Results from the 2010
National Survey on Drug Use and Health:
Summary of National Findings

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
Center for Behavioral Health Statistics and Quality

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Table of Contents

Table of Contents (continued)

Table of Contents (continued)

List of Figures

List of Figures (continued)

List of Figures (continued)

List of Figures (continued)

List of Tables

Highlights

This report presents the first information from the 2010 National Survey on Drug Use and Health (NSDUH), an annual survey sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA). The survey is the primary source of information on the use of illicit drugs, alcohol, and tobacco in the civilian, noninstitutionalized population of the United States aged 12 years old or older. The survey interviews approximately 67,500 persons each year. Unless otherwise noted, all comparisons in this report described using terms such as "increased," "decreased," or "more than" are statistically significant at the .05 level.

Illicit Drug Use

- In 2010, an estimated 22.6 million Americans aged 12 or older were current (past month) illicit drug users, meaning they had used an illicit drug during the month prior to the survey interview. This estimate represents 8.9 percent of the population aged 12 or older. Illicit drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

- The rate of current illicit drug use among persons aged 12 or older in 2010 (8.9 percent) was similar to the rate in 2009 (8.7 percent), but higher than the rate in 2008 (8.0 percent).

- Marijuana was the most commonly used illicit drug. In 2010, there were 17.4 million past month users. Between 2007 and 2010, the rate of use increased from 5.8 to 6.9 percent, and the number of users increased from 14.4 million to 17.4 million.

- In 2010, there were 1.5 million current cocaine users aged 12 or older, comprising 0.6 percent of the population. These estimates were similar to the number and rate in 2009 (1.6 million or 0.7 percent), but were lower than the estimates in 2006 (2.4 million or 1.0 percent).

- Hallucinogens were used in the past month by 1.2 million persons (0.5 percent) aged 12 or older in 2010, including 695,000 (0.3 percent) who had used Ecstasy. These estimates were similar to estimates in 2009.

- In 2010, there were 7.0 million (2.7 percent) persons aged 12 or older who used prescription-type psychotherapeutic drugs nonmedically in the past month. These estimates were similar to estimates in 2009 (7.0 million or 2.8 percent) and to estimates in 2002 (6.3 million or 2.7 percent).

- The number of past month methamphetamine users decreased between 2006 and 2010, from 731,000 (0.3 percent) to 353,000 (0.1 percent).

- Among youths aged 12 to 17, the current illicit drug use rate was similar in 2009 (10.0 percent) and 2010 (10.1 percent), but higher than the rate in 2008 (9.3 percent). Between 2002 and 2008, the rate declined from 11.6 to 9.3 percent.

- The rate of current marijuana use among youths aged 12 to 17 decreased from 8.2 percent in 2002 to 6.7 percent in 2006, remained unchanged at 6.7 percent in 2007 and 2008, then increased to 7.3 percent in 2009 and 7.4 percent in 2010.

- Among youths aged 12 to 17, the rate of current nonmedical use of prescription-type drugs declined from 4.0 percent in 2002 to 3.0 percent in 2010.

- The rate of current Ecstasy use among youths aged 12 to 17 declined from 0.5 percent in 2002 to 0.3 percent in 2004, remained at that level through 2007, then increased to 0.5 percent in 2009 and 2010.

- The rate of current use of illicit drugs among young adults aged 18 to 25 increased from 19.6 percent in 2008 to 21.2 percent in 2009 and 21.5 percent in 2010, driven largely by an increase in marijuana use (from 16.5 percent in 2008 to 18.1 percent in 2009 and 18.5 percent in 2010).

- Among young adults aged 18 to 25, the rate of current nonmedical use of prescription-type drugs in 2010 was 5.9 percent, similar to the rate in the years from 2002 to 2009. There were decreases from 2002 to 2010 in the use of cocaine (from 2.0 to 1.5 percent) and methamphetamine (from 0.6 to 0.2 percent).

- Among those aged 50 to 59, the rate of past month illicit drug use increased from 2.7 percent in 2002 to 5.8 percent in 2010. This trend partially reflects the aging into this age group of the baby boom cohort (i.e., persons born between 1946 and 1964), whose lifetime rate of illicit drug use has been higher than those of older cohorts.

- Among persons aged 12 or older in 2009-2010 who used pain relievers nonmedically in the past 12 months, 55.0 percent got the drug they most recently used from a friend or relative for free. Another 17.3 percent reported they got the drug from one doctor. Only 4.4 percent got pain relievers from a drug dealer or other stranger, and 0.4 percent bought them on the Internet. Among those who reported getting the pain reliever from a friend or relative for free, 79.4 percent reported in a follow-up question that the friend or relative had obtained the drugs from just one doctor.

- Among unemployed adults aged 18 or older in 2010, 17.5 percent were current illicit drug users, which was higher than the 8.4 percent of those employed full time and 11.2 percent of those employed part time. However, most illicit drug users were employed. Of the 20.2 million current illicit drug users aged 18 or older in 2010, 13.3 million (65.9 percent) were employed either full or part time.

- In 2010, 10.6 million persons aged 12 or older reported driving under the influence of illicit drugs during the past year. This corresponds to 4.2 percent of the population aged 12 or older, which was the same as the rate in 2009 and lower than the rate in 2002 (4.7 percent). In 2010, the rate was highest among young adults aged 18 to 25 (12.7 percent).

Alcohol Use

- Slightly more than half of Americans aged 12 or older reported being current drinkers of alcohol in the 2010 survey (51.8 percent). This translates to an estimated 131.3 million people, which was similar to the 2009 estimate of 130.6 million people (51.9 percent).

- In 2010, nearly one quarter (23.1 percent) of persons aged 12 or older participated in binge drinking. This translates to about 58.6 million people. The rate in 2010 was similar to the estimate in 2009 (23.7 percent). Binge drinking is defined as having five or more drinks on the same occasion on at least 1 day in the 30 days prior to the survey.

- In 2010, heavy drinking was reported by 6.7 percent of the population aged 12 or older, or 16.9 million people. This rate was similar to the rate of heavy drinking in 2009 (6.8 percent). Heavy drinking is defined as binge drinking on at least 5 days in the past 30 days.

- Among young adults aged 18 to 25 in 2010, the rate of binge drinking was 40.6 percent, and the rate of heavy drinking was 13.6 percent. These rates were similar to the rates in 2009.

- The rate of current alcohol use among youths aged 12 to 17 was 13.6 percent in 2010, which was lower than the 2009 rate (14.7 percent). Youth binge and heavy drinking rates in 2010 (7.8 and 1.7 percent) were also lower than rates in 2009 (8.8 and 2.1 percent).

- There were an estimated 10.0 million underage (aged 12 to 20) drinkers in 2010, including 6.5 million binge drinkers and 2.0 million heavy drinkers.

- Past month and binge drinking rates among underage persons declined between 2002 and 2010. Past month use declined from 28.8 to 26.3 percent, while binge drinking declined from 19.3 to 17.0 percent.

- In 2010, 55.3 percent of current drinkers aged 12 to 20 reported that their last use of alcohol in the past month occurred in someone else's home, and 29.9 percent reported that it had occurred in their own home. About one third (30.6 percent) paid for the alcohol the last time they drank, including 8.8 percent who purchased the alcohol themselves and 21.6 percent who gave money to someone else to purchase it. Among those who did not pay for the alcohol they last drank, 38.9 percent got it from an unrelated person aged 21 or older, 16.6 percent from another person younger than 21 years old, and 21.6 percent from a parent, guardian, or other adult family member.

- In 2010, an estimated 11.4 percent of persons aged 12 or older drove under the influence of alcohol at least once in the past year. This percentage had dropped since 2002, when it was 14.2 percent. The rate of driving under the influence of alcohol was highest among persons aged 21 to 25 (23.4 percent).

Tobacco Use

- In 2010, an estimated 69.6 million Americans aged 12 or older were current (past month) users of a tobacco product. This represents 27.4 percent of the population in that age range. In addition, 58.3 million persons (23.0 percent of the population) were current cigarette smokers; 13.2 million (5.2 percent) smoked cigars; 8.9 million (3.5 percent) used smokeless tobacco; and 2.2 million (0.8 percent) smoked tobacco in pipes.

- Between 2002 and 2010, past month use of any tobacco product decreased from 30.4 to 27.4 percent, and past month cigarette use declined from 26.0 to 23.0 percent. Rates of past month use of cigars, smokeless tobacco, and pipe tobacco in 2010 were similar to corresponding rates in 2002.

- The rate of past month tobacco use among 12 to 17 year olds declined from 15.2 percent in 2002 to 10.7 percent in 2010, including a decline from 2009 (11.6 percent) to 2010. The rate of past month cigarette use among 12 to 17 year olds also declined between 2002 and 2010, from 13.0 to 8.3 percent, including a decline between 2008 (9.1 percent) and 2010. Cigar use among youths declined between 2009 and 2010, from 4.0 to 3.2 percent.

Initiation of Substance Use (Incidence, or First-Time Use) within the Past 12 Months

- In 2010, an estimated 3.0 million persons aged 12 or older used an illicit drug for the first time within the past 12 months. This averages to about 8,100 initiates per day and was similar to the estimate for 2009 (3.1 million). A majority of these past year illicit drug initiates reported that their first drug was marijuana (61.8 percent). About one quarter initiated with psychotherapeutics (26.2 percent, including 17.3 percent with pain relievers, 4.6 percent with tranquilizers, 2.5 percent with stimulants, and 1.9 percent with sedatives). A sizable proportion reported inhalants (9.0 percent) as their first illicit drug, and a small proportion used hallucinogens as their first drug (3.0 percent).

- In 2010, the illicit drug categories with the largest number of past year initiates among persons aged 12 or older were marijuana use (2.4 million) and nonmedical use of pain relievers (2.0 million). These estimates were not significantly different from the numbers in 2009. However, the number of marijuana initiates increased between 2007 (2.1 million) and 2010 (2.4 million).

- In 2010, the average age of marijuana initiates among persons aged 12 to 49 was 18.4 years, significantly higher than the average age of marijuana initiates in 2002 (17.0 years).

- The number of past year initiates of methamphetamine among persons aged 12 or older was 105,000 in 2010. This estimate was significantly lower than the estimate in 2007 (157,000) and only about one third of the estimate in 2002 (299,000).

- The number of past year initiates of Ecstasy aged 12 or older was similar in 2009 (1.1 million) and 2010 (937,000), but these estimates were an increase from 2005 (615,000).

- The number of past year cocaine initiates aged 12 or older declined from 1.0 million in 2002 to 637,000 in 2010. The number of initiates of crack cocaine declined during this period from 337,000 to 83,000.

- In 2010, there were 140,000 persons aged 12 or older who used heroin for the first time within the past year, not significantly different from the estimates from 2002 to 2009. Estimates during those years ranged from 91,000 to 180,000 per year.

- Most (82.4 percent) of the 4.7 million past year alcohol initiates were younger than 21 at the time of initiation.

- The number of persons aged 12 or older who smoked cigarettes for the first time within the past 12 months was 2.4 million in 2010, similar to the estimate in 2009 (2.5 million), but significantly higher than the estimate for 2002 (1.9 million). Most new smokers in 2010 were younger than 18 when they first smoked cigarettes (58.8 percent or 1.4 million).

- The number of persons aged 12 or older who used smokeless tobacco for the first time within the past year increased from 928,000 in 2003 to 1.4 million in 2010.

Youth Prevention-Related Measures

- Perceived risk is measured by NSDUH as the percentage reporting that there is great risk in the substance use behavior. The percentage of youths aged 12 to 17 perceiving great risk in smoking marijuana once or twice a week decreased from 54.7 percent in 2007 to 47.5 percent in 2010. Between 2002 and 2008, the percentages who reported great risk in smoking one or more packs of cigarettes per day increased from 63.1 to 69.7 percent, but the percentage dropped to 65.8 percent in 2009 and remained steady at 65.5 percent in 2010.

- Almost half (48.6 percent) of youths aged 12 to 17 reported in 2010 that it would be "fairly easy" or "very easy" for them to obtain marijuana if they wanted some. Approximately one in five reported it would be easy to get cocaine (19.0 percent). About one in seven (12.9 percent) indicated that LSD would be "fairly" or "very" easily available, and 11.6 percent reported easy availability for heroin. Between 2002 and 2010, there were declines in the perceived availability for all four drugs.

- A majority of youths aged 12 to 17 (89.6 percent) in 2010 reported that their parents would strongly disapprove of their trying marijuana or hashish once or twice. Current marijuana use was much less prevalent among youths who perceived strong parental disapproval for trying marijuana or hashish once or twice than for those who did not (4.4 vs. 32.8 percent).

- In 2010, three quarters (75.9 percent) of youths aged 12 to 17 reported having seen or heard drug or alcohol prevention messages from sources outside of school, lower than in 2002 (83.2 percent). The percentage of school-enrolled youths reporting that they had seen or heard prevention messages at school also declined during this period, from 78.8 to 75.4 percent.

Substance Dependence, Abuse, and Treatment

- In 2010, an estimated 22.1 million persons (8.7 percent of the population aged 12 or older) were classified with substance dependence or abuse in the past year based on criteria specified in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV). Of these, 2.9 million were classified with dependence or abuse of both alcohol and illicit drugs, 4.2 million had dependence or abuse of illicit drugs but not alcohol, and 15.0 million had dependence or abuse of alcohol but not illicit drugs.

- Between 2002 and 2010, the number of persons with substance dependence or abuse was stable (22.0 million in 2002 and 22.1 million in 2010).

- The specific illicit drugs that had the highest levels of past year dependence or abuse in 2010 were marijuana (4.5 million), pain relievers (1.9 million), and cocaine (1.0 million). The number of persons with marijuana dependence or abuse did not change between 2002 and 2010, but the number with pain reliever dependence or abuse increased (from 1.5 million to 1.9 million) and the number with cocaine dependence or abuse declined (from 1.5 million to 1.0 million).

- In 2010, adults aged 21 or older who had first used alcohol at age 14 or younger were more than 5 times as likely to be classified with alcohol dependence or abuse than adults who had their first drink at age 21 or older (15.1 vs. 2.7 percent).

- Between 2002 and 2010, the percentage of youths aged 12 to 17 with substance dependence or abuse declined from 8.9 to 7.3 percent.

- Treatment need is defined as having a substance use disorder or receiving treatment at a specialty facility (hospital inpatient, drug or alcohol rehabilitation, or mental health centers) within the past 12 months. In 2010, 23.1 million persons aged 12 or older needed treatment for an illicit drug or alcohol use problem (9.1 percent of persons aged 12 or older). Of these, 2.6 million (1.0 percent of persons aged 12 or older and 11.2 percent of those who needed treatment) received treatment at a specialty facility. Thus, 20.5 million persons (8.1 percent of the population aged 12 or older) needed treatment for an illicit drug or alcohol use problem but did not receive treatment at a specialty facility in the past year.

- Of the 20.5 million persons aged 12 or older in 2010 who were classified as needing substance use treatment but did not receive treatment at a specialty facility in the past year, 1.0 million persons (5.0 percent) reported that they felt they needed treatment for their illicit drug or alcohol use problem. Of these 1.0 million persons who felt they needed treatment, 341,000 (33.3 percent) reported that they made an effort to get treatment, and 683,000 (66.7 percent) reported making no effort to get treatment.

- The number of people receiving specialty treatment in the past year in 2010 (2.6 million) was similar to the number in 2002 (2.3 million). However, the number receiving specialty treatment for a problem with nonmedical pain reliever use more than doubled during this period, from 199,000 to 406,000.

1. Introduction

This report presents a first look at results from the 2010 National Survey on Drug Use and Health (NSDUH), an annual survey of the civilian, noninstitutionalized population of the United States aged 12 years old or older. The report presents national estimates of rates of use, numbers of users, and other measures related to illicit drugs, alcohol, and tobacco products. The report focuses on trends between 2009 and 2010 and from 2002 to 2010, as well as differences across population subgroups in 2010. NSDUH estimates related to mental health, which were included in national findings reports prior to 2009, are not included in this 2010 report. A separate report focusing on 2010 mental health data, including co-occurring mental and substance use disorders, will be published later in 2011.

Summary of NSDUH

NSDUH is the primary source of statistical information on the use of illegal drugs, alcohol, and tobacco by the U.S. civilian, noninstitutionalized population aged 12 or older. Conducted by the Federal Government since 1971, the survey collects data through face-to-face interviews with a representative sample of the population at the respondent's place of residence. The survey is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services, and is planned and managed by SAMHSA's Center for Behavioral Health Statistics and Quality (CBHSQ, formerly the Office of Applied Studies, OAS). Data collection and analysis are conducted under contract with RTI International, Research Triangle Park, North Carolina.[1] This section briefly describes the survey methodology; a more complete description is provided in Appendix A.

NSDUH collects information from residents of households and noninstitutional group quarters (e.g., shelters, rooming houses, dormitories) and from civilians living on military bases. The survey excludes homeless persons who do not use shelters, military personnel on active duty, and residents of institutional group quarters, such as jails and hospitals. Appendix C describes substance use surveys that cover populations outside the NSDUH target population.

From 1971 through 1998, the survey employed paper and pencil data collection. Since 1999, the NSDUH interview has been carried out using computer-assisted interviewing (CAI). Most of the questions are administered with audio computer-assisted self-interviewing (ACASI). ACASI is designed to provide the respondent with a highly private and confidential mode for responding to questions in order to increase the level of honest reporting of illicit drug use and other sensitive behaviors. Less sensitive items are administered by interviewers using computer-assisted personal interviewing (CAPI).

The 2010 NSDUH employed a State-based design with an independent, multistage area probability sample within each State and the District of Columbia. The eight States with the largest population (which together account for about half of the total U.S. population aged 12 or older) were designated as large sample States (California, Florida, Illinois, Michigan, New York,

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[1] RTI International is a trade name of Research Triangle Institute.

Ohio, Pennsylvania, and Texas) and had a sample size of about 3,600 each. For the remaining 42 States and the District of Columbia, the sample size was about 900 per State. The design oversampled youths and young adults; each State's sample was approximately equally distributed among three age groups: 12 to 17 years, 18 to 25 years, and 26 years or older.

Nationally, screening was completed at 147,608 addresses, and 68,487 completed interviews were obtained. The survey was conducted from January through December 2010. Weighted response rates for household screening and for interviewing were 88.8 and 74.7 percent, respectively. See Appendix B for more information on NSDUH response rates.

Limitations on Trend Measurement

Because of the shift in interviewing method in 1999, the estimates from the pre-1999 surveys are not comparable with estimates from the current CAI-based surveys. Although the design of the 2002 through 2010 NSDUHs is similar to the design of the 1999 through 2001 surveys, there are methodological differences that affect the comparability of the 2002 to 2010 estimates with estimates from prior surveys. The most important change was the incentive payment that started in 2002. Each NSDUH respondent completing the interview is given $30. Also, the name of the survey was changed in 2002, from the National Household Survey on Drug Abuse (NHSDA) to the current name. Improved data collection quality control procedures were introduced in the survey starting in 2001, and updated population data from the 2000 decennial census were incorporated into the sample weights starting with the 2002 estimates. Analyses of the effects of these factors on NSDUH estimates have shown that 2002 and later data should not be compared with 2001 and earlier data from the survey series to assess changes over time. Appendix C of the 2004 NSDUH report on national findings discusses this in more detail (see OAS, 2005).

Because of changes in the questionnaire, estimates for methamphetamine, stimulants, and psychotherapeutics in this report should not be compared with corresponding estimates presented in reports for data years prior to 2007. Estimates for 2002 to 2006 for these drug categories in this report, as well as in the 2007 and 2008 reports, incorporate statistical adjustments that enable year-to-year comparisons to be made over the period from 2002 to 2010.

Format of Report and Data Presentation

This report has separate chapters that discuss findings on the use of illicit drugs; use of alcohol; use of tobacco products; initiation of substance use; prevention-related issues; and substance dependence, abuse, and treatment. A final chapter summarizes the results and discusses key findings in relation to other research and survey results. The data and findings described in this report are based on a comprehensive set of tables, referred to as "detailed tables," that include population estimates (e.g., numbers of drug users), rates (e.g., percentages of the population using drugs), and standard errors of estimates. These tables are available separately on the CBHSQ Web site (http://www.oas.samhsa.gov). In addition, the tables are accompanied by a glossary that covers key definitions used in this report and in the detailed tables. Appendices in this report describe the survey (Appendix A), technical details on the statistical methods and measurement (Appendix B), and other sources of related data (Appendix

C). A list of references cited in the report (Appendix D) and contributors to this report (Appendix E) also are provided.

Text, figures, and detailed tables present prevalence measures for the population in terms of both the number of persons and the percentage of the population. Substance use tables show prevalence estimates by lifetime (i.e., ever used), past year, and past month use. Analyses focus primarily on past month use, which also is referred to as "current use." Where applicable, footnotes are included in tables and figures to indicate whether the 2010 estimates are significantly different from 2009 or earlier estimates. In addition, some estimates are presented based on data combined from two or more survey years to increase precision of the estimates; those estimates are annual averages based on multiple years of data.

Statistical tests have been conducted for all statements appearing in the text of the report that compare estimates between years or subgroups of the population. Unless explicitly stated that a difference is not statistically significant, all statements that describe differences are significant at the .05 level. Statistically significant differences are described using terms such as "higher," "lower," "increased," and "decreased." Statements that use terms such as "similar," "no difference," "same," or "remained steady" to describe the relationship between estimates denote that a difference is not statistically significant. When a set of estimates for survey years or population subgroups is presented without a statement of comparison, statistically significant differences among these estimates are not implied and testing may not have been conducted.

All estimates presented in the report have met the criteria for statistical reliability (see Section B.2.2 in Appendix B). Estimates that do not meet these criteria do not appear in tables, figures, or text. Suppressed estimates are not included in statistical tests of comparisons. For example, a statement that "whites had the highest prevalence" means that the rate among whites was higher than the rate among all nonsuppressed racial/ethnic subgroups, but not necessarily higher than the rate among a subgroup for which the estimate was suppressed.

Data are presented for racial/ethnic groups based on guidelines for collecting and reporting race and ethnicity data (Office of Management and Budget [OMB], 1997). Because respondents could choose more than one racial group, a "two or more races" category is included for persons who reported more than one category (i.e., white, black or African American, American Indian or Alaska Native, Native Hawaiian, Other Pacific Islander, Asian, Other). Respondents choosing both Native Hawaiian and Other Pacific Islander but no other categories are classified as being in the "Native Hawaiian or Other Pacific Islander" category instead of the "two or more race" category. Except for the "Hispanic or Latino" group, the racial/ethnic groups include only non-Hispanics. The category "Hispanic or Latino" includes Hispanics of any race.

Data in this report also are presented for four U.S. geographic regions as defined by the U.S. Census Bureau (Figure 1.1). Other geographic comparisons also are made based on county type, a variable that reflects different levels of urbanicity and metropolitan area inclusion of counties. This county classification was originally developed and subsequently updated by the U.S. Department of Agriculture (Butler & Beale, 1994). Each county is either inside or outside a metropolitan statistical area (MSA), based on metropolitan area definitions issued by the OMB in June 2003 (OMB, 2003). Large metropolitan areas have a population of 1 million or more. Small metropolitan areas have a population of fewer than 1 million. Nonmetropolitan areas are outside

of MSAs. Counties in nonmetropolitan areas are further classified based on the number of people in the county who live in an urbanized area, as defined by the Census Bureau at the subcounty level. "Urbanized" counties have a population of 20,000 or more in urbanized areas, "less urbanized" counties have at least 2,500 but fewer than 20,000 population in urbanized areas, and "completely rural" counties have populations of fewer than 2,500 in urbanized areas.

Other NSDUH Reports and Data

Other reports focusing on specific topics of interest will be produced using the 2010 NSDUH data and made available on SAMHSA's Web site. In particular, data on mental health will be discussed in a separate report to be released later this year: *Results from the 2010 National Survey on Drug Use and Health: Mental Health Findings*. A report on State-level estimates for substance use and mental health for 2009-2010 is scheduled to be released in the spring of 2012. A report on substate estimates using data from 2008-2010 is scheduled for publication in the summer of 2012.

The detailed tables, other descriptive reports and in-depth analytic reports focusing on specific issues or populations, and methodological information on NSDUH, including the questionnaire, are all available at http://www.oas.samhsa.gov. In addition, CBHSQ makes public use data files available through the Substance Abuse and Mental Health Data Archive at http://www.datafiles.samhsa.gov. Currently, files are available from the 1979 to 2009 surveys. The 2010 NSDUH public use file will be available by the end of 2011.

Figure 1.1 U.S. Census Bureau Regions
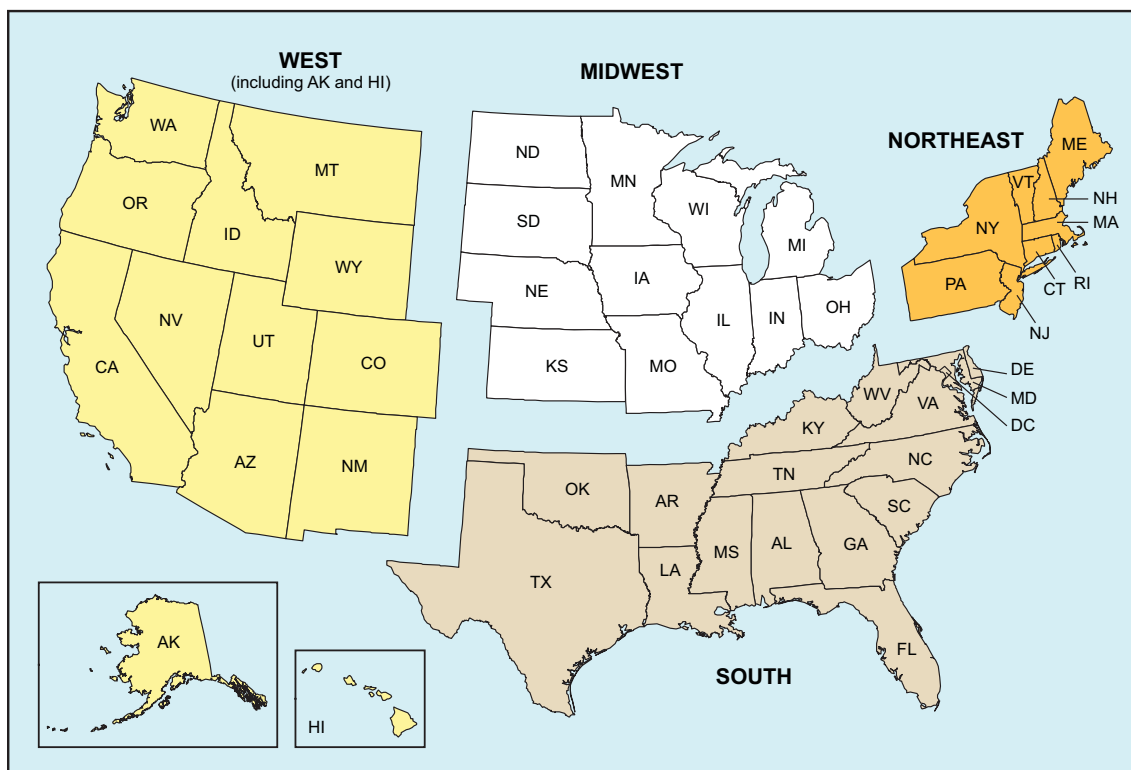
2. Illicit Drug Use

The National Survey on Drug Use and Health (NSDUH) obtains information on nine categories of illicit drug use: use of marijuana, cocaine, heroin, hallucinogens, and inhalants, as well as the nonmedical use of prescription-type pain relievers, tranquilizers, stimulants, and sedatives. In these categories, hashish is included with marijuana, and crack is considered a form of cocaine. Several drugs are grouped under the hallucinogens category, including LSD, PCP, peyote, mescaline, psilocybin mushrooms, and "Ecstasy" (MDMA). Inhalants include a variety of substances, such as nitrous oxide, amyl nitrite, cleaning fluids, gasoline, spray paint, other aerosol sprays, and glue. Respondents are asked to report use of inhalants to get high but not to report times when they accidentally inhaled a substance.

The four categories of prescription-type drugs (pain relievers, tranquilizers, stimulants, and sedatives) cover numerous medications that currently are or have been available by prescription. They also include drugs within these groupings that originally were prescription medications but currently may be manufactured and distributed illegally, such as methamphetamine, which is included under stimulants. Respondents are asked to report only "nonmedical" use of these drugs, defined as use without a prescription of the individual's own or simply for the experience or feeling the drugs caused. Use of over-the-counter drugs and legitimate use of prescription drugs are not included. NSDUH reports combine the four prescription-type drug groups into a category referred to as "psychotherapeutics."

Estimates of "illicit drug use" reported from NSDUH reflect the use of any of the nine drug categories listed above. Use of alcohol and tobacco products, while illegal for youths, is not included in these estimates, but is discussed in Chapters 3 and 4.

- In 2010, an estimated 22.6 million Americans aged 12 or older were current (past month) illicit drug users, meaning they had used an illicit drug during the month prior to the survey interview (Figure 2.1). This estimate represents 8.9 percent of the population aged 12 or older.

- The overall rate of current illicit drug use among persons aged 12 or older in 2010 (8.9 percent) was similar to the rate in 2009 (8.7 percent), but it was higher than the rates in 2002 through 2008 (Figure 2.2).

- In 2010, marijuana was the most commonly used illicit drug, with 17.4 million current users. It was used by 76.8 percent of current illicit drug users and was the only drug used by 60.1 percent of them. Also in 2010, 9.0 million persons aged 12 or older were current users of illicit drugs other than marijuana (or 39.9 percent of illicit drug users aged 12 or older). Current use of other drugs but not marijuana was reported by 23.2 percent of illicit drug users, and 16.7 percent used both marijuana and other drugs.

Figure 2.1 Past Month Illicit Drug Use among Persons Aged 12 or Older: 2010
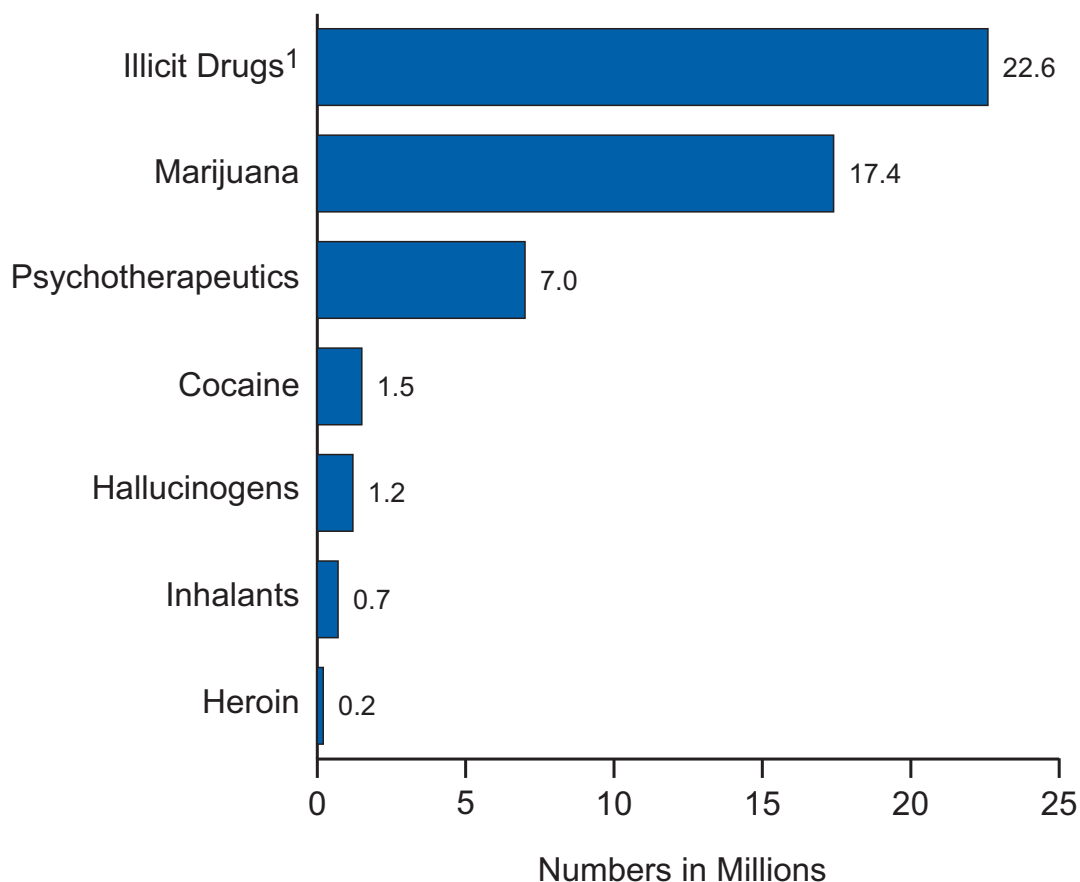
[1] Illicit Drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

- The number and percentage of persons aged 12 or older who were current users of marijuana in 2010 (17.4 million or 6.9 percent) were similar to the estimates for 2009 (16.7 million or 6.6 percent), but the estimates in 2010 were higher than those in 2002 through 2008. Between 2007 and 2010, the rate increased from 5.8 to 6.9 percent, and the number of users increased from 14.4 million to 17.4 million.

- An estimated 9.0 million people aged 12 or older (3.6 percent) were current users of illicit drugs other than marijuana in 2010. The majority of these users (7.0 million persons or 2.7 percent of the population) were nonmedical users of psychotherapeutic drugs, including 5.1 million users of pain relievers, 2.2 million users of tranquilizers, 1.1 million users of stimulants, and 374,000 users of sedatives.

- The number and percentage of persons aged 12 or older who were current nonmedical users of psychotherapeutic drugs in 2010 (7.0 million or 2.7 percent) were similar to those in 2009 (7.0 million or 2.8 percent) and to those in 2002 (6.3 million or 2.7 percent) (Figure 2.2).

Figure 2.2 Past Month Use of Selected Illicit Drugs among Persons Aged 12 or Older: 2002-2010
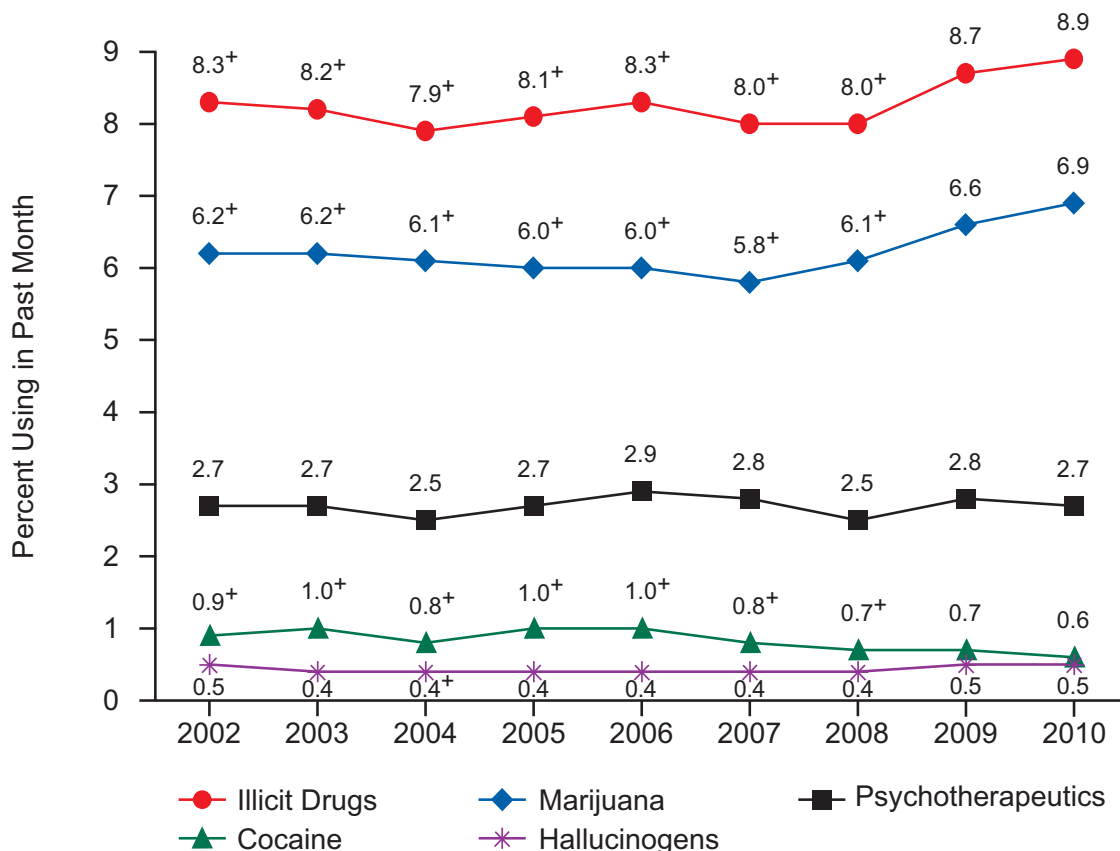
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- The number and percentage of persons aged 12 or older who were current nonmedical users of stimulants in 2010 (1.1 million or 0.4 percent) were similar to those in 2009 (1.3 million or 0.5 percent) (Figure 2.3).

- The number and percentage of persons aged 12 or older who were current users of methamphetamine in 2010 (353,000 or 0.1 percent) were similar to those from 2007 through 2009, but lower than those from 2002 through 2006. The previous numbers and percentages were 502,000 (0.2 percent) in 2009, 314,000 (0.1 percent) in 2008, 529,000 (0.2 percent) in 2007, 731,000 (0.3 percent) in 2006, 628,000 (0.3 percent) in 2005, 706,000 (0.3 percent) in 2004, 726,000 (0.3 percent) in 2003, and 683,000 (0.3 percent) in 2002.

- The number and percentage of persons aged 12 or older who were current users of cocaine in 2010 (1.5 million or 0.6 percent) were similar to those in 2009 (1.6 million or 0.7 percent), but lower than those from 2002 through 2008. The previous numbers and percentages were 1.9 million (0.7 percent) in 2008, 2.1 million (0.8 percent) in 2007, 2.4 million (1.0 percent) in 2006, 2.4 million (1.0 percent) in 2005, 2.0 million (0.8 percent) in 2004, 2.3 million (1.0 percent) in 2003, and 2.0 million (0.9 percent) in 2002.

Figure 2.3 Past Month Nonmedical Use of Types of Psychotherapeutic Drugs among Persons Aged 12 or Older: 2002-2010
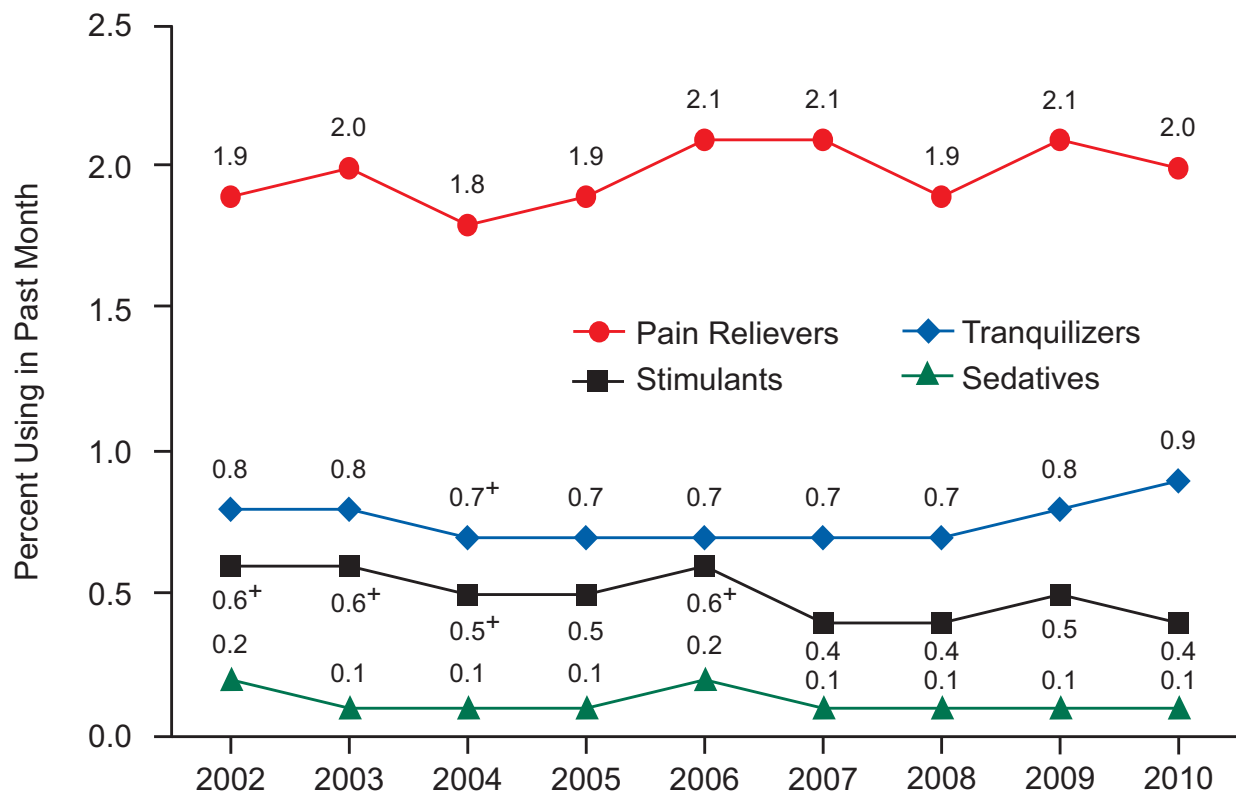
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- The number and percentage of persons aged 12 or older who were current users of hallucinogens in 2010 (1.2 million or 0.5 percent) were similar to those in 2009 (1.3 million or 0.5 percent). These include similar numbers and percentages for current users of Ecstasy, with 695,000 (0.3 percent) current users in 2010 and 760,000 (0.3 percent) current users in 2009.

Age

- The rate of current illicit drug use varied by age. Among youths aged 12 to 17 in 2010, the rate increased from 4.0 percent at ages 12 or 13 to 9.3 percent at ages 14 or 15 to 16.6 percent at ages 16 or 17 (Figure 2.4). The highest rate of current illicit drug use was among 18 to 20 year olds (23.1 percent), with the next highest rate among 21 to 25 year olds (20.5 percent). Thereafter, the rate generally declined with age, although not all declines were significant. For instance, the rate was 14.8 percent among those aged 26 to 29, 12.9 percent among those aged 30 to 34, and 1.1 percent among those aged 65 or older.

Figure 2.4 Past Month Illicit Drug Use among Persons Aged 12 or Older, by Age: 2009 and 2010
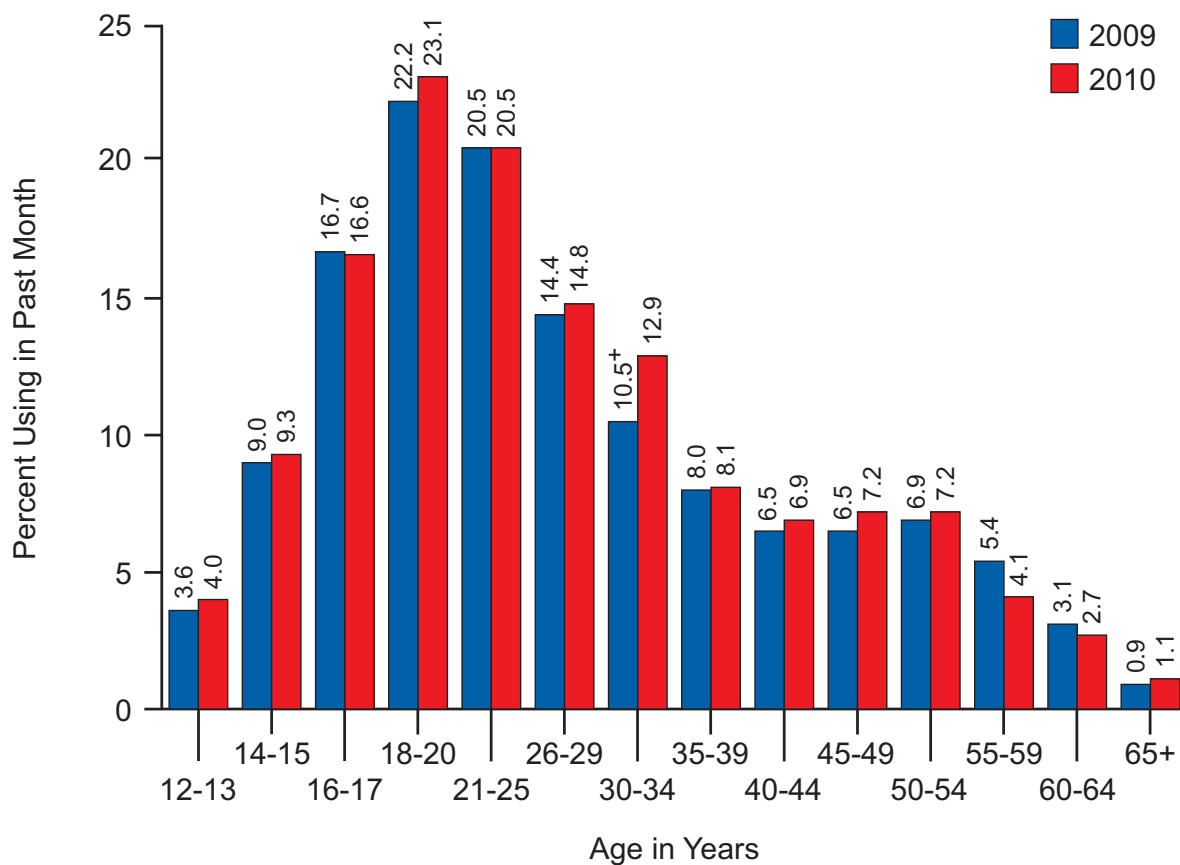
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- In 2010, adults aged 26 or older were less likely to be current users of illicit drugs than youths aged 12 to 17 or young adults aged 18 to 25 (6.6 vs. 10.1 and 21.5 percent, respectively) (Figure 2.5). However, there were more current users of illicit drugs aged 26 or older (12.8 million) than users aged 12 to 17 (2.5 million) and users aged 18 to 25 (7.3 million) combined.

Youths Aged 12 to 17

- The rate of current illicit drug use among youths aged 12 to 17 remained similar from 2009 to 2010 (10.0 vs. 10.1 percent), but higher than the rate in 2008 (9.3 percent). Between 2002 and 2008, the rate declined from 11.6 to 9.3 percent (Figure 2.6).

- In 2010, 10.1 percent of youths aged 12 to 17 were current illicit drug users, with 7.4 percent current users of marijuana, 3.0 percent current nonmedical users of psychotherapeutic drugs, 1.1 percent current users of inhalants, 0.9 percent current users of hallucinogens, and 0.2 percent current users of cocaine.

Figure 2.5 Past Month Illicit Drug Use among Persons Aged 12 or Older, by Age: 2002-2010
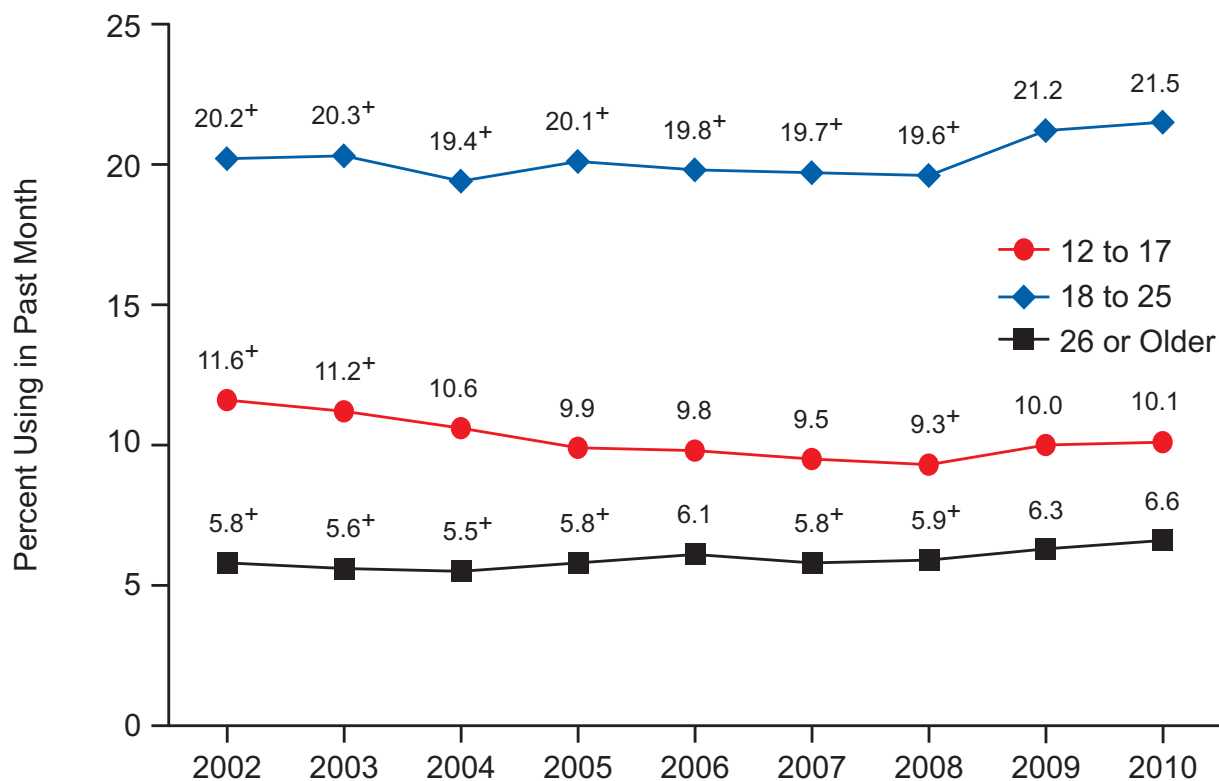
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- Among youths aged 12 to 17, the types of illicit drugs used in the past month varied by age group in 2010. Among 12 or 13 year olds, 2.0 percent used psychotherapeutic drugs nonmedically, 1.4 percent used inhalants, and 0.9 percent used marijuana. Among 14 or 15 year olds, 6.5 percent used marijuana, 3.0 percent used psychotherapeutic drugs nonmedically, 1.2 percent used inhalants, and 1.1 percent used hallucinogens. Among 16 or 17 year olds, 14.3 percent used marijuana, 3.9 percent used psychotherapeutic drugs nonmedically, 1.3 percent used hallucinogens, 0.6 percent used inhalants, and 0.5 percent used cocaine.

- After gradually declining from 11.6 percent in 2002 to 9.3 percent in 2008, the rate of current illicit drug use among 12 to 17 year olds increased to 10.0 percent in 2009 and 10.1 percent in 2010 (Figure 2.6). Current marijuana use declined from 8.2 percent in 2002 to 6.7 percent from 2006 through 2008 before increasing to 7.3 percent in 2009 and 7.4 percent in 2010. Current nonmedical use of psychotherapeutic drugs declined from 4.0 percent in 2002 and 2003 to 3.0 percent in 2010. Current use of Ecstasy declined from 0.5 percent in 2002 to 0.3 percent in 2004 through 2007 before increasing back to 0.5 percent in 2009 and 2010.

