting from 'natural' causes changes over the life span. (It has also changed over time (288).) For Americans ages 1 to 4, "natural" causes of death (28.5 per 100,000 population in 1985) are somewhat greater than "external" causes of death (23.0 per 100,000 population in 1985) (288); by ages 5 through 9, "external" causes (13.0 per 100,000 population in 1985) begin to account for slightly more deaths than "natural" causes (1.8 per 100,000 population in 1985) (288). In the age group 10 to 14, the ratio of "external" to "natural" causes of death is greater (16.5 deaths per 100,000 population for "external" causes v. 11.4 deaths per 100,000 population for "natural" causes, in 1985), and by ages 15 to 19, "external" causes of death (63.5 deaths per 100,000 population) clearly predominate over "natural" causes (17.7 deaths per 100,000 population (288). (In the analysis relied on for the foregoing comparisons, "external" causes of death include those from motor vehicle injuries, fire and flames, drownings, homicide and suicide; "natural" causes of death include those from malignant neoplasms (cancer), congenital anomalies, and heart disease (288).) In contrast, the leading causes of death for persons ages 25 to 64 are cancer (133 deaths per 100,000 population in 1987) and coronary heart disease (135 deaths per 100,000 population in 1987), followed by accidental injuries (approximately 30 deaths per 100,000 population in 1987), stroke (approximately 22 deaths per 100,000 population in 1987), and suicide (approximately 20 deaths per 100,000 population in 1987) (260); for persons 65 and over, heart disease, cancer, stroke, chronic obstructive lung disease, and pneumonia and influenza predominate (289).

Figure 4-Trends in Death Rates for the Five Leading Causes of Death Among U.S. Adolescents
Ages 10 to 14 and Ages 15 to 19, 1970-87



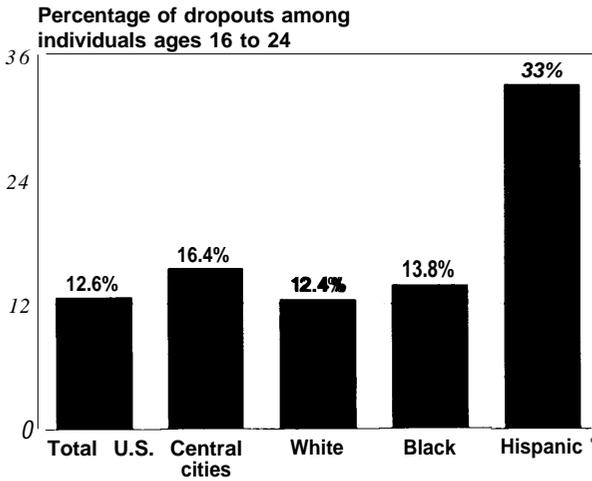
SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States 1970, Vol. II—Mortality* (Washington, DC: U.S. Government Printing Office, 1974); U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States 1975, Vol. II—Mortality* (Washington, DC: U.S. Government Printing Office, 1979); U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States 1980, Vol. II—Mortality*, Pub. No. (PHS) 85-1101 (Washington, DC: U.S. Government Printing Office, 1985); U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, *Vital Statistics of the United States 1985, Vol. II—Mortality*, Pub. No. (PHS) 88-1102 (Washington, DC: U.S. Government Printing Office, 1987); and U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, unpublished 1987 mortality data, Hyattsville, MD, 1990.

ics, blacks, and persons living in central cities (see figure 5).¹² According to one observer, high dropout rates are one indication of the failure of schools to meet their students' educational or social growth needs (74). Adolescents drop out of school for a variety of reasons—boredom or academic failure, health problems (e.g., mental health problems, sub-

stance abuse problems, pregnancy), and family financial or other problems. Whatever their reasons for their dropping out, however, adolescents who do not complete high school will likely be unable to realize their potential in the U.S. labor force and are likely to be at increased risk for a wide variety of health, economic, and social problems (e.g., underemployment, un-

¹²It is important to note that calculations of successful school completion (and conversely, school problems) are highly dependent on the definition used, the data source, and the level of detail to which the data are pursued. Shown here is the average proportion of those individuals ages 16 to 24 living in households (and thus responding to the household-based Current Population Survey) who have not completed high school (including the completion of the general educational development (GED) test). However, if the same data source is used but high school graduates as a proportion of 17-year-olds in the population is used as the indicator of successful school completion then an average of only 74 percent of 17-year-olds have successfully completed high school (249). Another indication is the graduation rate defined as the percentage of 9th graders who have graduated 4 years later (71.2 percent in 1989 (250a)). Graduation rates differ considerably by State and, within States, by school district and race, ethnicity, and socioeconomic status of the school population (e.g., 29; and see ch. 4 in Vol. II, "Schools and Discretionary Time"). However, all sources are consistent in that school problems tend to be more prevalent among Hispanic, black, and central city adolescents.

Figure 5-High School Dropout Rates in the United States, 1989^a



Dropout rates shown in this figure are status dropout rates (the proportion of individuals of a specified age who are not enrolled in school and have not finished high school at any given point in time) among individuals ages 16 to 24 as of October 1989.

^aThe data on which this figure is based are Current Population Survey data from the U.S. Department of Commerce, Bureau of the Census.

^cHispanics may be of any race.

SOURCE: Office of Technology Assessment, 1991, based on U.S. Department of Education, Office of Education Research and Improvement, National Center for Education Statistics, *Dropout Rates in the United States*, NCES 90-659 (Washington, DC: September 1990).

employment, welfare dependency, and homelessness) (79).¹³

- Lack of recreational opportunities--Opportunities for adolescents to engage in recreational or other activities that are attractive, satisfying, conducive to health, and acceptable to the adult community during their discretionary (nonschool) time are often perceived by adolescents and other informed observers to be inadequate.
- Chronic physical illnesses--Many adolescents experience acute physical problems, such as acute respiratory illnesses, which are the leading cause of school-loss days, but an estimated 5 to 10 percent of adolescents experience a serious chronic physical condition, for example, hay fever or allergic rhinitis without asthma (9.1 percent of adolescents), chronic sinusitis (9.0 percent), asthma (5.8 percent), a "deforming or orthopedic impairment" (5.4 percent), chronic bronchitis (3.9 percent), migraine headaches (2.9 percent), heart disease (2.2 percent), hearing impairments (2.1 percent), and visual impairments (1.9 percent)¹⁴ (291).¹⁵ Another indication of the prevalence of serious chronic conditions among adolescents, but which includes emotional disorders, is the finding that approximately 5 percent of 10- to 18-year-olds in 1988 had a limitation in a major activity (i.e., were not able to attend school¹⁶)

¹³OTA did not consider how adolescents' involvement in work affects their health. According to the W.T. Grant Foundation, about one-third of all high school students hold part-time jobs in any given week, and three-quarters of all high school seniors work an average of 16 to 20 hours a week (79). Some evidence suggests that the income (and, perhaps, peer and adult associations) associated with work are a risk factor for illicit drug use (64,80, 135,182,197). On the other hand, the opportunity for adolescents to participate in work or other constructive activity may have positive effects on adolescents' health such as increased self-esteem resulting from the gaining of competency.

¹⁴These most prevalent conditions are not necessarily the causes of the major limitations inactivity noted below; the calculations of activity limitations and prevalence of conditions were done separately (291). Further, the fact that the National Health Interview Survey sample of adolescents is so small (and the fact that the sample is drawn solely from the noninstitutionalized population) means that the extent of lower prevalence of very serious chronic conditions such as muscular dystrophy, Down's syndrome, cystic fibrosis, hemophilia seizure disorders, autism, and arthritis is not known. Another important point is that drawing the information from an informant rather than from the adolescents themselves may limit the reporting of some conditions. Further details on the prevalence of chronic physical conditions, and discussions of variations in definitions of chronic and serious, can be found in ch. 6, "Chronic Physical Illnesses: Prevention and Services," in Vol. II.

¹⁵Gortmaker and Sappenfield's comprehensive review can also be used to support the estimate of 5 to 10 percent prevalence in chronic problems, but also with the caveat that the conditions included in the Gortmaker and Sappenfield review varied in severity (78). Based on a variety of sources, Gortmaker and Sappenfield calculated that 13.3 percent of individuals ages 0 to 20 had a chronic condition, with the most prevalent conditions being asthma (3.8 percent; 1 percent of which was moderate to severe), visual impairments (3 percent), mental retardation (2.5 percent), and hearing impairments (1.6 percent) (78). If, as Gortmaker and Sappenfield estimated, 90 percent of the individuals with a chronic disorder survived until age 20, and assuming that all chronic disorders listed by Gortmaker and Sappenfield persisted into adolescence, 12 percent of 19-year-olds would have a chronic disorder. Assuming that asthma is not as severe a problem for adolescents as for younger children (and to make a rough adjustment, excluding the 1.8 percent of asthma that is not moderate to severe), and excluding mental retardation (2.5 percent of 0- to 20-year-olds), autism (0.04 percent), and Down's syndrome (0.1 percent) from the total (in order to be comparable to OTA's estimate based on National Health Interview Survey data and because children and adolescents with such disorders are served by a distinct service system), would reduce the proportion of adolescents with a chronic physical condition to approximately 8 percent. Perhaps not all of these conditions would be considered "serious" under the conventional definition. Conditions are typically deemed serious if they result in a limitation in a major activity.

¹⁶In surveys such as the National Health Interview survey, persons are classified in terms of the major activity usually associated with their age group; attending school is considered the major activity for the age group 5 to 17. Persons are not classified as having a limitation in a major activity unless one or more chronic condition is reported as the cause of the activity limitation (286).

due to a chronic condition (291). However, fewer than 1 percent were *completely* unable to carry on a major activity (291).

Two problems that may not be considered serious in and of themselves, but are of concern to many adolescents, are acne and menstrual distress (dysmenorrhea). About 9 percent of adolescents experience serious, chronic acne (291), and perhaps 50 percent of female adolescents have missed school or work because of menstrual distress (100,331). These problems are noteworthy because they suggest a wide gulf between what adolescents and what adults feel are important issues to be addressed by the health service delivery system.

- Nutrition and fitness problems—Adolescent-specific data on nutrition and fitness, aside from average nutrient intake information, are limited, but if one accepts the conventional wisdom concerning nutrition and fitness needs, it appears that many adolescents experience some nutritional or fitness problem (usually mineral deficiencies, imbalanced diets, or overweight or obesity). According to data from a variety of sources, female adolescents are especially prone to nutritional deficiencies. Those female adolescents who are pregnant (e.g., 275) or athletes are particularly prone to nutritional problems. National information on the nutritional and fitness problems of poor adolescents and of many racial and ethnic minority adolescents is not available.
- Dental and oral health problems--Adolescence is a pivotal period with respect to oral and dental health, in part because of the physical changes of adolescence and in part because of the transition from childhood to increasing personal responsibility for oral hygiene. Some adolescents do not have access to fluoridated water supplies or are unable to afford regular dental care, and for these adolescents and others (e.g., those with rampant caries), dental caries remains a significant problem. In addition, many U.S. adolescents need moderate treatment for gum disease, and some groups of adolescents (e.g., American Indians) have more serious periodontal problems.
- Acquired immunodeficiency syndrome (AIDS) and other sexually transmitted diseases (STDs)—Many U.S. adolescents are sexually active and at risk for problems associated with involvement in unprotected sexual intercourse.¹⁸ In 1988, more than half of 15- to 19-year-olds reported having had sexual intercourse in the last 3 months (68), but only 22 percent of sexually active female adolescents ages 15 to 19 reported current use of condoms (141). Condoms are the only known protection against AIDS, human immunodeficiency virus (HIV) infection and STDs for the sexually active. Recent data from the Centers for Disease Control suggests that, in 1989, 30 percent of newly reported gonorrhea cases, and 10 percent of newly reported syphilis cases in the United States occurred among 10- to 19-year-olds (12). The percentages of U.S. adolescents estimated to have specific STDs vary, depending on the disease and population on which the data are based (see figure 6).
- Pregnancy and parenting—About 1 million U.S. adolescents become pregnant each year; about half of these adolescents obtain abortions, and about half of them give birth (see figure 7). U.S. adolescents are having children out of wedlock at dramatically higher rates than in the past. About 65 percent of births to U.S. adolescents in 1988 were out-of-wedlock births (294). Adolescent mothers and their infants are



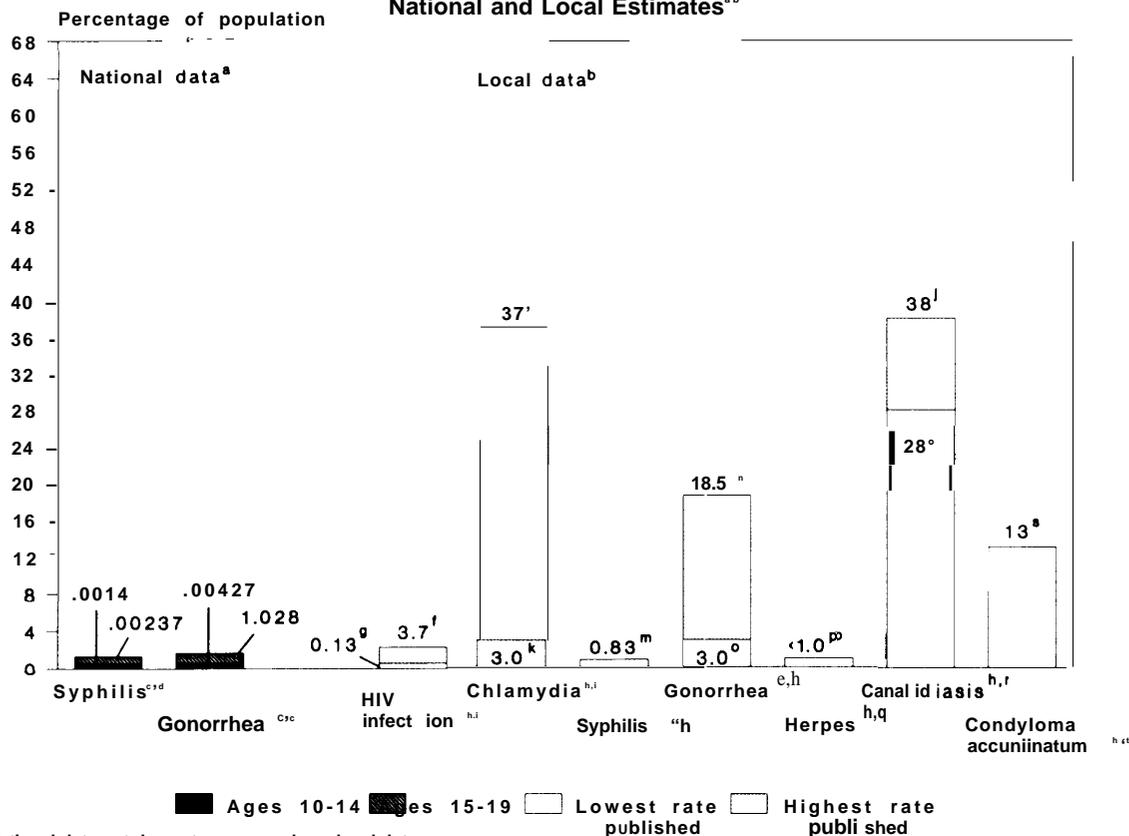
Photo credit: March of Dimes Birth Defects Foundation

About half a million U.S. adolescents give birth every year.

¹⁷By the end of adolescence, for example, two out of five American Indian dental patients have destructive periodontal disease with bone loss (295).

¹⁸Unprotected sexual intercourse refers to sexual intercourse without the use of condoms to prevent the transmission of AIDS and STDs and without the use of contraception to prevent pregnancy.

Figure 6--U.S. Adolescents With HIV Infection or Sexually Transmitted Diseases (STDs): National and Local Estimates^{a,b}



NOTE: National data not drawn to same scale as local data.

^aThe Centers for Disease Control (CDC) in the U.S. Department of Health and Human Services collects national data on syphilis and gonorrhea, but national data on other STDs are not available. CDC recommends that States report particular STDs, but has no authority to require such reporting (48,274). Thus, there is no uniformity in State reporting requirements for STDs. Even in the States that do report STDs, there are incomplete reporting requirements for STDs, differences in reporting by public and private health sources, and limitations in the specificity of diagnostic tests (17,123).

^bLocal data are obtained from different studies using varying sample sizes. The studies and selected pertinent details of each study are listed in footnotes below.

^cThis is a population incidence rate, which is the measure of the number of new cases of a particular disease or condition occurring in a population during a given period of time.

^dSyphilis is caused by the bacterium *Treponema pallidum*.

^eGonorrhea is caused by the bacterium *Neisseria gonorrhoeae*.

^fThis figure is from a study conducted on 510 runaway and homeless youth, age 18 or under, who were residing in Covenant House in New York City in 1987-88 (200).

^gThis figure is from a study conducted on 12,344 adolescent mothers (age 18 or under) of newborns, who were age 20 or less, in upstate New York in 1987-88 (162). The same study tested 12,871 adolescent mothers (age 18 or under) of newborns in New York City and found a clinical prevalence percentage of 0.72.

^hThis is a clinical prevalence rate, which is a measure of the number of individuals in a given clinical population who have a specific disease or other condition at a designated time (or during a particular period).

ⁱHIV (human immunodeficiency virus) is the virus associated with acquired immunodeficiency syndrome (AIDS).

^jThis figure is from a study conducted on 115 low-income, pregnant, predominantly black females, ages 13 to 19, who were receiving prenatal care in the Johns Hopkins Adolescent Pregnancy Program (69).

^kThese data are from a study conducted on 948 sexually active asymptomatic adolescent males, ages 13 to 19, who were attending teen or detention clinics in San Francisco, CA (188).

