Results from the 2013 National Survey on Drug Use and Health: Mental Health Findings

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Highlights

- In 2013, an estimated 43.8 million adults aged 18 or older in the United States had any mental illness (AMI) in the past year. This represents 18.5 percent of all adults in this country. The percentage of adults with AMI in 2013 was similar to the estimate in 2012.

- Among adults aged 18 or older in 2013, 10.0 million (4.2 percent) had serious mental illness (SMI) in the past year. The percentage of adults with past year SMI in 2013 was higher than in 2008 (3.7 percent) and 2009 (3.7 percent) and was similar to the percentages in 2010 (4.1 percent), 2011 (3.9 percent), and 2012 (4.1 percent).

- The percentage of adults in 2013 with AMI in the past year was highest for adults aged 26 to 49 (21.5 percent), followed by those aged 18 to 25 (19.4 percent), then by those aged 50 or older (15.3 percent). Similarly, the percentage of adults with past year SMI in 2013 was highest among adults aged 26 to 49 (5.3 percent), followed by those aged 18 to 25 (4.2 percent), then by those aged 50 or older (3.2 percent).

- Women aged 18 or older were more likely than men aged 18 or older to have past year AMI (22.3 vs. 14.4 percent) and SMI (4.9 vs. 3.5 percent) in 2013.

- Among the 43.8 million adults aged 18 or older in 2013 with AMI in the past year, 17.5 percent (7.7 million adults) met criteria for a substance use disorder (i.e., illicit drug or alcohol dependence or abuse). Among the 10.0 million adults with SMI in the past year, 23.1 percent also had past year substance dependence or abuse. In comparison, 6.5 percent of adults who did not have mental illness in the past year met criteria for a substance use disorder.

- In 2013, an estimated 9.3 million adults (3.9 percent) aged 18 or older had serious thoughts of suicide in the past year. The percentage remained stable between 2008 (3.7 percent) and 2013.

- Among adults aged 18 or older in 2013, 2.7 million (1.1 percent) made suicide plans in the past year, and 1.3 million (0.6 percent) attempted suicide in the past year.

- Adults aged 18 or older in 2013 with a past year substance use disorder were more likely than those without substance dependence or abuse to have serious thoughts of suicide in the past year (11.4 vs. 3.2 percent). Adults with a substance use disorder also were more likely to make suicide plans compared with adults without substance dependence or abuse (4.2 vs. 0.9 percent) and were more likely to attempt suicide compared with adults without substance dependence or abuse (2.3 vs. 0.4 percent).

- In 2013, 34.6 million adults (14.6 percent of the population aged 18 or older) received mental health care during the past 12 months. The number and the percentage were similar to those in 2012 (34.1 million adults and 14.5 percent).

- Between 2002 and 2013, the percentage of adults using outpatient mental health services in the past year declined from 7.4 to 6.6 percent, and the percentage using prescription medication for mental health issues increased from 10.5 to 12.5 percent.

- Among the 43.8 million adults aged 18 or older with AMI in 2013, 19.6 million (44.7 percent) received mental health services in the past year. Among the 10.0 million adults with SMI in 2013, 6.9 million (68.5 percent) received mental health services in the past year.

- Among the 7.7 million adults aged 18 or older in 2013 who had AMI in the past year and a past year substance use disorder, 47.8 percent received substance use treatment at a specialty facility or mental health care in the past year, including 7.7 percent who received both mental health care and specialty substance use treatment, 37.2 percent who received mental health care only, and 2.8 percent who received specialty substance use treatment only.

- Among the 2.3 million adults aged 18 or older in 2013 with both past year SMI and a substance use disorder in the past year, 69.2 percent received substance use treatment at a specialty facility or mental health care in that time period, including 12.8 percent who received both mental health care and specialty substance use treatment, 52.8 percent who received mental health care only, and 3.6 percent who received specialty substance use treatment only.

- In 2013, there were 2.6 million youths aged 12 to 17 (10.7 percent) who had major depressive episode (MDE) during the past year.

- Among youths aged 12 to 17 in 2013, females were more likely than males to have past year MDE (16.2 vs. 5.3 percent).

- Among youths aged 12 to 17 in 2013 who had past year MDE, 33.2 percent used illicit drugs in the past year compared with 15.1 percent among youths who did not have past year MDE.

- In 2013, youths aged 12 to 17 with MDE in the past year were more likely than those without MDE to have a substance use disorder in the past year (13.9 vs. 4.1 percent).

- In 2013, 3.3 million youths aged 12 to 17 (13.6 percent) received treatment or counseling for problems with emotions or behavior in a specialty mental health setting (inpatient or outpatient care) in the past 12 months. The percentage in 2013 was higher than those in 2007 through 2012 (ranging from 12.0 to 12.7 percent).

- The most common reason that youths aged 12 to 17 gave for receiving specialty mental health services in 2013 was feeling depressed (50.2 percent).

1. Introduction

This report presents results pertaining to mental health from the 2013 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. This report presents national estimates of past year mental health issues and past year mental health service utilization for youths aged 12 to 17 and adults aged 18 or older. Among adults, estimates presented include percentages and numbers of individuals with any mental illness (AMI), serious mental illness (SMI), suicidal thoughts and behavior, major depressive episode (MDE), treatment for depression (among adults with MDE), and mental health service utilization. Estimates presented in this report for youths include MDE, treatment for depression (among youths with MDE), and mental health service utilization. Measures related to the co-occurrence of mental health issues with substance use or with substance use disorders also are presented for both adults and youths. The report focuses mainly on trends between 2012 and 2013 and differences across population subgroups in 2013.

Summary of NSDUH

NSDUH is the primary source of statistical information on the use of illegal drugs, alcohol, and tobacco by the civilian, noninstitutionalized population of the United States aged 12 years or older. The survey also includes several modules of questions that focus on mental health issues. 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). Data collection and analysis are conducted under contract with RTI International.[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 people who do not use shelters, military personnel on active duty, and residents of institutional group quarters, such as jails and hospitals. Appendix C describes data sources that provide estimates of mental health indicators for populations outside of 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 about other sensitive topics, including mental health issues. Less sensitive items are administered by interviewers using computer-assisted personal interviewing (CAPI).

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

Consistent with previous years, the 2013 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) are designated as large sample States (California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas) and have a sample size of about 3,600 each. For the remaining 42 States and the District of Columbia, the sample size is about 900 per State. In all States and the District of Columbia, 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 160,325 addresses, and 67,838 completed interviews were obtained. The survey was conducted from January through December 2013. Weighted response rates for household screening and for interviewing were 83.9 and 71.7 percent, respectively. See Appendix B for more details.

Limitations on Trend Measurement

Several important changes were made to the adult mental health section in the 2008 NSDUH questionnaire. These changes provide valuable new data on mental health, but they also affect the comparability of some of the measures that have been collected in NSDUH since 2004. A brief summary of the changes and their impact is provided below.

From 2004 to 2007, NSDUH collected data for adults aged 18 or older on lifetime and past year MDE. The survey also included the Kessler-6 (K6) distress scale that was used to generate estimates of serious psychological distress (SPD) in the past 12 months. However, the K6 scale does not directly measure the presence of a diagnosable mental, behavioral, or emotional disorder, nor does it capture information on functional impairment (i.e., difficulties that substantially interfere with or limit role functioning in one or more major life activities). Both of these measures are needed to determine whether a respondent can be categorized as having SMI or other categories of mental illness defined by levels of functional impairment (i.e., low/mild mental illness or moderate mental illness).

To address SAMHSA's need for estimates of SMI and AMI, as well as data on suicidal thoughts and behavior, CBHSQ modified the NSDUH adult mental health items in 2008 to obtain these data. Items were added that assessed functional impairment due to mental illness (abbreviated World Health Organization Disability Assessment Schedule [WHODAS]; Novak, 2007) and that assessed suicidal thoughts and behavior among adults. In 2008, CBHSQ also expanded the K6 questions to ask about the past 30 days (the time frame for which the K6 was originally designed). In addition, as part of the Mental Health Surveillance Study (MHSS), a clinical follow-up study was initiated in which a randomly selected subsample of adults (about 1,500 in 2008, 2011, and 2012, and 500 in 2009 and 2010) who had completed the NSDUH interview was administered a standard clinical interview by mental health clinicians via paper and pencil over the telephone to determine respondents' mental illness status; the clinical interview was used as a "gold standard" for measuring mental illness among adults. Using both the clinical interview and the NSDUH CAI data for the respondents who completed the clinical interview, statistical models were developed that then were applied to data from all adult respondents who had completed the NSDUH CAI interviews (regardless of whether they had

clinical interview data) to produce estimates of mental illness among the adult civilian, noninstitutionalized population. Subsequently, using the entire clinical interview sample of approximately 5,000 interviews that were collected in 2008 to 2012, CBHSQ developed a more accurate statistical model for adults. This revised model incorporated the NSDUH respondent's age, past year suicidal thoughts, past year MDE, and the variables that were specified in the 2008 model (i.e., the K6 and WHODAS). Results for SMI and AMI from this revised model were closer to the direct estimates of SMI and AMI from the clinical interviews in the MHSS than the previous model's results were, especially for young adults aged 18 to 25. See Section B.4.3 in Appendix B of this report for a more complete discussion of the revised 2012 model and estimates.

Updated estimates of AMI and SMI for 2008 to 2011 were produced using this revised model and have been presented starting with the 2012 mental health findings report and the accompanying mental health detailed tables.[2] These revised 2008 to 2011 NSDUH estimates of AMI and SMI are not comparable with 2008 to 2011 estimates of AMI and SMI shown in many NSDUH reports that were published prior to the 2012 mental health findings report. Other mental health estimates for adults, such as MDE or suicidal thoughts and behaviors, were not affected.

Although the same information on MDE has been collected since 2004, the 2008 questionnaire changes for other mental health measures caused discontinuities in trends for MDE among adults; see Sections B.4.2 and B.4.4 in Appendix B for more information. A statistical adjustment to ensure comparability between past year and lifetime MDE estimates from 2005 onward was applied to estimates of lifetime and past year MDE that were affected by the 2008 questionnaire changes. This allowed trends in MDE among adults for 2005 onward to be included in reports since 2010. Because of these adjustments, estimates of past year and lifetime MDE for 2005 to 2008 in this report may differ from estimates published in NSDUH reports prior to 2010. Questionnaire changes in 2008 did not affect comparability of estimates based on adult mental health service utilization questions; therefore, estimates of mental health service utilization presented in this report reflect trends from 2002 to 2013.

The 2008 questionnaire changes did not affect youth MDE or the youth mental health service utilization items. In 2009, changes were made in the youth mental health utilization module; however, analyses determined that the changes did not affect estimates of MDE among youths in 2009 (see Section B.4.2 in Appendix B). The discussion of estimates for these measures in this report includes comparisons with prior years' data for youths.

The calculation of NSDUH person-level weights includes a calibration step that results in weights that are consistent with population control totals obtained from the U.S. Census Bureau (see Section A.3.3 in Appendix A). These control totals are based on the most recently available decennial census; the Census Bureau updates these control totals annually to account for population changes after the census. For the analysis weights in the 2002 through 2010 NSDUHs, the control totals were derived from the 2000 census data; starting with the 2011 NSDUH weights, the control totals were based on data from the 2010 census. This shift to the

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[2] This comprehensive set of tables is referred to as "mental health detailed tables" and is available at http://www.samhsa.gov/data/. The comprehensive set of tables for the 2008 NSDUH is referred to as "detailed tables" and also is available at this location.

2010 census data could affect comparisons between mental health estimates for 2011 and onward and those from prior years. An analysis of the impact of this change in 2011 NSDUH weights showed that estimates of the number of substance users for some demographic groups were substantially affected, but that the percentages of substance users within these groups were unaffected. Mental health estimates were affected relatively less, and the effects were restricted to certain estimates and demographic subgroups (CBHSQ, 2012b). A portion of this analysis was repeated using revised SMI and AMI estimates for 2010 and 2011, and the results were similar to the 2011 analysis. This change in control totals does not affect comparisons of estimates between 2012 and 2013 because the control totals for each of these years were based on the 2010 census. However, some trends between 2013 and years prior to 2011 may need to be interpreted with caution because of the differences in how the control totals for each of these years were developed.

Format of Report and Data Presentation

Estimates presented in this report—including those mentioned previously for AMI and SMI—are based on data from the 2013 mental health detailed tables. In addition, the tables are accompanied by a glossary that covers key definitions used in this report and the mental health detailed tables.[3] This report has separate chapters that discuss the national findings of mental health issues and service utilization for adults aged 18 or older, suicidal thoughts and behaviors among adults, MDE and service utilization for youths aged 12 to 17, and mental health issues that co-occurred with substance use or with substance use disorders for both adults and youths. Technical appendices in this report describe the survey (Appendix A), provide technical details on the statistical methods and measurement (Appendix B), discuss other sources of related data (Appendix C), and list the references cited in the report (Appendix D). A list of contributors to the production of this report also is provided (Appendix E).

Text, figures, and mental health detailed tables present estimates for the population in terms of both the number of individuals and the percentage of the population. Figures on mental health issues show estimates for the 12-month period prior to the survey (also referred to as the past year). Figures in which estimates are presented by year have footnotes indicating whether the 2013 estimates are significantly different from the 2012 or earlier estimates.

During regular data collection and processing checks for the 2011 NSDUH, data errors were identified. These errors affected the data for Pennsylvania (2006 to 2010) and Maryland (2008 and 2009). Data and estimates for 2011 and subsequent years were not affected, including those for 2013. The errors had minimal impact on the national estimates. The only estimates appreciably affected in this report and the mental health detailed tables were estimates for the Northeast region. Cases with erroneous data were removed from data files, and the remaining cases were reweighted to provide representative estimates. Therefore, some estimates for 2010 and other prior years in the 2013 mental health findings report and the 2013 mental health detailed tables will differ from corresponding estimates found in some previous reports and tables. Further information is available in Section B.3.4 in Appendix B of this report.

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[3] The glossary is available with the mental health detailed tables for the 2013 NSDUH at
http://www.samhsa.gov/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 are suppressed and 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 percentage" means that the percentage among whites was higher than the percentage among all nonsuppressed racial/ethnic subgroups, but not necessarily higher than the percentage 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, 1997). Because respondents could choose more than one racial group, a "two or more races" category is included for people 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 races" 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.

Other NSDUH Reports and Data

A first glimpse of the NSDUH substance use and mental health data was provided in September 2014 through a short report on SAMHSA's Web site at http://www.samhsa.gov/data/population-data-nsduh/reports?tab=36. A detailed report on substance use data was released in a separate report in September 2014: *Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings* (CBHSQ, 2014d). The 2012-2013 NSDUH State-level estimates for substance use and mental health are scheduled to be released in late 2014. Other reports using the 2013 NSDUH data and focusing on specific topics of interest will be made available on SAMHSA's Web site. The mental health detailed tables described previously are also available through the Internet at http://samhsa.gov/data/. The tables are organized into sections on mental health topics among adults and youths. Most tables are provided in several parts, showing population estimates (e.g., numbers of individuals with mental health issues), mental health estimates (e.g., percentages of individuals with mental health issues), and standard errors of all nonsuppressed estimates. Additional methodological information on NSDUH, including the questionnaire, is available electronically at the same Web address.

Descriptive reports and in-depth analytic reports focusing on specific issues or populations and methodological information on NSDUH, including the questionnaire, are available at http://samhsa.gov/data/. In addition, CBHSQ makes public use data files available through the Substance Abuse and Mental Health Data Archive (SAMHDA) at http://www.datafiles.samhsa.gov. Currently, files are available from the 1979 to 2012 surveys. The 2013 NSDUH public use file will be available by the end of 2014. CBHSQ also makes confidential restricted-use data available in two ways. Restricted-use data, including State codes and other detailed variables, can be included in tables as part of the online Restricted-use Data Analysis System (R-DAS). In the R-DAS, data are not available for downloading, but estimates can be generated by State and other restricted variables that are specified by the data user. Estimates that are generated by the R-DAS do not require any further review for protection of respondent confidentiality. CBHSQ also makes restricted-use microdata files available through a data portal on the SAMHDA Web site. More details on both of these programs are available at http://www.datafiles.samhsa.gov.

2. Mental Illness and Mental Health Service Utilization among Adults

This chapter presents findings from the National Survey on Drug Use and Health (NSDUH) on past year mental illness in the United States, including the percentage of adults aged 18 or older with any mental illness (AMI), serious mental illness (SMI), and major depressive episode (MDE). In addition, this chapter includes estimates of the percentages of adults who received mental health services in the past year overall and among those with AMI, SMI, and MDE. The chapter also presents data on the percentage of adults who had a perceived unmet need for mental health services in the past year.

Any Mental Illness

AMI among adults aged 18 or older is defined as currently or at any time in the past 12 months having had a diagnosable mental, behavioral, or emotional disorder (excluding developmental and substance use disorders) of sufficient duration to meet diagnostic criteria specified within the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association [APA], 1994).

In order to generate estimates of mental illness in the United States, the Substance Abuse and Mental Health Services Administration (SAMHSA) designed and implemented the Mental Health Surveillance Study (MHSS). Each year from 2008 to 2012, a subsample of adults was selected from the main study to participate in a follow-up telephone interview that obtained a detailed mental health assessment administered by a trained mental health clinician. The MHSS interview used the Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Non-patient Edition (SCID-I/NP) (First, Spitzer, Gibbon, & Williams, 2002). A prediction model created from the clinical interview data that were collected from 2008 to 2012 was applied to data from the 2008 to 2013 NSDUHs to produce estimates of AMI for the entire NSDUH adult sample in these years. Indicators in the prediction model of mental illness that was assessed in the clinical sample included serious psychological distress, functional impairment, MDE, serious thoughts of suicide, and age.

Adults who were classified as not having mental illness in the past 12 months based on the prediction model may include adults who had disorders or conditions that were not assessed in the MHSS clinical interviews, such as developmental disorders (e.g., intellectual disability and autism spectrum disorders, including Asperger's disorder) and other disorders that are typically identified in childhood (e.g., attention-deficit/hyperactivity disorder). As noted previously, substance use disorders also were not included in the definition of AMI. Nevertheless, adults who had any of these other conditions would be classified as not having mental illness only in instances when they did not have any of the disorders that *were* included in the assessment for

AMI.[4] Additional details about the prediction model are provided in Section B.4.3 of Appendix B.

- In 2013, an estimated 43.8 million adults aged 18 or older in the United States had AMI in the past year. This represents 18.5 percent of all adults in this country (Figure 2.1). The percentage of adults with AMI in 2013 was similar to the estimate in 2012.

- The percentage of adults in 2013 with AMI in the past year was highest for adults aged 26 to 49 (21.5 percent), followed by those aged 18 to 25 (19.4 percent), then by those aged 50 or older (15.3 percent) (Figure 2.1).

- Adult women in 2013 were more likely than adult men to have AMI in the past year (22.3 vs. 14.4 percent) (Figure 2.1). Among all adult age groups (i.e., 18 to 25, 26 to 49, 50 or older), females also were more likely than their male counterparts to have AMI in the past year.

Figure 2.1 Any Mental Illness in the Past Year among Adults Aged 18 or Older, by Age and Gender: 2013

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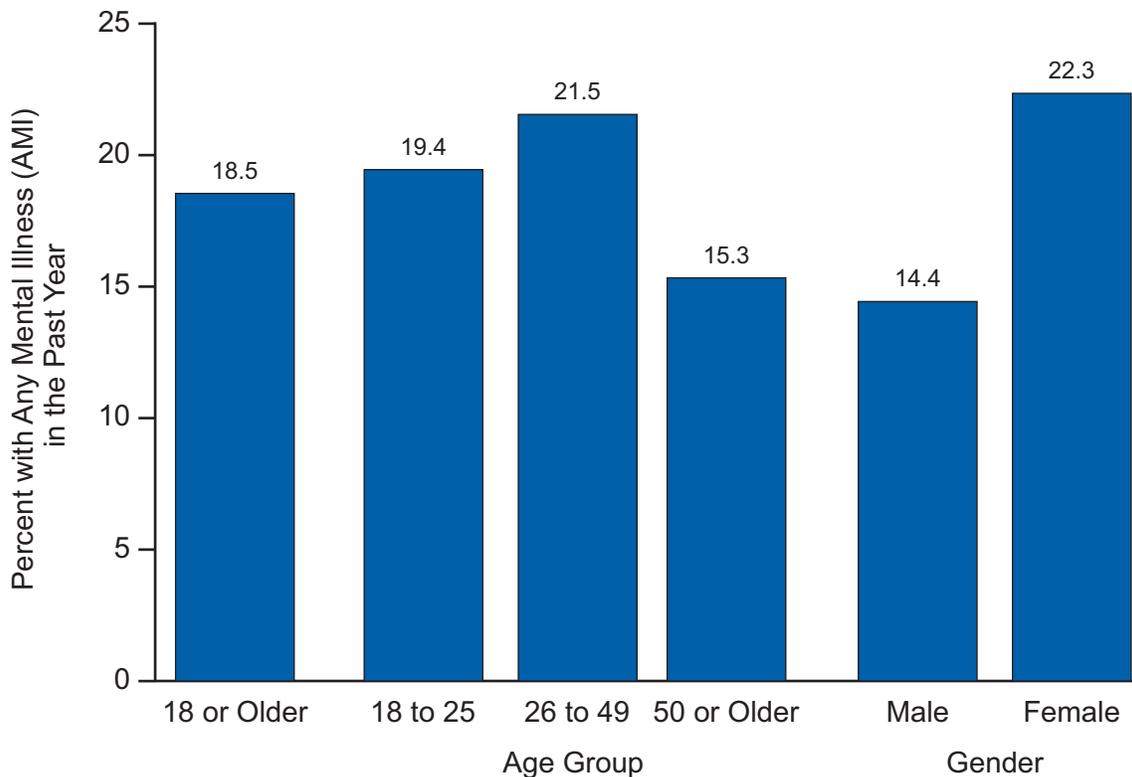
[4] Given that estimates of AMI were based on a model, misclassification bias also could affect estimates of AMI. However, misclassification bias based on the 2012 prediction model has been demonstrated to be minimal for both overall and subgroup estimates of AMI (Center for Behavioral Health Statistics and Quality, 2014a).

- In 2013, the percentage of adults aged 18 or older with past year AMI varied by race/ethnicity. The percentages were 12.3 percent among Asians, 14.4 percent among Native Hawaiians or Other Pacific Islanders, 16.9 percent among Hispanics, 16.9 percent among blacks, 19.3 percent among whites, 26.0 percent among American Indians or Alaska Natives, and 28.1 percent among adults reporting two or more races.

- In 2013, the percentage of adults with past year AMI was higher among unemployed adults (22.8 percent) and adults who were employed part time (20.3 percent) than among those who were employed full time (15.4 percent).

- The percentage of adults in 2013 with AMI in the past year was highest among those with a family income that was below the Federal poverty level (26.1 percent), followed by those with a family income at 100 to 199 percent of the Federal poverty level (20.9 percent), then by adults with a family income at 200 percent or more of the Federal poverty level (16.0 percent).

- In 2013, the percentage of adults who had AMI in the past year was higher among those who were covered by Medicaid or the Children's Health Insurance Program (CHIP)[5] (30.3 percent) than among those with no health insurance (20.8 percent), those with private health insurance (16.0 percent), and those with other forms of health insurance (17.9 percent). Having other forms of health insurance is defined as having Medicare, CHAMPUS, TRICARE, CHAMPVA, the VA, military health care, or any other type of health insurance.

- The percentages of adults in 2013 with AMI in the past year were similar among those who had not completed high school (20.0 percent) and those with some college but no degree (20.2 percent), but were higher than the percentages among adults with a high school degree but no further education (17.0 percent) and those with a college degree (17.7 percent).

- The percentage of adults in 2013 with past year AMI was 32.3 percent among those on probation in the past year, which was higher than that among adults who were not on probation in the past year (18.2 percent). Similarly, among adults on parole or supervised release in the past year, the percentage having AMI was 36.6 percent, which was higher than the percentage having AMI among adults who were not on parole or supervised release in the past year (18.3 percent).

Serious Mental Illness

Public Law No. 102-321, the Alcohol, Drug Abuse, and Mental Health Administration Reorganization Act of 1992, established a block grant for States within the United States to fund community mental health services for adults with SMI. The law required States to include estimates of percentages of adults with SMI in their annual applications for block grant funds. This legislation also required SAMHSA to develop a definition of SMI and develop a method for measuring and providing estimates of SMI. SAMHSA defined SMI as adults aged 18 or older who currently or at any time in the past year have had a diagnosable mental, behavioral, or

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[5] The estimate of AMI for adults who were covered either by Medicaid or CHIP refers to adults aged 18 or older who were covered by Medicaid or those aged 18 or 19 who were covered by CHIP.

emotional disorder (excluding developmental and substance use disorders) of sufficient duration to meet diagnostic criteria specified within DSM-IV (APA, 1994) that has resulted in serious functional impairment, which substantially interferes with or limits one or more major life activities.

In order to generate estimates of SMI in the United States, SAMHSA designed and implemented the MHSS. The procedures for the MHSS were briefly described in the previous section on "Any Mental Illness" and also are described in greater detail in Section B.4.3 of Appendix B. Similar to the AMI estimates, the prediction model created from the clinical interview data that were collected from 2008 to 2012 was applied to data from the 2008 to 2013 NSDUHs to produce estimates of SMI for the entire NSDUH adult sample in these years.

- In 2013, there were an estimated 10.0 million adults aged 18 or older in the United States with SMI in the past year. This represented 4.2 percent of all adults in this country in 2013 (Figure 2.2). The percentage of adults with past year SMI in 2013 was higher than in 2008 (3.7 percent) and 2009 (3.7 percent) and was similar to the percentages in 2010 (4.1 percent), 2011 (3.9 percent), and 2012 (4.1 percent).

Figure 2.2 Serious Mental Illness in the Past Year among Adults Aged 18 or Older, by Age and Gender: 2013
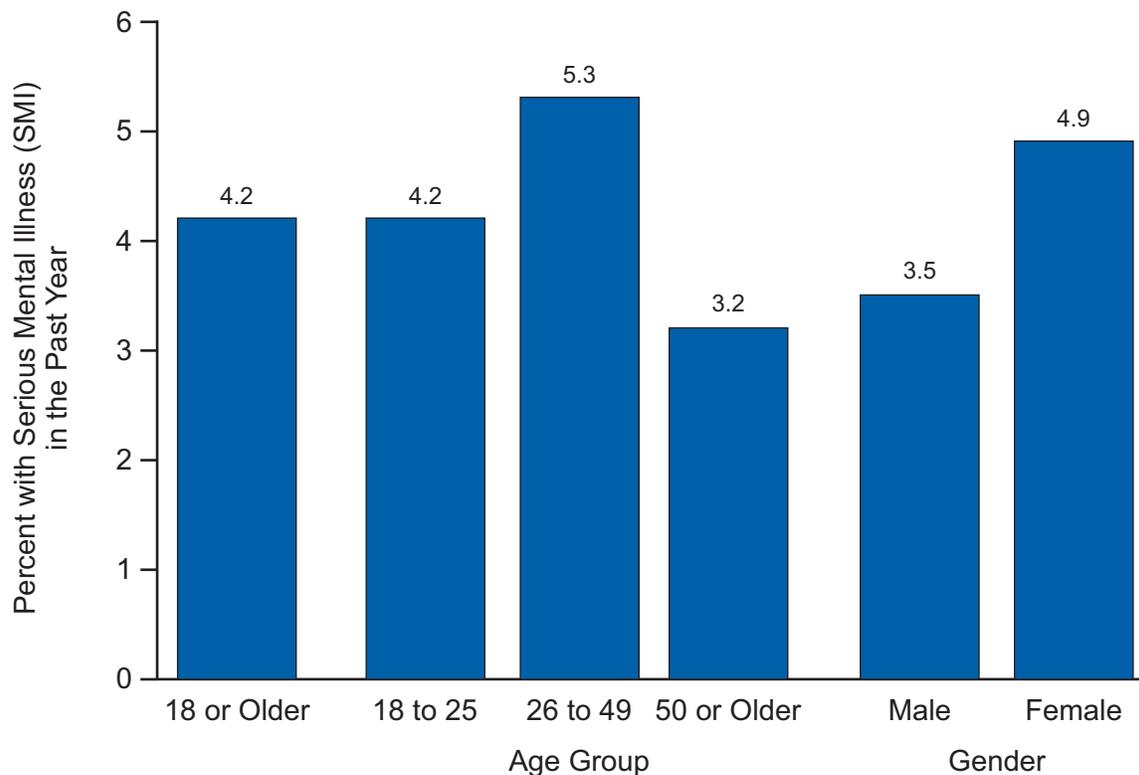
- The percentage of adults with past year SMI in 2013 was highest among adults aged 26 to 49 (5.3 percent), followed by those aged 18 to 25 (4.2 percent), then by those aged 50 or older (3.2 percent) (Figure 2.2).

- Women aged 18 or older in 2013 were more likely than men to have SMI in the past year (4.9 vs. 3.5 percent) (Figure 2.2).

- In 2013, the percentage of adults aged 18 or older with past year SMI varied by race/ethnicity. Percentages were 1.3 percent among Native Hawaiians or Other Pacific Islanders, 2.9 percent among Asians, 2.9 percent among blacks, 3.7 percent among Hispanics, 4.6 percent among whites, 5.8 percent among American Indians or Alaska Natives, and 7.1 percent among adults reporting two or more races.

- The percentage of adults with past year SMI in 2013 was higher among unemployed adults (6.6 percent) than among those who were employed either part time (4.8 percent) or full time (2.7 percent). Adults who were employed part time also were more likely than those who were employed full time to have SMI in the past year.

- In 2013, the percentage of adults with SMI in the past year was highest among those with a family income that was below the Federal poverty level (7.7 percent), followed by adults with a family income at 100 to 199 percent of the Federal poverty level (5.1 percent), then by adults with a family income at 200 percent or more of the Federal poverty level (3.2 percent).

- The percentage of adults in 2013 with SMI in the past year was higher among those who were covered by Medicaid or CHIP[6] (8.3 percent) than that among adults with no health insurance (5.9 percent), adults with other forms of health insurance (4.1 percent), and adults with private health insurance (3.0 percent).

- In 2013, the percentages of adults with SMI in the past year were 3.6 percent for adults with a college degree, 4.3 percent for those with a high school degree but no further education, 4.4 percent for those with less than high school education, and 4.8 percent for those who completed some college but had not received a degree.

- In 2013, the percentage of adults having past year SMI was higher among adults on probation in the past year (9.4 percent) than that among adults who were not on probation in the past year (4.1 percent). Similarly, among adults on parole or supervised release in the past year, 13.9 percent had past year SMI, which was higher than the percentage among adults who were not on parole or supervised release (4.1 percent).

Major Depressive Episode

A NSDUH module designed to obtain estimates of adults with lifetime and past year MDE and treatment for depression in the past year has been administered to adults aged 18 or older since 2004. Some questions in the adult depression module differ slightly from questions in

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[6] The estimate of SMI for adults who were covered either by Medicaid or CHIP refers to adults aged 18 or older who were covered by Medicaid or those aged 18 or 19 who were covered by CHIP.

the adolescent depression module. Therefore, the MDE data for adults aged 18 or older should not be compared or combined with MDE data for youths aged 12 to 17.

MDE, as defined in NSDUH, is based on the definition of MDE in the DSM-IV (APA, 1994) and is measured for the lifetime and past year periods. Lifetime MDE is defined as having at least five or more of nine symptoms of depression in the same 2-week period in a person's lifetime, in which at least one of the symptoms was a depressed mood or loss of interest or pleasure in daily activities. Respondents who had MDE in their lifetime were defined as having past year MDE if they had a period of depression lasting 2 weeks or longer in the past 12 months while also having some of the other symptoms of MDE. It should be noted that, unlike the DSM-IV criteria for MDE, no exclusions were made in NSDUH for depressive symptoms caused by medical illness, bereavement, or substance use disorders. Treatment for MDE in adults is defined as seeing or talking to a health professional or other professional or using prescription medication for depression in the past year. The specific questions used to measure MDE and a discussion of measurement issues are included in Section B.4.4 of Appendix B in this report.

Adding new adult mental health questions in 2008 (i.e., the past 30-day Kessler-6 or K6 scale, the functional impairment scale[s], and the suicidal thoughts and behavior items) may have affected how respondents reported their symptoms in the adult MDE module; for further discussion, see Sections B.4.2 and B.4.4 in Appendix B of this report. These changes in 2008 caused discontinuities in trends for MDE among adults. However, an adjustment was applied to estimates of MDE that were affected by these questionnaire changes to allow trends in MDE among adults for 2005 to 2013 to be included in this report.