16

Figure 2.6 Past Month Use of Selected Illicit Drugs among Youths Aged 12 to 17: 2002-2010
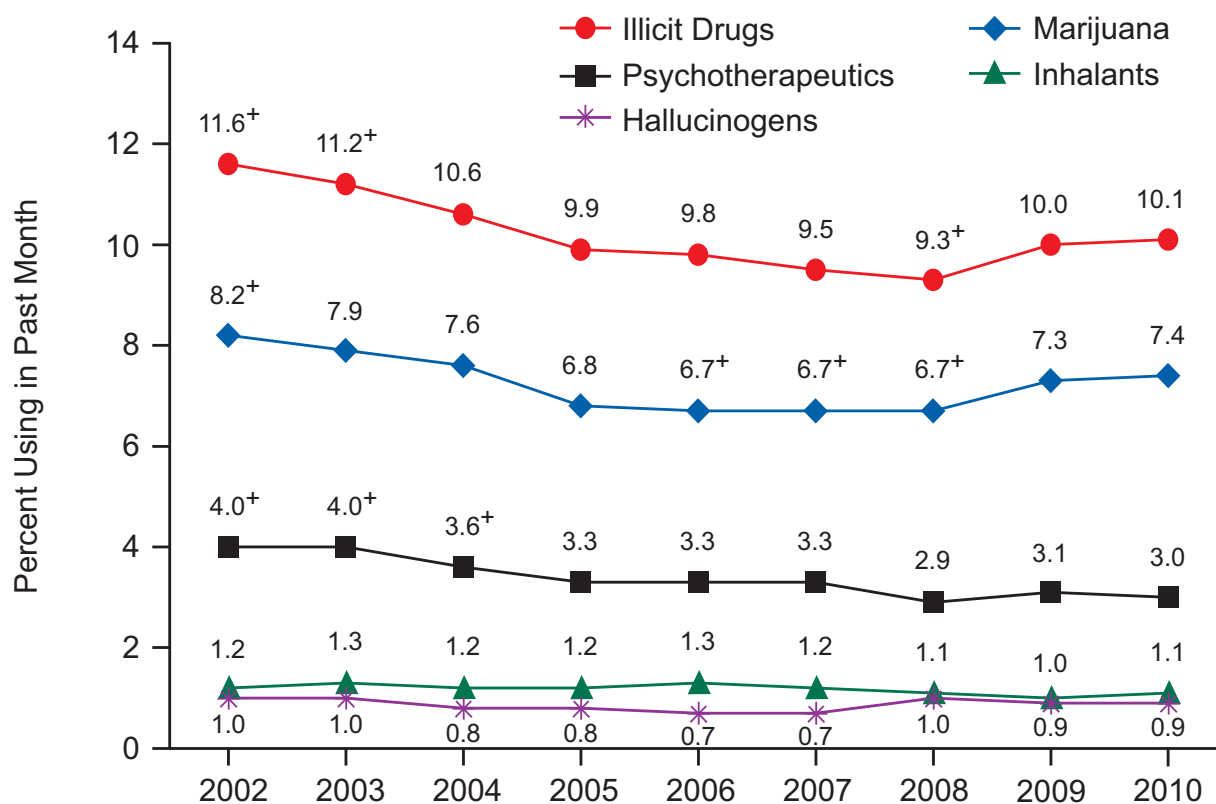
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Young Adults Aged 18 to 25

- In 2010, the rate of current illicit drug use was higher among young adults aged 18 to 25 (21.5 percent) than among youths aged 12 to 17 (10.1 percent) and adults aged 26 or older (6.6 percent). Among young adults, the rates were 18.5 percent for marijuana, 5.9 percent for nonmedical use of psychotherapeutic drugs, 2.0 percent for hallucinogens, and 1.5 percent for cocaine (Figure 2.7).

- The rate of current illicit drug use among young adults aged 18 to 25 increased from 19.6 percent in 2008 to 21.2 percent in 2009 and 21.5 percent in 2010, driven largely by an increase in marijuana use (from 16.5 percent in 2008 to 18.1 percent in 2009 and 18.5 percent in 2010).

- Among young adults aged 18 to 25, the rate of current nonmedical use of prescription-type drugs in 2010 was 5.9 percent, similar to the rate in the years from 2002 to 2009.

- Current use of cocaine among young adults aged 18 to 25 decreased from 2002 to 2010 (2.0 to 1.5 percent). From 2002 to 2010, the rate of methamphetamine use among young adults also declined from 0.6 percent (2002 and 2003) to 0.2 percent (2008 through 2010).

Figure 2.7 Past Month Use of Selected Illicit Drugs among Young Adults Aged 18 to 25: 2002-2010
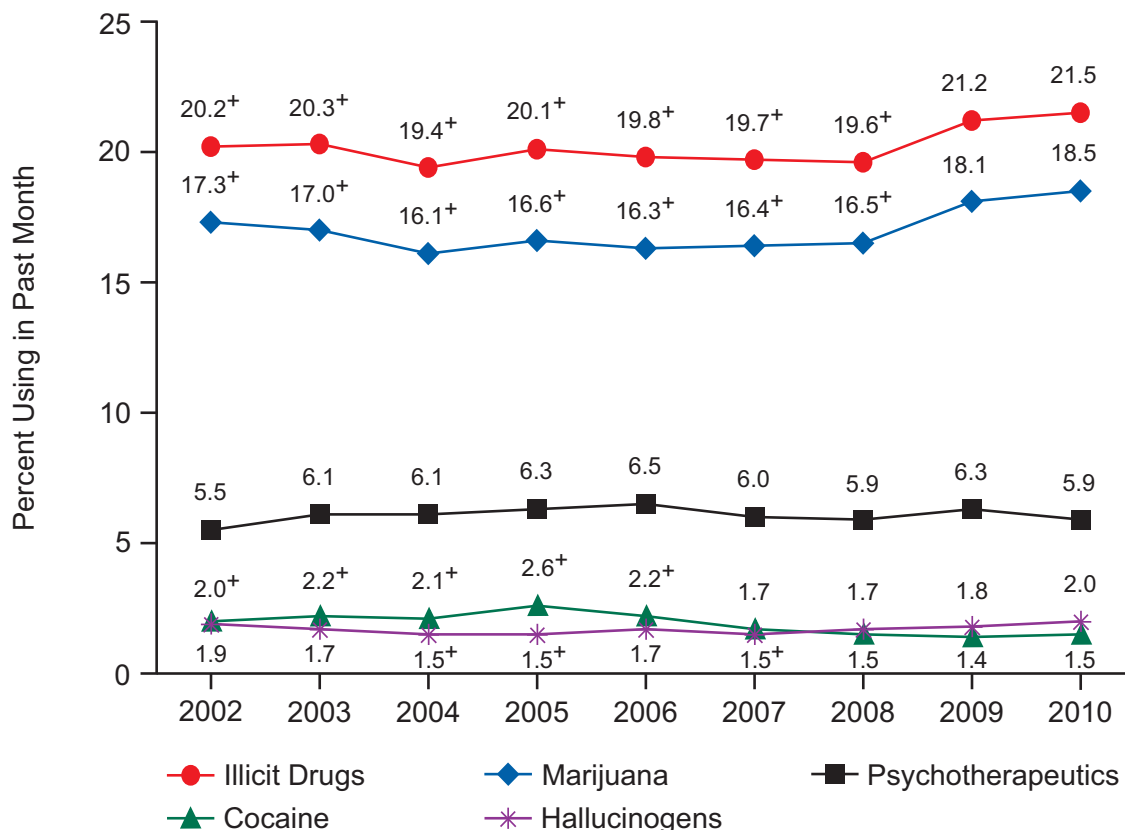
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Adults Aged 26 or Older

- In 2010, the rate of current illicit drug use among adults aged 26 or older was 6.6 percent, with 4.8 percent current users of marijuana and 2.2 percent current nonmedical users of psychotherapeutic drugs. Less than 1 percent each used cocaine (0.5 percent), hallucinogens (0.2 percent), heroin (0.1 percent), and inhalants (0.1 percent). These rates were similar to those reported in 2009. However, the rate of current marijuana use in 2010 was significantly higher than the rates in 2002 through 2008.

- Among adults aged 50 to 59, the rate of current illicit drug use increased from 2.7 to 5.8 percent between 2002 and 2010 (Figure 2.8). For those aged 50 to 54, the rate increased from 3.4 percent in 2002 to 7.2 percent in 2010. Among those aged 55 to 59, current illicit drug increased from 1.9 percent in 2002 to 4.1 percent in 2010. These patterns and trends partially reflect the aging into these age groups of members of the baby boom cohort, whose rates of illicit drug use have been higher than those of older cohorts. The baby boom cohort refers to persons born in the United States after World War II between 1946 and 1964 (Han, Gfroerer, & Colliver, 2009).

Figure 2.8 Past Month Illicit Drug Use among Adults Aged 50 to 59: 2002-2010
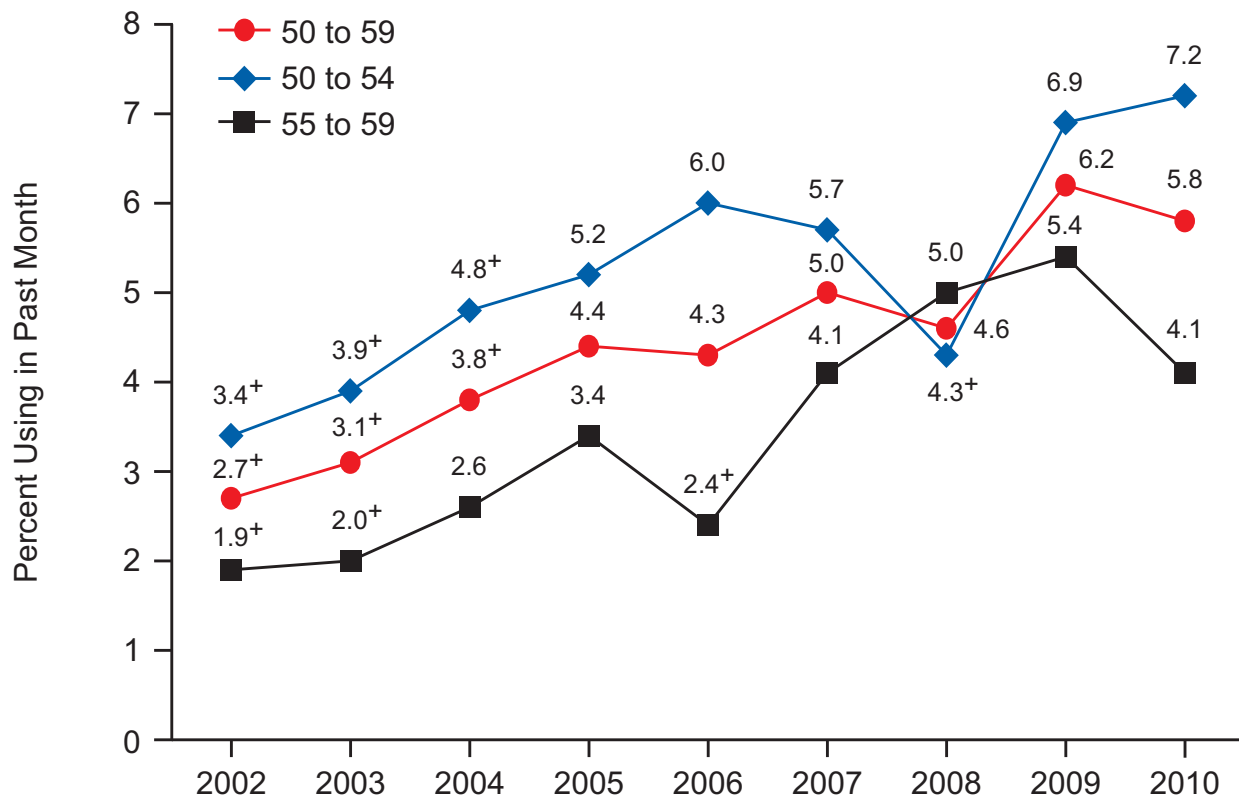
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Gender

- In 2010, as in prior years, the rate of current illicit drug use among persons aged 12 or older was higher for males (11.2 percent) than for females (6.8 percent). Males were more likely than females to be current users of several different illicit drugs, including marijuana (9.1 vs. 4.7 percent), nonmedical use of psychotherapeutic drugs (3.0 vs. 2.5 percent), cocaine (0.8 vs. 0.4 percent), and hallucinogens (0.6 vs. 0.3 percent). The 2010 rates for both males and females aged 12 or older were similar to those reported in 2009.

- In 2010, the rates of current illicit drug use were similar between males and females aged 12 to 17 (10.4 percent for males vs. 9.8 percent for females). However, males aged 12 to 17 were more likely than females aged 12 to 17 to be current marijuana users (8.3 vs. 6.4 percent), while females aged 12 to 17 were more likely than males aged 12 to 17 to be current nonmedical users of psychotherapeutic drugs (3.7 vs. 2.3 percent) and current nonmedical users of pain relievers (3.0 vs. 2.0 percent).

- The rate of current marijuana use among males aged 12 to 17 declined from 9.1 percent in 2002 to 6.8 percent in 2006, then increased to 8.3 percent in both 2009 and 2010 (Figure 2.9). Among females aged 12 to 17, the rate of current marijuana use changed little between 2002 (7.2 percent) and 2004 (7.1 percent), then declined to 6.2 percent in 2005. No significant changes have occurred among females since 2005.

Pregnant Women

- Among pregnant women aged 15 to 44, 4.4 percent were current illicit drug users based on data averaged across 2009 and 2010. This was lower than the rate among women in this age group who were not pregnant (10.9 percent). Among pregnant women aged 15 to 44, the average rate of current illicit drug use in 2009-2010 (4.4 percent) was not significantly different from the rate averaged across 2007-2008 (5.1 percent).

- The rate of current illicit drug use in the combined 2009-2010 data was 16.2 percent among pregnant women aged 15 to 17, 7.4 percent among pregnant women aged 18 to 25, and 1.9 percent among pregnant women aged 26 to 44.

Figure 2.9 Past Month Marijuana Use among Youths Aged 12 to 17, by Gender: 2002-2010
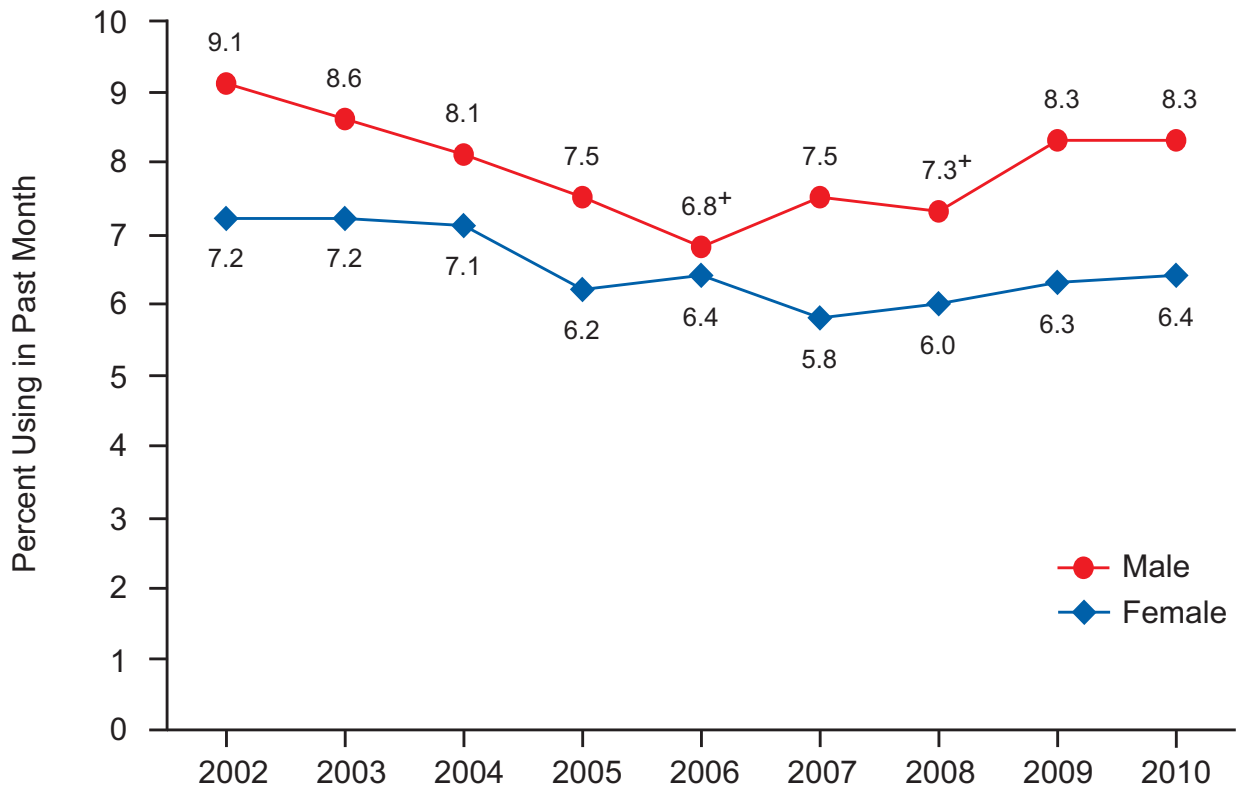
[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Race/Ethnicity

- In 2010, among persons aged 12 or older, the rate of current illicit drug use among Asians was similar to that among Native Hawaiians or Other Pacific Islanders (3.5 and 5.4 percent, respectively), but the rate among Asians was lower than among other racial/ethnic groups (Figure 2.10). The rate among persons of two or more races was similar to that among American Indians or Alaska Natives and among blacks (12.5, 12.1, and 10.7 percent, respectively). The rate was 8.1 percent among Hispanics and 9.1 percent among whites.

- There were no statistically significant differences in the rate of current illicit drug use between 2009 and 2010 or between 2002 and 2010 for any of the racial/ethnic groups. However, there were significant increases in the rate for whites and Hispanics between 2008 and 2010.

Figure 2.10 Past Month Illicit Drug Use among Persons Aged 12 or Older, by Race/Ethnicity: 2002-2010
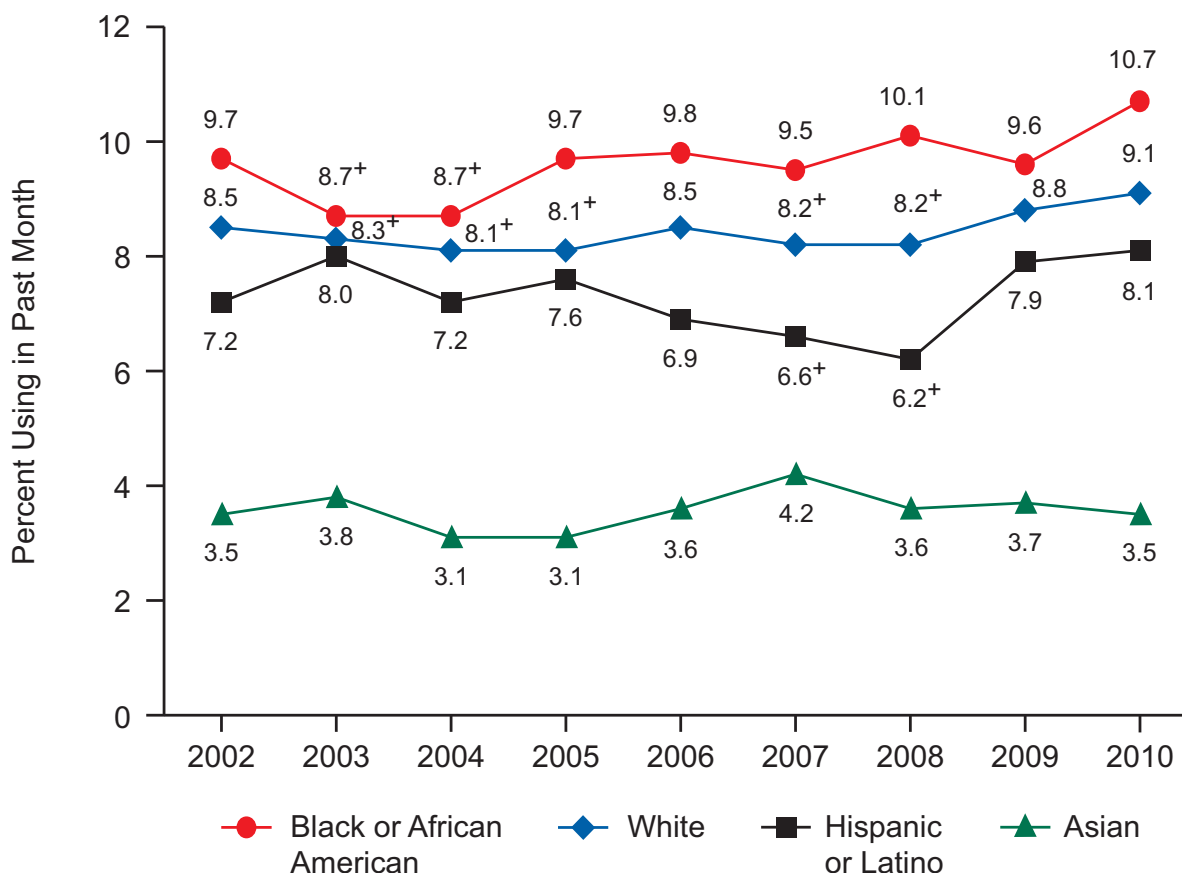
[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Note: Sample sizes for American Indians or Alaska Natives and for persons of two or more races were too small for reliable trend presentation for these groups. Due to low precision, estimates for Native Hawaiians or Other Pacific Islanders are not shown.

Education

- Illicit drug use in 2010 varied by the educational status of adults aged 18 or older, with the rate of current illicit drug use lower among college graduates (6.3 percent) than those with some college (10.7 percent), high school graduates (8.5 percent), and those who had not graduated from high school (10.8 percent). However, in 2010, adults aged 18 or older who had not finished high school had the lowest rate of lifetime illicit drug use (38.9 percent) compared with the lifetime rate among high school graduates (46.4 percent), those with some college (56.2 percent), and those who were college graduates (52.0 percent).

College Students

- In 2010, the rate of current use of illicit drugs was 22.0 percent among full-time college students aged 18 to 22. This was similar to the rate among other persons aged 18 to 22 (23.5 percent), which included part-time college students, students in other grades or types of institutions, and nonstudents. Among full-time college students aged 18 to 22, there was a decrease from 2009 to 2010 in the rate of nonmedical use of psychotherapeutic drugs (from 6.3 to 5.0 percent), with the 2010 rate being similar to the rates in 2008 (5.2 percent) and 2002 (5.6 percent).

Employment

- Current illicit drug use differed by employment status in 2010. Among adults aged 18 or older, the rate of current illicit drug use was higher for those who were unemployed (17.5 percent) than for those who were employed full time (8.4 percent) or part time (11.2 percent). (Figure 2.11).

- Although the rate of current illicit drug use was higher among unemployed persons in 2010 compared with those who were either employed full time, employed part time, or "other" (which includes retired persons, disabled persons, homemakers, students, and other persons not in the labor force), most of these users were employed. Of the 20.2 million current illicit drug users aged 18 or older in 2010, 13.3 million (65.9 percent) were employed either full or part time.

Geographic Area

- Among persons aged 12 or older, the rate of current illicit drug use in 2010 was 11.0 percent in the West, 9.4 percent in the Northeast, 8.2 percent in the Midwest, and 7.8 percent in the South.

- In 2010, the rate of current illicit drug use among persons aged 12 or older was 9.4 percent in large metropolitan counties, 8.8 percent in small metropolitan counties, and 7.5 percent in nonmetropolitan counties as a group (Figure 2.12). Within nonmetropolitan areas, the rate was 8.7 percent in urbanized counties, 7.1 percent in less urbanized counties, and 3.7 percent in completely rural counties.

Figure 2.11 Past Month Illicit Drug Use among Persons Aged 18 or Older, by Employment Status: 2009 and 2010
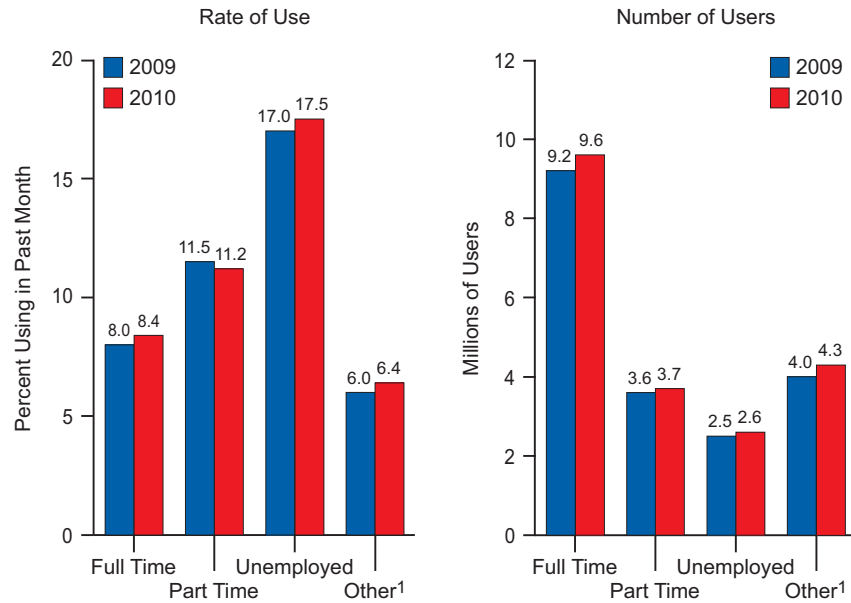
Rate of Use

Number of Users

[+]Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

[1]The Other Employment category includes retired persons, disabled persons, homemakers, students, or other persons not in the labor force.

Figure 2.12 Past Month Illicit Drug Use among Persons Aged 12 or Older, by County Type: 2010
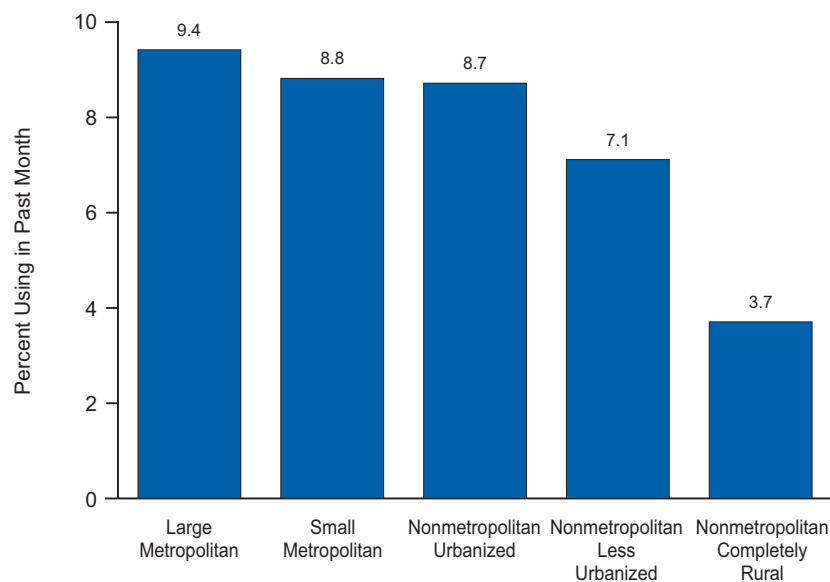
Criminal Justice Populations

- In 2010, an estimated 1.5 million adults aged 18 or older were on parole or other supervised release from prison at some time during the past year. More than one quarter of these (27.0 percent) were current illicit drug users, with 20.6 percent reporting current use of marijuana and 9.8 percent reporting current nonmedical use of psychotherapeutic drugs. These rates are higher than those reported by adults not on parole or supervised release during the past year (8.7 percent for illicit drug use, 6.7 percent for marijuana use, and 2.7 percent for nonmedical use of psychotherapeutic drugs).

- In 2010, an estimated 5.4 million adults aged 18 or older were on probation at some time during the past year. About 30 percent (29.9 percent) were current illicit drug users, with 23.0 percent reporting current use of marijuana and 10.5 percent reporting current nonmedical use of psychotherapeutic drugs. These rates are higher than those reported by adults not on probation during the past year (8.3 percent for illicit drug use, 6.4 percent for marijuana use, and 2.5 percent for nonmedical use of psychotherapeutic drugs).

Frequency of Use

- In 2010, an estimated 15.7 percent of past year marijuana users aged 12 or older used marijuana on 300 or more days within the past 12 months. This translates into 4.6 million persons using marijuana on a daily or almost daily basis over a 12-month period.

- In 2010, an estimated 39.9 percent (6.9 million) of current marijuana users aged 12 or older used marijuana on 20 or more days in the past month. This represents an increase from the 2009 estimates of 36.7 percent or 6.1 million users.

Association with Cigarette and Alcohol Use

- In 2010, the rate of current illicit drug use was approximately 8.5 times higher among youths aged 12 to 17 who smoked cigarettes in the past month (52.9 percent) than it was among those who did not smoke cigarettes in the past month (6.2 percent).

- In 2010, the rate of current illicit drug use also was associated with the level of past month alcohol use. Among youths aged 12 to 17 who were heavy drinkers (i.e., consumed five or more drinks on the same occasion on each of 5 or more days in the past 30 days), 70.6 percent were also current illicit drug users, which was higher than the rate among those who were not current alcohol users (5.1 percent).

Driving Under the Influence of Illicit Drugs

- In 2010, 10.6 million persons or 4.2 percent of the population aged 12 or older reported driving under the influence of illicit drugs during the past year. This rate was the same as the rate in 2009 (4.2 percent) and lower than the rate in 2002 (4.7 percent). Across age groups, the rate of driving under the influence of illicit drugs in 2010 was highest among young adults aged 18 to 25 (12.7 percent).

Source of Prescription Drugs

- Past year nonmedical users of psychotherapeutic drugs are asked how they obtained the drugs they most recently used nonmedically. Rates averaged across 2009 and 2010 show that over one half of the nonmedical users of pain relievers, tranquilizers, stimulants, and sedatives aged 12 or older got the prescription drugs they most recently used "from a friend or relative for free." In a follow-up question, three quarters or more of these respondents indicated that their friend or relative had obtained the drugs from one doctor.

- Among persons aged 12 or older in 2009-2010 who used pain relievers nonmedically in the past 12 months, 55.0 percent got the pain relievers they most recently used from a friend or relative for free. Another 11.4 percent bought them from a friend or relative (which was significantly higher than the 8.9 percent from 2007-2008), and 4.8 percent took them from a friend or relative without asking. More than one in six (17.3 percent) indicated that they got the drugs they most recently used through a prescription from one doctor, while about 1 in 20 users (4.4 percent) got pain relievers from a drug dealer or other stranger, and 0.4 percent bought them on the Internet. These percentages were similar to those reported in 2007-2008.

- Among persons aged 12 or older in 2009-2010 who used pain relievers nonmedically and indicated that they obtained the drugs from a friend or relative for free, the individuals reported that in 79.4 percent of the instances that the friend or relative obtained the drugs from just one doctor. Only 2.3 percent reported that the friend or relative had bought the drugs from a drug dealer or other stranger.

3.   Alcohol Use

        The National Survey on Drug Use and Health (NSDUH) includes questions about the recency and frequency of consumption of alcoholic beverages, such as beer, wine, whiskey, brandy, and mixed drinks. An extensive list of examples of the kinds of beverages covered is given to respondents prior to the question administration. A "drink" is defined as a can or bottle of beer, a glass of wine or a wine cooler, a shot of liquor, or a mixed drink with liquor in it. Times when the respondent only had a sip or two from a drink are not considered to be consumption. For this report, estimates for the prevalence of alcohol use are reported primarily at three levels defined for both males and females and for all ages as follows:

> <u>Current (past month) use</u> - At least one drink in the past 30 days.

> <u>Binge use</u> - Five or more drinks on the same occasion (i.e., at the same time or within a couple of hours of each other) on at least 1 day in the past 30 days.

> <u>Heavy use</u> - Five or more drinks on the same occasion on each of 5 or more days in the past 30 days.

These levels are not mutually exclusive categories of use; heavy use is included in estimates of binge and current use, and binge use is included in estimates of current use.

        This chapter is divided into two main sections. Section 3.1 describes trends and patterns of alcohol use among the population aged 12 or older. Section 3.2 is concerned particularly with the use of alcohol by persons aged 12 to 20. These persons are under the legal drinking age in all 50 States and the District of Columbia.

3.1.   Alcohol Use among Persons Aged 12 or Older

- Slightly more than half of Americans aged 12 or older reported being current drinkers of alcohol in the 2010 survey (51.8 percent). This translates to an estimated 131.3 million people, which was similar to the 2009 estimate of 130.6 million people (51.9 percent).

- Nearly one quarter (23.1 percent) of persons aged 12 or older participated in binge drinking at least once in the 30 days prior to the survey in 2010. This translates to about 58.6 million people. The rate in 2010 was similar to the rate in 2009 (23.7 percent).

- In 2010, heavy drinking was reported by 6.7 percent of the population aged 12 or older, or 16.9 million people. This percentage was similar to the rate of heavy drinking in 2009 (6.8 percent).

Age

- In 2010, rates of current alcohol use were 3.1 percent among persons aged 12 or 13, 12.4 percent of persons aged 14 or 15, 24.6 percent of 16 or 17 year olds, 48.9 percent of those aged 18 to 20, and 70.0 percent of 21 to 25 year olds (Figure 3.1). These estimates were similar to the rates reported in 2009.

- Among older age groups, the prevalence of current alcohol use decreased with increasing age, from 65.3 percent among 26 to 29 year olds to 51.6 percent among 60 to 64 year olds and 38.2 percent among people aged 65 or older.

Figure 3.1 Current, Binge, and Heavy Alcohol Use among Persons Aged 12 or Older, by Age: 2010
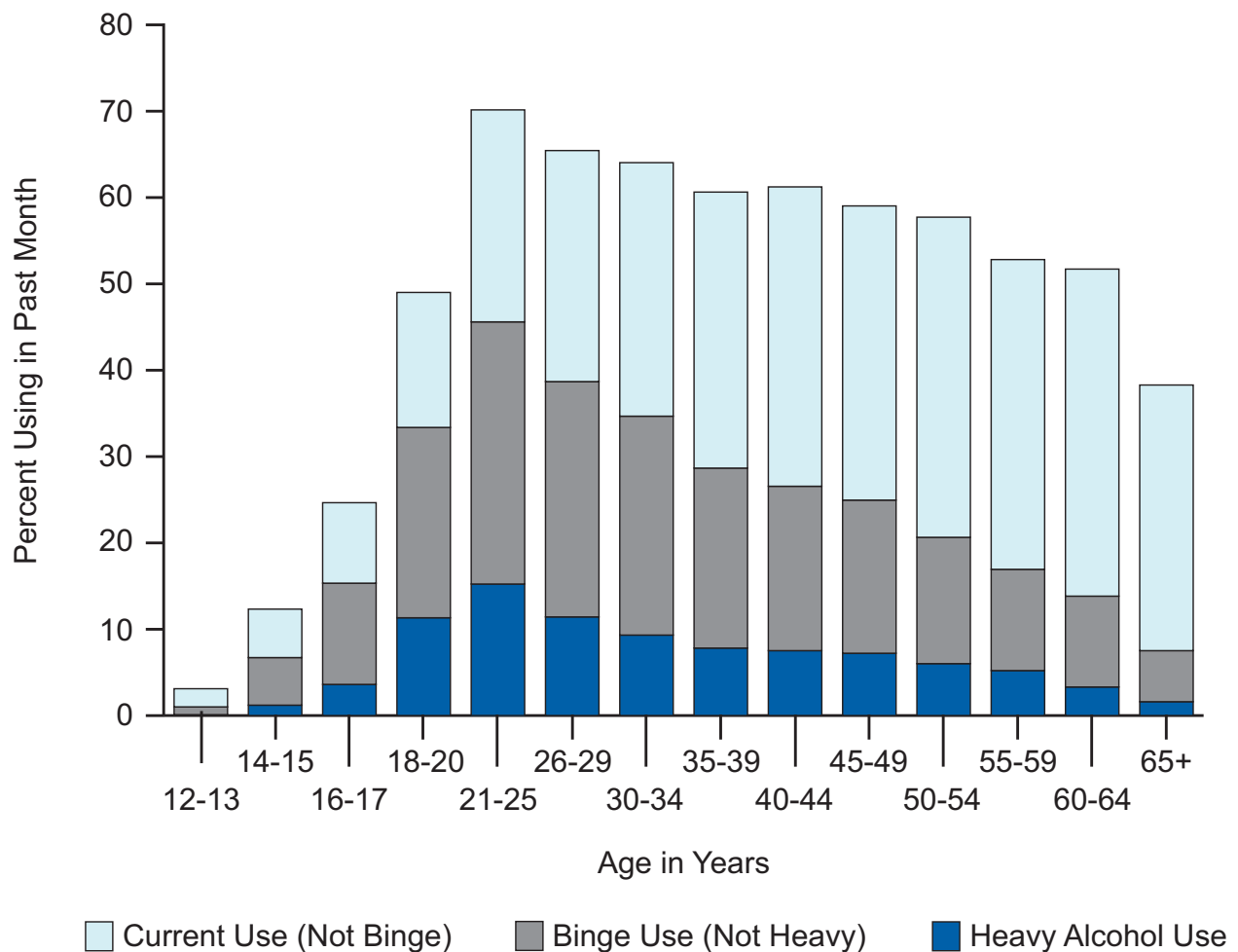
- Rates of binge alcohol use in 2010 were 1.0 percent among 12 or 13 year olds, 6.7 percent among 14 or 15 year olds, 15.3 percent among 16 or 17 year olds, 33.3 percent among persons aged 18 to 20, and peaked among those aged 21 to 25 at 45.5 percent. Binge drinking rates for 12 or 13 year olds and for 16 or 17 year olds were lower in 2010 (1.0 and 15.3 percent, respectively) than they were in 2009 (1.6 and 17.0 percent, respectively).

- The rate of binge drinking in 2010 was 40.6 percent for young adults aged 18 to 25. Heavy alcohol use was reported by 13.6 percent of persons aged 18 to 25. These rates were similar to the rates in 2009 (41.7 and 13.7 percent, respectively).

- The rate of binge drinking among persons aged 65 or older in 2010 was 7.6 percent, while the rate of heavy drinking was 1.6 percent in this age group. The binge drinking rate for this age group was lower than it was in 2009, when it was 9.8 percent.

- The rate of current alcohol use among youths aged 12 to 17 was 13.6 percent in 2010. Youth binge and heavy drinking rates were 7.8 and 1.7 percent, respectively. These rates were all lower than those reported in 2009 (14.7, 8.8, and 2.1 percent, respectively).

Gender

- In 2010, an estimated 57.4 percent of males aged 12 or older were current drinkers, higher than the rate for females (46.5 percent). However, among youths aged 12 to 17, the percentage of males who were current drinkers (13.7 percent) was similar to the rate for females (13.5 percent). The rate among males aged 12 to 17 dropped from 15.1 percent in 2009.

- Among young adults aged 18 to 25, an estimated 57.0 percent of females and 65.9 percent of males reported current drinking in 2010. These rates were similar to those reported in 2009 (57.7 and 65.9 percent, respectively).

Pregnant Women

- Among pregnant women aged 15 to 44, an estimated 10.8 percent reported current alcohol use, 3.7 percent reported binge drinking, and 1.0 percent reported heavy drinking. These rates were significantly lower than the rates for nonpregnant women in the same age group (54.7, 24.6, and 5.4 percent, respectively). Binge drinking during the first trimester of pregnancy was reported by 10.1 percent of pregnant women aged 15 to 44. All of these estimates by pregnancy status are based on data averaged over 2009 and 2010.

Race/Ethnicity

- Among persons aged 12 or older, whites in 2010 were more likely than other racial/ethnic groups to report current use of alcohol (56.7 percent) (Figure 3.2). The rates were 45.2 percent for persons reporting two or more races, 42.8 percent for blacks, 41.8 percent for Hispanics, 38.4 percent for Asians, and 36.6 percent for American Indians or Alaska Natives.

- The rate of binge alcohol use was lowest among Asians (12.4 percent). Rates for other racial/ethnic groups were 19.8 percent for blacks, 21.5 percent for persons reporting two or more races, 24.0 percent for whites, 24.7 percent for American Indians or Alaska Natives, and 25.1 percent for Hispanics.

- Among youths aged 12 to 17 in 2010, Asians had lower rates of current alcohol use than any other racial/ethnic group (4.8 percent), while 10.8 percent of black youths, 11.1 percent of American Indian or Alaska Native youths, 13.0 percent of youths reporting two or more races, 13.9 percent of Hispanic youths, and 14.9 percent of white youths were current drinkers. The rate for white youths was lower than it was in 2009, when it was 16.1 percent.

Figure 3.2 Current, Binge, and Heavy Alcohol Use among Persons Aged 12 or Older, by Race/Ethnicity: 2010
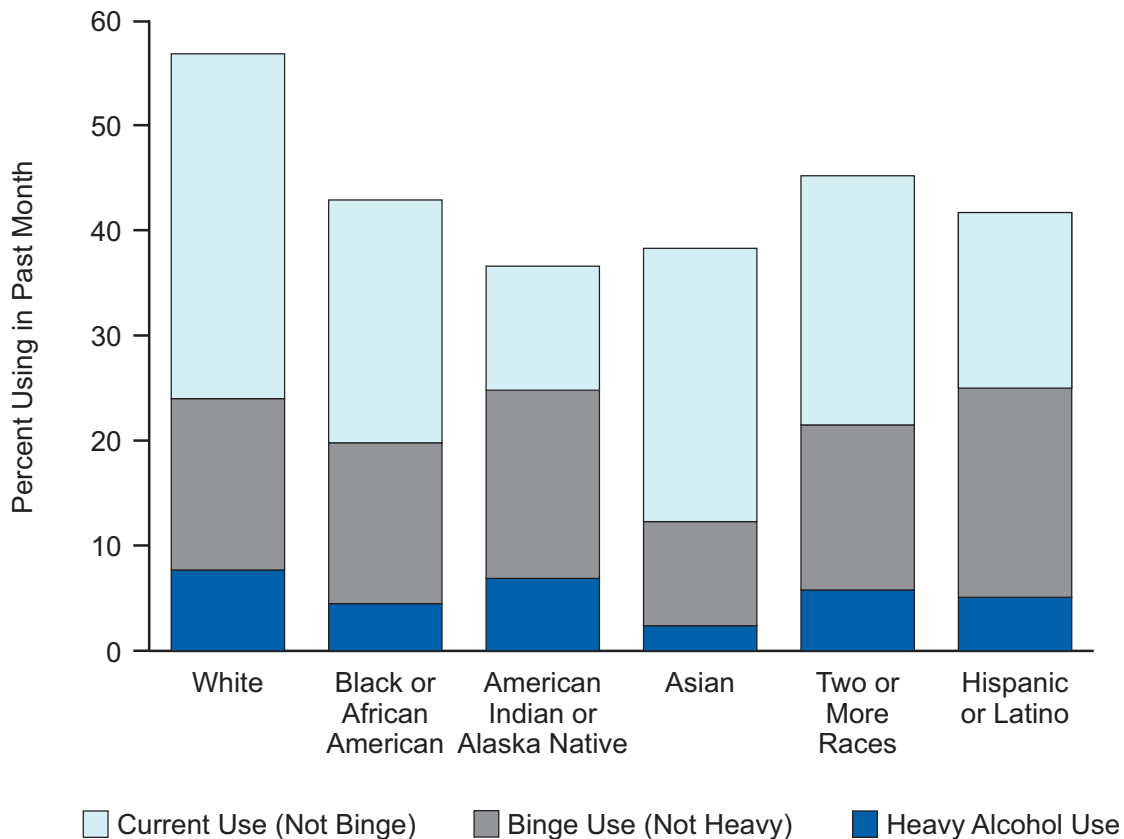
Note: Due to low precision, estimates for Native Hawaiians or Other Pacific Islanders are not shown.

Education

- Among adults aged 18 or older, the rate of past month alcohol use increased with increasing levels of education. Among adults with less than a high school education, 36.8 percent were current drinkers in 2010, significantly lower than the 69.1 percent of college graduates who were current drinkers.

- Among adults aged 18 or older, rates of binge and heavy alcohol use varied by level of education. Among those with some college education, 27.4 percent were binge drinkers, and 8.0 percent were heavy drinkers. Among those who had graduated from college, rates of binge and heavy drinking were 23.1 and 6.6 percent, respectively.

College Students

- Young adults aged 18 to 22 enrolled full time in college were more likely than their peers not enrolled full time (i.e., part-time college students and persons not currently enrolled in college) to use alcohol in the past month, binge drink, and drink heavily. Among full-time college students in 2010, 63.3 percent were current drinkers, 42.2 percent were binge drinkers, and 15.6 percent were heavy drinkers. Among those not enrolled full time in college, these rates were 52.4, 35.6, and 11.9 percent, respectively.

- The pattern of higher rates of current alcohol use, binge alcohol use, and heavy alcohol use among full-time college students compared with rates for others aged 18 to 22 has remained consistent since 2002 (Figure 3.3).

- Among young adults aged 18 to 22, the rate of binge drinking appears to be declining somewhat. In 2002, the binge drinking rate within this age group was 41.0 percent compared with the current 38.4 percent. Among full-time college students, the rate went from 44.4 to 42.2 percent, but the change was not significant. Among part-time college students and others not in college, the rate decreased from 38.9 to 35.6 percent during the same time period.

Employment

- The rate of current alcohol use was 64.8 percent for full-time employed adults aged 18 or older in 2010, higher than the rate for unemployed adults (56.1 percent). However, the rates of binge and heavy drinking among unemployed persons (32.8 and 11.1 percent, respectively) were higher than among full-time employed persons (29.7 and 8.5 percent).

- Most binge and heavy alcohol users were employed in 2010. Among 56.6 million adult binge drinkers, 42.3 million (74.7 percent) were employed either full or part time. Among 16.5 million heavy drinkers, 12.2 million (74.0 percent) were employed.

- Rates of binge and heavy alcohol use did not change significantly between 2009 and 2010 for full-time employed or unemployed adults.

Figure 3.3 Binge Alcohol Use among Adults Aged 18 to 22, by College Enrollment: 2002-2010
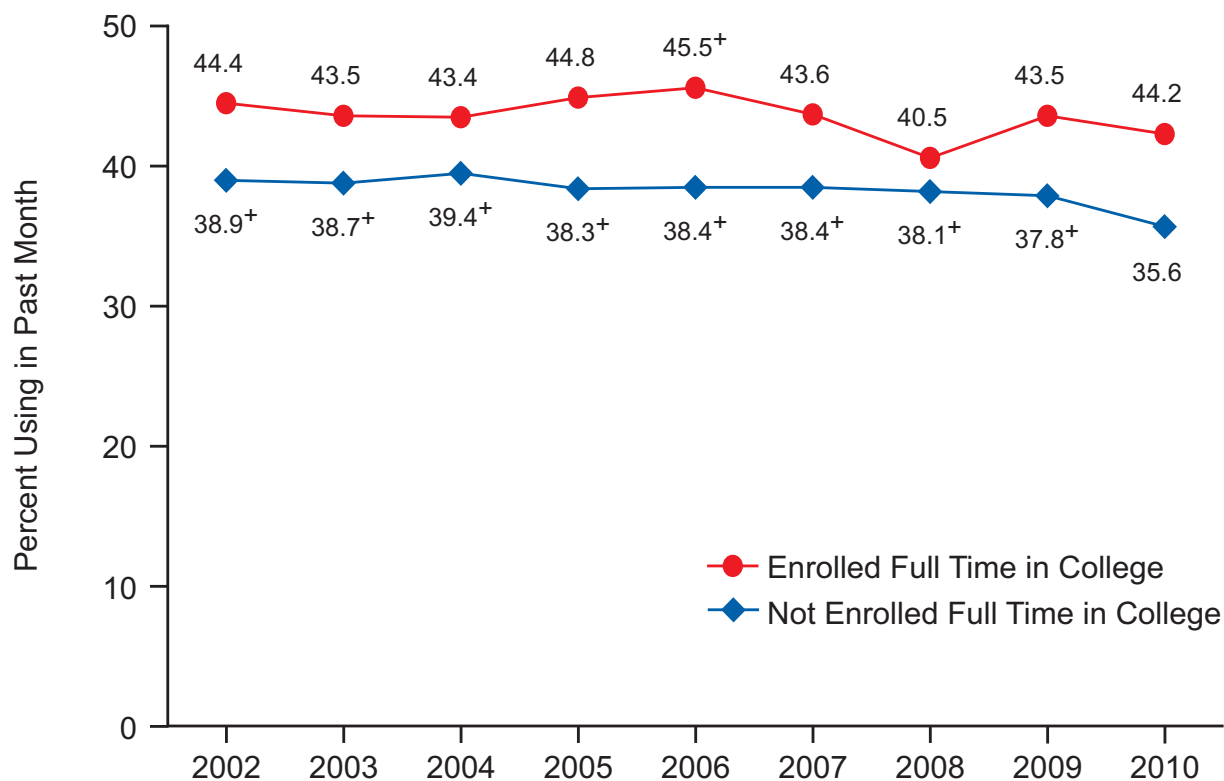
Geographic Area

- The rate of past month alcohol use for people aged 12 or older in 2010 was lower in the South (47.5 percent) than in the Northeast (57.8 percent), Midwest (54.7 percent), or West (51.0 percent).

- Among people aged 12 or older, the rate of past month alcohol use in large metropolitan areas (54.1 percent) was higher than the 50.6 percent in small metropolitan areas and 46.2 percent in nonmetropolitan areas. Binge drinking was equally prevalent in large metropolitan areas (23.5 percent), small metropolitan areas (22.8 percent), and nonmetropolitan areas (22.1 percent).

- The rates of binge alcohol use among youths aged 12 to 17 were 7.8 percent in large metropolitan areas, 7.7 percent in small metropolitan areas, and 8.5 percent in nonmetropolitan areas.

Association with Illicit Drug and Tobacco Use

- As was the case in prior years, the level of alcohol use was associated with illicit drug use in 2010. Among the 16.9 million heavy drinkers aged 12 or older, 31.8 percent were current illicit drug users. Persons who were not current alcohol users were less likely to have used illicit drugs in the past month (4.0 percent) than those who reported (a) current use of alcohol but no binge or heavy use (6.8 percent), (b) binge use but no heavy use (17.7 percent), or (c) heavy use of alcohol (31.8 percent).

- Alcohol consumption levels also were associated with tobacco use. Among heavy alcohol users aged 12 or older, 54.5 percent smoked cigarettes in the past month, while only 17.9 percent of non-binge current drinkers and 16.1 percent of persons who did not drink alcohol in the past month were current smokers. Smokeless tobacco use and cigar use also were more prevalent among heavy drinkers (11.8 and 17.1 percent, respectively) than among non-binge drinkers (2.2 and 3.7 percent) and nondrinkers (2.0 and 2.3 percent).

Driving Under the Influence of Alcohol

- In 2010, an estimated 11.4 percent of persons aged 12 or older drove under the influence of alcohol at least once in the past year (Figure 3.4). This percentage has dropped since 2002, when it was 14.2 percent. The 2010 estimate corresponds to 28.8 million persons.

- Driving under the influence of alcohol was associated with age in 2010. The rate was highest among persons aged 21 to 25 (23.4 percent) (Figure 3.5). An estimated 5.8 percent of 16 or 17 year olds and 15.1 percent of 18 to 20 year olds reported driving under the influence of alcohol in the past year. Beyond age 25, these rates showed a general decline with increasing age.

- Among persons aged 18 to 25, the rate of driving under the influence of alcohol decreased from the rate reported in 2009, from 21.5 to 20.0 percent.

- Among persons aged 12 or older, males were more likely than females (15.1 vs. 7.9 percent) to drive under the influence of alcohol in the past year. The rate for females decreased from the rate reported in 2009, when it was 8.6 percent.

3.2.   Underage Alcohol Use

- In 2010, about 10.0 million persons aged 12 to 20 (26.3 percent of this age group) reported drinking alcohol in the past month. Approximately 6.5 million (17.0 percent) were binge drinkers, and 2.0 million (5.1 percent) were heavy drinkers. The rate for binge drinking was lower than that obtained in 2009 (18.1 percent).