^lChlamydia infection (formal name, "nongonococcal urethritis") is caused by the bacterium *Chlamydia trachomatis*.

^mThis figure is from a study conducted on 2,521 adolescent males and females, ages 9 to 18, who were in the New York City Juvenile Detention Center (4).

ⁿThis figure is from a study conducted on 567 adolescent males and females who were visiting the Adolescent and Young Adult Clinic of the Children's National Medical Center in Washington, DC (45).

^oThis figure is from a study conducted on 100 low- and middle-income, sexually active, adolescent females from urban areas, who were attending the Adolescent Clinic of the Children's Hospital Medical Center in Cincinnati, OH (185).

^pThis figure is from a study conducted on 376 inner-city, low-income females, ages 12 to 18, who were seeking contraceptive counseling at the Teen Access Clinic in Birmingham, AL (163).

^qHerpes is caused by the herpes simplex virus (HSV).

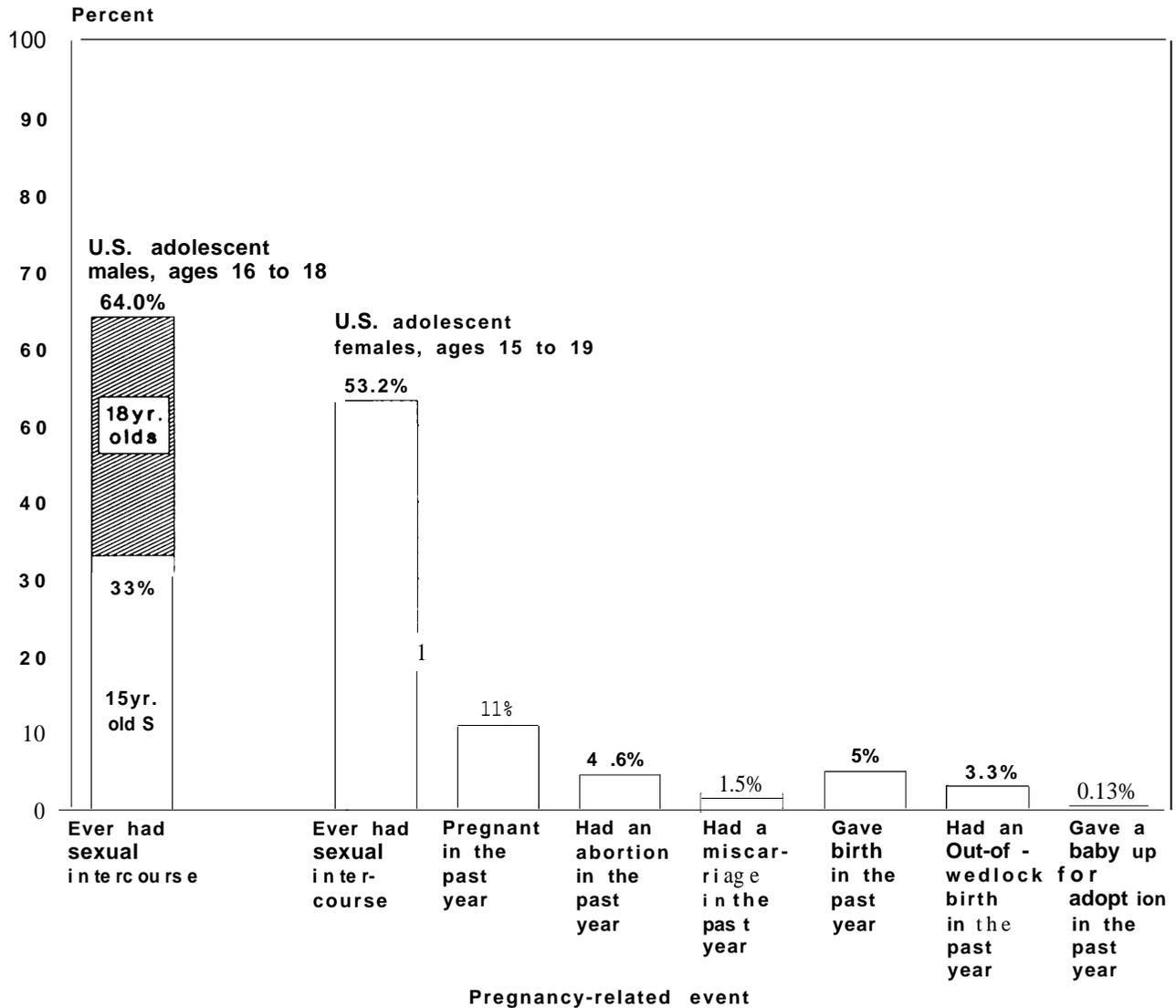
^rCandidiasis is caused by the bacterium *Candida albicans*.

^sThis figure is from a study conducted on 89 low-income, sexually active, primarily black females, ages 13 to 19, who were attending an adolescent clinic of the University of Maryland Hospital in Baltimore, MD (128).

^tCondyloma acuminatum is caused by human papillomavirus.

SOURCE: Office of Technology Assessment, 1991, based on the sources noted above.

Figure 7-Overview of U.S. Adolescent Pregnancy and Parenting*



*Percent of sexual intercourse, pregnancies, and out-of-wedlock births were tabulated from 1988 data. Percentages of abortions, miscarriages, and births were tabulated from 1984 data. Percentages of adoptions were tabulated from 1982 data.

SOURCE: Office of Technology Assessment, 1991, based on data from the following sources: Adolescent males ever had sexual intercourse: F.L. Sonnestein, J.H. Plock, and L.C. Ku, "Patterns of Sexual Activity Among Adolescent Males," paper presented at the annual meeting of the Population Association of America, Toronto, Canada, May 1990. Adolescent females ever had sexual intercourse: J.D. Forrest and S. Singh, "The Sexual and Reproductive Behavior of American Women, 1982-1988," *Family Planning Perspectives* 22(5) 220S214, 1990. Pregnant in the past year: U.S. Congress, Congressional Budget Office, *Sources of Support for Adolescent Mothers* (Washington, DC: September 1990). Had an out-of-wedlock birth in the past year: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Health Statistics, Division of Vital Statistics, "Advance Report of Final Natality Statistics, 1988," *Monthly Vital Statistics Report* 39 (No. 4, suppl.), DHHS Pub. No. (PHS) 901120 (Hyattsville, MD: Aug. 15, 1990). All others: National Academy of Sciences, National Research Council, Commission of Behavioral and Social Sciences and Education Committee on Child Development Research and Public Policy, Panel on Adolescent Pregnancy and Childbearing, *Risking the Future: Adolescent Sexuality, Pregnancy and Childbearing, Vol. 1*, C.D. Hayes (ad.) (Washington, DC: National Academy Press, 1987).

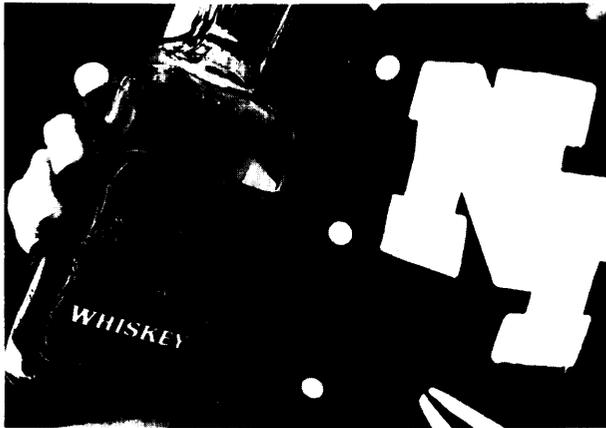


Photo credit: Education Week

Adolescents at one forum expressed their belief that alcohol use is the most prevalent drug problem among U.S. students. This belief is supported by national survey data.

typically in need of substantial services, ranging from child care to housing.

- Mental health problems--According to a survey of Minnesota students, an average of one-quarter of adolescents report being ‘sad, discouraged, and hopeless,’ experiencing extreme stresses and strains, dissatisfied with their personal lives, or “tired, worn out, exhausted” (209). A national survey of 8th and 10th graders found that 34 percent of female students and 15 percent of male students reported feeling ‘sad and hopeless’ during the month before the survey; 21 percent of female students and 11 percent of male students reported that it is “very hard for them to deal with stressful situations at home and at school; and 18 percent of female students and 9 percent of male students reported that they often felt that they had nothing to look forward to (10). Diagnosable mental disorders,¹⁹ ranging from anxiety and depression to schizophrenia (but

primarily including conduct disorders), are experienced by 18 to 22 percent of adolescents (e.g., 43). In 1987, 15 percent of 10th graders reported having made a suicide attempt (10). Although many adolescents with mental health problems do not get treatment, psychiatric hospitalizations of adolescents have recently been increasing (26,326).

- Alcohol, tobacco, and illicit drug abuse²⁰-The consumption of alcohol places adolescents at risk of immediate health problems (e.g., motor vehicle accidents) (315). In recent surveys of U.S. students, about one-third reported that they had had five or more alcoholic drinks on at least one occasion in the previous 2 weeks (10,252). Adolescent participants at one forum expressed their belief that alcohol use is the most prevalent drug problem among U.S. students (7), and that belief is supported by data from a 1988 household survey on drug abuse conducted by the National Institute on Drug Abuse in DHHS (see figure 8) (263).²¹

Nicotine, most commonly in the form of cigarettes, is used by a substantial number of U.S. adolescents. The 1988 household survey conducted by the National Institute on Drug Abuse found that 11.8 percent of 12- to 17-year-olds living at home had smoked cigarettes in the last month (see figure 8). It has been well documented that cigarette smoking over time places individuals at risk for lung cancer and other life-threatening health problems later in life. The use of smokeless tobacco also has significant health consequences (296), but national surveys such as the household survey conducted by the National Institute on Drug Abuse do not request information about smokeless tobacco use.²²

The use of illicit drugs such as marijuana, cocaine, inhalants, hallucinogens, heroin, or

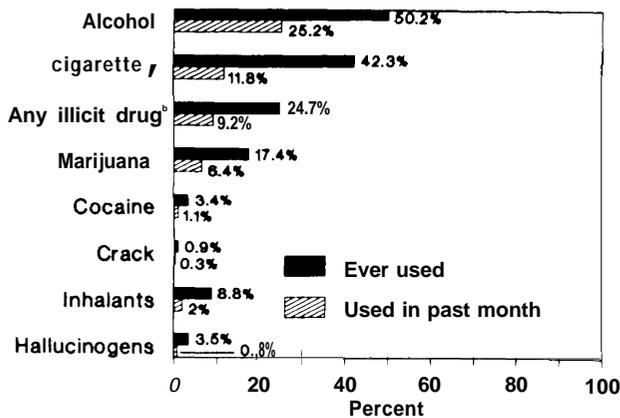
¹⁹Diagnosable mental disorders are disorders included in the American Psychiatric Association’s *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised, commonly known as *DSM-III-R* (9).

²⁰What constitutes adolescent substance abuse---any use at all or “problem” use—is a matter of controversy. The Office of Substance Abuse Prevention in DHHS is of the view that any psychoactive substance use by adolescents should be prevented (272). The American Psychiatric Association distinguishes between substance use, substance abuse, and substance dependence but these categories apply primarily to adults (9). These distinctions, and laws prohibiting the sale of alcohol to adolescents in all States, and tobacco to adolescents in many States (see ch. 12, “Alcohol, Tobacco, and Drug Use: Prevention and Services,” in Vol. II), also lead to other concerns about terminology. In this Report, OTA uses the terms “illicit” or “illegal” drugs to characterize only those substances that it is illegal for U.S. individuals of all ages to use (e.g., cocaine, marijuana).

²¹The household survey on drug abuse conducted by the National Institute on Drug Abuse sampled about 3,000 12- to 17-year-olds living at home. Homeless and institutionalized adolescents have not been systematically surveyed, Local surveys and clinical experience have found that adolescents who are homeless or institutionalized typically have higher rates of psychoactive substance use than do adolescents living at home.

²²The one-time National Adolescent School Health Survey found that an average of 4.4 percent of 10th grade males used smokeless tobacco daily (10).

Figure 8-Overview of U.S. Adolescents' Use of Alcohol, Cigarettes, and Illicit Drugs, 1988^a



^aData are from the 1988 Household Survey on Drug Abuse conducted by the National Institute on Drug Abuse (NIDA) for 12-to 17-year olds. The NIDA Household Survey on Drug Abuse measures the prevalence of drug use among the American household population age 12 and over and therefore does not include homeless or institutionalized adolescents. The sample of adolescents in the 1988 NIDA survey was quite small (3,095 in 1988, including 747 blacks, 763 Hispanics, and 67 other nonwhites).
^bAny illicit drug includes marijuana, inhalants, cocaine, hallucinogens, heroin, and nonmedical uses of psychotherapeutics.

SOURCE: Office of Technology Assessment. 1991. based on data from U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, 1988 *National Household Survey on Drug Abuse* (Rockville, MD: 1989).

nonprescription use of psychotherapeutics (sedatives, tranquilizers, stimulants, or analgesics) appears to be far less common among U.S. adolescents living at home than the use of alcohol or tobacco (see figure 8). The problems that illicit substances pose for the adolescents who abuse or sell them, however, can be substantial.

- Delinquency- In 1988, there were 1.6 million arrests of adolescents (301), and in 1987, about 700,000 adolescents were confined to public or private juvenile justice facilities (306,308). In recent years, the number of U.S. adolescents confined to public and private juvenile facilities for delinquent acts²³ has been **increasing** (305,306). Most of the increase has apparently been due to an increase in the number of

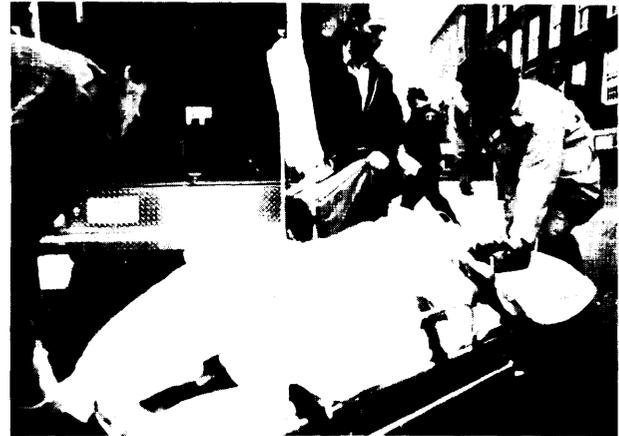


Photo credit: Benjamin Smith, Washington, DC

U.S. adolescents are more likely to be victims of violent crimes than individuals from other age groups.

adolescents confined for minor offenses²⁴ (including status offenses²⁵) rather than serious offenses (306,310).²⁶ 27 Adolescents confined to public juvenile justice facilities are disproportionately black males (310). Many adolescents confined in juvenile justice facilities have serious health problems upon entering the facilities and have been found to lack adequate health care while incarcerated.

It is important to note that adolescents (especially black and male adolescents) in this country are more likely to be victims of violent crimes than individuals from other age groups (see figure 9). Violence by adolescents and by individuals from other age groups is a major cause of injury and death among young people (307).

- Hopelessness-Some adolescents are homeless, either with their families or on their own. In 1984, DHHS estimated (on the basis of 1976 data) that there are as many as 1 million homeless and runaway adolescents each year (256). Homeless and runaway adolescents are

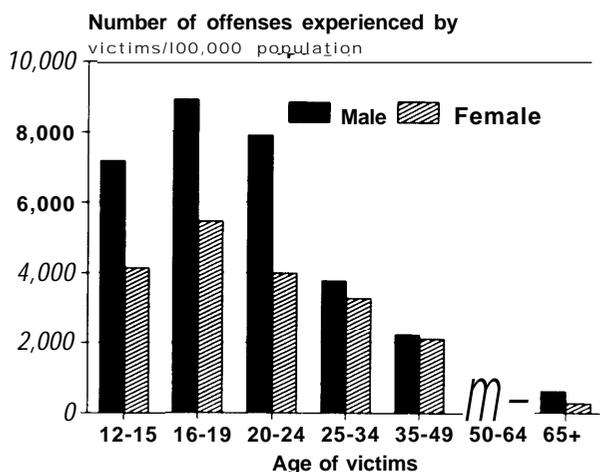
²³Delinquent acts are acts that are committed by minors that would be considered crimes if committed by an adult or are offenses only because they are committed by minors (e.g., truancy, running away from home)

²⁴Minor offenses are Federal Bureau of Investigation Part II offenses, which include acts that would be crimes if committed by adults (e.g., drug abuse violations, weapons violations, assaults without weapons, disorderly conduct, and driving under the influence) and status offenses (299).

²⁵Status offenses are offenses that are considered offenses only because they are committed by a person under the age of majority (e.g., running away from home, truancy)

²⁶Serious offenses are Federal Bureau of Investigation Part I offenses and include specified violent offenses (murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault) and specified property offenses (burglary, larceny theft, motor vehicle theft, and arson).

²⁷In 1989, the number of adolescents held in public facilities for serious violent offenses increased for the first time since 1983 (311).

Figure 9-Victimization Rates^a for Rape, Robbery, and Assault by Age and Sex, 1988

^aThe victimization rate is the number of offenses experienced by a given population per some population base during a given time period.

SOURCE: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, *Criminal Victimization in the United States, 1988* (Washington, DC: forthcoming).

at increased risk for a wide variety of mental and physical health problems.

Further information on the prevalence of selected health problems and an indication of which adolescents are most at risk are summarized in appendix B, "Burden of Health Problems Among U.S. Adolescents," in Volume III of this Report.