- In 2013, 6.7 percent of adults aged 18 or older (15.7 million people) had at least one MDE in the past year (Figure 2.3). The percentage of adults who had a past year MDE remained stable between 2005 (6.6 percent) and 2013 (6.7 percent).

- Among adults aged 18 or older, the percentage having past year MDE in 2013 was lowest for those aged 50 or older (5.1 percent), followed by those aged 26 to 49 (7.6 percent), then by those aged 18 to 25 (8.7 percent) (Figure 2.3).

- In 2013, the percentage of adults with past year MDE was higher among women than among men (8.1 vs. 5.1 percent) (Figure 2.3). Among women, the percentage having MDE was lowest among women aged 50 or older (6.3 percent), followed by women aged 26 to 49 (9.0 percent), then by those aged 18 to 25 (11.6 percent).

- Past year MDE among adults varied by race/ethnicity in 2013. The percentages of adults with past year MDE were 1.6 percent among Native Hawaiians or Other Pacific Islanders, 4.0 percent among Asians, 4.6 percent among blacks, 5.8 percent among Hispanics, 7.3 percent among whites, 8.9 percent among American Indians or Alaska Natives, and 11.4 percent among adults reporting two or more races.

- Among adults in 2013, the percentage having past year MDE was higher among unemployed adults (9.5 percent) and adults who were employed part time (7.8 percent) than among those who were employed full time (5.3 percent).

Figure 2.3 Major Depressive Episode in the Past Year among Adults Aged 18 or Older, by Age and Gender: 2013
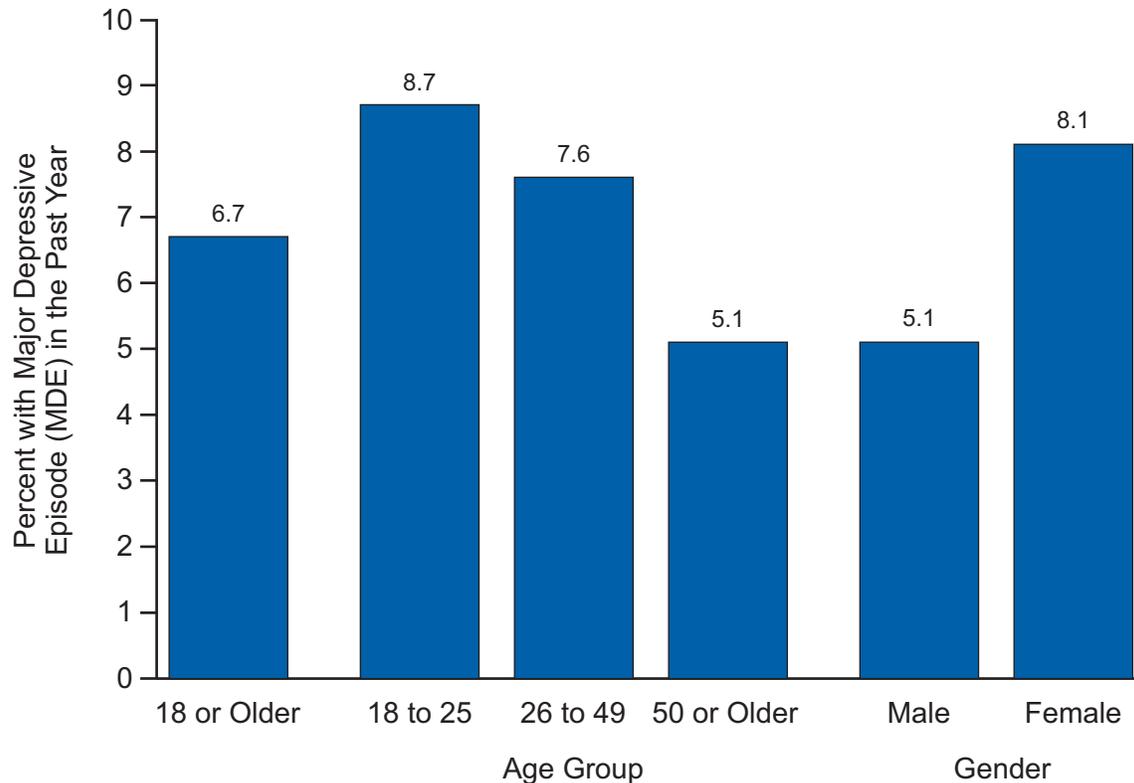
- Among the 15.7 million adults aged 18 or older who had MDE in the past year, 10.7 million (68.6 percent) received treatment (i.e., saw or talked to a health or alternative service professional or used prescription medication) for depression in the same time period (Figure 2.4).

- Adults aged 50 years or older in 2013 with past year MDE were most likely to receive treatment for depression in the past year (81.3 percent), followed by those aged 26 to 49 with past year MDE (66.7 percent), then by those aged 18 to 25 with past year MDE (50.8 percent) (Figure 2.4).

- In 2013, women aged 18 or older who had MDE in the past year were more likely than their male counterparts to have received treatment for depression in the past year (73.6 vs. 60.1 percent) (Figure 2.4).

Figure 2.4 Receipt of Treatment for Major Depressive Episode in the Past Year among Adults Aged 18 or Older Who Had a Major Depressive Episode in the Past Year, by Age and Gender: 2013
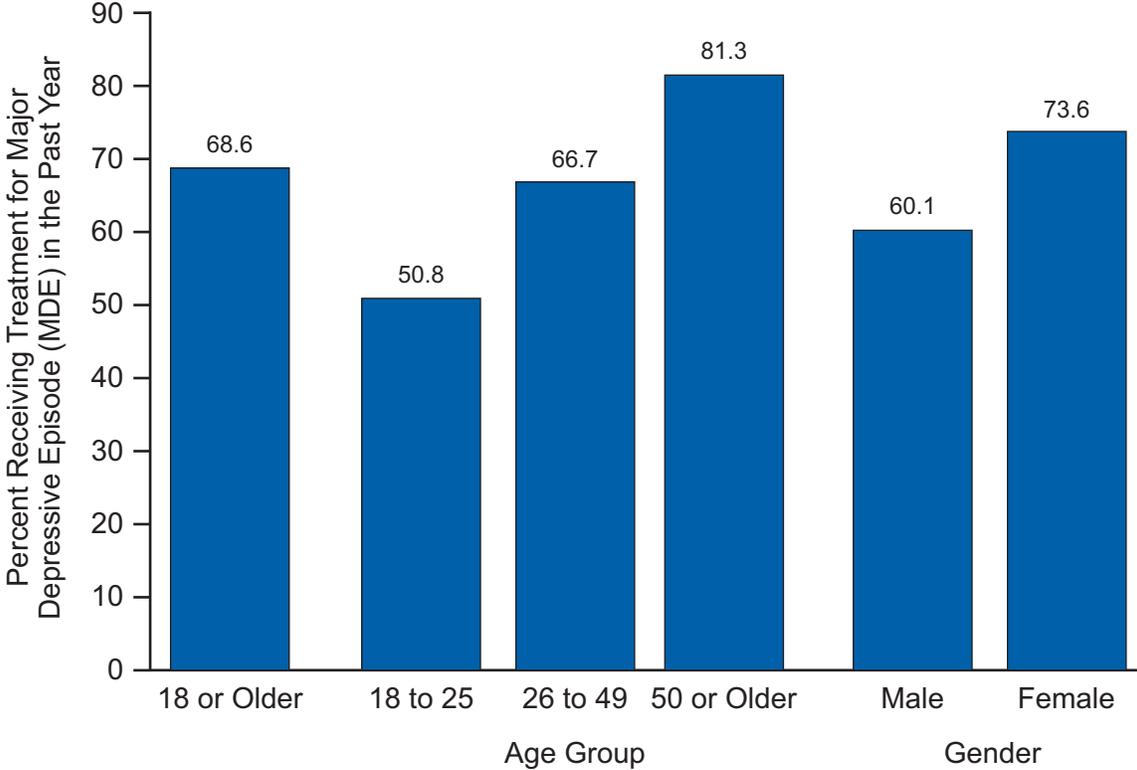
- Among adults aged 18 or older in 2013 with past year MDE, about half of those with no health insurance coverage (49.7 percent) received treatment for depression in the past year. This percentage was lower than those for adults with past year MDE who had private insurance (70.0 percent), those who were covered by Medicaid or CHIP[7] (80.8 percent), or those with other forms of health insurance (83.9 percent).

- Among adults aged 18 or older in 2013 with past year MDE, the percentages who received treatment in the past year were similar by poverty level (70.5 percent for those with past year MDE and a family income that was below the Federal poverty level, 64.3 percent for those with a family income at 100 to 199 percent of the Federal poverty level, and 69.9 percent for those with a family income at 200 percent or more of the Federal poverty level).

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[7] The estimate of MDE for adults who were covered either by Medicaid or CHIP refers to adults aged 18 or older who were covered by Medicaid or those aged 18 or 19 who were covered by CHIP.

- Adults aged 18 or older in 2013 with past year MDE who saw or talked to a health professional or other professional about depression in the past year were seen most commonly by general practitioners or family doctors (57.2 percent), followed by psychiatrists or psychotherapists (35.0 percent) and psychologists (31.8 percent), then by counselors (24.4 percent) (Figure 2.5).

Figure 2.5 Type of Professional Seen among Adults Aged 18 or Older with a Major Depressive Episode Who Received Treatment in the Past Year: 2013
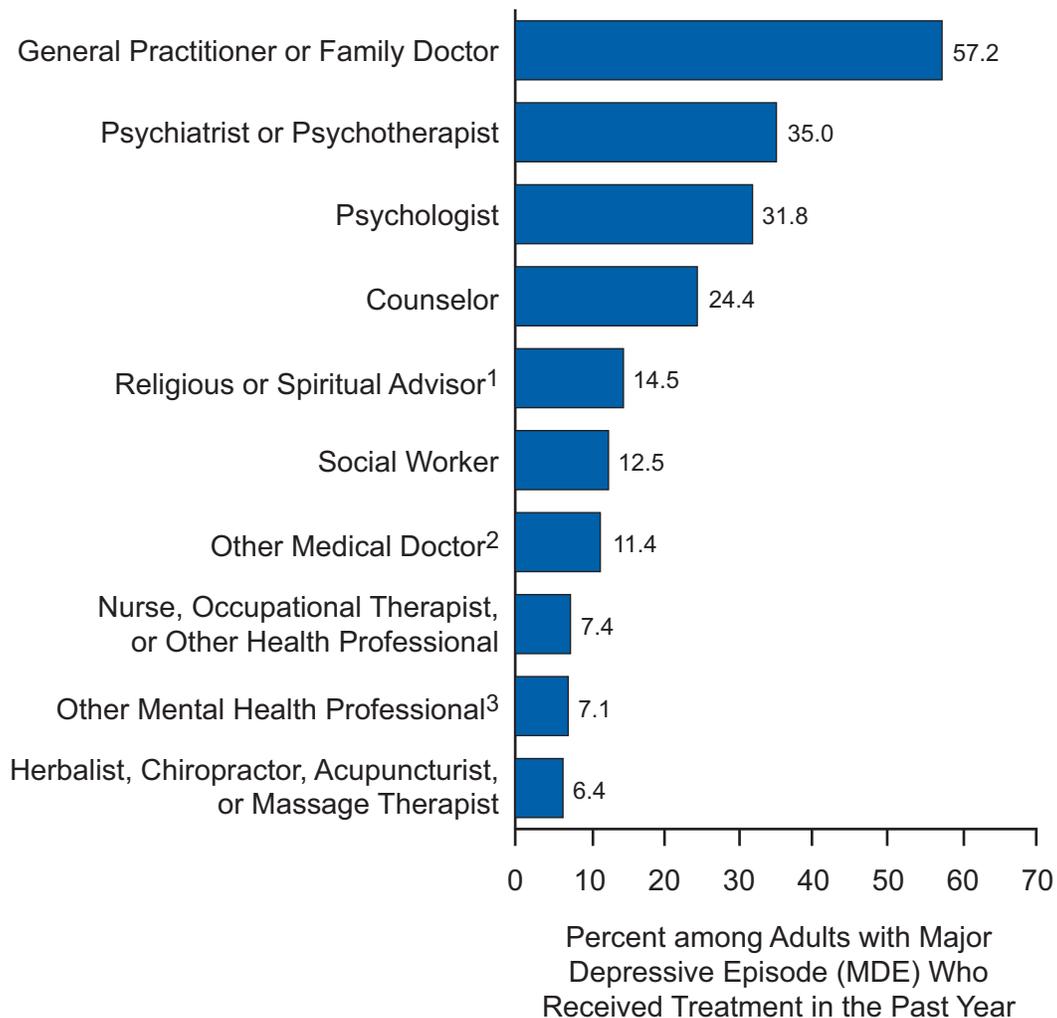
[1] Religious or Spiritual Advisor includes ministers, priests, or rabbis.

[2] Other Medical Doctor includes cardiologists, gynecologists, urologists, and other medical doctors who are not general practitioners or family doctors.

[3] Other Mental Health Professional includes mental health nurses and other therapists where type is not specified.

- In 2013, 46.4 percent of adults with past year MDE received treatment for depression through a combination of seeing or talking to a health professional or other professional and using prescription medication. In contrast, 13.6 percent saw or talked to a health professional or other professional only, and 6.7 percent used prescription medication only.

Mental Health Service Utilization

This section presents data on the receipt of mental health services among adults aged 18 or older. Adults are asked whether they received treatment or counseling for any problem with emotions, "nerves," or mental health in the past year in any inpatient or outpatient setting or used prescription medication in the past year for a mental or emotional condition, not including treatment for use of alcohol or illicit drugs. The treatment questions in this module do not ask specifically about treatment for a particular mental health issue. Consequently, references to treatment or counseling for any problem with emotions, nerves, or mental health are described broadly as "mental health service use" or receiving/needing "mental health care."

Questions in NSDUH on mental health service utilization are asked of all adults and are not limited to those with mental illness. Questions for adults about treatment for MDE also are asked in a section of the interview that is separate from these other questions about mental health service utilization. Thus, respondents could indicate receipt of treatment for depression in the adult MDE section without having indicated in the mental health service utilization section that they received services for any problems with emotions, nerves, or mental health.

Estimates of the receipt of mental health services are presented in this section by the level of mental illness for adults. These include AMI and three levels of mental illness among those with AMI: low (mild) mental illness, moderate mental illness, and SMI. Definitions for AMI and SMI among adults aged 18 or older were described previously. Low (mild) mental illness was defined as mental illness with mild impairment in carrying out major life activities; moderate mental illness was defined as mental illness with moderate impairment in carrying out major life activities (see Section B.4.3 in Appendix B for additional details on the procedures for constructing these measures).[8]

It is important to note that because the survey covers the U.S. civilian, noninstitutionalized population, people residing in long-term psychiatric or other institutions continuously throughout the year were not included in the NSDUH sampling frame (see Section A.1 in Appendix A and Section B.1 in Appendix B). However, people who were hospitalized or institutionalized for a period of time during the survey period, but who resided in households for most of the survey period, were included in the sample.

- In 2013, 34.6 million adults aged 18 or older (14.6 percent of the population aged 18 or older) received mental health care during the past 12 months (Figure 2.6). The number and the percentage were similar to those in 2012 (34.1 million adults and 14.5 percent). However, the percentage of adults in 2013 who received mental health care in the past 12 months was greater than the percentages from 2002 to 2011 (ranging from 12.8 to 13.8 percent).

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[8] Also see the entry for mental illness in the glossary included as part of the 2013 mental health detailed tables (for access information, see Chapter 1).

Figure 2.6 Past Year Mental Health Service Use among Adults Aged 18 or Older, by Type of Care: 2002-2013
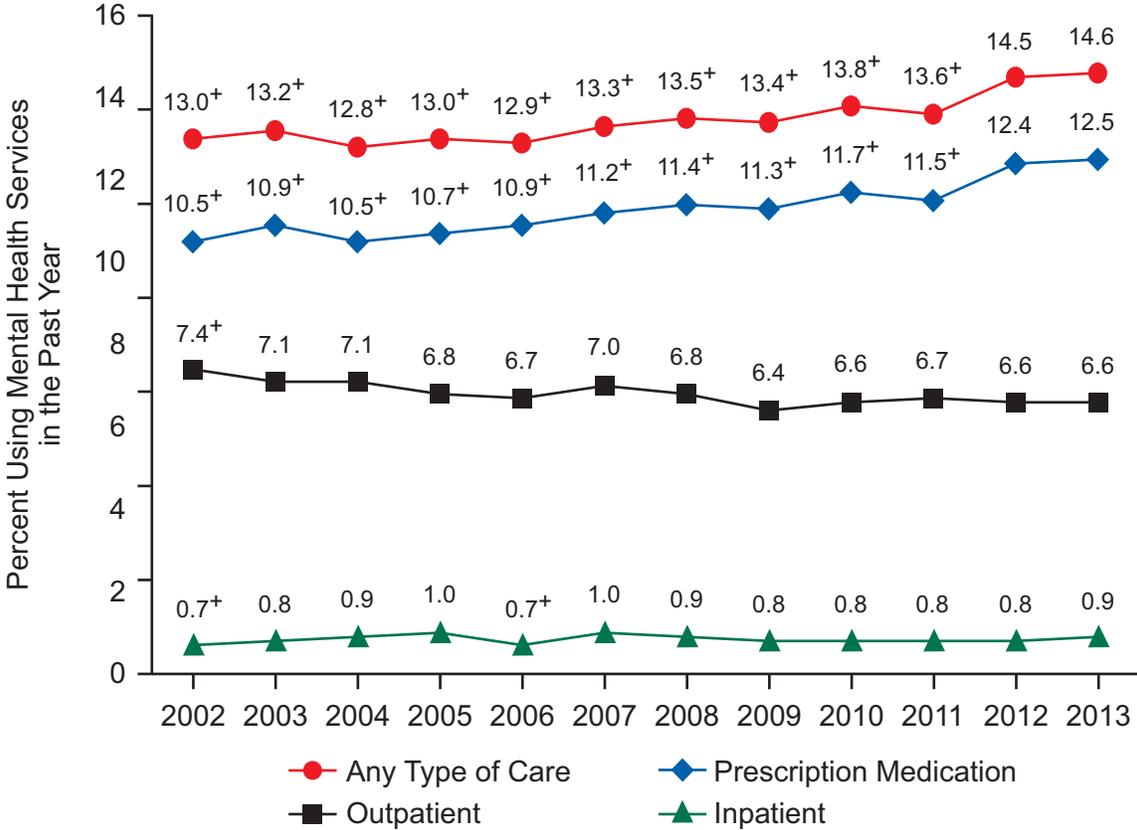
+Difference between this estimate and the 2013 estimate is statistically significant at the .05 level.

- The use of mental health services in the past year varied by age for adults. The percentages who used mental health services were higher among adults aged 26 to 49 (15.5 percent) and those aged 50 or older (14.6 percent) than among those aged 18 to 25 (12.2 percent).

- Among adults aged 18 or older in 2013, women were more likely than men to use mental health services in the past year (18.8 vs. 10.1 percent).

- Use of mental health services in the past year among adults aged 18 or older varied by race/ethnicity in 2013. The percentages of adults who used mental health services in 2013 were 4.2 percent for Native Hawaiians or Other Pacific Islanders, 6.4 percent for Asians, 8.7 percent for Hispanics, 8.9 percent for blacks, 15.7 percent for American Indians or Alaska Natives, 17.6 percent for whites, and 20.2 percent for adults reporting two or more races.

- In 2013, the percentage of adults using mental health services in the past year was higher among adults aged 18 or older who were covered by Medicaid or CHIP[9] (23.1 percent) compared with the percentages of adults with private health insurance (14.3 percent), adults without health insurance coverage (10.1 percent), and adults with other forms of health insurance coverage (15.7 percent).

- In 2013, the type of mental health service most commonly used by adults in the past year was prescription medication (12.5 percent or 29.5 million adults), followed by outpatient services (6.6 percent or 15.6 million adults), then by inpatient services (0.9 percent or 2.2 million adults) (see Figure 2.6 for the percentages). The percentages of adults who used prescription medication, outpatient services, or inpatient services in 2013 were similar to those in 2012 (12.4, 6.6, and 0.8 percent, respectively). Note that respondents could report using more than one type of mental health care.

- Between 2002 and 2013, the percentage of adults using outpatient services in the past year declined from 7.4 to 6.6 percent (Figure 2.6). The percentage of adults using prescription medication in 2013 (12.5 percent) was greater than the percentages from 2002 to 2011 (ranging from 10.5 to 11.7 percent).

- In 2013, adult women aged 18 or older were more likely than adult men to use outpatient mental health services (8.2 vs. 4.9 percent) or prescription medication (16.2 vs. 8.5 percent) for mental health issues in the past year.

- Among adults aged 18 or older in 2013 who reported using mental health services in the past year, 66.4 percent used one type of care (inpatient, outpatient, or prescription medication), 30.4 percent used two types of care, and 3.2 percent used all three types of care.

- Among adults aged 18 or older in 2013 who used outpatient mental health services in the past year, 57.9 percent received services at an office of a private therapist, psychologist, psychiatrist, social worker, or counselor that was not part of a clinic; 25.7 percent received services at an outpatient mental health clinic or center; 15.4 percent received services at a doctor's office that was not part of a clinic; and 6.9 percent received services at an outpatient medical clinic.

- In 2013, the most commonly reported sources of payment for outpatient mental health services among adults aged 18 or older who received outpatient mental health services in the past year were private health insurance (36.2 percent) and self-payment or payment by a family member living in the household (35.7 percent), followed by Medicare (17.1 percent), then by Medicaid (11.6 percent), followed by an employer (7.6 percent), then by the VA or other military program (5.0 percent).

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[9] The estimate of mental health service use for adults who were covered either by Medicaid or CHIP refers to adults aged 18 or older who were covered by Medicaid or those aged 18 or 19 who were covered by CHIP.

- Among the 43.8 million adults aged 18 or older with AMI in 2013, 19.6 million (44.7 percent) received mental health services in the past year (Figure 2.7). Also, among the 10.0 million adults aged 18 or older with SMI in 2013, 6.9 million (68.5 percent) received mental health services in the past year. Mental health services were received by 48.9 and 31.9 percent of adults with moderate mental illness and low (mild) mental illness, respectively.

Figure 2.7 Receipt of Mental Health Services among Adults Aged 18 or Older, by Level of Mental Illness: 2013
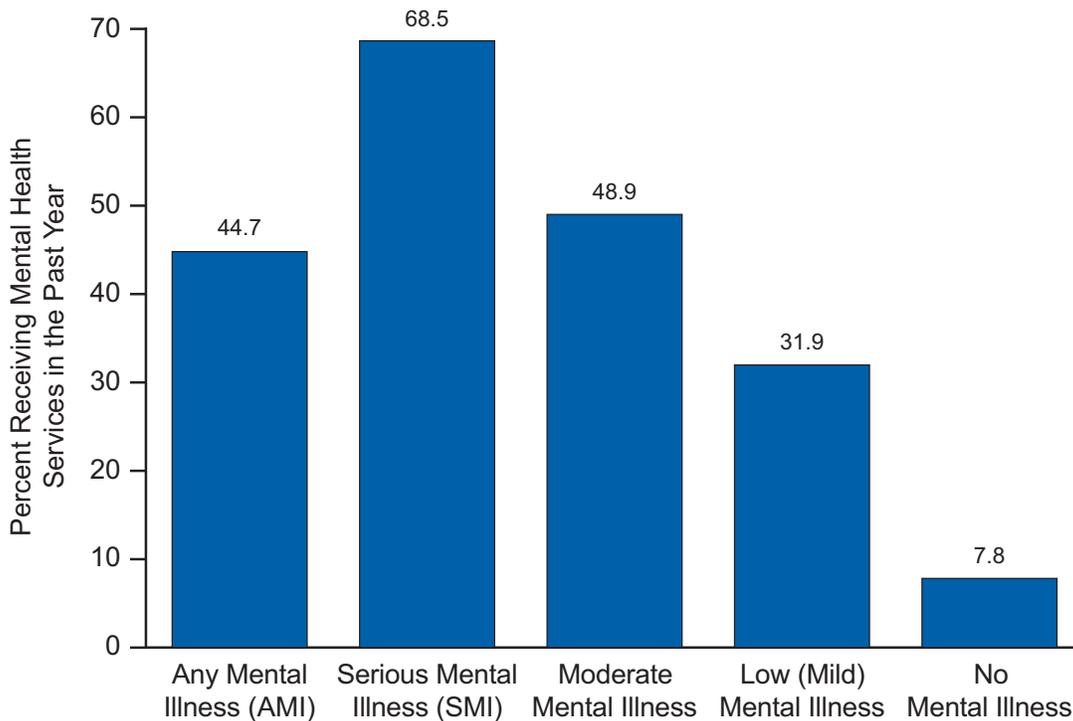
- Percentages of adults who used mental health services increased between 2012 and 2013 among adults with SMI (62.9 and 68.5 percent, respectively) and among adults with AMI (41.0 and 44.7 percent, respectively).

- Among adults with SMI in 2013, the percentage of adults who used mental health services was lower among adults aged 18 to 25 (54.0 percent) than among adults aged 26 to 49 (68.4 percent) and those aged 50 or older (74.9 percent).

- In 2013, among all adults aged 18 or older with past year AMI, 38.9 percent used prescription medication, 24.4 percent used outpatient services, and 3.3 percent used inpatient services for mental health issues in the past year. The percentages of adults with past year SMI who used prescription medication, outpatient services, and inpatient services were 62.1, 46.9, and 8.3 percent, respectively. Respondents could report that they used more than one type of service.

- Among the 19.6 million adults aged 18 or older in 2013 with past year AMI who reported receiving mental health services in the past year, 55.9 percent received one type of care (inpatient, outpatient, or prescription medication), 39.2 percent received two types of care, and 5.0 percent received all three types of care (Figure 2.8).

Figure 2.8 Number of Types of Mental Health Services Received among Adults Aged 18 or Older with Past Year Any Mental Illness Who Received Mental Health Services in the Past Year: 2013
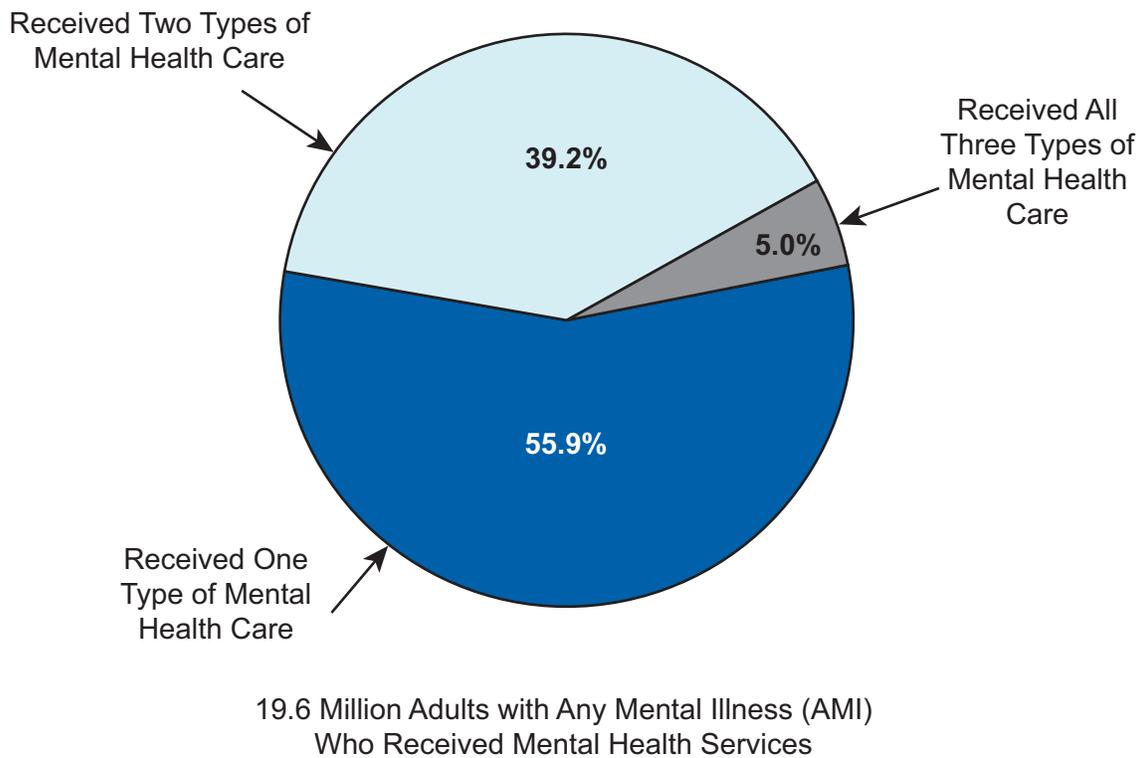
19.6 Million Adults with Any Mental Illness (AMI)
Who Received Mental Health Services

Note: The three types of mental health care are receiving inpatient care, outpatient care, or prescription medication.
Note: The percentages do not add to 100 percent due to rounding.

- Among the 6.9 million adults aged 18 or older in 2013 with past year SMI who reported receiving mental health services in the past year, 37.9 percent received one type of care (inpatient, outpatient, or prescription medication), 52.9 percent received two types of care, and 9.2 percent received all three types of care (Figure 2.9).

Figure 2.9 Number of Types of Mental Health Services Received among Adults Aged 18 or Older with Past Year Serious Mental Illness Who Received Mental Health Services in the Past Year: 2013

Received Two Types of Mental Health Care

52.9%

9.2%

Received All Three Types of Mental Health Care

37.9%

Received One Type of Mental Health Care
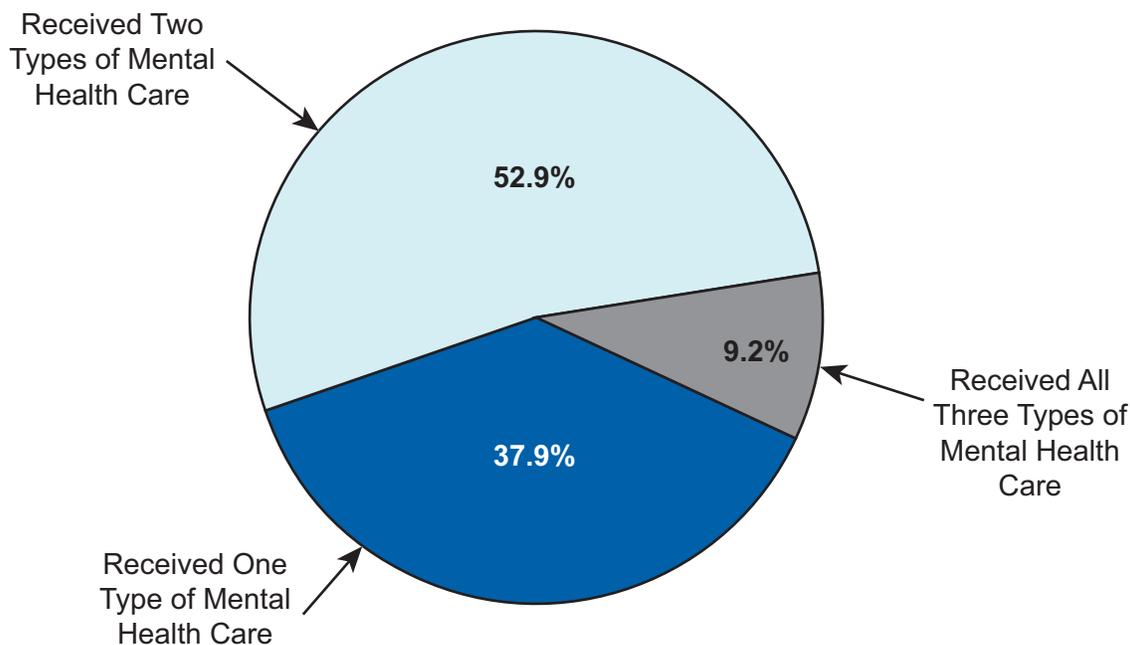
6.9 Million Adults with Serious Mental Illness (SMI)
Who Received Mental Health Services

Note: The three types of mental health care are receiving inpatient care, outpatient care, or prescription medication.