- Rates of current, binge, and heavy alcohol use among underage persons declined between 2002 and 2010. The rate of current alcohol use among 12 to 20 year olds went from 28.8 percent in 2002 to 26.3 percent in 2010. The binge drinking rate went from 19.3 to 17.0 percent, and the rate of heavy drinking went from 6.2 to 5.1 percent.

Figure 3.4   Driving Under the Influence of Alcohol in the Past Year among Persons Aged 12 or Older: 2002-2010

Percent Driving Under the Influence in Past Year

Year	Value
2002	14.2+
2003	13.6+
2004	13.5+
2005	13.0+
2006	12.4+
2007	12.7+
2008	12.4+
2009	12.0
2010	11.4
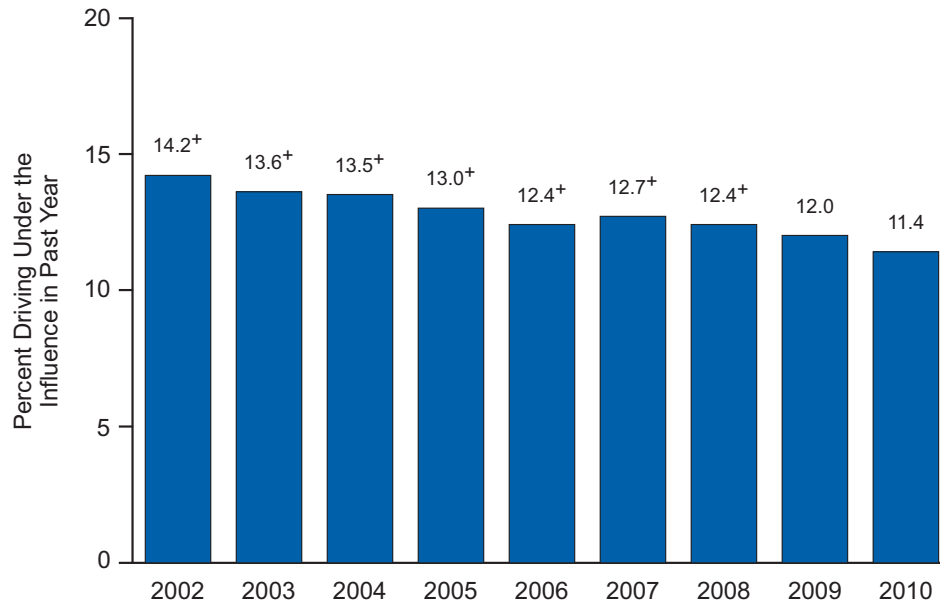
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Figure 3.5   Driving Under the Influence of Alcohol in the Past Year among Persons Aged 16 or Older, by Age: 2010

Percent Driving Under the Influence in Past Year

Age in Years	Value
16-17	5.8
18-20	15.1
21-25	23.4
26-29	19.3
30-34	18.0
35-39	14.8
40-44	13.4
45-49	11.8
50-54	10.5
55-59	10.1
60-64	6.4
65+	2.7

Age in Years
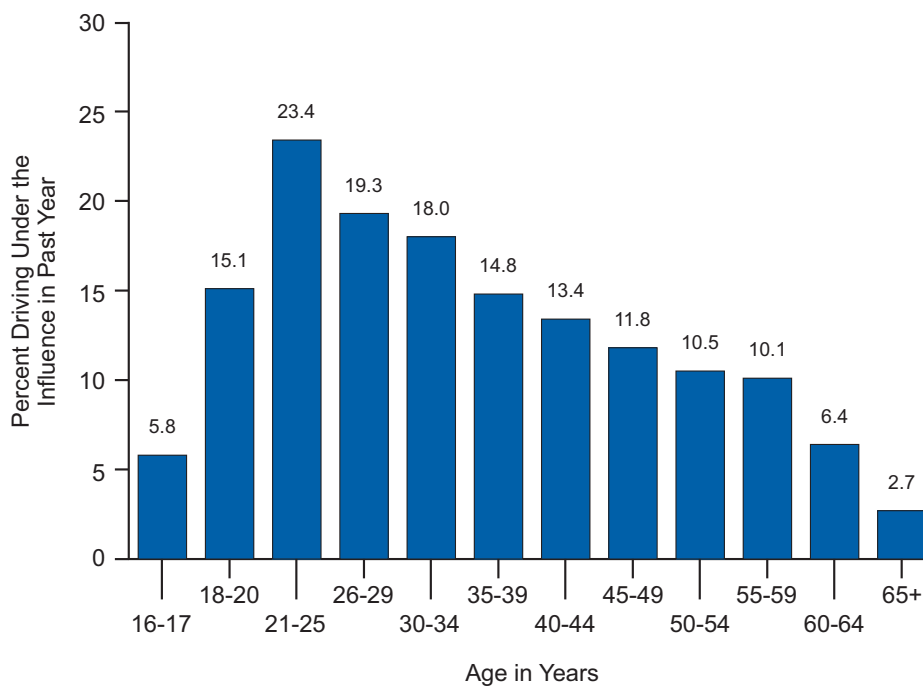
- Rates of current alcohol use increased with increasing age among underage persons. In 2010, 3.1 percent of persons aged 12 or 13, 12.4 percent of persons aged 14 or 15, 24.6 percent of 16 or 17 year olds, and 48.9 percent of 18 to 20 year olds drank alcohol during the 30 days before they were surveyed. This pattern has remained stable since 2002 (Figure 3.6).

Figure 3.6 Current Alcohol Use among Persons Aged 12 to 20, by Age: 2002-2010
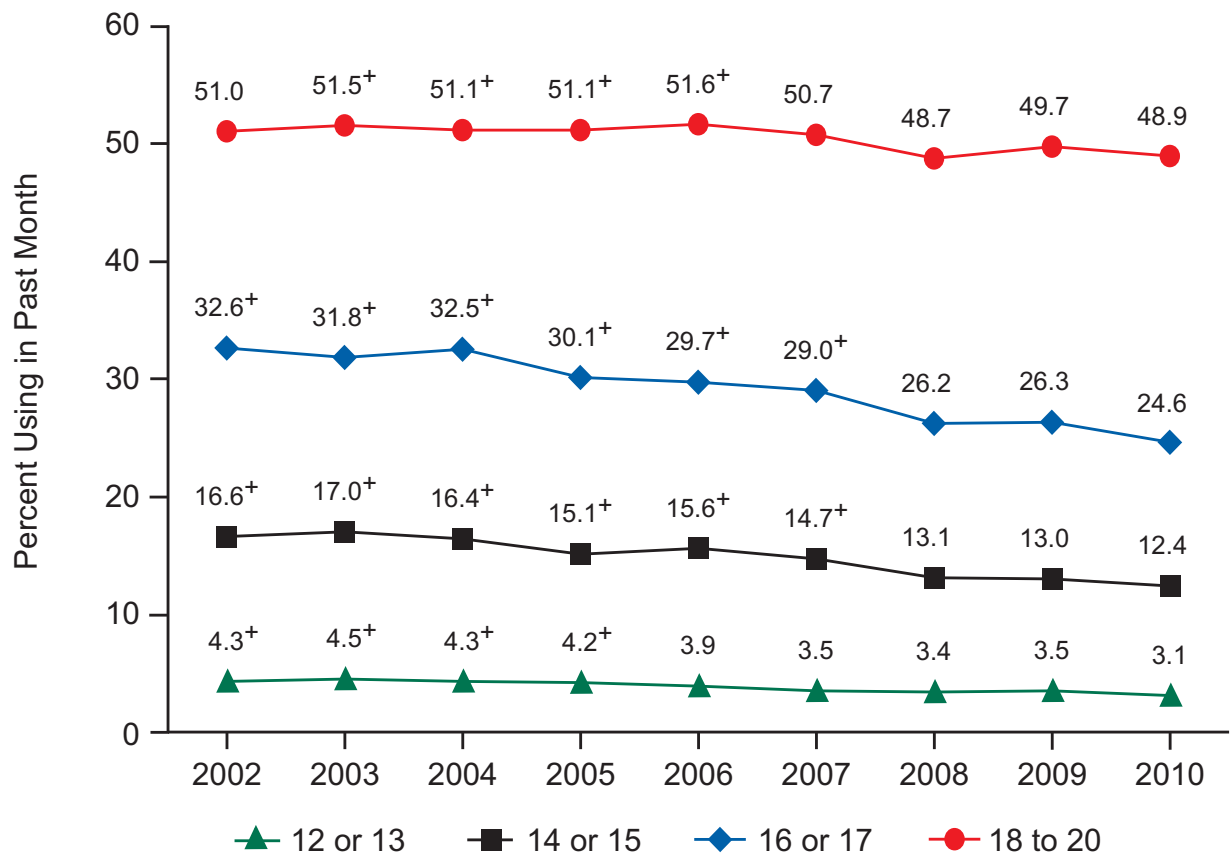
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- More males than females aged 12 to 20 reported current alcohol use (28.3 vs. 24.1 percent), binge drinking (19.8 vs. 14.0 percent), and heavy drinking (6.7 vs. 3.5 percent) in 2010 (Figure 3.7).

- Among persons aged 12 to 20, past month alcohol use rates in 2010 were 15.4 percent among Asians, 20.4 percent among blacks, 22.9 percent among American Indians or Alaska Natives, 24.2 percent among those reporting two or more races, 24.4 percent among Hispanics, and 29.3 percent among whites.

- In 2010, among persons aged 12 to 20, binge drinking was reported by 19.8 percent of whites, 18.4 percent of American Indians or Alaska Natives, 16.0 percent of Hispanics, and 15.1 percent of persons reporting two or more races, but only 9.9 percent of blacks and 7.8 percent of Asians reported binge drinking.

Figure 3.7 Current, Binge, and Heavy Alcohol Use among Persons Aged 12 to 20, by Gender: 2010
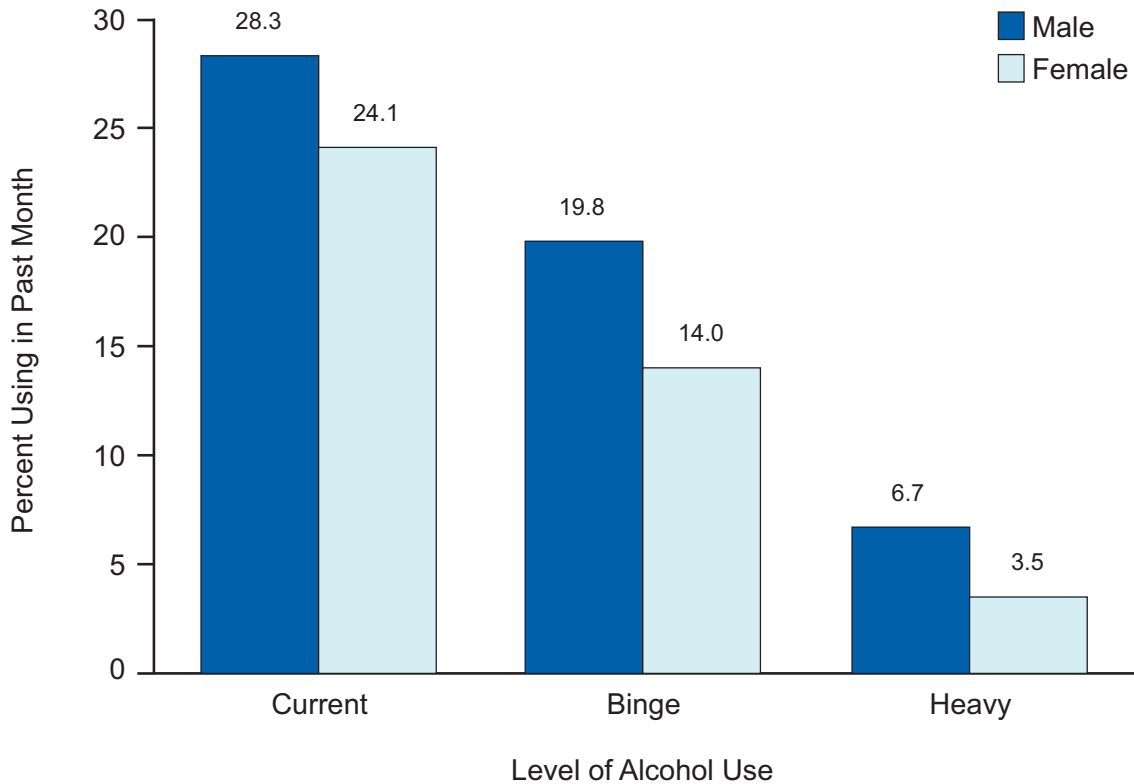
- Across geographic regions in 2010, the underage current alcohol use rate was higher in the Northeast (30.7 percent) than in the Midwest (26.4 percent), West (25.6 percent), and South (24.6 percent).

- In 2010, the underage current alcohol use rate was similar in large metropolitan areas (25.9 percent), small metropolitan areas (27.4 percent), and nonmetropolitan areas (25.5 percent).

- In 2010, 81.6 percent of current drinkers aged 12 to 20 were with two or more other people the last time they drank alcohol, 13.1 percent were with one other person the last time they drank, and 5.2 percent were alone.

- A majority of underage current drinkers in 2010 reported that their last use of alcohol in the past month occurred either in someone else's home (55.3 percent) or their own home (29.9 percent). Underage females were more likely than males to have been in a restaurant, bar, or club on their last drinking occasion (10.1 vs. 7.2 percent).

- Among underage current drinkers in 2010, 30.6 percent paid for the alcohol the last time they drank, including 8.8 percent who purchased the alcohol themselves and 21.6 percent who gave money to someone else to purchase it.

- Among underage drinkers who did not pay for the alcohol the last time they drank, the most common source was an unrelated person aged 21 or older (38.9 percent). Other underage persons provided the alcohol on the last occasion 16.6 percent of the time. Parents, guardians, or other adult family members provided the alcohol 21.6 percent of the time. Other sources of alcohol for underage drinkers who did not pay included (a) took the alcohol from home (6.0 percent), (b) took it from someone else's home (3.8 percent), and (c) got it some other way (8.1 percent).

- Underage drinkers were more likely than persons aged 21 or older to use illicit drugs within 2 hours of alcohol use on their last reported drinking occasion (19.0 vs. 5.1 percent, respectively). The most commonly reported illicit drug used by underage drinkers in combination with alcohol was marijuana, which was used within 2 hours of alcohol use by 18.0 percent of current underage drinkers (1.8 million persons) on their last drinking occasion.

4. Tobacco Use

The National Survey on Drug Use and Health (NSDUH) includes a series of questions about the use of tobacco products, including cigarettes, chewing tobacco, snuff, cigars, and pipe tobacco. Cigarette use is defined as smoking "part or all of a cigarette." For analytic purposes, data for chewing tobacco and snuff are combined as "smokeless tobacco."

- In 2010, an estimated 69.6 million Americans aged 12 or older were current (past month) users of a tobacco product. This represents 27.4 percent of the population in that age range. In addition, 58.3 million persons (23.0 percent of the population) were current cigarette smokers; 13.2 million (5.2 percent) smoked cigars; 8.9 million (3.5 percent) used smokeless tobacco; and 2.2 million (0.8 percent) smoked tobacco in pipes (Figure 4.1).

Figure 4.1   Past Month Tobacco Use among Persons Aged 12 or Older: 2002-2010
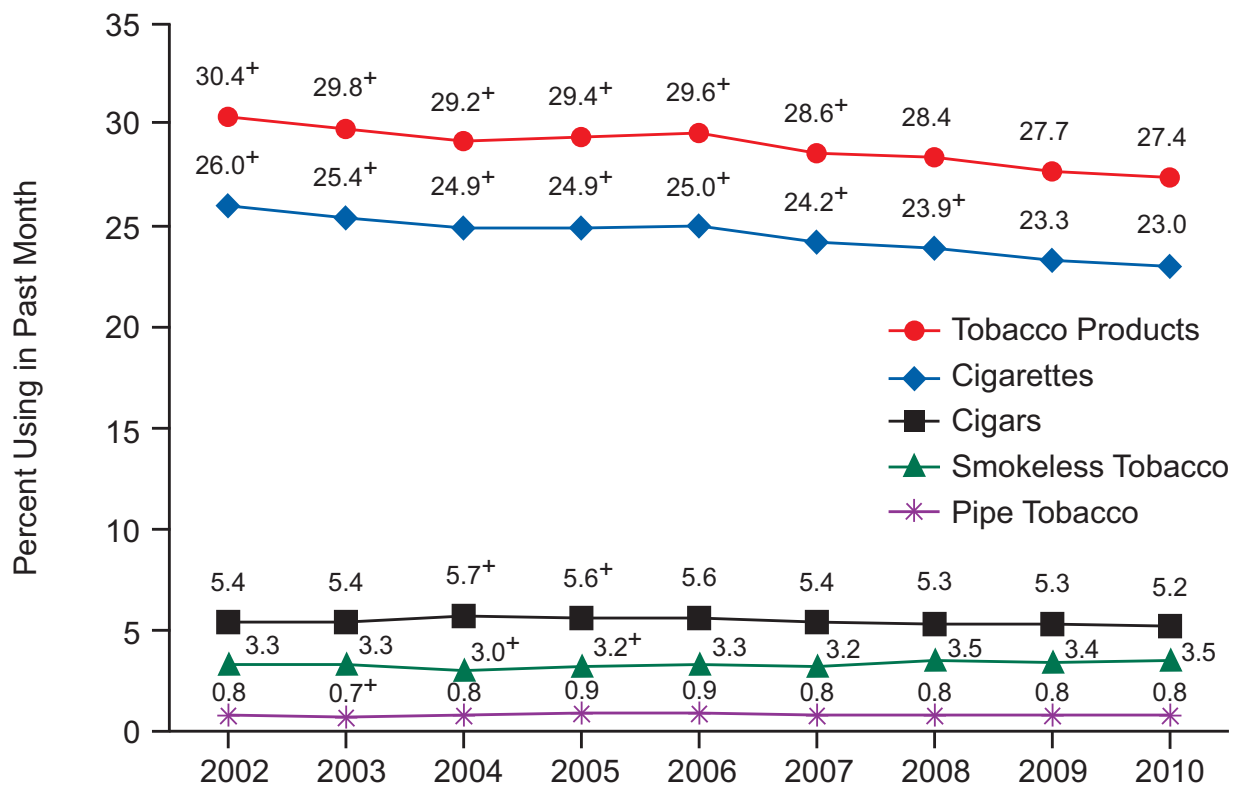
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

39

- The rate of current use of any tobacco product among persons aged 12 or older remained steady from 2009 to 2010 (27.7 and 27.4 percent, respectively). The rates of current use of cigarettes, smokeless tobacco, cigars, and pipe tobacco also did not change significantly over that period. Between 2002 and 2010, past month use of any tobacco product decreased from 30.4 to 27.4 percent, and past month cigarette use declined from 26.0 to 23.0 percent. Rates of past month use of cigars, smokeless tobacco, and pipe tobacco were similar in 2002 and 2010.

Age

- In 2010, young adults aged 18 to 25 had the highest rate of current use of a tobacco product (40.8 percent) compared with youths aged 12 to 17 and adults aged 26 or older (10.7 and 27.2 percent, respectively). Young adults had the highest usage rates of each of the specific tobacco products as well. In 2010, the rates of past month use among young adults were 34.2 percent for cigarettes, 11.2 percent for cigars, 6.4 percent for smokeless tobacco, and 1.8 percent for pipe tobacco. The rate of current use of a tobacco product by young adults was similar in 2009 and 2010 (41.6 and 40.8 percent, respectively). However, the rate of cigarette use by young adults declined between 2009 and 2010 from 35.8 to 34.2 percent. Between 2002 and 2010, there was a significant decrease in the rates for current use of tobacco products and cigarettes among young adults; in 2002, the rates were 45.3 and 40.8 percent, respectively.

- The rate of past month tobacco use among youths aged 12 to 17 declined from 11.6 percent in 2009 to 10.7 percent in 2010 (Figure 4.2). The rate of past month cigarette use among 12 to 17 year olds declined from 13.0 percent in 2002 to 8.3 percent in 2010. The rate of past month smokeless tobacco use among 12 to 17 year olds increased from 2.0 percent in 2002 to 2.3 percent in 2010.

- Across age groups, current cigarette use peaked among persons aged 21 to 25 (35.8 percent) and those aged 26 to 29 (36.8 percent) (Figure 4.3). About one third of 18 to 20 year olds and one third of 30 to 34 year olds (31.9 and 30.9 percent, respectively) smoked cigarettes in the past month. About one fifth (20.4 percent) of persons aged 35 or older in 2010 smoked cigarettes in the past month.

Figure 4.2 Past Month Tobacco Use among Youths Aged 12 to 17: 2002-2010
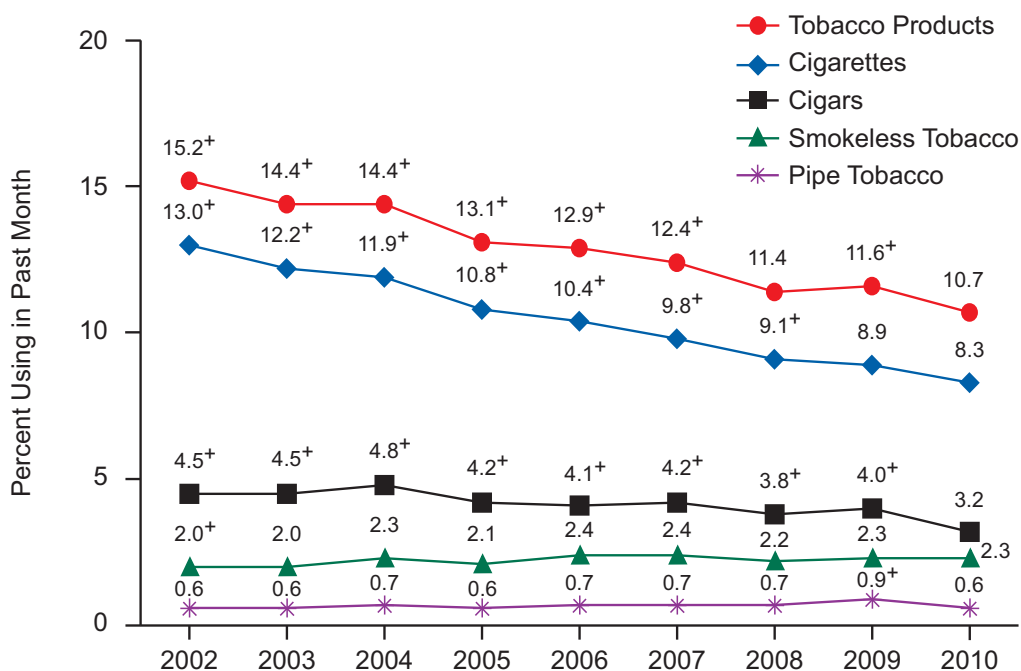
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Figure 4.3 Past Month Cigarette Use among Persons Aged 12 or Older, by Age: 2010

41
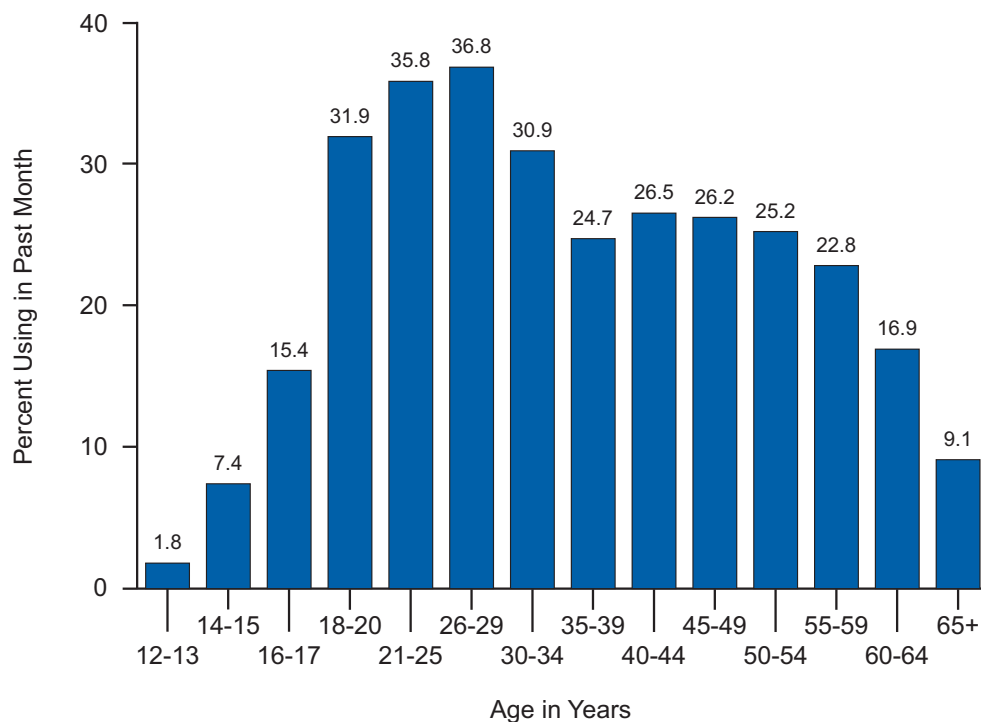
Gender

- In 2010, current use of a tobacco product among persons aged 12 or older was reported by a higher percentage of males (33.7 percent) than females (21.5 percent). Males also had higher rates of past month use than females of each specific tobacco product: cigarettes (25.4 percent of males vs. 20.7 percent of females), cigars (8.5 vs. 2.1 percent), smokeless tobacco (6.8 vs. 0.4 percent), and pipe tobacco (1.4 vs. 0.3 percent).

- Among youths aged 12 to 17, the rate of current cigarette smoking in 2010 was slightly higher for males than for females (8.6 percent for males vs. 8.1 percent for females), but the difference was not statistically significant (Figure 4.4). The rates declined slightly for both males and females between 2009 and 2010 (9.2 vs. 8.6 percent for males and 8.6 vs. 8.1 percent for females), although these declines were not statistically significant. From 2002 to 2010, the rate of current cigarette smoking among youths decreased for both males (from 12.3 to 8.6 percent) and females (from 13.6 to 8.1 percent).

Figure 4.4   Past Month Cigarette Use among Youths Aged 12 to 17, by Gender: 2002-2010
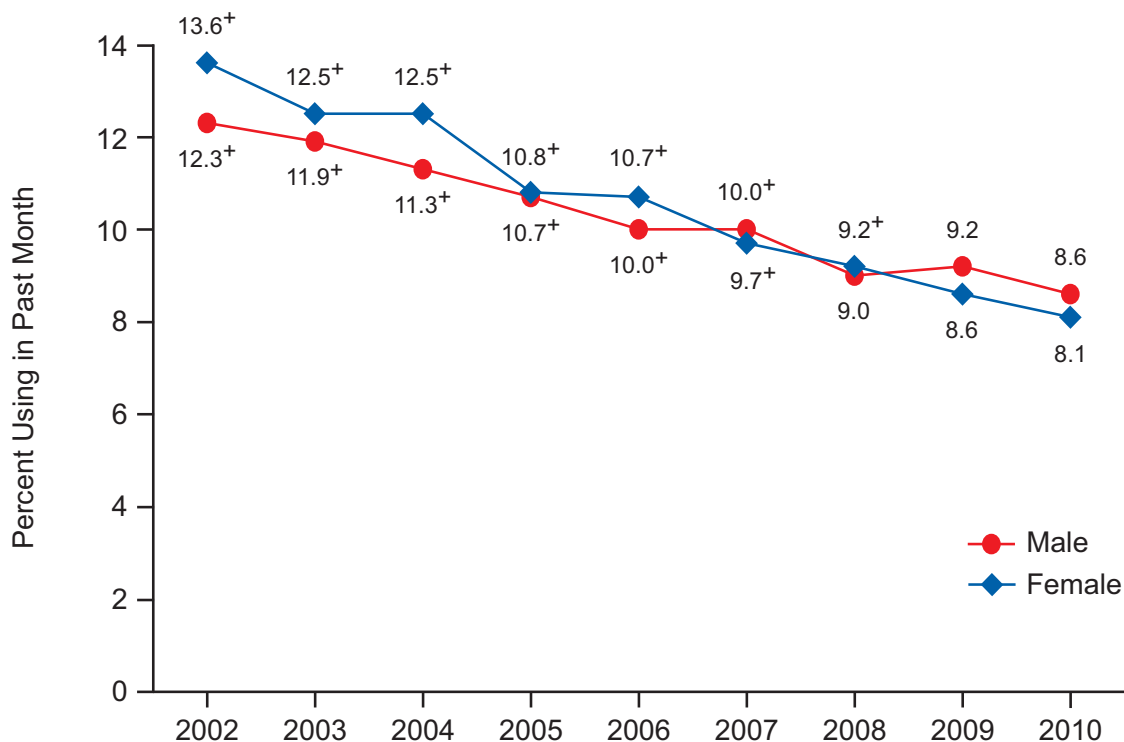
$^+$ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- The rate of current cigarette smoking among male young adults aged 18 to 25 dropped from 40.4 percent in 2009 to 38.1 percent in 2010. The rate also declined slightly for female young adults, but this change was not statistically significant (31.2 percent in 2009 vs. 30.3 percent in 2010). Between 2002 and 2010, the rate of cigarette use among young adults declined for both males (from 44.4 to 38.1 percent) and females (from 37.1 to 30.3 percent).

Pregnant Women

- About one in six pregnant women aged 15 to 44 had smoked cigarettes in the past month, based on combined data for 2009 and 2010. The rate of past month cigarette use was lower among those who were pregnant (16.3 percent) than it was among those who were not pregnant (26.7 percent). This pattern was also evident among women aged 18 to 25 (22.7 vs. 31.2 percent for pregnant and nonpregnant women, respectively) and among women aged 26 to 44 (11.8 vs. 27.0 percent, respectively). However, among those aged 15 to 17, the rate of cigarette smoking was higher for pregnant women than nonpregnant women (22.7 vs. 13.4 percent).

- Two-year moving average rates from 2002-2003 to 2009-2010 indicate that current cigarette use among women aged 15 to 44 decreased from 30.7 to 26.7 percent for those who were not pregnant and from 18.0 to 16.3 percent for those who were pregnant, although the latter difference was not statistically significant (Figure 4.5).

Figure 4.5   Past Month Cigarette Use among Women Aged 15 to 44, by Pregnancy Status: Combined Years 2002-2003 to 2009-2010
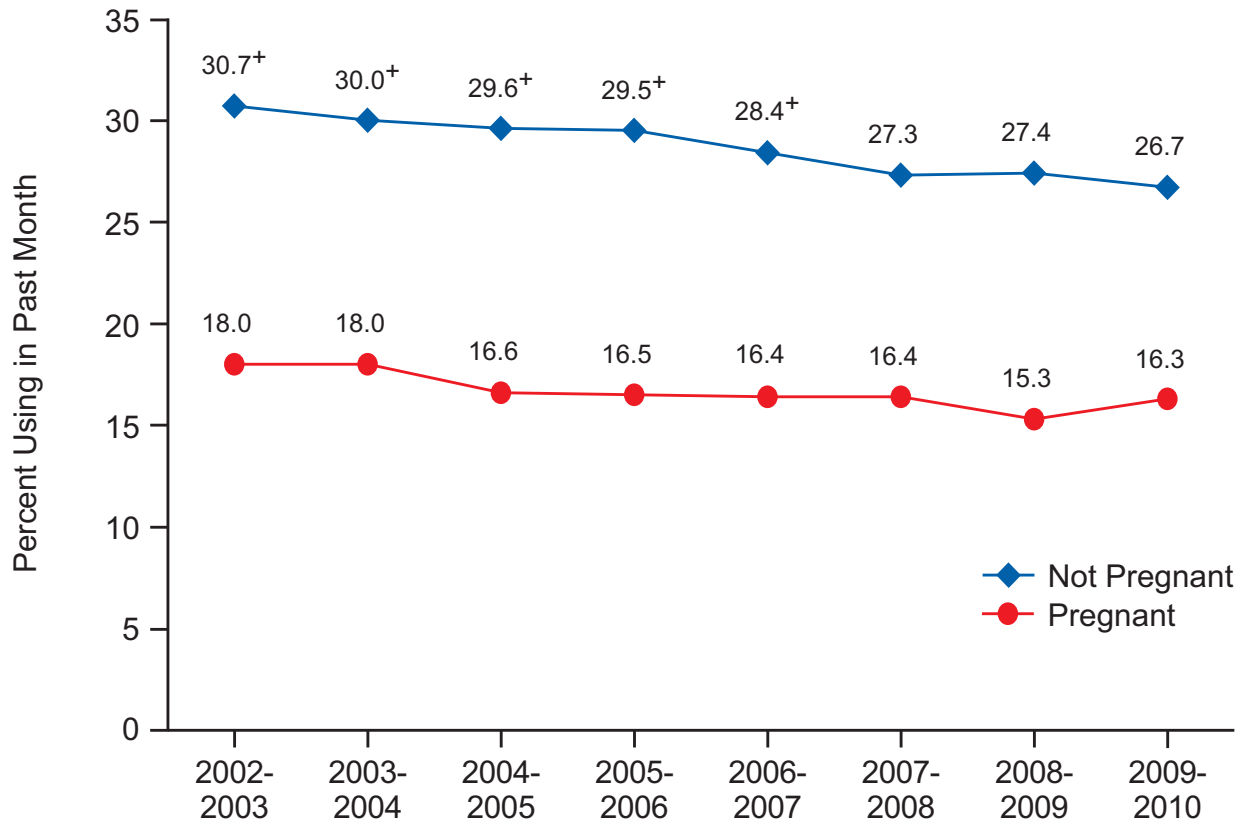
[+] Difference between this estimate and the 2009-2010 estimate is statistically significant at the .05 level.

Race/Ethnicity

- In 2010, the prevalence of current use of a tobacco product among persons aged 12 or older was 12.5 percent for Asians, 21.9 percent for Hispanics, 27.3 percent for blacks, 29.5 percent for whites, 32.0 percent for persons who reported two or more races, and 35.8 percent for American Indians or Alaska Natives. There were no statistically significant changes in past month use of a tobacco product between 2009 and 2010 for any of these racial/ethnic groups.

- In 2010, current cigarette smoking among youths aged 12 to 17 and young adults aged 18 to 25 was more prevalent among whites than blacks (9.8 vs. 4.5 percent for youths and 39.1 vs. 26.3 percent for young adults).

- The current smoking rates in 2010 for Hispanics across age groups were 8.0 percent among youths aged 12 to 17, 27.4 percent among young adults aged 18 to 25, and 20.5 percent among those aged 26 or older. These rates were similar to smoking rates for Hispanics in 2009.

- Smoking rates across age groups held steady for Asians between 2009 and 2010. The current smoking rate for Asian youths aged 12 to 17 was 2.5 percent in 2009 and 3.6 percent in 2010. The rates for Asian young adults aged 18 to 25 and adults aged 26 or older also held steady between 2009 and 2010 (21.6 to 21.0 percent for young adults and 9.9 to 10.1 percent for adults aged 26 or older, respectively).

- The current smoking prevalence rate for American Indian or Alaska Native youths aged 12 to 17 was 14.9 percent in 2010. This rate was not significantly different from the rate in 2008 (18.9 percent) or 2009 (11.6 percent).

Education

- As observed from 2002 onward, cigarette smoking in the past month was less prevalent among adults who were college graduates compared with those with less education. Among adults aged 18 or older, current cigarette use in 2010 was reported by 34.3 percent of those who had not completed high school, 29.6 percent of high school graduates who did not attend college, 25.8 percent of persons with some college, and 12.8 percent of college graduates. These rates were similar to the 2009 rates by educational attainment.

College Students

- Among young adults 18 to 22 years old, full-time college students were less likely to be current cigarette smokers than their peers who were not enrolled full time in college. Cigarette use in the past month in 2010 was reported by 24.8 percent of full-time college students, less than the rate of 39.9 percent for those not enrolled full time. The same pattern was found among both males and females in this age range.

- Among males aged 18 to 22 who were full-time college students in 2010, cigarette use declined from 31.7 percent in 2009 to 27.1 percent in 2010. Rates of past month use of smokeless tobacco did not differ significantly between males aged 18 to 22 who were full-time college students and males of the same age group who were not enrolled full time in college (12.0 and 12.7 percent, respectively).

Employment

- In 2010, current cigarette smoking was more common among unemployed adults aged 18 or older than among adults who were working full time or part time (39.9 vs. 24.9 and 24.4 percent, respectively). Cigar smoking followed a similar pattern, with 9.4 percent of unemployed adults reporting past month use compared with 5.9 percent of full-time workers and 5.3 percent of part-time workers.

- Current use of smokeless tobacco in 2010 was higher among adults aged 18 or older who were employed full time and those who were unemployed (both at 4.6 percent) than among adults who were employed part time (2.6 percent) and those in the "other" employment category, which includes persons not in the labor force (2.2 percent). These rates were similar to 2009 smokeless tobacco use rates for these employment categories.

Geographic Area

- In 2010, current cigarette smoking among persons aged 12 or older was lower in the West (20.0 percent) than in the Northeast (22.2 percent), which in turn was lower than in the South (24.1 percent) and Midwest (24.8 percent). Use of smokeless tobacco was also higher in the Midwest and South (3.9 and 4.3 percent, respectively) than in the West (3.0 percent), which in turn was higher than in the Northeast (2.1 percent). As in 2009, the rates of tobacco use in 2010 were associated with county type among persons aged 12 or older. The rate of current cigarette use was 21.7 percent in large metropolitan areas, 23.5 percent in small metropolitan areas, and 26.0 percent in nonmetropolitan areas. Use of smokeless tobacco in the past month in 2010 among persons aged 12 or older was lowest in large metropolitan areas (2.3 percent). In small metropolitan areas, the current smokeless tobacco use rate was 4.0 percent; in nonmetropolitan areas, it was 6.5 percent.

Association with Illicit Drug and Alcohol Use

- Use of illicit drugs and alcohol was more common among current cigarette smokers than among nonsmokers in 2010, as in prior years since 2002. Among persons aged 12 or older, 22.6 percent of past month cigarette smokers reported current use of an illicit drug compared with 4.9 percent of persons who were not current cigarette smokers. Over half (52.9 percent, or 1.1 million) of youths aged 12 to 17 who smoked cigarettes in the past month also used an illicit drug compared with 6.2 percent of youths who did not smoke cigarettes.

- Past month alcohol use was reported by 66.2 percent of current cigarette smokers compared with 47.5 percent of those who did not use cigarettes in the past month. The association also was found with binge drinking (43.7 percent of current cigarette smokers vs. 16.9 percent of current nonsmokers) and heavy drinking (15.8 vs. 3.9 percent, respectively).

45

Frequency of Cigarette Use

- Among the 58.3 million current cigarette smokers aged 12 or older in 2010, 34.7 million (59.6 percent) used cigarettes daily. The percentage of daily cigarette smokers increased with age, with 22.4 percent among past month cigarette users aged 12 to 17, 46.1 percent among those aged 18 to 25, and 64.8 percent among those aged 26 or older.

- Less than half (45.2 percent) of daily smokers aged 12 or older reported smoking 16 or more cigarettes per day (i.e., approximately one pack or more). The percentage of daily smokers who smoked at least one pack of cigarettes per day increased with age from 16.5 percent among those aged 12 to 17 to 27.8 percent among those aged 18 to 25 to 48.9 percent among those aged 26 or older (Figure 4.6).

- Since 2004, the percentage of daily smokers aged 26 or older who smoked one or more packs of cigarettes per day declined from 59.1 to 48.9 percent. Declines also were seen since 2002 for youths aged 12 to 17 (from 21.7 to 16.5 percent) and young adults (from 39.0 to 27.8 percent), although the decline for youths was not significant.

Figure 4.6 Past Month Smokers of One or More Packs of Cigarettes per Day among Daily Smokers, by Age Group: 2002-2010
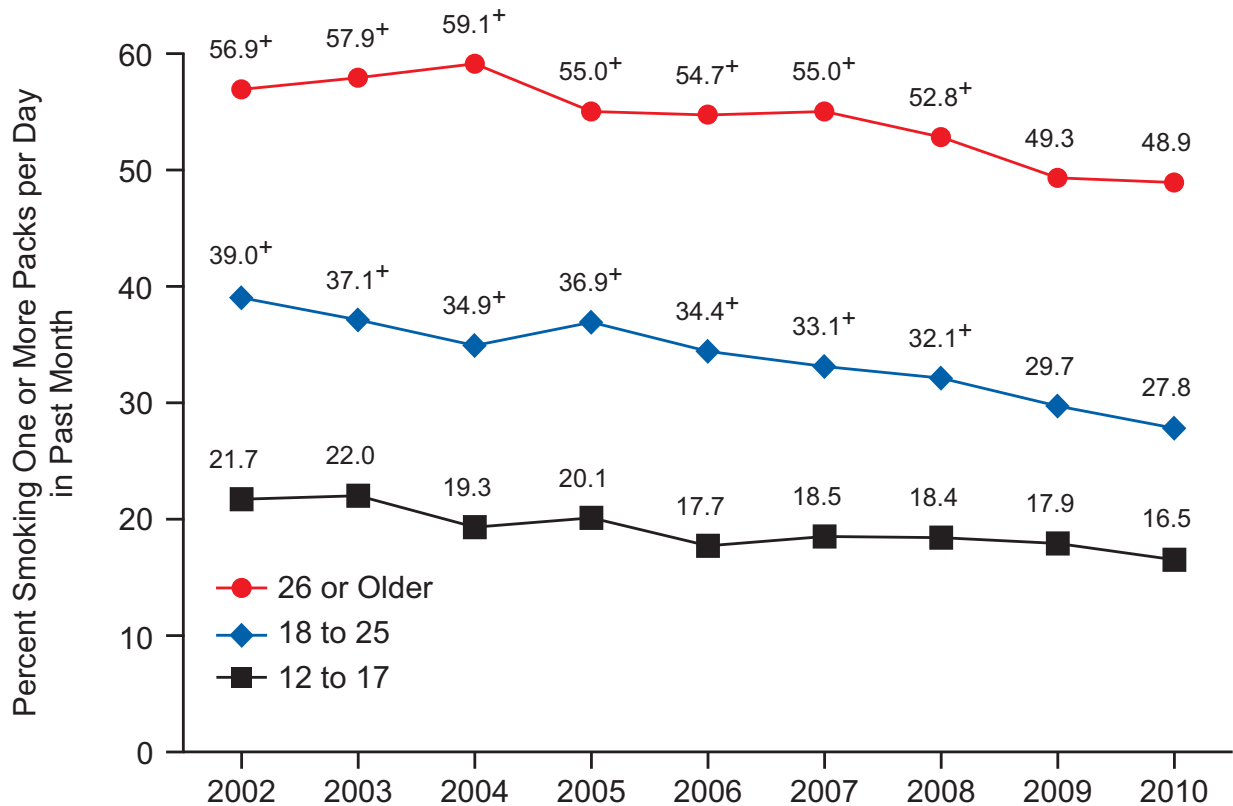
[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

# 5. Initiation of Substance Use

Information on substance use initiation, also known as incidence or first-time use, is important for policymakers and researchers. Measures of initiation are often leading indicators of emerging patterns of substance use. They provide valuable information that can be used to assess the effectiveness of current prevention programs and to focus prevention efforts.

With its large sample size and oversampling of youths aged 12 to 17 and young adults aged 18 to 25, the National Survey on Drug Use and Health (NSDUH) provides a variety of estimates related to initiation of substance use (illicit drugs, cigarettes, and alcohol) based on reported age and on year and month at first use. This chapter presents estimates of initiation occurring in the 12 months prior to the interview date. Individuals who initiated use within the past 12 months are referred to as recent or past year initiates. One caveat of this approach is that because the survey interviews persons aged 12 or older and asks about the past 12 months, the initiation estimates will represent some, but not all, of the initiation at age 11 and no initiation occurring at age 10 or younger. This underestimation problem primarily affects estimates of initiation for cigarettes, alcohol, and inhalants because they tend to be initiated at a younger age than other substances. See Section B.4.1 in Appendix B for further discussion of the methods and bias in initiation estimates.

This chapter includes estimates of the number and rate of past year initiation of illicit drug, cigarette, and alcohol use among the total population aged 12 or older and by age and gender categories from the 2002 to 2010 NSDUHs. Also included are initiation estimates that pertain to persons at risk for initiation. At risk for initiation is defined as persons who never used the substance in their lifetime along with persons who used the substance for the first time in the 12 months prior to the interview. In other words, persons at risk are those who had never used as of 12 months prior to the interview date. Some analyses are based on the ages at the time of interview, and others focus on the age at the time of first substance use. Readers need to be aware of these alternative estimation approaches when interpreting NSDUH incidence estimates and pay close attention to the approach used in each situation. Titles and notes on figures and associated detailed tables document which method applies.

For trend measurement, initiation estimates for each year (2002 to 2010) are produced independently based on the data from the survey conducted that year. It should be mentioned that trend estimates of incidence based on long recall periods have not been considered because of concerns about their validity (Gfroerer, Hughes, Chromy, Heller, & Packer, 2004).

Regarding the age at first use estimates, means, as measures of central tendency, are heavily influenced by the presence of extreme values in the data. Thus, for the purposes of this report and unless specified otherwise, the mean age at initiation pertains to persons aged 12 to 49. This constraint was implemented so that the mean age estimates reported would not be influenced by those few respondents who were past year initiates at age 50 or older. However, initiates aged 26 to 49 can have a smaller, but substantial effect on the stability of mean age estimates of persons aged 12 to 49, so caution is needed in describing these trends. Section B.4.1 in Appendix B discusses this issue in more detail. Note that this constraint only affects estimates

of mean age at initiation; other estimates in this chapter, including the number and prevalence of past year initiates, are among all persons aged 12 or older.

Another important consideration in examining incidence estimates across different drug categories is that substance users typically initiate use of different substances at different times in their lives. Thus, the estimates for past year initiation of each specific illicit drug cannot be added to obtain the total number of overall illicit drug initiates because some of the initiates previously had used other drugs. The first illicit drug initiation estimate only includes the past year initiation of use of a specific drug that was not preceded by use of other drugs. For example, a respondent who reported initiating marijuana use in the past 12 months is counted as a marijuana initiate. The same respondent also can be counted as an illicit drug initiate with marijuana as the first drug only if his or her marijuana use initiation was not preceded by use of any other drug (cocaine, heroin, hallucinogens, inhalants, pain relievers, tranquilizers, stimulants, or sedatives).

Initiation of Illicit Drug Use

- In 2010, approximately 3.0 million persons aged 12 or older used an illicit drug for the first time within the past 12 months; this averages to about 8,100 new users per day. This estimate was not significantly different from the number in 2009 (3.1 million). Over half of initiates (57.0 percent) were younger than age 18 when they first used, and 52.1 percent of new users were female. The average age at initiation among persons aged 12 to 49 was 19.1 years, which was significantly higher than the 2009 estimate (17.6 years) and the 2003 estimate (17.5 years), but similar to the 2008 estimate (18.8 years). See Section B.4.1 in Appendix B for a discussion of the effects of older adult initiates on estimates of mean age at first use.

- In 2010, of the 3.0 million persons aged 12 or older who used illicit drugs for the first time within the past 12 months, a majority reported that their first drug was marijuana (61.8 percent) (Figure 5.1). About one quarter initiated with psychotherapeutics (26.2 percent, including 17.3 percent with pain relievers, 4.6 percent with tranquilizers, 2.5 percent with stimulants, and 1.9 percent with sedatives). A notable proportion reported inhalants (9.0 percent) as their first drug, and a small proportion used hallucinogens as their first illicit drug (3.0 percent). All of the above percentages of first drug use were similar to the corresponding percentages in 2009.

Comparison, by Drug

- In 2010, the specific illicit drug category with the largest number of recent initiates among persons aged 12 or older was marijuana use (2.4 million), followed by nonmedical use of pain relievers (2.0 million), then followed by nonmedical use of tranquilizers (1.2 million), Ecstasy (0.9 million), inhalants (0.8 million), and cocaine and stimulants (0.6 million each) (Figure 5.2).

- Among persons aged 12 to 49 in 2010, the average age at first use was 16.3 years for inhalants, 18.4 years for marijuana, 19.4 years for Ecstasy, 21.0 years for pain relievers, 21.2 years for cocaine and stimulants, 21.3 years for heroin, and 24.6 years for tranquilizers (Figure 5.3).

Figure 5.1 First Specific Drug Associated with Initiation of Illicit Drug Use among Past Year Illicit Drug Initiates Aged 12 or Older: 2010

Pain Relievers (17.3%)

Inhalants (9.0%)

Tranquilizers (4.6%)

Hallucinogens (3.0%)

Stimulants (2.5%)

Sedatives (1.9%)

Cocaine (0.1%)

Heroin (0.1%)

Marijuana (61.8%)

3.0 Million Initiates of Illicit Drugs
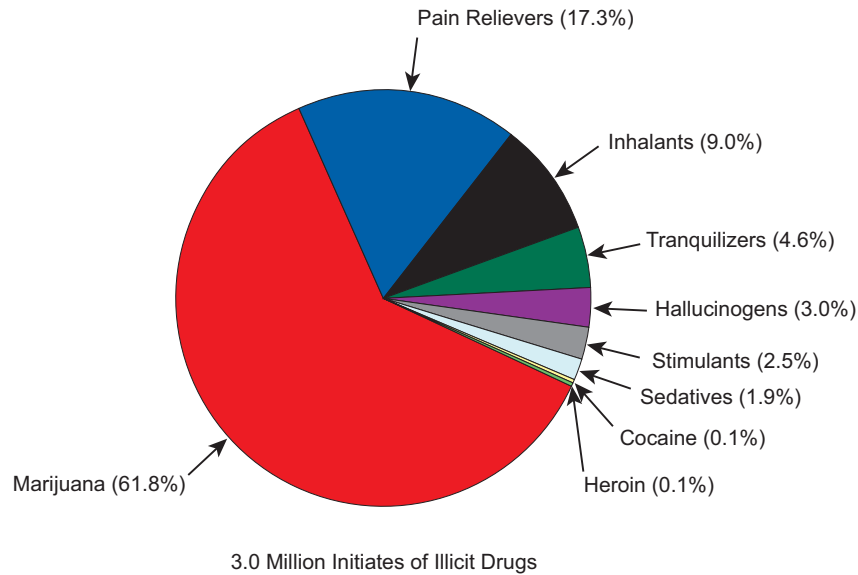
Note: The percentages do not add to 100 percent due to rounding or because a small number of respondents initiated multiple drugs on the same day. The first specific drug refers to the one that was used on the occasion of first-time use of any illicit drug.

Figure 5.2 Past Year Initiates of Specific Illicit Drugs among Persons Aged 12 or Older: 2010

Numbers in Thousands

Drug	Value
Marijuana	2,426
Pain Relievers	2,004
Tranquilizers	1,238
Ecstasy	937
Inhalants	793
Cocaine	637
Stimulants	624
LSD	377
Sedatives	252
Heroin	140
PCP	45
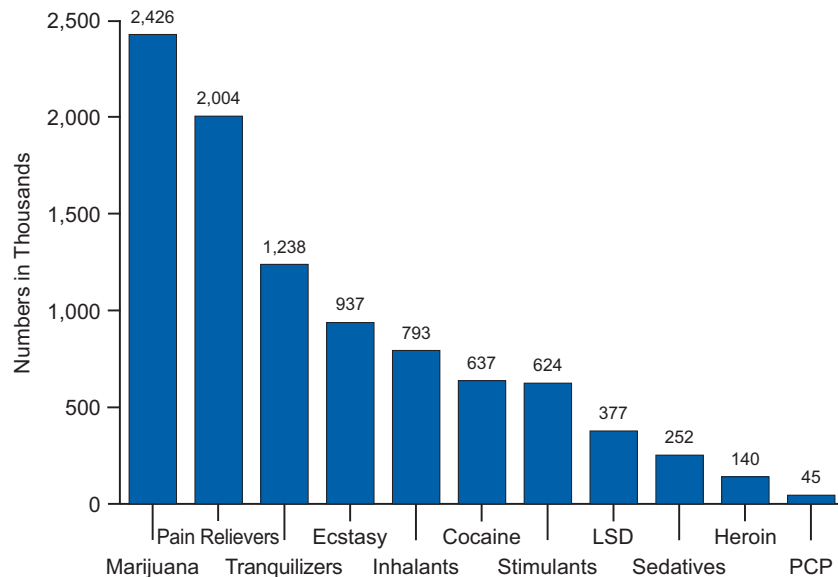
Note: The specific drug refers to the one that was used for the first time, regardless of whether it was the first drug used or not.