Not all of the news is bad. One positive change is the decline since 1970 in accidental injury death rates among U.S. adolescents, for reasons that may include successful prevention efforts such as increased use of safety belts, safer car construction, and designated driver programs (158). Death rates for some other serious physical health problems (e.g., some types of cancer and major cardiovascular disease, as shown in figure 4) have decreased, largely as a consequence of medical advances. Also, water fluoridation efforts have dramatically reduced the prevalence of dental caries among the U.S. adolescent population in the last decade (112). Pregnancy rates for sexually active U.S. adolescents ages 15 to 19 declined between 1970 and 1985 suggesting that at least some sexually active adoles-

cents are making effective use of contraceptives.²⁸ The percentage of U.S. adolescents living at home and in school who report using illicit drugs has recently decreased (252,263). Arrest rates for serious violent and serious property offenses in the aggregate among individuals under age 18 have been declining since the mid-1970s.

Nonetheless, the prevalence of health problems among U.S. adolescents is disturbingly high, and many health problems have been shown to be costly in both human and economic terms. Available information concerning the cost of various adolescent health problems is limited, but some of the figures that have been cited are shown in box B.

Which Adolescents Experience the Worst Problems?

The burden of health problems is not borne equally by all U.S. adolescents, as shown in appendix B, "Burden of Health Problems Among U.S. Adolescents," in Volume III. Nationally aggregated data for all adolescents obscure important age, sex, race, and income-related differences in the extent of specific problems. Unfortunately, reliable population-based information about the health status of adolescents from specific age, racial, ethnic, socioeconomic, regional, and residential groups is generally not available.²⁹ Most available information on adolescents focuses on older adolescents rather than younger ones.

Age Differences in Selected Adolescent Health Problems

As a general matter, older adolescents (roughly ages 15 to 18) are more likely than younger adolescents (ages 10 to 14) to experience health problems. The implications when a young adolescent experiences a health problem such as drug use or pregnancy, however, may be much more serious than the implications when an older adolescent experiences such a problem.

- Older adolescents (15- to 18-year-olds) are more likely than younger adolescents (10- to 14-year-olds) to be reported to be limited in a

²⁸There appeared to be an increase between 1985 and 1987, however (see "Specific Findings and Policy options," below). Problems in estimating adolescent pregnancies are discussed in ch. 10, "Pregnancy and Parenting: Prevention and Services," in Vol. II.

²⁹Age, sex, race, and income differences do not in themselves explain why certain adolescents are at high risk of certain problems.



Photo credit: Jonathan Roberts

The implications when a young adolescent experiences a health problem may be much more serious than the implications when an older adolescent experiences the same problem.

major activity³⁰ due to my chronic³¹ condition (5.3 percent v. 4.4 percent), to have a chronic orthopedic impairment (7.1 percent v. 3.9 percent), to have chronic sinusitis (9.7 percent v. 8.3 percent), to have acne (9.3 percent v. 3.5 percent), and to have a disease of the female genital organs (1.3 percent v. prevalence so low

as to be undetectable among younger adolescents by the National Health Interview Survey conducted by DHHS).

- Younger adolescents (10- to 14-year-olds) are more likely than older adolescents (15- to 18-year-olds) to be reported to have chronic asthma (6.2 percent v. 5.4 percent), heart murmurs (2 percent v. 1.3 percent), and speech impairments (1.1 percent v. prevalence so low as to be undetectable in the National Health Interview Survey) (291).³²

Gender Differences in Selected Adolescent Health Problems

- Female adolescents are reported to experience more days of restricted activity³³ due to acute conditions³⁴ than adolescent males (770.7 days per 10015- to 18-year-old adolescent females; 664.7 days per 10010- to 14-year-old females; 629.2 days per 10010- to 14-year-old adolescent males; and 580.6 days per 100 15-to 18-year-old adolescent males). These differences are due in part to pregnancy-related conditions, but there are also more reported days of restricted activity among females due to respiratory conditions (291).
- Male adolescents are reported to experience more days of restricted activity due to acute injuries than females (133.5 days per 100 adolescent males v. 104.9 days per 100 adolescent females), and are more likely to be reported to be limited in carrying on a major activity due to a chronic condition (5.4 percent of males v. 4.3 percent of females)³⁵ (291).

³⁰Includes physical conditions and mental (including emotional and behavioral) disorders.

³¹For purposes of the National Health Interview Survey, a condition is considered "chronic" if: 1) the respondent indicates it was first noticed more than 3 months before the reference date of the interview and it exists at the time of the interview, or 2) it is a type of condition that ordinarily has a duration of more than 3 months. Examples of conditions that are considered chronic regardless of their time of onset are diabetes, heart conditions, emphysema, and arthritis (286).

³²Differences were not tested for statistical significance.

³³In general, the National Center for Health Statistics defines a "restricted activity day" as one of the following four types of days in which a person's activity is restricted: 1) a *bed day*, during which a person stayed in bed more than half a day because of illness or injury or was in a hospital as an inpatient; 2) a *work-loss day*, during which a currently employed person 18 years of age and over missed more than half a day from a job or business; 3) a *school-loss day*, during which a student 5- to 17-years-old missed more than half a day from the school in which he or she was currently enrolled; and 4) a *cut-down day*, during which a person cuts down for more than half a day on the things he or she usually does. Work-loss, school-loss, and cut-down days refer to the short-term effects of illness or injury. Bed days are a measure of both long- or short-term disability, however, because a chronically ill bedridden person and a person with a cold could both report having spent more than half a day in bed due to an illness. It may be important to note that national surveys often rely on proxy respondents (e.g., parents, guardians) for individuals under age 17.

³⁴For purposes of the National Health Interview Survey, a condition is considered "acute" if: 1) it was first noticed no longer than 3 months before the reference date of the interview, and 2) it is not one of the conditions considered chronic regardless of the time of onset. However, any acute condition not associated with either at least one doctor visit or at least 1 day of restricted activity is considered to be of minor consequence and is excluded from the final data produced by the survey (28.5).

³⁵Reasons for not being able to carry on a major activity were not distinguished between physical conditions and mental (including emotional and behavioral) disorders.

Box B—Economic Costs of Selected Adolescent Health Problems

Available information on the economic costs of adolescent health problems in the United States is presented below. The information is incomplete but clearly demonstrates that the societal costs of adolescents' health problems are not insignificant. A deeper understanding of the full cost impact of adolescent health problems on the health care system and on society as a whole is impeded by data limitations.

The cost estimates presented below are expressed solely in monetary terms. Some costs (e.g., years of healthy life lost) are difficult to measure in terms of dollars. Alternative strategies that might be considered by policymakers were discussed in a 1980 OTA report on cost-effectiveness analysis (219).

Estimated Costs of Selected Adolescent Health Problems

<i>Health problem</i>	<i>Estimated cost and source</i>	<i>Important notes</i>
• Injuries	\$39.4 billion in lifetime costs associated with injuries sustained in 1985 by 12.5 million adolescents and young adults ages 15 to 24 ¹	Applies to individuals ages 15 to 24. Data not available for adolescents ages 10 to 18.
• Severe and chronic mental, emotional, and physical disabilities	\$3.9 billion in health care costs (1986 dollars) ³	Applies to <i>all</i> individuals under age 21, not just to adolescents ages 10 to 18.
• Families begun when parents were adolescents	\$16.65 billion in public costs for Aid to Families With Dependent Children (AFDC), Medicaid, and food stamps (1985 costs) ⁴	Note this is 1 year's estimated costs for <i>all</i> families begun when parents were adolescents, not just costs for adolescent-headed families in 1 year.
• Mental health problems	\$3.5 billion in treatment costs for adolescents ages 10 to 18 in 1986 ⁵	These are direct costs for <i>treatment provided only</i> . ⁶
• Delinquency	\$2 billion or more a year on confinement in public and private juvenile facilities for perhaps 700,000 adolescents. ⁷	<i>These data also</i> include juveniles under age 10, but these constitute a small fraction of the total.

Cost estimates for other problems experienced by adolescents, such as alcohol and substance abuse,⁸ AIDS or STDs, are not readily available.

Caveats

Primarily because of the limitations of available data, the costs noted above are not comparable. The costs are inconsistent regarding the entity that incurs the cost (e.g., society, the entire health care system, a specialty health care service system, publicly funded programs) and regarding the time during which the problems occurred (e.g., injuries sustained in 1985) or the costs were incurred (mental health treatment during 1986). The costs of injury, for example, reflect lifetime costs, while the costs of mental health treatment include only estimates of resources expended directly for the treatment of adolescents' mental health problems. Also, various ages are represented in the cost figures, from adolescents and young adults ages 15 to 24 (cost of injuries) to all individuals under age 21 (cost of disabilities).

The populations experiencing these problems may overlap (e.g., the costs of injuries includes adolescents with disabilities) or be excluded (e.g., the institutionalized population is not included in the estimates on disabilities) from the costs presented.

The **costs** of treatment and prevention noted above may not represent a level appropriate for adolescents' needs (26). Further, the appropriateness of the services represented in these costs is not evaluated here.

¹According to Rice and MacKenzie, lifetime costs associated with injuries represent the monetary burden on society of injury-related illness and premature death (179). The \$39.4 billion estimate shown here includes both direct costs (e.g., expenditures for hospital care, physician services, prescriptions, etc.) and indirect costs (e.g., long-term morbidity costs, such as reduced productivity, and costs associated with premature mortality, such as lost productivity) resulting from injuries sustained by individuals ages 15 to 24 in 1985 (129). Overall, adolescents and young

adults ages 15 to 24 accounted for 22 percent of the injuries and 25 percent of the total cost of injuries experienced by the total U.S. population in 1985. The estimate of lifetime costs was calculated by the authors using data from the National Health Interview Survey, the National Hospital Discharge Survey, the National Medical Care Utilization and Expenditure Survey, the National Mortality Detail File, the National Council on Compensation Insurance's Detailed Claim Information data base, and the National Nursing Home Survey. The authors did not differentiate between accidental injuries and intentional injuries (e.g., homicide or suicide).

²In 1986, the leading reported causes of disability among children and adolescents under age 21 (accounting for over half of reported disabilities in this group) were mental and nervous system disorders (7.3 per 1,000 children and adolescents under age 21); respiratory diseases (6.0 per 1,000), musculoskeletal and connective tissue diseases (4.3 per 1,000), and eye and ear diseases and disorders (3.7 per 1,000) (159).

³Newacheck and McManus arrived at this estimate using data on disabilities collected as part of the 1980 National Medical Care Utilization and Expenditure Survey, a household-based survey of the noninstitutionalized civilian population (159). Cost figures were adjusted by the authors up to 1986 levels using the medical care component of the Consumer Price Index. Because the survey's definition of disability included only those people with long-term limitation in usual activity, the "disabled" population represented in the survey may include a more severely disabled subset of the population with chronic conditions. The data are also limited by the small sample size (so that few children with low prevalence chronic conditions are represented in the sample) and by the timing of the sample (in that the data were collected in 1980-81 when more children were hospitalized, usually a more expensive treatment site).

⁴Burt's estimate includes direct payments to service providers, as well as the administrative costs of these three programs, but no indirect costs (such as morbidity and mortality due to maternal mortality among adolescents under age 15, low birthweight babies, loss of productivity associated with school dropouts, etc.). Also, the estimate does not include other services more likely to be used by families begun by an adolescent birth than by other families, such as publicly supported social services, housing, special educational services, and child protective services and foster care. To calculate the costs to AFDC and Medicaid, Burt used estimates for 1985 expenditures (including administrative expenditures) from the U.S. Budget, 1986. For estimates of food stamp expenditures, Burt used information from the Committee on Ways and Means, U.S. House of Representatives (27).

⁵Burns and Taube used data from the National Institute of Mental Health to calculate this estimate (see ch. 11, "Mental Health Problems: Prevention and Services," in Vol. II). Between 18 and 22 percent of U.S. adolescents have mental health problems requiring treatment; OTA estimates that perhaps 6 percent actually receive treatment.

⁶The total costs of adolescent mental health problems for society (including indirect costs, such as losses in productivity or the burden on public services) have not been quantified.

⁷Cost estimates of juveniles in facilities are calculated by the Department of Justice, Office of Juvenile Justice Delinquency Prevention (306).

⁸Although it is estimated that about 272,000 adolescents are treated over the course of a year for alcohol or substance abuse (267), there is no information on the type of treatment (e.g., residential v. outpatient) those adolescents receive or its duration which makes estimates of the total cost of these services for adolescents unreliable. (The costs of treatment are highly variable, with estimates ranging from \$15,000 to \$50,000 for medically intensive intermediate rehabilitation to \$1,000 to \$2,000 for low-intensity outpatient alcoholism programs to \$150 to \$300 for alcohol education programs [335].)

SOURCES: Office of Technology Assessment, 1991, compiled from data from the following sources: Injuries: D. Rice and MacKenzie & Associates, *Cost of Injury in the United States: A Report to Congress 1989* (San Francisco, CA: Institute for Health and Aging, University of California and the Injury Prevention Center, The Johns Hopkins University, 1989); W. Max, D.P. Rice, and E.J. MacKenzie, "The Lifetime Costs of Injury," *Inquiry* 27:332-343, Winter 1990. Disabilities: P. Newacheck and M. McManus, "Financing Health Care for Disabled Children," *Pediatrics* 81(3):385-394, March 1988. Pregnancy: M.R. Burt with F. Levy, "Estimates of Public Costs for Teenage Childbearing: A Review of Recent Studies and Estimates of 1985 Public Costs," in National Research Council, Commission on Behavioral and Social Sciences and Education, Committee on Child Development Research and Public Policy, Panel on Adolescent Pregnancy and Childbearing, *Volume II: Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing*, S.L. Hofferth and C.D. Hayes (eds.) (Washington, DC: National Academy Press, 1987). Mental health: B.J. Burns and C.A. Taube "Mental Health Services," contract paper prepared for the Office of Technology Assessment, U.S. Congress, Washington, DC, 1990. Delinquency: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention *Children in Custody, 1987*, prepared by B. Allen-Hagen (Washington, DC, 1988).

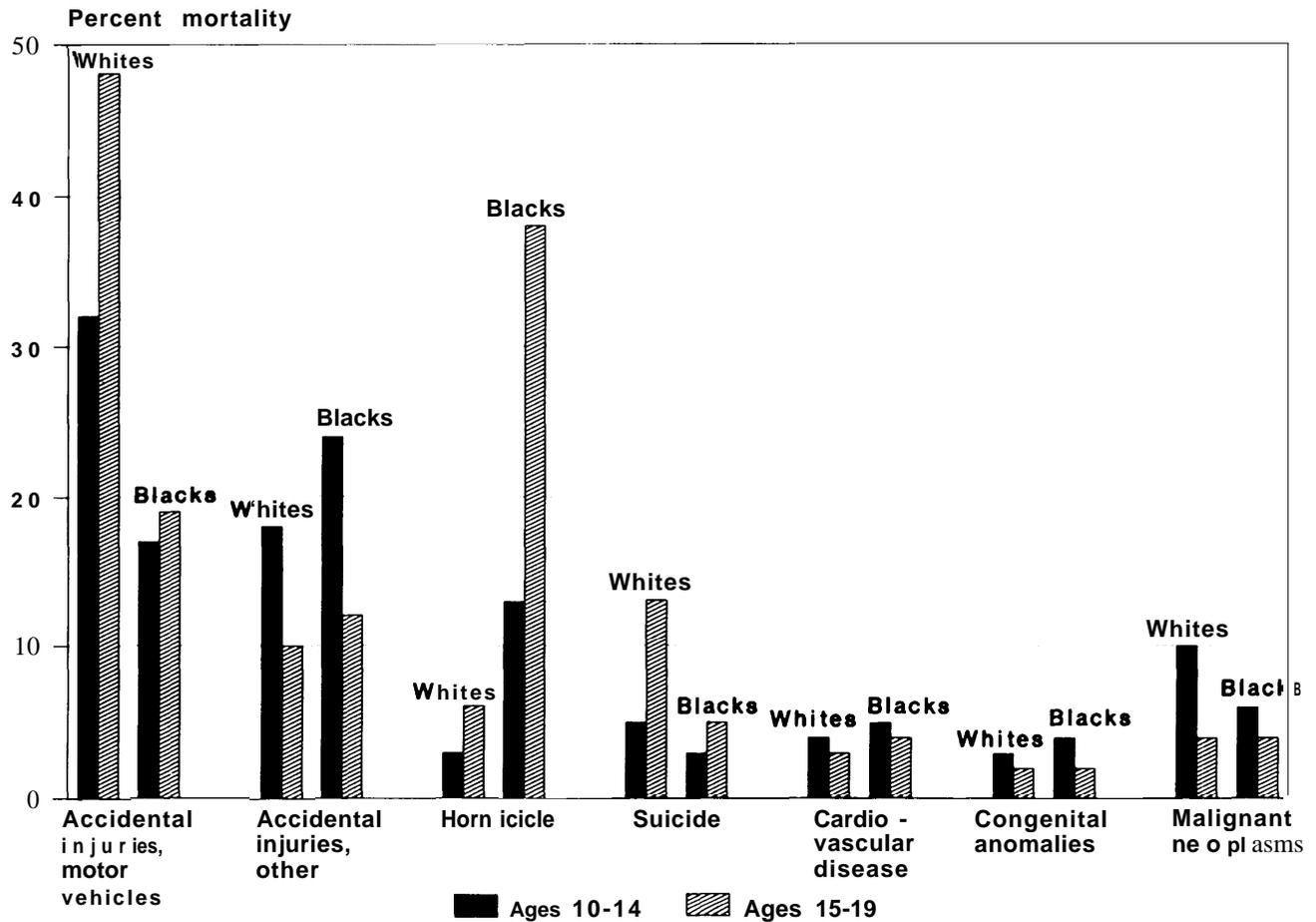
Female adolescents are obviously the only adolescents at risk of pregnancy. In addition, they are more likely than males to be the victims of rape or sexual abuse. They are also more likely to report subjective distress and to make suicide attempts than males. Male adolescents (especially older ones) are more likely than females to die as a result of accidental injuries, homicide, or suicide. Males are also more likely to be victims of robbery or assault (307).