- Among adults aged 18 or older in 2013 who reported receiving mental health services in the past year, the percentages receiving one type of mental health service (inpatient, outpatient, or prescription medication) were 37.9 percent among adults with past year SMI, 60.5 percent among adults with past year moderate mental illness, and 69.6 percent among adults with past year low (mild) mental illness.

- Among adults aged 18 or older, receipt of prescription medication for mental health issues varied by level of mental illness in the past year. In 2013, 62.1 percent of adults with SMI, 42.5 percent of adults with moderate mental illness, and 26.7 percent of adults with low (mild) mental illness received prescription medication for their mental illness in the past year.

Perceived Unmet Need for Mental Health Services

Described in this section are estimates of the perceived unmet need for mental health services and reasons for not receiving mental health services among adults aged 18 or older with a perceived unmet need. Unmet need is established using a question that asks whether a respondent perceived a need for, but did not receive, mental health treatment or counseling at any time in the 12 months prior to the NSDUH interview. This measure also includes adults who received some type of mental health service in the past 12 months but reported a perceived need for additional services they did not receive. Perceived unmet need is described among the overall adult population as well as among adults with AMI or SMI.

- In 2013, there were 11.0 million adults aged 18 or older (4.6 percent of all adults) who perceived an unmet need for mental health care at any time in the past year. Among adults who reported a need for mental health care, 5.1 million adults did not receive any mental health services in the past year.

- Among the 5.1 million adults aged 18 or older in 2013 who had a perceived unmet need for mental health care and did not receive mental health services in the past year, several reasons were reported for not receiving mental health services. These included an inability to afford the cost of care (48.3 percent), believing at the time that the problem could be handled without treatment (26.5 percent), not knowing where to go for services (24.6 percent), and not having the time to go for care (15.8 percent) (Figure 2.10).

- In 2013, there were 8.4 million adults aged 18 or older with AMI (19.3 percent of adults with AMI) who perceived an unmet need for mental health care in the past year.

- Among the 8.4 million adults aged 18 or older with AMI in the past year who had a perceived unmet need for mental health care, 39.9 percent (3.4 million) did not receive any mental health services in the past year.

- Among the 3.4 million adults aged 18 or older in 2013 with AMI who had a perceived unmet need for mental health care and did not receive mental health services in the past year, several reasons were reported for not receiving mental health services. These included an inability to afford the cost of care (55.3 percent), not knowing where to go for services (25.5 percent), believing at the time that the problem could be handled without treatment (24.6 percent), and not having the time to go for care (14.8 percent) (Figure 2.11).

- In 2013, there were 3.9 million adults aged 18 or older with SMI who perceived an unmet need for mental health care in the past year. These included 1.3 million adults with SMI who did not receive any mental health services in the past year.

- Among the 1.3 million adults aged 18 or older with SMI in 2013 who had a perceived unmet need for mental health care and did not receive mental health services in the past year, several reasons were reported for not receiving mental health services. These included an inability to afford the cost of care (61.1 percent), not knowing where to go for services (27.1 percent), believing at the time that the problem could be handled without treatment (19.8 percent), and concerns about being committed or having to take medication (19.8 percent) (Figure 2.12).

Figure 2.10 Reasons for Not Receiving Mental Health Services in the Past Year among Adults Aged 18 or Older with a Perceived Unmet Need for Mental Health Care Who Did Not Receive Mental Health Services: 2013

Reason	Percent
Could Not Afford Cost	48.3
Thought Could Handle the Problem without Treatment	26.5
Did Not Know Where to Go for Services	24.6
Did Not Have Time	15.8
Might Cause Neighbors/Community to Have Negative Opinion	10.3
Did Not Feel Need for Treatment at the Time	10.1
Treatment Would Not Help	9.2
Fear of Being Committed/Having to Take Medicine	9.1
Health Insurance Did Not Cover Enough Treatment	8.9
Concerned about Confidentiality	8.3
Might Have Negative Effect on Job	7.8
Did Not Want Others to Find Out	6.3
Health Insurance Did Not Cover Any Treatment	6.2
No Transportation/Inconvenient	2.8

Percent Reporting Reason

Figure 2.11   Reasons for Not Receiving Mental Health Services in the Past Year among Adults Aged 18 or Older with Past Year Any Mental Illness and a Perceived Unmet Need for Mental Health Care Who Did Not Receive Mental Health Services: 2013

Reason	Percent
Could Not Afford Cost	55.3
Did Not Know Where to Go for Services	25.5
Thought Could Handle the Problem without Treatment	24.6
Did Not Have Time	14.8
Treatment Would Not Help	11.1
Might Cause Neighbors/Community to Have Negative Opinion	11.0
Fear of Being Committed/Having to Take Medicine	11.0
Concerned about Confidentiality	10.7
Health Insurance Did Not Cover Enough Treatment	9.6
Might Have Negative Effect on Job	8.7
Did Not Feel Need for Treatment at the Time	8.1
Did Not Want Others to Find Out	6.8
Health Insurance Did Not Cover Any Treatment	6.7
No Transportation/Inconvenient	3.6

Percent Reporting Reason

Figure 2.12 Reasons for Not Receiving Mental Health Services in the Past Year among Adults Aged 18 or Older with Past Year Serious Mental Illness and a Perceived Unmet Need for Mental Health Care Who Did Not Receive Mental Health Services: 2013

Reason	Percent
Could Not Afford Cost	61.1
Did Not Know Where to Go for Services	27.1
Thought Could Handle the Problem without Treatment	19.8
Fear of Being Committed/ Having to Take Medicine	19.8
Concerned about Confidentiality	13.7
Treatment Would Not Help	13.2
Did Not Have Time	12.3
Might Cause Neighbors/Community to Have Negative Opinion	11.2
Might Have Negative Effect on Job	10.4
Health Insurance Did Not Cover Enough Treatment	8.5
Did Not Want Others to Find Out	7.9
No Transportation/Inconvenient	7.0
Health Insurance Did Not Cover Any Treatment	6.9
Did Not Feel Need for Treatment at the Time	3.8

Percent Reporting Reason

3. Suicidal Thoughts and Behavior

This chapter presents the findings from the 2013 National Survey on Drug Use and Health (NSDUH) on the percentage of adults aged 18 or older who had suicidal thoughts and behavior among adults in the civilian, noninstitutionalized population of the United States. The data in this chapter are based on a set of questions that have been included in the NSDUH questionnaire since 2008. These questions ask all adult respondents if at any time during the past 12 months they had serious thoughts of suicide, and among those who had serious thoughts of suicide, whether they planned or attempted suicide in the past year. If an attempt was made, additional items ask whether the respondent received medical attention or was hospitalized as a result of a suicide attempt.

Readers are reminded that estimates in this chapter do not reflect information from adults whose suicide attempts in the past year were fatal. However, the numbers of deaths in which suicide was reported as the cause of death are small relative to the total number of annual deaths in the United States. In 2010, for example, suicide was listed as the cause of death in fewer than 40,000 out of approximately 2.5 million deaths among individuals of all ages in the United States (Murphy, Xu, & Kochanek, 2013), although some suicide deaths may not have been reported as such. Nevertheless, some caution is advised in interpreting these data from NSDUH. In addition to NSDUH not including data from individuals whose suicide attempts were fatal, individuals in some population subgroups that are not covered in NSDUH could be more likely than those in the population covered by NSDUH to have had suicidal thoughts or behaviors in the past year (e.g., homeless people not living in shelters, people in residential mental health or inpatient rehabilitation facilities).

Suicidal Thoughts and Behavior among Adults

- In 2013, an estimated 9.3 million adults (3.9 percent) aged 18 or older had serious thoughts of suicide in the past year (Figure 3.1). The percentage of adults who had serious thoughts of suicide remained stable between 2008 (3.7 percent) and 2013.

- In 2013, the percentage of adults having serious thoughts of suicide was highest among adults aged 18 to 25 (7.4 percent), followed by adults aged 26 to 49 (4.0 percent), then by adults aged 50 or older (2.7 percent) (Figure 3.1).

- In 2013, the percentages of adults aged 18 or older who had serious thoughts of suicide in the past year were similar for males and females (3.8 and 4.0 percent, respectively) (Figure 3.1). However, the percentage of young adult males aged 18 to 25 who had serious thoughts of suicide in the past year was lower than the percentage for females (6.8 vs. 8.1 percent).

- Among adults aged 18 or older in 2013, 2.7 million people (1.1 percent) made suicide plans in the past year (Figure 3.2). The percentage of adults who made suicide plans in the past year was higher among adults aged 18 to 25 (2.5 percent) than among adults aged 26 to 49 (1.3 percent) and those aged 50 or older (0.6 percent). For all three age groups, the percentage of adults who made suicide plans in the past year remained stable between 2012 and 2013.

Figure 3.1 Suicidal Thoughts in the Past Year among Adults Aged 18 or Older, by Age and Gender: 2013

Percent with Suicidal Thoughts in the Past Year

| 18 or Older | 18 to 25 | 26 to 49 | 50 or Older | Male | Female |
| 3.9 | 7.4 | 4.0 | 2.7 | 3.8 | 4.0 |

Age Group   Gender
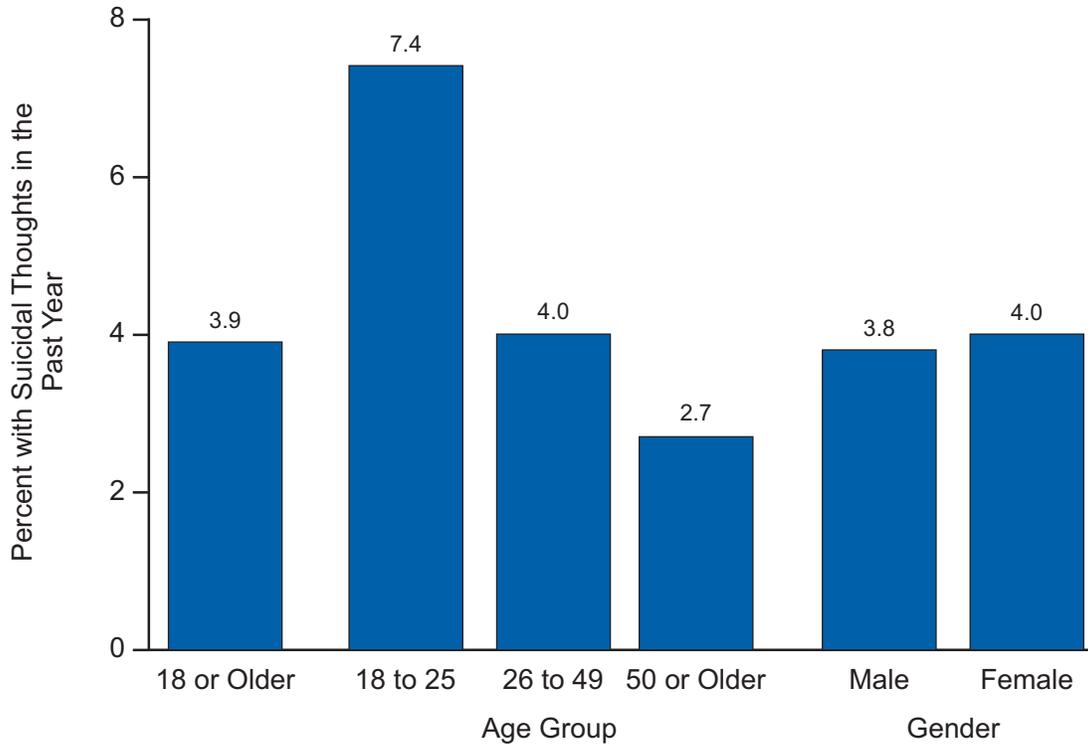
Figure 3.2 Suicidal Thoughts and Behavior in the Past Year among Adults Aged 18 or Older: 2013

1.1 Million Made Plans and Attempted Suicide

2.7 Million Made Suicide Plans

1.3 Million Attempted Suicide

9.3 Million Adults Had Serious Thoughts of Committing Suicide

0.2 Million Made No Plans and Attempted Suicide
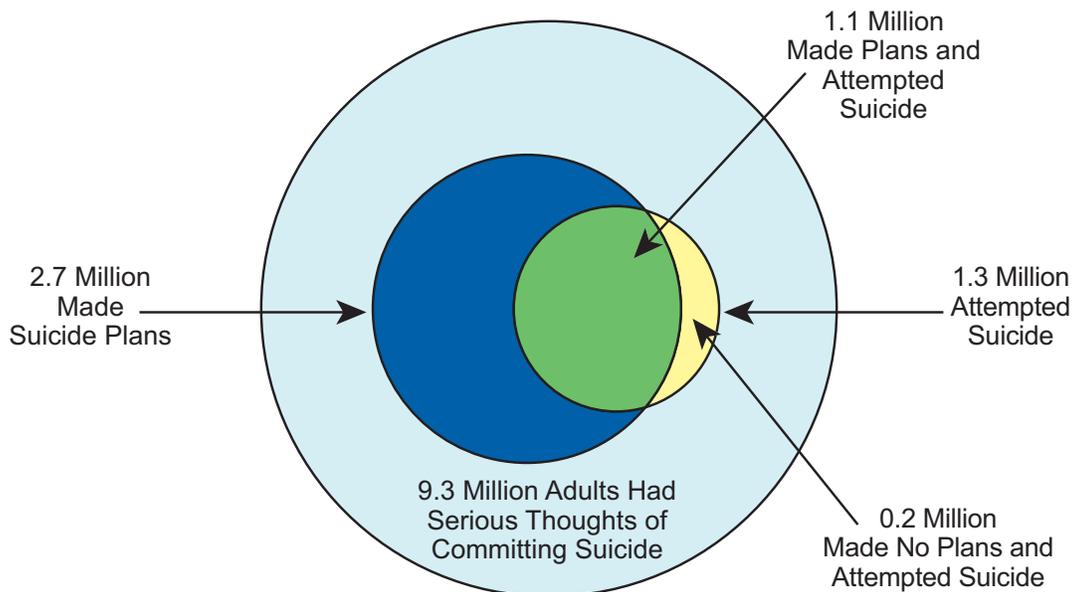
- In 2013, 1.3 million adults aged 18 or older (0.6 percent) attempted suicide in the past year (Figure 3.2). Among these adults who attempted suicide, 1.1 million also reported making suicide plans, and 0.2 million did not make suicide plans.

- In 2013, the percentages of adults aged 18 or older having serious thoughts of suicide in the past year were 2.9 percent among blacks, 3.3 percent among Asians, 3.6 percent among Hispanics, 4.1 percent among whites, 4.6 percent among Native Hawaiians or Other Pacific Islanders, 4.8 percent among American Indians or Alaska Natives, and 7.9 percent among adults reporting two or more races.

- Among adults aged 18 or older in 2013, those who completed college were less likely to have serious thoughts of suicide (3.1 percent) than their counterparts who had not completed high school (4.4 percent), were high school graduates but had no further education (4.1 percent), or had completed some college but had not received a degree (4.5 percent).

- In 2013, adults who were unemployed in the past year were more likely than those who were employed full time to have serious thoughts of suicide (7.0 vs. 3.0 percent), make suicide plans (2.3 vs. 0.7 percent), or attempt suicide (1.4 vs. 0.3 percent).

- Adults with Medicaid or those who were covered by the Children's Health Insurance Program (CHIP)[10] in 2013 were more likely than those with private health insurance to have serious thoughts of suicide (6.3 vs. 3.1 percent), make suicide plans (1.9 vs. 0.8 percent), or attempt suicide (1.3 vs. 0.3 percent) in the past year.

- In 2013, adults with annual family incomes at 200 percent or more of the Federal poverty level were less likely to have serious thoughts of suicide in the past year (3.1 percent) than their counterparts with family incomes below the Federal poverty level (6.6 percent) and their counterparts with family incomes between 100 and 199 percent of the Federal poverty level (4.7 percent).

College Students

- Among adults aged 18 to 22 in 2013, similar percentages of full-time college students and other adults in this age group had serious thoughts of suicide (8.0 and 8.7 percent, respectively) (Figure 3.3) or made suicide plans (2.4 and 3.1 percent). However, full-time college students aged 18 to 22 were less likely than other adults aged 18 to 22 to attempt suicide (0.9 vs. 1.9 percent) or receive medical attention as a result of a suicide attempt in the past year (0.3 vs. 0.7 percent).

- The percentage of full-time college students aged 18 to 22 who had serious thoughts of suicide increased between 2012 and 2013 (6.6 vs. 8.0 percent).

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[10] Estimates for adults who were covered either by Medicaid or CHIP refer to adults aged 18 or older who were covered by Medicaid or those aged 18 or 19 who were covered by CHIP.

Figure 3.3 Suicidal Thoughts in the Past Year among Full-Time College Students Aged 18 to 22 and Other Adults Aged 18 to 22, by Gender: 2013
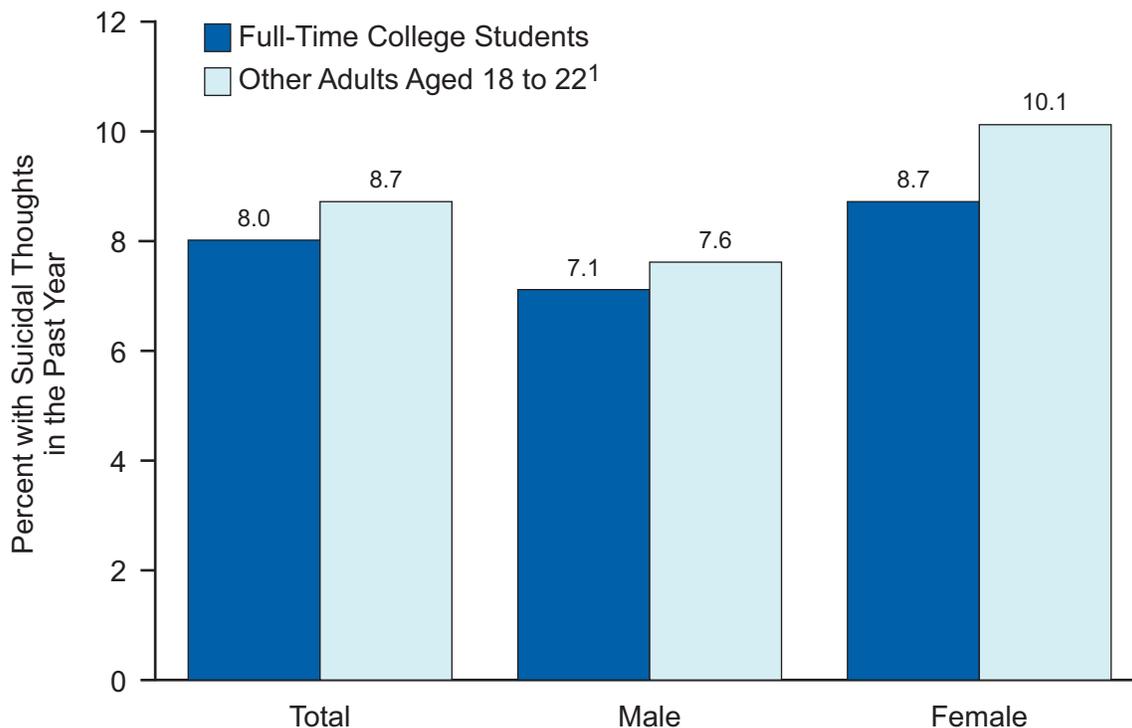
[1] Other adults include respondents aged 18 to 22 not enrolled in school, enrolled in college part time, enrolled in other grades either full or part time, or enrolled with no other information available.

- Among males aged 18 to 22 in 2013, similar percentages of full-time college students and others in this age group had serious thoughts of suicide (7.1 and 7.6 percent, respectively) (Figure 3.3) and made suicide plans (2.0 and 2.4 percent). Male full-time college students aged 18 to 22 were less likely than other male adults aged 18 to 22 to attempt suicide (0.7 vs. 1.6 percent). However, similar percentages of males who were full-time college students and those who were not in college full time received medical attention as a result of a suicide attempt in the past year (0.3 and 0.5 percent, respectively).

- Female full-time college students aged 18 to 22 were less likely than other female adults aged 18 to 22 to attempt suicide (1.1 vs. 2.3 percent, respectively) or receive medical attention as a result of a suicide attempt in the past year (0.3 vs. 0.9 percent). However, similar percentages of females who were full-time college students and those who were not in college full time had serious thoughts of suicide (8.7 and 10.1 percent) (Figure 3.3) or made suicide plans in the past year (2.8 and 3.9 percent).

Criminal Justice Populations

- In 2013, adults aged 18 or older who were on parole or a supervised release from jail in the past 12 months were more likely to have serious thoughts of suicide than their counterparts who were not on parole or a supervised release from jail during this period (10.7 vs. 3.9 percent).

- In 2013, adults aged 18 or older who were on probation during the past 12 months were more likely to have serious thoughts of suicide than their counterparts who were not on probation during this period (9.2 vs. 3.8 percent).

Suicidal Thoughts and Behavior among Adults Who Used Substances

Illicit Drug Use

- In 2013, adults aged 18 or older who used illicit drugs in the past year were more likely to have serious thoughts, plans, and attempts of suicide compared with all adults in the general population (i.e., including users and nonusers of illicit drugs in the past year). Among adults who used illicit drugs in the past year, 9.4 percent had serious thoughts of suicide (Figure 3.4), 3.2 percent made a suicide plan, and 1.9 percent attempted suicide in the past year. Corresponding percentages among all adults aged 18 or older were 3.9, 1.1, and 0.6 percent, respectively.

- Percentages of adults in 2013 who had serious thoughts of suicide in the past year were 9.3 percent among past year users of marijuana, 13.0 percent among past year users of hallucinogens, 13.5 percent among past year users of cocaine, 19.4 percent among past year users of inhalants, and 20.7 percent among past year users of heroin (Figure 3.4).

- In 2013, 12.1 percent of adults who were nonmedical users of psychotherapeutic drugs in the past year had serious thoughts of suicide in that period. Among adults who were nonmedical users of specific categories of prescription drugs in the past year, the following percentages had serious thoughts of suicide in the past year: 13.1 percent for pain relievers, 14.8 percent for sedatives, 15.7 percent for tranquilizers, and 16.0 percent for stimulants (Figure 3.4).

- Percentages of adults in 2013 who made suicide plans in the past year were 3.3 percent among past year users of marijuana, 4.9 percent among past year users of hallucinogens, 5.6 percent among past year users of cocaine, 10.6 percent among past year users of inhalants, and 13.6 percent among past year users of heroin.

- In 2013, 4.8 percent of adults who were nonmedical users of psychotherapeutic drugs in the past year made suicide plans in that period. Percentages of adults who made suicide plans in the past year among past year nonmedical users of specific categories of prescription drugs were 5.6 percent for pain relievers, 5.7 percent for sedatives, 6.5 percent for tranquilizers, and 7.5 percent for stimulants.

Figure 3.4 Suicidal Thoughts in the Past Year among Adults Aged 18 or Older, by Past Year Use of Selected Illicit Drugs: 2013

Category	Percent
All Adults	3.9
Users of Any Illicit Drug	9.4[+]
Users of Marijuana	9.3[+]
Users of Hallucinogens	13.0[+]
Users of Cocaine	13.5[+]
Users of Inhalants	19.4[+]
Users of Heroin	20.7[+]
Nonmedical Users of Pain Relievers	13.1[+]
Nonmedical Users of Sedatives	14.8[+]
Nonmedical Users of Tranquilizers	15.7[+]
Nonmedical Users of Stimulants	16.0[+]

Percent with Suicidal Thoughts in the Past Year
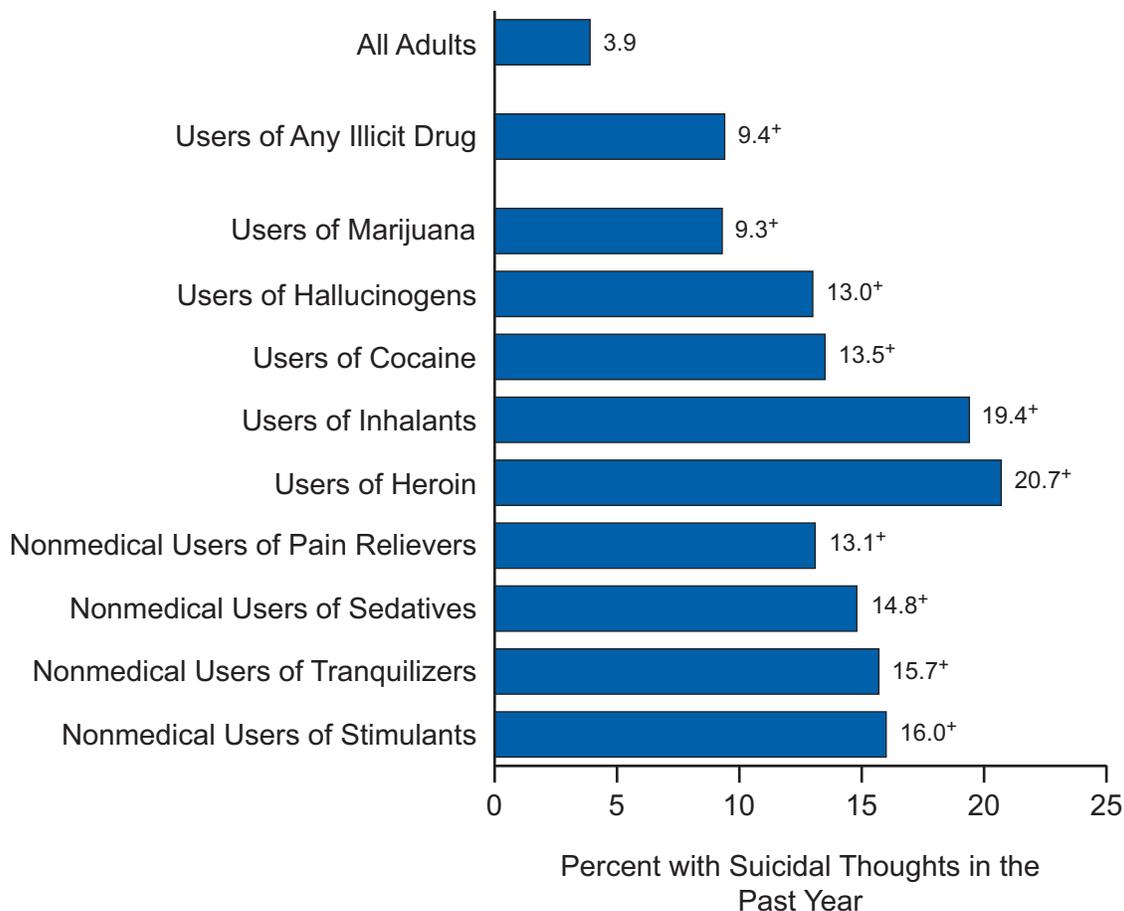
[+]Difference between this estimate and the estimate for all adults aged 18 or older is statistically significant at the .05 level.

Note: Illicit Drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

- Percentages of adults in 2013 who made suicide attempts in the past year were 2.0 percent among past year users of marijuana, 2.9 percent among past year users of hallucinogens, 3.0 percent among past year users of cocaine, 5.0 percent among year users of inhalants, and 5.8 percent among past year users of heroin.

- In 2013, 2.5 percent of adults who were nonmedical users of psychotherapeutic drugs in the past year attempted suicide in that period. Percentages of adults who attempted suicide in the past year among past year nonmedical users of specific categories of prescription drugs were 2.8 percent for pain relievers, 3.1 percent for sedatives, 3.4 percent for tranquilizers, and 4.5 percent for stimulants.

Binge and Heavy Alcohol Use

- Among adults aged 18 or older in 2013 who were binge alcohol users in the past month, 5.0 percent had serious thoughts of suicide, 1.7 percent made suicide plans, and 1.0 percent attempted suicide in the past year. Binge alcohol use is defined as having 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.

- Among adults who were heavy alcohol users in the past month, 6.7 percent had serious thoughts of suicide, 2.2 percent made suicide plans, and 1.5 percent attempted suicide in the past year. Heavy alcohol use is defined as having five or more drinks on the same occasion on 5 or more days in the past 30 days.

Suicidal Thoughts and Behavior among Adults with Substance Use Disorder and Adults with Major Depressive Episode

- In 2013, among adults aged 18 or older who had a substance use disorder in the past year (i.e., dependence or abuse for illicit drugs or alcohol), 2.3 million (11.4 percent) had serious thoughts of suicide, 0.8 million (4.2 percent) made suicide plans, and 0.5 million (2.3 percent) attempted suicide in the past year.

- Adults aged 18 or older in 2013 who had past year substance dependence or abuse were more likely than those without substance dependence or abuse to have serious thoughts of suicide (11.4 vs. 3.2 percent), make suicide plans (4.2 vs. 0.9 percent), or attempt suicide (2.3 vs. 0.4 percent) in the past year (Figure 3.5).

- Among adults in 2013 with past year alcohol dependence or abuse, 1.7 million (10.3 percent) had serious thoughts of suicide. Among adults in 2013 with past year illicit drug dependence or abuse, 1.1 million (19.4 percent) had serious thoughts of suicide.

- Among the 15.7 million adults in 2013 with a past year major depressive episode (MDE), 4.4 million (28.3 percent) had serious thoughts of suicide. A lower percentage of adults without a past year MDE had serious thoughts of suicide (2.2 percent). MDE is based on the criteria in the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1990) and is described in Section B.4.4 of Appendix B.

Suicidal Thoughts and Service Use among Adults

- Adults aged 18 or older in 2013 who received substance use treatment at a specialty facility in the past year[11] were more likely to have serious thoughts of suicide in the past year than those who did not receive substance use treatment at a specialty facility (18.8 vs. 3.8 percent).

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[11] Receiving illicit drug or alcohol use treatment at a specialty facility refers to treatment received at a hospital (inpatient only), rehabilitation facility (inpatient or outpatient), or mental health center in order to reduce or stop drug or alcohol use, or for medical problems associated with drug or alcohol use.

Figure 3.5 Suicidal Thoughts and Behavior in the Past Year among Adults Aged 18 or Older, by Substance Dependence or Abuse: 2013
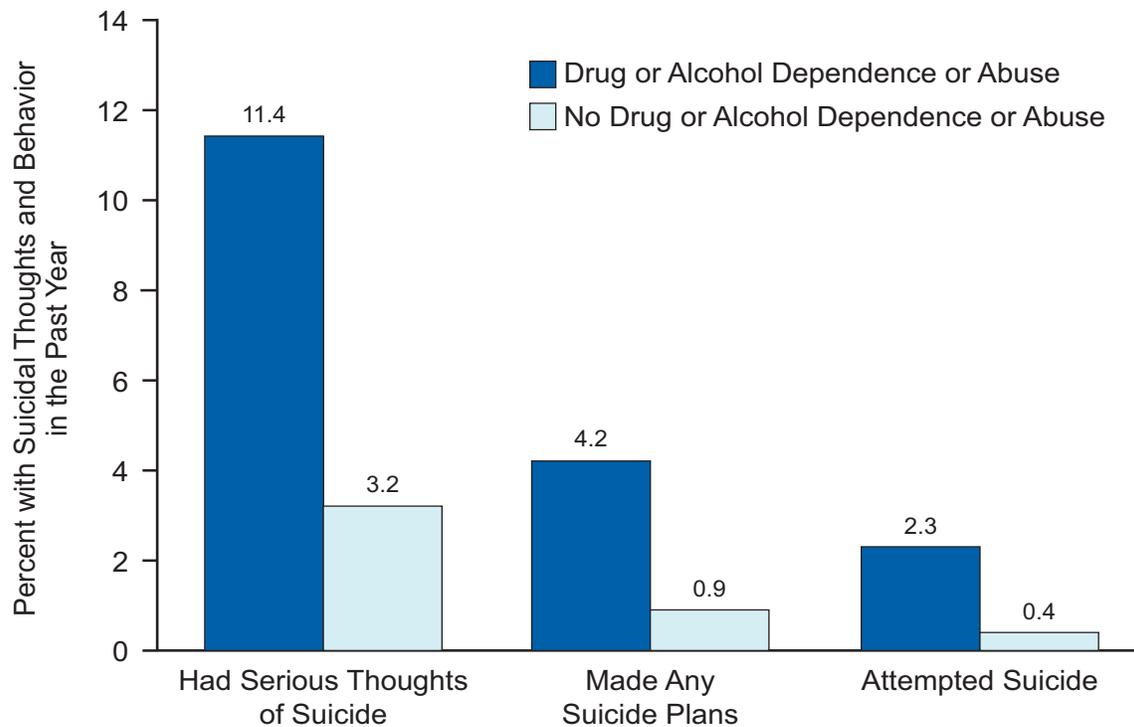
- Among the 34.6 million adults in 2013 who used mental health services in the past year,[12] 14.1 percent had serious thoughts of suicide. The corresponding percentage among adults who did not use mental health services in the past year was 2.2 percent. The percentage of adults who used mental health services and had serious thoughts of suicide was higher in 2013 than in 2012 (14.1 vs. 12.1 percent).