Figure 5.3 Mean Age at First Use for Specific Illicit Drugs among Past Year Initiates Aged 12 to 49: 2010
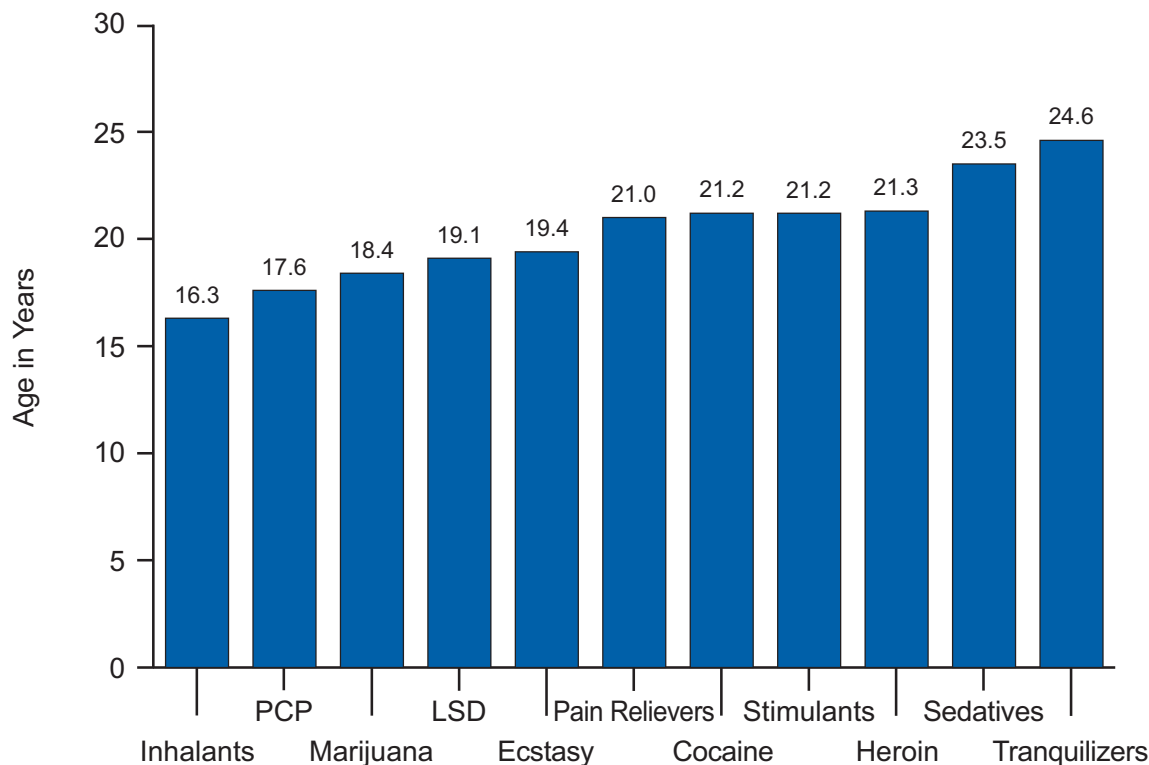
Marijuana

- In 2010, there were 2.4 million persons aged 12 or older who had used marijuana for the first time within the past 12 months; this averages to about 6,600 new users each day. This estimate was about the same as the estimates in 2008 and 2009 (2.2 million and 2.4 million, respectively), but higher than the estimates in 2002 through 2007 (Figure 5.4). It should be noted that although the total number of past year marijuana initiates aged 12 or older did not change between 2009 and 2010, the number of recent initiates aged 26 or older increased from 49,000 to 247,000 in that time period. Trends among this age group have been somewhat volatile since 2002. See Section B.4.1 in Appendix B for further discussion of the effects of older adult initiates on estimates of mean age at first use.

- Most (58.5 percent) of the 2.4 million recent marijuana initiates were younger than age 18 when they first used. Among all youths aged 12 to 17, an estimated 5.2 percent had used marijuana for the first time within the past year, similar to the rate in 2009 (5.4 percent).

- In 2010, among persons aged 12 or older, there were an estimated 1.4 million first-time past year marijuana users who initiated prior to the age of 18. This estimate was not significantly different from the corresponding estimates in 2009 (1.5 million) and 2008 (1.4 million).

Figure 5.4 Past Year Marijuana Initiates among Persons Aged 12 or Older and Mean Age at First Use of Marijuana among Past Year Marijuana Initiates Aged 12 to 49: 2002-2010
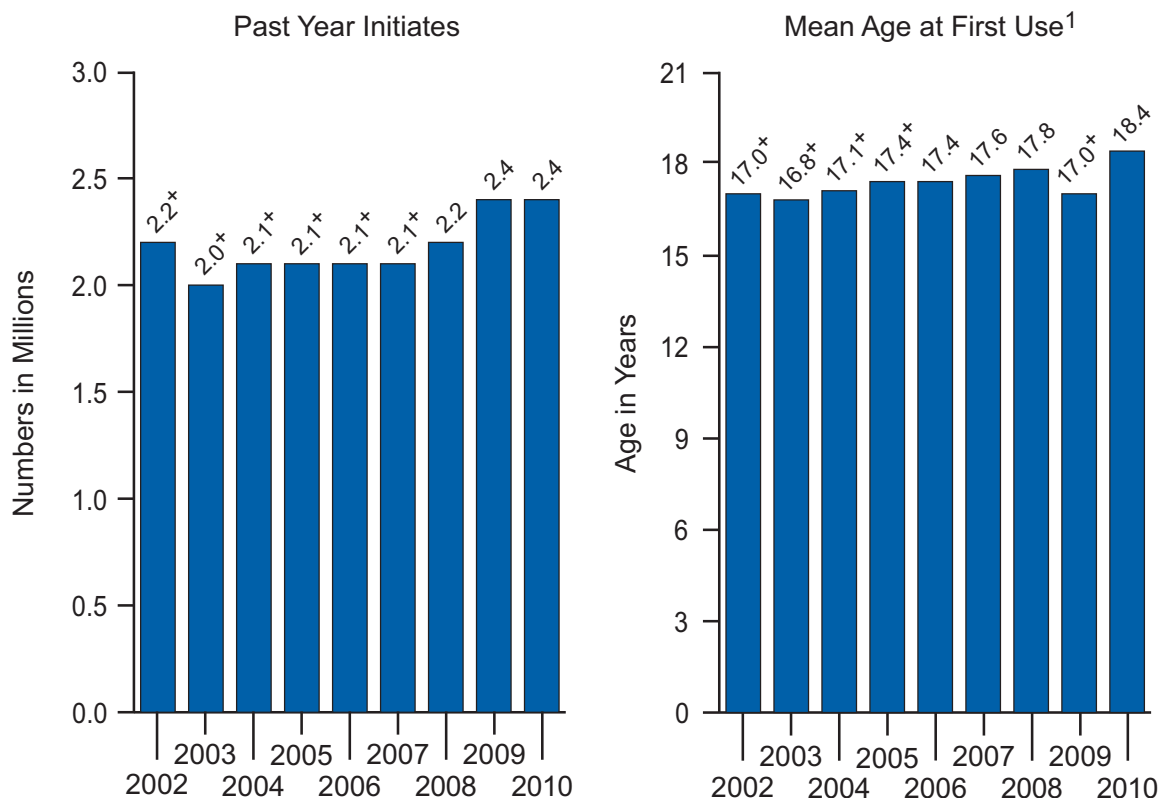
Past Year Initiates

Mean Age at First Use[1]

[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

[1] Mean-age-at-first-use estimates are for recent initiates aged 12 to 49.

- As a percentage of those aged 12 to 17 who had not used marijuana prior to the past year (i.e., those at risk for initiation), the youth marijuana initiation rate in 2010 (5.9 percent) was similar to the rate in 2009 (6.1 percent).

- In 2010, the average age at first marijuana use among recent initiates aged 12 to 49 was 18.4 years, which was higher than the average in 2009 (17.0 years) and in 2002 through 2005 when the average age ranged from 16.8 to 17.4 years (Figure 5.4). The low mean age in 2009 was apparently due to the low number of estimated initiates aged 26 to 49 in 2009, relative to other years. The estimates had been above 100,000 per year from 2004 to 2008, but dropped to 49,000 in 2009, before increasing to 210,000 in 2010. Section B.4.1 in Appendix B discusses the instability of estimates of older adult initiation and the impact on estimates of mean age at first use.

Cocaine

- In 2010, there were 637,000 persons aged 12 or older who had used cocaine for the first time within the past 12 months; this averages to approximately 1,700 initiates per day. This estimate was similar to the number in 2009 (617,000) and 2008 (722,000). The annual number of cocaine initiates declined from 1.0 million in 2002 to 637,000 in 2010. The number of initiates of crack cocaine declined during this period from 337,000 to 83,000.

- Most (71.6 percent) of the 0.6 million recent cocaine initiates were 18 or older when they first used. The average age at first use among recent initiates aged 12 to 49 was 21.2 years, which was similar to the average age in 2009 and 2008 (20.0 and 19.8 years, respectively). These average age estimates have remained fairly stable since 2002.

Heroin

- In 2010, there were 140,000 persons aged 12 or older who had used heroin for the first time within the past 12 months. This estimate was similar to the estimate in 2009 (180,000) and to estimates during 2002 to 2008 (ranging from 91,000 to 118,000 per year). The average age at first use among recent initiates aged 12 to 49 was 21.3 years, significantly lower than the 2009 estimate (25.5 years).

Hallucinogens

- In 2010, there were 1.2 million persons aged 12 or older who had used hallucinogens for the first time within the past 12 months (Figure 5.5). This estimate was not significantly different from the estimate in 2009 (1.3 million), but was higher than the estimates from 2003 to 2005 (ranging from 886,000 to 953,000).

- The number of past year initiates of LSD aged 12 or older was 377,000 in 2010, which was similar to the number in 2009 (337,000), but higher than the estimates from 2003 to 2007 (ranging from 200,000 to 270,000). Past year initiates of PCP decreased from 123,000 in 2002 to 45,000 in 2009 and 2010 (Figure 5.5).

- The number of past year initiates of Ecstasy was similar in 2009 (1.1 million) and 2010 (937,000) (Figure 5.5). The estimate was 1.2 million in 2002, declined to 642,000 in 2003, and increased by about 50 percent between 2005 (615,000) and 2010 (937,000). Most (59.2 percent) of the recent Ecstasy initiates in 2010 were aged 18 or older at the time they first used Ecstasy. Among past year initiates aged 12 to 49, the average age at initiation of Ecstasy in 2010 was 19.4 years, similar to the average age in 2009 (20.2 years), but lower than the average age in 2002 (21.2 years).

- In 2010, among persons aged 12 or older, the number of first-time past year Ecstasy users who initiated use prior to the age of 18 was 382,000. This estimate was significantly higher than the estimate in 2005 (209,000).

Figure 5.5 Past Year Hallucinogen Initiates among Persons Aged 12 or Older: 2002-2010
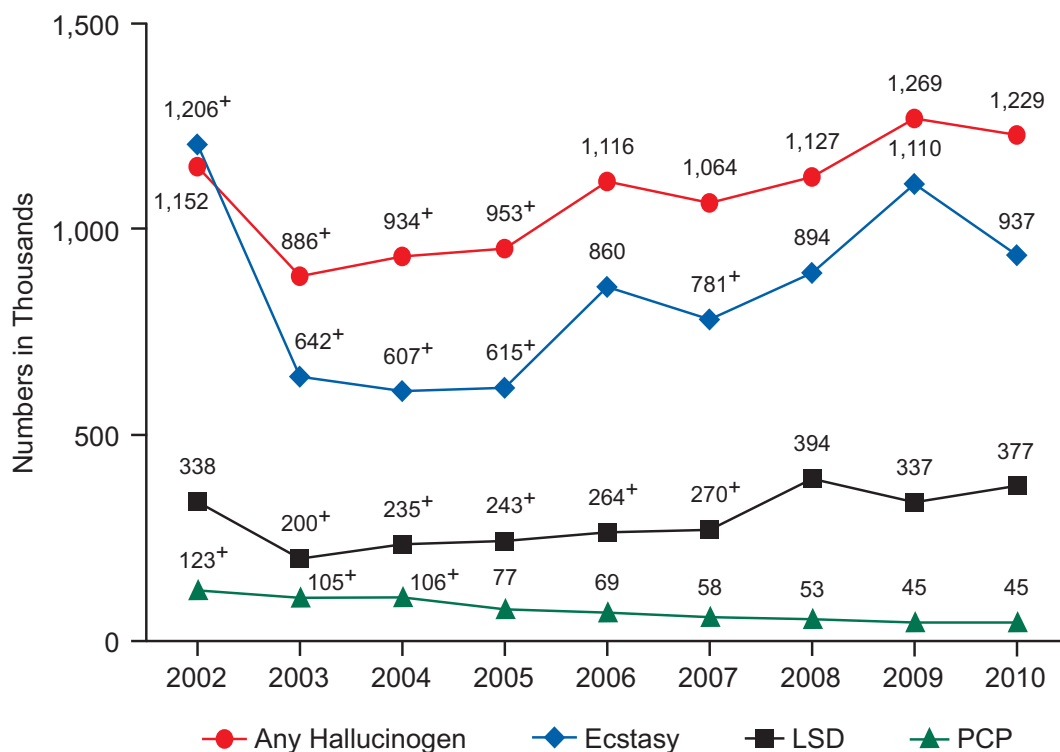
$^+$ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Inhalants

• In 2010, there were 793,000 persons aged 12 or older who had used inhalants for the first time within the past 12 months, which was similar to the numbers in prior years since 2002; 68.4 percent were under age 18 when they first used. The average age at first use among recent initiates aged 12 to 49 was also similar in 2009 and 2010 (16.9 and 16.3 years, respectively).

Psychotherapeutics

• Psychotherapeutics include the nonmedical use of any prescription-type pain relievers, tranquilizers, stimulants, or sedatives. Over-the-counter substances are not included. In 2010, there were 2.4 million persons aged 12 or older who used psychotherapeutics nonmedically for the first time within the past year, which averages around 6,600 initiates per day. The number of new users of psychotherapeutics in 2010 was similar to the 2009 estimate (2.6 million), but lower than the 2004 estimate (2.8 million). In 2010, the number of new users of pain relievers was 2.0 million, a number that has remained fairly constant since 2005 and was a decrease from 2002, 2003, and 2004 levels (2.3 million, 2.5 million, and 2.4 million, respectively). Among other specific psychotherapeutics, the number of initiates was 1.2 million for tranquilizers, 624,000 for stimulants, and 252,000 for sedatives.

- In 2010, the average age at first nonmedical use of any psychotherapeutics among recent initiates aged 12 to 49 was 22.3 years. More specifically, it was 24.6 years for tranquilizers, 23.5 years for sedatives, 21.2 years for stimulants, and 21.0 years for pain relievers.

- In 2010, the number of new nonmedical users of OxyContin® aged 12 or older was 598,000, with an average age at first use of 22.8 years among those aged 12 to 49. These estimates are similar to those for 2009 (584,000 and 22.3 years, respectively).

- The number of recent new users of methamphetamine among persons aged 12 or older was 105,000 in 2010 (Figure 5.6), which was similar to the 2009 estimate (154,000), but lower than the 2002 to 2007 estimates (ranging from 157,000 to 318,000). The average age of new methamphetamine users aged 12 to 49 in 2010 was 18.8 years, which was not significantly different from corresponding 2002 to 2009 estimates.

Figure 5.6 Past Year Methamphetamine Initiates among Persons Aged 12 or Older and Mean Age at First Use of Methamphetamine among Past Year Methamphetamine Initiates Aged 12 to 49: 2002-2010

[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

[1] Mean-age-at-first-use estimates are for recent initiates aged 12 to 49.

Alcohol

- In 2010, there were 4.7 million persons aged 12 or older who had used alcohol for the first time within the past 12 months; this averages to approximately 12,800 initiates per day.

- Most (82.4 percent) of the 4.7 million recent alcohol initiates were younger than age 21 at the time of initiation. Approximately 58.6 percent initiated prior to age 18.

- In 2010, the average age at first alcohol use among recent initiates aged 12 to 49 was 17.2 years, which was similar to the corresponding 2009 estimate (16.9 years), but higher than the 2002 to 2006 estimates, which ranged from 16.4 to 16.6 years. The mean age at first use among recent initiates aged 12 or older who initiated use prior to the age of 21 was 16.1 years, which was higher than the 2009 estimate of 15.9 years.

Tobacco

- The number of persons aged 12 or older who smoked cigarettes for the first time within the past 12 months was 2.4 million in 2010, which was similar to the estimate in 2009 (2.5 million), but significantly higher than the estimate for 2002 (1.9 million), 2003 (2.0 million), and 2004 (2.1 million) (Figure 5.7). The 2010 estimate averages out to approximately 6,500 new cigarette smokers every day. Most new cigarette smokers in 2010 initiated prior to age 18 (58.8 percent).

Figure 5.7 Past Year Cigarette Initiates among Persons Aged 12 or Older, by Age at First Use: 2002-2010
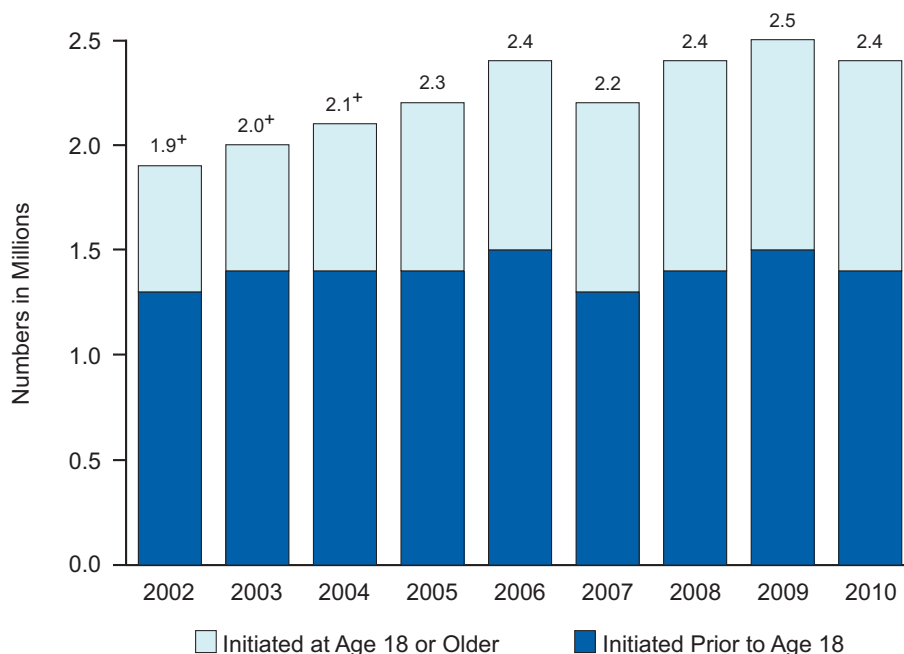
[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- In 2002 and 2010, the numbers of cigarette initiates who were under age 18 when they first used were similar (1.3 million and 1.4 million, respectively). However, the number of cigarette initiates who began smoking at age 18 or older increased from about 600,000 in 2002 to 1 million in 2010.

- In 2010, among recent initiates aged 12 to 49, the average age of first cigarette use was 17.3 years, similar to the average in 2009 (17.5 years).

- Of those aged 12 or older who had not smoked cigarettes prior to the past year (i.e., those at risk for initiation), the past year initiation rate for cigarettes was 2.6 percent in 2010, similar to the rate in 2009 (2.8 percent). Among youths aged 12 to 17 who had not smoked cigarettes prior to the past year, the incidence rate was 5.8 percent, which was similar to the 2009 rate (6.2 percent). Between 2002 and 2010, among males aged 12 to 17 who had never smoked prior to the past year, there was no significant change in the respective past year initiation rate (Figure 5.8). However, between 2002 and 2010, there was a significant decrease in the past year initiation rate among females.

- In 2010, the number of persons aged 12 or older who had started smoking cigarettes daily within the past 12 months was 952,000. This estimate was significantly lower than the 2009 estimate (1.1 million), but similar to the estimates for prior years (i.e., 2002 to 2008). Of the new daily smokers in 2010, 39.5 percent, or 376,000 persons, were younger than age 18 when they started smoking daily. This figure averages to approximately 1,000 initiates of daily smoking under age 18 every day.

- The average age of first daily smoking among new daily smokers aged 12 or older in 2010 was 19.1 years, a decline from the average of 21.3 years in 2009. Among males, the average age at first use was similar between 2009 (19.8 years) and 2010 (18.5 years); however, the average age for females declined from 22.7 years in 2009 to 19.8 years in 2010.

- In 2010, there were 2.9 million persons aged 12 or older who had used cigars for the first time in the past 12 months, which was similar to the 2009 estimate (3.1 million). However, the 2010 estimate reflects a significant decrease when compared with the 2005 estimate (3.3 million). Among past year cigar initiates aged 12 to 49, the average age at first use was 20.5 years in 2010, which was similar to the estimate in 2009 (20.7 years).

- The number of persons aged 12 or older initiating use of smokeless tobacco in the past year was 1.4 million in 2010, which was not significantly different from the estimates in 2006 (1.3 million), 2007 (1.3 million), 2008 (1.4 million), and 2009 (1.5 million). However, the estimated number of past year initiates of smokeless tobacco use experienced a steady increase from 2003 (928,000) to 2006 (1.3 million). About three quarters (75.3 percent) of new initiates in 2010 were male, and about half (46.1 percent) were under age 18 when they first used.

- The average age at first smokeless tobacco use among recent initiates aged 12 to 49 in 2010 was 19.3 years, which was similar to the 2009 estimate (18.8 years). Among both males and females, the average ages at first use of smokeless tobacco were similar in 2009 and 2010 (18.7 and 19.1 years for males, 19.3 and 19.9 years for females).

Figure 5.8 Past Year Cigarette Initiation among Youths Aged 12 to 17 Who Had Never Smoked Prior to the Past Year, by Gender: 2002-2010
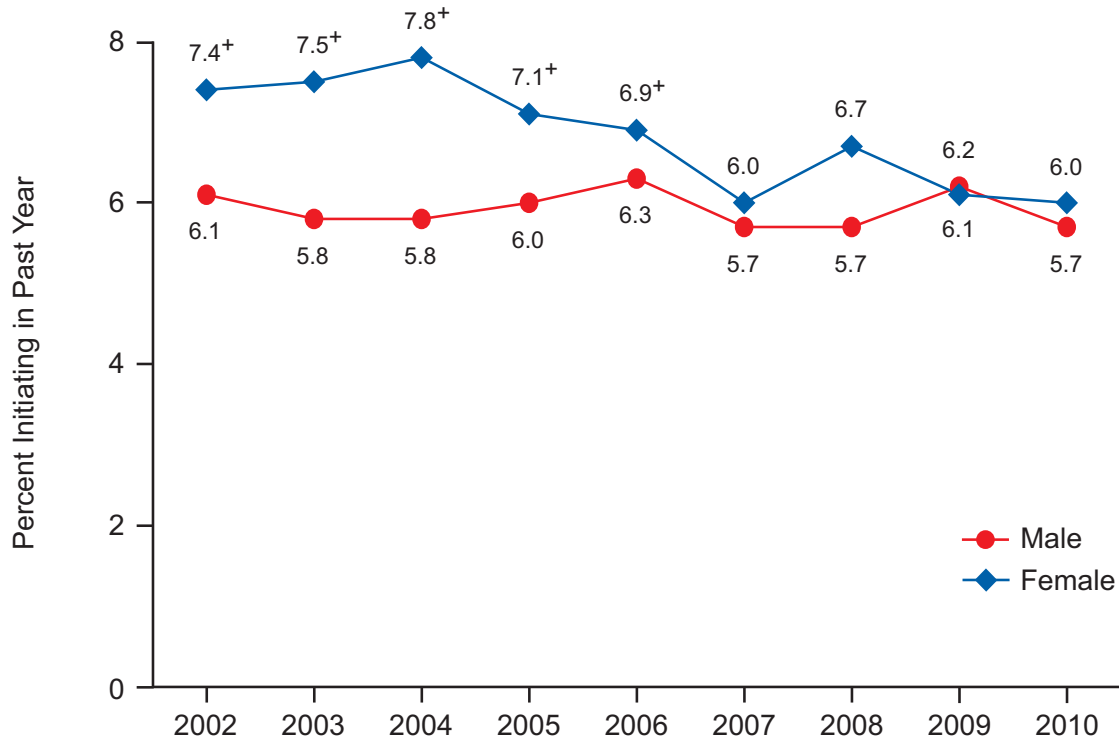
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

6. Youth Prevention-Related Measures

Research has shown that substance use by adolescents can be prevented through interventions involving risk and protective factors associated with the onset or escalation of use (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002). Risk and protective factors include variables that operate at different stages of development and reflect different domains of influence, including the individual, family, peer, school, community, and societal levels (Hawkins, Catalano, & Miller, 1992; Robertson, David, & Rao, 2003). Interventions to prevent substance use generally are designed to ameliorate the influence of risk factors and enhance the effectiveness of protective factors.

The National Survey on Drug Use and Health (NSDUH) includes questions for youths aged 12 to 17 to measure the risk and protective factors that may affect the likelihood that they will engage in substance use. This chapter presents findings on youth prevention-related measures, comparing the findings from 2002 to 2010. Included are measures of perceived risk from substance use (cigarettes, alcohol, and illicit drugs), perceived availability of substances, being approached by someone selling drugs, perceived parental disapproval of youth substance use, feelings about peer substance use, involvement in fighting and delinquent behavior, participation in religious and other activities, exposure to substance use prevention messages and programs, and parental involvement. Also presented are findings on the associations between selected measures of risk and protective factors and substance use from NSDUH, although the cross-sectional nature of these data preclude making any causal connections between these risk and protective factors and substance use.

Perceived Risk of Substance Use

One factor that can influence whether youths will use tobacco, alcohol, or illicit drugs is the extent to which they believe these substances might cause them harm. NSDUH respondents were asked how much they thought people risk harming themselves physically and in other ways when they use various substances in certain amounts or frequencies. Response choices for these items were "great risk," "moderate risk," "slight risk," or "no risk."

- The percentages of youths reporting binge alcohol use and the use of cigarettes and marijuana in the past month were lower among those who perceived great risk in using these substances than among those who did not perceive great risk. For instance, in 2010, past month binge drinking (consumption of five or more drinks of an alcoholic beverage on a single occasion on at least 1 day in the past 30 days) was reported by 4.8 percent of youths aged 12 to 17 who perceived great risk from "having five or more drinks of an alcoholic beverage once or twice a week," which was lower than the rate (10.0 percent) for youths who saw moderate, slight, or no risk from having five or more drinks of an alcoholic beverage once or twice a week (Figure 6.1). Past month marijuana use was reported by 1.3 percent of youths who saw great risk in smoking marijuana once a month compared with 10.2 percent of youths who saw moderate, slight, or no risk.

Figure 6.1 Past Month Binge Drinking and Marijuana Use among Youths Aged 12 to 17, by Perceptions of Risk: 2010
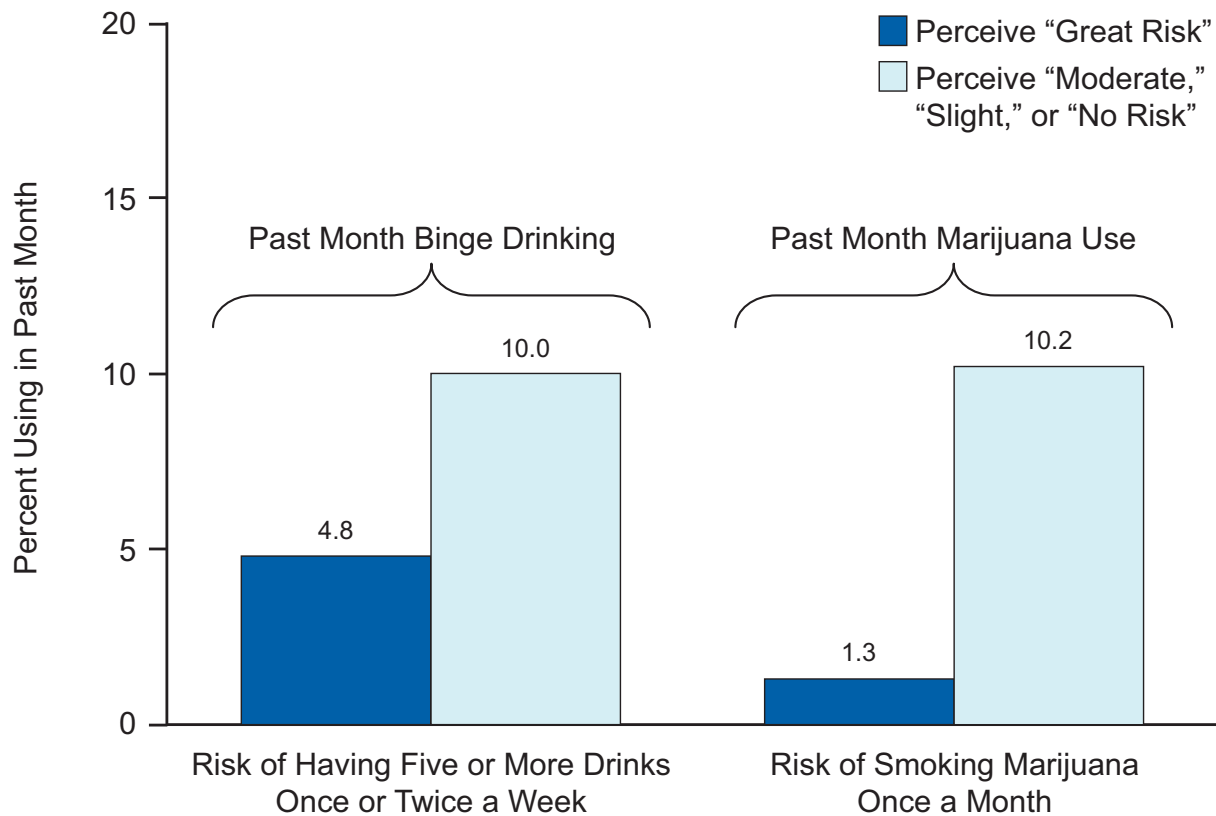
- Trends in substance use often coincide with trends in perceived risk. Increases in perceived risk typically precede or occur simultaneously with decreases in use, and vice versa. For example, the proportion of youths aged 12 to 17 who reported perceiving great risk from smoking one or more packs of cigarettes per day increased from 63.1 percent in 2002 to 69.7 percent in 2008, then declined to 65.8 percent in 2009; this rate remained unchanged between 2009 and 2010 (65.5 percent) (Figure 6.2). Consistent with increases in the perceived risk of cigarette smoking, the rate of past month adolescent cigarette smoking dropped from 13.0 percent in 2002 to 8.3 percent in 2010.

- The percentage of youths aged 12 to 17 indicating great risk in having four or five drinks of an alcoholic beverage nearly every day increased from 62.2 percent in 2002 to 65.0 percent in 2010 (Figure 6.2). The percentage of youths perceiving great risk in having five or more drinks of an alcoholic beverage once or twice a week increased from 38.2 percent in 2002 to 40.8 percent in 2010. Consistent with these increases in perceived risk among youths aged 12 to 17, there were decreases between 2002 and 2010 in the rates of past month heavy alcohol use (from 2.5 to 1.7 percent) and binge alcohol use (from 10.7 to 7.8 percent).

Figure 6.2 Perceived Great Risk of Cigarette and Alcohol Use among Youths Aged 12 to 17: 2002-2010

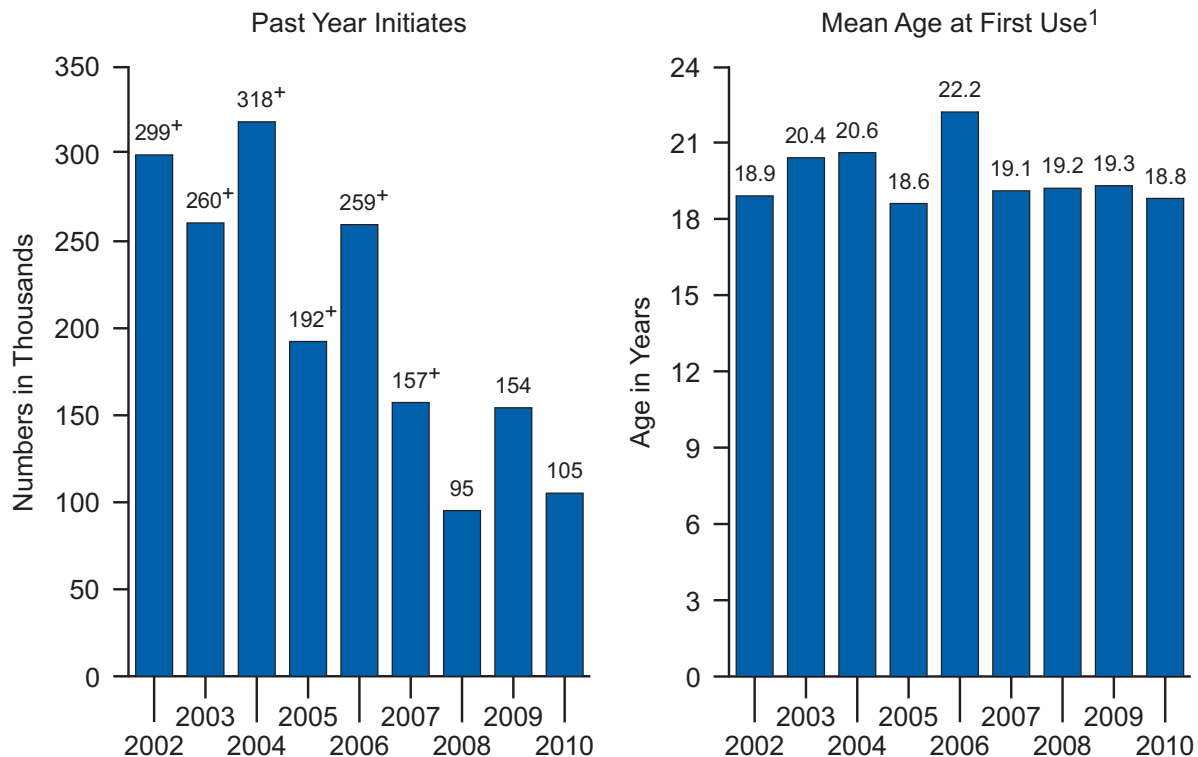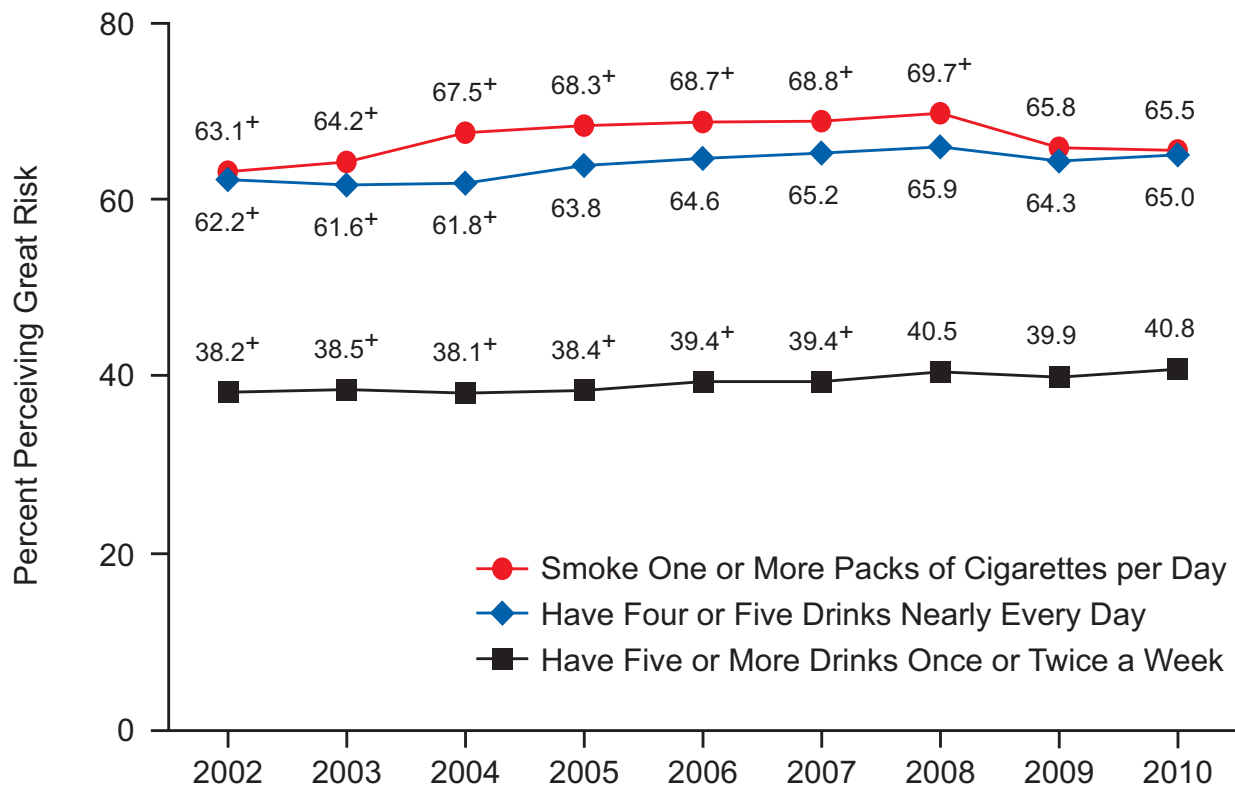+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- The percentage of youths aged 12 to 17 indicating great risk in smoking marijuana once a month decreased from 34.5 percent in 2007 to 30.1 percent in 2010, and the rate of youths perceiving great risk in smoking marijuana once or twice a week also decreased from 54.7 percent in 2007 to 47.5 percent in 2010 (Figure 6.3). Consistent with decreasing trends in the perceived risk of marijuana use, the prevalence of past month marijuana use among youths increased between 2008 (6.7 percent) and 2010 (7.4 percent).

- Between 2002 and 2010, the percentage of youths aged 12 to 17 perceiving great risk from using a substance once or twice a week declined for the following substances: heroin (from 82.5 to 80.5 percent), cocaine (from 79.8 to 78.4 percent), LSD (from 76.2 to 71.5 percent), and marijuana (51.5 to 47.5 percent) (Figure 6.4). Youths were less likely to perceive great risk for smoking marijuana than for use of the other listed substances.

Figure 6.3 Perceived Great Risk of Marijuana Use among Youths Aged 12 to 17: 2002-2010
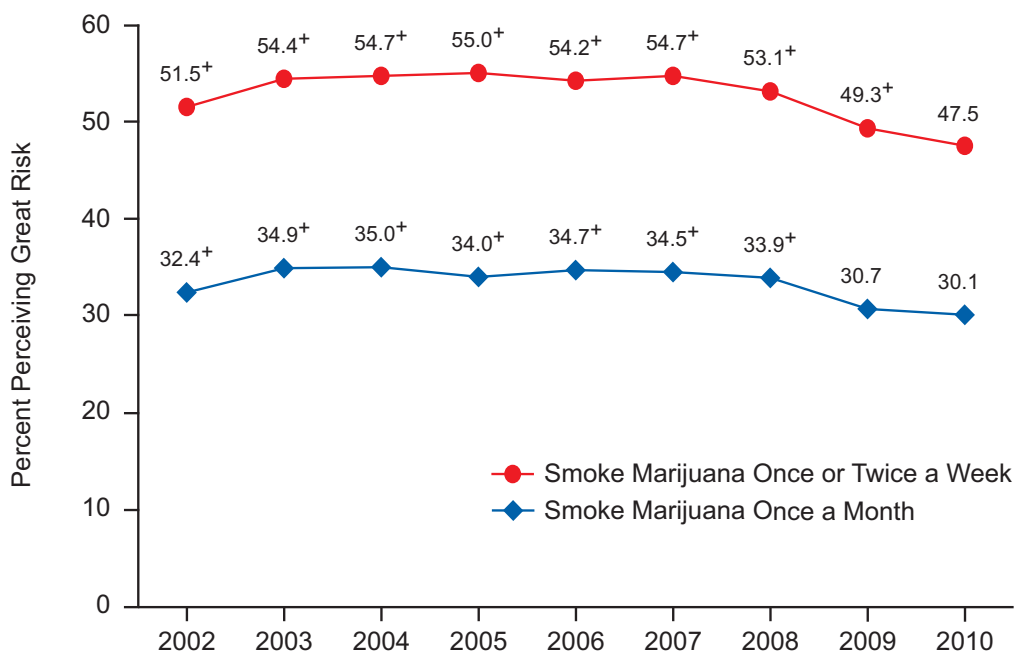
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Figure 6.4 Perceived Great Risk of Use of Selected Illicit Drugs Once or Twice a Week among Youths Aged 12 to 17: 2002-2010

+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Perceived Availability

- In 2010, about half (48.6 percent) of youths aged 12 to 17 reported that it would be "fairly easy" or "very easy" for them to obtain marijuana if they wanted some (Figure 6.5). About one in eight (11.6 percent) indicated that heroin would be fairly or very easily available, and 12.9 percent reported so for LSD. Between 2002 and 2010, there were decreases in the perceived easy availability of marijuana (from 55.0 to 48.6 percent), cocaine (from 25.0 to 19.0 percent), crack (from 26.5 to 20.0 percent), LSD (from 19.4 to 12.9 percent), and heroin (from 15.8 to 11.6 percent).

- The percentage of youths who reported that marijuana, cocaine, and LSD would be easy to obtain increased with age in 2010. For instance, 20.5 percent of those aged 12 or 13 said it would be fairly or very easy to obtain marijuana compared with 52.6 percent of those aged 14 or 15 and 70.2 percent of those aged 16 or 17.

- In 2010, 14.3 percent of youths aged 12 to 17 indicated that they had been approached by someone selling drugs in the past month. This rate was the same as the 2009 rate, but lower than the rate reported in 2002 (16.7 percent).

Figure 6.5 Perceived Availability of Selected Illicit Drugs among Youths Aged 12 to 17: 2002-2010
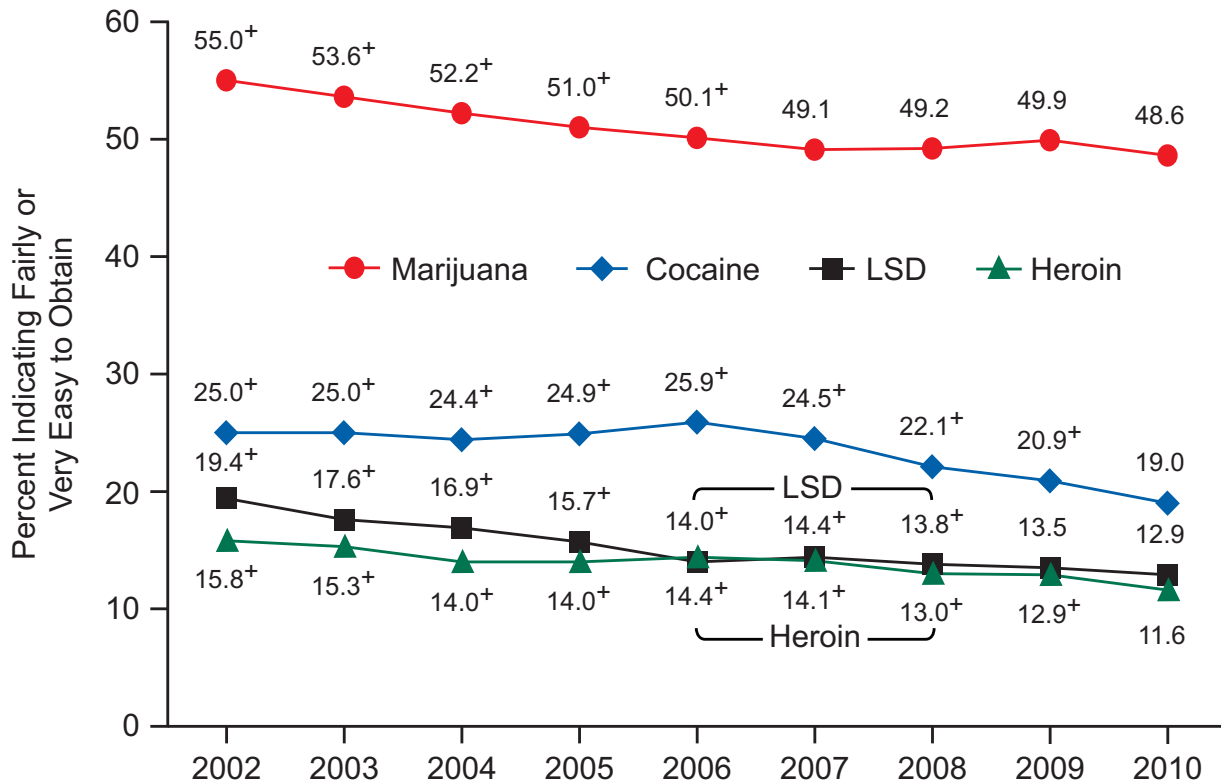
[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Perceived Parental Disapproval of Substance Use

- Most youths aged 12 to 17 believed their parents would "strongly disapprove" of their using substances. In 2010, 89.6 percent of youths reported that their parents would strongly disapprove of their trying marijuana or hashish once or twice; this was lower than the 90.5 percent reported in 2009, but was similar to the 89.1 percent reported in 2002. Most youths in 2010 (90.5 percent) reported that their parents would strongly disapprove of their having one or two drinks of an alcoholic beverage nearly every day, which was similar to the rate in 2009 (90.3 percent) and was higher than the rate in 2002 (89.0 percent). In 2010, 92.6 percent of youths reported that their parents would strongly disapprove of their smoking one or more packs of cigarettes per day, which was the same as the rate reported in 2009, but was higher than the 89.5 percent reported in 2002.

- Youths aged 12 to 17 who believed their parents would strongly disapprove of their using substances were less likely to use that substance than were youths who believed their parents would somewhat disapprove or neither approve nor disapprove. For instance, in 2010, past month cigarette use was reported by 5.8 percent of youths who perceived strong parental disapproval of their smoking one or more packs of cigarettes per day compared with 39.8 percent of youths who believed their parents would not strongly disapprove. Also, past month marijuana use was much less prevalent among youths who perceived strong parental disapproval for trying marijuana or hashish once or twice than among those who did not (4.4 vs. 32.8 percent, respectively).

Attitudes toward Peer Substance Use

- A majority of youths aged 12 to 17 reported that they disapprove of their peers using substances. In 2010, 90.3 percent of youths "strongly" or "somewhat" disapproved of their peers smoking one or more packs of cigarettes per day, which was similar to the rate of 90.1 percent in 2009, but higher than the 87.1 percent in 2002. Also in 2010, 81.3 percent strongly or somewhat disapproved of peers using marijuana or hashish once a month or more, which was similar to the 82.0 percent reported in 2009 and the 80.4 percent reported in 2002. In addition, 87.9 percent of youths strongly or somewhat disapproved of peers having one or two drinks of an alcoholic beverage nearly every day in 2010, which was similar to the 87.4 percent reported in 2009, but was higher than the 84.7 percent reported in 2002.

- In 2010, past month marijuana use was reported by 2.4 percent of youths aged 12 to 17 who strongly or somewhat disapproved of their peers using marijuana once a month or more, lower than the 28.9 percent among youths who reported that they neither approve nor disapprove of such behavior from their peers.

Fighting and Delinquent Behavior

- In 2010, 20.1 percent of youths aged 12 to 17 reported that, in the past year, they had gotten into a serious fight at school or at work; this was lower than the rate in 2009 (21.1 percent), but similar to the rate in 2002 (20.6 percent). Approximately one in eight youths (12.8 percent) in 2010 had taken part in a group-against-group fight, which was lower than the rates in 2009 (14.4 percent) and 2002 (15.9 percent). About 1 in 30 (3.1 percent) had carried a handgun at least once in the past year in 2010, which was similar to the rates in 2009 (3.2 percent) and 2002 (3.3 percent). An estimated 7.1 percent had, in at least one instance, attacked others with the intent to harm or seriously hurt them in 2010, which was similar to the rate in 2009 (7.2 percent) and lower than the rate in 2002 (7.8 percent). An estimated 3.1 percent had sold illegal drugs in 2010, which was similar to the rate of 3.2 percent in 2009, but was lower than the 4.4 percent rate in 2002. In 2010, 4.0 percent had, at least once, stolen or tried to steal something worth more than $50; this was similar to the rate of 4.4 percent in 2009, but was lower than the rate of 4.9 percent in 2002.

- Youths aged 12 to 17 who had engaged in fighting or other delinquent behaviors were more likely than other youths to have used illicit drugs in the past month. For instance, in 2010, past month illicit drug use was reported by 18.3 percent of youths who had gotten into a serious fight at school or work in the past year compared with 8.0 percent of those who had not engaged in fighting at school or work, and by 39.3 percent of those who had stolen or tried to steal something worth over $50 in the past year compared with 8.8 percent of those who had not attempted or engaged in such theft.

Religious Beliefs and Participation in Activities

- In 2010, 30.8 percent of youths aged 12 to 17 reported that they had attended religious services 25 or more times in the past year, which was similar to the rate in 2009 (31.4 percent), but was lower than the rate in 2002 (33.0 percent). Also, 74.7 percent agreed or strongly agreed with the statement that religious beliefs are a very important part of their lives, which was the same as the rate estimated for 2009, but was lower than the 78.2 percent reported in 2002. In 2010, 33.2 percent agreed or strongly agreed with the statement that it is important for their friends to share their religious beliefs, which was similar to the rate in 2009 (34.0 percent), but was lower than the rate in 2002 (35.8 percent).

- The rates of past month use of illicit drugs and cigarettes and binge alcohol use were lower among youths aged 12 to 17 who agreed with these statements about religious beliefs than among those who disagreed. For instance, in 2010, past month illicit drug use was reported by 7.9 percent of those who agreed or strongly agreed that religious beliefs are a very important part of life compared with 16.6 percent of those who disagreed with that statement. Similar differences were found between those two subgroups for the past month use of cigarettes and binge alcohol use (6.1 vs. 14.8 percent, and 6.1 and 12.9 percent, respectively).

Exposure to Substance Use Prevention Messages and Programs

- In 2010, approximately one in eight youths aged 12 to 17 (11.5 percent) reported that they had participated in drug, tobacco, or alcohol prevention programs outside of school in the past year. This rate was similar to the 12.0 percent reported in 2009, but was lower than the rate reported in 2002 (12.7 percent). In 2010, the prevalence of past month use of illicit drugs, marijuana, cigarettes, or past month binge alcohol use among those who participated in these prevention programs outside of school was not significantly different (9.5, 6.8, 8.1, or 7.3 percent, respectively) from the prevalence among those who did not (10.1, 7.4, 8.3, or 7.9 percent, respectively).

- In 2010, 75.9 percent of youths aged 12 to 17 reported having seen or heard drug or alcohol prevention messages in the past year from sources outside of school, which was lower than the 77.0 percent reported in 2009 and the 83.2 percent reported in 2002 (Figure 6.6). In 2010, the prevalence of past month use of illicit drugs among those who reported having such exposure (10.1 percent) was not significantly different from the prevalence among those who reported having no such exposure (10.0 percent).