Racial, Ethnic, and Socioeconomic Status Differences in Selected Adolescent Health Problems

There appear to be a number of racial and ethnic differences in health and related outcomes.

- White and black adolescents are about equal in being reported to be limited in a major activity due to a chronic condition (4.9 percent of white

Figure 10-Percent Mortality Due to Seven Leading Causes of Death for Black and White U.S. Adolescents Ages 10 to 14 and 15 to 19, 1987



SOURCE: Office of Technology Assessment, 1991, based on National Center for Education in Maternal and Child Health, Georgetown University, *The Health of America's Youth* (Washington, DC: September 1990).

adolescents and 5.1 percent of black adolescents), but white adolescents are more likely to be reported to incur school-loss days³⁶ as a result of an acute condition (399.9 days per 100 white adolescents v. 302.8 days per 100 black adolescents) (291).

- Black, Hispanic, and American Indian/Alaska Native adolescents drop out of high school at higher rates than other adolescents (34,74).
- Black male adolescents are in double jeopardy, being more likely than white males to die as a result of homicide (as shown in figure 10) and also more likely than white males to commit

violent crimes and be arrested and incarcerated for delinquent offenses (74).

- White male adolescents are more likely than black males or other adolescents to die from motor vehicle and certain other accidents and suicide (see figure 10).
- Black and Hispanic females have high adolescent pregnancy and birth rates (61,74,320); however, pregnancy rates of white adolescents have been increasing faster than those of black adolescents (146). In 1988, 0.5 percent of black 10- to 14-year-olds and 10.6 percent of black 15- to 19-year-olds gave birth, compared with 0.06 and 4.4 percent of white adolescents in

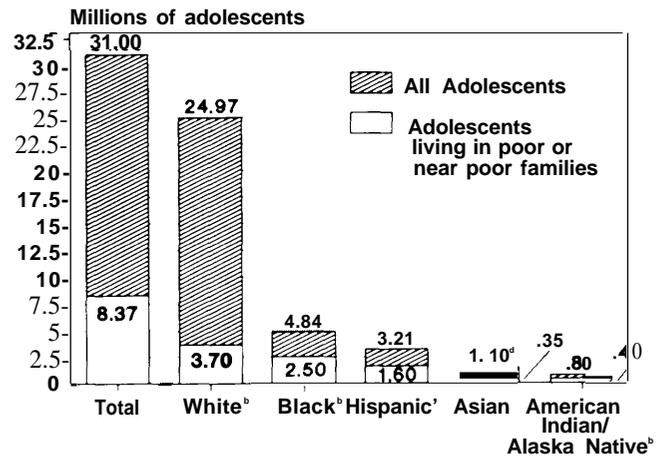
³⁶A school-loss day is a day in which a student missed more than half a day from the school in which he or she was currently enrolled.

those age groups³⁷ (294). Comparable population-based data on births to adolescents for other racial and ethnic groups are not available separately because of shortcomings in pre-1990 Census data (294). Available data from 30 States and the District of Columbia suggest that one-sixth of the Hispanic-origin births (476,082 babies) in 1988 were to females under age 20, with wide variations in the incidence of adolescent childbearing among Hispanic groups (e.g., Mexicans, Puerto Ricans, Cubans, Central and South Americans); in 1988, there were 8,455 American Indian and Alaska Native babies, 1,181 Hawaiian babies, and 5,394 Asian babies born to females under age 20 (294).

- Black non-Hispanic adolescents account for 36 percent of all adolescent (13-to 19-year-old, by the Centers for Disease Control's definition) AIDS cases; Hispanic adolescents (all races) account for almost 20 percent of adolescent AIDS cases (280).
- Mexican-Americans have high rates of obesity, increasing their risk of eventually developing Type 11 (adult-onset) diabetes (133).
- American Indian adolescents are at high risk for a number of health problems, in particular, suicide, alcohol abuse, motor vehicle accidents, mental health problems, substance use, pregnancy, and periodontal problems.

What accounts for these racial and ethnic differences is not entirely clear. While some of the differences may be related to cultural factors, many of them are more likely to be attributable to differences in socioeconomic status. The proportion of U.S. adolescents living in poor or near-poor families varies considerably by race and ethnicity (see figure 11). Differences in health status by socioeconomic status are difficult to separate from those of racial and ethnic differences, because there is very little information collected that relates adolescents' socioeconomic status to their health. One indicator of health differences by socioeconomic status is that in 1988, adolescents whose family incomes were under \$10,000 (7.8 percent) were more than *twice as likely* as those whose family incomes were \$35,000 or above (3.5 percent) to have a limitation in a major activity as a result of a chronic condition (291). Other problems found more frequently among poor adolescents include poor physi-

Figure 11--Number of U.S. Adolescents Ages 10 to 18 and Number Living in Poor or Near-Poor Families, by Race and Ethnicity, 1988^a



^aPoor and near-poor families are those with incomes at or below 150 percent of the Federal poverty level. Because 1988 population data are not available disaggregate by Hispanic and non-Hispanic, yet poverty statistics have been calculated for Hispanic and non-Hispanic, there is a slight overcount for the white and black adolescent populations.

^bIncludes both Hispanic and non-Hispanic.

^cPersons of Hispanic origin may be of any race.

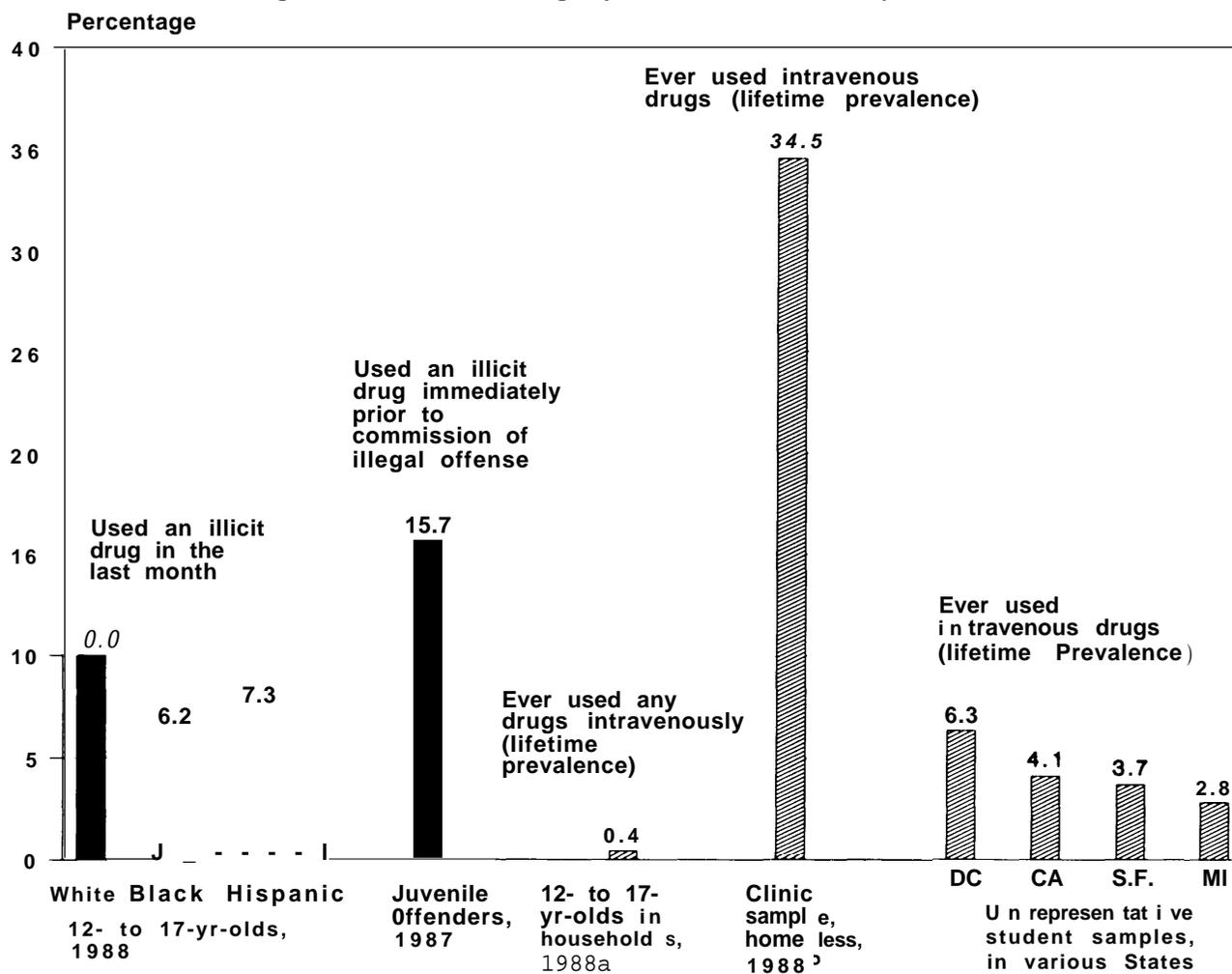
^dThe Census Bureau is unable to calculate the number of Asian and Pacific Islanders who are ages 10 through 18 for periods beyond 1980. OTA's rough estimate that there are approximately 1.100 million Asian and Pacific Islanders ages 10 to 18 is made by applying the estimated proportion of Asian and Pacific Islanders who were ages 10 to 18 in 1980 (15.9 percent, derived by taking 9/17ths of the proportion of the Asian and Pacific Islander population who were under 18 in 1980 (30.2 percent)) to the estimated total population of Asian and Pacific Islanders as of July 1, 1989. Better estimates of the 10-to-18-year-old Asian and Pacific Islander population of the United States will be available from 1990 Census statistics. Asian and Pacific islanders include Filipinos, Chinese, Vietnamese, Koreans, Japanese, Asian-Indians, and "others."

SOURCE: Office of Technology Assessment, 1991, based on data from the following sources: Adolescent population counts: U.S. Department of Commerce, Bureau of the Census, *U.S. Population Estimates, by Age, Sex, Race, and Hispanic Origin: 1989 Current Population Reports, Series P-25, No. 1057*, by F.W. Hollmann (Washington, DC: U.S. Government Printing Office, March 1990); S. Sue and N. Zanø, "Health and Related Services for Asian American Adolescents," contract paper prepared for the Office of Technology Assessment, U.S. Congress, Washington, DC, November 1989; F. Hollmann, Demographer, Bureau of the Census, U.S. Department of Commerce, personal communication dated in F. Butterfield, "Asians Spread Across a Land, and Help Change It," *The New York Times*, Sunday, Feb. 24, 1991, p. 22. Number of adolescents living in poor or near-poor families: R. Kronick, Adjunct Professor, University of California, San Diego, CA, calculations based on U.S. Department of Commerce, Bureau of the Census, March 1989 Current Population Survey public use files, 1990.

cal health, depression, pregnancy, and criminal victimization. For further discussion of socioeconomic differences in adolescent health, see chapter 18, "Issues in the Delivery of Services to Selected Groups of Adolescents," in Volume III.

³⁷These percentages are derived from rates of birth presented by race of the baby, and may not truly reflect the race of the mother (2 W).

Figure 12—Use of Illicit Drugs by Different Adolescent Populations



^aSample sizes of adolescents were too small to disaggregate data on intravenous use of drugs by racial and ethnic group.

^bIncludes young adults over 18 as well as adolescents.

SOURCE: Office of Technology Assessment, 1991, based on data from the following sources: 12- to 17-year-olds living in households, 1988: U.S. Department of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration, National Institute on Drug Abuse, *National Household Survey on Drug Abuse, 1988* (Rockville, MD: 1989). Incarcerated juvenile offenders, 1987: U.S. Department of Justice, office of Justice Programs, Bureau of Justice Statistics, Report to the Nation of Crime and Justice, 2d ed., NCJ-105508M (Washington, DC: March 1988). Homeless adolescents and young adults, 1988: G. Yates, R. MacKenzie, J. Pennbridge, et al., "A Risk Profile Comparison of Runaway and Non-Runaway Youth," *American Journal of Public Health* 78:820-821, 1988. Unrepresentative student samples, 1988: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, "HIV-Related Beliefs, Knowledge, and Behaviors Among High School Students," *Morbidity and Mortality Weekly Report* 37:717-721, Dec. 2, 1988.

Other Factors Associated With Differences in Adolescent Health Problems

In addition to cultural factors and socioeconomic factors, a number of other factors may affect adolescents' health (rural v. urban, neighborhood, lack of legal or financial access, and, of course, the occurrence of another health problem). As an example of how problems vary by populations, see figure 12, which illustrates differences in levels of

illicit and intravenous drug use as reported by adolescents living in different locations and life circumstances (e.g., adolescents living in households, incarcerated juvenile offenders, homeless adolescents in a clinic, different States and cities).

One admittedly rough set of estimates by Dryfoos suggests that 10 percent of adolescents ages 10 to 17 have *multiple* serious *behaviorally based* problems (i.e., they have committed multiple serious offenses,

used multiple drugs, and have been sexually active) (50,51). There is some evidence that these (and other) multiple-problem adolescents are at somewhat higher risk for other problem *behaviors* such as truancy and dangerous driving behaviors (49,59,99,165). On the basis of their involvement in minor offenses, marijuana and/or alcohol use, or sexual activity, Dryfoos estimated that another 40 percent of 11- to 17-year-olds (and 62 percent of 15-to 21-year-olds) were at *moderate* risk of multiple health problems (50). Other evidence such as that accumulated by OTA suggests that adolescents with multiple problems are at particular risk of lack of access to health services (e.g., in juvenile justice facilities, for drug abuse problems³⁸). There is no one single source that has evaluated the prevalence of the *entire range* of possible health problems among adolescents (i.e., including emotional and physical, as well as behavioral, problems) or covariation among problems.³⁹

What Causes Adolescent Health Problems?

In part because of uncertainty in the definition of adolescent health and health problems, and in part because of a lack of support for longitudinal and other intensive and innovative research strategies, it is difficult to pinpoint the factors leading to well-being or poor health. As the specific findings of this Report indicate, even the causes of many long-standing problems remain largely elusive.⁴⁰

For example, why do some adolescents engage in potentially health-compromising 'risky behaviors' such as riding in cars without using safety belts or with drunk drivers, having unprotected sexual intercourse, or using firearms in an unsafe way? What causes some adolescents to be violent? Why have so many adolescents attempted suicide? Why do so many feel depressed and hopeless? Why do so many drop out of school? Alternatively, why do some 'resilient' adolescents appear to do well in the face of what seem to be seriously adverse family or other circumstances? Likewise, the causes of some physical problems are unclear (e.g., leukemia, acne, dysmenorrhea).



Photo credit: Education Week

Adolescents who do well seem to have strong and developmentally appropriate social support, preferably from their families, but if not from their families, from some other adult or adults.

Having the answers to both the problem-oriented and success-oriented questions is essential to the design of effective preventive and treatment strategies. Although systematic, problem-specific evidence is scarce, some general themes emerged throughout OTA's analysis, some from analyses of risk factors, and others from evaluations of change interventions. Put positively, adolescents who do well seem to have strong and developmentally appropriate social support, preferably from their families, but if not from their families, from some other adult or adults. Similarly, schools that are small, comfortable, safe, and intellectually engaging and emotionally intimate communities can also make a difference in adolescent health and well-being. Interactions with healthy peers, guided by a caring and trained adult, have been shown to prevent additional delinquent behavior.

³⁸See ch 12 'Alcohol, Tobacco, and Drug Abuse: Prevention and Services,' in Vol. II.

³⁹*Covariation* is the tendency of health problems to occur in the same individual at about the same time. Most of the evidence on covariation of adolescent problems is based on cross-sectional studies, so it is still unclear for many problems whether one problem leads to another or the problems occur together, due to a single cause or set of causes (165). Another limitation of the evidence on covariation is that most of the evidence is limited to covariation in adolescent behaviors and does not consider emotional or physical problems.

⁴⁰The limitations of the knowledge base on particular adolescent health problems are discussed in a section below entitled "Specific Findings and Policy Options."

Health care providers who are perceived as being attentive to adolescent concerns ensure greater compliance with treatment regimens. Evidence about the potential positive impact of these kinds of interactions suggests guidelines for changes in adolescent environments, including the design of services in a wide variety of areas.⁴¹

What Should Be Done To Prevent and Treat Adolescent Health Problems?

Interventions currently in place for adolescents have been characterized as either prevention or treatment. In general, *prevention services are intended to prevent the occurrence of a problem (e.g., disease or condition). Conventional epidemiologic definitions of prevention differentiate preventive efforts as: 1) primary prevention (aimed at reducing the incidence of a disease or other health problem), 2) secondary prevention (aimed at reducing the prevalence of a problem by shortening duration among those who already have the problem), and 3) tertiary prevention (aimed at reducing complications) (1 14). With some exceptions, OTA's analysis of prevention services focuses most often on primary and secondary prevention intervention efforts delivered to adolescents during their adolescence. Treatment services are intended to cure or ameliorate the effects of a problem (e.g., disease or condition) once the problem has occurred.*⁴²

Although the distinction between prevention and treatment services is used throughout this Report, it

is important to point out that in the case of adolescents in particular, the line between prevention and treatment is not always clear. Adolescents may have health concerns (e.g., problems in school, need for family planning counseling or contraceptive services, subjective distress) that would not be considered fill-blown clinical problems (e.g., a learning disability, a conduct disorder, a pregnancy, clinical depression) by the mainstream health services treatment system but that could benefit from early clinical intervention. Perhaps more important, interventions for these subclinical issues are not typically financed by health insurers or public clinics.⁴³

Further, an appropriate concern regarding adolescent health services is the extent to which they address the promotion of either specific aspects of or overall adolescent health as opposed to being focused on specific problems (39,137).