- Among the 9.3 million adults in 2013 who had serious thoughts of suicide in the past year, 4.9 million used mental health services in the past year and 4.4 million did not.

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[12] Mental health service use is defined as having received inpatient care or outpatient care or having used prescription medication for problems with emotions, nerves, or mental health. Respondents were not to include treatment for drug or alcohol use. Respondents with unknown information on the use of mental health services were excluded.

4. Major Depressive Episode and Mental Health Service Utilization among Youths

This chapter presents findings from the National Survey on Drug Use and Health (NSDUH) on past year major depressive episode (MDE), MDE accompanied by severe impairment in one or more role domains, and the percentage receiving treatment for depression among youths aged 12 to 17 in the United States. This chapter also presents findings on mental health service utilization by youths for any emotional and behavioral problems (excluding those caused by alcohol or illicit drug use).

Major Depressive Episode (MDE), MDE with Severe Impairment, and Treatment for Depression

A module of questions designed to estimate the percentages of youths aged 12 to 17 with lifetime and past year MDE and severe impairment caused by MDE in the past year has been administered to youths since 2004. This module also has measured treatment for MDE in the past year among youths. As described in the next paragraph, some questions in the adolescent depression module differ slightly from questions in the adult depression module to make them more appropriate for youths. Therefore, these data should not be compared or combined with MDE data for adults aged 18 or older.

MDE is defined as a period of at least 2 weeks when a person experienced a depressed mood or loss of interest or pleasure in daily activities and had at least four of seven additional symptoms reflecting the criteria as described in the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association [APA], 1994). Unlike the DSM-IV criteria for MDE, however, no exclusions were made in NSDUH for depressive symptoms caused by medical illness, bereavement, or substance use disorders. Severe impairment is defined by the level of role interference reported to be caused by MDE. The role domains (i.e., chores at home, school or work, close relationships with family, or social life) for youths aged 12 to 17 are slightly modified from those for adults to be made age appropriate. Treatment for MDE among youths is defined as seeing or talking to a medical doctor or other professional or using prescription medication for depression in the past year. The specific questions used to measure MDE and a discussion of measurement issues are included in Section B.4.4 of Appendix B.

- In 2013, 10.7 percent of the population aged 12 to 17 (2.6 million youths) had MDE during the past year (Figure 4.1). This was higher than the percentages in 2004 to 2012 (ranging from 7.9 to 9.1 percent) (Figure 4.2).

- In 2013, 7.7 percent of the population aged 12 to 17 (1.9 million youths) had past year MDE with severe impairment in one or more role domains (Figure 4.1). This was higher than the percentages in 2006 to 2012 (ranging from 5.5 to 6.3 percent) (Figure 4.3).

Figure 4.1 Major Depressive Episode in the Past Year among Youths Aged 12 to 17, by Severe Impairment, Age, and Gender: 2013
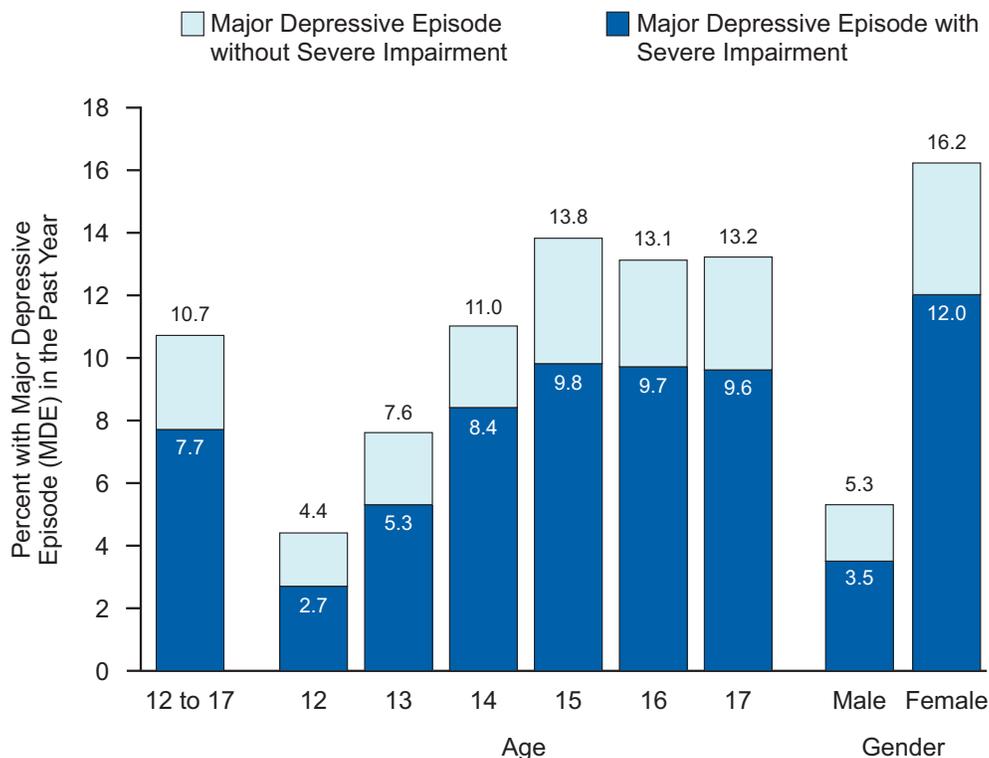
Note: Respondents with an unknown level of impairment were included in the estimates for Major Depressive Episode without Severe Impairment.

- In 2013, past year MDE and past year MDE with severe impairment among youths generally increased with age. Among 12 year olds, 4.4 percent had past year MDE and 2.7 percent had past year MDE with severe impairment (Figure 4.1). Corresponding percentages in 2013 for past year MDE and past year MDE with severe impairment among 16 year olds were 13.1 and 9.7 percent, respectively, and 13.2 and 9.6 percent, respectively, among 17 year olds. The percentages for 17 year olds in 2013 were higher than in 2012 (13.2 vs. 10.9 percent for MDE and 9.6 vs. 7.5 percent for MDE with severe impairment).

- Among youths aged 12 to 17 in 2013, females were more likely than males to have past year MDE (16.2 vs. 5.3 percent) and past year MDE with severe impairment (12.0 vs. 3.5 percent) (Figure 4.1).

- The percentage of female youths in 2013 with past year MDE (16.2 percent) was higher than the percentages in 2004 to 2012 (ranging from 11.7 to 13.7 percent) (Figure 4.2). The percentage of female youths in 2013 who had past year MDE with severe impairment (12.0 percent) was higher than the percentages in 2006 to 2012 (ranging from 8.2 to 9.8 percent) (Figure 4.3).

Figure 4.2 Major Depressive Episode in the Past Year among Youths Aged 12 to 17, by Gender: 2004-2013
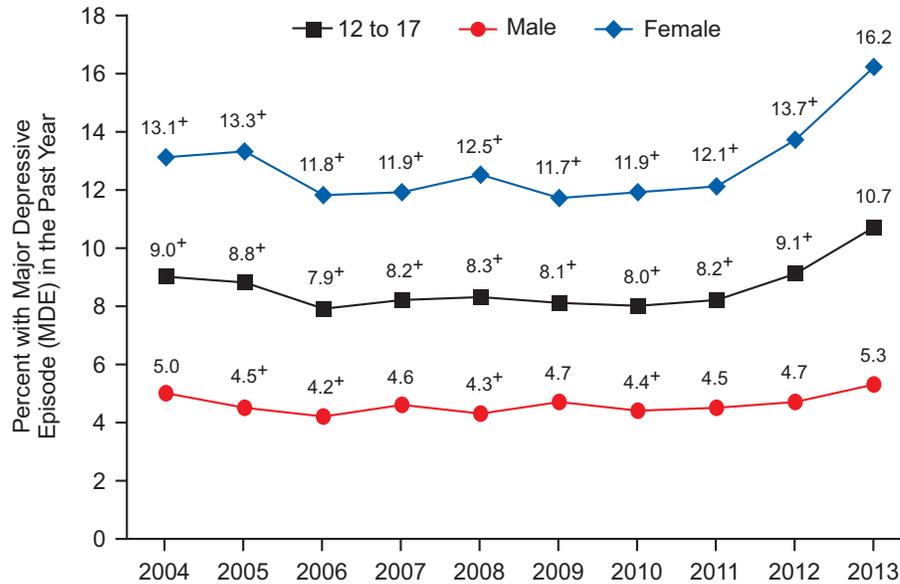
+ Difference between this estimate and the 2013 estimate is statistically significant at the .05 level.

Figure 4.3 Major Depressive Episode with Severe Impairment in the Past Year among Youths Aged 12 to 17, by Gender: 2006-2013
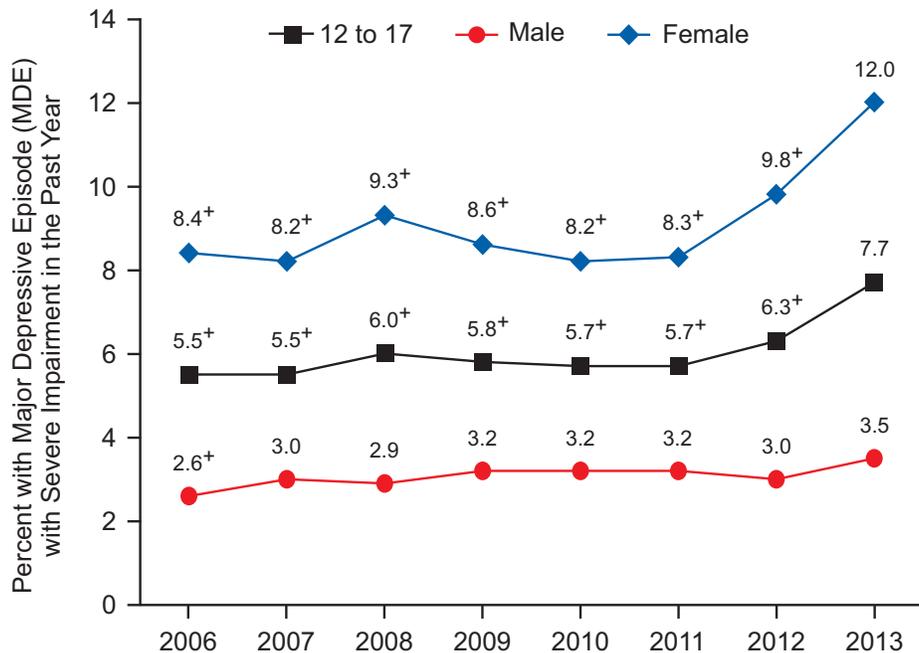
+ Difference between this estimate and the 2013 estimate is statistically significant at the .05 level.

- The percentage of male youths aged 12 to 17 in 2013 with past year MDE (5.3 percent) was similar to the percentages in 2011 (4.5 percent) and 2012 (4.7 percent) (Figure 4.2). The percentage of male youths in 2013 who had past year MDE with severe impairment (3.5 percent) was similar to the percentages in 2007 to 2012 (ranging from 2.9 to 3.2 percent), but was higher than the percentage in 2006 (2.6 percent) (Figure 4.3).

- In 2013, 38.1 percent of youths aged 12 to 17 with past year MDE received treatment for depression (i.e., saw or talked to a medical doctor or other professional or used prescription medication). This was similar to the percentages in 2004 to 2012 (ranging from 34.6 to 40.3 percent). Also in 2013, 45.0 percent of youths aged 12 to 17 with past year MDE with severe impairment received treatment for depression. This was similar to the percentages in 2006 to 2008 and in 2010 to 2012 (ranging from 41.0 to 46.5 percent), but was higher than the percentage in 2009 (38.8 percent).

- Among youths in 2013 with past year MDE, 20.4 percent saw or talked to a health professional only, 3.7 percent used prescription medication only, and 12.3 percent received treatment from both sources for depression in the past year (Figure 4.4). These percentages were similar to those in 2012 (19.6, 2.4, and 13.7 percent, respectively).

Figure 4.4 Type of Treatment Received for Major Depressive Episode in the Past Year among Youths Aged 12 to 17, by Gender: 2013
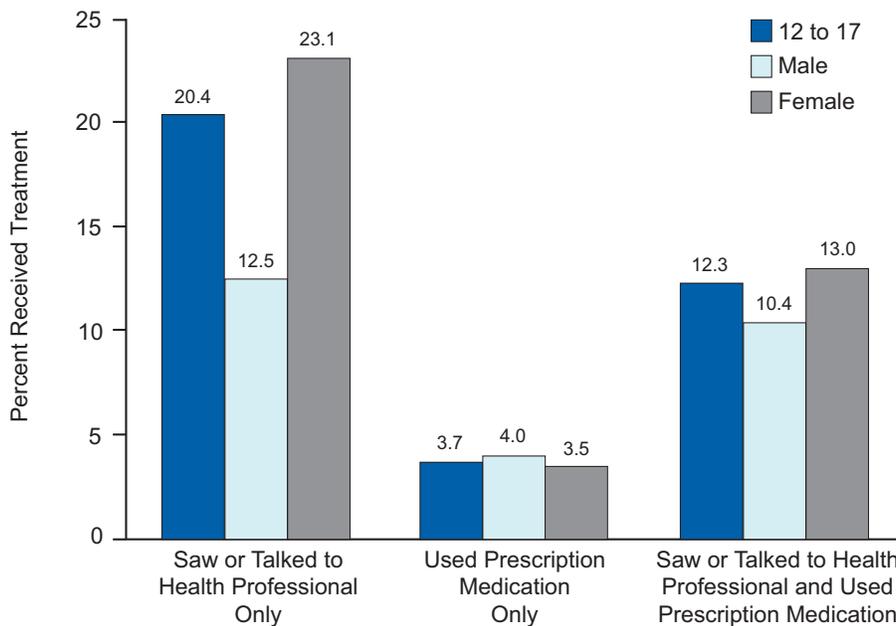
Note: Health Professionals include general practitioner or family doctor; other medical doctor (e.g., cardiologist, gynecologist, urologist); psychologist; psychiatrist or psychotherapist; social worker; counselor; other mental health professional (e.g., mental health nurse or other therapist where type is not specified); and nurse, occupational therapist, or other health professional.

- Among female youths in 2013 with past year MDE, 23.1 percent saw or talked to a health professional only, 3.5 percent used prescription medication only, and 13.0 percent received treatment from both sources for depression in the past year (Figure 4.4). These percentages for female youths were similar to those in 2012 (21.5, 2.2, and 15.2 percent, respectively).

- Among male youths in 2013 with past year MDE, 12.5 percent saw or talked to a health professional only, 4.0 percent used prescription medication only, and 10.4 percent received treatment from both sources for depression in the past year (Figure 4.4). These percentages for male youths were similar to those in 2012 (14.4, 2.9, and 9.6 percent, respectively).

Mental Health Service Utilization

Since 2000, NSDUH has included mental health service utilization modules for respondents aged 12 to 17 and those aged 18 or older. These modules ask about services for emotional and behavioral problems that were not caused by substance use. The mental health service utilization questions for youths aged 12 to 17 are different from those asked of adults aged 18 or older. The youth module was revised in 2009 to include updates to the sources of youth mental health services in an education setting (i.e., school system) and a new question on mental health service utilization in a juvenile justice setting.

The youth mental health service utilization module asks respondents aged 12 to 17 whether they received any treatment or counseling within the 12 months prior to the interview for problems with emotions or behavior in several settings: (a) the *specialty mental health setting* (inpatient or outpatient care); (b) the *education setting* (talked with a school social worker, psychologist, or counselor about an emotional or behavioral problem; participated in a program for students with emotional or behavioral problems while in a regular school; or attended a school for students with emotional or behavioral problems); (c) the *general medical setting* (pediatrician or family physician care for emotional or behavioral problems); (d) the *juvenile justice setting* (received services for an emotional or behavioral problem in a detention center, prison, or jail); or (e) the *child welfare setting* (foster care or therapeutic foster care). Youths also are asked about the number of nights spent in overnight facilities, the number of visits they had to outpatient mental health or general medical providers for mental health services, and the reason(s) for the most recent stay or visit.

The definition of mental health service use among youths aged 12 to 17 for this report differs from the definition that was used in reports prior to the 2013 survey. The child welfare setting was redefined as a separate service category instead of being included in the inpatient services under specialty services. Therefore, some estimates of mental health service use among youths in this report may differ from estimates in reports prior to the 2013 NSDUH.

- In 2013, 3.3 million youths aged 12 to 17 (13.6 percent) received mental health services for problems with emotions or behaviors in a specialty mental health setting (inpatient or outpatient care) in the past 12 months. The percentage of youths in 2013 who received specialty mental health services was higher than those in 2007 to 2012 (ranging from 12.0 to 12.7 percent).

- In 2013, 3.1 million youths (13.0 percent) received mental health services in an education setting, which was similar to the estimates in 2010 and 2012 (3.0 million and 3.2 million or 12.4 and 12.9 percent, respectively) and was higher than the estimates in 2009 and 2011 (2.9 million in each year or 12.1 and 11.9 percent, respectively).

- In 2013, 686,000 youths (2.8 percent) received mental health services in a general medical setting. Additionally in 2013, 1.5 million youths (6.1 percent) received mental health services in both a specialty setting and a nonspecialty setting (i.e., either an education or a general medical setting). These numbers and percentages were similar to those in 2012.

- In 2013, 59,000 youths (0.2 percent) received mental health services in a juvenile justice setting in the past 12 months. Estimates were greater for male than for female youths, with 41,000 males (0.3 percent) and 18,000 females (0.1 percent) having received mental health services in a juvenile justice setting.

- Of the 3.3 million youths aged 12 to 17 in 2013 who received specialty mental health services, the most commonly reported reason for receiving services was feeling depressed (50.2 percent), followed by having problems with home or family (28.2 percent), thinking about or attempting suicide (25.2 percent), then feeling very afraid or tense (22.4 percent), breaking rules and "acting out" (20.3 percent), having problems at school (18.2 percent), and having trouble controlling anger (15.9 percent) (Figure 4.5).

- Youths in 2013 who received inpatient specialty mental health services in the past year were more likely than those who received outpatient specialty mental health services to report that they received services because they thought about or attempted suicide (52.4 vs. 23.8 percent). Between 2012 and 2013, the percentage of youths receiving inpatient specialty mental health services because they thought about or attempted suicide increased from 40.2 to 52.4 percent.

- Of the 3.1 million youths aged 12 to 17 in 2013 who received mental health services in the education setting, the most commonly reported reason for receiving mental health services was feeling depressed (40.2 percent), followed by having problems at school (22.4 percent), breaking rules or "acting out" (19.9 percent), feeling very afraid or tense (18.5 percent), having problems with friends (17.7 percent), and having problems with home or family (16.2 percent).

- Of the 686,000 youths aged 12 to 17 in 2013 who received mental health services in a general medical setting, the most commonly reported reason for receiving mental health services was feeling depressed (47.9 percent), followed by having thoughts of or attempting suicide (21.4 percent), feeling very afraid or tense (18.7 percent), breaking rules or "acting out" (14.6 percent), having eating problems (13.8 percent), having problems at school (13.0 percent), having problems with home or family (11.3 percent), followed by having problems controlling anger (7.7 percent), then by having problems with friends (4.5 percent).

Figure 4.5 Reasons for Receiving Specialty Mental Health Services among Youths Aged 12 to 17 Who Received Mental Health Services in the Past Year: 2013

Reason	Percent
Felt Depressed	50.2
Had Problems with Home/Family	28.2
Thought about Killing Self or Tried to Kill Self	25.2
Felt Very Afraid and Tense	22.4
Broke Rules and "Acted Out"	20.3
Had Problems at School	18.2
Had Trouble Controlling Anger	15.9
Had Problems with Friends	11.5
Had Eating Problems	10.6
Had Problems with People Other Than Family/Friends	8.7
Got into Physical Fights	3.2
Had Other Diagnosed Mental/Neurological Disorder	2.7

Percent among Youths Who Received Specialty Mental Health Services

- Female youths aged 12 to 17 were more likely than male youths in 2013 to use outpatient specialty mental health services (15.9 vs. 9.2 percent), education services (14.6 vs. 11.4 percent), and general medical-based services (3.2 vs. 2.4 percent) (Figure 4.6). Similar percentages of female and male youths received inpatient specialty mental health services (2.4 and 2.3 percent, respectively). Between 2012 and 2013, the percentage of female youths receiving outpatient specialty mental health services increased from 14.5 to 15.9 percent, and the percentage of male youths receiving mental health services in a general medical setting increased from 1.7 to 2.4 percent.

Figure 4.6 Past Year Mental Health Service Use among Youths Aged 12 to 17, by Gender: 2012 and 2013
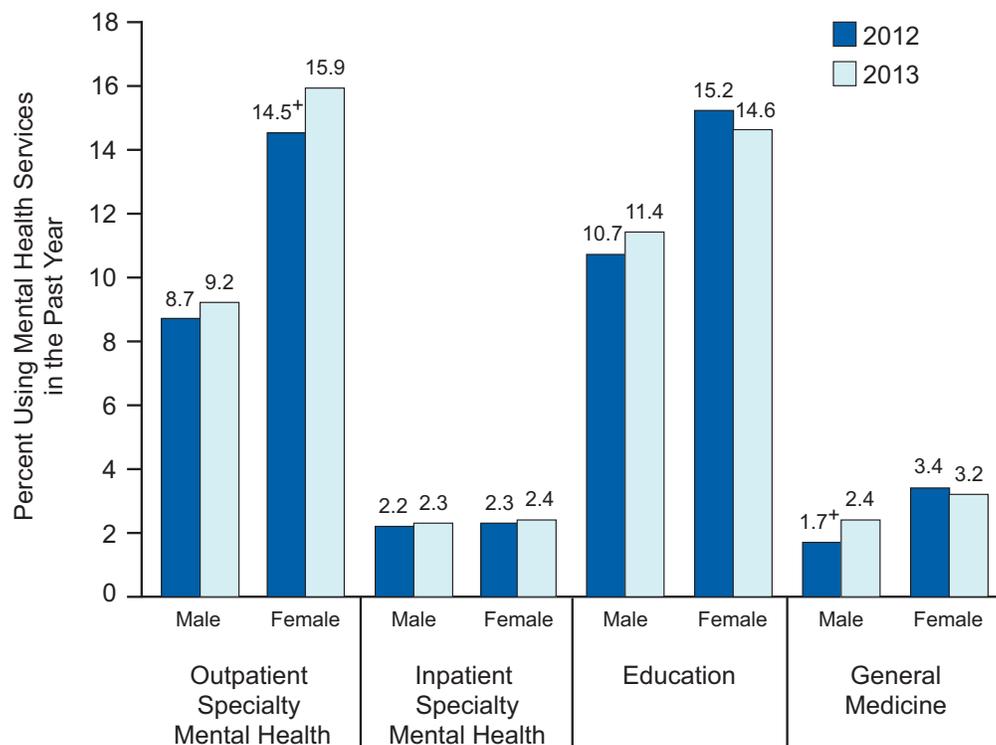
+ Difference between this estimate and the 2013 estimate is statistically significant at the .05 level.

- Of the 3.1 million youths aged 12 to 17 in 2013 who received outpatient specialty mental health services in the past 12 months, 16.1 percent reported having 1 visit, 14.0 percent reported having 2 visits, 27.7 percent reported having 3 to 6 visits, 28.4 percent reported having 7 to 24 visits, and 13.8 percent reported having 25 or more visits (Figure 4.7).

- Of the 574,000 youths aged 12 to 17 in 2013 who received inpatient or residential specialty mental health services in the past 12 months, 33.2 percent reported staying overnight 1 night, 16.1 percent reported staying overnight 2 nights, 20.4 percent reported staying overnight 3 to 6 nights, 23.6 percent reported staying overnight 7 to 24 nights, and 6.6 percent reported staying overnight 25 or more nights.

Figure 4.7 Number of Outpatient Visits in the Past Year among Youths Aged 12 to 17 Who Received Outpatient Specialty Mental Health Services: 2013

2
Visits

14.0%

1
Visit

16.1%

3 to 6
Visits

27.7%

25 or More
Visits

13.8%

7 to 24
Visits

28.4%
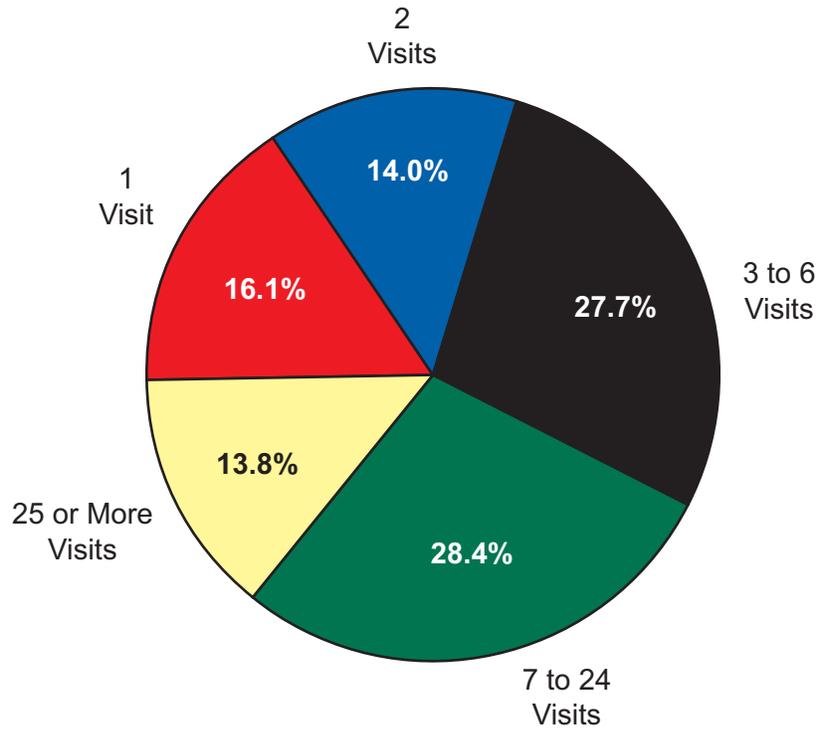
3.1 Million Youths Who Received Outpatient
Specialty Mental Health Services

5. Co-Occurrence of Mental Illness and Substance Use

This chapter presents findings from the 2013 National Survey on Drug Use and Health (NSDUH) on co-occurring mental illness (including major depressive episode [MDE]), substance use, and co-occurring mental illness and substance use disorders (i.e., illicit drug or alcohol dependence or abuse) among adults aged 18 or older in the United States. This chapter also discusses the receipt of mental health care and specialty substance use treatment among adults with co-occurring mental illness and substance use disorders. In addition, findings for youths aged 12 to 17 are presented on the co-occurrence of MDE and substance use disorders.

Mental illness, as discussed in Chapter 2, is defined as the presence of a diagnosable mental, behavioral, or emotional disorder (excluding developmental and substance use disorders) of sufficient duration to meet diagnostic criteria specified within the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association, 1994). Levels of any mental illness (AMI) considered in this report include serious mental illness (SMI), moderate mental illness, and low (mild) mental illness, which are differentiated by their level of functional impairment. Functional impairment is the interference with or limitation of one or more major life activities. Refer to Chapter 2 for detailed definitions. Also, definitions for these mental health measures and other measures used in this chapter are included in a glossary as part of the 2013 mental health detailed tables.[13] Procedures in NSDUH for estimating these levels of mental illness in the past year among adults are described in Section B.4.3 of Appendix B. Note that the terms "substance use disorders," "substance dependence or abuse," and "alcohol or illicit drug dependence or abuse" are used interchangeably.

Substance Use among Adults with Mental Illness

- In 2013, the percentage of adults aged 18 or older who used illicit drugs in the past year was higher among adults who had past year AMI (27.6 percent) than it was among adults who did not have past year mental illness (13.0 percent) (Figure 5.1). This pattern was similar for most specific types of illicit drug use, including the use of marijuana, cocaine, hallucinogens, inhalants, or heroin and the nonmedical use of prescription-type psychotherapeutics.

- Among adults aged 18 or older in 2013, the percentage of adults who used cigarettes in the past year was higher among those who had past year AMI than it was among those who did not have past year mental illness (37.6 vs. 24.4 percent).

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[13] See Chapter 1 for more information on this report's mental health glossary and the mental health detailed tables.

Figure 5.1 Past Year Substance Use among Adults Aged 18 or Older, by Any Mental Illness: 2013
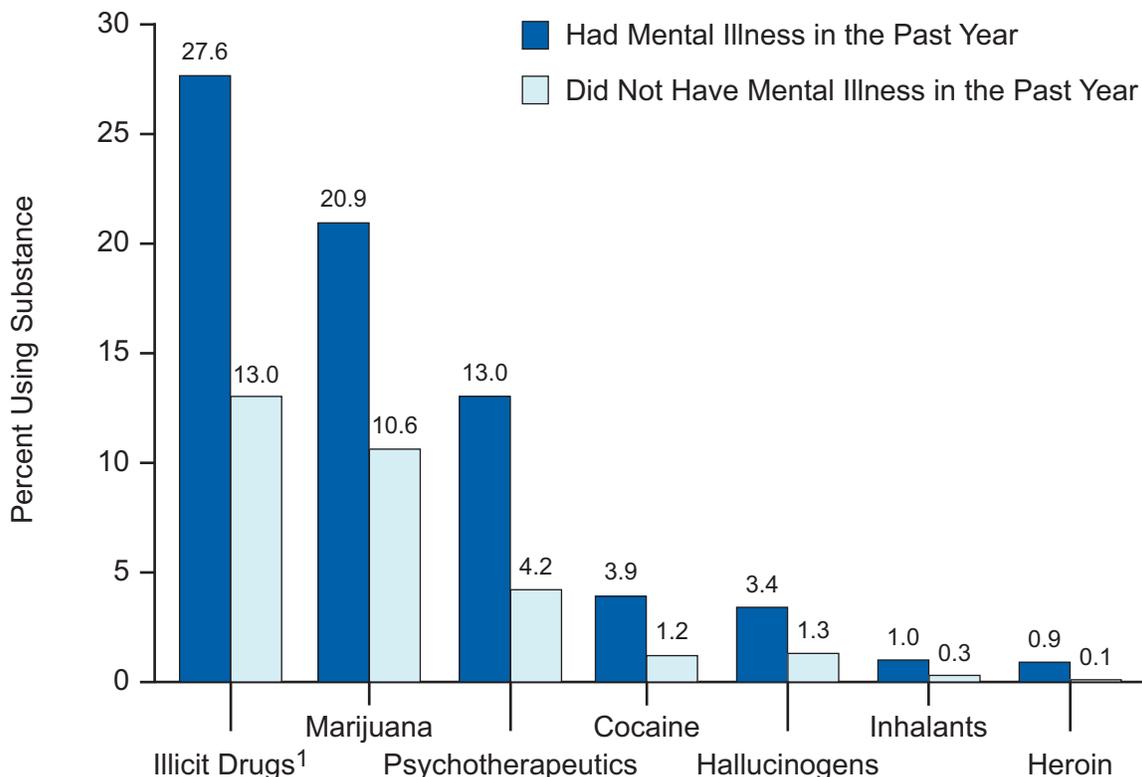
[1] Illicit Drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

- In 2013, 25.9 percent of adults aged 18 or older with past year AMI were binge alcohol users in the past month, which was similar to the percentage among adults who did not have past year mental illness (24.3 percent). Binge alcohol use is defined as drinking 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.

- In 2013, the percentage of adults aged 18 or older who were heavy alcohol users in the past month was higher among those who had past year AMI than it was among adults who did not have past year mental illness (8.0 vs. 6.6 percent). Heavy alcohol use is defined as drinking five or more drinks on the same occasion on 5 or more days in the past 30 days.

- Past year illicit drug use was associated with levels of mental illness in the past year. In 2013, the percentage of adults aged 18 or older who used illicit drugs in the past year was highest among adults with past year SMI (33.4 percent), followed by adults with moderate mental illness (27.7 percent) and those with low (mild) mental illness (24.9 percent), then by those who did not have past year mental illness (13.0 percent).

- In 2013, the percentage of adults aged 18 or older who used cigarettes in the past year was higher among those who had past year SMI than it was among adults who did not have past year mental illness (45.6 vs. 24.4 percent).