Figure 6.6 Exposure to Substance Use Prevention Messages and Programs among Youths Aged 12 to 17: 2002-2010

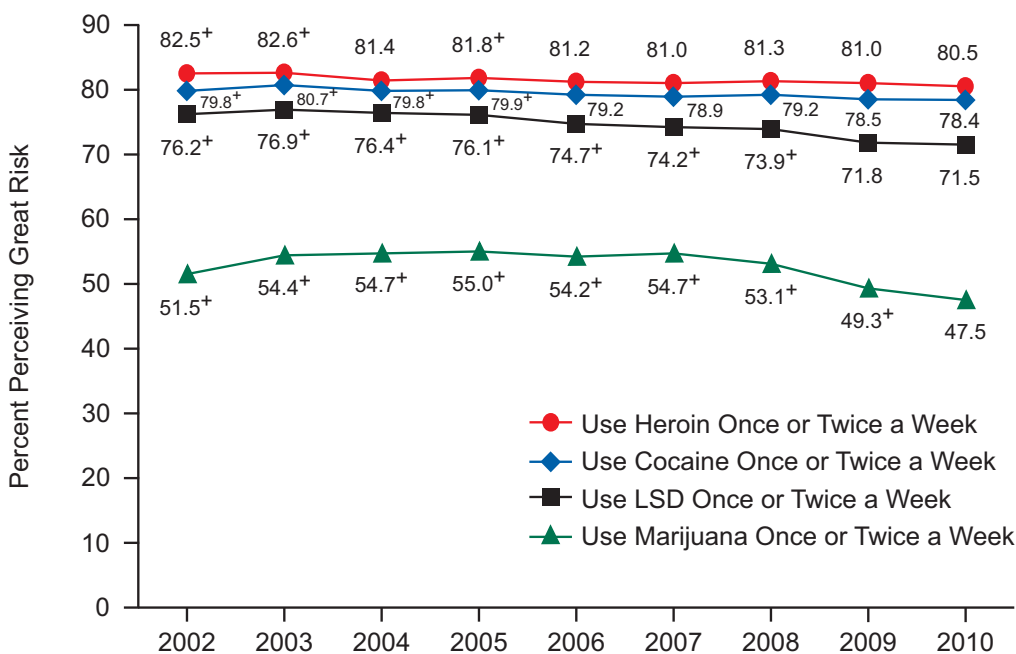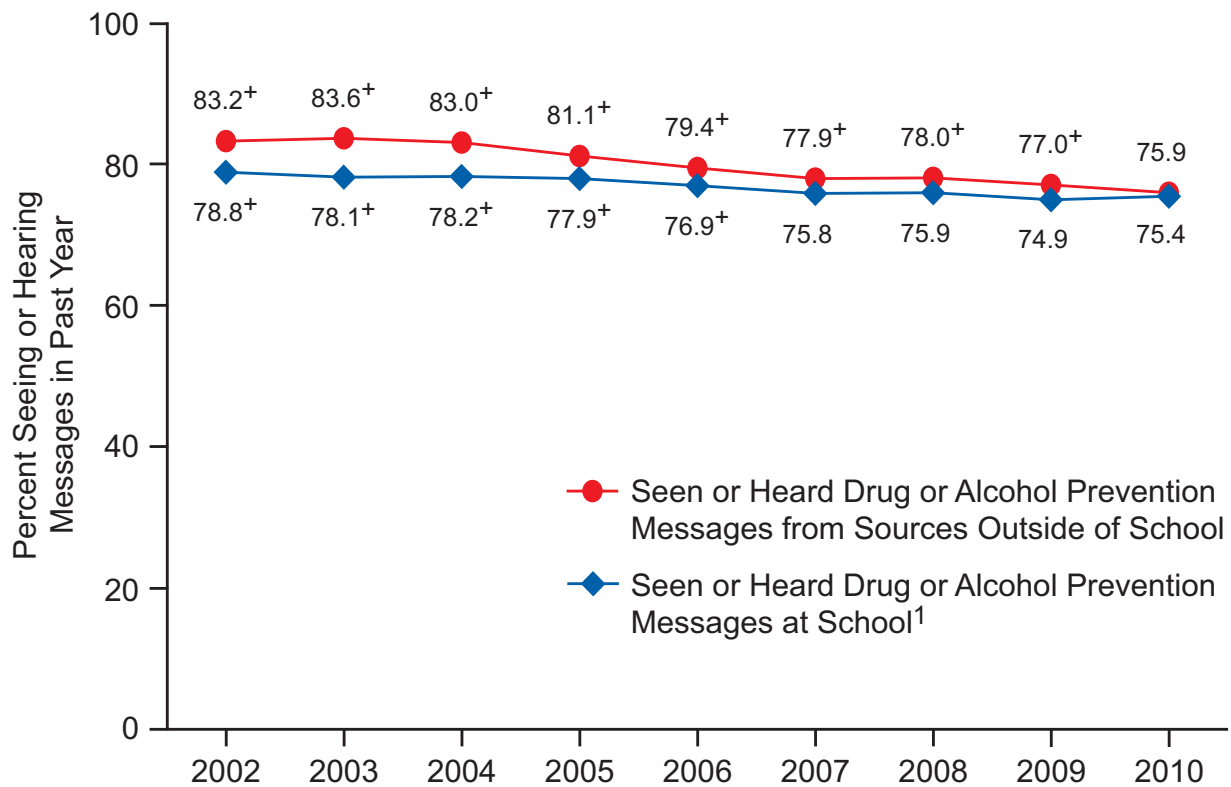[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

[1] Estimates are from youths aged 12 to 17 who were enrolled in school in the past year.

- In 2010, 75.4 percent of youths aged 12 to 17 enrolled in school in the past year reported having seen or heard drug or alcohol prevention messages at school, which was similar to the 74.9 percent reported in 2009, but was lower than the 78.8 percent reported in 2002 (Figure 6.6). In 2010, the prevalence of past month use of illicit drugs or marijuana was lower among those who reported having such exposure (9.3 and 6.9 percent for illicit drugs and marijuana, respectively) than among those who reported having no such exposure (12.5 and 9.4 percent, respectively).

Parental Involvement

- Youths aged 12 to 17 were asked several questions related to the extent of support, oversight, and control that they perceived their parents exercised over them in the year prior to the survey interview. In 2010, among youths aged 12 to 17 who were enrolled in school in the past year, 70.8 percent reported that their parents limited the amount of time that they spent out with friends on school nights. This was similar to the rate reported in 2009 and remained statistically unchanged from the rate reported in 2002. However, in 2010, 80.6 percent reported that in the past year their parents always or sometimes checked on whether or not they had completed their homework, and 79.9 percent reported that their parents always or sometimes provided help with their homework. Both of the rates reported in 2010 were similar to the rates in 2009, but the rate for parents checking on completing homework was higher than in 2002 while the rate for parents providing help with homework was lower than in 2002.

- In 2010, 88.1 percent of youths aged 12 to 17 reported that in the past year their parents always or sometimes made them do chores around the house, 86.0 percent reported that their parents always or sometimes let them know that they had done a good job, and 85.6 percent reported that their parents always or sometimes let them know they were proud of something they had done. All of these percentages in 2010 were similar to those reported in 2009 and 2002. In 2010, 39.8 percent of youths reported that their parents limited the amount of time that they watched television, which was similar to the rate in 2009 (40.1 percent), but was higher than the 36.9 percent reported in 2002.

- In 2010, past month use of illicit drugs and cigarettes and binge alcohol use were lower among youths aged 12 to 17 who reported that their parents always or sometimes engaged in monitoring behaviors than among youths whose parents seldom or never engaged in such behaviors. For instance, the rate of past month use of any illicit drug was 8.4 percent for youths whose parents always or sometimes helped with homework compared with 17.1 percent among youths who indicated that their parents seldom or never helped. Rates of current cigarette smoking and past month binge alcohol use were also lower among youths whose parents always or sometimes helped with homework (6.6 and 6.3 percent, respectively) than among youths whose parents did not (15.1 and 14.7 percent, respectively).

7. Substance Dependence, Abuse, and Treatment

The National Survey on Drug Use and Health (NSDUH) includes a series of questions to assess the prevalence of substance use disorders (substance dependence or abuse) in the past 12 months. Substances include alcohol and illicit drugs, such as marijuana, cocaine, heroin, hallucinogens, inhalants, and the nonmedical use of prescription-type psychotherapeutic drugs. These questions are used to classify persons as dependent on or abusing specific substances based on criteria specified in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV) (American Psychiatric Association [APA], 1994).

The questions related to dependence ask about health and emotional problems associated with substance use, unsuccessful attempts to cut down on use, tolerance, withdrawal, reducing other activities to use substances, spending a lot of time engaging in activities related to substance use, or using the substance in greater quantities or for a longer time than intended. The questions on abuse ask about problems at work, home, and school; problems with family or friends; physical danger; and trouble with the law due to substance use. Dependence is considered to be a more severe substance use problem than abuse because it involves the psychological and physiological effects of tolerance and withdrawal. Although individuals may meet the criteria specified here for both dependence and abuse, persons meeting the criteria for both are classified as having dependence, but not abuse. Persons defined with abuse in this report do not meet the criteria for dependence.

This chapter provides estimates of the prevalence and patterns of substance use disorders occurring in the past year from the 2010 NSDUH and compares these estimates against the results from the 2002 through 2009 surveys. It also provides estimates of the prevalence and patterns of the receipt of treatment in the past year for problems related to substance use. This chapter concludes with a discussion of the need for and the receipt of treatment at specialty facilities for problems associated with substance use.

7.1. Substance Dependence or Abuse

- In 2010, an estimated 22.1 million persons aged 12 or older were classified with substance dependence or abuse in the past year (8.7 percent of the population aged 12 or older) (Figure 7.1). Of these, 2.9 million were classified with dependence or abuse of both alcohol and illicit drugs, 4.2 million had dependence or abuse of illicit drugs but not alcohol, and 15.0 million had dependence or abuse of alcohol but not illicit drugs.

- The number of persons with substance dependence or abuse was stable between 2002 and 2010 (22.0 million in 2002, 21.6 million in 2003, 22.5 million in 2004, 22.2 million in 2005, 22.6 million in 2006, 22.3 million in 2007, 22.2 million in 2008, 22.5 million in 2009, and 22.1 million in 2010).

Figure 7.1 Substance Dependence or Abuse in the Past Year among Persons Aged 12 or Older: 2002-2010
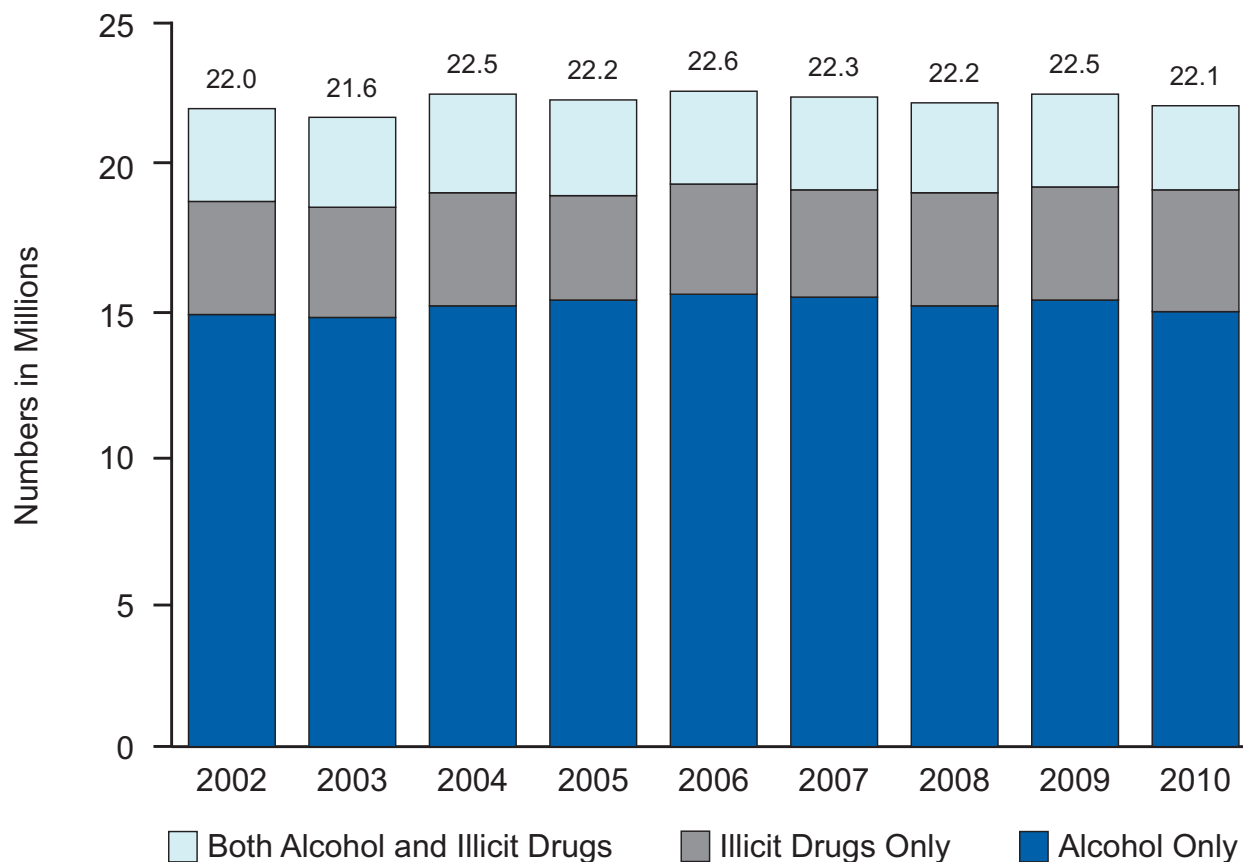
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

- In 2010, 17.9 million persons aged 12 or older were classified with alcohol dependence or abuse. This represented 7.0 percent of the population, which was lower than the rate in 2002 (7.7 percent). The number of persons with alcohol dependence or abuse remained similar between 2002 and 2010.

- Marijuana was the illicit drug with the highest rate of past year dependence or abuse in 2010, followed by pain relievers and cocaine. Of the 7.1 million persons aged 12 or older classified with illicit drug dependence or abuse in 2010, 4.5 million had marijuana or hashish dependence or abuse (representing 1.8 percent of the total population aged 12 or older, and 63.0 percent of all those classified with illicit drug dependence or abuse), 1.9 million persons had pain reliever dependence or abuse, and 1.0 million persons had cocaine dependence or abuse (Figures 7.2 and 7.3).

Figure 7.2 Specific Illicit Drug Dependence or Abuse in the Past Year among Persons Aged 12 or Older: 2010

Drug	Numbers in Thousands
Marijuana	4,476
Pain Relievers	1,921
Cocaine	1,003
Tranquilizers	521
Hallucinogens	397
Heroin	359
Stimulants	357
Sedatives	162
Inhalants	161

Numbers in Thousands
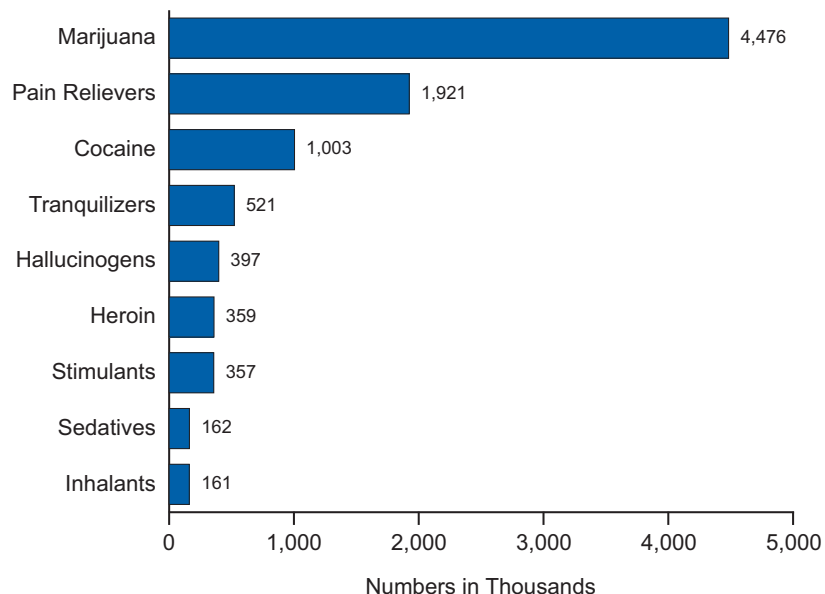
Figure 7.3 Illicit Drug Dependence or Abuse in the Past Year among Persons Aged 12 or Older: 2002-2010
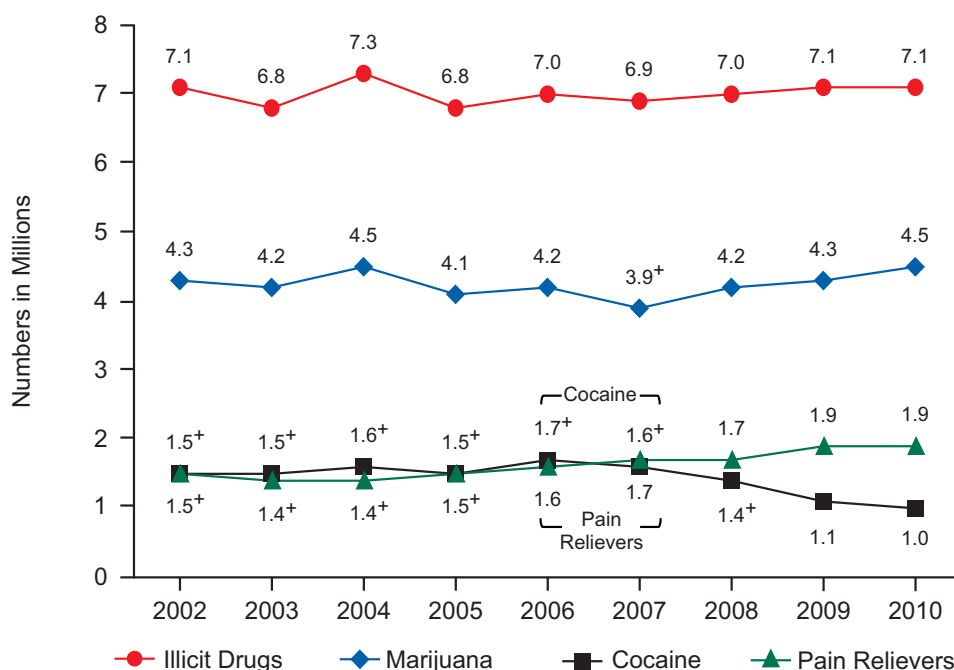
Year	Illicit Drugs	Marijuana	Cocaine	Pain Relievers
2002	7.1	4.3	1.5+	1.5+
2003	6.8	4.2	1.4+	1.5+
2004	7.3	4.5	1.4+	1.6+
2005	6.8	4.1	1.5+	1.5+
2006	7.0	4.2	1.7+	1.6
2007	6.9	3.9+	1.6+	1.7
2008	7.0	4.2	1.4+	1.7
2009	7.1	4.3	1.1	1.9
2010	7.1	4.5	1.0	1.9

Numbers in Millions

● Illicit Drugs ◆ Marijuana ■ Cocaine ▲ Pain Relievers

+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

71

- The rate and the number of persons who had marijuana dependence or abuse did not change significantly between 2002 (1.8 percent and 4.3 million) and 2010 (1.8 percent and 4.5 million) and between 2009 (1.7 percent and 4.3 million) and 2010. The rate of persons who had pain reliever dependence or abuse remained unchanged between 2002 and 2010 and between 2009 and 2010, but the number of persons who had pain reliever dependence or abuse increased between 2002 (1.5 million) and 2010 (1.9 million). The rate and the number of persons who had cocaine dependence or abuse decreased between 2002 (0.6 percent and 1.5 million) and 2010 (0.4 percent and 1.0 million), but they remained stable between 2009 (0.4 percent and 1.1 million) and 2010. The number of persons who had heroin dependence or abuse increased from 214,000 in 2002 to 359,000 in 2010.

- The percentages of persons aged 12 or older with illicit drug dependence or abuse remained the same between 2009 (2.8 percent) and 2010 (2.8 percent) and were stable between 2002 (3.0 percent) and 2010. During the 9-year period, the percentages of persons with alcohol dependence or abuse declined (7.7 percent in 2002 and 7.0 percent in 2010).

Age at First Use

- In 2010, among adults aged 18 or older, age at first use of marijuana was associated with illicit drug dependence or abuse. Among those who first tried marijuana at age 14 or younger, 12.8 percent were classified with illicit drug dependence or abuse, higher than the 2.6 percent of adults who had first used marijuana at age 18 or older.

- Among adults, age at first use of alcohol was associated with alcohol dependence or abuse. Among adults aged 18 or older who first tried alcohol at age 14 or younger, 16.2 percent were classified with alcohol dependence or abuse, which was higher than the 3.8 percent of adults who had first used alcohol at age 18 or older. Adults aged 21 or older who had first used alcohol before age 21 were more likely than adults who had their first drink at age 21 or older to be classified with alcohol dependence or abuse (15.1, 9.1, and 4.4 percent for adults who first used alcohol at age 14 or younger, age 15 to 17, and age 18 to 20, respectively, vs. 2.7 percent for first use at age 21 or older) (Figure 7.4).

Age

- Rates of substance dependence or abuse were associated with age. In 2010, the rate of substance dependence or abuse among adults aged 18 to 25 (19.8 percent) was higher than that among youths aged 12 to 17 (7.3 percent) and among adults aged 26 or older (7.0 percent). None of these rates changed significantly between 2009 and 2010. From 2002 to 2010, the rate decreased for youths aged 12 to 17 (from 8.9 to 7.3 percent) and for young adults aged 18 to 25 (from 21.7 to 19.8 percent). For adults aged 26 or older, the rate remained stable from 2002 to 2010.

Figure 7.4 Alcohol Dependence or Abuse in the Past Year among Adults Aged 21 or Older, by Age at First Use of Alcohol: 2010
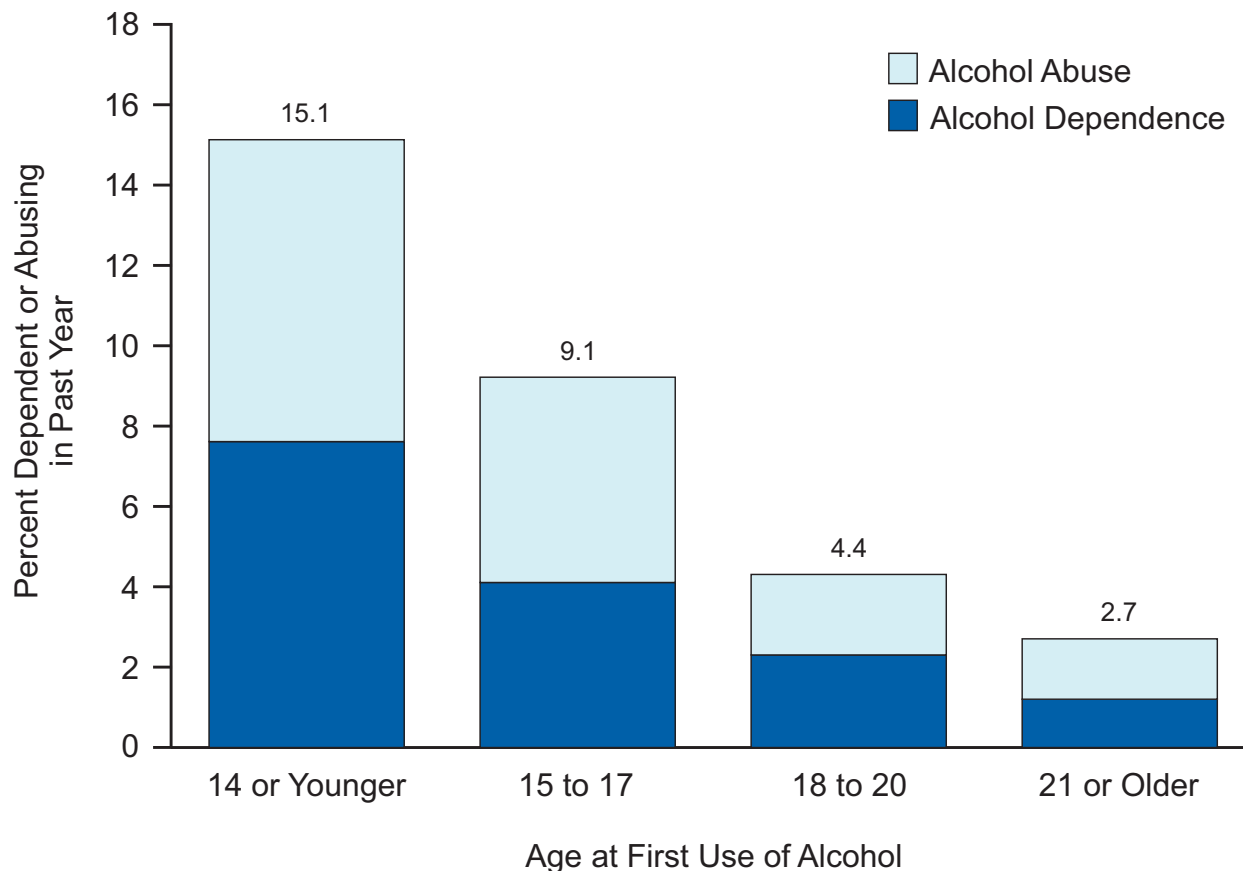
- The rate of alcohol dependence or abuse among youths aged 12 to 17 was 4.5 percent in 2010, which was similar to the 4.6 percent reported in 2009 and was down from 5.9 percent in 2002 (Figure 7.5). Among young adults aged 18 to 25, the rate of alcohol dependence or abuse remained unchanged between 2009 (16.0 percent) and 2010 (15.6 percent), but it decreased between 2002 (17.7 percent) and 2010. Among adults aged 26 or older, the rate remained stable between 2009 (6.3 percent) and 2010 (5.9 percent) and between 2002 (6.2 percent) and 2010.

Gender

- As was the case from 2002 through 2009, the rate of substance dependence or abuse for males aged 12 or older in 2010 was about twice as high as the rate for females. For males in 2010, the rate was 11.6 percent, which was similar to the 11.9 percent in 2009, while for females, it was 5.9 percent in 2010, which did not differ significantly from the 6.1 percent in 2009 (Figure 7.6). Among youths aged 12 to 17, the rate of substance dependence or abuse among males was similar to the rate among females in 2010 (6.9 vs. 7.7 percent).

Figure 7.5 Alcohol and Illicit Drug Dependence or Abuse among Youths Aged 12 to 17: 2002-2010
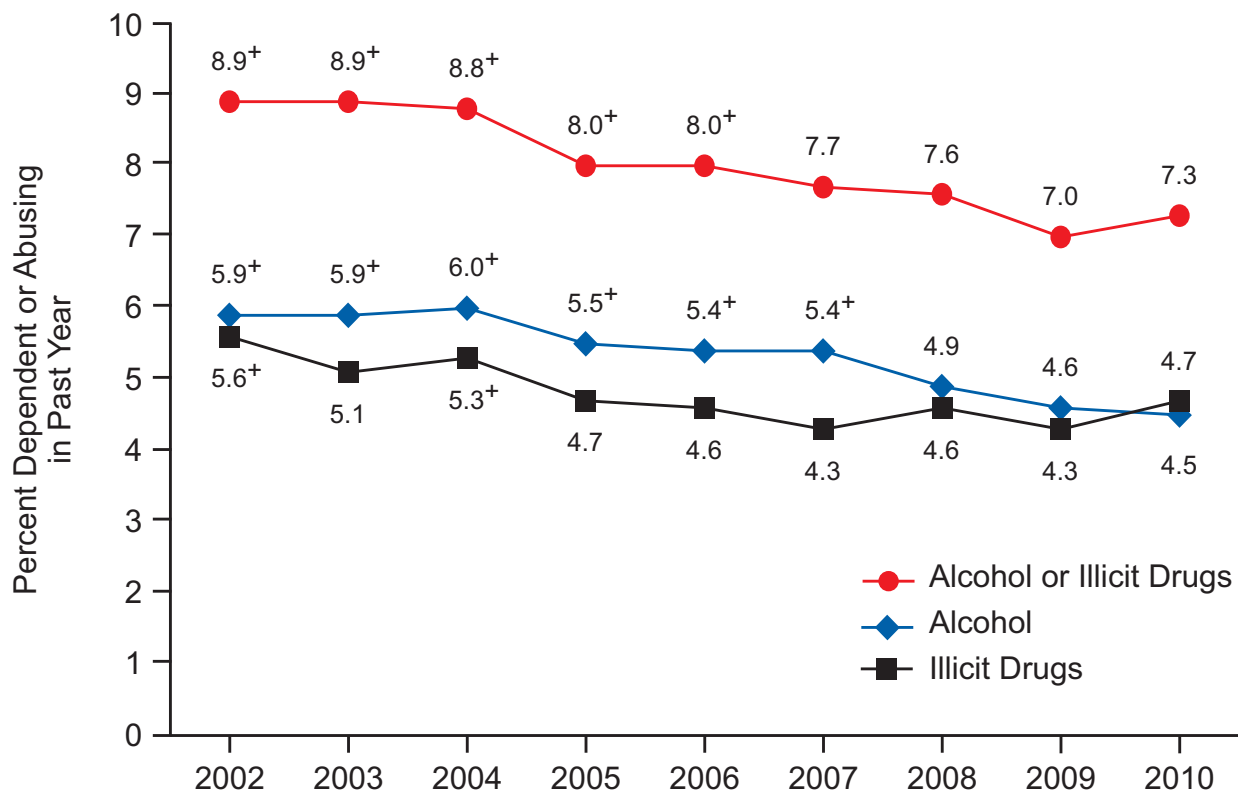
+ Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Race/Ethnicity

- In 2010, among persons aged 12 or older, rates of substance dependence or abuse were lower among Asians (4.1 percent) and Native Hawaiians or Other Pacific Islanders (5.6 percent) than among other racial/ethnic groups. The rates for the other racial/ethnic groups were 16.0 percent for American Indians or Alaska Natives, 9.7 percent for persons reporting two or more races, 9.7 percent for Hispanics, 8.9 percent for whites, and 8.2 percent for blacks. The rates of alcohol dependence or abuse for the racial/ethnic groups in 2010 were similar to the rates in 2002 and 2009, except that among blacks aged 12 or older, the rate of alcohol dependence or abuse in 2010 (5.7 percent) was lower than that in 2009 (7.0 percent) and in 2002 (7.1 percent). Moreover, among persons aged 18 or older who reported two or more races, the rate of substance dependence or abuse in 2010 (9.6 percent) was lower than that in 2009 (14.4 percent).

Figure 7.6 Substance Dependence or Abuse in the Past Year, by Age and Gender: 2010
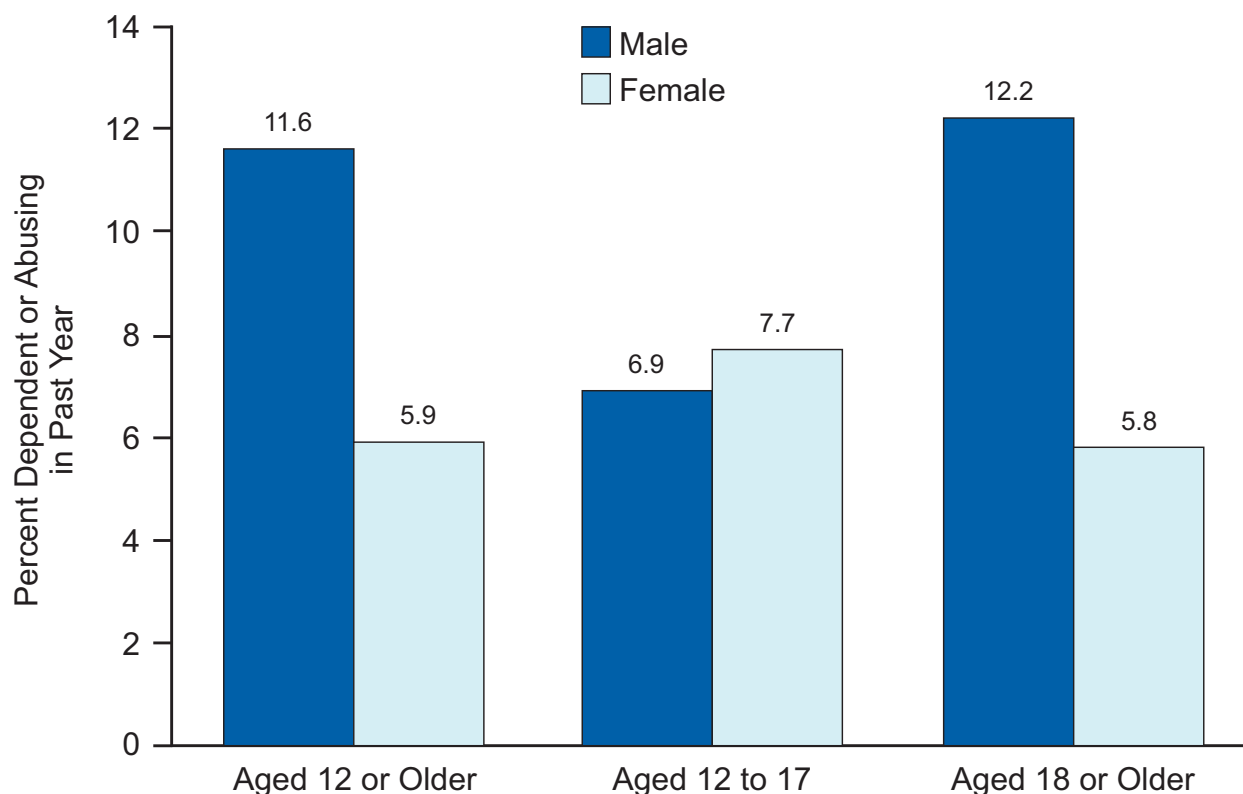
Education/Employment

- Rates of substance dependence or abuse were associated with level of education in 2010. Among adults aged 18 or older, those who graduated from a college or university had a lower rate of substance dependence or abuse (7.3 percent) than those who graduated from high school (8.3 percent), those who did not graduate from high school (10.2 percent), and those with some college (10.6 percent).

- Rates of substance dependence or abuse were associated with current employment status in 2010. A higher percentage of unemployed adults aged 18 or older were classified with dependence or abuse (15.7 percent) than were full-time employed adults (8.9 percent) or part-time employed adults (10.9 percent). The rate of alcohol dependence or abuse among full-time employed persons aged 18 or older declined from 8.4 percent in 2009 to 7.7 percent in 2010.

- About half of adults aged 18 or older with substance dependence or abuse were employed full time in 2010. Of the 20.3 million adults classified with dependence or abuse, 10.1 million (49.8 percent) were employed full time.

Criminal Justice Populations

- In 2010, adults aged 18 or older who were on parole or a supervised release from jail during the past year had higher rates of illicit drug or alcohol dependence or abuse (38.2 percent) than their counterparts who were not on parole or supervised release during the past year (8.7 percent).

- In 2010, probation status was associated with substance dependence or abuse. The rate of substance dependence or abuse was 37.4 percent among adults who were on probation during the past year, which was significantly higher than the rate among adults who were not on probation during the past year (8.2 percent).

Geographic Area

- In 2010, rates of substance dependence or abuse for persons aged 12 or older were 10.0 percent in the West, 7.8 percent in the South, 8.8 percent in the Midwest, and 8.9 percent in the Northeast.

- Rates for substance dependence or abuse among persons aged 12 or older in 2010 were similar in large metropolitan counties (8.9 percent) and small metropolitan counties (8.9 percent), but higher than in nonmetropolitan counties (7.6 percent).

7.2. Past Year Treatment for a Substance Use Problem

Estimates described in this section refer to treatment received for illicit drug or alcohol use, or for medical problems associated with the use of illicit drugs or alcohol. This includes treatment received in the past year at any location, such as a hospital (inpatient), rehabilitation facility (outpatient or inpatient), mental health center, emergency room, private doctor's office, prison or jail, or a self-help group, such as Alcoholics Anonymous or Narcotics Anonymous. Persons could report receiving treatment at more than one location. Note that the definition of treatment in this section is different from the definition of specialty treatment described in Section 7.3. Specialty treatment only includes treatment at a hospital (inpatient), a rehabilitation facility (inpatient or outpatient), or a mental health center.

Individuals who reported receiving substance use treatment but were missing information on whether the treatment was specifically for alcohol use or illicit drug use were not counted in estimates of either illicit drug use treatment or alcohol use treatment; however, they were counted in estimates for "drug or alcohol use" treatment.

- In 2010, 4.1 million persons aged 12 or older (1.6 percent of the population) received treatment for a problem related to the use of alcohol or illicit drugs. Of these, 1.3 million received treatment for the use of both alcohol and illicit drugs, 0.9 million received treatment for the use of illicit drugs but not alcohol, and 1.5 million received treatment for the use of alcohol but not illicit drugs. (Note that estimates by substance do not sum to the total number of persons receiving treatment because the total includes persons who reported receiving treatment but did not report for which substance the treatment was received.)

- The percentage of the population aged 12 or older receiving substance use treatment within the past year remained stable between 2009 and 2010 and between 2002 and 2010 (1.6 percent in 2010, 1.7 percent in 2009, and 1.5 percent in 2002). Although the number of persons receiving substance use treatment within the past year remained stable between 2009 (4.3 million) and 2010 (4.1 million), the number increased between 2002 (3.5 million) and 2010.

- In 2010, among the 4.1 million persons aged 12 or older who received treatment for alcohol or illicit drug use in the past year, 2.3 million persons received treatment at a self-help group, and 1.7 million received treatment at a rehabilitation facility as an outpatient (Figure 7.7). There were 1.0 million persons who received treatment at a mental health center as an outpatient, 1.0 million persons who received treatment at a rehabilitation facility as an inpatient, 731,000 at a hospital as an inpatient, 653,000 at a private doctor's office, 467,000 at an emergency room, and 342,000 at a prison or jail. None of these estimates changed significantly between 2009 and 2010 or between 2002 and 2010.

Figure 7.7 Locations Where Past Year Substance Use Treatment Was Received among Persons Aged 12 or Older: 2010

Numbers in Thousands
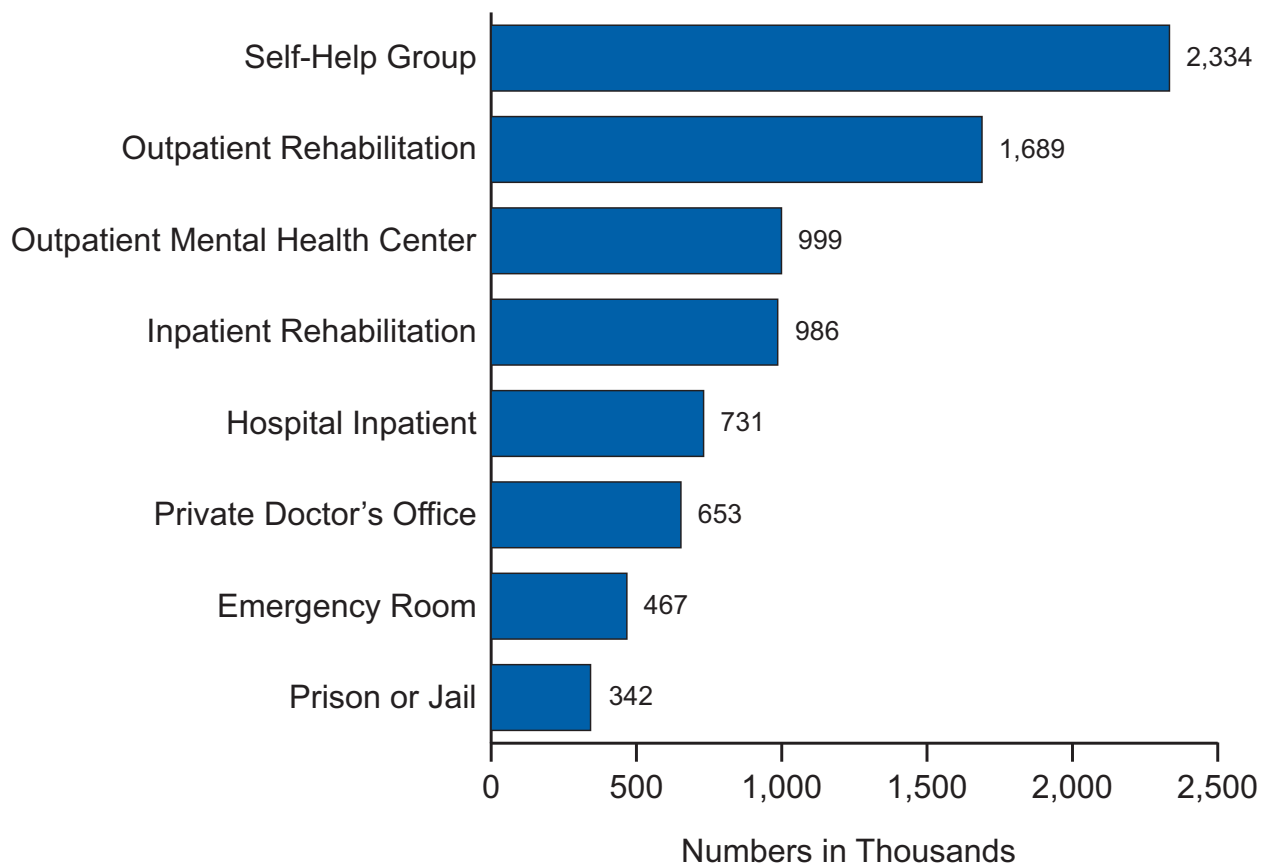
- In 2010, during their most recent treatment in the past year, 2.6 million persons aged 12 or older reported receiving treatment for alcohol use, and 1.0 million persons reported receiving treatment for marijuana use (Figure 7.8). Estimates on receiving treatment for the use of other drugs were 754,000 persons for pain relievers, 699,000 for cocaine, 417,000 for heroin, 350,000 for tranquilizers, 343,000 for stimulants, and 333,000 for hallucinogens. None of these estimates changed significantly between 2009 and 2010. The numbers who received treatment for the use of pain relievers (see Figure 7.9) and tranquilizers increased between 2002 and 2010, but the numbers who received treatment for alcohol, marijuana, cocaine, heroin, hallucinogens, and stimulants were stable during the 9-year period. (Note that respondents could indicate that they received treatment for more than one substance during their most recent treatment.)

7.3.   Need for and Receipt of Specialty Treatment

This section discusses the need for and receipt of treatment for a substance use problem at a "specialty" treatment facility. Specialty treatment is defined as treatment received at any of the following types of facilities: hospitals (inpatient only), drug or alcohol rehabilitation facilities (inpatient or outpatient), or mental health centers. It does not include treatment at an emergency room, private doctor's office, self-help group, prison or jail, or hospital as an outpatient. An individual is defined as needing treatment for an alcohol or drug use problem if he or she met the DSM-IV (APA, 1994) diagnostic criteria for alcohol or illicit drug dependence or abuse in the past 12 months or if he or she received specialty treatment for alcohol use or illicit drug use in the past 12 months.

In this section, an individual needing treatment for an illicit drug use problem is defined as receiving treatment for his or her drug use problem only if he or she reported receiving specialty treatment for drug use in the past year. Thus, an individual who needed treatment for illicit drug use but only received specialty treatment for alcohol use in the past year or who received treatment for illicit drug use only at a facility not classified as a specialty facility was not counted as receiving treatment for drug use. Similarly, an individual who needed treatment for an alcohol use problem was only counted as receiving alcohol use treatment if the treatment was received for alcohol use at a specialty treatment facility. Individuals who reported receiving specialty substance use treatment but were missing information on whether the treatment was specifically for alcohol use or drug use were not counted in estimates of specialty drug use treatment or in estimates of specialty alcohol use treatment; however, they were counted in estimates for "drug or alcohol use" treatment.

In addition to questions about symptoms of substance use problems that are used to classify respondents' need for treatment based on DSM-IV criteria, NSDUH includes questions asking respondents about their perceived need for treatment (i.e., whether they felt they needed treatment or counseling for illicit drug use or alcohol use). In this report, estimates for perceived need for treatment are only discussed for persons who were classified as needing treatment (based on DSM-IV criteria) but did not receive treatment at a specialty facility. Similarly, estimates for whether a person made an effort to get treatment are only discussed for persons who felt the need for treatment.

Figure 7.8 Substances for Which Most Recent Treatment Was Received in the Past Year among Persons Aged 12 or Older: 2010

Substance	Numbers in Thousands
Alcohol	2,596
Marijuana	1,021
Pain Relievers	754
Cocaine	699
Heroin	417
Tranquilizers	350
Stimulants	343
Hallucinogens	333

Numbers in Thousands
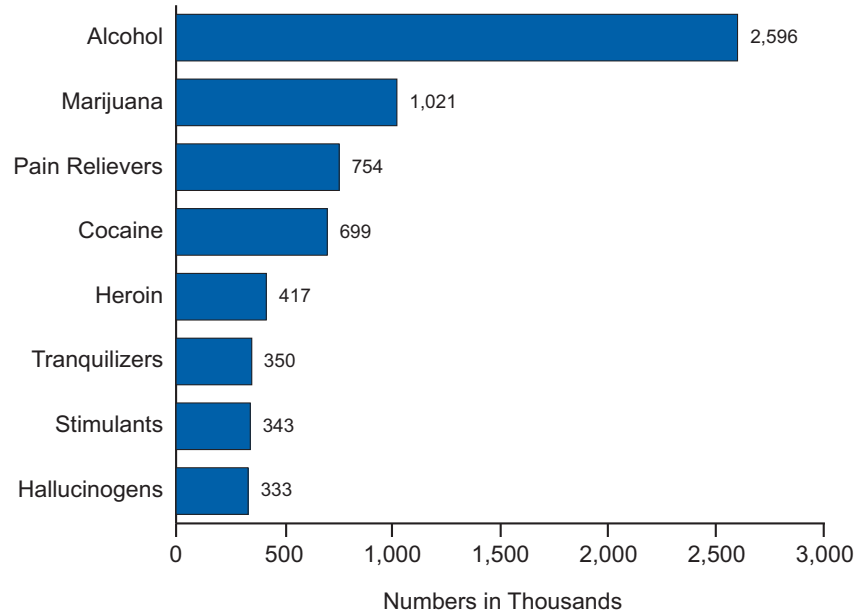
Figure 7.9 Received Most Recent Treatment in the Past Year for the Use of Pain Relievers among Persons Aged 12 or Older: 2002-2010
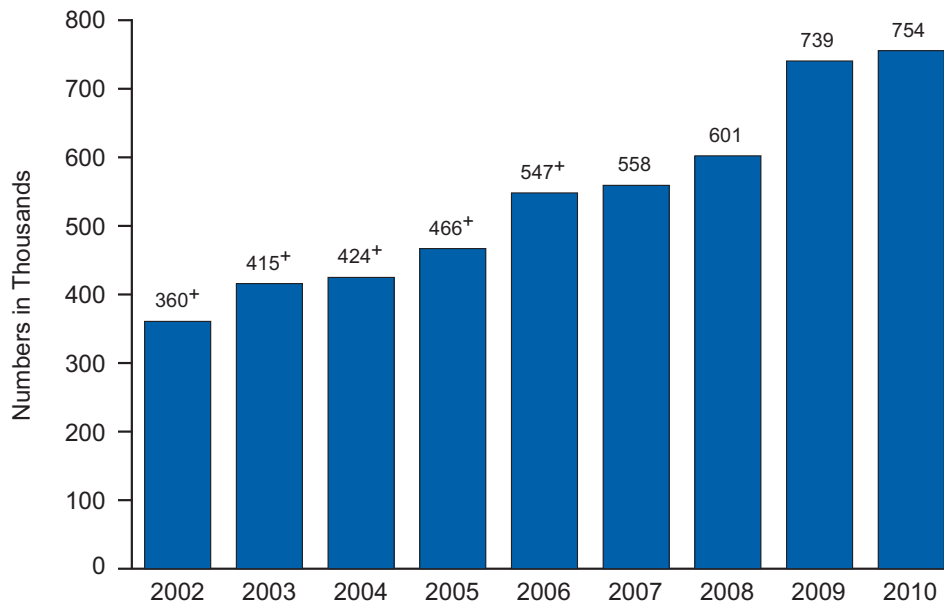
Year	Numbers in Thousands
2002	360[+]
2003	415[+]
2004	424[+]
2005	466[+]
2006	547[+]
2007	558
2008	601
2009	739
2010	754

[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Illicit Drug or Alcohol Use Treatment and Treatment Need

- In 2010, 23.1 million persons aged 12 or older needed treatment for an illicit drug or alcohol use problem (9.1 percent of persons aged 12 or older). Of these, 2.6 million (1.0 percent of persons aged 12 or older and 11.2 percent of those who needed treatment) received treatment at a specialty facility. Thus, 20.5 million persons (8.1 percent of the population aged 12 or older) needed treatment for an illicit drug or alcohol use problem but did not receive treatment at a specialty facility in the past year. These population estimates are similar to the estimates for 2009 and for 2002. These percentage estimates for 2010 are similar to the estimates for 2009. However, the percentage of persons aged 12 or older who needed treatment for an illicit drug or alcohol use problem declined from 9.7 percent in 2002 to 9.1 percent in 2010. The percentage of persons aged 12 or older who needed treatment for an illicit drug or alcohol use problem but did not receive treatment at a specialty facility also declined from 8.7 percent in 2002 to 8.1 percent in 2010.

- Of the 2.6 million people aged 12 or older who received specialty substance use treatment in 2010, 958,000 received treatment for alcohol use only, 881,000 received treatment for illicit drug use only, and 625,000 received treatment for both alcohol and illicit drug use. These estimates are similar to the estimates for 2009 and for 2002.

- In 2010, among persons who received their most recent substance use treatment at a specialty facility in the past year, 41.5 percent reported using their "own savings or earnings" as a source of payment for their most recent specialty treatment, 36.9 percent reported using private health insurance, 35.6 percent reported using public assistance other than Medicaid, 29.2 percent reported using Medicaid, 27.4 percent reported using Medicare, and 22.6 percent reported using funds from family members. None of these estimates changed significantly between 2009 and 2010 and between 2002 and 2010. (Note that persons could report more than one source of payment.)

- Of the 20.5 million persons aged 12 or older in 2010 who were classified as needing substance use treatment but not receiving treatment at a specialty facility in the past year, 1.0 million persons (5.0 percent) reported that they perceived a need for treatment for their illicit drug or alcohol use problem (Figure 7.10). Of these 1.0 million persons who felt they needed treatment but did not receive treatment in 2010, 341,000 (33.3 percent) reported that they made an effort to get treatment, and 683,000 (66.7 percent) reported making no effort to get treatment. These estimates remained stable between 2009 and 2010.

- The number and the percentage of youths aged 12 to 17 who needed treatment for an illicit drug or alcohol use problem in 2010 (1.8 million, 7.5 percent) were similar to those in 2009 (1.8 million, 7.2 percent), but they were lower than those in 2002 (2.3 million, 9.1 percent). Of the 1.8 million youths who needed treatment in 2010, 138,000 received treatment at a specialty facility (about 7.6 percent of the youths who needed treatment), leaving 1.7 million who needed treatment for a substance use problem but did not receive it at a specialty facility.