In no case—health promotion, problem prevention, treatment—does the evidence give comfort that adolescent health problems are in general being appropriately addressed by current health policies and service delivery systems. There are numerous examples of promising health promotion, problem prevention, and treatment interventions, but they have been implemented only sporadically. These promising interventions can provide considerable guidance for program implementation and the continuing design of more effective approaches.

⁴¹They cannot, of course, be used to prevent such problems as leukemia, asthma, and acne, but they can serve as a guide to interpersonally appropriate treatment of adolescents with such problems.

⁴²Prevention efforts can also be differentiated in various other ways. One way is in terms of prevention strategy: empowerment, health promotion, health protection and preventive education (all forms of primary prevention) and screening and early clinical services (often considered forms of secondary prevention). Still other ways of differentiating prevention efforts are by intervention target (e.g., parents, teachers, individual adolescents, peers, entire communities, or all of the above) and, especially for primary prevention by the age at which the intervention takes place (e.g., infancy, early or middle childhood, adolescence).

⁴³An example encountered by an OTA staff member illustrates the problem. Jason was an 18-year-old from a very disadvantaged family and neighborhood who said he wanted to graduate from high school and join a branch of the military service so that he could travel and get a college education or learn a trade. His mother was a long-time alcoholic who had had her first child at age 15, and had her first five children taken away by various child protective services. Jason himself had been placed temporarily in foster homes a number of times, but was still living with his mother as he neared age 18. Jason, his mother, and his teenaged sister lived in a one-bedroom apartment in a neighborhood riddled by drugs and violence. Conflict between Jason and his mother grew, and he went to live with a family who had befriended him over the years. It quickly became apparent to the family that if Jason was to complete his senior year in school and have any hope of a normal, productive life, he would need intensive counseling as well as an evaluation for a possible learning disability. Jason fought with his peers in school, talked back to teachers, and had trouble concentrating. He had never read an entire book; most nights he did not bring home any schoolwork claiming he had none. When the school finally found his records, it turned out he still had to take 2 years of English if he was to graduate; the school had him recorded as a sophomore, despite the fact that he was 18 years old.

Unfortunately, Jason had no health insurance other than Medicaid. Efforts to get him assistance through the local department of mental health were met with claims, probably true, that, compared to other young mates in his city, Jason was doing well. He did not seem to be using or selling drugs, and he was not under arrest. So no publicly funded counseling was available; and neither Jason's mother nor his "adoptive" family could afford private counseling. Similarly, Jason had apparently never received assistance through Education for All Handicapped Children Act programs because no one had ever identified him as having a learning or mental health problem. Jason was referred solely to an Alateen program (group discussion sessions for children of alcoholics). He became disenchanting with the group because it consisted primarily of much younger children and, for this and other reasons, he soon dropped out.

Prevention of Adolescent Health Problems

A great number of efforts to prevent specific adolescent health problems or (less commonly) promote adolescent well-being have been designed and implemented. Conclusions about their effectiveness are often difficult to draw, in large part because few prevention interventions have been rigorously evaluated. The performance of methodologically sound evaluations appears to have been impeded by a number of factors, primarily a lack of funding and sensitivities concerning the discussion of some subjects (e.g., sexual behavior, suicide) with adolescents. In addition, there are some important problems for which there has been little concerted attention to prevention (e.g., violence). Further, many preventive efforts consist of standardized curricula, designed to be delivered by classroom teachers, or other relatively passive measures such as films, videos, brochures, and posters. While these may provide important health-related information to adolescents, it is unrealistic to expect these measures alone to either engender much behavior change or address the nonbehavioral aspects of adolescent health concerns (e.g., subjective distress, physical pain, family problems, school problems). Finally, there has been relatively little specific attention to efforts to promote well-being. For example, few adolescents—especially those living in poor communities—appear to have adequate access to recreational and other opportunities to make developmentally appropriate and healthful uses of their discretionary time (37,61a,62,204,206,255).

There is a growing consensus (in some cases accompanied by evidence from evaluations) about the following:

- Preventive efforts that change environments (e.g., safety belts and airbags that provide automatic protection in auto accidents), provide some form of concrete aid (e.g., contraception), or improve competencies (e.g., life-skills training) are more effective primary prevention strategies than are strictly didactic, education-based interventions,
- Preventive efforts that use comprehensive approaches involving multiple systems and addressing multiple issues may be more effective than traditional single-issue, single-focus approaches.
- In many cases (e.g., suicide, drug abuse), early intervention with appropriate clinical services—

sometimes, but not always (189), termed secondary prevention—may be both more feasible and more effective than primary prevention. These too can be considered preventive interventions.

Education about the nature of health, health problems, and health-related interventions is, of course, important. Promising *educationally based* preventive interventions appear to be those that are both appropriate to the developmental and experiential level of the individual and participatory (i.e., encouraging guided discussion among adolescent participants) rather than didactic. In addition, to be consistent with findings from research on behavioral change, it is important for health education efforts to include explicit information about how adolescents can secure health and related services. Various groups' recommendations concerning health education for adolescents are summarized in box C. Not surprisingly, the promising elements of prevention interventions are consistent with findings about the elements of positive family life during adolescence: that it provide a prolonged protective and supportive environment, in which power is gradually shared, with the ratio between parental control and children's autonomy slowly becoming weighted in the direction of autonomy. It is possible to reorient existing prevention efforts so that they reflect these important principles.

Treatment of Adolescent Health Problems

If adolescent health problems cannot be prevented, then treatment services to cure or ameliorate the adverse effects of problems should theoretically be accessible, appropriate, and effective. To be *accessible*, treatment services must be available, approachable, and affordable. To be *appropriate*, the services must be delivered in a manner appropriate to the developmental and experiential status of the individual to be served. To be *effective*, services must accomplish what they are intended to accomplish. Many U.S. adolescents in need of health and related treatment services are likely to face problems related to access and appropriateness. In addition, treatment approaches for some highly visible problems—and for comprehensive approaches to health care delivery—have not yet been demonstrated to be effective.

Accessibility of Treatment—Access to basic health and related services is a critical problem for adolescents and appears to be related to the occur-

Box C—Key Groups' Recommendations on Health Education for Adolescents

Recognizing that most contemporary health education efforts are neither appropriate nor effective, several different groups have generated suggestions for change. These include the Carnegie Council on Adolescent Development Task Force on Education of Young Adolescents (29), the Centers for Disease Control within the U.S. Department of Health and Human Services (153); and the National Commission on the Role of the School and the Community in Improving Adolescent Health (153).

The different groups' suggestions for change overlap a great deal, but each group emphasizes somewhat different elements of a model strategy for health education. Furthermore, although none of the groups appears to have made a concerted effort to select or reject specific topics in health education, each group does mention somewhat different topics.¹ It is important to note that all three groups' recommendations pertain to school-based health education. To OTA's knowledge, there have been no attempts to conceptualize comprehensive health education for adolescents who are not in school.²

The recommendations of the Carnegie Council on Adolescent Development Task Force on Education of Young Adolescents emphasize the following elements of a model strategy for health education:

- . integrating health education into school environments that are health-promoting;
- integrating health education into the core instructional program as an element of the life sciences³; and
- training in the so-called life skills that help adolescents to resist interpersonal or media messages to engage in specific negative behaviors, increase self-control and self-esteem, reduce stress and anxiety, gain in the ability to express apprehension and disapproval, and become assertive (29).⁴

The Centers for Disease Control supports the concept of comprehensive school health, defined as follows:

1. a documented, planned, and sequential program of health education for students in grades kindergarten through 12;

¹The Carnegie Council Task Force specifically mentions growth and function of adolescent bodies during adolescence; the value of a healthful diet and exercise; the dangers of illicit drugs, alcohol, and tobacco; and the avoidance of other risk behaviors (29). The Centers for Disease Control supports education on "a range of categorical health problems and issues" and mentions as specific topics for health education human immunodeficiency virus (HIV) infection, drug abuse, drinking and driving, emotional health, and environmental pollution (153). The National Commission on the Role of School and Community in Improving Adolescent Health mentions disease and accident prevention, family life and sex education, drug and alcohol abuse, violence, mental health, and nutrition (153). Overall, however, the primary concern of the three groups seems to be the approach to health education rather than specific topics in health education.

²The Centers for Disease Control are charged with developing HIV-related education prevention for out-of-school youth.

³Carnegie Corporation of New York is funding Stanford University to adapt for the middle grades its interdisciplinary approach to the postsecondary teaching of human biology; thus, a model curriculum will be available for implementation and testing.

⁴Students can learn these essential life skills through systematic instruction and role-playing (29,83).

rence of many serious adolescent health problems. Some adolescents are more likely to be without access to health care than others:

- the one out of seven adolescents without access to health insurance (including the one out of three poor adolescents without access to Medicaid⁴⁴);
- adolescents whose health insurance benefits do not cover the services they need (e.g., adolescents who do not yet manifest full-blown clinical mental health problems);
- adolescents who are not aware of the existence of services;
- . adolescents whose only access is to urban public health clinics that appear unapproachable;
- . adolescents in actual or potential conflict with their parents about the receipt of health services for which they must have parental consent;
- . adolescents incarcerated in juvenile justice facilities;
- . homeless adolescents, living in families or on their own;
- adolescents with multiple problems, who almost inevitably face gaps among service systems;

⁴⁴Poor adolescents' access to Medicaid was changed by the Omnibus Budget Reconciliation Act of 1990 (OBRA-90, Public Law 101-508), which required that beginning July 1, 1991, children born after Sept. 30, 1983, with family incomes up to 100 percent of the Federal poverty level, are to be phased in to the Medicaid program. This change will not, therefore, affect the current generation of adolescents.

2. a curriculum that addresses and integrates education about a range of categorical health problems and issues (e.g., human immunodeficiency virus (HIV) infection, drug abuse, drinking and driving, emotional health, environmental pollution) at developmentally appropriate ages;
3. activities to help young people develop the skills they will need to avoid: a) behaviors that result in unintentional and intentional injuries; b) drug and alcohol abuse; c) tobacco use; d) sexual behaviors that result in HIV infection, other sexually transmitted diseases, and unintended pregnancies; e) imprudent dietary patterns; and f) inadequate physical activity;
4. instruction provided for a prescribed amount of time at each grade level;
5. management and coordination in each school by an education professional trained to implement the program;
6. instruction from teachers who have been trained to teach the subject;
7. instructions of parents, health professionals, and other concerned community members; and
8. periodic evaluations, updating, and improvement (153).

The National Commission on the Role of the School and Community in Improving Adolescent Health, a joint project of the National Association of State Boards of Education and the American Medical Association, recommended that young people receive a “new kind of health education—a sophisticated, multifaceted program that goes light years beyond present lectures on ‘personal hygiene’ or the four food groups” and includes the following elements:

- provides honest, relevant information about disease and accident prevention, family life and sex education, drug and alcohol abuse, violence, mental health, and nutrition;
- teaches skills and strategies needed to make wise decisions, develop positive values, generate alternatives, deal with group pressure, work cooperatively, and avoid fights—skills that are better learned through role-playing and other small group participatory activities than through lectures;
- includes participation in physical activity programs that foster lifelong exercise habits; and
- begins before students are pressured to experiment with risky behaviors and continues throughout adolescence. It should begin in kindergarten and continue in a planned, sequential manner through grade 12 (153).

SOURCES: Carnegie Council on Adolescent Development **Task Force on Education of Young Adolescents:** Carnegie Corporation of New York, Carnegie Council on Adolescent Development, Task Force on Education of Young Adolescents, *Turning Points: Preparing American Youth for the 21st Century* (Washington, DC: June 1989); Centers for Disease Control and National Commission on the **Role of the School and the Community in Improving Adolescent Health:** National Commission on the Role of the School and the Community in Improving Adolescent Health, *Code Blue: Uniting for Healthier Youth* (Alexandria, VA: National Association of State Boards of Education, 1990).

- . adolescents in rural areas;
- . Black, Hispanic, American Indian, and Alaska Native adolescents, because half of them live in families with incomes below 150 percent of the Federal poverty level (approximately \$13,000 for a family of three in 1989).

Some of the major problems affecting adolescents’ access to health and related services are listed in table 1. Barriers to access include poverty, lack of insurance, lack of trained providers, limitations in coverage, lack of information about the availability of services, lack of parental availability to accompany adolescents, and requirements for parental consent or notification. Some adolescents are affected by more than one of these barriers. Adolescents in juvenile justice facilities are typically not

eligible for Medicaid, because most juvenile justice facilities are public institutions under the Medicaid definition, and Medicaid is prohibited from paying for health care provided in publicly funded institutions. Many American Indian adolescents are urban (and thus do not have access to the reservation-based Indian Health Service’s services) and poor (and thus most likely without private health insurance and perhaps without Medicaid). Homeless adolescents are particularly likely to be affected by financial and legal restrictions on access.

Appropriateness of Treatment—Even if adolescents do gain access to treatment services, the services may not be appropriate to their developmental and experiential levels. Despite a long-standing recognition by medical professionals that

Table I—Major Problems That Affect U.S. Adolescents’ Access to Health and Related Services

Problem	Estimated proportion and/or number of U.S. adolescents affected	Adolescents most at risk
Lack of financial access to services		
Lack of health insurance:		
• Living in poverty without Medicaid	About 30 percent of poor adolescents do not have Medicaid (approximately 2.76 million).	Poor adolescents in Southern and, to a lesser extent, Western States are less likely to be Medicaid-eligible than poor adolescents in other regions,
• No private health insurance	About 30 percent of all adolescents do not have private health insurance coverage, but some (15 percent) have Medicaid or other public (e.g., the Civilian Health and Medical Program of the Uniformed Services) coverage. In 1988, 2.926 million adolescents whose parent(s) worked were uninsured. ^a	Adolescents in Southern (65 percent have private coverage) and Western (54 percent have private coverage) States have less private health insurance coverage than adolescents in other regions.
Limitations in coverage:		
• Limitations in coverage provided by Medicaid	Unknown. An estimated 3.70 to 4.58 million adolescents had Medicaid coverage at some point in time during fiscal year 1988. ^b How many are affected by coverage limitations depends on the service needed, type of provider, setting, adolescent’s State of residence, and whether service is sought under Medicaid’s Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program.	A number of services are optional under Medicaid, and adolescents in States that do not provide the service could experience a barrier to access. Services that are optional for States to provide to Medicaid beneficiaries include case management; dental services; some diagnostic, screening, preventive, and rehabilitative services; prescription drugs; eyeglasses, prosthetic devices, dentures, and orthopedic shoes; physical, occupational, and speech, hearing, and language disorder therapies; services of psychologists, chiropractors, optometrists, and podiatrists; private duty nursing; clinic services; intermediate care facility services; home and skilled nursing facility care for children; inpatient psychiatric facility care for children under age 21; and other medical or remedial care recognized under State law. In 1989, however, Congress passed EPSDT reforms that significantly expand adolescents’ and other children’s access to Medicaid-covered services by requiring States to periodically screen Medicaid-eligible adolescents for any illnesses, abnormalities, or treatable conditions and refer them for definitive treatment. States also must cover treatment for conditions identified during an EPSDT screen.

^aIn 1988, about 2.926 million *uninsured* U.S. adolescents had parents who worked sometime during the year; 2.85 million uninsured U.S. adolescents had parents who worked for an employer 26 weeks or more during the year.

^bThis estimate was developed by OTA, the Office of the Actuary within the Health Care Financing Administration (HCFA) of DHHS (253). HCFA estimates that the average period of duration of Medicaid coverage is 9 months. In contrast, data from the March 1989 Current Population Survey, a household-based survey of noninstitutionalized persons, found that 2.96 million adolescents had Medicaid coverage only in calendar year 1988 (109). An additional 740,000 (23 to 25 percent of the 2.96 million) had both Medicaid and private coverage in 1988, according to the Current Population Survey. (See ch. 16, “Financial Access to Health Services,” in Vol. III.)

Table I—Major Problems That Affect U.S. Adolescents' Access to Health and Related Services-Continued

Problem	Estimated proportion and/or number of U.S. adolescents affected	Adolescents most at risk
Limitations in the coverage provided by a private health insurance plan	Unknown. Approximately 21.7 million adolescents (70 percent of adolescents) are covered by private health insurance. How many are affected by coverage limitations depends on the service needed, type of provider, the limitations in any particular insurance plan, and, to some extent, the adolescent's State of residence.	Adolescents in need of mental health care (especially those adolescents without a diagnosable mental disorder), substance abuse treatment services, prenatal care (see below), home health care, extended care facilities, preventive screening procedures, including contraceptive services, general dental care, vision services, immunizations and inoculations, routine physical exams, hearing, orthodontia and abortion services. ^c
Lack of parental availability	About 60 percent (1 7.5 million) of adolescents ages 10 to 17 live in households where both parents (or their single parent) work full time.	
Lack of independent legal access to services	Unknown. How many are affected depends on combination of age, health problem, type of service sought, and State of residence.	Adolescents below the age of majority (age 18 in most States) and in actual or potential conflict with their parents about the need for particular health services.
Lack of information about the availability of health services	Unknown, but available estimates indicate that the proportion of adolescents affected is high (or that adolescents are in fact correct that services are not available). For example, the majority of adolescents in a national survey either were not sure or did not believe they could obtain confidential treatment for a sexually transmitted disease (STD) (when almost all States allow services for STDs to be provided confidentially) (10).	Unknown.
Lack of perceived approachability y/ appropriateness	Unknown, but available estimates indicate the proportion of adolescents affected may be high. Adolescents disagree with health care providers about what the most important health problems are, about what should be discussed during health care visits, and fear that private office-based physicians may breach confidentiality.	
Lack of appropriate care for adolescents	Depending on the problem and the specialty, from 4 ^e to 74 ^e percent of health care providers surveyed in the 1980s perceive themselves insufficiently trained to treat specified adolescent health problems. Primary care physicians appear to have difficulty in identifying adolescents who have behavioral, emotional, and substance abuse problems. ^f	

^cFor example at least eight States and the Federal Employees Health Benefits Plan have mandated some restriction of Private health insurance benefits for abortions. Four States require that covered abortions be provided-but only on an optional basis and at extra cost.