- Among adults aged 18 or older in 2013, the percentages who were binge alcohol users or heavy alcohol users in the past month among those with past year SMI (25.3 and 7.9 percent, respectively) were similar to the percentages among adults without past year mental illness (24.3 and 6.6 percent, respectively).

Mental Illness and Substance Use Disorders among Adults

- In 2013, among the 20.3 million adults with a past year substance use disorder, 37.8 percent (7.7 million adults) had co-occurring mental illness in the past year (Figure 5.2). In contrast, among adults without past year substance use disorders, 16.7 percent (36.2 million adults) had mental illness in the past year.

Figure 5.2 Past Year Substance Use Disorders and Mental Illness among Adults Aged 18 or Older: 2013
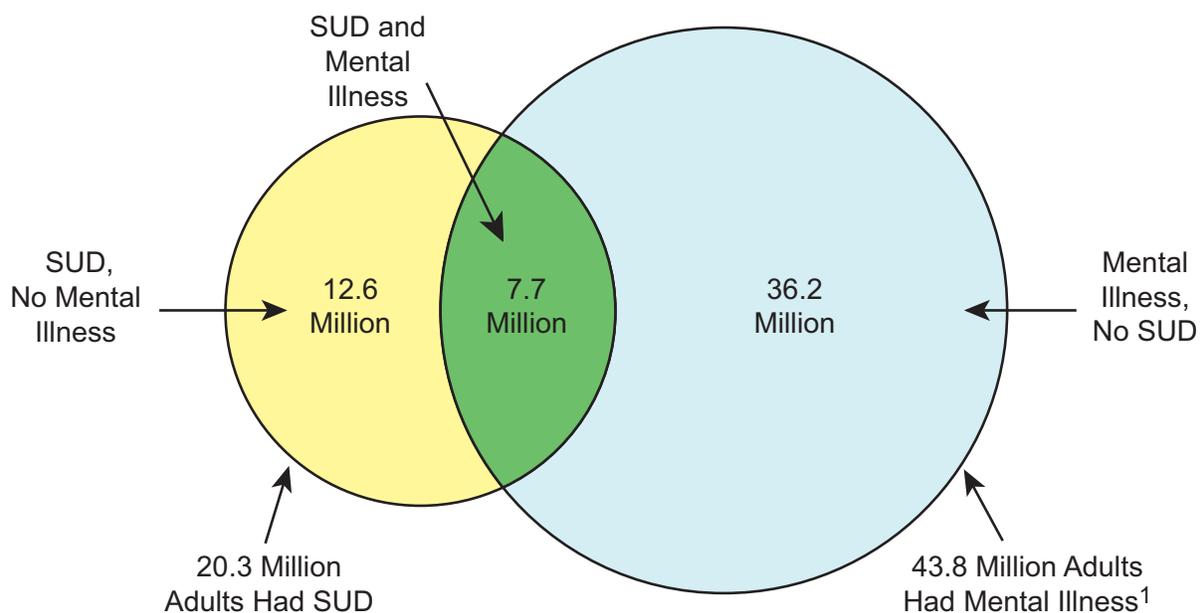
SUD = substance use disorder.

[1] Statistics on mental illness are provided in Chapter 2 of this report.

- Among the 43.8 million adults aged 18 or older in 2013 who had past year AMI, 17.5 percent (7.7 million adults) met criteria for a substance use disorder in the past year (Figure 5.2). In contrast, 6.5 percent of adults who did not have past year mental illness (12.6 million adults) met criteria for a substance use disorder in the past year.

- Among adults aged 18 or older in 2013 with past year AMI, the percentage of adults who had a past year substance use disorder was highest among those aged 18 to 25 (31.1 percent), followed by those aged 26 to 49 (21.0 percent), then by those aged 50 or older (7.2 percent). Similarly, among adults aged 18 or older in 2013 with past year SMI, the percentage of adults who had a past year substance use disorder was highest among those aged 18 to 25 (39.6 percent), followed by those aged 26 to 49 (25.6 percent), then by those aged 50 or older (12.0 percent).

- Among the 20.3 million adults aged 18 or older in 2013 who had a past year substance use disorder, 11.4 percent (2.3 million adults) also had SMI in the past year (Figure 5.3).

Figure 5.3 Past Year Substance Use Disorders and Serious Mental Illness among Adults Aged 18 or Older: 2013
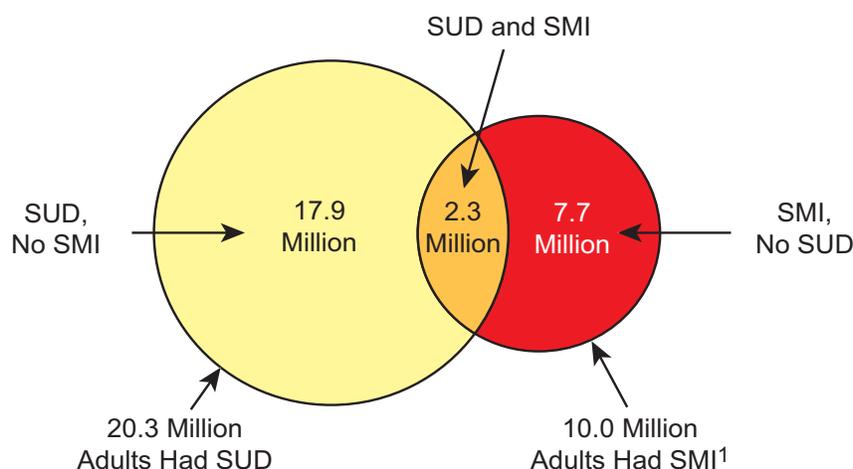
SMI = serious mental illness; SUD = substance use disorder.

[1] Statistics on mental illness are provided in Chapter 2 of this report.

- Past year substance use disorders were associated with levels of mental illness in the past year. In 2013, 23.1 percent of adults aged 18 or older who had SMI in the past year and 19.6 percent of those with moderate mental illness also had past year substance use disorders, followed by 13.9 percent of adults with low (mild) mental illness, then by 6.5 percent of adults who did not have mental illness (Figure 5.4).

- In 2013, 10.5 percent of adults aged 18 or older with past year SMI also had a co-occurring illicit drug use disorder in the past year, as did 8.6 percent of adults with moderate mental illness, 4.8 percent of adults with low (mild) mental illness, and 1.5 percent of adults who did not have mental illness (Figure 5.5).

- In 2013, 17.4 percent of adults aged 18 or older with past year SMI and 15.0 percent of those with moderate mental illness also had a co-occurring alcohol use disorder in the past year, followed by 10.8 percent of adults with low (mild) mental illness, then by 5.5 percent of adults who did not have mental illness (Figure 5.6).

Figure 5.4 Past Year Substance Use Disorders among Adults Aged 18 or Older, by Level of Mental Illness: 2013

Chart: Percent Dependent or Abusing Substance by level of mental illness.
- Serious Mental Illness (SMI): 23.1
- Moderate Mental Illness: 19.6
- Low (Mild) Mental Illness: 13.9
- No Mental Illness: 6.5
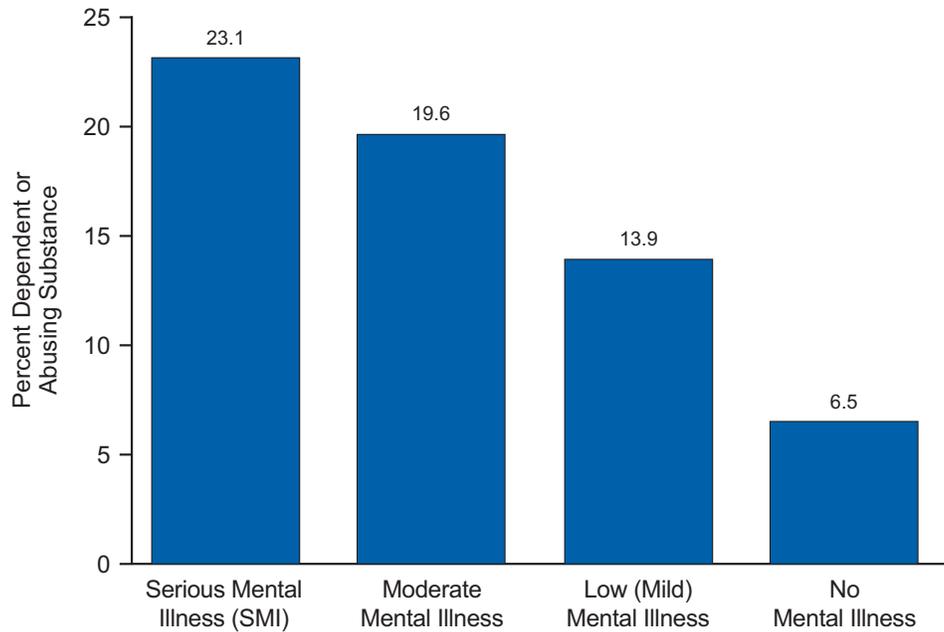
Figure 5.5 Past Year Illicit Drug Use Disorders among Adults Aged 18 or Older, by Level of Mental Illness: 2013

Chart: Percent Dependent or Abusing Substance by level of mental illness.
- Serious Mental Illness (SMI): 10.5
- Moderate Mental Illness: 8.6
- Low (Mild) Mental Illness: 4.8
- No Mental Illness: 1.5
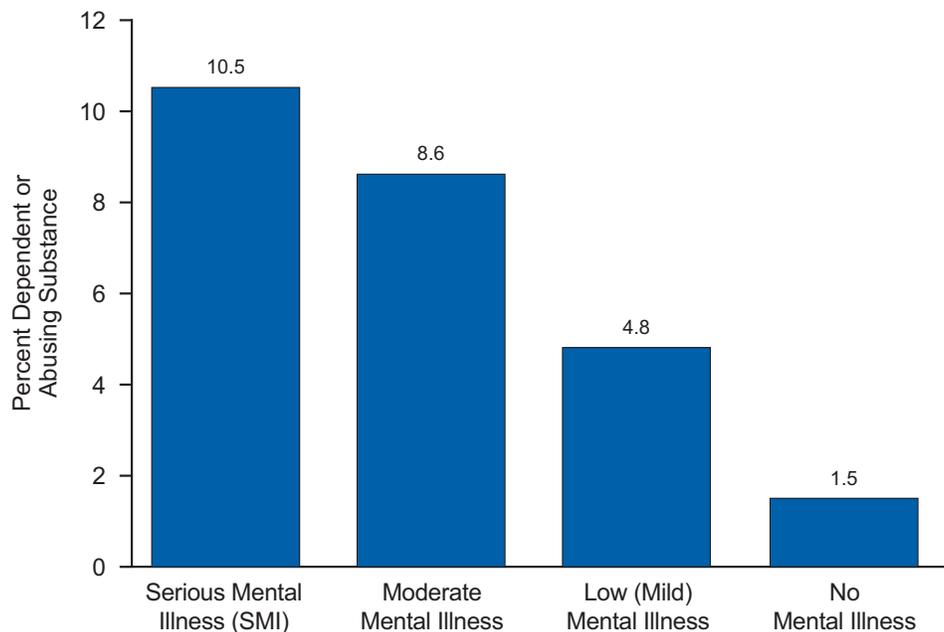
Figure 5.6 Past Year Alcohol Use Disorders among Adults Aged 18 or Older, by Level of Mental Illness: 2013
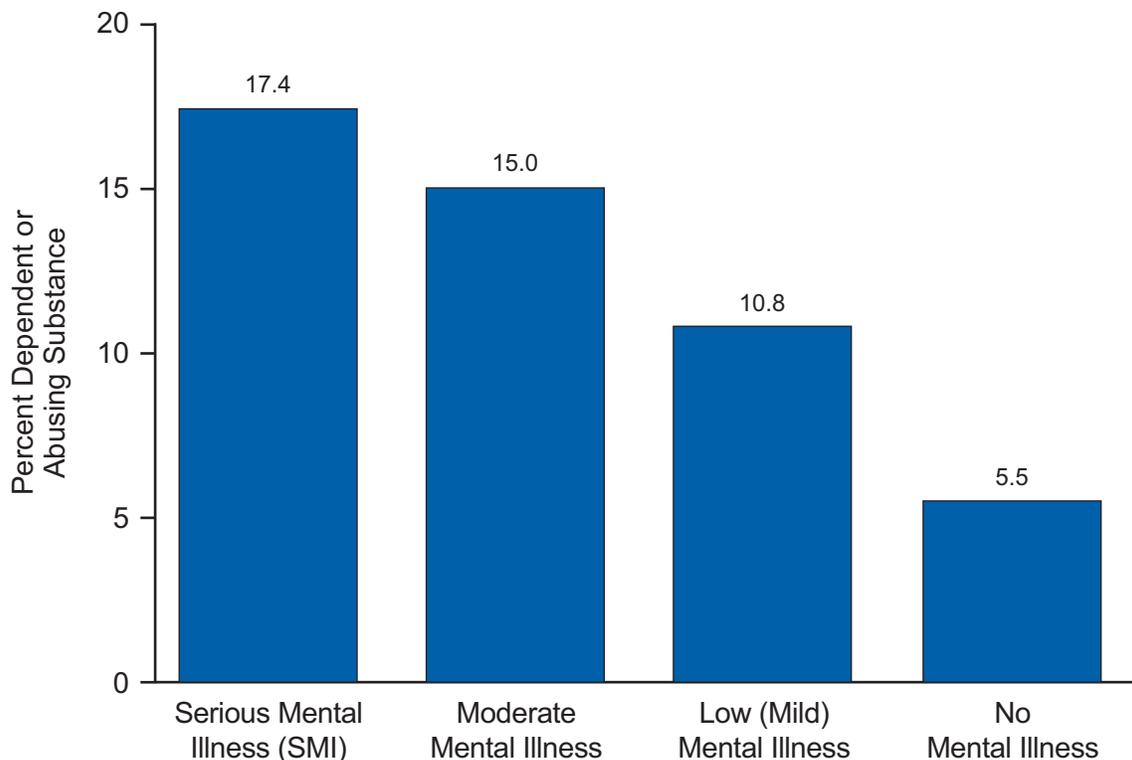
Co-Occurring Mental Illness and Substance Use Disorders among Adults, by Sociodemographic Characteristics

The prior section described mental illness among adults with a past year substance use disorder as well as substance use disorders among adults with mental illness. This section presents findings on the percentages of adults in the United States as a whole who had co-occurring substance use disorders and mental illness. This section also presents findings on co-occurring substance use disorders and mental illness among sociodemographic subgroups of adults.

- In 2013, an estimated 7.7 million adults aged 18 or older (3.2 percent of adults) had co-occurring mental illness and substance use disorders in the past year. The percentage of adults who had co-occurring mental illness and substance use disorders in the past year was highest among adults aged 18 to 25 (6.0 percent), followed by those aged 26 to 49 (4.5 percent), then by those aged 50 or older (1.1 percent) (Figure 5.7).

- In 2013, the percentage of adults aged 18 or older who had co-occurring mental illness and substance use disorders in the past year was higher among males than females (3.6 vs. 2.8 percent) (Figure 5.7).

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Figure 5.7 Co-Occurring Mental Illness and Substance Use Disorders in the Past Year among Adults Aged 18 or Older, by Age and Gender: 2013
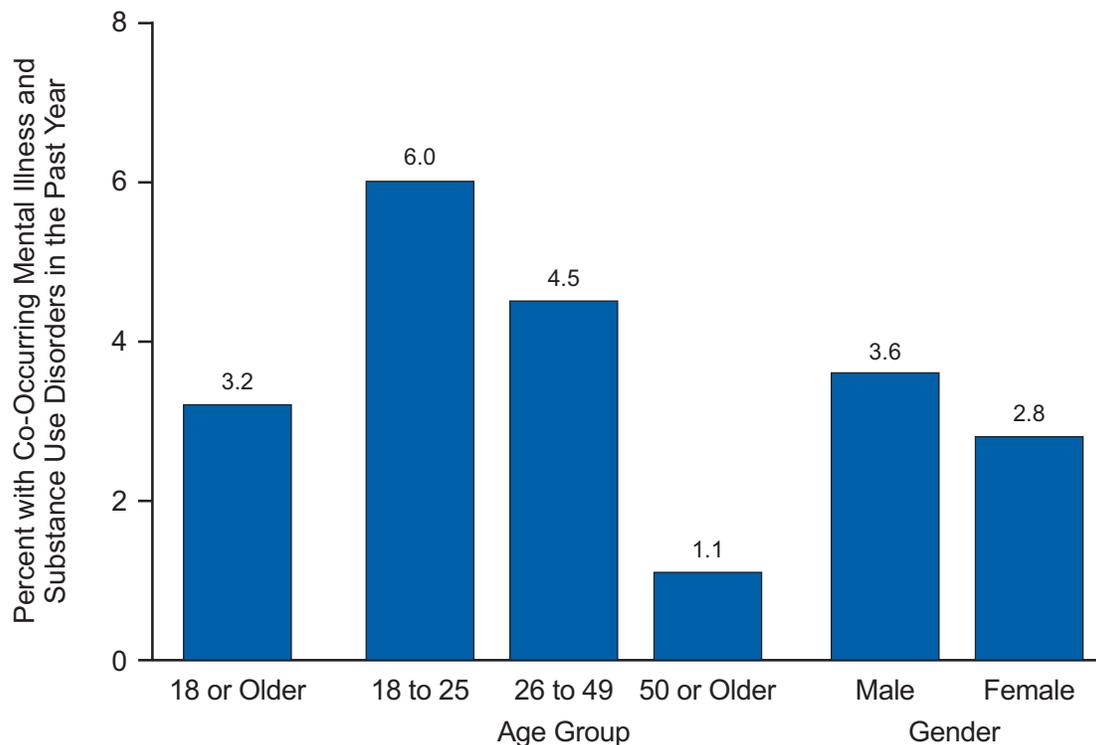
- In 2013, the percentages of adults aged 18 or older who had co-occurring mental illness and substance use disorders in the past year were 1.4 percent among Asians, 2.3 percent among Native Hawaiians or Other Pacific Islanders, 3.1 percent among Hispanics, 3.3 percent among blacks, 3.3 percent among whites, 7.4 percent among American Indians or Alaska Natives, and 7.8 percent among adults reporting two or more races.

- Among adults aged 18 or older in 2013, those who had graduated from college were less likely to have co-occurring mental illness and substance use disorders in the past year (2.8 percent) than those who had some college education, but did not have a college degree (4.1 percent). However, the percentage of adults who graduated from college who had co-occurring mental illness and substance use disorders was similar to the percentages among those who had graduated from high school but had no further education (2.9 percent) and among those who had not completed high school (3.4 percent).

- In 2013, among adults aged 18 or older, the percentage of unemployed adults with co-occurring mental illness and substance use disorders in the past year (6.8 percent) was higher than the percentages among those who were employed full time (3.0 percent) or part time (4.0 percent) (Figure 5.8).

Figure 5.8 Co-Occurring Mental Illness and Substance Use Disorders in the Past Year among Adults Aged 18 or Older, by Employment Status: 2013
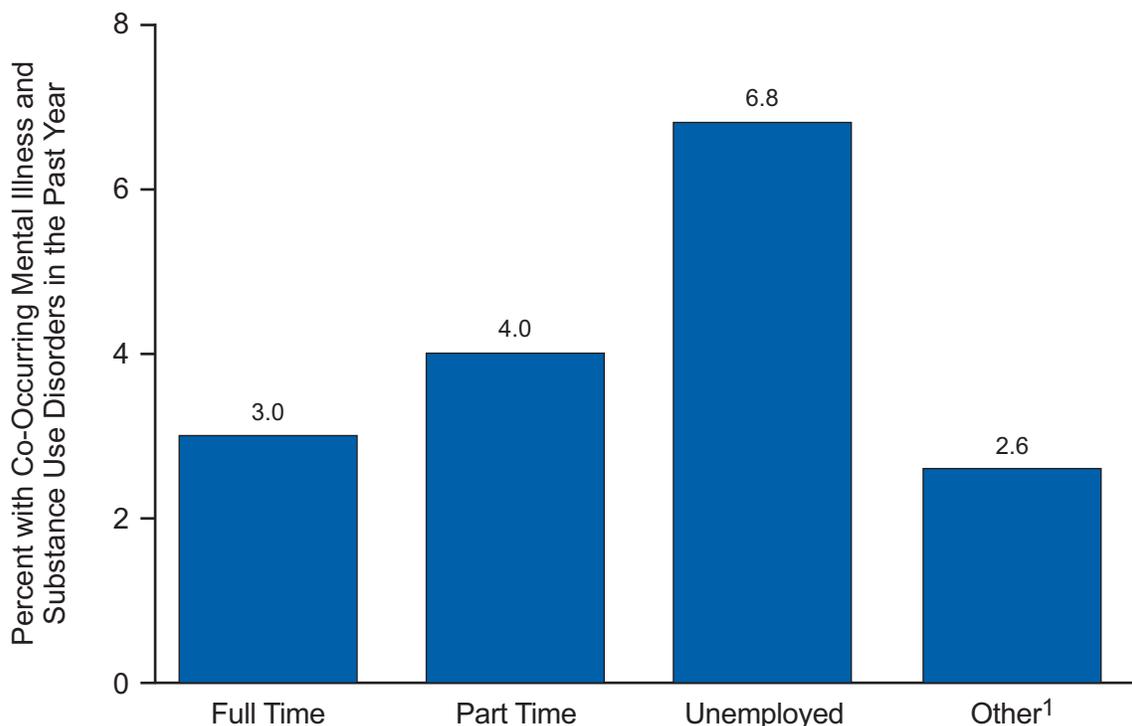
¹ The Other Employment category includes students, persons keeping house or caring for children full time, retired or disabled persons, or other persons not in the labor force.

- Among adults aged 18 or older in 2013 whose family income was below the Federal poverty level, 4.8 percent (1.7 million adults) had co-occurring mental illness and substance use disorders in the past year. This percentage and number of adults were similar to those for adults whose family income was between 100 and 199 percent of the Federal poverty level (4.0 percent and 1.9 million adults). In contrast, 2.6 percent of adults whose family income was at or above 200 percent of the Federal poverty level (4.0 million adults) had co-occurring mental illness and substance use disorders in the past year.

- In 2013, the percentage of adults aged 18 or older who had co-occurring mental illness and substance use disorders in the past year was highest among those without health insurance (5.4 percent) and among adults who were covered by Medicaid or the Children's Health Insurance Program (CHIP)[14] (5.0 percent), followed by adults with private health insurance (2.5 percent), then by adults with other types of health insurance (1.8 percent).

[14] The estimate for adults with co-occurring mental illness and substance use disorders who were covered either by Medicaid or CHIP refers to adults aged 18 or older who were covered by Medicaid or those aged 18 or 19 who were covered by CHIP.

- In 2013, an estimated 2.3 million adults aged 18 or older (1.0 percent of adults) had co-occurring SMI and substance use disorders in the past year. Percentages were similar for adults aged 18 to 25 (1.7 percent) and those aged 26 to 49 (1.4 percent), both of which were higher than among adults aged 50 or older (0.4 percent).

- Among adults aged 18 or older in 2013, similar percentages of males and females had co-occurring SMI and substance use disorders in the past year (1.1 and 0.9 percent, respectively).

- In 2013, the percentages of adults aged 18 or older who had co-occurring SMI and substance use disorders in the past year were 0.5 percent among Asians, 0.7 percent among blacks, 1.0 percent among Hispanics, 1.0 percent among whites, 1.1 percent among American Indians or Alaska Natives, and 1.9 percent among adults reporting two or more races.

- Among adults aged 18 or older in 2013, the percentages with co-occurring SMI and substance use disorders in the past year were 0.8 percent among adults who had graduated from college, 0.9 percent among those who had graduated from high school but had no further education, 1.0 percent for those who had not completed high school, and 1.3 percent among those who had some college education but did not have a college degree.

- In 2013, the percentages of adults with co-occurring SMI and substance use disorders in the past year were higher among unemployed adults (2.1 percent) and adults who were employed part time (1.4 percent) than among adults who were employed full time (0.7 percent).

- Among adults aged 18 or older in 2013, the percentage of adults who had co-occurring SMI and substance use disorders in the past year was higher among those whose family income was below the Federal poverty level (2.0 percent) than it was among those whose family income was between 100 and 199 percent of the Federal poverty level (1.0 percent) and among those whose family income was at or above 200 percent of the Federal poverty level (0.7 percent).

- In 2013, 1.9 percent of adults without health insurance and 2.0 percent of adults who were covered by Medicaid or CHIP[15] had co-occurring SMI and substance use disorders in the past year. These percentages were higher than the percentages among adults with private health insurance (0.6 percent) and among adults with other types of health insurance (0.6 percent).

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[15] The estimate for adults with co-occurring SMI and substance use disorders who were covered either by Medicaid or CHIP refers to adults aged 18 or older who were covered by Medicaid or those aged 18 or 19 who were covered by CHIP.

Major Depressive Episode and Substance Use among Adults

- In 2013, the percentage of adults aged 18 or older who used illicit drugs in the past year was higher among adults who had past year MDE than it was among those without past year MDE (28.8 vs. 14.8 percent) (Figure 5.9). A similar pattern was observed for specific types of past year illicit drug use, such as the use of marijuana, cocaine, hallucinogens, inhalants, or heroin and the nonmedical use of prescription-type psychotherapeutics.

- Among adults aged 18 or older in 2013, the percentage of adults who were heavy alcohol users in the past month was higher among those who had past year MDE (8.6 percent) than it was among those without past year MDE (6.7 percent).

- In 2013, the percentage of adults aged 18 or older who were daily cigarette users in the past month was higher among those with past year MDE than it was among adults without past year MDE (22.0 vs. 13.3 percent).

Figure 5.9 Past Year Substance Use among Adults Aged 18 or Older, by Major Depressive Episode in the Past Year: 2013
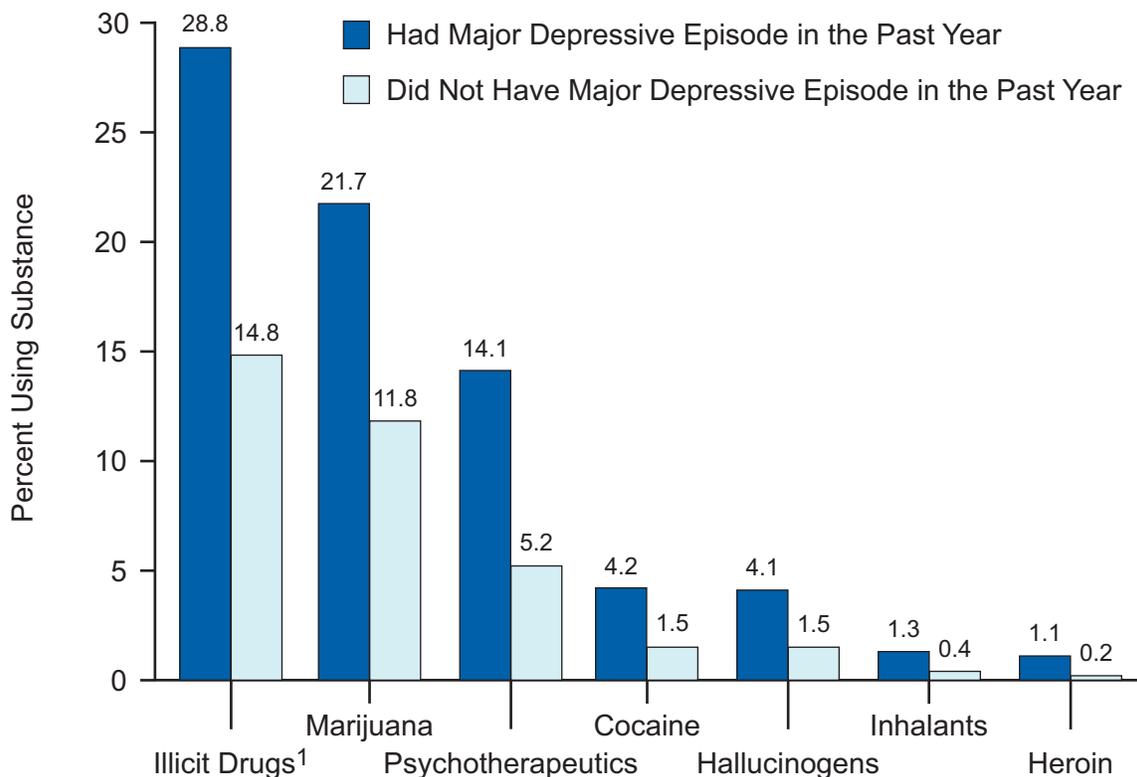
[1] Illicit Drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

Major Depressive Episode and Substance Use Disorders among Adults

- In 2013, an estimated 3.3 million adults aged 18 or older (1.4 percent among this population) had both MDE and a substance use disorder in the past year.

- Among the 20.3 million adults aged 18 or older in 2013 who had a past year substance use disorder, 3.3 million adults (16.4 percent) had MDE in the past year.

- In 2013, the percentage of adults aged 18 or older who had a substance use disorder in the past year was higher among those with past year MDE than it was among those without past year MDE (21.0 vs. 7.6 percent) (Figure 5.10).

- In 2013, the percentage of adults aged 18 or older who had an illicit drug use disorder in the past year was higher among those with past year MDE than it was among adults without past year MDE (8.4 vs. 2.1 percent) (Figure 5.10). Also, the percentage of adults who had an alcohol use disorder in the past year was higher among adults with past year MDE than it was among adults without past year MDE (16.9 vs. 6.3 percent).

Figure 5.10 Past Year Substance Dependence or Abuse among Adults Aged 18 or Older, by Major Depressive Episode in the Past Year: 2013
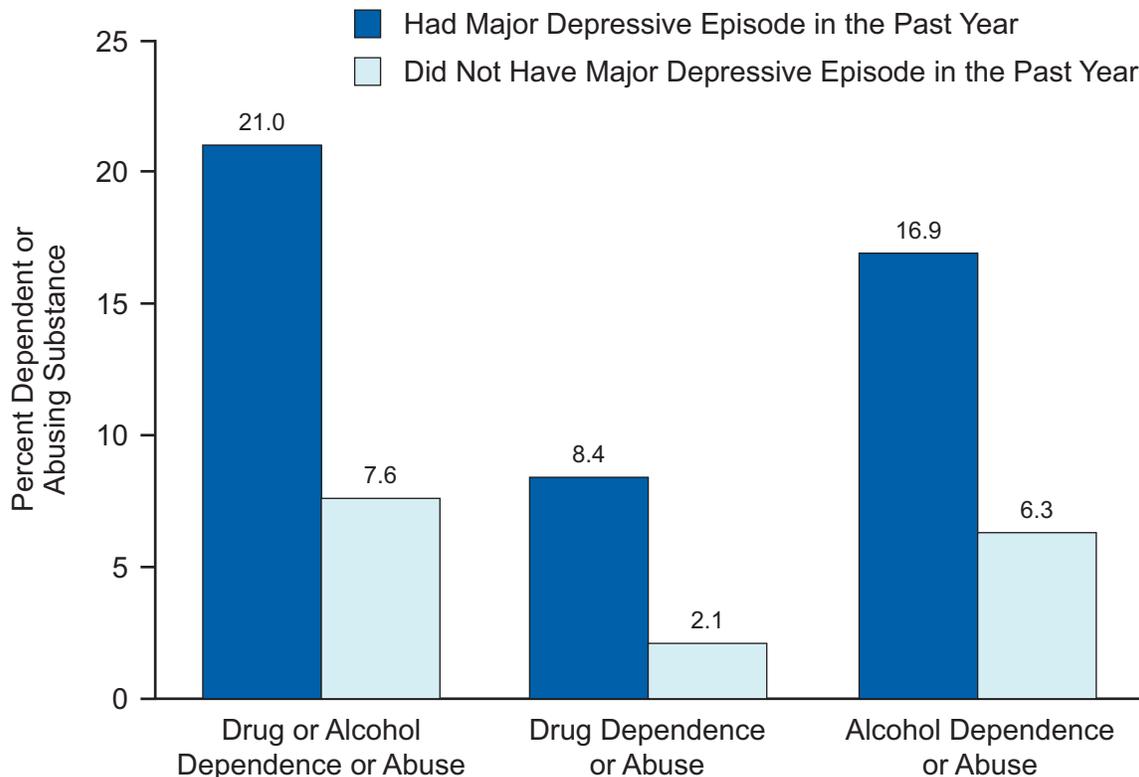
Mental Health Care and Specialty Substance Use Treatment among Adults with Co-Occurring Mental Illness and Substance Use Disorders

- Among the 7.7 million adults aged 18 or older in 2013 who had co-occurring AMI and substance use disorders in the past year, 47.8 percent received either mental health care or substance use treatment at a specialty facility in the past year, including 7.7 percent who received both mental health care and specialty substance use treatment, 37.2 percent who received mental health care only, and 2.8 percent who received specialty substance use treatment only (Figure 5.11). A specialty substance use treatment facility is defined as a drug or alcohol rehabilitation facility (inpatient or outpatient), a hospital (inpatient services only), or a mental health center.