Figure 7.10 Past Year Perceived Need for and Effort Made to Receive Specialty Treatment among Persons Aged 12 or Older Needing But Not Receiving Treatment for Illicit Drug or Alcohol Use: 2010

Did Not Feel They Needed Treatment

95.0%

Felt They Needed Treatment and Did Not Make an Effort

3.3%

1.7%

Felt They Needed Treatment and Did Make an Effort
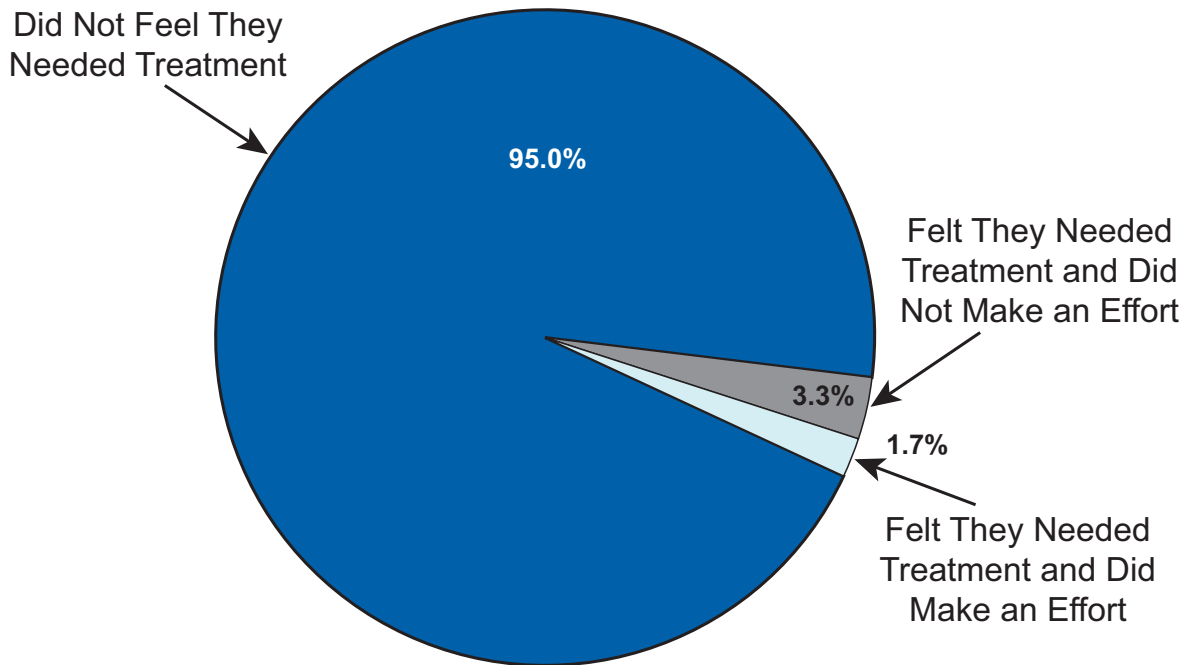
20.5 Million Needing But Not Receiving Treatment for Illicit Drug or Alcohol Use

- Based on 2007-2010 combined data, the six most often reported reasons for not receiving illicit drug or alcohol use treatment among persons aged 12 or older who needed but did not receive treatment at a specialty facility and perceived a need for treatment were (a) not ready to stop using (40.2 percent), (b) no health coverage and could not afford cost (32.9 percent), (c) possible negative effect on job (11.5 percent), (d) concern that receiving treatment might cause neighbors/community to have negative opinion (11.3 percent), (e) could handle the problem without treatment (9.9 percent), and (f) not knowing where to go for treatment (9.3 percent).

- Based on 2007-2010 combined data, among persons aged 12 or older who needed but did not receive illicit drug or alcohol use treatment, felt a need for treatment, and made an effort to receive treatment, the most often reported reasons for not receiving treatment were (a) no health coverage and could not afford cost (38.1 percent), (b) not ready to stop using (30.3 percent), (c) able to handle the problem without treatment (9.0 percent), (d) no transportation/inconvenient (8.4 percent), (e) might have negative effect on job (7.9 percent), (f) had health coverage but did not cover treatment or did not cover cost (7.4 percent), (g) might cause neighbors/community to have negative opinion (7.1 percent), and (h) did not feel need for treatment at the time (6.5 percent) (Figure 7.11).

Figure 7.11 Reasons for Not Receiving Substance Use Treatment among Persons Aged 12 or Older Who Needed and Made an Effort to Get Treatment But Did Not Receive Treatment and Felt They Needed Treatment: 2007-2010 Combined
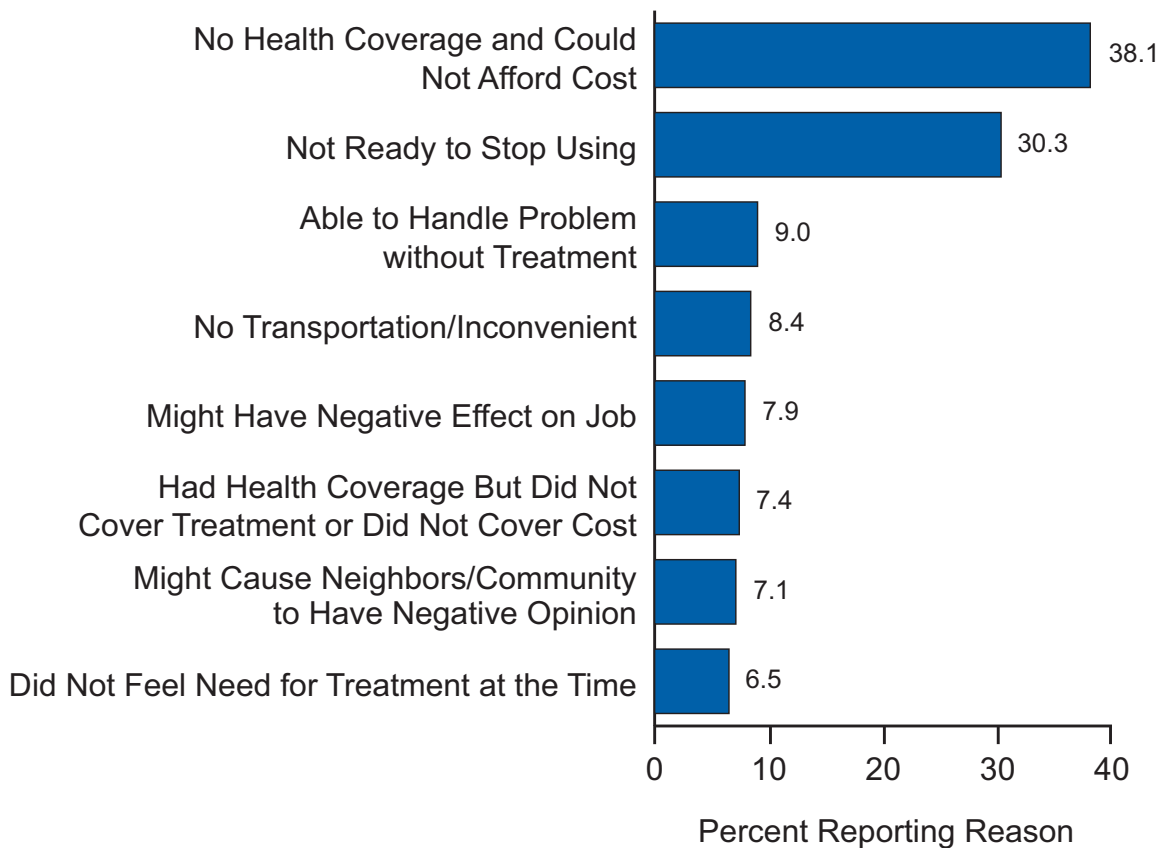
Illicit Drug Use Treatment and Treatment Need

- In 2010, the number of persons aged 12 or older needing treatment for an illicit drug use problem was 7.9 million (3.1 percent of the total population). Of these, 1.5 million (0.6 percent of the total population and 19.1 percent of the persons who needed treatment) received treatment at a specialty facility for an illicit drug use problem in the past year. Thus, there were 6.4 million persons (2.5 percent of the total population) who needed but did not receive treatment at a specialty facility for an illicit drug use problem in 2010. None of these estimates changed significantly between 2009 and 2010 and between 2002 and 2010.

- Of the 6.4 million people aged 12 or older who needed but did not receive specialty treatment for illicit drug use in 2010, 392,000 (6.1 percent) reported that they perceived a need for treatment for their illicit drug use problem. Of the 392,000 persons who felt a need for treatment in 2010, 193,000 reported that they made an effort, which was similar to what was reported in 2009, and 200,000 reported making no effort to get treatment, which was not significantly different from the 2009 estimate.

- The number and the percentage of whites aged 18 or older who needed treatment for an illicit drug problem but did not receive treatment declined between 2009 (3.6 million, 2.3 percent) and 2010 (3.1 million, 2.0 percent). However, the number and the percentage of blacks aged 18 or older who needed treatment for an illicit drug problem but did not receive treatment increased between 2009 (735,000 persons, 2.8 percent) and 2010 (1.0 million, 3.8 percent).

- Among youths aged 12 to 17, there were 1.2 million (4.8 percent) who needed treatment for an illicit drug use problem in 2010. Of this group, only 98,000 received treatment at a specialty facility (8.4 percent of youths aged 12 to 17 who needed treatment), leaving 1.1 million youths who needed treatment but did not receive it at a specialty facility.

- Among people aged 12 or older who needed but did not receive illicit drug use treatment and felt they needed treatment (based on 2007-2010 combined data), the most often reported reasons for not receiving treatment were (a) no health coverage and could not afford cost (41.8 percent), (b) not ready to stop using (30.7 percent), (c) concern that receiving treatment might cause neighbors/community to have negative opinion (14.6 percent), (d) possible negative effect on job (12.4 percent), (e) not knowing where to go for treatment (12.1 percent), and (f) being able to handle the problem without treatment (9.6 percent).

Alcohol Use Treatment and Treatment Need

- In 2010, the number of persons aged 12 or older needing treatment for an alcohol use problem was 18.5 million (7.3 percent of the population aged 12 or older). Of these, 1.6 million (0.6 percent of the total population and 8.5 percent of the people who needed treatment for an alcohol use problem) received alcohol use treatment at a specialty facility. Thus, there were 17.0 million people who needed but did not receive treatment at a specialty facility for an alcohol use problem. None of these estimates changed significantly between 2009 and 2010 and between 2002 and 2010, except that the percentage of persons aged 12 or older who needed treatment for an alcohol use problem declined from 2002 (7.9 percent) to 2010 (7.3 percent), and that the percentage of persons aged 12 or older who needed treatment for an alcohol use problem and did not receive treatment at a specialty facility also declined from 2002 (7.3 percent) to 2010 (6.7 percent).

- Among the 17.0 million people aged 12 or older who needed but did not receive treatment for an alcohol use problem in 2010, there were 698,000 (4.1 percent) who felt they needed treatment for their alcohol use problem. The number and the percentage were similar to those reported in 2009 (676,000 persons and 3.8 percent) and 2002 (761,000 persons and 4.5 percent). Of these, 485,000 did not make an effort to get treatment, and 213,000 made an effort but were unable to get treatment in 2010.

- In 2010, there were 1.1 million youths (4.7 percent) aged 12 to 17 who needed treatment for an alcohol use problem. Of this group, only 70,000 received treatment at a specialty facility (0.3 percent of all youths and 6.1 percent of youths who needed treatment), leaving almost 1.1 million youths (4.4 percent) who needed but did not receive treatment.

8. Discussion of Trends in Substance Use among Youths and Young Adults

This report presents findings from the 2010 National Survey on Drug Use and Health (NSDUH). Conducted since 1971 and previously named the National Household Survey on Drug Abuse (NHSDA), the survey underwent several methodological improvements in 2002 that have affected prevalence estimates. As a result, the 2002 through 2010 estimates are not comparable with estimates from 2001 and earlier surveys. Therefore, the primary focus of this report is on comparisons of measures of substance use across subgroups of the U.S. population in 2010, changes between 2009 and 2010, and changes between 2002 and 2010. This chapter provides an additional discussion of the findings concerning a topic of great interest—trends in substance use among youths and young adults.

An important step in the analysis and interpretation of NSDUH or any other survey data is to compare the results with those from other data sources. This can be difficult sometimes because the other surveys typically have different purposes, definitions, and designs. Research has established that surveys of substance use and other sensitive topics often produce inconsistent results because of different methods used. Thus, it is important to understand that conflicting results often reflect differing methodologies, not incorrect results. Despite this limitation, comparisons can be very useful. Consistency across surveys can confirm or support conclusions about trends and patterns of use, and inconsistent results can point to areas for further study. Further discussion of this issue is included in Appendix C, along with descriptions of methods and results from other sources of substance use data.

Unfortunately, few additional data sources are available at this time to compare with NSDUH results. One established source is Monitoring the Future (MTF), a study sponsored by the National Institute on Drug Abuse (NIDA). MTF surveys students in the 8th, 10th, and 12th grades in classrooms during the spring of each year, and it also collects data by mail from a subsample of adults who had participated earlier in the study as 12th graders (Johnston, O'Malley, Bachman, & Schulenberg, 2011a, 2011b). Historically, NSDUH rates of substance use among youths have been lower than those of MTF, and occasionally the two surveys have shown different trends over a short time period. Nevertheless, the two sources have shown very similar long-term trends in prevalence. NSDUH and MTF rates of substance use generally have been similar among young adults, and the two sources also have shown similar trends.

A comparison of NSDUH and MTF estimates for 2002 to 2010 is shown in Tables 8.1 and 8.2 at the end of this chapter for several substances that are defined similarly in the two surveys. For comparison purposes, MTF data on 8th and 10th graders are combined to give an age range close to 12 to 17 years, the standard youth age group for NSDUH. Appendix C provides comparisons according to MTF definitions (8th, 10th, and 12th grades). MTF follow-up data on persons aged 19 to 24 provide the closest match on age to estimates for NSDUH young adults aged 18 to 25. The NSDUH results are remarkably consistent with MTF trends for both youths and young adults, as discussed in the following paragraphs.

Youths

Both surveys showed decreases between 2002 and 2010 in the percentages of youths who used cocaine, alcohol, and cigarettes in the past month (Table 8.1). The data on trends in alcohol use showed remarkably similar patterns in the two surveys, with a significant decline between 2007 and 2008, no change between 2008 and 2009, and a significant decline between 2009 and 2010 (Figure 8.1). However, the results for cigarette use differed. NSDUH showed a continuing decline in youth cigarette use between 2008 and 2010, while MTF estimates did not change significantly over this period (Figure 8.2). NSDUH and MTF data showed consistent trends for past month use of marijuana (Figure 8.3) and Ecstasy, with decreases in use from 2002 to the middle of the decade, then increasing use from 2007 or 2008 to 2010. Both surveys indicated little change in past month use of LSD or inhalants.

NSDUH and MTF data on perceived risk of harm provide an important context for these trends. The extent to which youths believe that substances might cause them harm is an important factor influencing whether or not they will use these substances. Declining levels of perceived risk among youths historically have been associated with subsequent increases in rates of use, and this association continues to be evident in the most recent data. Among youths aged 12 to 17, the percentage reporting in NSDUH that they thought there was a great risk of harm in smoking marijuana once or twice a week was 54.7 percent in 2007, 53.1 percent in 2008, 49.3 percent in 2009, and 47.5 percent in 2010. MTF data for combined 8th and 10th graders showed a similar decline in perceived harmfulness of regular marijuana use over this time period. NSDUH does not obtain data on perceived harm for Ecstasy use, but MTF data showed significant declines among youths who perceived risk in using Ecstasy. For example, the percentage of 8th and 10th graders reporting great risk in occasionally using Ecstasy declined from 69.9 percent in 2004 to 52.1 percent in 2010.

Another source of data on trends in the use of drugs among youths is the Youth Risk Behavior Survey (YRBS), sponsored by the Centers for Disease Control and Prevention (CDC). YRBS surveys students in the 9th through 12th grades in classrooms every other year during the spring (Eaton et al., 2010). The most recent survey was completed in 2009. Generally, the YRBS showed higher prevalence rates but similar long-term trends when compared with NSDUH and MTF. However, comparisons between the YRBS and NSDUH or MTF were less straightforward because of the different periodicity (i.e., biennially instead of annually) and ages covered, the limited number of drug use questions, and smaller sample size in the YRBS. For the substances for which information on current use was collected in the YRBS, including alcohol, cigarettes, marijuana, and cocaine, the YRBS trend results between 2001 and 2009 were consistent with NSDUH and MTF (see http://www.cdc.gov/HealthyYouth/yrbs/; Grunbaum et al., 2002). YRBS data for the combined grades 9 through 12 showed significant decreases in past month alcohol use (47.1 percent in 2001 and 41.8 percent in 2009) and cigarette use (28.5 percent in 2001 and 19.5 percent in 2009). YRBS showed a decline in past month marijuana use between 2001 (23.9 percent) and 2007 (19.7 percent), but the rate was 20.8 percent in 2009. This increase was consistent with the recent NSDUH and MTF increases since 2007, but the MTF and YRBS increases were not statistically significant.

Figure 8.1 Past Month Alcohol Use among Youths in NSDUH and MTF: 2002-2010
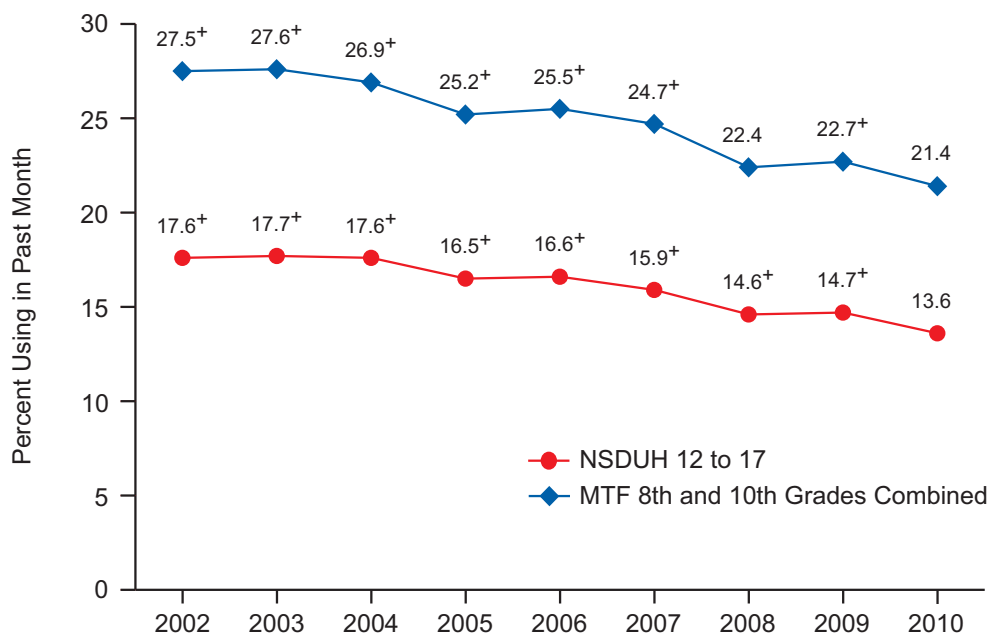
MTF = Monitoring the Future; NSDUH = National Survey on Drug Use and Health.

[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Figure 8.2 Past Month Cigarette Use among Youths in NSDUH and MTF: 2002-2010
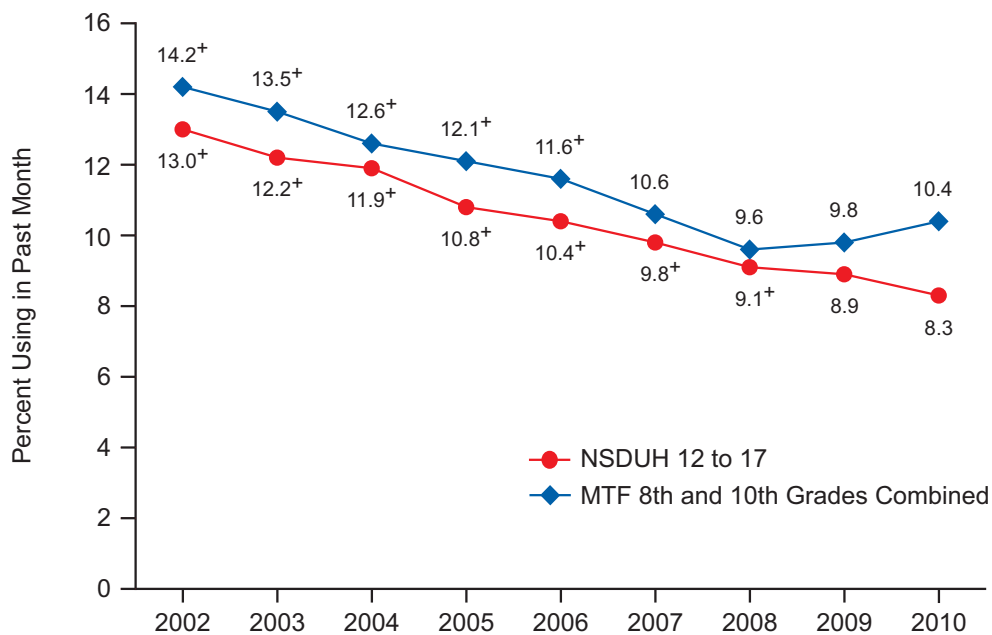
MTF = Monitoring the Future; NSDUH = National Survey on Drug Use and Health.

[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Figure 8.3 Past Month Marijuana Use among Youths in NSDUH and MTF: 2002-2010
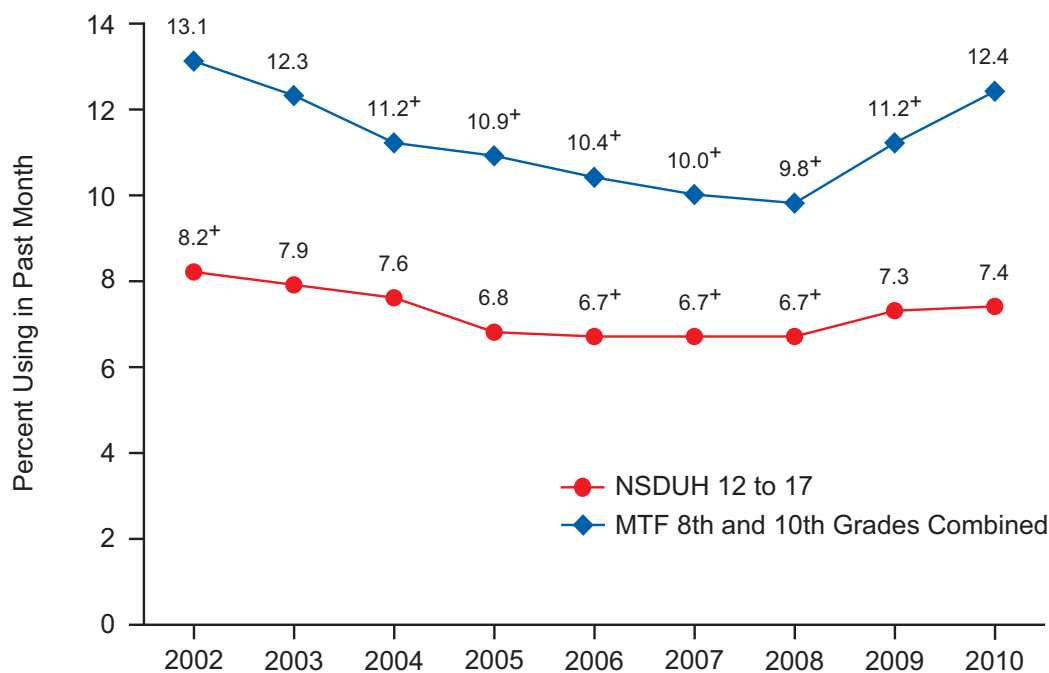
MTF = Monitoring the Future; NSDUH = National Survey on Drug Use and Health.

[+] Difference between this estimate and the 2010 estimate is statistically significant at the .05 level.

Although changes in NSDUH survey methodology preclude direct comparisons of recent estimates with estimates from before 2002, it is important to put the recent trends in context by reviewing longer term trends in use. NSDUH data (prior to the design changes in 1999 and 2002) on youths aged 12 to 17 and MTF data on high school seniors showed substantial increases in youth illicit drug use during the 1970s, reaching a peak in the late 1970s. Both surveys then showed significant declines throughout the 1980s until about 1992, when rates reached a low point. These trends were driven by the trend in marijuana use. With the start of annual data collection in NSDUH in 1991, along with the biennial YRBS and the annual 8th and 10th grade samples in MTF, trends among youths are well documented since the low point that occurred in the early 1990s. Although they employ different survey designs and cover different age groups, the three surveys are consistent in showing increasing rates of marijuana use during the early to mid-1990s, reaching a peak in the late 1990s (but lower than in the late 1970s). This peak in the late 1990s was followed by declines in use after the turn of the 21st century and an increase in the most recent years (Figure 8.4).

Figure 8.4 Past Month Marijuana Use among Youths in NSDUH, MTF, and YRBS: 1971-2010
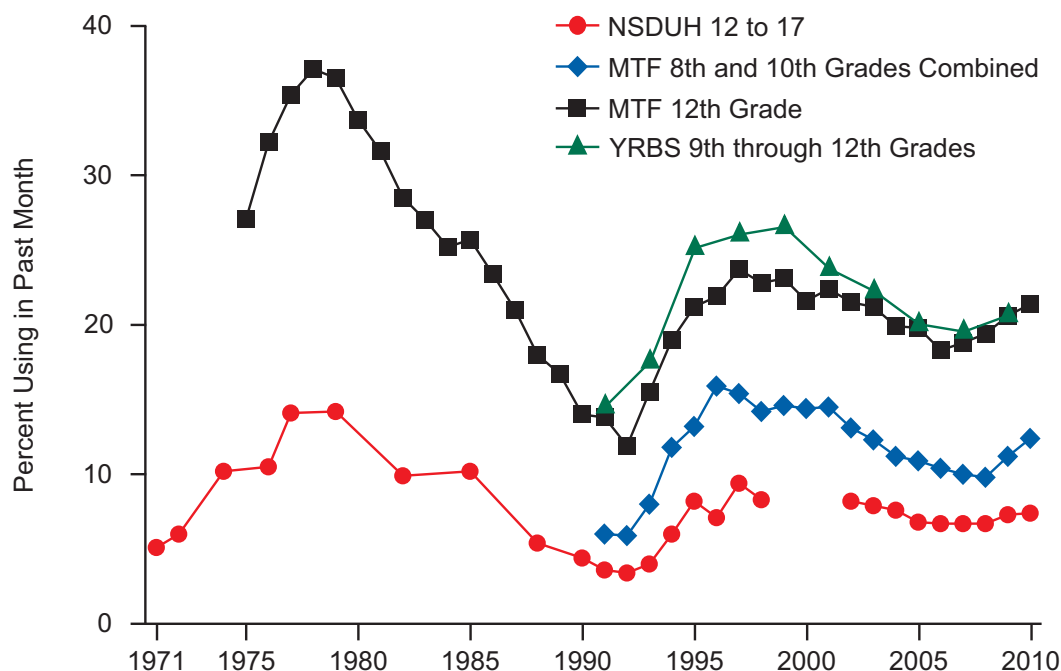
MTF = Monitoring the Future; NSDUH = National Survey on Drug Use and Health; YRBS = Youth Risk Behavior Survey.

Note: NSDUH data for youths aged 12 to 17 are not presented for 1999 to 2001 because of design changes in the survey. These design changes preclude direct comparisons of estimates from 2002 to 2010 with estimates prior to 1999.

Young Adults

Data on young adults also showed similar trends in NSDUH and MTF, although not as consistent as for the youth data (Table 8.2). Potential reasons for differences from the data for youths are the relatively smaller MTF sample size for young adults and possible bias in the MTF sample due to noncoverage of school dropouts and a low overall response rate; the response rate is affected by nonresponse by schools, by students in the 12th grade survey, and by students in the follow-up mail survey.

Both surveys showed an increase in past month marijuana use among young adults from 2008 to 2010, although the change in MTF was not significant. Both surveys showed declines in cigarette use, but no significant change between 2002 and 2010 in the rate of current alcohol use among young adults. Both surveys showed declines in past year and past month cocaine use from 2003 to 2010. Both surveys showed a significant increase in past month Ecstasy use between 2007 and 2010.

Nonmedical Use of Prescription Pain Relievers

As noted in Chapter 2 of this report, nonmedical use of prescription drugs among youths and young adults in 2010 was the second most prevalent illicit drug use category, with marijuana being first. NSDUH data showed a decline in past month nonmedical prescription drug use among youths between 2002 (4.0 percent) and 2008 (2.9 percent), with no significant change between 2008 and 2010 (3.0 percent). Among young adults aged 18 to 25, past month prevalence of nonmedical prescription drug use was 5.9 percent in 2010, similar to the rates in other years since 2002, which varied between 5.5 percent in 2002 and 6.5 percent in 2006. The most prevalent category of misused prescription drugs is pain relievers. Nonmedical pain reliever use in the past month among youths declined from 3.2 percent in 2002 to 2.5 percent in 2010, while the rate among young adults was similar in 2002 (4.1 percent) and 2010 (4.5 percent).

NSDUH and MTF use different definitions and questioning strategies to track misuse of prescription drugs. For example, NSDUH defines misuse as use of prescription drugs that were not prescribed for the respondent or use of these drugs only for the experience or feeling they caused; MTF defines misuse as use not under a doctor's orders. MTF also does not estimate overall prescription drug misuse. However, MTF asks questions about "narcotics other than heroin," a category similar in coverage to the pain relievers category in NSDUH. These data are reported for 12th graders and for young adults. In addition, as is the case with NSDUH trends, methodological changes in MTF have sometimes resulted in discontinuities. For the data on use of narcotics other than heroin, there was a questionnaire change in the 2002 MTF that resulted in increased reporting of opiates, such that estimates prior to 2002 are not strictly comparable with estimates for 2002 and beyond.

Figure 8.5 shows NSDUH data for past year misuse of pain relievers from 1994 and to 1998 and 2002 to 2010 for youths and young adults (comparable estimates for prior years are not available). MTF data for 12th graders also are shown for past year misuse of narcotics other than heroin since 1994. From 1994 to 2001, the MTF rate of nonmedical use of narcotics other than heroin nearly doubled among high school seniors. NSDUH estimates for youths and young adults were more stable from 1994 to 1998.

Both surveys showed relatively little change in the prevalence of past year misuse of pain relievers/narcotics other than heroin from 2002 to 2010 among these population groups, although some significant differences were observed in NSDUH. The prevalence in MTF among 12th graders ranged from 8.7 to 9.5 percent over this period, with a rate of 8.7 percent in 2010. Among youths in NSDUH, the prevalence ranged from 6.2 to 7.7 percent over this time period, with the rate in 2010 (6.2 percent) lower than rates in 2002, 2003, 2004, and 2006. Among young adults in NSDUH, the prevalence ranged from 11.1 to 12.4 percent over this time period, with the rate in 2010 (11.1 percent) lower than the rates in 2003 to 2009. MTF estimates for young adults aged 19 to 24 years ranged from 8.5 to 9.9 percent during this period, with no statistically significant changes (Table 8.2).

Figure 8.5 Past Year Nonmedical Pain Reliever Use among Youths and Young Adults in NSDUH and MTF: 1994-2010
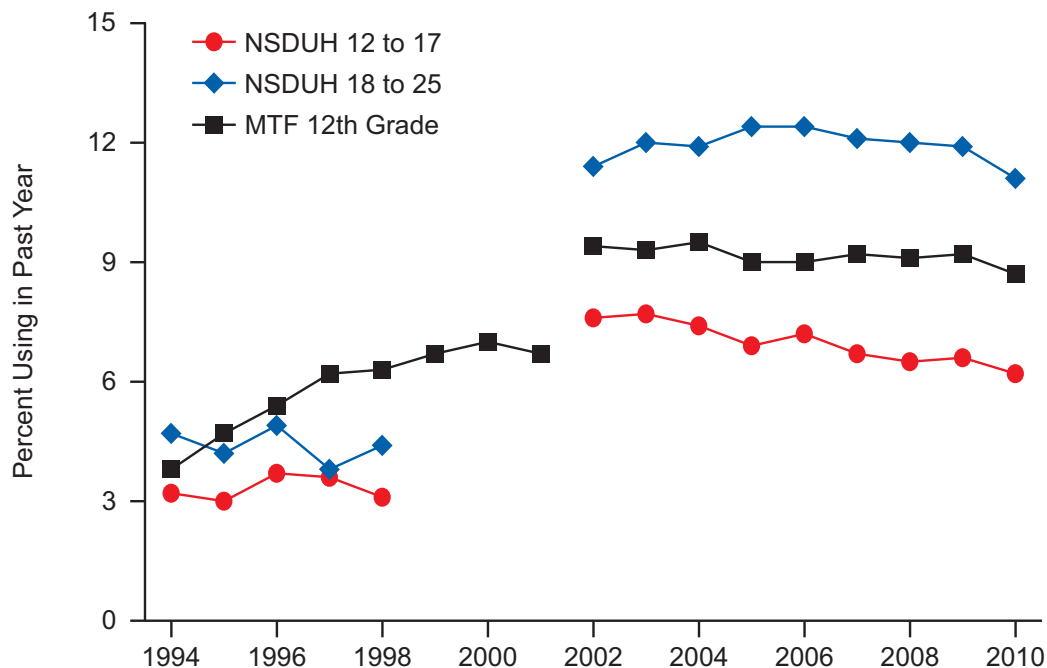
MTF = Monitoring the Future; NSDUH = National Survey on Drug Use and Health.

Note: NSDUH data are not presented for 1999 to 2001 because of design changes in the survey. These design changes preclude direct comparisons of estimates from 2002 to 2010 with estimates prior to 1999.

Note: Data for MTF are for "narcotics other than heroin." MTF estimates from 1994 to 2001 are not comparable with MTF estimates for 2002 and later due to questionnaire changes.

Although these data do not indicate an overall increase in nonmedical pain reliever use from 2002 to 2010, other trends indicate a growing problem. According to NSDUH, initiation rates for nonmedical pain reliever use continue to be second only to marijuana rates, with 2 million or more new nonmedical pain reliever users each year since 2002, including over 500,000 who initiate use without ever having used another illicit drug. The sustained numbers of new and continuing users have contributed to substantial increases in indicators of problems associated with use, especially among adults. The rate of pain reliever dependence for persons aged 12 or older increased from 2002 to 2010 (from 0.4 to 0.6 percent of the population), and the number of persons with dependence increased from 936,000 to 1.4 million. Most of these pain reliever-dependent persons were aged 26 or older (56.6 percent), but about one third (463,000) were aged 18 to 25. The number of people receiving specialty treatment in the past year in 2010 (2.6 million) was similar to the number in 2002 (2.3 million). However, the number of persons receiving specialty substance use treatment within the past year for misuse of pain relievers more than doubled during this period, from 199,000 to 406,000. In 2010, 65.7 percent were aged 26 or older, and 25.9 percent were aged 18 to 25. Other data sources confirm these trends, with admissions to publicly funded substance abuse treatment programs for a primary non-heroin opiate problem increasing from 45,816 in 2002 to 138,639 in 2009; in 2009, 72 percent of such admissions were aged 25 or older, and 27 percent were aged 18 to 24 (Center for Behavioral

Health Statistics and Quality [CBHSQ], 2011b). The number of emergency department visits involving nonmedical use of narcotic pain relievers increased from 145,000 in 2004 to 306,000 in 2008 (CBHSQ, 2011a).

Summary

Despite the methodological differences between MTF and NSDUH, the two surveys generally showed similar trends for most substances among youths, including the increase in marijuana use from 2008 to 2010 and the decrease in alcohol use from 2002 to 2010. NSDUH showed a 10 percent increase in the past month rate of marijuana use from 2008 to 2010, while MTF showed a 27 percent increase. The prevalence of past month alcohol use declined by 23 percent from 2002 to 2010 in NSDUH and by 22 percent in MTF. For youth cigarette use, the two surveys showed similar declines in current use from 2002 to 2008, but trends differed in the following years. For 2008 to 2010, NSDUH indicated a continuing decline from 9.1 to 8.3 percent, but MTF data suggested a stall or reversal of the downward trend, with rates of 9.6 percent in 2008 and 10.4 percent in 2010 (not a statistically significant difference). This discrepancy in the recent trend in youth cigarette use requires further study to determine whether methodological differences in the surveys could affect the comparison. NSDUH and MTF data for young adults both indicated continuing declines in cigarette use from 2002 to 2010, including declines between 2008 and 2010.

Multiple datasets confirm the trends associated with the misuse of prescription pain relievers among youths and young adults. Although there was no evidence of overall increases from 2002 to 2010, nonmedical use of pain relievers continued to be prevalent among youths and young adults. Substantial increases in consequences associated with pain reliever misuse were observed, especially among adults.

Table 8.1 Comparison of NSDUH and MTF Prevalence Estimates among Youths: Percentages, 2002-2010

Substance/ Time Period	NSDUH (2002)	NSDUH (2003)	NSDUH (2004)	NSDUH (2005)	NSDUH (2006)	NSDUH (2007)	NSDUH (2008)	NSDUH (2009)	NSDUH (2010)	MTF (2002)	MTF (2003)	MTF (2004)	MTF (2005)	MTF (2006)	MTF (2007)	MTF (2008)	MTF (2009)	MTF (2010)
Marijuana																		
Lifetime	20.6[a]	19.6[a]	19.0[a]	17.4	17.3	16.2	16.5	17.0	17.0	29.0[a]	27.0	25.7	25.3	23.8	22.6[a]	22.3[a]	24.0	25.4
Past Year	15.8[a]	15.0[a]	14.5	13.3	13.2	12.5[a]	13.0[a]	13.6	14.0	22.5[a]	20.5	19.7	19.4	18.5[a]	17.5[a]	17.4[a]	19.3[a]	20.6
Past Month	8.2[a]	7.9	7.6	6.8	6.7[a]	6.7[a]	6.7[a]	7.3	7.4	13.1	12.3	11.2[a]	10.9[a]	10.4[a]	10.0[a]	9.8[a]	11.2[a]	12.4
Cocaine																		
Lifetime	2.7[a]	2.6[a]	2.4[a]	2.3[a]	2.2[a]	2.1[a]	1.9[a]	1.6	1.5	4.9[a]	4.4[a]	4.4[a]	4.5[a]	4.1[a]	4.2[a]	3.8	3.6	3.2
Past Year	2.1[a]	1.8[a]	1.6[a]	1.7[a]	1.6[a]	1.5[a]	1.2	1.0	1.0	3.2[a]	2.8[a]	2.9[a]	2.9[a]	2.6[a]	2.7[a]	2.4	2.2	1.9
Past Month	0.6[a]	0.6[a]	0.5[a]	0.6[a]	0.4[a]	0.4[a]	0.4[a]	0.3	0.2	1.4[a]	1.1[a]	1.3[a]	1.3[a]	1.3[a]	1.1[a]	1.0	0.9	0.8
Ecstasy																		
Lifetime	3.3[a]	2.4	2.1[a]	1.6[a]	1.9[a]	1.8[a]	2.1[a]	2.3	2.5	5.5	4.3	3.6[a]	3.4[a]	3.5[a]	3.8[a]	3.4[a]	3.9[a]	4.9
Past Year	2.2	1.3[a]	1.2[a]	1.0[a]	1.2[a]	1.3[a]	1.4[a]	1.7	1.9	3.9	2.6[a]	2.1[a]	2.2[a]	2.1[a]	2.5[a]	2.3[a]	2.5[a]	3.6
Past Month	0.5	0.4	0.3[a]	0.3[a]	0.3[a]	0.3[a]	0.4	0.5	0.5	1.6	0.9[a]	0.8[a]	0.8[a]	1.0[a]	0.9[a]	1.0[a]	1.0[a]	1.5
LSD																		
Lifetime	2.7[a]	1.6[a]	1.2[a]	1.1	0.9	0.8	1.1	1.0	0.9	3.8[a]	2.8	2.3	2.2	2.2	2.3	2.3	2.4	2.4
Past Year	1.3[a]	0.6	0.6	0.6	0.4	0.5	0.7	0.6	0.6	2.1[a]	1.5	1.4	1.4	1.3	1.5	1.6	1.5	1.6
Past Month	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.7
Inhalants																		
Lifetime	10.5[a]	10.7[a]	11.0[a]	10.5[a]	10.1[a]	9.6[a]	9.3[a]	9.2[a]	8.2	14.4	14.3	14.9[a]	15.1[a]	14.7[a]	14.6[a]	14.3	13.6	13.3
Past Year	4.4[a]	4.5[a]	4.6[a]	4.5[a]	4.4[a]	3.9	3.9	3.9	3.6	6.8	7.1	7.8[a]	7.8[a]	7.8[a]	7.5	7.4	7.1	6.9
Past Month	1.2	1.3	1.2	1.2	1.3	1.2	1.1	1.0	1.1	3.1	3.2	3.5[a]	3.2	3.2	3.2	3.1	3.0	2.8
Alcohol																		
Lifetime	43.4[a]	42.9[a]	42.0[a]	40.6[a]	40.4[a]	39.4[a]	38.3[a]	38.1[a]	35.2	57.0[a]	55.8[a]	54.1[a]	52.1[a]	51.0[a]	50.3[a]	48.6	47.9	47.0
Past Year	34.6[a]	34.3[a]	33.9[a]	33.3[a]	32.9[a]	31.8[a]	30.8[a]	30.3[a]	28.5	49.4[a]	48.3[a]	47.5[a]	45.3[a]	44.7[a]	44.1[a]	42.3	41.6	40.7
Past Month	17.6[a]	17.7[a]	17.6[a]	16.5[a]	16.6[a]	15.9[a]	14.6[a]	14.7[a]	13.6	27.5[a]	27.6[a]	26.9[a]	25.2[a]	25.5[a]	24.7[a]	22.4	22.7[a]	21.4
Cigarettes																		
Lifetime	33.3[a]	31.0[a]	29.2[a]	26.7[a]	25.8[a]	23.7[a]	22.9[a]	22.2[a]	20.3	39.4[a]	35.7[a]	34.3[a]	32.4[a]	30.4[a]	28.4[a]	26.1	26.4	26.5
Past Year	20.3[a]	19.0[a]	18.4[a]	17.3[a]	17.0[a]	15.7[a]	15.0	15.0	14.1	--	--	--	--	--	--	--	--	--
Past Month	13.0[a]	12.2[a]	11.9[a]	10.8[a]	10.4[a]	9.8[a]	9.1[a]	8.9	8.3	14.2[a]	13.5[a]	12.6[a]	12.1[a]	11.6[a]	10.6	9.6	9.8	10.4

MTF = Monitoring the Future; NSDUH = National Survey on Drug Use and Health.

-- Not available.

NOTE: NSDUH data are for youths aged 12 to 17, and MTF data are simple averages of estimates for 8th and 10th graders. MTF data for 8th and 10th graders are reported in Johnston, O'Malley, Bachman, and Schulenberg (2011a). MTF design effects used for variance estimation are reported in Johnston, O'Malley, Bachman, and Schulenberg (2010).

[a] Difference between this estimate and 2010 estimate is statistically significant at the .05 level.

Sources: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2002-2010. National Institute on Drug Abuse, Monitoring the Future Study, University of Michigan, 2002-2010.

Table 8.2 Comparison of NSDUH and MTF Prevalence Estimates among Young Adults: Percentages, 2002-2010

Substance/ Time Period	NSDUH (2002)	NSDUH (2003)	NSDUH (2004)	NSDUH (2005)	NSDUH (2006)	NSDUH (2007)	NSDUH (2008)	NSDUH (2009)	NSDUH (2010)	MTF (2002)	MTF (2003)	MTF (2004)	MTF (2005)	MTF (2006)	MTF (2007)	MTF (2008)	MTF (2009)	MTF (2010)
Marijuana																		
Lifetime	53.8[a]	53.9[a]	52.8[a]	52.4	52.4	50.8	50.4	52.2	51.1	56.1[a]	56.4[a]	55.6	54.4	53.8	53.9	53.0	53.8	53.2
Past Year	29.8	28.5[a]	27.8[a]	28.0[a]	28.0[a]	27.5[a]	27.6[a]	30.6	29.8	34.2[a]	33.0	31.6	31.4	30.9	31.0	30.9	32.1	31.7
Past Month	17.3[a]	17.0[a]	16.1[a]	16.6[a]	16.3[a]	16.4[a]	16.5[a]	18.1	18.5	19.8[a]	19.9[a]	18.2	17.0	17.0	17.5	17.3	18.5	17.8
Cocaine																		
Lifetime	15.4[a]	15.0[a]	15.2[a]	15.1[a]	15.7[a]	15.0[a]	14.4[a]	14.8[a]	13.3	12.9[a]	14.5[a]	14.3[a]	12.6[a]	13.6[a]	12.4	12.2	12.2	11.0
Past Year	6.7[a]	6.6[a]	6.6[a]	6.9[a]	6.9[a]	6.4[a]	5.5[a]	5.3[a]	4.6	6.5[a]	7.3[a]	7.8[a]	6.9[a]	7.0[a]	6.3[a]	6.0[a]	5.7	4.7
Past Month	2.0[a]	2.2[a]	2.1[a]	2.6[a]	2.2[a]	1.7	1.5	1.4	1.5	2.5[a]	2.6[a]	2.4[a]	2.1[a]	2.4[a]	1.9	1.9	1.8	1.4
Ecstasy																		
Lifetime	15.1[a]	14.8[a]	13.8[a]	13.7[a]	13.4[a]	12.8	12.1	12.4	12.4	16.0[a]	16.6[a]	14.9[a]	12.4	11.5	9.5	10.1	9.4	10.3
Past Year	5.8[a]	3.7[a]	3.1[a]	3.1[a]	3.8[a]	3.5[a]	3.9	4.3	4.4	8.0[a]	5.3	3.3[a]	3.4	3.6	2.8[a]	3.8	3.6	4.7
Past Month	1.1	0.7[a]	0.7[a]	0.8[a]	1.0	0.7[a]	0.9	1.1	1.2	1.6	1.0	0.8	0.6	0.9	0.3[a]	0.9	0.7	1.2
LSD																		
Lifetime	15.9[a]	14.0[a]	12.1[a]	10.5[a]	8.9[a]	7.3[a]	6.5	6.8	6.4	13.9[a]	13.8[a]	10.4[a]	7.9[a]	6.7	5.9	5.6	5.3	5.7
Past Year	1.8	1.1[a]	1.0[a]	1.0[a]	1.2[a]	1.1[a]	1.5	1.5	1.6	2.4	1.5	1.2[a]	1.1[a]	1.5	1.4	1.9	2.1	1.9
Past Month	0.1[a]	0.2	0.3	0.2	0.2[a]	0.2	0.3	0.3	0.3	0.4	0.2[a]	0.2[a]	0.2[a]	0.3	0.3	0.5	0.3	0.5
Inhalants																		
Lifetime	15.7[a]	14.9[a]	14.0[a]	13.3[a]	12.5[a]	11.3[a]	10.4	10.7[a]	9.9	11.7[a]	11.4[a]	10.6[a]	9.3[a]	9.7[a]	7.5	8.4	7.7	6.9
Past Year	2.2[a]	2.1[a]	2.1[a]	2.1[a]	1.8	1.6	1.6	1.9	1.7	2.2	1.5	2.3	1.6	1.8	1.1	1.7	1.2	1.7
Past Month	0.5	0.4	0.4	0.5	0.4	0.4	0.3	0.4	0.4	0.8[a]	0.3	0.4	0.3	0.4	0.3	0.6	0.2	0.3
Alcohol																		
Lifetime	86.7[a]	87.1[a]	86.2	85.7	86.5	85.2	85.6	85.8	85.7	88.4[a]	87.6[a]	87.2[a]	87.1[a]	87.0[a]	86.0	86.4	85.7	84.8
Past Year	77.9	78.1	78.0	77.9	78.8	77.9	78.0	78.8	78.7	83.9[a]	82.3	83.1[a]	82.8[a]	83.2[a]	82.8[a]	82.5[a]	82.0	80.5
Past Month	60.5	61.4	60.5	60.9	61.9	61.2	61.2	61.8	61.5	67.7	66.3	67.3	66.8	67.0	67.4	67.4	68.1	65.8
Cigarettes																		
Lifetime	71.2[a]	70.2[a]	68.7[a]	67.3[a]	66.6[a]	64.7[a]	64.2[a]	63.7[a]	62.1	--	--	--	--	--	--	--	--	--
Past Year	49.0[a]	47.6[a]	47.5[a]	47.2[a]	47.0[a]	45.1[a]	45.0[a]	45.2[a]	43.1	41.8[a]	40.8[a]	41.4[a]	40.2[a]	37.1[a]	36.2[a]	35.4[a]	35.0	33.0
Past Month	40.8[a]	40.2[a]	39.5[a]	39.0[a]	38.4[a]	36.2[a]	35.7[a]	35.8[a]	34.2	31.4[a]	29.5[a]	30.2[a]	28.7[a]	26.7[a]	25.7[a]	24.3[a]	23.5	21.8
Pain Relievers[1]																		
Lifetime	22.1[b]	23.7	24.3	25.5[b]	25.5[b]	24.8	24.4	24.3	23.8	--	17.3	17.7	16.9	17.9	17.8	17.8	17.2	16.6
Past Year	11.4	12.0[a]	11.9[a]	12.4[b]	12.4[b]	12.1[b]	12.0[a]	11.9[a]	11.1	8.5	9.7	9.7	9.2	9.9	9.0	9.2	8.5	9.1
Past Month	4.1	4.7	4.7	4.7	4.9	4.6	4.6	4.8	4.5	--	3.4	3.4	3.7	3.6	3.5	3.7	3.2	3.4

MTF = Monitoring the Future; NSDUH = National Survey on Drug Use and Health.

-- Not available.

NOTE: NSDUH data are for persons aged 18 to 25. MTF data were calculated for persons aged 19 to 24 using simple averages of modal age groups 19-20, 21-22, and 23-24 (source data at http://www.monitoringthefuture.org/pubs.html). For the 19 to 24 age group in the MTF data, significance tests were performed assuming independent samples between years an odd number of years apart because two distinct cohorts a year apart were monitored longitudinally at 2-year intervals. Although appropriate for comparisons of 2003, 2005, 2007, and 2009 estimates with 2010 estimates, this assumption results in conservative tests for comparisons of 2002, 2004, 2006, and 2008 data with 2010 estimates because it does not take into account covariances that are associated with repeated observations from the longitudinal samples. Estimates of covariances were not available.

[a] Difference between this estimate and 2010 estimate is statistically significant at the .05 level.

[1] MTF data are for "narcotics other than heroin." In 2002, MTF question text was changed in half of the sample by updating the example list of narcotics other than heroin. To be consistent with MTF data for 2003 and later years, MTF data for 2002 past year use of narcotics other than heroin are based on the half sample that received the new question text.

Sources: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2002-2010. National Institute on Drug Abuse, Monitoring the Future Study, University of Michigan, 2002-2010.

Appendix A: Description of the Survey

A.1   Sample Design

The sample design for the 2010 National Survey on Drug Use and Health (NSDUH)[2] is an extension of a coordinated 5-year design providing estimates for all 50 States plus the District of Columbia initially for the years 2005 through 2009, then continuing through 2011. The respondent universe is the civilian, noninstitutionalized population aged 12 years old or older residing within the United States. The survey covers residents of households (persons living in houses/townhouses, apartments, condominiums; civilians living in housing on military bases, etc.) and persons in noninstitutional group quarters (e.g., shelters, rooming/boarding houses, college dormitories, migratory workers' camps, halfway houses). Excluded from the survey are persons with no fixed household address (e.g., homeless and/or transient persons not in shelters), active-duty military personnel, and residents of institutional group quarters, such as correctional facilities, nursing homes, mental institutions, and long-term hospitals.