^dIn one study of Midwestern physicians, 96 percent of obstetrician-gynecologists felt comfortable addressing adolescents' sexual concerns (compared to 54 percent of pediatricians and 50 percent of psychiatrists) (164).

^eIn one national mail survey of primary care physicians (pediatricians, internists, and family practitioners), 74 percent of Internists reported training deficiencies in all 19 health problem areas listed in the study. In contrast, greater proportions of family practitioners and pediatricians perceived having received adequate training, although there were seven topic areas for which at least 50 percent of family practitioners felt insufficiently trained to handle, and similarly, eight topic areas for pediatricians. Six of the seven topic areas for family practitioners, and six of the eight topic areas for pediatricians, consisted of psychosocial, behavioral, and mental health concerns (21, 22).

^fThe number of physicians trained specifically in adolescent medicine is not known, but is probably around 1,400 to 2,000, not all of whom are frontline health care providers; in addition, another 1,500 psychiatrists, 1,500 psychologists, and 370 obstetrician-gynecologists have expressed specific interest in adolescent health issues. Except for training of adolescent medicine specialists, criteria for training in adolescent health care are vague, although improving (1, 53).

Continued on next page

Table I—Major Problems That Affect U.S. Adolescents' Access to Health and Related Services-Continued

Problem	Estimated proportion and/or number of U.S. adolescents affected	Adolescents most at risk
Specific groups of adolescents or types of adolescent problems		
• Adolescents with private health insurance in need of prenatal care	One-third of privately insured adolescents are not covered for maternity-related services by their parents' employment-based health insurance plan. This problem affects about 3.6 million adolescent females. ⁹	
• Adolescents in juvenile justice facilities	2 percent of adolescents (about 700,000),	
• Homeless adolescents	Unknown, but DHHS estimated in 1984 (on the basis of 1976 data) that there were 1 million homeless and runaway adolescents each year (256).	Homeless adolescents who are not emancipated, whose parents cannot be reached, or whose parents will not give permission for access.
• Adolescents with or at risk of multiple problems, who almost inevitably face gaps among service systems.	Unknown, because a complete assessment of the overlap of health problems (especially environmental, physical, and emotional, as opposed to behavioral) has not been conducted (50,51,165). ¹⁰ Nevertheless, documented clinical experience suggests that numerous adolescents who seek health services have more than one problem, and typically could receive services from more than one health care or related "system" (e.g., primary health care, mental health services, substance abuse services, child welfare, shelters for the homeless) (54,95,199).	Adolescents with one problem who are likely to have other health problems include: adolescents with problem use of substances (may have a mental health problem); adolescents adjudicated to be delinquent (likely to have multiple health problems); homeless adolescents (likely to have multiple health problems); adolescents failing or misbehaving in school (likely to become pregnant delinquent, and/or drop out of school before graduation).
• Racial and ethnic minority adolescents	Likely to be poor, and thus likely to be without health insurance.	Black adolescents, Hispanic adolescents, American Indian and Alaska Native adolescents, Asian-American adolescents. But Hispanic adolescents are much more likely than others to be uninsured regardless of family income (109).
• Rural adolescents	More likely to be poor, and thus more likely to be without health insurance. ¹¹ More likely to try to solve problems on their own rather than seek help. ¹² More likely to have problems gaining physical access to health services because of lack of health and mental health care providers as well as transportation problems.	Adolescents living on farms less likely to have help available to them and more likely to try to solve problems on their own rather than seek help, even though they are more likely to be troubled.

⁹Approximately 21.7 million adolescents are covered by private health insurance. Approximately half of these (10.85 million) are estimated to be females (based on the male/female adolescent population distribution). 3.6 million represents one-third of 10.85 million adolescents.

¹⁰One admittedly rough estimate is that 1 in 10 adolescents ages 10 to 17 (3 million) is "in dire straits, delinquent, in trouble in school, and prone to other high-risk behaviors (e.g., unprotected sexual intercourse, substance abuse), and that another group of 4 million was "extremely vulnerable to the negative consequences of [though not necessarily engaging in] multiple high-risk behaviors such as school failure, substance abuse, and early unprotected intercourse. . ." (50). The 10 percent in the "dire straits" were initially judged to be so on the basis of having committed serious multiple offenses, been multiple drug users, and been sexually active (50). Those behaviors are also associated, to some degree, with the other problem behaviors mentioned by Dryfoos (e.g., trouble in school) (165).

¹¹Like almost all other differences, rural-urban-suburban differences in health insurance disappear when differences in family income are taken into account (109).

¹²It is not known whether rural adolescents who did not seek help were extremely self-reliant, undesirous of help, or unable to go and get help (323).

SOURCE: Office of Technology Assessment, 1991.

special skills and knowledge are required to treat adolescents, there are few health care or youth services professionals who have been specially trained to treat adolescents. Approximately 1,400 primary care physicians are specialists in adolescent medicine and only 1,400 psychologists express a special interest in adolescents (less than one of each of these professionals for every 1,000 persons ages 10 to 18); and there are approximately 5,000 psychiatrists specially trained to treat both children and adolescents (8,60, 194,228). There is an American Society for Adolescent Psychiatry (1,500 members), and a North American Society for Pediatric and Adolescent Gynecology (370 members) (142,191). Other health professionals do not have special interest sections or keep track of members especially interested in adolescent health care. Unfortunately, while the need for adolescent-specific training is almost universally recognized, there are few training programs, and the effectiveness of current training criteria has not been systematically evaluated.

The most promising recent innovation to address the health and related needs of adolescents is the school-linked health or youth services center. Several private foundations, States, and local governments have provided considerable resources to initiate comprehensive school-linked health and/or youth services centers in which adolescents are offered confidential services without cost to the adolescents. Parental consent is usually obtained on a blanket basis before the adolescent seeks services.⁴⁵ A concerted effort is made at such centers to select health professionals capable of meeting the health and interpersonal needs of adolescents.

A number of barriers—in particular, inadequate funding, lack of trained personnel, community and provider resistance, and lack of systematic data on effectiveness—may interfere with successful implementation of comprehensive school-linked health or youth services centers. There are, in fact, several respects in which many school-linked health centers can be improved upon, as is well recognized by those who have worked closely with the centers (e.g., 115). Currently, for example, many school-linked health centers are similar to the mainstream health care system in that they do not meet the needs of students on holidays, weekends, and after school.

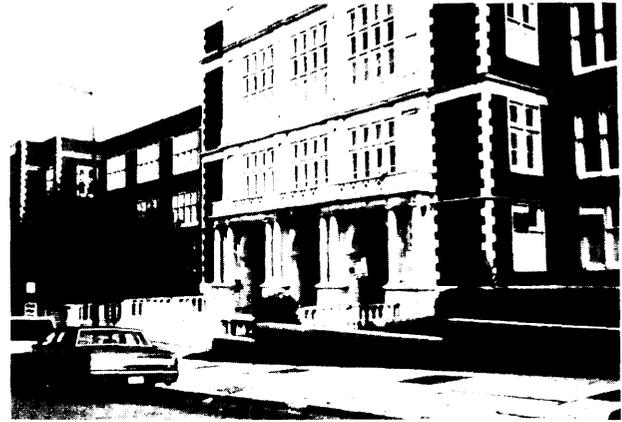


Photo credit: Office of Technology Assessment

The most promising recent innovation to address the health and related needs of adolescents is the comprehensive school-linked health or youth services center for adolescents.

Some centers also are similar to mainstream health services in that they do not conduct the kinds of outreach that would attract more students (e.g., males (105)) or adapt services to the simultaneous needs of students and the centers' financial constraints (e.g., emphasize mental health promotion and group counseling for students in addition to individual counseling (2)). School-linked health centers are limited by the inadequate numbers of health care providers specially trained to work with adolescents (see above), in multicultural settings, and in an interdisciplinary fashion (15). Further, adolescents who have dropped out of school typically do not have access to school-linked health centers,

These shortcomings are not insurmountable. Accumulating evidence, and increasing levels of support, suggest that the second generation of school-linked health and youth services centers may be able to go much further than either the mainstream health services system or the first generation of such centers in meeting the health (and, perhaps, related) needs of adolescents. Community-based health centers that provide confidential care appropriate to the needs of adolescents could help meet the needs of adolescents who cannot or do not choose to use school-linked services.

Effectiveness of Treatment—Although it was beyond the scope of this Report to conduct a

⁴⁵Sec. ch 15, 'Major Issues Pertaining to the Delivery of primary and Comprehensive Health Services to Adolescents,' in Vol. III. Consent forms often allow for parents to refuse permission for specific services to be performed.

full-scale evaluation of the effectiveness of treatment for every adolescent health problem, OTA found that treatment for some of the more highly visible problems—e.g., treatment for alcohol, tobacco, and drug abuse and treatment for problems associated with delinquency and homelessness—has not been adequately assessed for effectiveness. Some services (e.g., prenatal care for pregnant adolescents, mental health care) may be known to be efficacious under ideal conditions of use, but there is little information about their effectiveness under average or actual conditions of use.

What Is the Federal Government's Role in Improving Adolescent Health?

U.S. Executive Branch Agencies

U.S. executive branch agencies' activities related to adolescent health are numerous and varied:

- monitoring adolescents' health status and the provision of services to adolescents;
- supporting research;
- helping to build the capacity to provide services to adolescents;
- financing services;
- directly providing prevention and treatment services⁴⁶;
- protecting adolescent health through the regulation of environmental risks to health; and
- using the leverage of existing programs to implement change.

Many executive branch agencies—from the U.S. Department of Agriculture to the U.S. Department of Transportation—play an important role in addressing adolescent health and related issues. The major functions of some of these agencies are briefly summarized in table 2.

Taken together, Federal agencies and the Nation as a whole appear to spend considerable resources on issues related to adolescent health and well-being. It is difficult to define “considerable resources” and particularly difficult to determine whether Federal agencies are spending “enough” on adolescents or any other group. As a percent of specific Federal agency budgets, however, the amounts devoted specifically to adolescents are typically small. Estimated adolescent-specific expenditures by Federal agencies responding to a survey conducted by OTA in 1989 are shown in figure 13. Within DHHS, it is rare for an agency to devote more than 10 percent of its expenditures specifically to adolescents.⁴⁷ In some Federal agencies outside DHHS, adolescent issues may tend to receive a larger proportion of appropriated funds, although the total dollar amounts are small (see figure 13).⁴⁸

The Federal Government is widely acknowledged to play an essential role in research and health monitoring, but relatively few research and health monitoring efforts focus on adolescents. The National Institute on Child Health and Human Development, the lead agency for basic research in adolescent health and development, estimated that it devoted 6.6 percent of its fiscal year 1988 expenditures to adolescent issues.⁴⁹ Little information about the health status of adolescents is collected by the Federal Government, and what is collected is difficult to obtain and use. For further discussion of these problems, see appendix C, “Issues Related to the Lack of Information About Adolescent Health and Health and Related Services.

Four other critical issues with respect to the Federal role in adolescent health may be as important as the proportion of funds that the Federal Government spends on adolescent health issues. One is that most of the health spending related to adolescents is on *entitlement* programs

⁴⁶Generally speaking, the Federal Government does not currently play a major **role** in directly providing prevention or treatment **services** (see, for example, C.D. Brindis and P.R. Lee, “Public Policy Issues Affecting the Health Care Delivery Systems of Adolescents” (25)). One exception is the provision of **services** to American Indians and Alaska Natives by the Indian **Health Service** (in **DHHS**) and the Bureau of Indian Affairs (in the U.S. Department of the Interior). However, the role of these agencies in adolescent health is **small** (228; see ch. 18, “Issues in the Delivery of Services to Selected Groups of Adolescents,” in Vol. III).

⁴⁷The **Centers for Disease Control's** Division of Adolescent and School Health, the National Institutes of Health's National Institute of **Allergy and Infectious Diseases**, and the Alcohol, Drug Abuse, and Mental Health Administration's National Institute of Mental Health are the exceptions (with 100 percent, 15 percent, and 12 percent, respectively, of expenditures estimated to be for adolescents).

⁴⁸**Total Federal outlays in 1988 were** \$1.1 trillion (318). **Of this, \$533 billion was for the** “human resources” programs that account for the preponderance of the adolescent-health-related expenditures of the Federal Government (318). Figure 13 suggests that perhaps 2 percent of the \$533 billion was spent on **adolescent-specific** issues.

⁴⁹The **National Institute on Child Health and Human Development** devoted similar percentages from 1979 to 1988 (297). In late 1990, however, the agency began to design a separate adolescent program (3).

Table 2—Primary Functions of U.S. Executive Branch Agencies With a Role in Adolescent Health^a

Agency	Primary Function(s)
U.S. Department of Health and Human Services (DHHS)	Administers a wide range of programs related to health, welfare, and income security.
1. Family Support Administration (FSA)	Administers various programs intended to strengthen the American family.
A. Office of Family Assistance	Administers the Aid to Families With Dependent Children (AFDC) program and the Job Opportunity and Basic Skills Training (JOBS) program.
B. Office of Child Support Enforcement	Supports State efforts to enforce support obligations owed by absent parents to their children.
C. Office of Community Services	Administers the community services block grant and discretionary grant programs, which assist poor people.
2. Health Care Financing Administration (HCFA)	Administers the Medicaid ^b and Medicare programs.
3. Office of Human Development Services (OHDS)	Oversees various human services programs for the elderly, children and youth, families, Native Americans, persons living in rural areas, and people with disabilities.
A. Administration for Native Americans	Advises the Assistant Secretary for Human Development Services on matters related to American Indians and other Native Americans. Administers a grant program and provides technical assistance to Native American organizations to help them implement locally determined social and economic development strategies.
B. Administration on Development Disabilities	Administers the Development Disabilities Act and supports the development and coordination of programs for developmentally disabled persons of all ages.
C. Administration for Children, Youth, and Families	Funds comprehensive services for young children and their families through the Head Start program. Administers provisions of the Child Abuse Prevention and Treatment Act and manages a national clearinghouse on child abuse and neglect. Provides Federal support for child welfare services (including Federal funds for foster care maintenance). Administers the Runaway and Homeless Youth Act and a drug abuse prevention program for runaway and homeless youth. Supports a wide variety of efforts to improve the physical and mental health of Americans.
4. Public Health Service	Supports efforts to increase knowledge about and to prevent and treat alcohol and drug abuse and mental health disorders in the United States.
A. Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA)	Conducts and supports research on alcohol abuse and alcoholism.
• National Institute on Alcohol Abuse and Alcoholism	Conducts and supports research on drug abuse.
• National Institute on Drug Abuse	Conducts and supports research on mental health and the prevention and treatment of mental illness.
• Office for Substance Abuse	Supports innovative prevention demonstration projects for individuals at high risk for drug or alcohol abuse; supports an information clearinghouse with drug and alcohol abuse prevention materials; provides technical assistance to States; supports training for substance abuse counselors.
• Office for Treatment Improvement	Supports efforts by States and communities to improve drug and alcohol abuse treatment programs; administers the alcohol, drug abuse, and mental health services block grant program.
B. Centers for Disease Control	Administers national programs for the prevention and control of communicable diseases; chronic diseases; and environmental health problems.
• Center for Chronic Disease Prevention and Health Promotion	Directs a national program aimed at the prevention of premature mortality, morbidity, and disability due to chronic illnesses.
—Division of Adolescent and School Health	Administers programs to reduce health risks to adolescents through comprehensive school health education and other means.
—Division of Reproductive Health	Administers programs and conducts research in areas related to contraception, pregnancy, human reproduction, and infancy.
• Center for Environmental Health and Injury Control	Directs a national program aimed at promoting a healthy environment and preventing premature death, avoidable illness, and disability caused by environmental and related factors.

^aThe Federal agencies listed in this table are primarily agencies that responded to a survey conducted by OTA in August 1989 to determine the scope and level of adolescent-health-related activity at the Federal level. For further discussion, see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III.

^bMedicaid was established in 1965 under Title XIX of the Social Security Act to assist States in providing health care (e.g., inpatient and outpatient medical services, family planning services, prenatal care) to the poor.