Figure 5.11 Receipt of Mental Health Care and Specialty Substance Use Treatment in the Past Year among Adults Aged 18 or Older Who Had Past Year Mental Illness and Substance Use Disorders: 2013
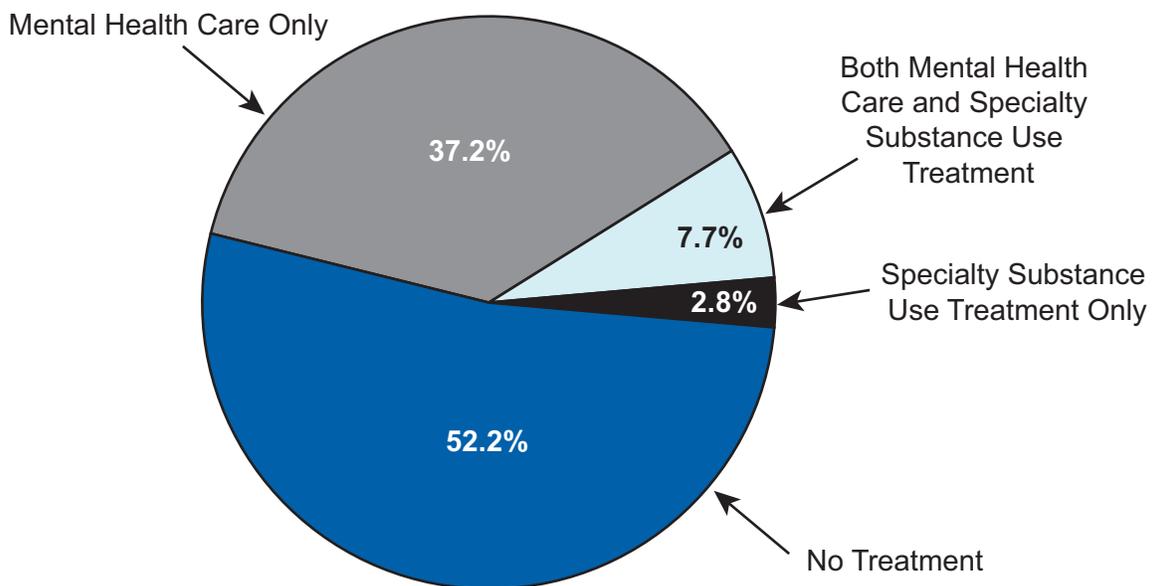
7.7 Million Adults with Co-Occurring
Mental Illness and Substance Use Disorders

Note: Mental health care is defined as having received inpatient care or outpatient care or having used prescription medication for problems with emotions, nerves, or mental health. Specialty substance use treatment refers to treatment at a hospital (inpatient only), rehabilitation facility (inpatient or outpatient), or mental health center in order to reduce or stop drug or alcohol use, or for medical problems associated with drug or alcohol use.
Note: The percentages do not add to 100 percent due to rounding.

- Among the 2.3 million adults aged 18 or older in 2013 who had past year SMI and substance use disorders, 69.2 percent received either substance use treatment at a specialty facility or mental health care in the past year (Figure 5.12), including 12.8 percent who received both mental health care and specialty substance use treatment, 52.8 percent who received mental health care only, and 3.6 percent who received specialty substance use treatment only.

- Among adults who had past year substance use disorders in 2013, those who had past year SMI were most likely to have received either mental health care or specialty substance use treatment (69.2 percent), followed by those who had moderate mental illness (46.6 percent), then by those with low (mild) mental illness (32.6 percent), then by those who had no mental illness in the past year (14.6 percent).

Figure 5.12 Receipt of Mental Health Care and Specialty Substance Use Treatment in the Past Year among Adults Aged 18 or Older Who Had Past Year Serious Mental Illness and Substance Use Disorders: 2013

Mental Health Care Only — 52.8%

Both Mental Health Care and Specialty Substance Use Treatment — 12.8%

Specialty Substance Use Treatment Only — 3.6%

No Treatment — 30.8%
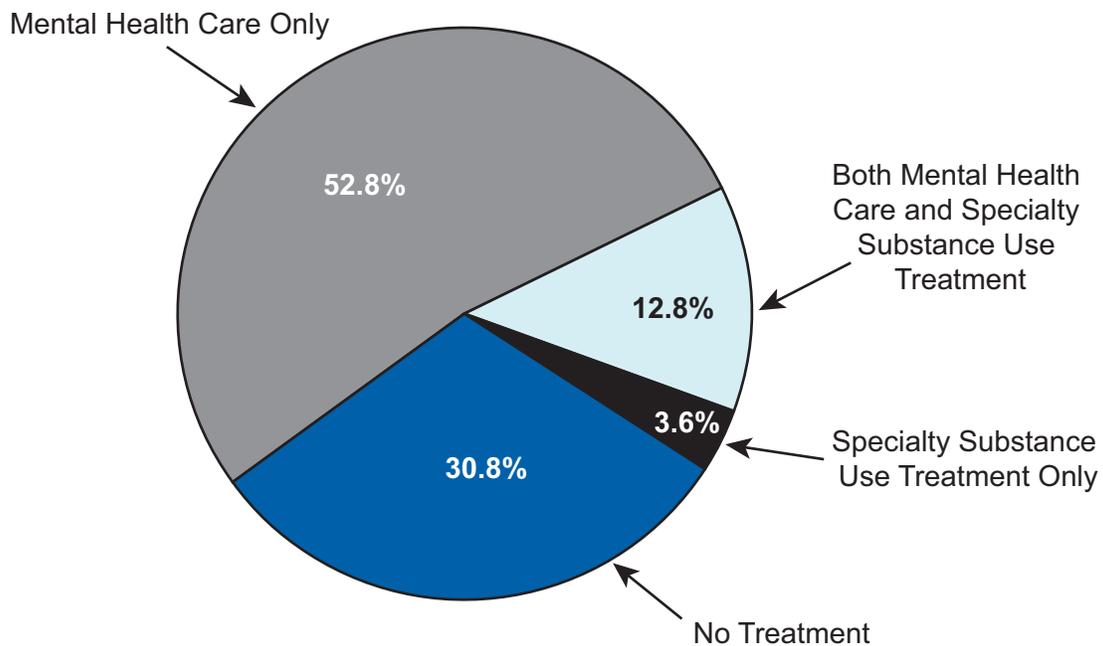
2.3 Million Adults with Co-Occurring Serious Mental Illness (SMI) and Substance Use Disorders

Note: Mental health care is defined as having received inpatient care or outpatient care or having used prescription medication for problems with emotions, nerves, or mental health. Specialty substance use treatment refers to treatment at a hospital (inpatient only), rehabilitation facility (inpatient or outpatient), or mental health center in order to reduce or stop drug or alcohol use, or for medical problems associated with drug or alcohol use.

Major Depressive Episode and Substance Use among Youths

- In 2013, the percentage of youths aged 12 to 17 who used illicit drugs in the past year was higher among those with past year MDE than it was among those without past year MDE (33.2 vs. 15.1 percent) (Figure 5.13). This pattern was similar for most specific types of illicit drug use, including the use of marijuana, inhalants, hallucinogens, cocaine, and the nonmedical use of prescription-type psychotherapeutics.

- Among youths aged 12 to 17 in 2013, the percentage who were daily cigarette users in the past month was higher among those with past year MDE than it was among youths without past year MDE (1.8 vs. 1.0 percent).

- In 2013, 1.2 percent of youths aged 12 to 17 with past year MDE and 1.2 percent of those without past year MDE were heavy alcohol users in the past month.

Figure 5.13 Past Year Substance Use among Youths Aged 12 to 17, by Past Year Major Depressive Episode: 2013
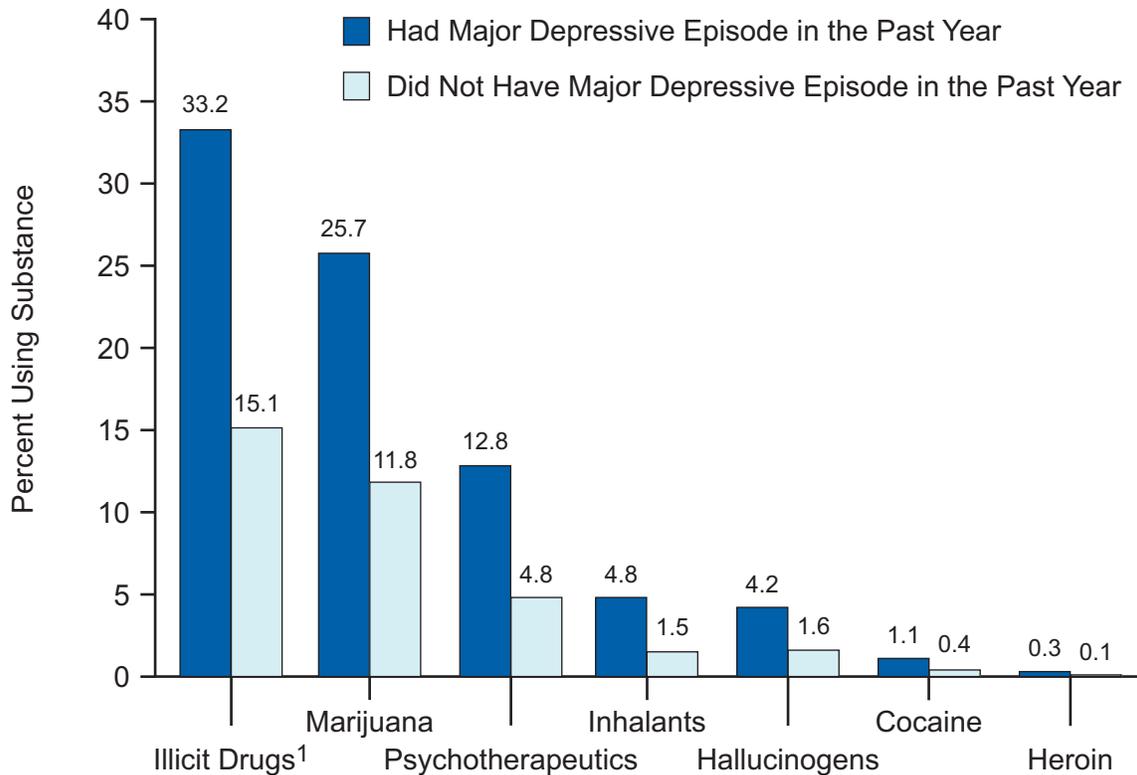
[1] Illicit Drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically.

Major Depressive Episode and Substance Use Disorders among Youths

- In 2013, an estimated 359,000 youths aged 12 to 17 (1.4 percent of youths) had both a substance use disorder and MDE in the past year. Among the 1.3 million youths aged 12 to 17 who had a past year substance use disorder, 28.8 percent (359,000 youths) had past year MDE (Figure 5.14).

Figure 5.14 Past Year Substance Use Disorders and Past Year Major Depressive Episode among Youths Aged 12 to 17: 2013

MDE and
SUD

SUD,
No MDE

0.9
Million

359,000

2.2
Million

MDE,
No SUD

1.3 Million
Youths Had SUD

2.6 Million
Youths Had MDE
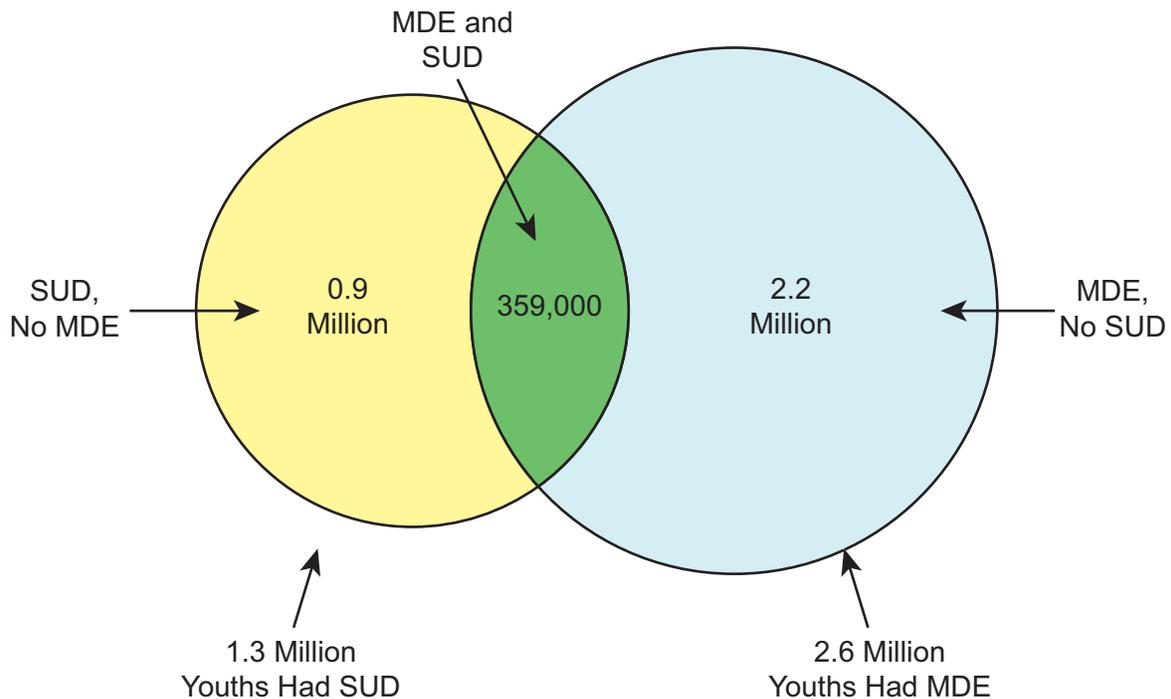
MDE = major depressive episode; SUD = substance use disorder.

- In 2013, among the 2.6 million youths aged 12 to 17 who had past year MDE, 13.9 percent (359,000 youths) had a substance use disorder in the past year (Figure 5.14).

- Among youths aged 12 to 17 in 2013, the percentage of youths who had a substance use disorder in the past year was higher among those with past year MDE (13.9 percent) than it was among those without past year MDE (4.1 percent) (Figure 5.15).

- In 2013, 33.6 percent of youths aged 12 to 17 who had past year illicit drug or alcohol dependence also had MDE in the past year.

Figure 5.15 Past Year Substance Dependence or Abuse among Youths Aged 12 to 17, by Past Year Major Depressive Episode: 2013

Legend:
- Had Major Depressive Episode in the Past Year
- Did Not Have Major Depressive Episode in the Past Year

Y-axis: Percent Dependent or Abusing Substance

Category	Had Major Depressive Episode	Did Not Have Major Depressive Episode
Drug or Alcohol Dependence or Abuse	13.9	4.1
Drug Dependence or Abuse	9.3	2.7
Alcohol Dependence or Abuse	8.4	2.1
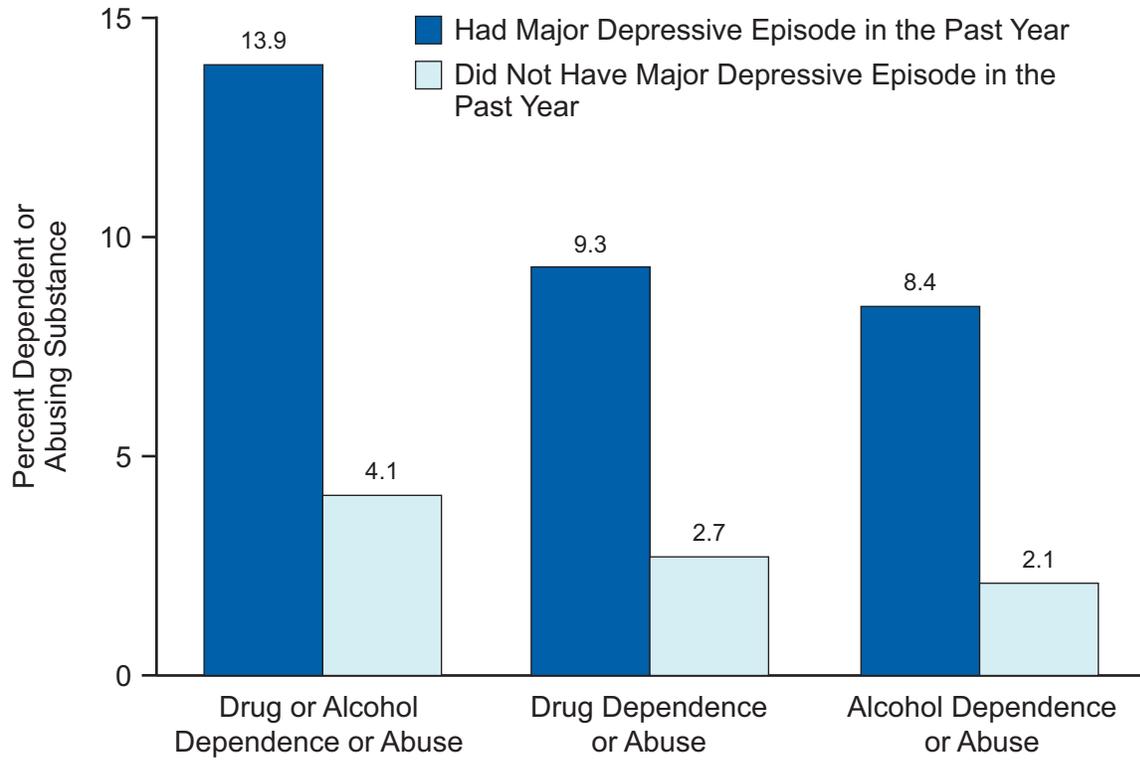
Appendix A: Description of the Survey

A.1 Sample Design

The sample design for the 2013 National Survey on Drug Use and Health (NSDUH)[16] was 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 2013. The respondent universe for NSDUH is the civilian, noninstitutionalized population aged 12 years old or older residing within the United States. The survey covers residents of households (individuals living in houses/townhouses, apartments, condominiums; civilians living in housing on military bases, etc.) and individuals in noninstitutional group quarters (e.g., shelters, rooming/boarding houses, college dormitories, migratory workers' camps, halfway houses). Excluded from the survey are individuals with no fixed household address (e.g., homeless and/or transient people 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 included a 50 percent overlap in second-stage units (area segments) within each successive 2-year period from 2005 through 2009. The 2010 through 2013 NSDUHs continued the 50 percent overlap by retaining half of the second-stage units from the previous survey. Because the coordinated design enabled 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 variable for reporting estimates.

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 2013, the actual sample sizes in these States ranged from 3,503 to 3,729. For the remaining 42 States and the District of Columbia, the target sample size was 900. Sample sizes in these States ranged from 852 to 953 in 2013. This approach ensured there was sufficient sample in every State to support State estimation by either direct methods or small area estimation (SAE)[17] while at the same time providing adequate precision 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.[18] 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

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

[17] SAE is a hierarchical Bayes modeling technique used to make State-level estimates for 25 measures related to substance use and mental health. For more details, see "2011-2012 NSDUH: Model-Based Prevalence Estimates (50 States and the District of Columbia)" (Tables 1 to 26, by Age Group) at http://www.samhsa.gov/data/population-data-nsduh/reports?tab=33.

[18] Sampling areas were defined using 2000 census geography. Counts of dwelling units (DUs) and population totals were obtained from the 2000 decennial census data supplemented with revised population projections from Nielsen Claritas.

of selection for the 2005 through 2013 NSDUHs was census tracts.[19] This stage was included to contain sample segments within a single census tract to the extent possible.[20]

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 2005 through 2009 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 have chosen to field. These 24 segments constituted the reserve sample and were available for use in 2010, 2011, 2012, and 2013. Eight reserve sample segments per SSR were fielded during the 2013 survey year. Four of these segments were retained from the 2012 survey, and four were selected for use in the 2013 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 227,075 addresses was selected. Of the selected addresses, 190,067 were determined to be eligible sample units. In these sample units (which can be either households or units within group quarters), sampled individuals 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 160,325. 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 87.5 percent and 18 to 25 year olds at a rate of 68.5 percent on average, when they were present in the sampled households or group quarters. Similarly, adults in age groups 26 or older were sampled at rates of 23.4 percent or less, with adults in the eldest age group (50 years or older) sampled at a rate of 8.3 percent on average. The overall population sampling rates were 0.090 percent for 12 to 17 year olds, 0.064 percent for 18 to 25 year olds, 0.017 percent for 26 to 34 year olds, 0.015 percent for 35 to 49 year olds, and 0.007 percent for those 50 or older. Nationwide, 88,742 individuals were selected. Consistent with previous surveys in this series, the final respondent sample of 67,838 individuals 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 about the sample design can be found in the 2013 NSDUH sample design report (Center for Behavioral Health Statistics and Quality [CBHSQ], 2014c).

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[19] Census tracts are relatively permanent statistical subdivisions of counties and parishes and provide a stable set of geographic units across decennial census periods.
[20] 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 sampled individuals, incorporating procedures to increase respondents' cooperation and willingness to report honestly about sensitive topics, such as illicit drug use behavior and mental health issues. 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 individuals for the interview, 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 can be completed in English or Spanish, and both versions have the same content. If the sampled 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 sampled person does not speak English or Spanish, the interview is not conducted.

Immediately after completion of the screener, interviewers attempt to conduct the NSDUH interview with each sampled person in the household. The interviewer requests that the sampled respondent 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.

Questions about mental illness and the utilization of mental health services are included in noncore self-administered sections of the interview. Although many of the questions are asked both of youths aged 12 to 17 and adults, some are asked only of adults and others are asked only of youths. In separate age-specific modules, adults and youths each are asked questions about major depressive episode (MDE) and mental health service utilization. Mental health service utilization questions for both youths and adults cover receipt of mental health services in inpatient settings in the past 12 months, the number of nights that respondents received inpatient treatment, receipt of mental health services in outpatient settings in the past 12 months, and the number of visits to outpatient mental health service providers in that period. Questions that are asked only of adults include symptoms of psychological distress in the past 30 days and past 12 months, impairment with daily activities because of psychological distress, use of prescribed medication to treat a mental or emotional condition in the past 12 months, and perceived unmet need for mental health care in that period. All adults also are asked questions about suicidal thoughts and behavior; youths do not receive these same questions on suicidal thoughts and behavior. Both youths and adults are asked about suicidal thoughts and behavior as a symptom of MDE. However, this symptom is assessed only if respondents reported having a period in their life lasting 2 weeks or longer in which they had feelings associated with being depressed (i.e., feeling sad, empty, or depressed; feeling discouraged or hopeless; or losing interest with most things). Questions that are asked of youths but not adults include reasons for receiving mental health services from specific sources, receipt of school-based mental health services, and receipt of mental health services in juvenile detention, prison, or jail in the past year. Definitions for many of these terms are included in the glossary of the mental health detailed tables.[21]

Additional topics in 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 other health care 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. In practice, 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).

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 incentive as a token of appreciation for his or her time.

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[21] This comprehensive set of mental health detailed tables is available at http://www.samhsa.gov/data/.

No personal identifying information about the respondent is captured in the CAI record. FIs transmit the completed interview data to RTI in Research Triangle Park, North Carolina. Screening and interview data are encrypted while they reside on laptops and mobile computers. Data are transmitted back to RTI on a regular basis using either a direct dial-up connection or the Internet. All data are encrypted while in transit across dial-up or Internet connections. In addition, the screening and interview data are transmitted back to RTI in separate data streams and are kept physically separate (on different devices) before transmission occurs.

After the data are transmitted to RTI, certain cases are selected for verification. The respondents are contacted by RTI 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 the 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 verification involves 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 falsifying FI are verified and reworked by the FI conducting the field verification. Any cases completed by the falsifying FI in earlier quarters of the same year are also verified. All cases from earlier quarters identified as falsified or unresolvable are removed and not reworked. Examples of unresolvable cases include those for which verifiers were never able to make contact with a resident of the DU, residents who refused to verify their data, previous residents who had moved, or residents who reported accurate roster data for the DU but did not recall speaking to an FI.

Between 2008 and 2012, as part of the Mental Health Surveillance Study (MHSS), subsamples of adult NSDUH respondents also were administered a clinical follow-up interview. These clinical data were used to develop a statistical model that predicts mental illness status based on adult NSDUH respondents' responses to questions in the main NSDUH interview on psychological distress (Kessler-6 [K6] scale), functional impairment (an abbreviated version of the World Health Organization Disability Assessment Schedule [WHODAS]), past year MDE, past year suicidal thoughts, and age. This model was used in the estimation of mental illness not only for the 2008 to 2012 NSDUHs, but also for the 2013 survey. Further details on the MHSS clinical study, including the content and function of the clinical interview data, are provided in Section B.4.3 in Appendix B.

A.3   Data Processing

Data that FIs transmit to RTI are processed to create a raw data file in which no logical editing of the data has been done. The raw data file consists of one record for each transmitted interview. Cases are eligible to be treated as final respondents only if they provided data on lifetime use of cigarettes and at least 9 out of 13 of the other substances in the core section of the questionnaire. 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 2013 will appear in the *2013 NSDUH Methodological Resource Book*, which is in process. Until that volume becomes available, refer to the *2012 NSDUH Methodological Resource Book* (CBHSQ, 2014b).

A.3.1   Data Coding and Editing

With the exception of industry and occupation data, coding of written answers that respondents or interviewers typed was performed at RTI for the 2013 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). For example, the "OTHER, Specify" data for mental health issues in 2013 included (but were not limited to) such topics as outpatient settings in which adults aged 18 or older received mental health services in the past 12 months and reasons for the most recent visit or stay in outpatient or inpatient mental health service settings in the past 12 months for adolescents aged 12 to 17.

Written responses in "OTHER, Specify" data were assigned numeric codes 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.

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). An important aspect of editing the mental health variables was documentation of situations in which it was known unambiguously that respondents legitimately

skipped out of the corresponding questions. These included situations in which respondents were not asked questions based on their age and those that were based on routing logic within a given set of mental health questions. For example, if adult respondents reported that they did not stay overnight or longer in a hospital or other facility to receive mental health services in the past 12 months, the CAI logic skipped them out of all remaining adult mental health treatment utilization questions about inpatient mental health services. In the editing procedures, the skipped variables were assigned codes to indicate that these additional inpatient adult mental health services variables did not apply.

If respondents were skipped out of drug use questions because they reported that they never used a given drug, the corresponding drug variables used in this report also were edited to assign codes indicating lifetime nonuse. 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. Procedures for editing the drug use variables also are discussed in Appendix A of the national findings report for the 2013 NSDUH (CBHSQ, 2014d).

In the 2013 NSDUH data, all adult respondents with item nonresponse for psychological distress items (based on the K6 distress scale) or functional impairment (based on the abridged WHODAS) had their scores assigned as zeros.[22] In addition, respondents who were not administered the WHODAS because their total K6 score was zero were assigned a zero value for the individual WHODAS items. Specifically, of the 45,344 final adult respondents in the 2013 NSDUH, approximately 550 had at least one of the six past month K6 item scores missing.[23] Of those, slightly fewer than 150 had all six item scores missing. Approximately 8,550 respondents were skipped out of the WHODAS questions because the sum of all imputation-revised K6 item scores[24] was zero. Of the approximately 8,550 respondents who were skipped out of the WHODAS questions because of a zero total K6 score, about 8,300 responded to all K6 items, and about 250 were missing at least one K6 item score. Of the nearly 36,800 final adult respondents who were asked the WHODAS questions in the 2013 NSDUH, about 2,000 had at least one of the eight WHODAS item scores missing. Of those, about 100 had all eight item scores missing. As a result of assigning zeros to the K6 and WHODAS scores in these situations, there were no missing values in the 2013 survey for measures of adult serious mental illness

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[22] The content of the K6 and WHODAS in the 2013 NSDUH and procedures for scoring these scales are described further in Section B.4.3 in Appendix B.

[23] The number of final adult respondents differs from the number of interviews for adults presented in Appendix B because data in Appendix B are based on initial demographic information obtained from screener data.

[24] Missing values in individual K6 items were assigned a value of zero for computing the imputation-revised K6 item scores.

(SMI) and other mental illness measures that were created from a model using K6 and WHODAS scores. Further details on the creation of these mental illness measures can be found in Section B.4.3 in Appendix B.

A.3.2   Statistical Imputation

For substance use, demographic, and other key variables that still had missing or ambiguous values after editing, statistical imputation was used to replace these values with appropriate response codes. For estimates of substance use disorders (i.e., illicit drug or alcohol dependence and abuse) presented in Chapter 5 of this report, missing values in the dependence or abuse variables were treated as though respondents did not meet the relevant criteria (i.e., they were treated the same as a response of "no"). The mental health variables related to mental health service utilization, suicidal thoughts and behavior, and MDE used in this report were not imputed.

The remainder of this section discusses procedures for substance use and other variables that underwent statistical imputation to replace missing or ambiguous values. For example, a response is ambiguous if the editing procedures assigned a respondent's most recent use of a drug to "Used 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 has been used in all subsequent survey years. PMN allows for 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 imputed 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. Table A.1 at the end of this appendix summarizes the distribution of weighted statistical imputation rates of these variables by interview section.

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In the modeling stage of PMN, the model chosen depends on the nature of the response variable. In the 2013 NSDUH, the models included binomial logistic regression, multinomial logistic regression, Poisson regression, time-to-event (survival) 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 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 2013 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. Since 2005, NSDUH has 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, incorporate 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.

Census control totals for the 2013 NSDUH weights were based on population estimates from the 2010 decennial census as for the 2011 and 2012 NSDUHs, whereas the control totals for the 2010 NSDUH weights were still based on the 2000 census. Section B.4.5 in Appendix B of the 2011 NSDUH mental health findings report (CBHSQ, 2012b) discusses the results of an investigation using data from 2010 and 2011 that assessed the effects of using control totals based on the 2010 census instead of the 2000 census for making mental health estimates for 2010.

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 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 included to poststratify the household-level weights to obtain census-consistent estimates based on the household rosters from all screened households. 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 respondent poststratification step poststratified the respondent person sample to external census data (defined within the State whenever possible, as discussed above).

Table A.1 Weighted Statistical Imputation Rates (Percentages) for the 2013 NSDUH, by Interview Section

Interview Section	Number of Variables	Mean	Minimum	25th Percentile	75th Percentile	Maximum
Core Demographics	14	2.19	0.03	0.53	3.27	3.36
Core Drug Use[1]	98	1.69	0.01	0.18	2.17	9.50
Income and Health Insurance	17	1.86	0.27	0.37	2.10	10.20
Other Noncore Demographics[2]	12	0.20	0.05	0.10	0.27	0.38

[1] Core drug use variables do not include initiation variables beyond age at first use because these additional questions are asked only if respondents first used within 1 year of their current age.

[2] Other noncore demographic variables include work status, immigrant status, and household roster variables.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2013.

Appendix B: Statistical Methods and Measurement

B.1 Target Population

The estimates of the prevalence of mental health issues and substance use 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 estimates of mental disorders and substance use and therefore may have specific mental health issues or needs. For example, the survey excludes active military personnel, who may be exposed to combat situations or stressors associated with extended overseas deployment. In addition, military personnel have been shown to have significantly lower rates of illicit drug use but higher rates of heavy alcohol use compared with their counterparts in the civilian population. The survey also excludes people living in institutional group quarters, such as prisons and residential mental health or substance abuse treatment centers. People in some of these institutional settings may have higher rates of mental or substance use disorders compared with the general population. Another subpopulation excluded from NSDUH consists of homeless people not living in a shelter on the survey date; they are another population shown to have higher than average rates of mental disorders and illicit drug use. Readers are reminded to consider the exclusion of these subpopulations when interpreting results. Appendix C describes other surveys that provide mental health data for these populations.

B.2 Sampling Error and Statistical Significance

This report includes national mental health estimates that were drawn from a set of tables referred to as "mental health detailed tables" that are available at http://www.samhsa.gov/data/. The national estimates, along with the associated standard errors (SEs, which are the square roots of the variances), were computed for all mental health detailed tables using a multiprocedure package, SUDAAN® Software for Statistical Analysis of Correlated Data. This software accounts for the complex survey design in NSDUH in estimating the SEs (RTI International, 2012). The final, nonresponse-adjusted, and poststratified analysis weights were used in SUDAAN to compute unbiased design-based estimates.