The coordinated design for 2005 through 2009 facilitated a 50 percent overlap in second-stage units (area segments) within each successive 2-year period from 2005 through 2009. The 2010 NSDUH continued the 50 percent overlap by retaining half of the second-stage units from the 2009 survey. The remainder of the sample was drawn from the 2005 through 2009 reserve sample. This reserve sample consisted of area segments not used in previous years but reserved for any supplemental samples or field tests that may be implemented. Because the coordinated design enables estimates to be developed by State in all 50 States plus the District of Columbia, States may be viewed as the first level of stratification and as a reporting variable.

For the 50-State design, 8 States were designated as large sample States (California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas) with target sample sizes of 3,600. In 2010, sample sizes in these States ranged from 3,590 to 3,731. For the remaining 42 States and the District of Columbia, the target sample size was 900. Sample sizes in these States ranged from 868 to 974 in 2010. This approach ensures there is sufficient sample in every State to support State estimation by either direct methods or small area estimation (SAE)[3] while at the same time maintaining efficiency for national estimates.

States were first stratified into a total of 900 State sampling regions (SSRs) (48 regions in each large sample State and 12 regions in each small sample State). These regions were contiguous geographic areas designed to yield approximately the same number of interviews.[4] Unlike the 1999 through 2001 NHSDAs and the 2002 through 2004 NSDUHs in which the first-stage sampling units were clusters of census blocks called area segments, the first stage of

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[2] Prior to 2002, the survey was known as the National Household Survey on Drug Abuse (NHSDA).
[3] SAE is a hierarchical Bayes modeling technique used to make State-level estimates for approximately 20 measures related to substance use. For more details, see the *State Estimates of Substance Use and Mental Disorders from the 2008-2009 National Surveys on Drug Use and Health* (Hughes, Muhuri, Sathe, & Spagnola, 2011).
[4] Sampling areas were defined using 2000 census geography. Counts of dwelling units (DUs) and population totals were obtained from the 2000 census data supplemented with revised population counts from Nielsen Claritas.

selection for the 2005 through 2011 NSDUHs was census tracts.[5] This stage was included to contain sample segments within a single census tract to the extent possible.[6]

Within each SSR, 48 census tracts were selected with probability proportional to population size. Within sampled census tracts, adjacent census blocks were combined to form the second-stage sampling units or area segments. One area segment was selected within each sampled census tract with probability proportional to population size. Although only 24 segments were needed to support the coordinated 5-year sample, an additional 24 segments were selected to support any supplemental studies that the Substance Abuse and Mental Health Services Administration (SAMHSA) may choose to field. These 24 segments constitute the reserve sample and were available for use in 2010. Eight sample segments per SSR were fielded during the 2010 survey year. Four of these segments were retained from the 2009 survey, and four were selected from the reserve sample. An additional four reserve segments per SSR will be selected for use in the 2011 survey.

These sampled segments were allocated equally into four separate samples, one for each 3-month period (calendar quarter) during the year. That is, a sample of addresses was selected from two segments in each calendar quarter so that the survey was relatively continuous in the field. In each of the area segments, a listing of all addresses was made from which a national sample of 201,865 addresses was selected. Of the selected addresses, 166,435 were determined to be eligible sample units. In these sample units (which can be either households or units within group quarters), sample persons were randomly selected using an automated screening procedure programmed in a handheld computer carried by the interviewers. The number of sample units completing the screening was 147,608. Youths aged 12 to 17 years and young adults aged 18 to 25 years were oversampled at this stage, with 12 to 17 year olds sampled at an actual rate of 86.6 percent and 18 to 25 year olds at a rate of 71.3 percent on average, when they were present in the sampled households or group quarters. Similarly, persons in age groups 26 or older were sampled at rates of 31.4 percent or less, with persons in the eldest age group (50 years or older) sampled at a rate of 7.9 percent on average. The overall population sampling rates were 0.09 percent for 12 to 17 year olds, 0.07 percent for 18 to 25 year olds, 0.02 percent for 26 to 34 year olds, 0.02 percent for 35 to 49 year olds, and 0.01 percent for those 50 or older. Nationwide, 85,668 persons were selected. Consistent with previous surveys in this series, the final respondent sample of 68,487 persons was representative of the U.S. general population (since 1991, the civilian, noninstitutionalized population) aged 12 or older. In addition, State samples were representative of their respective State populations. More detailed information on the disposition of the national screening and interview sample can be found in Appendix B.

More information on the sample design can be found in the 2010 NSDUH sample design report by Morton, Martin, Chromy, Hirsch, and Ridenhour (2011).

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[5] Census tracts are relatively permanent statistical subdivisions of counties and provide a stable set of geographic units across decennial census periods.
[6] Some census tracts had to be aggregated in order to meet the minimum DU requirement of 150 DUs in urban areas and 100 DUs in rural areas.

A.2 Data Collection Methodology

The data collection method used in NSDUH involves in-person interviews with sample persons, incorporating procedures that would be likely to increase respondents' cooperation and willingness to report honestly about their illicit drug use behavior. Confidentiality is stressed in all written and oral communications with potential respondents. Respondents' names are not collected with the data, and computer-assisted interviewing (CAI) methods are used to provide a private and confidential setting to complete the interview.

Introductory letters are sent to sampled addresses, followed by an interviewer visit. When contacting a dwelling unit (DU), the field interviewer (FI) asks to speak with an adult resident (aged 18 or older) of the household who can serve as the screening respondent. Using a handheld computer, the FI completes a 5-minute procedure with the screening respondent that involves listing all household members along with their basic demographic data. The computer uses the demographic data in a preprogrammed selection algorithm to select zero to two sample persons, depending on the composition of the household. This selection process is designed to provide the necessary sample sizes for the specified population age groupings. In areas where a third or more of the households contain Spanish-speaking residents, the initial introductory letters written in English are mailed with a Spanish version on the back. All interviewers carry copies of this letter in Spanish. If the interviewer is not certified bilingual, he or she will use preprinted Spanish cards to attempt to find someone in the household who speaks English and who can serve as the screening respondent or who can translate for the screening respondent. If no one is available, the interviewer will schedule a time when a Spanish-speaking interviewer can come to the address. In households where a language other than Spanish is encountered, another language card is used to attempt to find someone who speaks English to complete the screening.

The NSDUH interview is available in English and Spanish, and both versions have the same content. If the sample person prefers to complete the interview in Spanish, a certified bilingual interviewer is sent to the address to conduct the interview. Because the interview is not translated into any other language, if a sample person does not speak English or Spanish, the interview is not conducted.

Interviewers attempt to conduct the NSDUH interview immediately with each sample person in the household. The interviewer requests the selected respondent to identify a private area in the home to conduct the interview away from other household members. The interview averages about an hour and includes a combination of CAPI (computer-assisted personal interviewing, in which the interviewer reads the questions) and ACASI (audio computer-assisted self-interviewing).

The NSDUH interview consists of core and noncore (i.e., supplemental) sections. A core set of questions critical for basic trend measurement of prevalence estimates remains in the survey every year and comprises the first part of the interview. Noncore questions, or modules, that can be revised, dropped, or added from year to year make up the remainder of the interview. The core consists of initial demographic items (which are interviewer-administered) and self-administered questions pertaining to the use of tobacco, alcohol, marijuana, cocaine, crack cocaine, heroin, hallucinogens, inhalants, pain relievers, tranquilizers, stimulants, and sedatives. Topics in the remaining noncore self-administered sections include (but are not limited to)

injection drug use, perceived risks of substance use, substance dependence or abuse, arrests, treatment for substance use problems, pregnancy and health care issues, and mental health issues. Noncore demographic questions (which are interviewer-administered and follow the ACASI questions) address such topics as immigration, current school enrollment, employment and workplace issues, health insurance coverage, and income. It should be noted that some of the noncore portions of the interview have remained in the survey, relatively unchanged, from year to year (e.g., current health insurance coverage, employment).

Thus, the interview begins in CAPI mode with the FI reading the questions from the computer screen and entering the respondent's replies into the computer. The interview then transitions to the ACASI mode for the sensitive questions. In this mode, the respondent can read the questions silently on the computer screen and/or listen to the questions read through headphones and enter his or her responses directly into the computer. At the conclusion of the ACASI section, the interview returns to the CAPI mode with the FI completing the questionnaire. Each respondent who completes a full interview is given a $30 cash payment as a token of appreciation for his or her time.

No personal identifying information is captured in the CAI record for the respondent. FIs transmit the completed interview data to RTI in Research Triangle Park, North Carolina, via home telephone analog lines.

After the data are transmitted to RTI, cases are selected for verification. The verification process involves contacting respondents to verify the quality of an FI's work based on information that respondents provide at the end of screening (if no one is selected for an interview at the DU or the entire DU is ineligible for the study) or at the end of the interview. For screening, the adult DU member who served as the screening respondent provides his or her first name and telephone number to the FI, who enters the information into a handheld computer and transmits the data to RTI. For completed interviews, respondents write their home telephone number and mailing address on a quality control form and seal the form in a preaddressed envelope that FIs mail back to RTI. All contact information is kept completely separate from the answers provided during the screening or interview.

Samples of respondents who completed screenings or interviews are randomly selected for verification. These cases are called by telephone interviewers who ask scripted questions designed to determine the accuracy and quality of the data collected. Any cases discovered to have a problem or discrepancy are flagged and routed to a small specialized team of telephone interviewers who recontact respondents for further investigation of the issue(s). Depending on the amount of an FI's work that cannot be verified through telephone verification, including bad telephone numbers (e.g., incorrect number, disconnected, not in service), a field verification may be conducted. Field verifications involve another FI returning to the sampled DU to verify the accuracy and quality of the data in person. If the verification procedures identify situations in which an FI has falsified data, the FI is terminated. All cases completed that quarter by the FI who falsified data are reworked by the FI conducting the field verification.

A.3   Data Processing

Computers at RTI direct the information to a raw data file (i.e., in which no logical editing of the data had been done) that consists of one record for each completed interview. Cases are retained only if respondents provided data on lifetime use of cigarettes and at least nine other substances in the core section of the questionnaire. Written responses to questions (e.g., names of other drugs that were used) are assigned numeric codes as part of the data processing procedures. Even though editing and consistency checks are done by the CAI program during the interview, additional, more complex edits and consistency checks are completed at RTI. Additionally, statistical imputation is used to replace missing or ambiguous values after editing for some key variables. Analysis weights are created so that estimates will be representative of the target population. Details of the editing, imputation, and weighting procedures for 2010 will appear in the *2010 NSDUH Methodological Resource Book*, which is in process. Until that volume becomes available, refer to the *2009 NSDUH Methodological Resource Book* (RTI International, 2011).

A.3.1   Data Coding and Logical Editing

With the exception of industry and occupation data, coding of written answers that respondents or interviewers typed was performed at RTI for the 2010 NSDUH. These written answers include mentions of drugs that respondents had used or other responses that did not fit a previous response option (subsequently referred to as "OTHER, Specify" data). Coding of the "OTHER, Specify" variables was accomplished through computer-assisted survey procedures and the use of a secure Web site that allowed for coding and review of the data. The computer-assisted procedures entailed a database check for a given "OTHER, Specify" variable that contained typed entries and the associated numeric codes. If an exact match was found between the typed response and an entry in the system, the computer-assisted procedures assigned the appropriate numeric code. Typed responses that did not match an existing entry were coded through the Web-based coding system. Data on the industries in which respondents worked and respondents' occupations were assigned numeric industry and occupation codes by staff at the U.S. Census Bureau.

As noted above, the CAI program included checks that alerted respondents or interviewers when an entered answer was inconsistent with a previous answer in a given module. In this way, the inconsistency could be resolved while the interview was in progress. However, not every inconsistency was resolved during the interview, and the CAI program did not include checks for every possible inconsistency that might have occurred in the data.

Therefore, the first step in processing the raw NSDUH data was logical editing of the data. Logical editing involved using data from within a respondent's record to (a) reduce the amount of item nonresponse (i.e., missing data) in interview records, including identification of items that were legitimately skipped; (b) make related data elements consistent with each other; and (c) identify ambiguities or inconsistencies to be resolved through statistical imputation procedures (see Section A.3.2).

For example, if respondents reported that they never used a given drug, the CAI logic skipped them out of all remaining questions about use of that drug. In the editing procedures, the

skipped variables were assigned codes to indicate that the respondents were lifetime nonusers. Similarly, respondents were instructed in the prescription psychotherapeutics modules (i.e., pain relievers, tranquilizers, stimulants, and sedatives) not to report the use of over-the-counter (OTC) drugs. Therefore, if a respondent's only report of lifetime use of a particular type of "prescription" psychotherapeutic drug was for an OTC drug, the respondent was logically inferred never to have been a nonmedical user of the prescription drugs in that psychotherapeutic category.

In addition, respondents could report that they were lifetime users of a drug but not provide specific information on when they last used it. In this situation, a temporary "indefinite" value for the most recent period of use was assigned to the edited recency-of-use variable (e.g., Used at some point in the lifetime LOGICALLY ASSIGNED), and a final, specific value was statistically imputed. The editing procedures for key drug use variables also involved identifying inconsistencies between related variables so that these inconsistencies could be resolved through statistical imputation. For example, if a respondent reported last using a drug more than 12 months ago and also reported first using it at his or her current age, both of those responses could not be true. In this example, the inconsistent period of most recent use was replaced with an "indefinite" value, and the inconsistent age at first use was replaced with a missing data code. These indefinite or missing values were subsequently imputed through statistical procedures to yield consistent data for the related measures, as discussed in the next section.

A.3.2 Statistical Imputation

For some key variables that still had missing or ambiguous values after editing, statistical imputation was used to replace these values with appropriate response codes. For example, a response is ambiguous if the editing procedures assigned a respondent's most recent use of a drug to "use at some point in the lifetime," with no definite period within the lifetime. In this case, the imputation procedure assigns a value for when the respondent last used the drug (e.g., in the past 30 days, more than 30 days ago but within the past 12 months, more than 12 months ago). Similarly, if a response is completely missing, the imputation procedures replace missing values with nonmissing ones.

For most variables, missing or ambiguous values are imputed in NSDUH using a methodology called predictive mean neighborhoods (PMN), which was developed specifically for the 1999 survey and used in all subsequent survey years. The PMN method offers a rigorous and flexible method that was implemented to improve the quality of estimates and allow more variables to be imputed. Some additional key reasons for implementing this method include the following: (1) the ability to use covariates to determine donors is greater than that offered in the hot-deck imputation procedure, (2) the relative importance of covariates can be determined by standard modeling techniques, (3) the correlations across response variables can be accounted for by making the imputation multivariate, and (4) sampling weights can be easily incorporated in the models. The PMN method has some similarity with the predictive mean matching method of Rubin (1986) except that, for the donor records, Rubin used the observed variable value (not the predictive mean) to compute the distance function. Also, the well-known method of nearest neighbor imputation is similar to PMN, except that the distance function is in terms of the original predictor variables and often requires somewhat arbitrary scaling of discrete variables. PMN is a combination of a model-assisted imputation methodology and a random nearest

neighbor hot-deck procedure. The hot-deck procedure within the PMN method ensures that missing values are imputed to be consistent with nonmissing values for other variables. Whenever feasible, the imputation of variables using PMN is multivariate, in which imputation is accomplished on several response variables at once. Variables requiring imputation using PMN are the core demographic variables, core drug use variables (recency of use, frequency of use, and age at first use), income, health insurance, and noncore demographic variables for work status, immigrant status, and the household roster.

In the modeling stage of PMN, the model chosen depends on the nature of the response variable Y. In the 2010 NSDUH, the models included binomial logistic regression, multinomial logistic regression, Poisson regression, and ordinary linear regression, where the models incorporated the sampling design weights.

In general, hot-deck imputation replaces an item nonresponse (missing or ambiguous value) with a recorded response that is donated from a "similar" respondent who has nonmissing data. For random nearest neighbor hot-deck imputation, the missing or ambiguous value is replaced by a responding value from a donor randomly selected from a set of potential donors. Potential donors are those defined to be "close" to the unit with the missing or ambiguous value according to a predefined function called a distance metric. In the hot-deck procedure of PMN, the set of candidate donors (the "neighborhood") consists of respondents with complete data who have a predicted mean close to that of the item nonrespondent. The predicted means are computed both for respondents with and without missing data, which differs from Rubin's method where predicted means are not computed for the donor respondent (Rubin, 1986). In particular, the neighborhood consists of either the set of the closest 30 respondents or the set of respondents with a predicted mean (or means) within 5 percent of the predicted mean(s) of the item nonrespondent, whichever set is smaller. If no respondents are available who have a predicted mean (or means) within 5 percent of the item nonrespondent, the respondent with the predicted mean(s) closest to that of the item nonrespondent is selected as the donor.

In the univariate case (where only one variable is imputed using PMN), the neighborhood of potential donors is determined by calculating the relative distance between the predicted mean for an item nonrespondent and the predicted mean for each potential donor, then choosing those means defined by the distance metric. The pool of donors is restricted further to satisfy logical constraints whenever necessary (e.g., age at first crack use must not be less than age at first cocaine use).

Whenever possible, missing or ambiguous values for more than one response variable are considered together. In this (multivariate) case, the distance metric is a Mahalanobis distance, which takes into account the correlation between variables (Manly, 1986), rather than a Euclidean distance. The Euclidean distance is the square root of the sum of squared differences between each element of the predictive mean vector for the respondent and the predictive mean vector for the nonrespondent. The Mahalanobis distance standardizes the Euclidean distance by the variance-covariance matrix, which is appropriate for random variables that are correlated or have heterogeneous variances. Whether the imputation is univariate or multivariate, only missing or ambiguous values are replaced, and donors are restricted to be logically consistent with the response variables that are not missing. Furthermore, donors are restricted to satisfy "likeness constraints" whenever possible. That is, donors are required to have the same values for variables

101

highly correlated with the response. For example, donors for the age at first use variable are required to be of the same age as recipients, if at all possible. If no donors are available who meet these conditions, these likeness constraints can be loosened. Further details on the PMN methodology are provided by Singh, Grau, and Folsom (2002).

Although statistical imputation could not proceed separately within each State due to insufficient pools of donors, information about each respondent's State of residence was incorporated in the modeling and hot-deck steps. For most drugs, respondents were separated into three "State usage" categories as follows: respondents from States with high usage of a given drug were placed in one category, respondents from States with medium usage into another, and the remainder into a third category. This categorical "State rank" variable was used as one set of covariates in the imputation models. In addition, eligible donors for each item nonrespondent were restricted to be of the same State usage category (i.e., the same "State rank") as the nonrespondent.

In the 2010 NSDUH, the majority of variables that underwent statistical imputation required less than 5 percent of their records to be logically assigned or statistically imputed. Variables for measures that are highly sensitive or that may not be known to younger respondents (e.g., family income) often have higher rates of item nonresponse. In addition, certain variables that are subject to a greater number of skip patterns and consistency checks (e.g., frequency of use in the past 12 months and past 30 days) often require greater amounts of imputation.

A.3.3 Development of Analysis Weights

The general approach to developing and calibrating analysis weights involved developing design-based weights as the product of the inverse of the selection probabilities at each selection stage. Similar to the 2008 and 2009 NSDUHs, the 2010 NSDUH used a four-stage sample selection scheme in which an extra selection stage of census tracts was added before the selection of a segment. Thus, the design-based weights, d_k, for the 2010 NSDUH incorporated an extra layer of sampling selection to reflect the sample design change. Adjustment factors, $a_k(\lambda)$, then were applied to the design-based weights to adjust for nonresponse, to poststratify to known population control totals, and to control for extreme weights when necessary. In view of the importance of State-level estimates with the 50-State design, it was necessary to control for a much larger number of known population totals. Several other modifications to the general weight adjustment strategy that had been used in past surveys also were implemented for the first time beginning with the 1999 CAI sample.

Weight adjustments were based on a generalization of Deville and Särndal's (1992) logit model. This generalized exponential model (GEM) (Folsom & Singh, 2000) incorporates unit-specific bounds $(\ell_k, u_k), k \in s,$ for the adjustment factor $a_k(\lambda)$ as follows:

$$a_k(\lambda) = \frac{\ell_k(u_k - c_k) + u_k(c_k - \ell_k)\exp(A_k x_k^/ \lambda)}{(u_k - c_k) + (c_k - \ell_k)\exp(A_k x_k^/ \lambda)},$$

where c_k are prespecified centering constants, such that $\ell_k < c_k < u_k$ and $A_k = (u_k - \ell_k) / (u_k - c_k)(c_k - \ell_k)$. The variables ℓ_k, c_k, and u_k are user-specified bounds, and λ is the column vector of p model parameters corresponding to the p covariates x. The λ-parameters are estimated by solving

$$\sum_s x_k d_k a_k(\lambda) - \tilde{T}_x = 0,$$

where $\tilde{T}_x$ denotes control totals that could be either nonrandom, as is generally the case with poststratification, or random, as is generally the case for nonresponse adjustment.

The final weights $w_k = d_k a_k(\lambda)$ minimize the distance function $\Delta(w,d)$ defined as

$$\Delta(w,d) = \sum_{k \in s} \frac{d_k}{A_k} \left\{ (a_k - \ell_k) \log \frac{a_k - \ell_k}{c_k - \ell_k} + (u_k - a_k) \log \frac{u_k - a_k}{u_k - c_k} \right\}.$$

This general approach was used at several stages of the weight adjustment process, including (1) adjustment of household weights for nonresponse at the screener level, (2) poststratification of household weights to meet population controls for various household-level demographics by State, (3) adjustment of household weights for extremes, (4) poststratification of selected person weights, (5) adjustment of responding person weights for nonresponse at the questionnaire level, (6) poststratification of responding person weights, and (7) adjustment of responding person weights for extremes.

Every effort was made to include as many relevant State-specific covariates (typically defined by demographic domains within States) as possible in the multivariate models used to calibrate the weights (nonresponse adjustment and poststratification steps). Because further subdivision of State samples by demographic covariates often produced small cell sample sizes, it was not possible to retain all State-specific covariates (even after meaningful collapsing of covariate categories) and still estimate the necessary model parameters with reasonable precision. Therefore, a hierarchical structure was used in grouping States with covariates defined at the national level, at the census division level within the Nation, at the State group within the census division, and, whenever possible, at the State level. In every case, the controls for the total population within a State and the five age groups (12 to 17, 18 to 25, 26 to 34, 35 to 49, 50 or older) within a State were maintained except that, in the last step of poststratification of person weights, six age groups (12 to 17, 18 to 25, 26 to 34, 35 to 49, 50 to 64, 65 or older) were used. Census control totals by age, race, gender, and Hispanic origin were required for the civilian, noninstitutionalized population of each State. Beginning with the 2002 NSDUH, the Population Estimates Branch of the U.S. Census Bureau has produced the necessary population estimates for the same year as each NSDUH survey in response to a special request.

Consistent with the surveys from 1999 onward, control of extreme weights through separate bounds for adjustment factors was incorporated into the GEM calibration processes for both nonresponse and poststratification. This is unlike the traditional method of winsorization in which extreme weights are truncated at prespecified levels and the trimmed portions of weights

103

are distributed to the nontruncated cases. In GEM, it is possible to set bounds around the prespecified levels for extreme weights, then the calibration process provides an objective way of deciding the extent of adjustment (or truncation) within the specified bounds. A step was added to poststratify the household-level weights to obtain census-consistent estimates based on the household rosters from all screened households; these household roster-based estimates then provided the control totals needed to calibrate the respondent pair weights for subsequent planned analyses. An additional step poststratified the selected person sample to conform to the adjusted roster estimates. This additional step takes advantage of the inherent two-phase nature of the NSDUH design. The final step poststratified the respondent person sample to external census data (defined within the State whenever possible, as discussed above).

For certain populations of interest, 2 years of NSDUH data were combined to obtain annual averages. The person-level weights for estimates based on the annual averages were obtained by dividing the analysis weights for the 2 specific years by a factor of 2.

Appendix B: Statistical Methods and Measurement

B.1 Target Population

The estimates of drug use prevalence from the National Survey on Drug Use and Health (NSDUH) are designed to describe the target population of the survey—the civilian, noninstitutionalized population aged 12 or older living in the United States. This population includes almost 98 percent of the total U.S. population aged 12 or older. However, it excludes some small subpopulations that may have very different drug use patterns. For example, the survey excludes active military personnel, who have been shown to have significantly lower rates of illicit drug use. The survey also excludes two groups that have been shown to have higher rates of illicit drug use: persons living in institutional group quarters, such as prisons and residential drug use treatment centers, and homeless persons not living in a shelter. Readers are reminded to consider the exclusion of these subpopulations when interpreting results. Appendix C describes other surveys that provide data for some of these populations.

B.2 Sampling Error and Statistical Significance

This report includes national estimates that were drawn from a set of tables referred to as "detailed tables."[7] The national estimates, along with the associated standard errors (SEs, which are the square roots of the variances), were computed for all detailed tables using a multiprocedure package, SUDAAN® Software for Statistical Analysis of Correlated Data. This software accounts for the complex survey design of NSDUH in estimating the SEs (RTI International, 2008). The final, nonresponse-adjusted, and poststratified analysis weights were used in SUDAAN to compute unbiased design-based drug use estimates.

The sampling error (i.e., the SE) of an estimate is the error caused by the selection of a sample instead of conducting a census of the population. The sampling error may be reduced by selecting a large sample and/or by using efficient sample design and estimation strategies, such as stratification, optimal allocation, and ratio estimation. The use of probability sampling methods in NSDUH allows estimation of sampling error from the survey data. SEs have been calculated using SUDAAN for all estimates presented in this report using a Taylor series linearization approach that takes into account the effects of NSDUH's complex design features. The SEs are used to identify unreliable estimates and to test for the statistical significance of differences between estimates.

B.2.1 Variance Estimation for Totals

The variances and SEs of estimates of means and proportions can be calculated appropriately in SUDAAN using a Taylor series linearization approach. Estimates of means or

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[7] This comprehensive set of tables is available at http://www.oas.samhsa.gov/WebOnly.htm#NSDUHtabs.

proportions, $\hat{p}_d$, such as drug use prevalence estimates for a domain d, can be expressed as a ratio estimate:

$$\hat{p}_d = \frac{\hat{Y}_d}{\hat{N}_d},$$

where $\hat{Y}_d$ is a linear statistic estimating the number of substance users in the domain d and $\hat{N}_d$ is a linear statistic estimating the total number of persons in domain d (both users and nonusers). The SUDAAN software package is used to calculate direct estimates of $\hat{Y}_d$ and $\hat{N}_d$ (and, therefore, $\hat{p}_d$) and also can be used to estimate their respective SEs. A Taylor series approximation method implemented in SUDAAN provides the estimate for the SE of $\hat{p}_d$.

When the domain size, $\hat{N}_d$, is free of sampling error, an appropriate estimate of the SE for the total number of substance users is

$$SE(\hat{Y}_d) = \hat{N}_d SE(\hat{p}_d).$$

This approach is theoretically correct when the domain size estimates, $\hat{N}_d$, are among those forced to match their respective U.S. Census Bureau population estimates through the weight calibration process. In these cases, $\hat{N}_d$ is not subject to a sampling error induced by the NSDUH design. Section A.3.3 in Appendix A contains further information about the weight calibration process. In addition, more detailed information about the weighting procedures for 2010 will appear in the *2010 NSDUH Methodological Resource Book*, which is in process. Until that volume becomes available, refer to the *2009 NSDUH Methodological Resource Book* (RTI International, 2011).

For estimated domain totals, $\hat{Y}_d$, where $\hat{N}_d$ is not fixed (i.e., where domain size estimates are not forced to match the U.S. Census Bureau population estimates), this formulation still may provide a good approximation if it can be assumed that the sampling variation in $\hat{N}_d$ is negligible relative to the sampling variation in $\hat{p}_d$. This is a reasonable assumption for many cases in this study.

For various subsets of estimates, the above approach yielded an underestimate of the variance of a total because $\hat{N}_d$ was subject to considerable variation. Because of this underestimation, alternatives for estimating SEs of totals were implemented. Since the 2005 NSDUH report, a "mixed" method approach has been implemented for all detailed tables to improve the accuracy of SEs and to better reflect the effects of poststratification on the variance of total estimates. This approach assigns the method of SE calculation to domains (subgroups for which the estimates were calculated) within tables so that all estimates among a select set of domains with fixed $\hat{N}_d$ were calculated using the formula above, and all other estimates were calculated directly in SUDAAN, regardless of other estimates within the same table. The set of

domains considered controlled (i.e., those with a fixed $\hat{N}_d$) was restricted to main effects and two-way interactions in order to maintain continuity between years. Domains consisting of three-way interactions may be controlled in a single year but not necessarily in preceding or subsequent years. The use of such SEs did not affect the SE estimates for the corresponding proportions presented in the same sets of tables because all SEs for means and proportions are calculated directly in SUDAAN. As a result of the use of this mixed-method approach, the SEs for the total estimates within many detailed tables were calculated differently from those in NSDUH reports prior to the 2005 report.

Table B.1 at the end of this appendix contains a list of domains with a fixed $\hat{N}_d$. This table includes both the main effects and two-way interactions and may be used to identify the method of SE calculation employed for estimates of totals. For example, Table 1.23 in the 2010 detailed tables[8] presents estimates of illicit drug use among persons aged 18 or older within the domains of gender, Hispanic origin and race, education, and current employment. Estimates among the total population (age main effect), males and females (age by gender interaction), and Hispanics and non-Hispanics (age by Hispanic origin interaction) were treated as controlled in this table, and the formula above was used to calculate the SEs. The SEs for all other estimates, including white and black or African American (age by Hispanic origin by race interaction) were calculated directly from SUDAAN. Estimates presented in this report for racial groups are for non-Hispanics. For instance, the domain for whites is actually non-Hispanic whites and is therefore a two-way interaction.

B.2.2 Suppression Criteria for Unreliable Estimates

As has been done in past NSDUH reports, direct survey estimates produced for this study that are considered to be unreliable are not shown in this report and are noted by asterisks (*) in figures containing such estimates. The criteria used for suppressing all direct survey estimates were based on the prevalence (for proportion estimates), relative standard error (RSE) (defined as the ratio of the SE over the estimate), nominal (actual) sample size, and effective sample size for each estimate. These suppression criteria for various NSDUH estimates are summarized in Table B.2 at the end of this appendix.

Proportion estimates ($\hat{p}$), or rates, within the range $[0 < \hat{p} < 1]$, and the corresponding estimated number of users were suppressed if

$$\text{RSE}[-\ln(\hat{p})] > .175 \text{ when } \hat{p} \le .5$$

or

$$\text{RSE}[-\ln(1-\hat{p})] > .175 \text{ when } \hat{p} > .5.$$

Using a first-order Taylor series approximation to estimate $\text{RSE}[-\ln(\hat{p})]$ and $\text{RSE}[-\ln(1-\hat{p})]$, the following equation was derived and used for computational purposes when developing a suppression rule dependent on effective sample size:

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[8] Available at http://www.oas.samhsa.gov/WebOnly.htm#NSDUHtabs.

$$\frac{SE(\hat{p})/\hat{p}}{-\ln(\hat{p})} > .175 \text{ when } \hat{p} \leq .5$$

or

$$\frac{SE(\hat{p})/(1-\hat{p})}{-\ln(1-\hat{p})} > .175 \text{ when } \hat{p} > .5.$$

The separate formulas for $\hat{p} \leq .5$ and $\hat{p} > .5$ produce a symmetric suppression rule; that is, if $\hat{p}$ is suppressed, $1 - \hat{p}$ will be suppressed as well (see Figure B.1 following Table B.2). When $.05 < \hat{p} < .95,$ the symmetric properties of the rule produce a local minimum of 50 at $\hat{p}$ = .2 and at $\hat{p}$ = .8. Using the minimum for the suppression rule would mean that estimates of $\hat{p}$ between .05 and .95 would be suppressed if their corresponding effective sample sizes were less than 50. Within this same interval, a local maximum of 68 is found at $\hat{p}$ = .5. To simplify requirements and maintain a conservative suppression rule, estimates of $\hat{p}$ between .05 and .95 were suppressed if they had an effective sample size below 68.

In addition, a minimum nominal sample size suppression criterion (n = 100) that protects against unreliable estimates caused by small design effects and small nominal sample sizes was employed; Table B.2 shows a formula for calculating design effects. Prevalence estimates also were suppressed if they were close to 0 or 100 percent (i.e., if $\hat{p}$ < .00005 or if $\hat{p}$ ≥ .99995).

Estimates of totals were suppressed if the corresponding prevalence rates were suppressed. Estimates of means that are not bounded between 0 and 1 (e.g., mean age at first use) were suppressed if the RSEs of the estimates were larger than .5 or if the sample size was smaller than 10 respondents.

B.2.3 Statistical Significance of Differences

This section describes the methods used to compare prevalence estimates in this report. Customarily, the observed difference between estimates is evaluated in terms of its statistical significance. Statistical significance is based on the p value of the test statistic and refers to the probability that a difference as large as that observed would occur because of random variability in the estimates if there were no difference in the prevalence estimates for the population groups being compared. The significance of observed differences in this report is reported at the .05 level. When comparing prevalence estimates, the null hypothesis (no difference between prevalence estimates) was tested against the alternative hypothesis (there is a difference in prevalence estimates) using the standard difference in proportions test expressed as

$$Z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\text{var}(\hat{p}_1) + \text{var}(\hat{p}_2) - 2\,\text{cov}(\hat{p}_1, \hat{p}_2)}},$$

where $\hat{p}_1$ = first prevalence estimate, $\hat{p}_2$ = second prevalence estimate, $\text{var}(\hat{p}_1)$ = variance of first prevalence estimate, $\text{var}(\hat{p}_2)$ = variance of second prevalence estimate, and $\text{cov}(\hat{p}_1, \hat{p}_2)$ =

covariance between $\hat{p}_1$ and $\hat{p}_2$. In cases where significance tests between years were performed, the prevalence estimate from the earlier year (e.g., 2002, 2003, 2004, 2005, 2006, 2007, 2008, or 2009) becomes the first estimate, and the prevalence estimate from the later year (e.g., 2003, 2004, 2005, 2006, 2007, 2008, 2009, or 2010) becomes the second estimate.

Under the null hypothesis, Z is asymptotically distributed as a normal random variable. Therefore, calculated values of Z can be referred to the unit normal distribution to determine the corresponding probability level (i.e., p value). Because the covariance term between the two estimates is not necessarily zero, SUDAAN was used to compute estimates of Z along with the associated p values using the analysis weights and accounting for the sample design as described in Appendix A. A similar procedure and formula for Z were used for estimated totals. Whenever it was necessary to calculate the SE outside of SUDAAN (i.e., when domains were forced by the weighting process to match their respective U.S. Census Bureau population estimates), the corresponding test statistics also were computed outside of SUDAAN.

When comparing population subgroups across three or more levels of a categorical variable, log-linear chi-square tests of independence of the subgroups and the prevalence variables were conducted using SUDAAN in order to first control the error level for multiple comparisons. If Shah's Wald F test (transformed from the standard Wald chi-square) indicated overall significant differences, the significance of each particular pairwise comparison of interest was tested using SUDAAN analytic procedures to properly account for the sample design (RTI International, 2008). Using the published estimates and SEs to perform independent t tests for the difference of proportions usually will provide the same results as tests performed in SUDAAN. However, where the significance level is borderline, results may differ for two reasons: (1) the covariance term is included in SUDAAN tests, whereas it is not included in independent t tests; and (2) the reduced number of significant digits shown in the published estimates may cause rounding errors in the independent t tests.

As part of a comparative analysis discussed in Chapter 8, prevalence estimates from the Monitoring the Future (MTF) study, sponsored by the National Institute on Drug Abuse (NIDA), were presented for recency measures of selected substances (see Tables 8.1 and 8.2). The analyses focused on prevalence estimates for 8th and 10th graders and prevalence estimates for young adults aged 19 to 24 for 2002 through 2010. Estimates for the 8th and 10th grade students were calculated using MTF data as the simple average of the 8th and 10th grade estimates. Estimates for young adults aged 19 to 24 were calculated using MTF data as the simple average of three modal age groups: 19 and 20 years, 21 and 22 years, and 23 and 24 years. Published results were not available from NIDA for significant differences in prevalence estimates between years for these subgroups, so testing was performed using information that was available.

For the 8th and 10th grade average estimates, tests of differences were performed between 2010 and the 8 prior years. Estimates for persons in grade 8 and grade 10 were considered independent, simplifying the calculation of variances for the combined grades. Across years, the estimates for 2010 involved samples independent of those in 2002, 2003, 2004, 2005, 2006, 2007, and 2008. For 2009 and 2010, however, the sample of schools overlapped 50 percent, creating a covariance in the estimates. Design effects published in Johnston et al. (2010) for adjacent and nonadjacent year testing were used.

For the 19- to 24-year-old age group, tests of differences were done assuming independent samples between years an odd number of years apart because two distinct cohorts a year apart were monitored longitudinally at 2-year intervals. This is appropriate for comparisons of 2003, 2005, 2007, and 2009 with 2010. However, this assumption results in conservative tests for comparisons of 2002, 2004, 2006, and 2008 data with 2010 data because testing did not take into account covariances associated with repeated observations from the longitudinal samples. Estimates of covariances were not available.

As an example, the difference between the 2009 and 2010 averages of prevalence estimates for persons in grades 8 and 10 can be expressed as

$$\bar{p}_2 - \bar{p}_1,$$

where $\bar{p}_1 = (\hat{p}_{11} + \hat{p}_{12})/2$; $\hat{p}_{11}$ and $\hat{p}_{12}$ are the prevalence estimates for the 8th and 10th grades, respectively, for 2009; and $\bar{p}_2$ is defined similarly for 2010. The variance of a prevalence estimate $\hat{p}$ can be written as

$$\text{var}(\hat{p}) = \tfrac{1}{n} D\hat{p}(1 - \hat{p}),$$

where n is the sample size and D is the appropriate design effect obtained from the sampling design. In the MTF study, design effects were available for comparisons between adjacent-year (i.e., 2009 vs. 2010) estimates and nonadjacent-year (i.e., 2002 vs. 2010, 2003 vs. 2010, 2004 vs. 2010, 2005 vs. 2010, 2006 vs. 2010, 2007 vs. 2010, and 2008 vs. 2010) estimates; therefore, the variance of the difference between 2 years of estimates for a particular grade can be expressed as

$$\text{var}(\hat{p}_{2i} - \hat{p}_{1i}) = D_i \left[\tfrac{1}{n_{1i}} \hat{p}_{1i}(1 - \hat{p}_{1i}) + \tfrac{1}{n_{2i}} \hat{p}_{2i}(1 - \hat{p}_{2i}) \right]; i = 1, 2,$$

where $i = 1$ indexes the 8th grade, $i = 2$ indexes the 10th grade, D_i is the design effect appropriate for comparisons between estimates of the 2 years (with separate design effect parameters for adjacent and nonadjacent years), and the n_{ji} are the sample sizes corresponding to the indexed year and grade prevalence estimates, $i, j = 1, 2$. Because the 8th and 10th grade samples were drawn independently, the variance of the difference between the 8th and 10th grade averages can be expressed as

$$\text{var}(\bar{p}_2 - \bar{p}_1) = \tfrac{1}{4}\left\{ \text{var}(\hat{p}_{21} - \hat{p}_{11}) + \text{var}(\hat{p}_{22} - \hat{p}_{12}) \right\}.$$

The test statistic can therefore be written as

$$Z = \frac{\bar{p}_2 - \bar{p}_1}{\sqrt{\text{var}(\bar{p}_2 - \bar{p}_1)}},$$

where Z is asymptotically distributed as a standard normal random variable.

B.3   Other Information on Data Accuracy

The accuracy of survey estimates can be affected by nonresponse, coding errors, computer processing errors, errors in the sampling frame, reporting errors, and other errors not due to sampling. These types of "nonsampling errors" and their impact are reduced through data editing, statistical adjustments for nonresponse, close monitoring and periodic retraining of interviewers, and improvement in quality control procedures.

Although these types of errors often can be much larger than sampling errors, measurement of most of these errors is difficult. However, some indication of the effects of some types of these errors can be obtained through proxy measures, such as response rates, and from other research studies.

B.3.1   Screening and Interview Response Rate Patterns

In 2010, respondents continued to receive a $30 incentive in an effort to maximize response rates. The weighted screening response rate (SRR) is defined as the weighted number of successfully screened households[9] divided by the weighted number of eligible households (as defined in Table B.3), or

$$SRR = \frac{\sum w_{hh} complete_{hh}}{\sum w_{hh} eligible_{hh}},$$

where w_{hh} is the inverse of the unconditional probability of selection for the household and excludes all adjustments for nonresponse and poststratification defined in Section A.3.3 of Appendix A. Of the 166,435 eligible households sampled for the 2010 NSDUH, 147,608 were screened successfully, for a weighted screening response rate of 88.8 percent (Table B.3). At the person level, the weighted interview response rate (IRR) is defined as the weighted number of respondents divided by the weighted number of selected persons (see Table B.4), or

$$IRR = \frac{\sum w_i complete_i}{\sum w_i selected_i},$$

where w_i is the inverse of the probability of selection for the person and includes household-level nonresponse and poststratification adjustments (adjustments 1, 2, and 3 in Section A.3.3 of Appendix A). To be considered a completed interview, a respondent must provide enough data to pass the usable case rule.[10] In the 147,608 screened households, a total of 85,668 sample persons were selected, and completed interviews were obtained from 68,487 of these sample persons, for a weighted IRR of 74.7 percent (Table B.4). A total of 12,216 (18.1 percent) sample persons were classified as refusals or parental refusals, 2,801 (3.3 percent) were not available or never at

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[9] A successfully screened household is one in which all screening questionnaire items were answered by an adult resident of the household and either zero, one, or two household members were selected for the NSDUH interview.

[10] The usable case rule requires that a respondent answer "yes" or "no" to the question on lifetime use of cigarettes and "yes" or "no" to at least nine additional lifetime use questions.

home, and 2,164 (3.9 percent) did not participate for various other reasons, such as physical or mental incompetence or language barrier (see Table B.4, which also shows the distribution of the selected sample by interview code and age group). Among demographic subgroups, the weighted IRR was higher among 12 to 17 year olds (84.8 percent), females (76.0 percent), blacks (80.3 percent), persons in the South (76.2 percent), and residents of nonmetropolitan areas (76.7 percent) than among other related groups (Table B.5).

The overall weighted response rate, defined as the product of the weighted screening response rate and weighted interview response rate or

$$ORR = SRR \times IRR$$

was 66.3 percent in 2010. Nonresponse bias can be expressed as the product of the nonresponse rate $(1 - R)$ and the difference between the characteristic of interest between respondents and nonrespondents in the population $(P_r - P_{nr})$. By maximizing NSDUH response rates, it is hoped that the bias due to the difference between the estimates from respondents and nonrespondents is minimized. Drug use surveys are particularly vulnerable to nonresponse because of the difficult nature of accessing heavy drug users. However, in a study that matched 1990 census data to 1990 NHSDA nonrespondents,[11] it was found that populations with low response rates did not always have high drug use rates. For example, although some populations were found to have low response rates and high drug use rates (e.g., residents of large metropolitan areas and males), other populations had low response rates and low drug use rates (e.g., older adults and high-income populations). Therefore, many of the potential sources of bias tend to cancel each other in estimates of overall prevalence (Gfroerer, Lessler, & Parsley, 1997a).

B.3.2 Inconsistent Responses and Item Nonresponse

Among survey participants, item response rates were generally very high for most drug use items. However, respondents could give inconclusive or inconsistent information about whether they ever used a given drug (i.e., "yes" or "no") and, if they had used a drug, when they last used it; the latter information is needed to identify those lifetime users of a drug who used it in the past year or past month. In addition, respondents could give inconsistent responses to items such as when they first used a drug compared with their most recent use of a drug. These missing or inconsistent responses first are resolved where possible through a logical editing process. Additionally, missing or inconsistent responses are imputed using statistical methodology. These imputation procedures in NSDUH are based on responses to multiple questions, so that the maximum amount of information is used in determining whether a respondent is classified as a user or nonuser, and if the respondent is classified as a user, whether the respondent is classified as having used in the past year or the past month. For example, ambiguous data on the most recent use of cocaine are statistically imputed based on a respondent's data for use (or most recent use) of tobacco products, alcohol, inhalants, marijuana, hallucinogens, and nonmedical use of prescription psychotherapeutic drugs. Nevertheless, editing and imputation of missing responses are potential sources of measurement error. For more information on editing and statistical imputation, see Sections A.3.1 and A.3.2 of Appendix

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[11] Prior to 2002, NSDUH was known as the National Household Survey on Drug Abuse (NHSDA).

A. Details of the editing and imputation procedures for 2010 also will appear in the *2010 NSDUH Methodological Resource Book*, which is in process. Until that volume becomes available, refer to the *2009 NSDUH Methodological Resource Book* (RTI International, 2011).

B.3.3 Data Reliability

A reliability study was conducted as part of the 2006 NSDUH to assess the reliability of responses to the NSDUH questionnaire. An interview/reinterview method was employed in which 3,136 individuals were interviewed on two occasions during 2006 generally 5 to 15 days apart; the initial interviews in the reliability study were a subset of the main study interviews. The reliability of the responses was assessed by comparing the responses of the first interview with the responses from the reinterview. Responses from the first interview and reinterview that were analyzed for response consistency were raw data that had been only minimally edited for ease of analysis and had not been imputed (see Sections A.3.1 and A.3.2 in this report).

This section summarizes the results for the reliability of selected variables related to substance use and demographic characteristics. Reliability is expressed by estimates of Cohen's kappa (κ) (Cohen, 1960), which can be interpreted according to benchmarks proposed by Landis and Koch (1977, p. 165): (a) *poor* agreement for kappas less than 0.00, (b) *slight* agreement for kappas of 0.00 to 0.20, (c) *fair* agreement for kappas of 0.21 to 0.40, (d) *moderate* agreement for kappas of 0.41 to 0.60, (e) *substantial* agreement for kappas of 0.61 to 0.80, and (f) *almost perfect* agreement for kappas of 0.81 to 1.00.

The kappa values for the lifetime and past year substance use variables (marijuana use, alcohol use, and cigarette use) all showed almost perfect response consistency, ranging from 0.82 for past year marijuana use to 0.93 for lifetime marijuana use and past year cigarette use. The value obtained for the substance dependence or abuse measure in the past year showed substantial agreement (0.67), while the substance abuse treatment variable showed almost perfect consistency in both the lifetime (0.89) and past year (0.87). The variables for age at first use of marijuana and perceived great risk of smoking marijuana once a month showed substantial agreement (0.74 and 0.68, respectively). The demographic variables showed almost perfect agreement, ranging from 0.95 for current enrollment in school to 1.00 for gender. For further information on the reliability of a wide range of measures contained in NSDUH, see the complete methodology report (Chromy et al., 2010).

B.3.4 Validity of Self-Reported Substance Use

Most substance use prevalence estimates, including those produced for NSDUH, are based on self-reports of use. Although studies generally have supported the validity of self-report data, it is well documented that these data may be biased (underreported or overreported). The bias varies by several factors, including the mode of administration, the setting, the population under investigation, and the type of drug (Aquilino, 1994; Brener et al., 2006; Harrison & Hughes, 1997; Tourangeau & Smith, 1996; Turner, Lessler, & Gfroerer, 1992). NSDUH utilizes widely accepted methodological practices for increasing the accuracy of self-reports, such as encouraging privacy through audio computer-assisted self-interviewing (ACASI) and providing assurances that individual responses will remain confidential. Comparisons using these methods within NSDUH have shown that they reduce reporting bias (Gfroerer, Eyerman, & Chromy,

2002). Various procedures have been used to validate self-report data, such as biological specimens (e.g., urine, hair, saliva), proxy reports (e.g., family member, peer), and repeated measures (e.g., recanting) (Fendrich, Johnson, Sudman, Wislar, & Spiehler, 1999). However, these procedures often are impractical or too costly for general population epidemiological studies (SRNT Subcommittee on Biochemical Verification, 2002).

A study cosponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) and the National Institute on Drug Abuse (NIDA) examined the validity of NSDUH self-report data on drug use among persons aged 12 to 25. The study found that it is possible to collect urine and hair specimens with a relatively high response rate in a general population survey, and that most youths and young adults reported their recent drug use accurately in self-reports (Harrison, Martin, Enev, & Harrington, 2007). However, there were some reporting differences in either direction, with some respondents not reporting use but testing positive, and some reporting use but testing negative. Technical and statistical problems related to the hair tests precluded presenting comparisons of self-reports and hair test results, while small sample sizes for self-reports and positive urine test results for opiates and stimulants precluded drawing conclusions about the validity of self-reports of these drugs. Further, inexactness in the window of detection for drugs in biological specimens and biological factors affecting the window of detection could account for some inconsistency between self-reports and urine test results.

B.4 Measurement Issues

B.4.1 Incidence

In epidemiological studies, incidence is defined as the number of new cases of a disease occurring within a specific period of time. Similarly, in substance use studies, incidence refers to the first use of a particular substance.

In the 2004 NSDUH national findings report (Office of Applied Studies [OAS], 2005), a new measure related to incidence was introduced and since then has become the primary focus of Chapter 5 in this national findings report series. The incidence measure is termed "past year initiation" and refers to respondents whose date of first use of a substance was within the 12 months prior to their interview date. This measure is determined by self-reported past year use, age at first use, year and month of recent new use, and the interview date.

Since 1999, the survey questionnaire has allowed for collection of year and month of first use for recent initiates (i.e., persons who used a particular substance for the first time in a given survey year). Month, day, and year of birth also are obtained directly or are imputed for item nonrespondents as part of the data postprocessing. Additionally, the computer-assisted interviewing (CAI) instrument records and provides the date of the interview. By imputing a day of first use within the year and month of first use, a specific date of first use, $t_{fu,d,i}$, can be used for estimation purposes.

Past year initiation among persons using a substance in the past year can be viewed as an indicator variable defined as follows:

$$I_{(Past\ Year\ Initiate)}(i) = \begin{cases} 1 & \text{if } (DOI_i MOI_i YOI_i - t_{fu,d,i}) \leq 365 \\ 0 & \text{otherwise} \end{cases},$$

where DOI_i, MOI_i, and YOI_i denote the day, month, and year of the interview, respectively, and $t_{fu,d,i}$ denotes the date of first use.

The calculation of this estimate does not take into account whether a respondent initiated substance use while a resident of the United States. This method of calculation has little effect on past year estimates and allows for direct comparability with other standard measures of substance use because the populations of interest for the measures will be the same (i.e., both measures examine all possible respondents and are not restricted to those initiating substance use only in the United States).

One important note for incidence estimates is the relationship between main categories and subcategories of substances (e.g., illicit drugs would be a main category, and inhalants and marijuana would be subcategories in relation to illicit drugs). For most measures of substance use, any member of a subcategory is by necessity a member of the main category (e.g., if a respondent is a past month user of a particular drug, then he or she is also a past month user of illicit drugs in general). However, this is not the case with regard to incidence statistics. Because an individual can only be an initiate of a particular substance category (main or sub) a single time, a respondent with lifetime use of multiple substances may not, by necessity, be included as a past year initiate of a main category, even if he or she were a past year initiate for a particular subcategory because his or her first initiation of other substances within the main category could have occurred earlier.

Caution also is recommended for interpreting data on the estimated numbers of past year initiates aged 26 or older because of the small numbers of respondents in this age group who report initiation of use and because of variability in the trend data. Specifically, the number of past year initiates of marijuana aged 12 or older remained unchanged between 2009 and 2010 (approximately 2.4 million in both years). However, the estimated number of past year initiates of marijuana among persons aged 26 or older in 2010 (247,000) was nearly 5 times the estimated number in 2009 (49,000) (Table B.6). In contrast, the number of past year initiates in this age group in 2008 (159,000) was not significantly different from that in 2010.