Continued on next page

Table 2—Primary Functions of U.S. Executive Branch Agencies With a Role in Adolescent Health^a—Continued

Agency	Primary function(s)
—Division of Injury Control	Administers and directs programs on the prevention and control of intentional and unintentional injuries.
—Division of Birth Defects and Developmental Disabilities.	Administers programs directed toward determining the environmental causes of selected adverse reproductive outcomes and perinatal and childhood disabilities.
. Center for Infectious Diseases	Directs a national program aimed at improving the identification, investigation, diagnosis, prevention, and control of infectious diseases.
—Division of HIV/AIDS	Conducts studies, develops guidelines, evaluates programs and disseminates information on the prevention of human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS).
. Center for Prevention Services	Directs national programs of assistance involving preventive health services to State and local health agencies.
—Division of STDs and HIV Prevention	Administers programs, in cooperation with other CDC components, for the prevention and control of sexually transmitted diseases (STDs), including HIV infection.
-National AIDS information and Education Program	Disseminates information about HIV infection and AIDS to the public through various means (mass media, national information hotline, and clearinghouse).
. National Center for Health Statistics	Collects, analyzes, and disseminates health statistics on activities that relate to health status, needs, and resources.
C. Health Resources and Services Administration (HRSA)	Oversees a number of programs on general health services and resource issues relating to access, equity, quality, and cost of care; helps coordinate government and private efforts on behalf of rural health facilities.
● Bureau of Health Care Delivery and Assistance	Supports States and communities in their efforts to plan, organize, and deliver health care services to medically underserved populations, and to special services populations such as migrants and homeless people. Administers the National Health Service Corps Program.
. Bureau of Health Professions	Undertakes efforts to improve the education, distribution, and quality of health care professionals in the United States.
. Bureau of Maternal and Child Health ^c	Supports States and immunities in their efforts to plan, organize, and deliver health care services to mothers and children. Awards maternal and child health block grants to States and discretionary grants for developing models of health care delivery to mothers and children, including adolescents.
D. Indian Health Service (IHS)	Provides health services for American Indians and Alaska Natives.
E. National Institutes of Health (NIH)	Conducts and supports biomedical research into the causes, prevention, and care of diseases.
. National Cancer Institute.	Conducts and supports research on the causes, prevention, diagnosis, and treatment of cancer.
. National Eye Institute	Research on the eye and visual disorders.
● National Heart, Lung, and Blood Institute	Conducts and supports research on the causes, diagnosis, prevention, and treatment of heart, blood vessel, lung, and blood diseases. Conducts educational activities related to the prevention of these diseases.
● National Institute of Allergy and Infectious Diseases	Conducts and supports research on the causes, characteristics, prevention, control and treatment of a wide variety of diseases believed to be attributable to infectious agents, to allergies, or to other deficiencies or disorders in the responses of the body's immune mechanisms.
● National Institute of Arthritis and Musculoskeletal and Skin Diseases	Research on arthritis (including juvenile arthritis) and musculoskeletal and skin disorders (e.g., muscular dystrophies, acne).
. National Institute of Child Health and Human Development	Conducts and supports multidisciplinary behavioral and biomedical research on child health and maternal health, on problems of human development (e.g., mental retardation) and on family structure. Supports research on new contraceptives and AIDS.
● National Institute of Dental Research.	Research aimed at eliminating tooth decay and an array of other oral-facial disorders.

^cIn 1990, the Bureau of Maternal and Child Health and Resources Development split into two separate bureaus: 1) the Bureau of Maternal and Child Health, and 2) the Health Resources Development Bureau.

Table 2—Primary Functions of U.S. Executive Branch Agencies With a Role in Adolescent Health^a—Continued

Agency	Primary function(s)
. National Institute of Diabetes and Digestive and Kidney Diseases	Conducts and supports research into the causes, prevention, diagnosis, and treatment of various metabolic and digestive diseases (e.g., juvenile diabetes, cystic fibrosis, sickle-cell anemia, hemophilia).
● National Institute of Environmental Health Sciences	Conducts and supports research to understand the effects of chemical, biological, and physical factors in the environment on health.
● National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) ^d	Conducts and supports research on neurological disorders (e.g., head and spinal cord injury) and stroke.
. National Center for Nursing Research	Administers programs and research training programs aimed at promoting the quality of research in nursing and patient care, including care for adolescents.
F. Office of the Assistant Secretary of Health (OASH)	Aids the Secretary of Health with management responsibilities of the department.
. Office of Disease Prevention and Health Promotion	Supports and coordinates prevention programs within the Alcohol, Drug Abuse, and Mental Health Administration, the Centers for Disease Control, the Food and Drug Administration, the Health Resources and Services Administration, and the National Institutes of Health.
. Office of Minority Health	Ensures that DHHS funds are used to address minority health problems by organizing, and assessing current programs for minority health problems; provides technical assistance to States and local governments with respect to their efforts to address minority health issues. ^e
. Office of Population Affairs	Carries out Public Health Service Act Title X and Title XX programs related to adolescent pregnancy, family planning, and population research.
ACTION	Administers several Federal domestic volunteer service programs, including VISTA, the Foster Grandparents Program, and Student Community Service Projects. ^f
National Science Foundation (NSF)	Supports research in science and engineering through grants to universities and other research organizations.
U.S. Consumer Product Safety Commission	Collects information on consumer-product related injuries, promotes research on the causes and prevention of such injuries, develops voluntary or mandatory standards for consumer products, and sometimes bans hazardous products.
U.S. Department of Agriculture (USDA)	Administers a wide range of programs related to farms, nutrition, food, hunger, rural development, and the environment.
1. Office of the Assistant Secretary, Food and Consumer Services	
A. Food and Nutrition Service	Administers several programs to make food assistance available to needy people, including the Food Stamp Program, the School Breakfast Program, the Food Distribution Program, and the Special Supplemental Food Program for Women, Infants, and Children. Also gives grants to States for disseminating nutrition information to children.
B. Human Nutrition Information Service	Performs research in human nutrition; monitors food and nutrient consumption in the United States; and disseminates information on nutrition.
2. Office of the Assistant Secretary, Science and Education	
A. Extension Service	Serves as USDA's educational agency and is the Federal partner in the Cooperative Extension System, a nationwide educational network that provides access to food- and agriculture-related research, science and technology. Recent initiatives include programs on human nutrition, youth at risk building human capital, and family and economic well-being.

^dIn 1990, the National Institute of Neurological and Communicative Disorders and Stroke split into two separate institutes: 1) the National Institute of Neurological Disorders and Stroke, and 2) the National Institute on Deafness and Other Communication Disorders.

^eThese were its functions prior to the passage of Public Law 101-527, which established separate funding for an Office of Minority Health in DHHS.

^fThese were its functions prior to passage of the National and Community Service Act (Public Law 101-610).

Continued on next page

Table 2—Primary Functions of U.S. Executive Branch Agencies With a Role in Adolescent Health*—Continued

Agency	Primary function(s)
U.S. Department of Commerce	Administers a wide range of programs to promote the Nation's international trade, economic growth, and technical advancement.
Bureau of the Census	Collects, tabulates, and publishes or otherwise makes available a wide variety of statistical data on the U.S. population and the economy.
U.S. Department of Defense (DOD)	Oversees U.S. military forces and various civilian defense agencies.
1. Office of Civilian Health and Medical Program of the Uniformed Services (CHAMPUS)	Administers a civilian health and medical program for retirees and spouses and dependents of active duty, retired, and deceased members of the military.
U.S. Department of Education (DOE)	Establishes policy for, administers, and coordinates most Federal assistance for education.
1. Office of the Assistant Secretary for Elementary and Secondary Education	Formulates policies for, directs, and coordinates programs for elementary and secondary education. Administers grants to States and local school districts for Indian and migrant education, as well as grants to help schools meet the educational needs of educationally disadvantaged children (e.g., neglected or delinquent children under State care).
2. Office of the Assistant Secretary for Educational Research and Improvement	Administers functions concerning research, statistics, demonstrations, and assessment. Administers discretionary grants to improve health education for elementary and secondary students.
3. Office of the Assistant Secretary for Special Education and Rehabilitative Service	Administers programs in special education and provides services designed to meet the needs and develop the full potential of handicapped children.
4. Office of Bilingual Education and Minority Languages Affairs	Provides support for programs to meet the special educational needs of minority language populations.
5. Office of the Assistant Secretary for Vocational and Adult Education	Administers programs of grants and assistance for vocational and technical education and coordinates rural education programs.
U.S. Department of the Interior	Has responsibility for the stewardship of nationally owned lands and natural resources; has trust responsibilities for American Indian reservations.
1 B of Indian Affairs	Works with American Indian and Alaska Native people to develop and implement educational, social, and community development programs.
U.S. Department of Justice	Has broad responsibilities related to law enforcement, including oversight of the Federal Bureau of Investigation, the Drug Enforcement Administration, the Bureau of Prisons, the U.S. Marshals Service, the Immigration and Naturalization Service, and the Department's Civil Rights Division, Antitrust Division, Tax Division, Civil Division, Criminal Division, Environment and Natural Resources Division, etc.
1 Office of Justice Programs ^a	
A. Bureau of Justice Assistance	Provides financial and technical assistance to States and local governments to control drug abuse and violent crime and improve the criminal justice system.
B. Bureau of Justice Statistics	Collects, analyzes, and disseminates information about crime, and the operation of the criminal justice system at all levels of government.
C. National Institute of Justice	Works to improve the criminal justice system, address crime prevention and control, and enhance community safety and security.

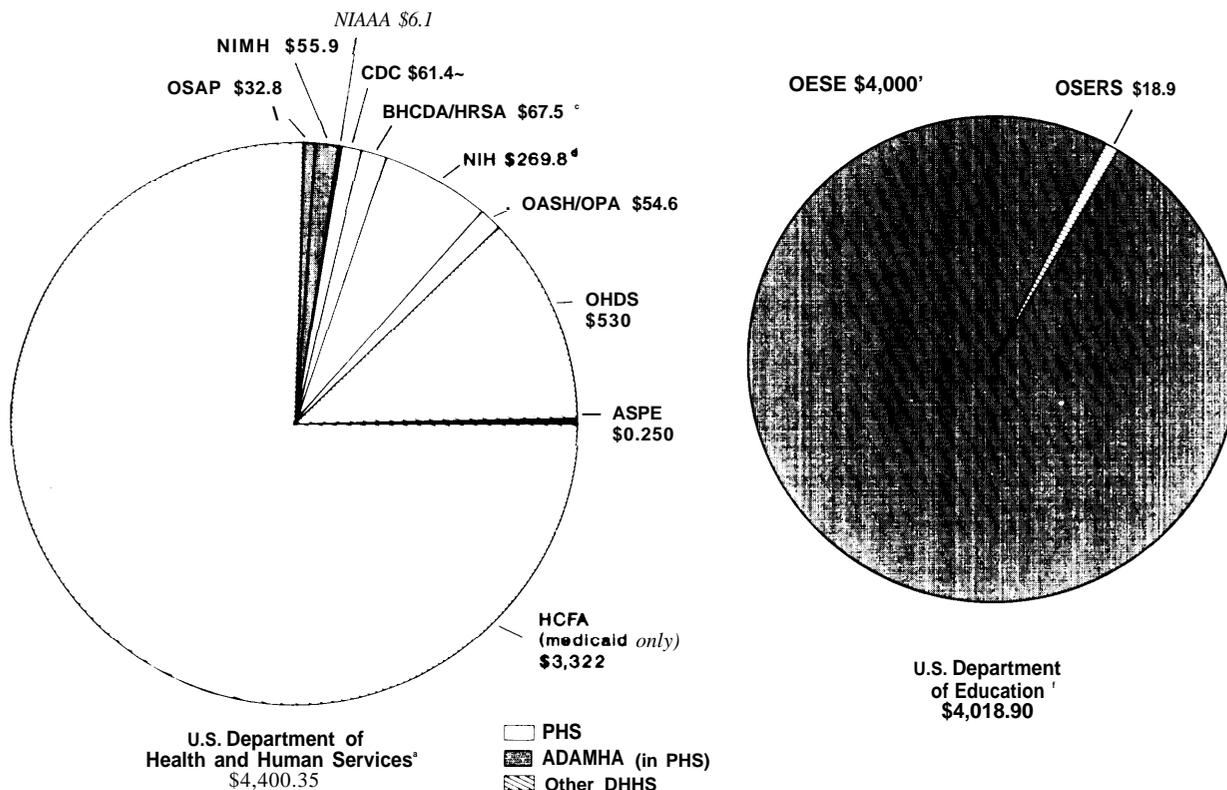
* The Office of Justice Programs was established by the Justice Assistance Act of 1984 and reauthorized in 1988 to help foster cooperation and coordination needed to make the criminal justice system function effectively.

Table 2—Primary Functions of U.S. Executive Branch Agencies With a Role in Adolescent Health^a—Continued

Agency	Primary function(s)
D. Office of Juvenile Justice and Delinquency Prevention	Administers programs and policies intended to improve the juvenile justice system; assists communities in responding to the needs of juveniles; assesses the factors that contribute to juvenile delinquency; and informs practitioners about research findings and successful interventions.
E. Office for Victims of Crime	Carries out activities mandated by the Victims of Crime Act of 1984.
U.S. Department of Labor	Fosters U.S. workers' welfare, improves their working conditions, and promotes opportunities for employment.
1. Employment and Training Administration	Has responsibilities related to employment services, unemployment insurance, and job training. Administers the Job Training Partnership Act, which authorizes block grants to States for job training programs for economically disadvantaged individuals and provides authority for the Job Corps.
U.S. Department of Transportation	Develops coordinated national transportation policies and oversees a wide variety of transportation programs carried out by nine operating administrations (aviation, highway, railroad; highway traffic safety; urban mass transportation, etc.).
1. Federal Highway Administration	Administers the Federal-aid highway program of financial assistance to the States for highway construction and improvements, such as highway repairs and maintenance, which improve the safety of the roads; exercises jurisdiction over commercial motor carriers in interstate commerce.
2. National Highway Traffic Safety Administration	Carries out programs and research related to the safety and performance of motor vehicles, and related equipment.

SOURCE: U.S. Congress, Office of Technology Assessment, 1991, based on: National Archives and Records Administration, Office of the Federal Register, The *United States Government Manual 1990/91* (Washington DC: U.S. Government Printing Office, July 1, 1990),

Figure 13—Estimated Adolescent-Specific Expenditures by U.S. Executive Branch Agencies Responding to OTA's 1989 Survey (dollars are in millions)

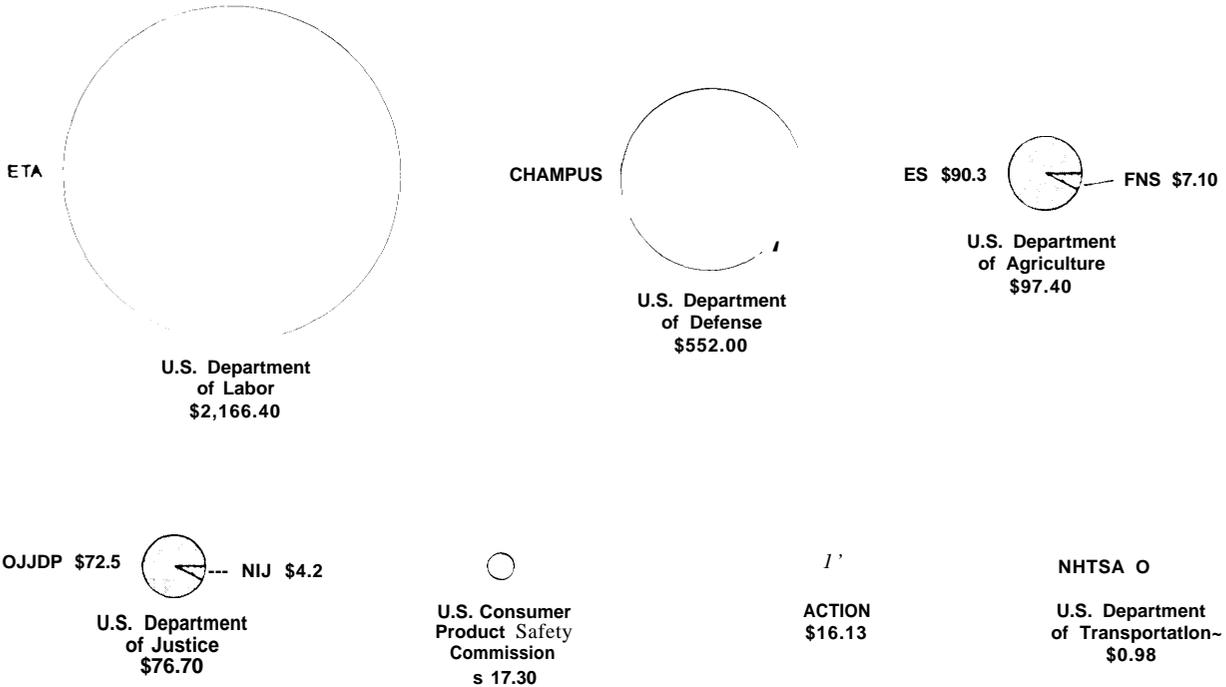


NOTE: Graphs are not drawn to scale. Differences in size are designed to provide rough estimates of differences in adolescent-specific expenditures only.

Key to abbreviations:

- | | |
|---|---|
| ADAMHA—Alcohol, Drug Abuse, and Mental Health Administration | NIAAA—National Institute on Alcohol Abuse and Alcoholism |
| ASPE—Assistant Secretary for Planning and Evaluation | NIDA—National Institute on Drug Abuse |
| BHCDA—Bureau of Health Care Delivery and Assistance | NIH—National Institutes of Health |
| BMCH—Bureau of Maternal and Child Health | NIJ—National Institute of Justice |
| CCDPHP—Center for Chronic Disease Prevention and Health Promotion | NIMH—National Institute of Mental Health |
| CDC—Centers for Disease Control | NHTSA—National Highway Traffic and Safety Administration |
| CEHIC—Center for Environmental Health and Injury Control | OASH—Office of the Assistant Secretary for Health |
| CHAMPUS—Civilian Health and Medical Program of the Uniformed Services | ODPHP—Office of Disease Prevention and Health Promotion |
| CID—Center for Infectious Diseases | OESE—Office of Elementary and Secondary Education |
| CPS—Center for Prevention Services | OHDS—Office of Human Development Services |
| DI—Division of Immunization | OJJDP—Office of Juvenile Justice and Delinquency Prevention |
| DTC—Division of Tuberculosis Control | OMH—Office of Minority Health |
| ES—Extension Service | OPA—Office of Population Affairs |
| ETA—Employment and Training Administration | ORHP—Office of Rural Health Policy |
| FNS—Food and Nutrition Service | OSAP—Office of Substance Abuse Prevention |
| FSA—Family Support Administration | OSERS—Office of Special Education and Rehabilitative Services |
| HCFA—Health Care Financing Administration | OSH—Office of Smoking and Health |
| HRSA—Health Resources and Services Administration | OTI—Office of Treatment Improvement |
| IHS—Indian Health Service | PHS—Public Health Service |
| NAIEP—National AIDS Information and Education Program | SSA—Social Security Administration |

^aThe following agencies within DHHS were unable to provide OTA with the amount spent on adolescents alone: Family Support Administration, Social Security Administration, Indian Health Service, National Institute on Drug Abuse (ADAMHA, PHS), Office of Treatment Improvement (ADAMHA, PHS), National AIDS Information Education Program (CDC, PHS), Office of Safety and Health (CCDPHP, CDC, PHS), Division of Immunization (CPS, CDC, PHS), Division of Tuberculosis Control (CPS, CDC, PHS), Office of Rural Health Policy (HRSA, PHS), Bureau of Maternal and Child Health (HRSA, PHS), Bureau of Health Resources Development (HRSA, PHS), Office of Disease Prevention and Health Promotion (OASH, PHS), Office of Minority Health (OASH, PHS).