The sampling error 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 reasonably well in SUDAAN using a Taylor series linearization approach. Estimates of means or 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 individuals in domain d (including 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

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

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 2013 will appear in the *2013 NSDUH Methodological Resource Book*, which is in process. Until that volume becomes available, refer to the *2012 NSDUH Methodological Resource Book* (Center for Behavioral Health Statistics and Quality [CBHSQ], 2014b).

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 some subsets of domain estimates, the above approach can yield an underestimate of the SE of the total when $\hat{N}_d$ 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 methods of SE calculation to domains (i.e., 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 prior formula, and all other estimates were calculated directly in SUDAAN, regardless of what the other estimates are 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 only a partial list of domains with a fixed $\hat{N}_d$ that were used in the weight calibration process. However, the list does include all of the domains that were used in computing SEs for estimates produced in this report and in the 2013 mental health detailed tables. 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 in the mental health detailed tables from which data are presented in this report. For example, Tables 1.2 and 1.7 in the mental health detailed tables present estimates of any mental illness (AMI) and serious mental illness (SMI), respectively, among adults aged 18 or older within the domains of gender, Hispanic origin and race, 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 these tables, and the prior formula 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. Thus, the domain for whites by age group in the weight calibration process in Table B.1 is a two-way interaction. However, published estimates for whites by age group in this report and in the 2013 mental health detailed tables actually represent a three-way interaction: white by Hispanic origin (i.e., not Hispanic) by age group.

B.2.2 Suppression Criteria for Unreliable Estimates

As has been done in past NSDUH reports, direct estimates from NSDUH that are designated as unreliable are not shown in this report and are noted by asterisks (*) in figures containing these estimates. The criteria used to define unreliability of direct estimates from NSDUH are 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 numbers of users were suppressed if

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

or

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

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

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

or

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

The separate formulas for $\hat{p} \le .5$ 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 effective sample size 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 effective sample size 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 $\hat{p} \ge .99995$).

Beginning with the 1991 survey, the suppression rule for proportions based on $RSE[-1n(\hat{p})]$ described previously replaced a rule in which data were suppressed whenever $RSE(\hat{p}) > .5$. This rule was changed because the rule prior to 1991 imposed a very stringent application for suppressing estimates when $\hat{p}$ is small but imposed a very lax application for large $\hat{p}$. The new rule ensured a more uniformly stringent application across the whole range of $\hat{p}$ (i.e., from 0 to 1). The previous rule also was asymmetric in the sense that suppression only occurred in terms of $\hat{p}$. That is, there was no complementary rule for $(1-\hat{p})$, which the current NSDUH suppression criteria for proportions take into account.

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 of age at first

use) were suppressed if the RSEs of the estimates were larger than .5 or if the nominal sample size was smaller than 10 respondents. This rule was based on an empirical examination of the estimates of mean age of first use and their SEs for various empirical sample sizes. Although arbitrary, a sample size of 10 appeared to provide sufficient precision and still allow reporting by year of first use for many substances.

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

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

where $\hat{p}_1$ = first prevalence estimate, $\hat{p}_2$ = second prevalence estimate, $\mathrm{var}(\hat{p}_1)$ = variance of first prevalence estimate, $\mathrm{var}(\hat{p}_2)$ = variance of second prevalence estimate, and $\mathrm{cov}(\hat{p}_1, \hat{p}_2)$ = 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 becomes the first prevalence estimate, and the prevalence estimate from the later year becomes the second prevalence estimate (e.g., 2012 is the first estimate and 2013 the second).

Under the null hypothesis, Z is asymptotically distributed as a standard 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, 2012). 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.

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. They are sometimes referred to as "nonsampling errors." These types of errors and their impact are reduced through data editing, statistical adjustments for nonresponse, close monitoring and periodic retraining of interviewers, and improvement in various 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 2013, respondents continued to receive a $30 incentive for the main study in an effort to maximize response rates. The weighted screening response rate (SRR) is defined as the weighted number of successfully screened households[25] 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 190,067 eligible households sampled for the 2013 NSDUH, 160,325 were screened successfully, for a weighted screening response rate of 83.9 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 individuals (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

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[25] 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.

pass the usable case rule.[26] In the 160,325 screened households, a total of 88,742 sampled individuals were selected, and completed interviews were obtained from 67,838 of these sampled individuals, for a weighted IRR of 71.7 percent (Table B.4). A total of 15,717 sampled individuals (20.9 percent) were classified as refusals or parental refusals, 2,622 (3.0 percent) were not available or never at home, and 2,565 (4.4 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 (82.0 percent), females (73.3 percent), blacks (78.8 percent), individuals in the South (73.3 percent), and residents of small metropolitan areas (73.4 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 60.2 percent in 2013. 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,[27] 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, 1997).

B.3.2 Inconsistent Responses and Item Nonresponse

Among survey participants, item response rates were generally very high for most mental health and drug use items. For example, 0.2 percent of the adult respondents in 2012 had missing data (i.e., responses other than "yes" or "no") for whether they received mental health services in the past 12 months as an inpatient, and 0.5 percent had missing data for whether they received outpatient mental health services in this period. Also, about 0.5 percent of adults had missing data for questions about suicidal thoughts and behavior. About 0.7 to 1.0 percent of adults had missing data for questions about specific lifetime symptoms of depression; the highest percentage of missing data (1.0 percent) occurred in the question about the specific number of pounds that respondents lost without trying to lose weight (question AD26f in the adult depression module). In addition, about 0.7 to 0.8 percent of adults had missing data for these lifetime depression symptom questions because they had missing data (e.g., answers of "don't know" or "refused") for preceding questions that needed to be answered affirmatively in order

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[26] 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.

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

for them to be asked the questions about depression symptoms. Information on item nonresponse for questions used to measure psychological distress and functional impairment among adults is presented in Section A.3.1 in Appendix A of this report.

For respondents aged 12 to 17 in the 2013 NSDUH, 0.8 to 1.9 percent had missing data for whether they received mental health services from specific sources in the past 12 months. About 1.6 to 2.3 percent had missing data for questions about specific lifetime symptoms of depression; as for adults, the highest percentage of missing data for the depression items (2.3 percent) occurred in the question about the specific number of pounds that youths lost without trying (question YD26f in the adolescent depression module). About 1.5 to 1.9 percent of youths had missing data for these lifetime depression symptom questions because they had missing data for preceding questions that youths needed to answer affirmatively in order to be asked the questions about depression symptoms.

In addition, the logic in the 2013 NSDUH computer-assisted interviewing (CAI) instrumentation skipped respondents out of the mental health and other questions that would not apply based on their answers to previous questions. This skip logic reduced the potential for inconsistent data by limiting respondents' opportunity to provide answers that were inconsistent with previous answers. For example, if adult respondents did not report that they stayed overnight in a hospital or other facility to receive mental health services in the past 12 months, they were not asked questions about the type of inpatient facility where they received mental health services, the number of nights they spent in inpatient facilities, or the payment sources for their inpatient mental health services in that period. Thus, respondents could not report that they did not receive inpatient mental health services in the past 12 months and then answer one or more of these additional questions as though they had.

Respondents also 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. Further, the logic in the CAI instrument did not eliminate all occurrences of inconsistent data. For example, 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.

As was the case with the drug use variables, the CAI skip logic also did not eliminate all opportunities for inconsistent reports in the mental health questions. Consequently, the logical editing procedures for the mental health data could slightly increase the amount of missing data when inconsistent answers were given. For example, if adult or adolescent respondents who met

the criteria for a lifetime major depressive episode (MDE) (see Section B.4.4) reported an age at onset for depression symptoms[28] that was greater than their current age, the inconsistent age-at-onset variable was set to a missing value. However, the number of respondents in 2013 with this inconsistency was small (i.e., fewer than 10 respondents aged 12 or older).

For more information on editing and statistical imputation, see Sections A.3.1 and A.3.2 of Appendix A. Details of the editing and imputation procedures for 2013 also will appear in the *2013 NSDUH Methodological Resource Book*, which is in process. Until that volume becomes available, refer to the *2012 NSDUH Methodological Resource Book* (CBHSQ, 2014b).

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 of Appendix A).

This section summarizes results for the reliability of selected variables related to substance use, mental health, and demographic characteristics. Reliability is expressed by estimates of Cohen's kappa (κ), which ranges from -1.00 to 1.00 (Cohen, 1960). Cohen's kappa 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) among individuals aged 12 or older 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).

Among adults, the values for past year outpatient mental health services and use of prescription medication for a mental health issue showed almost perfect consistency (0.85 each). Reliability statistics for the adult MDE measures were moderate to substantial (lifetime: 0.67; past year: 0.52).

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[28] Adults were asked to report the age when they first had a period of 2 weeks or longer when they were sad or discouraged or lost interest in most things for most of the day nearly every day and also reported that they had some symptoms of depression. Adolescents were asked to report the age when they first had a period of 2 weeks or longer when they were sad, discouraged, or really bored and also reported that they had some symptoms of depression.

A dichotomous measure of whether adults had scores of less than 13 or scores of 13 or higher based on six items (the Kessler-6 or K6 scale; see Section B.4.3 in this appendix for more information on the K6 scale) was used to estimate symptoms of psychological distress during the one month in the past 12 months when respondents were at their worst emotionally.[29] This measure showed substantial agreement (0.64) between the first interview and the reinterview. The kappa for the K6 score, which ranged from 0 to 24, was weak (0.21) when exact agreement was required between the scores from the first interview and the reinterview. When the K6 scores were allowed to differ by no more than three points between the two interviews, however, the kappa increased to 0.63.

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   Revised Estimates for 2006 to 2010

During regular data collection and processing checks for the 2011 NSDUH, data errors were identified. These errors resulted from fraudulent cases submitted by field interviewers and affected the data for Pennsylvania (2006 to 2010) and Maryland (2008 and 2009). Although all fraudulent interview cases were removed from the data files, the affected screening cases were not removed because they were part of the assigned sample. Instead, these screening cases were assigned a final screening code of 39 ("Fraudulent Case") and treated as incomplete with unknown eligibility. The screening eligibility status for these cases then was imputed. Those cases that were imputed to be eligible were treated as unit nonrespondents for weighting purposes; however, these cases were not treated differently from other unit nonrespondents in the weighting process in 2006 to 2010 (see Section A.3.3 in Appendix A).

Table B.3 in Appendix B of the 2011 mental health findings report (CBHSQ, 2012b) presents screening results for 2010, the last year that was affected by these errors. Cases that were imputed to be eligible are classified with a final code of 39 ("Fraudulent Case"; see Table B.3 in this report). The cases that were imputed to be ineligible did not contribute to the weights and were reported as "Other, Ineligible" in the affected years. Because any cases with falsified data were treated either as ineligible or as unit nonrespondents at the screening level, they were excluded from the interview data (see Table B.4). However, some estimates for 2006 to 2010 in the 2013 mental health findings report and the 2013 mental health detailed tables, as well as other new reports, may differ from corresponding estimates found in some previous reports or tables.

These errors had minimal impact on the national estimates and no effect on direct estimates for the other 48 States and the District of Columbia. In reports where model-based small area estimation techniques are used, estimates for all States may be affected, even though the errors were concentrated in only two States. In reports that do not use model-based estimates,

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[29] In NSDUHs prior to 2008, a score of 13 or higher on the K6 scale was used to define a measure of serious psychological distress (SPD) among adults.

the only estimates appreciably affected are estimates for Pennsylvania, Maryland, the mid-Atlantic division, and the Northeast region.

The 2013 mental health findings report and mental health detailed tables do not include division-level, State-level, or model-based estimates. However, they do show region-level estimates, including estimates for the Northeast region. Single-year estimates based on 2006 to 2010 data and estimates based on pooled data including any of these years may differ from previously published estimates. Tables and estimates based only on data since 2011 are unaffected by these data errors.

Caution is advised when comparing data from older reports with data from more recent reports that are based on corrected data files. As discussed previously, comparisons of mental health estimates for Pennsylvania, Maryland, the mid-Atlantic division, and the Northeast region are of most concern, while comparisons of national data or data for other States and regions are essentially still valid. CBHSQ within the Substance Abuse and Mental Health Services Administration (SAMHSA) has produced a selected set of corrected versions of reports and tables. In particular, CBHSQ has released a set of modified detailed tables for 2006 to 2008 that include revised estimates for the Northeast region for certain mental health measures. However, CBHSQ does not recommend making comparisons between unrevised 2006 to 2010 mental health estimates and estimates based on data for 2011 and subsequent years for the Northeast region.

B.4   Measurement Issues

Several measurement issues associated with the 2013 NSDUH are discussed in this section. Specifically, these issues include the methods for measuring substance dependence and abuse and mental health issues.

B.4.1   Illicit Drug and Alcohol Dependence and Abuse

The 2013 NSDUH CAI instrumentation included questions that were designed to measure alcohol and illicit drug dependence and abuse. For these substances,[30] dependence and abuse questions were based on the criteria in the American Psychiatric Association (APA) *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV) (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.

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

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. 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). A respondent was defined as having dependence if he or she met three or more of seven dependence criteria for these substances.

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 about the dependence and abuse questions during the interview included the core substance use questions, the frequency of substance use questions (for alcohol and marijuana only), and the noncore substance use questions (for cocaine, heroin, and stimulants, including methamphetamine). 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 because of the complexity of doing this and to avoid disrupting trends for imputed variables as a result of any changes to the noncore questions. Very infrequently, this may result in responses to the dependence and abuse questions that are 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 (i.e., they had missing frequency data). These missing frequency data were subsequently imputed after data

collection processing. 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 (i.e., the imputed frequency value was 5 or fewer days). For alcohol, for example, about 40,000 respondents were past year alcohol users in 2013. Of these, fewer than 100 respondents were missing their frequency data, but were still asked the alcohol dependence and abuse questions; however, 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, fewer than 1,400 respondents in 2013 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,[31] 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 psychotherapeutic drug (e.g., pain relievers, tranquilizers, or sedatives), then they were categorized as NOT having past year dependence or abuse of psychotherapeutics. Also, if these respondents were not classified as having dependence or abuse for other substances (e.g., alcohol, marijuana, other illicit drugs), then they were categorized as not having dependence or abuse for illicit drugs, illicit drugs or alcohol, or 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, dimethyltryptamine (DMT), alpha-methyltryptamine (AMT), Foxy, or *Salvia divinorum*; stimulant dependence and abuse if they additionally reported nonmedical use of Adderall®; and sedative dependence and abuse if they

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

additionally reported nonmedical use of Ambien®. Complying with the previous decision to exclude respondents whose methamphetamine use was based solely on responses to noncore questions from being classified as having stimulant dependence or abuse, respondents who indicated past year use or nonmedical use of hallucinogens, stimulants, or sedatives 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.

B.4.2 Effects of Questionnaire Changes on Mental Health Measures

Changes were made to the mental health questions in the 2008 and 2009 NSDUH questionnaires. These changes are summarized as follows:

1. For adults aged 18 or older, changes were made to the K6 questions for measuring SPD. In 2007, a single set of six K6 items asked adult respondents to report how often they experienced certain emotions or feelings *during the one month in the past 12 months that they were the most depressed, anxious, or stressed*. In 2008, adult respondents first were asked about these feelings in the past 30 days. If there was a month in the past 12 months when they felt more depressed, anxious, or emotionally stressed than they felt during the past 30 days, they then were asked the same K6 items about this month as well.

2. For adults aged 18 or older, a split-sample study was embedded within the 2008 NSDUH, such that a reduced set of questions from the World Health Organization Disability Assessment Schedule (WHODAS) or the Sheehan Disability Scale (SDS) were randomly assigned to respondents. The WHODAS questions were retained for use in the 2009 NSDUH and future surveys. The SDS items were no longer included after 2008.

3. For youths aged 12 to 17, a total of five questions that were in the youth mental health service utilization (YMHSU) module in 2008 were no longer included in 2009. These questions asked about the receipt of special education services and school counseling, as well as time spent in jail or foster care.

4. For youths, seven questions have been included since 2009 that asked about receipt of mental health services in the education and justice system sectors. These questions replaced the previous questions that were removed from the YMHSU module in 2009.

For the first change, the past year K6 score in 2008 was created for each adult aged 18 or older based on responses to items regarding either the past 30 days (if an adult said that he or she did not have any other month that was worse) or the worst month in the past 12 months. This change in questionnaire structure may have affected K6 scores and estimates of SPD for the worst month in the past year that were created from the K6 items.

The remaining changes to questions between survey years could affect how respondents answer questions in subsequent modules (i.e., context effects). A context effect may be said to take place when the response to a question is affected by information that is not part of the question itself. For example, the content of a preceding question may affect the interpretation of a subsequent question. Or a respondent may answer a subsequent question in a manner that is consistent with responses to a preceding question if the two questions are closely related to each other.[32]

Effects of Changes to the Questions for Adults. For adults aged 18 or older, estimates of past year K6 scores and the percentage of adults with SPD based on the entire 2008 sample, as well as the WHODAS and SDS subsamples, were compared with estimates based on 2007 data. Significant differences in the mean past year K6 scores were observed between 2008 and 2007, thus suggesting a lack of comparability between the 2 years. Across each of the six items forming the past year K6 score, estimates of adults reporting that they had a given problem "none of the time" (e.g., "how often felt restless in worst month") were higher in 2008 based on the full sample of adults compared with the estimates for 2007. The estimate of past year SPD was slightly lower from the full sample of adults in 2008 than in 2007.

The split-sample design in 2008 for adults (item 2 above) affected reporting of MDE, depending on whether adult respondents received the WHODAS or SDS. Both lifetime and past year MDE estimates based on the WHODAS half sample were lower than corresponding estimates from 2007. In turn, lifetime and past year MDE estimates based on the entire sample in 2008 were lower than corresponding estimates from 2007. However, estimates of lifetime and past year MDE based on the SDS half sample in 2008 were not significantly different from the estimates in 2007. Also, the estimate of past year MDE in 2008 based on the WHODAS half sample was lower than the estimate based on the SDS half sample.

Therefore, CBHSQ decided to publish estimates of adult MDE in 2008 that were based on the half sample of adults who received the WHODAS because it was decided that the WHODAS would be retained in subsequent surveys. However, subsequent adjustment procedures were developed for adult MDE from the SDS half sample to allow data from all adult respondents in 2008 to be used for estimating MDE among adults. These adjustment procedures are described further in Section B.4.4 in this appendix.

Administration of the WHODAS or SDS in 2008 did not appear to differentially affect responses to the questions for adults about suicidal thoughts and behavior that also were added in 2008. Therefore, further investigation was not done to examine the effects on estimates of suicidal thoughts and behavior in 2009 due to the removal of the SDS items.

Effects of Changes to the Questions for Youths. The changes to the YMHSU module (items 3 and 4 above) in 2009 could have affected how adolescents answered the items at the

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[32] The errors that were discussed in Section B.3.4 were identified for 2007 and 2008 after the effects of changes to the questionnaire for 2008 had been investigated. As noted in Section B.3.4, however, these errors had minimal impact on the national estimates. Therefore, the data errors that affected the data for 2007 and 2008 were unlikely to change the overall conclusions that were reached about the effects of these questionnaire changes on estimates for 2008. Nevertheless, because of the data errors that were identified, actual estimates for 2007 and 2008 are not presented in this report.

beginning of the adolescent depression module (i.e., due to context effects). The adolescent depression module follows the YMHSU module for youths. In turn, changes in youths' answers to these introductory adolescent depression items could affect estimates of adolescent MDE.

Adolescents aged 12 to 17 could be asked up to three questions (YDS21, YDS22, and YDS23) to determine whether they should be asked further questions about lifetime and past year MDE. All adolescents were asked question YDS21 ("Have you ever in your life had a period of time lasting several days or longer when most of the day you felt sad, empty, or depressed?"). Those who did not answer question YDS21 as "yes" then were asked question YDS22 ("Have you ever had a period of time lasting several days or longer when most of the day you felt very discouraged or hopeless about how things were going in your life?"). Youths who did not answer either question YDS21 or YDS22 as "yes" then were asked question YDS23 ("Have you ever had a period of time lasting several days or longer when you lost interest and became bored with most things you usually enjoy, like work, hobbies, and personal relationships?"). Any adolescents who gave an affirmative answer in questions YDS21, YDS22, or YDS23 then were administered additional depression-related items that also were used to determine lifetime and past year MDE.

The effects of these changes to the YMHSU module on subsequent reports in the adolescent depression module were investigated using data from the first 6 months of the 2009 NSDUH. This analysis sought to determine whether changes in the YMHSU module affected responses to the first three adolescent depression questions and the lifetime and past year MDE estimates. To assess whether any differences in estimates between 2008 and 2009 could be due to more than just true changes in the population, comparisons between consecutive years beginning in 2005 also were carried out. For consistency with the 2009 data, comparisons were limited to the first 6 months of data from other survey years.

The changes to the YMHSU module in 2009 did not appear to affect estimates for the variables based on the lead adolescent depression questions or estimates of adolescent MDE between 2008 and 2009. None of the differences in estimated responses to the three lead adolescent MDE items or estimates of adolescent lifetime and past year MDE between 2008 and 2009 was statistically significant. No apparent trend was observed between 2005 and 2009 for the lifetime and past year MDE estimates or for the variable corresponding to question YDS23.

B.4.3   Estimation of Serious and Other Levels of Mental Illness

Background. The 1992 Alcohol, Drug Abuse, and Mental Health Administration Reorganization Act that created SAMHSA also required SAMHSA to develop a definition and methodology for estimating SMI among adults. States were required to utilize these measures in developing their plans for use of block grant funds distributed by SAMHSA. SAMHSA convened a technical advisory group that developed a definition of SMI, which was published in the *Federal Register* in 1993 (SAMHSA, 1993):

> Pursuant to Section 1912(c) of the Public Health Service Act, as amended by Public Law 102-321, "adults with serious mental illness" are defined as the following:

- Persons aged 18 and over, who currently or at any time during the past year, have had diagnosable mental, behavioral, or emotional disorder of sufficient duration to meet diagnostic criteria specified within DSM-III-R [sic] that has resulted in functional impairment, which substantially interferes with or limits one or more major life activities.

- These disorders include any mental disorders (including those of biological etiology) listed in DSM-III-R or their ICD-9-CM equivalent (and subsequent revisions), with the exception of DSM-III-R "V" codes, substance use disorders, and developmental disorders, which are excluded unless they co-occur with other diagnosable serious mental illness.

- All of these disorders have episodic, recurrent, or persistent features; however, they vary in terms of severity or disabling effects. Functional impairment is defined as difficulties that substantially interfere with or limit role functioning in one or more major life activities including basic daily living skills (e.g., eating, bathing, dressing); instrumental living skills (e.g., maintaining a household, managing money, getting around the community, taking prescribed medication); and functioning in social, family, and vocational/educational contexts.

- Adults who would have met functional impairment criteria during the referenced year without benefit of treatment or other support services are considered to have serious mental illness.

In NSDUH reports prior to 2004, the K6 psychological distress scale was used to measure SMI. In 2004, yearly estimation of SMI ceased temporarily because of concerns about the validity of using only the K6 distress scale to measure SMI without including a functional impairment scale (see Section B.4.4 of Appendix B in the 2004 NSDUH national findings report [OAS, 2005] for a discussion). In December 2006, a new technical advisory group was convened by SAMHSA's OAS (which later became CBHSQ) and the Center for Mental Health Services (CMHS) to solicit recommendations for data collection strategies to address SAMHSA's legislative requirements. The panel recommended that NSDUH be used to produce estimates of SMI among adults by employing NSDUH's mental health measures and a "gold-standard" clinical psychiatric interview.

Although it was recognized that the ideal way to estimate SMI in NSDUH would be to administer a clinical diagnostic interview annually to all 45,000 adult respondents, this approach was not feasible because of constraints on the interview time and the need for trained mental health clinicians to conduct the interviews. Therefore, the approach recommended by the technical advisory group and adopted by SAMHSA for NSDUH was to utilize short scales in the NSDUH interview that separately measure psychological distress and functional impairment for use in a statistical model that predicts whether a respondent had mental illness. To accomplish this, SAMHSA's CBHSQ initiated a Mental Health Surveillance Study (MHSS) in 2007 as part of NSDUH to develop and implement methods to estimate SMI. The estimation methodology was implemented in the 2008 NSDUH. Models using the short scales for psychological distress and impairment to predict mental illness status were developed from a subsample of adult respondents who had completed the NSDUH interview and were administered a psychological

diagnostic interview. For the clinical interview data, individuals were defined as having SMI if they had a diagnosable mental, behavioral, or emotional disorder in the past 12 months, other than a developmental or substance use disorder, that met DSM-IV criteria (APA, 1994) and resulted in substantial functional impairment.

Historical Summary of the 2008 Model. A randomly selected subsample of approximately 1,500 adults in 2008 who had completed the NSDUH interview was recruited for a follow-up clinical interview consisting of a diagnostic assessment for mental disorders.[33] Also, in order to determine the optimal scale for measuring functional impairment in NSDUH, a split-sample design was incorporated into the full 2008 NSDUH data collection. Roughly half of the adult respondents were assigned to receive an abbreviated eight-item version of the WHODAS (Novak, Colpe, Barker, & Gfroerer, 2010), and the other half were assigned to receive the SDS (Leon, Olfson, Portera, Farber, & Sheehan, 1997).

Weighted logistic regression models that predicted mental illness were developed for each half sample using the data from the subsample of MHSS respondents. The short scales (the K6 in combination with the WHODAS or the K6 in combination with the SDS) were used as predictors in models of mental illness assessed via the clinical interviews. The model parameter estimates then were used to predict SMI in the full 2008 NSDUH sample. For more detailed information on the 2008 MHSS design and analysis, see Colpe, Epstein, Barker, and Gfroerer (2009) and OAS (2009a). Information about the 2008 model is available in Appendix B of the 2012 mental health findings report (CBHSQ, 2013c).

Based on an analysis of the 2008 MHSS data, it was determined that the WHODAS was the better predictor of SMI and that this scale would be used in combination with the K6 scale to predict SMI. It also was decided that the WHODAS would continue to be administered as the sole impairment scale in the 2009 and subsequent NSDUHs (OAS, 2009a). This model that had been developed using the 2008 data (subsequently referred to as the "2008 model") was used in the 2008 through 2011 NSDUHs to produce a predicted probability of having SMI for each clinical interview respondent.

Based on the accumulated MHSS clinical data that were collected from 2008 to 2012, however, SAMHSA determined that the 2008 model had some important shortcomings that had not been detected in the original model fitting because of the small number of respondents in the 2008 clinical sample. Specifically, estimates of SMI and AMI among young adults based on the NSDUH main study data and prediction model were higher than the estimates for this age group based on the clinical interview data. In addition, improvements were needed in the weighting procedures for the MHSS clinical data to account better for undercoverage and nonresponse (i.e., because only NSDUH respondents who answered their surveys in English were eligible for the clinical follow-up and because individuals with mental illness appeared to be more likely to participate in the follow-up). Therefore, using the combined 2008-2012 clinical data, SAMHSA fit a more accurate model for the 2012 estimates with revised weights (subsequently referred to as the "2012 model"). In particular, to reduce bias and improve prediction, additional mental health-related variables and an age variable were added in the 2012 model. In addition, to protect

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[33] The Structured Clinical Interview for the DSM-IV-TR Axis I Disorders, Research Version, Non-patient Edition (SCID-I/NP) (First et al., 2002).

against potential coverage and nonresponse error, alternatives for the weights were applied to the clinical sample data for the model development. To provide consistent data for trend assessment, mental illness estimates for 2008 to 2011 were revised using the new 2012 model. The 2012 model continued to be used for the 2013 mental illness estimates.

The next subsections describe the instruments and items used to measure the variables employed in the 2012 model. Specifically, the instrument used to measure mental illness in the clinical interviews is described, followed by descriptions of the scales and items in the main NSDUH interviews that were used as predictor variables in the model (e.g., the K6 and WHODAS total scores, age, and suicidal thoughts).[34] Next, procedures for the MHSS clinical interview sampling and weighting and for developing the 2012 model are described. The final subsection in Section B.4.3 discusses SEs for the mental illness estimates based on the 2012 model.

Clinical Measurement of Mental Illness. Mental illness was measured in the MHSS clinical interviews using an adapted version of the SCID (First et al., 2002) and was differentiated by the level of functional impairment based on the Global Assessment of Functioning (GAF) scale (Endicott, Spitzer, Fleiss, & Cohen, 1976). Past year disorders that were assessed through the SCID included mood disorders (e.g., MDE, manic episode), anxiety disorders (e.g., panic disorder, generalized anxiety disorder, posttraumatic stress disorder), eating disorders (e.g., anorexia nervosa), intermittent explosive disorder, and adjustment disorder. In addition, the presence of psychotic symptoms was assessed. Substance use disorders also were assessed, although these disorders were not used to produce estimates of mental illness.

- Respondents were defined as having *any mental illness* (AMI) if they were determined to have any of the mental disorders assessed in the SCID (not including substance use disorders), regardless of the level of functional impairment.

- Respondents were defined as having *low (mild) mental illness* if they had any of the mental disorders assessed in the SCID (not including substance use disorders), but these disorders resulted in no more than mild impairment, based on GAF scores of greater than 59.

- Respondents were defined as having *moderate mental illness* if they had any of the mental disorders assessed in the SCID (not including substance use disorders), and these disorders resulted in moderate impairment, based on GAF scores of 51 to 59.

- Respondents were defined as having *serious mental illness* (SMI) if they had any of the mental disorders assessed in the SCID (not including substance use disorders), and these disorders resulted in substantial impairment in carrying out major life activities, based on GAF scores of 50 or below. The SMI diagnosis was used as the response variable in both the 2008 and 2012 prediction models.

The SCID and the GAF in combination were considered to be the gold standard for measuring mental illness.

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[34] MDE also was included in the 2012 model and is discussed in more detail in Section B.4.4.

K6. The K6 in the main NSDUH interview consists of two sets of six questions that asked adult respondents how frequently they experienced symptoms of psychological distress during two different time periods: (1) during the past 30 days, and (2) if applicable, the one month in the past year when they were at their worst emotionally. Respondents were asked about the second time period only if they indicated that there was a month in the past 12 months when they felt more depressed, anxious, or emotionally stressed than they felt during the past 30 days.

The six questions comprising the K6 scale for the past month are as follows:

NERVE30   During the past 30 days, how often did you feel nervous?

        1   All of the time

        2   Most of the time

        3   Some of the time

        4   A little of the time

        5   None of the time

        Don't know/Refused

Response categories are the same for the remaining questions shown below.

HOPE30   During the past 30 days, how often did you feel hopeless?

FIDG30   During the past 30 days, how often did you feel restless or fidgety?

NOCHR30   During the past 30 days, how often did you feel so sad or depressed that nothing could cheer you up?

EFFORT30   During the past 30 days, how often did you feel that everything was an effort?

DOWN30   During the past 30 days, how often did you feel down on yourself, no good or worthless?

To create a score, the six items (NERVE30, HOPE30, FIDG30, NOCHR30, EFFORT30, and DOWN30) on the K6 scale were recoded from 0 to 4 so that "all of the time" was coded as 4, "most of the time" as 3, "some of the time" as 2, "a little of the time" as 1, and "none of the time" as 0. Responses of "don't know" and "refused" also were coded as 0. Summing across the transformed responses in these six items resulted in a score with a range from 0 to 24.

If respondents were asked about a month in the past 12 months when they felt more depressed, anxious, or emotionally stressed than they felt during the past 30 days, they were asked comparable K6 items for that particular month in the past 12 months. The scoring procedures for these K6 items for the past 12 months were the same as those described previously for the past 30 days. The higher of the two K6 total scores for the past 30 days or past 12 months was used both for MHSS analysis purposes and in the adult respondents' final data.

An **alternative K6** total score was created in which K6 scores of less than 8 were recoded as 0 and scores from 8 to 24 were recoded as 1 to 17. The rationale for creating the alternative past year K6 score was that SMI prevalence typically was extremely low for respondents with past year K6 scores of less than 8, and the prevalence rates started increasing only when scores were 8 or greater. This alternative K6 score was used in both the 2008 and 2012 SMI prediction models.

WHODAS. An initial step of the MHSS was to modify the WHODAS for use in a general population survey, including making minor changes to question wording and reducing its length (Novak, 2007). That is, a subset of 8 items was found to capture the information represented in the full 16-item scale with no significant loss of information.