The number of past year initiates of marijuana aged 26 or older also has shown considerable variability from 2002 to 2010. Although the estimated number of past year initiates of marijuana in this age group appeared to peak at 252,000 persons in 2005, this estimate is significantly different only from the estimate in 2009. The estimate in 2009 also is significantly different from the estimates in 2004 to 2008. In most years, past year initiates of marijuana aged 26 or older primarily were aged 26 to 49. The number of past year initiates of marijuana aged 26 to 49 also increased from 2009 (49,000) to 2010 (210,000).

Unlike past year initiation of marijuana, the number of past year initiates aged 26 or older for any illicit drug was stable from 2009 (430,000) to 2010 (458,000). As for marijuana, however, the number of past year initiates of any illicit drug aged 26 to 49 increased from 2009 (201,000) to 2010 (366,000).

Small numbers of respondents aged 26 or older reported past year initiation of marijuana in 2009 and 2010 (15 and 30, respectively). The increase in the estimated number of past year initiates in this age group from 2009 to 2010 occurred because of an increase in the average analysis weights for past year initiates aged 26 or older, from 3,275 in 2009 to about 8,230 in 2010. Given that the estimated numbers of past year initiates of marijuana aged 26 or older were not significantly different between 2010 and all years from 2004 to 2008, the change from 2009 to 2010 may be an anomaly.

In addition to estimates of the number of persons initiating use of a substance in the past year, estimates of the mean age of past year first-time users of these substances are computed. Unless specified otherwise, estimates of the mean age at initiation in the past 12 months have been restricted to persons aged 12 to 49 so that the mean age estimates reported are not influenced by those few respondents who were past year initiates at age 50 or older. As a measure of central tendency, means are influenced heavily by the presence of extreme values in the data, and this constraint should increase the utility of these results to health researchers and analysts by providing a better picture of the substance use initiation behaviors among the civilian, noninstitutionalized population in the United States. This constraint was applied only to estimates of mean age at first use and does not affect estimates of incidence.

As noted in Chapter 5, the mean age at first use of marijuana in 2010 (18.4 years) among past year initiates aged 12 to 49 was higher than the average in 2009 (17.0 years) and in 2002 to 2005 (ranging from 16.8 to 17.4 years) (Figure 5.4). The mean age at first use of marijuana also decreased significantly from 2008 (17.8 years) to 2009. Similarly, the mean age at first use of any illicit drug among past year initiates aged 12 to 49 did not change significantly between consecutive years from 2004 to 2008 (ranging from 18.0 to 19.0 years). However, the mean decreased from 18.8 years in 2008 to 17.6 years in 2009, then increased to 19.1 years in 2010.

To understand the change from 2009 to 2010 in the mean age at first use of any illicit drug among past year initiates aged 12 to 49, data for the number of past year initiates were examined for all of the drugs that comprise the category of any illicit drug use. The only illicit drug category where the number of past year initiates increased significantly from 2009 to 2010 was for marijuana among persons aged 26 to 49. Among past year initiates of marijuana aged 26 to 49, the mean age at first use in 2010 was 36.3 years, which was higher than the averages in 2002 to 2006 (ranging from 29.1 to 31.2 years) (Table B.7). Although the mean age at first use in 2009 (32.1 years) appeared to be lower than the mean of 36.3 years in 2010, these two averages were not significantly different.

Nevertheless, increases in the numbers of past year initiates of marijuana and any illicit drug aged 26 to 49 between 2009 and 2010 affected the 2010 mean age at first use of marijuana and any illicit drug for the 26 to 49 and 12 to 49 age groups. Among past year initiates of any illicit drug aged 26 to 49, the mean age at first use in 2010 (37.2 years) was higher than the average in 2009 (31.7 years). However, the mean age at first use in 2010 was not significantly different from the mean ages between 2005 to 2008 (ranging from 32.9 to 35.1 years). Thus, similar to estimates for the numbers of past year initiates aged 26 to 49, the mean ages at first use in 2009 among past year initiates aged 26 to 49 for marijuana and any illicit drug may be anomalous.

Because NSDUH is a survey of persons aged 12 years old or older at the time of the interview, younger individuals in the sample dwelling units are not eligible for selection into the NSDUH sample. Some of these younger persons may have initiated substance use during the past year. As a result, past year initiate estimates suffer from undercoverage if a reader assumes that these estimates reflect all initial users instead of only for those above the age of 11. For earlier years, data can be obtained retrospectively based on the age at and date of first use. As an example, persons who were 12 years old on the date of their interview in the 2010 survey may report having initiated use of cigarettes between 1 and 2 years ago; these persons would have been past year initiates reported in the 2009 survey had persons who were 11 years old on the date of the 2009 interview been allowed to participate in the survey. Similarly, estimates of past year use by younger persons (age 10 or younger) can be derived from the current survey, but they apply to initiation in prior years and not the survey year.

To get an impression of the potential undercoverage in the current year, reports of substance use initiation reported by persons aged 12 or older were estimated for the years in which these persons would have been 1 to 11 years younger. These estimates do not necessarily reflect behavior by persons 1 to 11 years younger in the current survey. Instead, the data for the 11 year olds reflect initiation in the year prior to the current survey; the data for the 10 year olds reflect behavior between the 12th and 23rd months prior to this year's survey, and so on. A very rough way to adjust for the difference in the years that the estimate pertains to without considering changes in the population is to apply an adjustment factor to each age-based estimate of past year initiates. This adjustment factor can be based on a ratio of lifetime users aged 12 to 17 in the current survey year to the same estimate for the prior applicable survey year. To illustrate the calculation, consider past year use of alcohol. In the 2010 survey, 77,477 persons 12 years old were estimated to have initiated use of alcohol between 1 and 2 years earlier. These persons would have been past year initiates in the 2009 survey conducted on the same dates had the 2009 survey covered younger persons. The estimated number of lifetime users currently aged 12 to 17 was 8,573,937 for 2010 and 9,382,813 for 2009, indicating fewer overall initiates of alcohol use among persons aged 17 or younger in 2010. Thus, an adjusted estimate of initiation of alcohol use by persons who were 11 years old in 2010 is given by

$$(\textit{Estimated Past Year Initiatives Aged 11})_{2009} \times \frac{(\textit{Estimated Lifetime Users Aged 12 to 17})_{2010}}{(\textit{Estimated Lifetime Users Aged 12 to 17})_{2009}}.$$

This yielded an adjusted estimate of 70,798 persons 11 years old on a 2010 survey date and initiating use of alcohol in the past year:

$$77,477 * \frac{8,573,937}{9,382,813} = 70,798.$$

A similar procedure was used to adjust the estimated number of past year initiates among persons who would have been 10 years old on the date of the interview in 2008 and for younger persons in earlier years. The overall adjusted estimate for past year initiates of alcohol use by persons 11 years of age or younger on the date of the interview was 167,528, or about 3.6 percent of the estimate based on past year initiation by persons 12 or older only ($167,528 \div 4,673,215 = 0.0358$).

Based on similar analyses, the estimated undercoverage of past year initiates was 4.1 percent for cigarettes, 0.7 percent for marijuana, and 19.4 percent for inhalants. These 2010 results are comparable with undercoverage estimates presented in prior reports using data from the 2005 through 2009 surveys.

The undercoverage of past year initiates aged 11 or younger also affects the mean age at first use estimate. An adjusted estimate of the mean age at first use was calculated using a weighted estimate of the mean age at first use based on the current survey and the numbers of persons aged 11 or younger in the past year obtained in the aforementioned analysis for estimating undercoverage of past year initiates. Analysis results showed that the mean age at first use was changed from 17.2 to 16.9 for alcohol, from 17.3 to 16.9 for cigarettes, from 18.4 to 18.3 for marijuana, and from 16.3 to 15.0 for inhalants. The decreases reported above are comparable with results generated in prior survey years.

B.4.2 Illicit Drug and Alcohol Dependence and Abuse

The 2010 NSDUH CAI instrumentation included questions that were designed to measure alcohol and illicit drug dependence and abuse. For these substances,[12] dependence and abuse questions were based on the criteria in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV) (American Psychiatric Association [APA], 1994). Specifically, for marijuana, hallucinogens, inhalants, and tranquilizers, a respondent was defined as having dependence if he or she met three or more of the following six dependence criteria:

1. Spent a great deal of time over a period of a month getting, using, or getting over the effects of the substance.

2. Used the substance more often than intended or was unable to keep set limits on the substance use.

3. Needed to use the substance more than before to get desired effects or noticed that the same amount of substance use had less effect than before.

4. Inability to cut down or stop using the substance every time tried or wanted to.

5. Continued to use the substance even though it was causing problems with emotions, nerves, mental health, or physical problems.

6. The substance use reduced or eliminated involvement or participation in important activities.

For alcohol, cocaine, heroin, pain relievers, sedatives, and stimulants, a seventh withdrawal criterion was added. A respondent was defined as having dependence if he or she met three or more of seven dependence criteria. The seventh withdrawal criterion is defined by a respondent reporting having experienced a certain number of withdrawal symptoms that vary by substance (e.g., having trouble sleeping, cramps, hands tremble).

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[12] Substances include alcohol, marijuana, cocaine, heroin, hallucinogens, inhalants, pain relievers, tranquilizers, stimulants, and sedatives.

For each illicit drug and alcohol, a respondent was defined as having abused that substance if he or she met one or more of the following four abuse criteria and was determined not to be dependent on the respective substance in the past year:

1. Serious problems at home, work, or school caused by the substance, such as neglecting your children, missing work or school, doing a poor job at work or school, or losing a job or dropping out of school.

2. Used the substance regularly and then did something that might have put you in physical danger.

3. Use of the substance caused you to do things that repeatedly got you in trouble with the law.

4. Had problems with family or friends that were probably caused by using the substance and continued to use the substance even though you thought the substance use caused these problems.

Criteria used to determine whether a respondent was asked the dependence and abuse questions during the interview included responses from the core substance use questions and the frequency of substance use questions, as well as the noncore substance use questions. Missing or incomplete responses in the core substance use and frequency of substance use questions were imputed. However, the imputation process did not take into account reported data in the noncore (i.e., substance dependence and abuse) CAI modules. Very infrequently, this may result in responses to the dependence and abuse questions that were inconsistent with the imputed substance use or frequency of substance use.

For alcohol and marijuana, respondents were asked the dependence and abuse questions if they reported substance use on more than 5 days in the past year, or if they reported any substance use in the past year but did not report their frequency of past year use. Therefore, inconsistencies could have occurred where the imputed frequency of use response indicated less frequent use than required for respondents to be asked the dependence and abuse questions originally. For alcohol, for example, the final number of respondents who were past year alcohol users in 2010 was 41,597. Of these, 78 respondents (0.2 percent) were asked the alcohol dependence and abuse questions, but their final imputed frequency of use indicated that they used alcohol on 5 or fewer days in the past year.

For cocaine, heroin, and stimulants, respondents were asked the dependence and abuse questions if they reported past year use in a core drug module or past year use in the noncore special drugs module. Thus, the CAI logic allowed some respondents to be asked the dependence and abuse questions for these drugs even if they did not report past year use in the corresponding core module. For cocaine, for example, 1,535 respondents in 2010 were asked the questions about cocaine dependence and abuse because they reported past year use of cocaine or crack in the core section of the interview. Fewer than 10 additional respondents were asked these questions because they reported past year use of cocaine with a needle in the special drugs module despite not having previously reported past year use of cocaine or crack.

In 2005, two new questions were added to the noncore special drugs module about past year methamphetamine use: "Have you ever, even once, used methamphetamine?" and "Have

you ever, even once, used a needle to inject methamphetamine?" In 2006, an additional follow-up question was added to the noncore special drugs module confirming prior responses about methamphetamine use: "Earlier, the computer recorded that you have never used methamphetamine. Which answer is correct?" The responses to these new questions were used in the skip logic for the stimulant dependence and abuse questions. Based on the decisions made during the methamphetamine analysis,[13] respondents who indicated past year methamphetamine use solely from these new special drug use questions (i.e., did not indicate methamphetamine use from the core drug module or other questions in the special drugs module) were categorized as NOT having past year stimulant dependence or abuse regardless of how they answered the dependence and abuse questions. Furthermore, if these same respondents were categorized as not having past year dependence or abuse of any other substance (e.g., pain relievers, tranquilizers, or sedatives for the psychotherapeutic drug grouping), then they were categorized as NOT having past year dependence or abuse of psychotherapeutics, illicit drugs, illicit drugs or alcohol, and illicit drugs and alcohol.

In 2008, questionnaire logic for determining hallucinogen, stimulant, and sedative dependence or abuse was modified. The revised skip logic used information collected in the noncore special drugs module in addition to that collected in questions from the core drug modules. Respondents were asked about hallucinogen dependence and abuse if they additionally reported in the special drugs module using Ketamine, DMT, AMT, Foxy, or *Salvia divinorum*; stimulant dependence and abuse if they reported additionally using Adderall®; and sedative dependence and abuse if they reported additionally using Ambien®. Complying with the previous decision to exclude respondents whose methamphetamine use was based solely on responses in a noncore module from being classified as having stimulant dependence or abuse, respondents who indicated past year hallucinogen, stimulant, or sedative use based solely on these special drug questions were categorized as NOT having past year dependence or abuse of the relevant substance regardless of how they answered the dependence and abuse questions.

Respondents might have provided ambiguous information about past year use of any individual substance, in which case these respondents were not asked the dependence and abuse questions for that substance. Subsequently, these respondents could have been imputed to be past year users of the respective substance. In this situation, the dependence and abuse data were unknown; thus, these respondents were classified as not having dependence or abuse of the respective substance. However, such a respondent never actually was asked the dependence and abuse questions.

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[13] See Section B.4.8 in the *Results from the 2008 National Survey on Drug Use and Health: National Findings* (OAS, 2009) for the methamphetamine analysis decisions.

Table B.1 Demographic and Geographic Domains Forced to Match Their Respective U.S. Census Bureau Population Estimates through the Weight Calibration Process, 2010

Main Effects	Two-Way Interactions

Age Group
  12-17
  18-25
  26-34
  35-49
  50-64
  65 or Older
  All Combinations of Groups Listed Above[1]
 	
Gender
  Male
  Female
 	
Hispanic Origin
  Hispanic or Latino
  Not Hispanic or Latino
 	
Race
  White
  Black or African American
 	
Geographic Region
  Northeast
  Midwest
  South
  West
 	
Geographic Division
  New England
  Middle Atlantic
  East North Central
  West North Central
  South Atlantic
  East South Central
  West South Central
  Mountain
  Pacific
	
	Age Group × Gender
	  (e.g., Males Aged 12 to 17)
	
	Age Group × Hispanic Origin
	  (e.g., Hispanics or Latinos Aged 18 to 25)
	
	Age Group × Race
	  (e.g., Whites Aged 26 or Older)
	
	Age Group × Geographic Region
	  (e.g., Persons Aged 12 to 25 in the Northeast)
	
	Age Group × Geographic Division
	  (e.g., Persons Aged 65 or Older in New England)
	
	Gender × Hispanic Origin
	  (e.g., Not Hispanic or Latino Males)
	
	Hispanic Origin × Race
	  (e.g., Not Hispanic or Latino Whites)

[1] Combinations of the age groups (including but not limited to 12 or older, 18 or older, 26 or older, 35 or older, and 50 or older) also were forced to match their respective U.S. Census Bureau population estimates through the weight calibration process.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2010.

Table B.2 Summary of 2010 NSDUH Suppression Rules

Estimate	Suppress if:
Prevalence Rate, $\hat{p}$, with Nominal Sample Size, n, and Design Effect, *deff* $\left(deff = \dfrac{n[\text{SE}(\hat{p})]^2}{\hat{p}(1-\hat{p})} \right)$	(1) The estimated prevalence rate, $\hat{p}$, is $< .00005$ or $\geq .99995$, or (2) $\dfrac{\text{SE}(\hat{p}) \ / \ \hat{p}}{-\ln(\hat{p})} > .175$ when $\hat{p} \leq .5$, or $\dfrac{\text{SE}(\hat{p}) \ / \ (1-\hat{p})}{-\ln(1-\hat{p})} > .175$ when $\hat{p} > .5$, or (3) *Effective* $n < 68$, where *Effective* $n = \dfrac{n}{deff} = \dfrac{\hat{p}(1-\hat{p})}{\left[\text{SE}(\hat{p})\right]^2}$, or (4) $n < 100$. Note: The rounding portion of this suppression rule for prevalence rates will produce some estimates that round at one decimal place to 0.0 or 100.0 percent but are not suppressed from the tables.
Estimated Number (Numerator of $\hat{p}$)	The estimated prevalence rate, $\hat{p}$, is suppressed. Note: In some instances when $\hat{p}$ is not suppressed, the estimated number may appear as a 0 in the tables. This means that the estimate is greater than 0 but less than 500 (estimated numbers are shown in thousands).
Mean Age at First Use, $\bar{x}$, with Nominal Sample Size, n	(1) $\text{RSE}(\bar{x}) > .5$, or (2) $n < 10$.

deff = design effect; RSE = relative standard error; SE = standard error.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2010.

Figure B.1 Required Effective Sample in the 2010 NSDUH as a Function of the Proportion Estimated
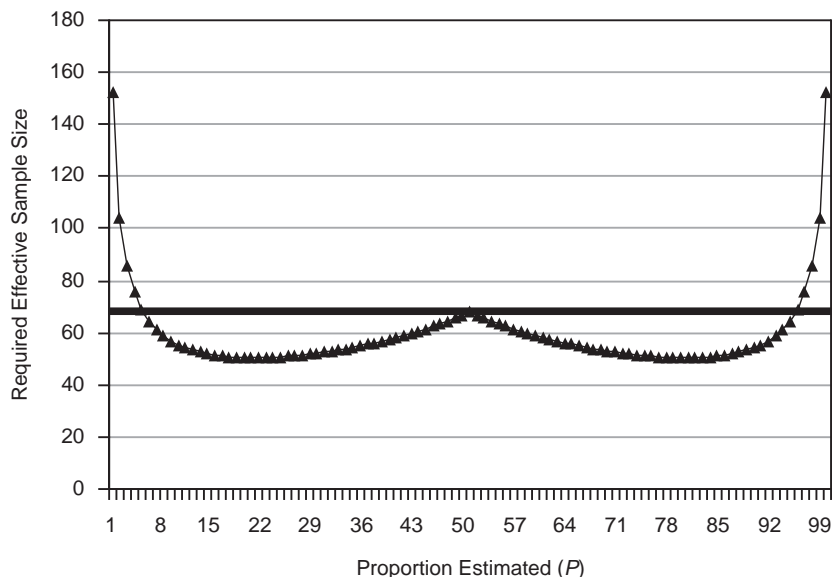
Table B.3 Weighted Percentages and Sample Sizes for 2009 and 2010 NSDUHs, by Final Screening Result Code

Final Screening Result Code	Sample Size 2009	Sample Size 2010	Weighted Percentage 2009	Weighted Percentage 2010
TOTAL SAMPLE	195,132	201,865	100.00	100.00
Ineligible Cases	33,811	35,430	17.27	17.24
Eligible Cases	161,321	166,435	82.73	82.76
INELIGIBLES	33,811	35,430	17.27	17.24
10 - Vacant	18,933	19,833	55.68	55.29
13 - Not a Primary Residence	7,279	8,348	22.15	24.41
18 - Not a Dwelling Unit	2,547	2,430	7.35	6.12
22 - All Military Personnel	347	323	1.09	0.88
Other, Ineligible[1]	4,705	4,496	13.74	13.29
ELIGIBLE CASES	161,321	166,435	82.73	82.76
Screening Complete	143,565	147,608	88.77	88.76
30 - No One Selected	84,727	88,284	51.78	52.63
31 - One Selected	31,874	32,449	19.79	19.56
32 - Two Selected	26,964	26,875	17.20	16.57
Screening Not Complete	17,756	18,827	11.23	11.24
11 - No One Home	2,951	3,115	1.76	1.79
12 - Respondent Unavailable	451	482	0.27	0.28
14 - Physically or Mentally Incompetent	419	423	0.28	0.25
15 - Language Barrier - Hispanic	107	65	0.06	0.04
16 - Language Barrier - Other	579	505	0.41	0.33
17 - Refusal	11,910	13,045	7.60	7.83
21 - Other, Access Denied[2]	1,269	1,070	0.79	0.64
24 - Other, Eligible	15	16	0.01	0.01
27 - Segment Not Accessible	0	0	0.00	0.00
33 - Screener Not Returned	23	79	0.01	0.04
39 - Fraudulent Case	27	25	0.03	0.02
44 - Electronic Screening Problem	5	2	0.00	0.00

[1] Examples of "Other, Ineligible" cases are those in which all residents lived in the dwelling unit for less than half of the calendar quarter and dwelling units that were listed in error.

[2] "Other, Access Denied" includes all dwelling units to which the field interviewer was denied access, including locked or guarded buildings, gated communities, and other controlled access situations.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2009 and 2010.

Table B.4 Weighted Percentages and Sample Sizes for 2009 and 2010 NSDUHs, by Final Interview Code

Final Interview Code	12+ Sample Size 2009	12+ Sample Size 2010	12+ Weighted Percentage 2009	12+ Weighted Percentage 2010	12-17 Sample Size 2009	12-17 Sample Size 2010	12-17 Weighted Percentage 2009	12-17 Weighted Percentage 2010	18+ Sample Size 2009	18+ Sample Size 2010	18+ Weighted Percentage 2009	18+ Weighted Percentage 2010
TOTAL	85,429	85,668	100.00	100.00	26,377	26,157	100.00	100.00	59,052	59,511	100.00	100.00
70 - Interview Complete	68,700	68,487	75.68	74.66	22,644	22,246	85.73	84.79	46,056	46,241	74.59	73.57
71 - No One at Dwelling Unit	1,252	1,170	1.56	1.39	202	202	0.71	0.65	1,050	968	1.65	1.46
72 - Respondent Unavailable	1,772	1,631	1.96	1.94	324	313	1.07	1.21	1,448	1,318	2.05	2.02
73 - Break-Off	21	21	0.03	0.03	4	4	0.02	0.01	17	17	0.03	0.04
74 - Physically/ Mentally Incompetent	847	881	1.83	1.80	208	212	0.78	0.95	639	669	1.94	1.90
75 - Language Barrier - Hispanic	155	128	0.23	0.20	7	7	0.03	0.03	148	121	0.25	0.22
76 - Language Barrier - Other	430	413	1.08	1.15	29	20	0.11	0.11	401	393	1.18	1.26
77 - Refusal	9,498	9,929	16.15	17.20	756	756	2.92	2.87	8,742	9,173	17.60	18.74
78 - Parental Refusal	2,087	2,287	0.80	0.86	2,087	2,287	8.16	8.94	0	0	0.00	0.00
91 - Fraudulent Case	6	21	0.01	0.03	1	1	0.01	0.00	5	20	0.01	0.04
Other[1]	661	700	0.67	0.72	115	109	0.46	0.43	546	591	0.69	0.76

[1] "Other" includes eligible person moved, data not received from field, too dangerous to interview, access to building denied, computer problem, and interviewed wrong household member.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2009 and 2010.

124

Table B.5 Response Rates and Sample Sizes for 2009 and 2010 NSDUHs, by Demographic Characteristics

Demographic Characteristic	Selected Persons 2009	Selected Persons 2010	Completed Interviews 2009	Completed Interviews 2010	Weighted Response Rate 2009	Weighted Response Rate 2010
TOTAL	85,429	85,668	68,700	68,487	75.68%	74.66%
AGE IN YEARS						
12-17	26,377	26,157	22,644	22,246	85.73%	84.79%
18-25	28,444	28,447	23,248	23,322	81.70%	81.39%
26 or Older	30,608	31,064	22,808	22,919	73.34%	72.21%
GENDER						
Male	42,008	42,116	33,282	33,164	74.21%	73.20%
Female	43,421	43,552	35,418	35,323	77.07%	76.03%
RACE/ETHNICITY						
Hispanic	12,779	13,003	10,502	10,715	78.70%	78.29%
White	56,052	55,890	44,601	44,005	75.14%	73.65%
Black	9,804	9,990	8,315	8,507	80.70%	80.25%
All Other Races	6,794	6,785	5,282	5,260	65.91%	67.14%
REGION						
Northeast	17,503	17,453	13,772	13,700	73.44%	73.29%
Midwest	23,827	24,139	19,133	19,301	75.97%	74.81%
South	25,560	25,597	20,976	20,769	77.39%	76.24%
West	18,539	18,479	14,819	14,717	74.50%	73.17%
COUNTY TYPE						
Large Metropolitan	38,216	38,141	30,160	29,831	73.97%	73.33%
Small Metropolitan	29,404	29,972	23,926	24,261	77.55%	75.94%
Nonmetropolitan	17,809	17,555	14,614	14,395	77.92%	76.72%

NOTE: Estimates are based on demographic information obtained from screener data and are not consistent with estimates on demographic characteristics presented in the 2009 and 2010 sets of detailed tables.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2009 and 2010.

Table B.6 Past Year Initiates of Marijuana and Any Illicit Drug among Persons Aged 26 or Older or Aged 26 to 49: Numbers in Thousands, 2002-2010

Drug/Age Group	2002	2003	2004	2005	2006	2007	2008	2009	2010
Marijuana, Aged 26 or Older	90[a]	88[a]	176	252	126	134	159	49[b]	247
Marijuana, Aged 26 to 49	90[a]	56[b]	127	122	126	121	155	49[b]	210
Any Illicit Drug, Aged 26 or Older	268[a]	324	479	579	414	326	419	430	458
Any Illicit Drug, Aged 26 to 49	251	209[a]	333	379	405	250	350	201[a]	366

*Low precision; no estimate reported.

[a] Difference between estimate and 2010 estimate is statistically significant at the .05 level.

[b] Difference between estimate and 2010 estimate is statistically significant at the .01 level.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2002-2010.

Table B.7 Mean Age at First Use of Marijuana and Any Illicit Drug among Past Year Initiates Aged 26 to 49, 2002-2010

Drug	2002	2003	2004	2005	2006	2007	2008	2009	2010
Marijuana	31.2[a]	29.6[b]	29.5[b]	30.4[b]	29.1[b]	32.4	32.6	32.1	36.3
Any Illicit Drug	34.8	32.8[a]	31.6[b]	34.0	33.9	32.9	35.1	31.7[b]	37.2

*Low precision; no estimate reported.

[a] Difference between estimate and 2010 estimate is statistically significant at the .05 level.

[b] Difference between estimate and 2010 estimate is statistically significant at the .01 level.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2002-2010.

Appendix C: Other Sources of Data

A variety of surveys and data systems other than the National Survey on Drug Use and Health (NSDUH) collect data on substance use. It is useful to consider the results of these other studies when discussing NSDUH data. This appendix briefly describes several of these other data systems and presents selected comparisons with NSDUH results. In addition, this appendix describes surveys on substance use of populations not covered by NSDUH. Descriptions of these surveys are presented in alphabetical order.

When considering the information presented here, it is important to understand the methodological differences between the different surveys and the impact that these differences could have on estimates of the presence of substance use. Several studies have compared NSDUH estimates with estimates from other studies and have evaluated how differences may have been affected by differences in survey methodology (Gfroerer, Wright, & Kopstein, 1997b; Grucza, Abbacchi, Przybeck, & Gfroerer, 2007; Hennessy & Ginsberg, 2001; Miller et al., 2004). These comparisons suggest that the goals and approaches of surveys are often different, making comparisons between them difficult. Some methodological differences that have been identified as affecting comparisons include populations covered, sampling methods, modes of data collection, questionnaires, and estimation methods.

C.1 Other National Surveys of Substance Use

Behavioral Risk Factor Surveillance System (BRFSS)

The Behavioral Risk Factor Surveillance System (BRFSS)—a State-based system of health surveys—collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. The BRFSS surveys are cross-sectional telephone surveys conducted by State health departments with technical and methodological assistance from the Centers for Disease Control and Prevention (CDC). Every year, States conduct monthly telephone surveys of noninstitutionalized adults (aged 18 or older) using random-digit-dialing methods. Since 1994, BRFSS has collected data from all 50 States, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam using a computer-assisted telephone interviewing (CATI) design. More than 350,000 adults are interviewed each year. National estimates typically are presented as medians. BRFSS includes questions on alcohol consumption and tobacco use.

NSDUH and BRFSS rates of current alcohol use have been generally similar, but NSDUH has shown consistently higher rates of binge drinking than BRFSS. The use of audio computer-assisted self-interviewing (ACASI) in NSDUH, which is considered to be more anonymous and yields higher reporting of sensitive behaviors, was offered as an explanation for the lower binge rates in BRFSS (Miller et al., 2004).

Because BRFSS uses CATI, it may yield lower reports of some sensitive behaviors than NSDUH, which employs face-to-face data collection with ACASI for questions about these

127

behaviors. Response rates also are higher in NSDUH than BRFSS, which could have resulted in differential nonresponse bias patterns in the two surveys.

For further details, see the CDC Web site at http://www.cdc.gov/brfss/.

Harvard School of Public Health's College Alcohol Study (CAS)

The Harvard School of Public Health's College Alcohol Study (CAS) is a survey of students at 4-year colleges and universities in 40 States. It examined various issues, including heavy drinking on college campuses, the role of fraternities and sororities and athletics, the relationship of State alcohol control measures and college policies to this behavior, and the roles that access to alcohol and alcohol prices play in college alcohol use. The study also examined other high-risk behaviors among college students, including tobacco and illicit drug use, unsafe sex, and violence. Supported by The Robert Wood Johnson Foundation, CAS surveyed a random sample of students at the same colleges in 1993, 1997, 1999, and 2001. The schools and students were selected to provide nationally representative samples of schools and students. In 1993, a national sample of 195 colleges was selected from the American Council on Education's list of accredited 4-year colleges by using probability proportionate to size of enrollment; of the 195 colleges, 140 agreed to participate, for an unweighted school-level response rate of 72 percent (Wechsler, Dowdall, Davenport, & Castillo, 1995). Of these 140 colleges, 130 participated in 1997, 128 in 1999, and 120 in 2001. Student-level response rates to the two-stage mail survey were 70 percent in 1993, 59 percent in 1997 and 1999, and 52 percent in 2001. The researchers provided a short survey to nonrespondents in order to better weight the data (Wechsler et al., 2002). In 2005, sampled colleges with high levels of heavy alcohol use were surveyed again.

For further details, see the CAS Web site at http://www.hsph.harvard.edu/cas/.

Monitoring the Future (MTF)

The Monitoring the Future (MTF) study is an ongoing study of substance use trends and related attitudes among America's secondary school students, college students, and adults through age 50. The study is conducted annually by the Institute for Social Research at the University of Michigan through grants awarded by the National Institute on Drug Abuse (NIDA). The MTF and NSDUH are the Federal Government's largest and primary tools for tracking youth substance use. The MTF is composed of three substudies: (a) an annual survey of high school seniors initiated in 1975; (b) ongoing panel studies of representative samples from each graduating class that have been conducted by mail since 1976; and (c) annual surveys of 8th and 10th graders initiated in 1991. Each spring, students in the 8th, 10th, and 12th grades complete a self-administered, machine-readable questionnaire during a regular class period. Approximately 50,000 students in about 420 public and private secondary schools are surveyed annually for the cross-sectional study, and approximately 2,400 persons who participated in the survey of 12th graders are followed longitudinally. The latest MTF was conducted in 2010. The MTF provides information on the use of alcohol, illicit drugs, and tobacco.

Comparisons between the MTF estimates and estimates based on students sampled in NSDUH generally have shown NSDUH substance use prevalence levels to be lower than MTF

estimates (Table C.1).[14] The lower prevalences in NSDUH may be due to more underreporting in the household setting as compared with the MTF school setting. However, the MTF does not survey dropouts or include students who were absent from school on the day of the survey. NSDUH has shown dropouts to have higher rates of illicit drug use (Gfroerer et al., 1997b). Findings presented in Chapter 8 of this report generally show parallel trends in the prevalence of substance use in NSDUH and MTF for both youths and young adults.

For further details, see the MTF Web site at http://www.monitoringthefuture.org/.

National Comorbidity Survey (NCS)

The National Comorbidity Survey (NCS) was sponsored by the National Institute of Mental Health (NIMH), NIDA, and the W.T. Grant Foundation. It was designed to measure in the general population the prevalence of the illnesses described in the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd edition revised (DSM-III-R) (American Psychiatric Association [APA], 1987). The first wave of the NCS was a household survey collecting data from 8,098 respondents aged 15 to 54 in a face-to-face interview using paper-and-pencil interviewing (PAPI). These responses were weighted to produce nationally representative estimates. A random sample of 4,414 respondents also was administered an additional module that captured information on nicotine dependence. The interviews took place between 1990 and 1992. The NCS used a modified version of the Composite International Diagnostic Interview (the University of Michigan [UM]-CIDI) to generate DSM-III-R diagnoses.

There have been several recent follow-ups to and replications of the original NCS, including a 10-year follow-up of the baseline sample (NCS-2), a replication study conducted in 2001 and 2002 with a newly recruited nationally representative sample of 9,282 respondents aged 18 or older (NCS-R), and an adolescent sample with a targeted recruitment of more than 10,000 adolescents aged 13 to 17 (NCS-A) along with their parents.

The NCS provides information on the use of alcohol, illicit drugs, and tobacco and on substance dependence or abuse. The NCS-R used an updated version of the CIDI that was designed to capture diagnoses of substance abuse or dependence using current DSM-IV criteria (APA, 1994). Interviews were conducted using computer-assisted personal interviewing (CAPI). It should be noted that in several NCS-R studies (Kessler et al., 2005a; Kessler, Chiu, Demler, Merikangas, & Walters, 2005b), the diagnosis for abuse also includes those who meet the diagnosis for dependence. In contrast, NSDUH follows DSM-IV guidelines and measures abuse and dependence separately. To make the NCS definition of abuse comparable with that of NSDUH, the rate for dependence must be subtracted from the rate for abuse. Rates of alcohol dependence or abuse and rates of illicit drug dependence or abuse were generally lower in NCS-R than in NSDUH (Kessler et al., 2003a, 2003b).

For further details, see the NCS Web site at http://www.hcp.med.harvard.edu/ncs/.

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[14] To examine estimates that are comparable with MTF data, NSDUH estimates presented in Table C.1 are based on data collected in the first 6 months of the survey year and are subset to ages 12 to 20.

National Health Interview Survey (NHIS)

The National Health Interview Survey (NHIS) is a continuous nationwide sample survey that collects data using personal household interviews through an interviewer-administered CAPI system. The survey is sponsored by the National Center for Health Statistics (NCHS) and provides national estimates of the health status and behaviors of the civilian, noninstitutionalized population, including cigarette smoking and alcohol use among persons aged 18 or older. NHIS data have been collected since 1957. In 2009, data were derived from three core components of the survey: the Family Core, which collects information from all family members aged 18 or older in each household; the Sample Adult Core, which collects information from one adult aged 18 or older in each family; and the Sample Child Core, which collects information on youths under age 18 from a knowledgeable family member in households with a child, usually a parent. In 2009, NHIS data were based on 88,446 persons in the Family Core, 27,731 adults in the Sample Adult Core, and 11,156 children in the Sample Child Core (NCHS, Division of Health Interview Statistics, 2010).

For further details, see the NCHS Web site at http://www.cdc.gov/nchs/nhis.htm.

National Longitudinal Alcohol Epidemiologic Survey (NLAES) and National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)

The National Longitudinal Alcohol Epidemiologic Survey (NLAES) was conducted in 1991 and 1992 by the U.S. Bureau of the Census for the National Institute on Alcohol Abuse and Alcoholism (NIAAA). Face-to-face, interviewer-administered interviews were conducted with 42,862 respondents aged 18 or older in the contiguous United States. Despite the survey name, the design was cross-sectional.

The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) was conducted in 2001 and 2002, also by the U.S. Bureau of the Census for NIAAA, using a computerized interviewer-administered interview. The NESARC sample was designed to make inferences for persons aged 18 or older in the civilian, noninstitutionalized population of the United States, including Alaska, Hawaii, and the District of Columbia, and including persons living in noninstitutional group quarters. NESARC was designed to be a longitudinal survey. The first wave was conducted in 2001 and 2002, with a final sample size of 43,093 respondents aged 18 or older. The second wave was conducted in 2004 and 2005 (Grant & Dawson, 2006).

The study contains comprehensive assessments of drug use, dependence, and abuse and associated mental disorders. NESARC included an extensive set of questions, based on DSM-IV criteria (APA, 1994), designed to assess the presence of symptoms of alcohol and drug dependence and abuse in persons' lifetimes and during the prior 12 months. In addition, DSM-IV diagnoses of major mental disorders were generated using the Alcohol Use Disorder and Associated Disabilities Interview Schedule-version 4 (AUDADIS-IV), which is a structured diagnostic interview that captures major DSM-IV axis I and axis II disorders.

Research indicates that (a) prevalence estimates for substance use were generally higher in NSDUH than in NESARC; (b) rates of past year substance use disorder (SUD) for cocaine and heroin use were higher in NSDUH than in NESARC; (c) rates of past year SUD for use of

alcohol, marijuana, and hallucinogens were similar between NSDUH and NESARC; and (d) prevalence estimates for past year SUD conditional on past year use were substantially lower in NSDUH for the use of marijuana, hallucinogens, and cocaine (Grucza et al., 2007). A number of methodological factors might have contributed to such discrepancies, including privacy and anonymity (questions about sensitive topics in NSDUH are self-administered, while similar questions are interviewer administered in NESARC, which may have resulted in higher use estimates in NSDUH) and differences in SUD diagnostic instrumentation (which may have resulted in higher SUD prevalence among past year substance users in NESARC).

For further details about NLAES, see Stinson et al. (1998). For an overview of NESARC findings, see Caetano (2006).

National Longitudinal Study of Adolescent Health (Add Health)

The National Longitudinal Study of Adolescent Health (Add Health) was conducted to measure the effects of family, peer group, school, neighborhood, religious institution, and community influences on health risks, such as tobacco, drug, and alcohol use. Initiated in 1994 and supported by grants from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) with cofunding from 21 other Federal agencies and foundations, Add Health is the largest, most comprehensive survey of adolescents ever undertaken.

The study began in 1994-1995 (Wave I) with an in-school questionnaire administered to a nationally representative sample of students in grades 7 to 12 and followed up with an in-home interview. In Wave I, about 90,000 students in grades 7 to 12 were surveyed at 144 schools around the United States using brief, machine-readable questionnaires during a regular class period. Interviews also were conducted with about 20,000 students and their parents in the students' homes using a combined CAPI and ACASI design. In Wave II, conducted in 1996, about 15,000 students in grades 8 to 12 were interviewed a second time in their homes. In Wave III in 2001-2002, about 15,000 of the original Add Health respondents, then aged 18 to 26, were reinterviewed to investigate how adolescent experiences and behaviors are related to outcomes during the transition to adulthood. Wave IV was conducted in 2007-2008 when the approximately 15,000 respondents were aged 24 to 32. The study provides information on the use of alcohol, illicit drugs, and tobacco.

For further details, see the Add Health Web site at http://www.cpc.unc.edu/projects/addhealth.

National Survey of Parents and Youth (NSPY)

The National Survey of Parents and Youth (NSPY) was sponsored by NIDA to evaluate the Office of National Drug Control Policy's (ONDCP's) National Youth Anti-Drug Media Campaign. NSPY was a national, household-based survey of youths aged 9 to 18 years old and their parents. Data were collected using a combination of computer-assisted interviewing technologies, including CAPI for nonsensitive portions of the survey and ACASI for the sensitive portions. The study provides information on the use of alcohol, illicit drugs, and tobacco.

NSPY employed a panel survey design with four rounds consisting of nine waves of data collection for youths between November 1999 and June 2004. Round 1 was conducted in three waves between November 1999 and June 2001 and included 8,117 youths aged 9 to 18 and 7,620 of their parents (Waves 1-3). Rounds 2, 3, and 4 were follow-up data collections, each of which was conducted in two waves. Round 2 was conducted from July 2001 to June 2002 (Waves 4-5); Round 3 was conducted from July 2002 to June 2003 (Waves 6-7); and Round 4 was conducted from July 2003 to June 2004 (Waves 8-9). Wave 9 from Round 4 was conducted between January and June 2004 with 3,143 youths and 2,381 parents.

Data from NSPY and NSDUH produced similar estimates of marijuana use for youths. For example, Wave 9 of NSPY data indicated that 16.7 percent of youths aged 12 to 18 had used marijuana in the past year, and the 2004 NSDUH yielded an estimate of 17.1 percent among this age group for this time period (Orwin et al., 2006). One explanation for the similarity in estimates is that both surveys used ACASI.

For further details about NSPY, see http://archives.drugabuse.gov/initiatives/westat/.

Partnership Attitude Tracking Study (PATS)

The Partnership Attitude Tracking Study (PATS), an annual national research study that tracks attitudes about illegal drugs, is sponsored by the Partnership for a Drug-Free America (PDFA). PATS consists of two nationally representative samples—a teenage sample for students in grades 9 through 12 and a parent sample. Adolescents complete self-administered, machine-readable questionnaires during a regular class period with their teacher remaining in the room. The latest PATS surveys of teenagers and parents were conducted in 2010. The 2010 survey of adolescents included questions about use of cigarettes, alcohol, and illicit drugs. In 2010, 2,544 teenagers were surveyed nationwide in the 22nd wave of the survey conducted since 1987, and 831 parents or caregivers of children in grades 9 to 12 were surveyed (PDFA, 2011).

In general, NSDUH estimates of substance use prevalence for adolescents are lower than PATS estimates for youths in that age group. The differences in prevalence estimates are likely to be due to the different study designs. The youth portion of PATS is a school-based survey, which may elicit more reporting of sensitive behaviors than the home-based NSDUH. In addition, the most recent PATS survey was conducted with a sample of students in the 9th through 12th grades, which was an older sample than that of the NSDUH 12- to 17-year-old sample.

For further details, see the PDFA Web site at http://www.drugfree.org/.

Youth Risk Behavior Survey (YRBS)

The Youth Risk Behavior Survey (YRBS) is a component of the CDC's Youth Risk Behavior Surveillance System (YRBSS), which measures the prevalence of six priority health risk behavior categories: (a) behaviors that contribute to unintentional injuries and violence; (b) tobacco use; (c) alcohol and other drug use; (d) sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases (STDs), including human immunodeficiency virus (HIV) infection; (e) unhealthy dietary behaviors; and (f) physical inactivity. The YRBSS includes national, State, territorial, tribal, and local school-based surveys of high school students

conducted every 2 years. The national school-based survey uses a three-stage cluster sample design to produce a nationally representative sample of students in grades 9 through 12 who attend public and private schools. The State and local surveys use a two-stage cluster sample design to produce representative samples of public school students in grades 9 through 12 in their jurisdictions. The YRBS is conducted during the spring, with students completing a self-administered, machine-readable questionnaire during a regular class period. The latest YRBS was conducted in 2009. For the 2009 national YRBS, 16,410 usable questionnaires were obtained in 158 schools.

In general, the YRBS school-based survey has found higher rates of substance use for youths than those found in NSDUH (Table C.2).[15] The lower prevalence rates in NSDUH are likely due to the differences in study design; specifically, the YRBS is school-based, which likely has resulted in higher rates of reported use as compared with the home-based NSDUH.

For further details, see the CDC Web site at http://www.cdc.gov/HealthyYouth/yrbs/.

C.2   Surveys of Populations Not Covered by NSDUH

Department of Defense (DoD) Survey of Health Related Behaviors Among Active Duty Military Personnel

The 2008 Department of Defense (DoD) Survey of Health Related Behaviors Among Active Duty Military Personnel was the 10th in a series of studies conducted since 1980. The sample consisted of 28,546 active-duty Armed Forces personnel worldwide who anonymously completed self-administered questionnaires that assessed substance use and other health behaviors. Members of the Coast Guard were included for the first time in the 2008 survey. (Bray et al., 2009). The survey provides information about the use of alcohol, illicit drugs, and tobacco.

In recent administrations of this survey, comparisons with NSDUH data have consistently shown that, even after accounting for demographic differences between the military and civilian populations, the military personnel had higher rates of heavy alcohol use than their civilian counterparts, similar rates of cigarette use, and lower rates of illicit drug use.

For further details, see the DoD Lifestyle Assessment Program (DLAP) Web site at https://dlap.rti.org/.

Surveys of Inmates in State and Federal Correctional Facilities (SISCF, SIFCF)

The Survey of Inmates in State Correctional Facilities (SISCF) and the Survey of Inmates in Federal Correctional Facilities (SIFCF) are conducted regularly using the same data collection instrument. The two surveys provide nationally representative data on State prison inmates and sentenced Federal inmates held in federally owned and operated facilities. The Survey of State Inmates was conducted in 1974, 1979, 1986, 1991, 1997, and 2004, and the Survey of Federal Inmates in 1991, 1997, and 2004. The 2004 SISCF was conducted for the Bureau of Justice

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[15] To examine estimates that are comparable with YRBS data, NSDUH estimates presented in Table C.2 are based on data collected in the first 6 months of the survey year and are subset to ages 12 to 20.

Statistics (BJS) by the U.S. Census Bureau, which also conducted the SIFCF for the BJS and the Federal Bureau of Prisons (FBOP). Both surveys provide information about current offense and criminal history, family background and personal characteristics, prior drug and alcohol use and treatment, gun possession, and prison treatment, programs, and services. The surveys are the only national source of detailed information on criminal offenders, particularly special populations such as drug and alcohol users and offenders who have mental health problems. Systematic random sampling was used to select the inmates, and the 2004 surveys of State and Federal inmates were administered through CAPI. In 2004, 14,499 State prisoners in 287 State prisons and 3,686 Federal prisoners in 39 Federal prisons were interviewed.

Prior drug use among State prisoners remained stable on all measures between 1997 and 2004, while the percentage of Federal inmates who reported prior drug use rose on most measures (Mumola & Karberg, 2006). For the first time, half of Federal inmates reported drug use in the month before their offense. In 2004, measures of drug dependence and abuse based on criteria in DSM-IV (APA, 1994) were introduced, and 53 percent of the State and 45 percent of Federal prisoners met the DSM-IV criteria for drug abuse or dependence. The survey results indicate substantially higher rates of drug use among State and Federal prisoners as compared with NSDUH's rates for the general household population.

For further details, see BJS's "All Data Collections" Web page at http://bjs.ojp.usdoj.gov/index.cfm?ty=dca.

Table C.1 Use of Specific Substances in Lifetime, Past Year, and Past Month among 8th, 10th, and 12th Graders in MTF and NSDUH: Percentages, 2009 and 2010

Drug/Current Grade Level	MTF Lifetime (2009)	MTF Lifetime (2010)	MTF Past Year (2009)	MTF Past Year (2010)	MTF Past Month (2009)	MTF Past Month (2010)	NSDUH Lifetime (2009)	NSDUH Lifetime (2010)	NSDUH Past Year (2009)	NSDUH Past Year (2010)	NSDUH Past Month (2009)	NSDUH Past Month (2010)
Marijuana												
8th Grade	15.7	17.3	11.8[b]	13.7	6.5[b]	8.0	7.4	8.3	6.0	7.0	2.9	3.0
10th Grade	32.3	33.4	26.7	27.5	15.9	16.7	24.0	27.2	18.8	21.9	10.1	10.9
12th Grade	42.0	43.8	32.8	34.8	20.6	21.4	37.3	37.6	28.9	29.9	15.9	17.1
Cocaine												
8th Grade	2.6	2.6	1.6	1.6	0.8	0.6	0.5	0.8	0.3	0.4	0.1	0.1
10th Grade	4.6	3.7	2.7	2.2	0.9	0.9	2.1	2.7	1.1	2.0	0.3	0.3
12th Grade	6.0	5.5	3.4	2.9	1.3	1.3	5.1	3.8	3.1	2.6	1.0	0.6
Inhalants												
8th Grade	14.9	14.5	8.1	8.1	3.8	3.6	10.1	10.1	4.5	4.8	1.0	1.4
10th Grade	12.3	12.0	6.1	5.7	2.2	2.0	9.9	9.3	3.3	3.9	0.6	0.7
12th Grade	9.5	9.0	3.4	3.6	1.2	1.4	8.6	7.5	2.3	3.1	0.5	0.6
Cigarettes												
8th Grade	20.1	20.0	--	--	6.5	7.1	13.4	13.4	8.5	8.4	4.6	4.2
10th Grade	32.7	33.0	--	--	13.1	13.6	28.5	29.6	19.4	21.4	11.5	12.1
12th Grade	43.6	42.2	--	--	20.1	19.2	43.7	42.1	32.2	31.6	21.4	21.9
Alcohol												
8th Grade	36.6	35.8	30.3	29.3	14.9	13.8	26.4	23.3	18.7	17.3	7.0	6.8
10th Grade	59.1	58.2	52.8	52.1	30.4	28.9	52.9	49.8	44.0	41.7	21.1	18.6
12th Grade	72.3	71.0	66.2	65.2	43.5[a]	41.2	67.9	69.2	59.4	60.2	36.7	33.8

MTF = Monitoring the Future; NSDUH = National Survey on Drug Use and Health.

-- Not available.

NOTE: NSDUH data have been drawn from January to June of each survey year and subset to persons aged 12 to 20 to be more comparable with MTF data.

[a] Difference between estimate and 2010 estimate is statistically significant at the .05 level.
[b] Difference between estimate and 2010 estimate is statistically significant at the .01 level.

Sources: National Institute on Drug Abuse, Monitoring the Future Study, University of Michigan, 2009 and 2010. SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2009 and 2010 (January-June).

Table C.2 Lifetime and Past Month Substance Use among Students in Grades 9 to 12 in YRBS and NSDUH: Percentages, 2005, 2007, and 2009

Substance/ Period of Use	YRBS (2005)	YRBS (2007)	YRBS (2009)	NSDUH (2005)	NSDUH (2007)	NSDUH (2009)
Marijuana						
Lifetime Use	38.4	38.1	36.8	28.1	26.3	27.6
Past Month Use	20.2	19.7	20.8	11.2	10.9	11.9
Cocaine						
Lifetime Use	7.6[a]	7.2	6.4	3.8[a]	3.8[b]	2.8
Past Month Use	3.4	3.3	2.8	0.8[a]	0.6	0.4
Ecstasy						
Lifetime Use	6.3	5.8	6.7	2.8	2.9	3.2
Past Month Use	--	--	--	0.4[a]	0.4[a]	0.8
Inhalants						
Lifetime Use	12.4	13.3[a]	11.7	12.0[a]	10.7	10.1
Past Month Use	--	--	--	1.1[a]	1.1[b]	0.6
Cigarettes						
Lifetime Use	54.3[b]	50.3[a]	46.3	39.0[b]	35.1	33.5
Past Month Use	23.0[a]	20.0	19.5	17.0[b]	15.4	14.7
Alcohol						
Lifetime Use	74.3	75.0	72.5	57.5	57.5	56.1
Past Month Use	43.3	44.7[a]	41.8	26.0	26.3	25.7

NSDUH = National Survey on Drug Use and Health; YRBS = Youth Risk Behavior Survey.
-- Not available.

NOTE: NSDUH data have been drawn from January to June of each survey year and subset to persons aged 12 to 20 to be more comparable with YRBS data. Statistical tests for the YRBS were conducted using the "Youth Online" tool (see http://www.cdc.gov/HealthyYouth/yrbs/). Results of testing for statistical significance in this table may differ from published YRBS reports of change.

[a] Difference between estimate and 2009 estimate is statistically significant at the .05 level.
[b] Difference between estimate and 2009 estimate is statistically significant at the .01 level.

Sources: Centers for Disease Control and Prevention, Youth Risk Behavior Survey, 2005, 2007, and 2009. SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, January-June for 2005, 2007, and 2009.

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Appendix E: List of Contributors

This National Survey on Drug Use and Health (NSDUH) report was prepared by the Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services (HHS), and by RTI International (a trade name of Research Triangle Institute), Research Triangle Park, North Carolina. Work by RTI was performed under Contract No. HHSS283200800004C.

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