^dThis figure includes \$33.3 million spent by the Division of Adolescent and School Health (CCDPHP), \$0.45 million spent by the Division of Reproductive Health (CCDPHP), \$23.7 million spent by the Division of STD/HIV Prevention (CPS), \$0.525 million spent by the Division of HIV/AIDS (CID), \$3.3 million spent by Division of Injury Control (CEHC), and \$0.158 million spent by the Division of Prevention Programs (CEHC).

^eThis figure includes expenditures by the Bureau of Health Care Delivery and Assistance only. Expenditures on adolescents by other subagencies (e.g., the Bureau of Maternal and Child Health) within HRSA were not provided to OTA.

^fThis figure includes: \$19.5 million spent by the National Cancer Institute, \$0.148 million spent by the National Center for Nursing Research, \$2.1 million spent by the National Center for Research Resources, \$15.4 million spent by the National Heart, Lung, and Blood Institute, \$98.2 million spent by the National Institute of Allergy and Infectious Diseases, \$0.784 million spent by the National Institute of Arthritis and Musculoskeletal and Skin Diseases, \$25.1 million spent by the National Institute of Child Health and Human Development, \$26.6 million spent by the National Institute of Diabetes and Digestive and Kidney Diseases, \$1.3 million spent by the National Institute of Neurological Disorders and Stroke. All are estimates.

^gThis is a very rough estimate by OTA. The Office of Elementary and Secondary Education dispenses most of the funds that are spent by the U.S. Department of Education. The Office has no specific line items for adolescents, because it distributes grants to schools and other organizations for various programs that are not aimed at a particular age group. In 1989, the Office of Elementary and Secondary Education disbursed \$6.6 billion for all activities. OTA's estimate is based on the assumption that 10- to 18-year-olds are attending grades 5 through 12, which constitute 66.6 percent of elementary and secondary grades, not including kindergarten. Two-thirds of \$6.6 billion is \$4.4 billion. Since the percentage of adolescents attending school is likely to be lower than the percentage of younger children attending school, this estimate may be too high. OTA estimates, therefore, that the office of Elementary and Secondary Education spends about \$4 billion on education of adolescents. However, this estimate does not take into account that the cost of adolescents' education may be higher than that of younger students (e.g. more highly trained teachers, more sophisticated lab equipment).

^hThis figure does not include spending by the following offices within the U.S. Department of Education that also serve adolescents: Office of Bilingual Education and Minority Languages Affairs, Office of Planning, Budget, and Evaluation, Office of Postsecondary Education, Office of Vocational and Adult Education. These offices were not able to provide OTA with estimates of spending on adolescents.

ⁱThis is a very rough estimate by OTA. The figure was tabulated by using the following percentages on how many adolescents were served in the respective programs: 43 percent of the participants in the National School Lunch Program are in grades 7 through 12; 24 percent of the participants in the Supplemental Food Program for Women, Infants, and Children are pregnant, breastfeeding, or postpartum females under age 18; and 34 percent of participants in the Food Stamp Program are between the ages of 15 and 17.

^jThis figure does not include the Federal Highway Administration, which also serves adolescents.

SOURCE: Office of Technology Assessment, 1991, based on various responses to the Office of Technology Assessment's 1989 questionnaire regarding adolescent health initiatives, Washington, DC, 1989.

(e.g., Medicaid, Civilian Health and Medical Program of the Uniformed Services) rather than on *discretionary* programs (research, program development, some support for services).⁵⁰ For example, Federal spending for adolescents under Medicaid dwarfs spending in the National Institutes of Health, the Centers for Disease Control, the Alcohol, Drug Abuse, and Mental Health Administration, and other DHHS agencies combined (figure 13).⁵¹ Second, even some of the discretionary spending is in the form of block grants to States.⁵² Unless discretionary spending is increased, or moneys are reallocated from other population groups or health concerns, these approaches to funding for adolescent health potentially leave Congress and the U.S. executive branch relatively little flexibility in spending for adolescent health.⁵³ Third, much of the Federal non-block-granted discretionary spending on adolescent health issues is devoted to a limited range of specific topics and to a particular perspective on the causes of adolescent health problems.⁵⁴ The focus is overwhelmingly on nonenvironmental approaches to changing adolescents' behavior. Although no one would argue that there are certain behaviors in which adolescents should not engage, there is little emphasis in Federal programs on viewing problems from the perspective of adolescents, improving social environments⁵⁵ in order to potentially effect change in adolescent behavior, or improving adolescents' access to health services. The fourth issue is that, as this problem-specific approach suggests—and OTA's analysis of Federal policies confirms—the Federal Government does not have a coordinated approach to adolescent health. While there are numerous coordinating bodies and memorandums of inter-agency agreements within the U.S. executive

branch, these coordinating efforts have not resulted in a synchronized approach to adolescent health that would prevent both excessive fragmentation and unwarranted duplication of effort.

Congressional Committees

The fragmented and problem-specific approach of U.S. executive branch agencies is understandable, at least in part, as a reaction to the multitude of congressional committees with a potential role in adolescent health. As intended by the U.S. Constitution, executive branch agencies take their direction from the legislation enacted by Congress. As shown in table 3, numerous congressional committees and subcommittees do or can potentially play a role in the many facets of improving adolescent health.

Two congressional committees and subcommittees play a major role in authorizing legislation related to adolescent health:

- the Senate Committee on Labor and Human Resources and its Subcommittee on children, Family, Drugs, and Alcoholism; and
- the House Committee on Energy and Commerce and its Subcommittee on Health and the Environment.

Other congressional committees and subcommittees have important roles in various topic, special population, or service delivery areas (e.g., the Senate and House Committees on Agriculture authorize nutrition programs and rural development programs that have the potential to affect the lives of rural adolescents; the Senate Finance Committee is a major actor in Medicaid legislation). As in the U.S. executive branch, certain congressional committees

⁵⁰**Entitlements are benefits paid out automatically each year to all who qualify unless there is a change in underlying law; these include Federal** employee retirement benefits, Medicare, Medicaid, unemployment compensation Aid to Families With Dependent Children, and supplemental security income (218). Congress can influence spending for entitlements by changing program eligibility and benefit rules; spending for entitlements is also affected by demographic and economic trends, and by the extent to which individuals seek services (e.g., under Medicaid). Discretionary programs are those subject to the annual appropriations process.

It is also important to note that general and mental hospital costs accounted for about two-fifths of estimated Medicaid expenditures for 10- to 18-year-olds in 1988 (253).

⁵²**Block grants are sums of Federal funds allotted to State agencies (e.g., education, health) which may be passed onto local agencies. States determine** the mix of services provided and the population served and are accountable to the Federal Government only to the extent that funds are spent in accordance with program requirements. Sometimes, however, set-asides are required for specific population groups.

⁵³**Barriers to change in current policies related to the current Federal deficit and recently legislated limitations on increases in domestic discretionary** spending are discussed below (see "Barriers and Opportunities to Change").

⁵⁴**OTA's analysis of Federal efforts with respect to adolescents suggests that the adolescent health problems that currently receive the most Federal** attention are problems related to adolescent sexuality, drug use, and, to some extent, delinquency (other than drug use) (see ch. 19, "The Role of Federal Agencies in Adolescent Health," in Vol. III).

⁵⁵**A social environment is the aggregate of social and cultural conditions that influence the life of an individual or community. Aspects of the social** environment particularly important to adolescents include adolescents' families, other adults with whom adolescents come in contact, schools, workplaces, recreational facilities, and the media.

Table 3—Congressional Committees With a Role in Adolescent Health^a

Congressional committees and subcommittees	AP = Handles appropriations B = Sets funding guidelines					AU = Authorizes major program areas A = Authorizes specific programs		O = Oversight of programs T = Jurisdiction over funding sources such as trust funds		
	Families	Schools and education	Work, recreation, and fitness	Nutrition	Special groups	Health and related services (delivery and access)	Financial access to health services	Future competitiveness and defense readiness	Other	
Senate committees										
Agriculture, Nutrition, and Forest@ Nutrition and Investigations				AU/O	A/O					
Appropriations ^d	AP/O	AP/O	AP/O	AP/O	AP/O	AP/O	AP/O	AP/O	AP/O	
Armed Services ^e						A/o	A/o	A/o		
Banking, Housing, and Urban Affairs' Housing and Urban Affairs	A/O				A/O					
Budget	o	o	o	o	o	o	o	o	o	
Commerce, Science, and Transportation@			AU/O						AU/O	
Environment and Public Works ^h			A/o					AU/O		
Finanecd Social Security and Family Policy Health for Families and the Uninsured	T/O					T/O	AU/T/O			
Governmental Affairs ^j	o	o	o	o	o	o	o -	o	AU/O	

^aExcept where noted, the congressional committees shown in this table are standing committees. *Standing committees* are committees that are permanent bodies of either the House or the Senate, have responsibility for broad areas of legislation (e.g., agriculture), and are responsible for most of the legislation considered by Congress. The Senate has 16 standing committees, and the House has 22 standing committees. *Select committees* are committees created to study particular problems or concerns (e.g., Select Committee on Children, Youth, and Families). These committees make recommendations but are usually not permitted to report legislation to Congress (the one exception is the Select Intelligence Committee). Joint committees are committees composed of members from both the House and the Senate. The Joint Economic Committee is the only joint committee which has a policy role v. an administrative role, and reports its findings to Congress.

^bOnly subcommittees that deal extensively with legislation related to adolescent health are noted. A *subcommittee* is an offshoot of a standing or joint committee and deals with a particular area covered by the full committee. There are usually a number of subcommittees within a particular committee. Members of the subcommittee are also members of the full committee. Subcommittees hold hearings and amend bills relating to their particular topic area. The amendments must be voted on in the full committee before returning to the House or Senate floor.

^cThe Senate Agriculture, Nutrition, and Forestry Committee authorizes and exercises oversight over numerous programs administered by the U.S. Department of Agriculture, including food and nutrition programs (e.g., the Food Stamp Program, school nutrition programs) and programs related to rural development.

^dThe following subcommittees of the Senate Appropriations Committee deal with programs relevant to adolescent health: Agriculture, Rural Development, and Related Agencies; Commerce, Justice, and State, the Judiciary, and Related Agencies; Defense; Interior and Related Agencies; Labor, Health and Human Services, Education and Related Agencies; and Transportation and Related Agencies.

^eThe Senate Armed Services Committee authorizes and exercises oversight over numerous programs administered by the U.S. Department of Defense, including the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), a civilian health and medical program for retirees and the spouses and dependent children of active duty, retired, and deceased military personnel.

^fThe Senate Banking, Housing, and Urban Affairs Committee authorizes and exercises oversight over programs administered by the U.S. Department of Housing and Urban Development, including public and private housing programs and community development block grants.

^gThe Senate Commerce, Science, and Transportation Committee authorizes and exercises oversight over programs administered by the U.S. Department of Transportation, including programs related to highway and motor vehicle transportation safety.

^hThe Senate Environment and Public Works Committee authorizes and exercises oversight over programs administered by the Environmental Protection Agency that alleviate or reduce noise, water, and air pollution.

ⁱThe Senate Finance Committee authorizes health programs under the Social Security Act, including Medicaid.

^jThe Senate Governmental Affairs Committee has jurisdiction over programs of the Census Bureau, and over the organization of Congress and the U.S. executive branch.

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Table 3-Congressional Committees With a Role in Adolescent Health^a-Continued

	AP = Authorizes major program areas A = Authorizes specific programs				O = Oversight of programs T = Jurisdiction over funding sources such as trust funds				
Congressional committees and subcommittees ^b	Families	Schools and education	work, recreation, and fitness	Nutrition	Special groups	Health and related services (delivery and access)	Financial access to health services	Future competitiveness and defense readiness	Other
Judiciary ^c					AU/O				AU/O
Labor and Human Resources	AU/O	AU/O	AU/O	AU/O	AU/O	AU/O	AU/O	AU/O	AU/O
Labor									
Education, Arts, and Humanities									
Employment and Productivity									
Disability Policy									
Children, Family, Drugs, Alcoholism									
Select Committee on Indian Affairs					O	O	O		
House committees									
Agricultural				A/O	AU/O				
Conservation, Credit, and Rural Development									
Domestic Marketing, Consumer Relations, and Nutrition									
Appropriations ^d	AP/O	AP/O	AP/O	AP/O	AP/O	AP/O	AP/O	AP/O	AP/O
Armed Services ^e						A/O	A/O	A/O	
Banking, Finance, and Urban Affairs	A/O				A/O				
Housing and Community Development									
Budget	O	O	O	O	O	O	O	O	O
Education and Labor	AU/O	AU/O	AU/O	A/O	A/O				AU/O
Elementary, Secondary, and Vocational Education									
Health and Safety									
Employment Opportunities									
Select Education									

^kThe Senate Judiciary Committee authorizes and exercises oversight over programs administered by the U.S. Department of Justice, including Office of Justice and other programs related to juvenile justice and delinquency prevention.

^lThe Senate Labor and Human Resources Committee authorizes and exercises oversight over a wide range of programs related to health, education, labor, and public welfare. It has jurisdiction Over the Public Health Service Act, substance abuse programs, education programs, and numerous other programs related to children and families.

^mThe House Agriculture Committee authorizes and exercises oversight over programs administered by the U.S. Department of Agriculture, including food and nutrition programs (e.g., the Food Stamp Program, school nutrition programs) and programs related to rural development.

ⁿThe following subcommittees of the House Committee on Appropriations deal with programs relevant to adolescent health: Commerce, Justice, and State, the Judiciary, and Related Agencies; Defense; interior and Related Agencies; Labor, Health and Human Services, Education, and Related Agencies; Rural Development, Agriculture, and Related Agencies; and VA, HUD, and Independent Agencies.

^oThe House Armed Services Committee authorizes programs administered by the U.S. Department of Defense, including CHAMPUS (see Senate Armed Services Committee above).

^pThe House Banking, Finance, and Urban Affairs Committee authorizes and exercises oversight over programs administered by the U.S. Department of Housing and Urban Development, including housing and community development programs.

^qThe House Education and Labor Committee authorizes and exercises oversight over a wide range of programs related to education, labor standards, human resources programs for the elimination of poverty and the care and treatment of children (e.g., Head Start, community services block grants, juvenile justice and delinquency prevention, and programs for runaway youths), and job training.

Table 3—Congressional Committees With a Role in Adolescent Health^a—Continued

	AU = Authorizes major program areas	O = Oversight of programs						
	A = Authorizes specific programs							
	Families	Schools and education	Work, recreation, and fitness	Nutrition	Special groups	Health-related services (delivery and access)	Financial access to health services	Future competitiveness and defense readiness
Congressional committees and subcommittees								
Health and the Environment								
Government pers								
Interior and Insular Affairs ¹	AU/U		AU/U					
Judiciary ²								
Post ³								
Science, Space, and Technology ⁴								
Ways and Means ⁵								
Health								
Human Resources								
Select Committee on Children, Youth, and Families								
Select Committee on Hunger								
Select Committee on Narcotics Abuse and Control ⁶								
Joint committee								
Joint Economic Committee								
Economic Resources and Competitiveness								
Education and Health								

¹On January 1, 1990, the Department of the Interior transferred jurisdiction over a wide range of programs related to health and the environment, including Medicaid and national health insurance, to the Department of Health and Human Services. It also has jurisdiction over the Clean Air Act and the Safe Drinking Water Act.

²The House Government Operations Committee has oversight responsibilities related to the organization and reorganization of the U.S. executive branch.

³The House Interior and Insular Affairs Committee authorizes and exercises oversight over programs administered by the U.S. Department of the Interior, including programs that deal with national parks and several programs that affect Native Americans.

⁴This House Judiciary Committee authorizes and exercises oversight over programs administered by the U.S. Department of Justice, including Office of Justice and other programs related to juvenile justice and delinquency prevention.

⁵The House Post Office and Civil Service Committee has jurisdiction over programs of the Census Bureau and authorizes programs that deal with health and related services for Federal employees and their families.

⁶The House Science, Space, and Technology Committee authorizes research and development in science and technology.

⁷The House Ways and Means Committee authorizes and exercises oversight over numerous programs of the Social Security Act, including AFDC.

⁸The House Select Committee on Narcotics Abuse and Control investigates issues relating to substance abuse and the criminal justice system.

SOURCE: Office of Technology Assessment, based on material from U.S. Congress, Library of Congress, *Congressional Yellow Book 16(3)* (Washington, DC: Monitor Publishing Co., Fall 1990).