These eight WHODAS items that were included in the main NSDUH interview were assessed on a 0 to 3 scale, with responses of "no difficulty," "don't know," and "refused" coded as 0; "mild difficulty" coded as 1; "moderate difficulty" coded as 2; and "severe difficulty" coded as 3. Some items had an additional category for respondents who did not engage in a particular activity (e.g., they did not leave the house on their own). Respondents who reported that they did not engage in an activity were asked a follow-up question to determine if they did not do so because of emotions, nerves, or mental health. Those who answered "yes" to this follow-up question were subsequently assigned to the "severe difficulty" category; otherwise (i.e., for responses of "no," "don't know," or "refused"), they were assigned to the "no difficulty" category. Summing across these codes for the eight responses resulted in a total score with a range from 0 to 24. More information about scoring of the WHODAS can be found in the 2012 NSDUH public use file codebook (CBHSQ, 2013b).

An **alternative WHODAS** total score was created in which individual WHODAS item scores of less than 2 were recoded as 0, and item scores of 2 to 3 were recoded as 1. The individual alternative item scores then were summed to yield a total alternative score ranging from 0 to 8. Creation of an alternative version of the WHODAS score was based on the assumption that a dichotomous measure dividing respondents into two groups (i.e., severely impaired vs. less severely impaired) might fit better than a linear continuous measure in models predicting SMI. This alternative WHODAS score was the variable used in both the 2008 and 2012 SMI prediction models.

Suicidal Thoughts, MDE, and Age. In addition to the K6 and WHODAS scales, the 2012 model included the following measures as predictors of SMI: (a) serious thoughts of suicide in the past year; (b) having a past year MDE; and (c) age. The first two variables were added to the model to decrease the error rate in the predictions (i.e., the sum of the false-negative and false-positive rates relative to the clinical interview results). A recoded age variable reduced the biases in estimates for particular age groups, especially 18 to 25 year olds.

Since 2008, all adult respondents in NSDUH have been asked the following question: "At any time in the past 12 months, that is from [DATEFILL] up to and including today, did you

seriously think about killing yourself?"[35] Definitions for MDE in the lifetime and past year periods are discussed in Section B.4.4. For respondents aged 18 to 30, an adjusted age was created by subtracting 18 from the respondent's current age, resulting in values ranging from 0 to 12. For a respondent aged 18, for example, the adjusted age was 0 (i.e., 18 minus 18), and for a respondent aged 30, the adjusted age was 12 (i.e., 30 minus 18). For respondents aged 31 or older, the adjusted age was assigned a value of 12.

Sampling and Weighting. The target annual respondent sample sizes for the MHSS clinical interviews were 1,500 in 2008 (750 of which received the WHODAS and were used in developing the 2008 model), 500 in 2009 and 2010, and 1,500 in 2011 and 2012. Respondent sample sizes were roughly equal across quarters.

A stratified Bernoulli selection process was used in which each eligible NSDUH respondent was given an independent probability of selection based on his or her stratum. In 2008 and the first two quarters in 2009, K6 scores were used in the stratification in an attempt to minimize the variance of the estimate for SMI prevalence. In the last two quarters in 2009, a decision was made to allocate the sample to K6 scores based on AMI rather than SMI in order to reduce the probability that a respondent with an extremely large weight would be selected. Starting from 2010, to better control the distribution of respondents selected for the MHSS by functional impairment levels and age, both K6 and WHODAS scores were used in the stratification, as well as age. The younger age groups were undersampled for the MHSS clinical sample to reverse the impact of the oversampling of younger adults aged 18 to 25 in the main survey (see Section A.1 in Appendix A). This resulted in a more equally allocated clinical sample by age. More details about the sample design for the MHSS clinical study can be found in SAMHSA's 2012 NSDUH sample design report (CBHSQ, 2013a).

Special clinical sample analysis weights were created as the product of the following seven weight components: (1) NSDUH analysis weight; (2) coverage adjustment for Hispanics completing the main NSDUH interview in English to account for Hispanics who completed it in Spanish and thus were not eligible for the English-language clinical follow-up interview; (3) inverse of the selection probability for clinical follow-up; (4) refusal adjustment to account for NSDUH respondents who were selected for the MHSS but declined to be contacted for the clinical interview; (5) another nonresponse adjustment to account for MHSS nonresponse among NSDUH respondents who had originally agreed to be recontacted for the clinical interview but did not complete the interview; (6) poststratification adjustments from the main NSDUH interview by age, gender, race/ethnicity, alternative K6 score, alternative WHODAS score, having had serious thoughts of suicide in the past year, and having had an MDE; and (7) a scaling factor that scaled the weights in each year using different values.[36] The first six weight components were created separately for each year.

Separate sets of analysis weights were computed for (a) MHSS respondents from the 2008 half sample assigned to impairment questions derived from the WHODAS and (b) MHSS

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[35] In the question about serious thoughts of suicide, [DATEFILL] refers to the date at the start of a respondent's 12-month reference period. The interview program sets the start of the 12-month reference period as the same month and day as the interview date but in the previous calendar year.
[36] Both the lifetime and past year measures of MDE in adults (see Section B.4.4) were used in poststratification.

respondents from the half sample assigned to the alternative scale for measuring impairment based on the SDS. Only the MHSS respondents from the WHODAS half sample were used in determining and fitting the 2012 model.

The 2012 model was fit under the assumption that the relationship between SMI and the covariates of the model stayed the same from 2008 through 2012. Because the sample size, sampling allocation, and weight adjustments for the MHSS clinical samples differed across years, gains in statistical efficiency were realized by scaling the weights in each year using the following scaling factors: 12 percent for 2008, 4 percent for 2009, 14 percent for 2010, 35 percent for 2011, and 35 percent for 2012. The scaling factors were determined based on the relative sizes of the estimated variances for estimates of SMI, AMI, and past year MDE made directly from SCID diagnoses.[37]

The 2012 SMI Model. The 2012 SMI prediction model was fit with data from 4,912 WHODAS MHSS respondents from 2008 through 2012. The response variable Y equaled 1 when an SMI diagnosis was positive based on the clinical interview; otherwise, Y was 0. Letting **X** be a vector of characteristics attached to a NSDUH respondent and letting the probability that this respondent had SMI be $\pi = \Pr(Y = 1 | \mathbf{X})$, the 2012 SMI prediction model was

$$\text{logit}(\hat{\pi}) = \log[\hat{\pi} / (1 - \hat{\pi})] = -5.972664 + 0.0873416 X_k + 0.3385193 X_w + 1.9552664 X_s \\ + 1.1267330\, X_m + 0.1059137 X_a \qquad (1)$$

or

$$\hat{\pi} = \frac{1}{1 + \exp[-(-5.972664 + 0.0873416 X_k + 0.3385193 X_w + 1.9552664 X_s + 1.1267330\, X_m + 0.1059137 X_a)]},$$

where $\hat{\pi}$ refers to the estimate of the SMI response probability π.

These covariates in equation (1) came from the main NSDUH interview data:

- X_k = *Alternative Past Year K6 Score*: Past year K6 score of less than 8 recoded as 0; past year K6 score of 8 to 24 recoded as 1 to 17.

- X_w = *Alternative WHODAS Score*: WHODAS item score of less than 2 recoded as 0; WHODAS item score of 2 to 3 recoded as 1, then summed for a score ranging from 0 to 8.

- X_s = *Serious Thoughts of Suicide in the Past Year*: Coded as 1 if "yes"; coded as 0 otherwise.

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[37] Past year MDE was defined based on responses to the SCID for the MHSS respondents and in the main survey for all adult respondents (see Section B.4.4). The two measures were created independently. The reference here is to the SCID measure from the MHSS.

- X_m = *Past Year MDE*: Coded as 1 if the criteria for past year MDE were met (see Section B.4.4);[38] coded as 0 otherwise.

- X_a = *Adjusted Age*: Coded as age minus 18 if aged 18 to 30; coded as 12 otherwise.

As with the 2008 model, a cut point probability π_0 was determined, so that if $\hat{\pi} \geq \pi_0$ for a particular respondent, then he or she was predicted to be SMI positive; otherwise, he or she was predicted to be SMI negative. The cut point (0.260573529) was chosen so that the weighted numbers of false positives and false negatives in the MHSS dataset were as close to equal as possible. The predicted SMI status for all adult NSDUH respondents was used to compute prevalence estimates of SMI.

A second cut point probability (0.0192519810) was determined so that any respondent with an SMI probability greater than or equal to the cut point was predicted to be positive for AMI, and the remainder were predicted to be negative for AMI. The second cut point was chosen so that the weighted numbers of AMI false positives and false negatives were as close to equal as possible.

Estimates of SMMI (serious or moderate mental illness; GAF score below 60) were analogously computed with the SMI method; the cut point was 0.077686285365. Estimates of low (mild) mental illness and moderate mental illness were derived by a process of subtraction. Respondents were classified as belonging to the moderate mental illness category if they belonged to the SMMI category, but they did not belong to the SMI category. Respondents were classified as belonging to the low (mild) mental illness category if they belonged to the AMI category but not to the SMMI category.

Alternative 2012 Model for the SDS Half Sample. In 2008, approximately half of the respondents in the adult NSDUH sample were assigned to receive questions about impairment based on the WHODAS (referred to as the 2008A sample), and the other half were assigned to receive questions based on the SDS (referred to as the 2008B sample). As noted previously, the purpose of this split sample was to determine whether the SDS or WHODAS impairment scale was a better predictor of SMI. The WHODAS scale was identified as the better predictor.

For the clinical interview respondents who had been administered the SDS in the main survey, an alternative SMI model was fit using the complete MHSS dataset of clinical interviews from 2008 through 2012. SMI, AMI, and SMMI estimates were obtained using the same cut point methodology described previously but applied to the alternative model. Mental illness estimates based on the predicted values for the 2008B sample were compared with the ones based on the 2008A sample using the 2012 model described previously. The model-based estimates based on the 2008A and 2008B samples were similar, and the predicted values for the two half samples in 2008 were deemed to be comparable. For example, the AMI estimates for the 2008A and 2008B half samples were 17.69 and 17.78 percent, respectively. Therefore, the predicted values from the 2008B sample were combined with predicted values from the complete WHODAS sample for 2008A and for 2009 through 2012.

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[38] In this situation, the past year MDE measure is from the main NSDUH interview (i.e., not from the SCID).

In fitting the alternative 2012 model for the SDS half sample, weights for the clinical interview respondents who had been assigned to the SDS were developed separately using the same steps as in other years. The 2008 sample of clinical interview respondents who had received WHODAS questions in NSDUH was treated as being equivalent to a sample in a different year. When data from clinical interview respondents were combined from the 2008A, 2008B, 2009, 2010, 2011, and 2012 samples, the 2008A and 2008B weights were each scaled by 6 percent (0.06). Weights for the other years were scaled as described previously.

The modified 2012 SMI prediction model for the SDS half sample was

$$\text{logit}(\hat{\pi}) = \log[\hat{\pi} / (1 - \hat{\pi})] = -5.7736246 + 0.1772067 X_k + 1.8392433 X_s + 1.6428623 X_m + 0.1231266 X_a \qquad (2)$$

or

$$\hat{\pi} = \frac{1}{1 + \exp[-(-5.7736246 + 0.1772067 X_k + 1.8392433 X_s + 1.6428623 X_m + 0.1231266 X_a)]}.$$

All of the covariates in equation (2) appeared in equation (1) as well.

The estimates of the parameters of the models displayed in equations (1) and (2) are given in Table B.6 shown at the end of this appendix.

Standard Errors for Mental Illness Estimates. For this report and the mental health detailed tables, SEs for mental illness estimates (SMI, AMI, SMMI, moderate mental illness, and low [mild] mental illness) were computed using the NSDUH dichotomous variable values without taking into account any variance introduced through using a model based on the clinical subsample data. This ignores the added error resulting from fitting the 2012 SMI model, which can be very large (see CBHSQ, 2014a). These *conditional* SEs (conditional on the model predictions being correct) are useful when making comparisons across years and across subpopulations within years because the errors due to model fitting are nearly the same across the estimates being compared and consequently roughly cancel each other out.

B.4.4   Major Depressive Episode (Depression)

Beginning in 2004, modules related to MDE derived from DSM-IV (APA, 1994) criteria for major depression were included in the questionnaire. These questions permit estimates to be calculated for the prevalence of MDE and treatment for MDE. Separate modules were administered to adults aged 18 or older and youths aged 12 to 17. The adult questions were adapted from the depression section of the National Comorbidity Survey Replication (NCS-R), and the questions for youths were adapted from the depression section of the National Comorbidity Survey Replication Adolescent Supplement (NCS-A).[39] To make the modules developmentally appropriate for youths, there are minor wording differences in a few questions between the adult and youth modules. Revisions to the questions in both modules were made primarily to reduce their length and to modify the NCS questions, which are interviewer-administered, to the audio computer-assisted self-interviewing (ACASI) format used in NSDUH.

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[39] For details, see http://www.hcp.med.harvard.edu/ncs/.

In addition, some revisions, based on cognitive testing, were made to improve comprehension. Furthermore, even though titles similar to those used in the NCS were used for the NSDUH modules, the results of these items may not be directly comparable. This is mainly due to differing modes of administration in each survey (ACASI in NSDUH vs. computer-assisted personal interviewing [CAPI] in the NCS), revisions to wording necessary to maintain the logical processes of the ACASI environment, and possible context effects resulting from deleting questions not explicitly pertinent to severe depression.

According to DSM-IV, a person is defined as having had MDE in his or her lifetime if he or she has had at least five or more of the following nine symptoms nearly every day in the same 2-week period, where at least one of the symptoms is a depressed mood or loss of interest or pleasure in daily activities (APA, 1994): (1) depressed mood most of the day; (2) markedly diminished interest or pleasure in all or almost all activities most of the day; (3) significant weight loss when not sick or dieting, or weight gain when not pregnant or growing, or decrease or increase in appetite; (4) insomnia or hypersomnia; (5) psychomotor agitation or retardation; (6) fatigue or loss of energy; (7) feelings of worthlessness; (8) diminished ability to think or concentrate or indecisiveness; and (9) recurrent thoughts of death or suicidal ideation. Respondents who have had MDE in their lifetime are asked if, during the past 12 months, they had a period of depression lasting 2 weeks or longer while also having some of the other symptoms mentioned. Those reporting that they have had MDE in the past year are asked questions from the SDS to measure the level of functional impairment in major life activities reported to be caused by the MDE in the past 12 months (Leon et al., 1997).

NSDUH measures the nine attributes associated with MDE as defined in DSM-IV with the following questions. Note that the questions shown are taken from the adult depression module. A few of the questions in the youth module were modified slightly to use wording more appropriate for youths aged 12 to 17. It should be noted that no exclusions were made for MDE caused by medical illness, bereavement, or substance use disorders.

1. Depressed mood most of the day

The following questions refer to the worst or most recent period of time when the respondent experienced any or all of the following: sadness, discouragement, or lack of interest in most things.

During that [worst/most recent] period of time…

   a. … did you feel sad, empty, or depressed **most of the day nearly every day**?
   b. … did you feel discouraged about how things were going in your life **most of the day nearly every day**?

2. Markedly diminished interest or pleasure in all or almost all activities most of the day

   a. … did you lose interest in almost all things like work and hobbies and things you like to do for fun?
   b. … did you lose the ability to take pleasure in having good things happen to you, like winning something or being praised or complimented?

3. Weight

In answering the next questions, think about the [worst/most recent] period of time.

    a. Did you have a much smaller appetite than usual nearly every day during that time?
    b. Did you have a much **larger** appetite than usual nearly every day?
    c. Did you gain weight without trying to during that [worst/most recent] period of time?
        a.   … because you were growing?
        b.   … because you were pregnant?
        c.   How many pounds did you gain?

    d. Did you lose weight without trying to?
        a.   … because you were sick or on a diet?
        b.   How many pounds did you lose?

4. Insomnia or hypersomnia

    a. Did you have a lot more trouble than usual falling asleep, staying asleep, or waking too early nearly every night during that [worst/most recent] period of time?
    b. During that [worst/most recent] period of time, did you sleep a lot more than usual nearly every night?

5. Psychomotor agitation or retardation

    a. Did you talk or move more slowly than is normal for you nearly every day?
    b. Were you so restless or jittery nearly every day that you paced up and down or couldn't sit still?

6. Fatigue or loss of energy

    a. During that [worst/most recent] period of time, did you feel tired or low in energy nearly every day even when you had not been working very hard?

7. Feelings of worthlessness

    a. Did you feel that you were not as good as other people nearly every day?
    b. Did you feel totally worthless nearly every day?

8. Diminished ability to think or concentrate or indecisiveness

    a. During that [worst/most recent] time period, did your thoughts come much more slowly than usual or seem confused nearly every day?
    b. Did you have a lot more trouble concentrating than usual nearly every day?
    c. Were you unable to make decisions about things you ordinarily have no trouble deciding about?

9. Recurrent thoughts of death or recurrent suicidal ideation

    a. Did you often think about death, either your own, someone else's, or death in general?
    b. During that period, did you ever think it would be better if you were dead?
    c. Did you think about committing suicide?

       NSDUH also collects data on impairment using the SDS, which is a measure of impairment because of mental health issues in four major life activities or role domains. These four domains are defined separately for adults aged 18 or older and youths aged 12 to 17 to reflect the different roles associated with the two age groups. Each module consists of four questions, and each item uses an 11-point scale ranging from 0 (no interference) to 10 (very severe interference). The impairment score is defined as the single highest severity level of role impairment across the four SDS role domains. Ratings greater than or equal to 7 on the scale were considered severe impairment. In addition to past year MDE, NSDUH shows estimates for past year MDE with severe impairment. Estimates for severe impairment are calculated separately for youths and adults because the four domains are slightly different for the two groups. The questions pertaining to the four domains are listed below for both groups.

Adult Depression Module: Functional Impairment

ASDSHOME   Think about the time in the past 12 months when these problems with your mood were **most severe.**

               Using the 0 to 10 scale shown below, where 0 means **no** interference and 10 means very **severe** interference, select the number that describes how much these problems interfered with **your ability to do** each of the following activities during that period. You can use any number between 0 and 10 to answer.

No Interference	Mild	Moderate	Severe	Very Severe Interference
0	1 2 3	4 5 6	7 8 9	10

               How much did your [depression symptoms] interfere with your **ability to do home management tasks**, like cleaning, shopping, and working around the house, apartment, or yard?

ASDSWORK   During the time in the past 12 months when your [depression symptoms] were most severe, how much did this interfere with **your ability to work**?

ASDSREL   How much did your [depression symptoms] interfere with your **ability to form and maintain close relationships** with other people during that period of time?

ASDSSOC   How much did [depression symptoms] interfere with your **ability to have a social life** during that period of time?

Youth Depression Module: Functional Impairment

YSDSHOME   Think about the time in the past 12 months when these problems with your mood were the **worst.**

Using the 0 to 10 scale shown below, where 0 means **no** problems and 10 means very **severe** problems, select the number that describes how much your [depression symptoms] caused problems with **your ability to do** each of the following activities during that time. You can use any number between 0 and 10 to answer.

No Problems		Mild			Moderate			Severe		Very Severe Problems
0	1	2	3	4	5	6	7	8	9	10
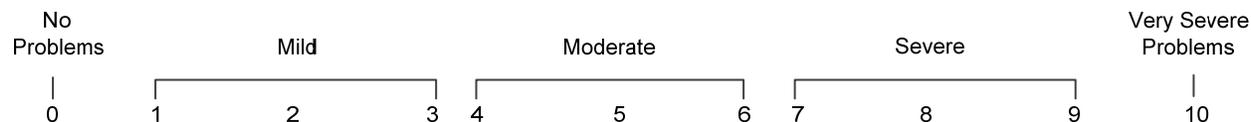
How much did your [depression symptoms] cause problems with your **chores at home**?

YSDSWORK   During the time in the past 12 months when your [depression symptoms] were worst, how much did this cause problems with your **ability to do well at school or work**?

YSDSREL   How much did your [depression symptoms] cause problems with your **ability to get along with your family** during that time?

YSDSSOC   How much did your [depression symptoms] cause problems with your **ability to have a social life** during that time?

Adjustment of MDE Data for Context Effects. Since 2004, the NSDUH questions that determine MDE have remained unchanged for both adults and youths. In the 2008 questionnaire, however, changes were made in other mental health items that precede the MDE questions (K6, suicide, and impairment) for adults. Questions also were retained in 2009 for the WHODAS impairment scale, and the questions for the SDS impairment scale were deleted; see Sections B.4.2 and B.4.3 of this report for further details about these questionnaire changes. These questionnaire changes in 2008 appear to have affected the reporting on MDE questions among adults. Thus, adult MDE estimates for 2008 and 2009 cannot be directly compared with NSDUH adult MDE estimates based on data prior to 2008. See Sections B.4.4 and B.4.7 of the 2008 NSDUH's national findings report (OAS, 2009b) for a further discussion. In addition, estimates of adult MDE in 2008 that were included in the 2009 mental health findings report (CBHSQ, 2010) were based only on half of the sample (see Section B.4.2 in this current appendix).

To address the break in comparability of the adult MDE data beginning in 2008 and to estimate adult MDE based on the full sample of adults from 2008, adjusted versions of lifetime and past year MDE variables for adults were created retroactively for 2005 to 2008. These variables were adjusted to make MDE estimates from the SDS half sample in 2008 and from all adult respondents for 2005 to 2007 that would be comparable with the MDE estimates based on

data from the half sample who received the WHODAS in 2008 and from all adult respondents in later years. The adjusted data from 2005 to 2008 were used in conjunction with unadjusted data from later years to estimate trends in adult MDE over the entire period from 2005 to 2012.

Specifically, a weighted logistic regression was fit for the NSDUH data from 2005 to 2009 with past year MDE as the binary dependent variable. Independent variables in this model controlled for the questionnaire differences between NSDUHs from 2005 to 2007 and NSDUHs from 2008 and 2009, as well as for the context effects associated with the SDS half sample in 2008. This model was used to compute predicted probabilities of past year MDE for each respondent. The predicted probabilities, which can have any value between 0 and 1, then were dichotomized such that each respondent was specified as having or not having MDE in the past year. Adjusted lifetime MDE estimates were similarly constructed, with the additional condition that respondents reporting past year MDE were assumed to have lifetime MDE. Details about the adjustment of the adult MDE data for 2005 to 2008 can be found in a report describing these procedures (CBHSQ, 2012a).

In addition, changes to YMHSU module questions in 2009 that preceded the questions about adolescent depression could have affected adolescents' responses to the adolescent depression questions and estimates of adolescent MDE. As discussed in Section B.4.2 in this report, however, these changes in 2009 did not appear to affect the estimates of adolescent MDE. Therefore, data on trends in past year MDE from 2004 to 2009 did not require adjustment for adolescents aged 12 to 17.

Table B.1 Demographic and Geographic Domains Forced to Match Their Respective U.S. Census Bureau Population Estimates through the Weight Calibration Process, 2013

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[2]** 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., Individuals Aged 12 to 25 in the Northeast) **Age Group × Geographic Division** (e.g., Adults 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.

[2] Unlike racial/ethnic groups discussed elsewhere in this report, race domains in this table include Hispanics in addition to individuals who were not Hispanic.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2013.

Table B.2 Summary of 2013 NSDUH Suppression Rules

Estimate	Suppress if:
Prevalence Rate, $\hat{p}$, with Nominal Sample Size, n, and Design Effect, $deff$ $\left(deff = \dfrac{n\left[SE(\hat{p})\right]^2}{\hat{p}(1-\hat{p})} \right)$	(1) The estimated prevalence rate, $\hat{p}$, is $< .00005$ or $\geq .99995$, or (2) $\dfrac{SE(\hat{p})/\hat{p}}{-\ln(\hat{p})} > .175$ when $\hat{p} \leq .5$, or $\dfrac{SE(\hat{p})/(1-\hat{p})}{-\ln(1-\hat{p})} > .175$ when $\hat{p} > .5$, or (3) *Effective* $n < 68$, where *Effective* $n = \dfrac{n}{deff} = \dfrac{\hat{p}(1-\hat{p})}{\left[SE(\hat{p})\right]^2}$, 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.
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. 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) $RSE(\bar{x}) > .5$, 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, 2013.

Figure B.1 Required Effective Sample in the 2013 NSDUH as a Function of the Proportion Estimated
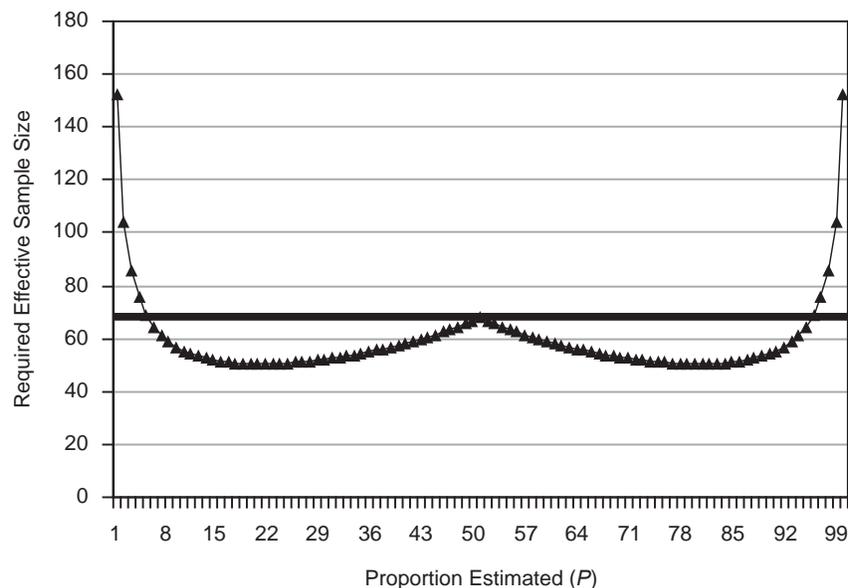
Table B.3 Weighted Percentages and Sample Sizes for 2012 and 2013 NSDUHs, by Final Screening Result Code

Final Screening Result Code	Sample Size 2012	Sample Size 2013	Weighted Percentage 2012	Weighted Percentage 2013
TOTAL SAMPLE	214,274	227,075	100.00	100.00
Ineligible Cases	35,688	37,008	16.57	15.96
Eligible Cases	178,586	190,067	83.43	84.04
INELIGIBLES	35,688	37,008	16.57	15.96
10 - Vacant	19,257	19,839	51.50	51.74
13 - Not a Primary Residence	8,520	8,220	27.46	24.52
18 - Not a Dwelling Unit	2,496	2,617	6.52	6.70
22 - All Military Personnel	352	374	0.97	0.90
Other, Ineligible[1]	5,063	5,958	13.55	16.13
ELIGIBLE CASES	178,586	190,067	83.43	84.04
Screening Complete	153,873	160,325	86.07	83.93
30 - No One Selected	92,991	98,431	50.99	50.51
31 - One Selected	33,455	34,424	19.12	18.38
32 - Two Selected	27,427	27,470	15.96	15.04
Screening Not Complete	24,713	29,742	13.93	16.07
11 - No One Home	3,029	3,244	1.62	1.56
12 - Respondent Unavailable	457	473	0.26	0.27
14 - Physically or Mentally Incompetent	597	598	0.32	0.30
15 - Language Barrier - Hispanic	48	96	0.03	0.06
16 - Language Barrier - Other	748	821	0.50	0.52
17 - Refusal	16,807	21,086	9.39	11.39
21 - Other, Access Denied[2]	2,359	2,549	1.37	1.40
24 - Other, Eligible	14	24	0.01	0.01
27 - Segment Not Accessible	0	0	0.00	0.00
33 - Screener Not Returned	90	73	0.05	0.04
39 - Fraudulent Case	563	776	0.37	0.50
44 - Electronic Screening Problem	1	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, 2012 and 2013.

Table B.4 Weighted Percentages and Sample Sizes for 2012 and 2013 NSDUHs, by Final Interview Code

Final Interview Code	12+ Sample Size 2012	12+ Sample Size 2013	12+ Weighted Percentage 2012	12+ Weighted Percentage 2013	12-17 Sample Size 2012	12-17 Sample Size 2013	12-17 Weighted Percentage 2012	12-17 Weighted Percentage 2013	18+ Sample Size 2012	18+ Sample Size 2013	18+ Weighted Percentage 2012	18+ Weighted Percentage 2013
TOTAL	87,656	88,742	100.00	100.00	27,147	27,630	100.00	100.00	60,509	61,112	100.00	100.00
70 - Interview Complete	68,309	67,838	73.04	71.69	22,492	22,532	82.84	81.95	45,817	45,306	72.00	70.61
71 - No One at Dwelling Unit	1,147	1,101	1.26	1.15	192	172	0.67	0.53	955	929	1.33	1.22
72 - Respondent Unavailable	1,445	1,521	1.75	1.81	276	314	1.00	1.15	1,169	1,207	1.83	1.88
73 - Break-Off	21	23	0.05	0.03	0	4	0.00	0.01	21	19	0.06	0.04
74 - Physically/ Mentally Incompetent	1,023	1,012	1.95	1.95	274	284	1.16	1.03	749	728	2.04	2.04
75 - Language Barrier - Hispanic	116	105	0.17	0.16	9	5	0.02	0.02	107	100	0.18	0.17
76 - Language Barrier - Other	419	409	1.24	1.12	30	29	0.15	0.13	389	380	1.36	1.22
77 - Refusal	11,488	12,606	18.63	19.90	900	1,016	3.37	3.62	10,588	11,590	20.25	21.62
78 - Parental Refusal	2,787	3,111	0.97	1.04	2,787	3,111	10.06	10.95	0	0	0.00	0.00
91 - Fraudulent Case	158	93	0.22	0.17	44	18	0.17	0.10	114	75	0.22	0.18
Other[1]	743	923	0.73	0.96	143	145	0.56	0.52	600	778	0.75	1.01

[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, 2012 and 2013.

Table B.5 Response Rates and Sample Sizes for 2012 and 2013 NSDUHs, by Demographic Characteristics

Demographic Characteristic	Selected Persons 2012	Selected Persons 2013	Completed Interviews 2012	Completed Interviews 2013	Weighted Response Rate 2012	Weighted Response Rate 2013
TOTAL	87,656	88,742	68,309	67,838	73.04%	71.69%
AGE IN YEARS						
12-17	27,147	27,630	22,492	22,532	82.84%	81.95%
18-25	28,639	28,921	22,762	22,458	79.26%	77.34%
26 or Older	31,870	32,191	23,055	22,848	70.76%	69.45%
GENDER						
Male	42,942	43,823	32,869	32,840	71.24%	69.97%
Female	44,714	44,919	35,440	34,998	74.71%	73.30%
RACE/ETHNICITY						
Hispanic	13,906	14,369	11,168	11,278	74.95%	74.03%
White	56,374	56,577	43,165	42,305	72.19%	70.47%
Black	10,074	10,304	8,433	8,561	79.06%	78.76%
All Other Races	7,302	7,492	5,543	5,694	67.06%	66.23%
REGION						
Northeast	18,301	18,334	13,773	13,661	69.59%	68.75%
Midwest	24,499	24,842	19,142	18,822	74.27%	71.54%
South	26,279	26,758	20,886	20,782	74.22%	73.32%
West	18,577	18,808	14,508	14,573	72.75%	71.48%
COUNTY TYPE						
Large Metropolitan	39,096	40,266	29,918	30,126	71.21%	70.40%
Small Metropolitan	30,250	30,100	23,859	23,290	75.23%	73.38%
Nonmetropolitan	18,310	18,376	14,532	14,422	75.05%	72.82%

NOTE: Estimates are based on demographic information obtained from screener data and are not consistent with estimates on demographic characteristics presented in the 2012 and 2013 sets of detailed tables.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2012 and 2013.

Table B.6 Final SMI Prediction Models in the 2008-2012 MHSSs

	Beta	Beta SE	*T* Statistic	*P* Value	*DF*	Wald *P* Value[1]
WHODAS Sample (2008A-2012)						
Intercept	-5.9726640	0.3201	-18.6586	0.0000		
Alt PY K6	0.0873416	0.0248	3.5247	0.0009	1	0.0009
Alt WHODAS	0.3385193	0.0349	9.7034	0.0000	1	0.0000
PY Suicidal Thoughts	1.9552664	0.2164	9.0342	0.0000	1	0.0000
PY MDE	1.1267330	0.2196	5.1308	0.0000	1	0.0000
Age1830	0.1059137	0.0244	4.3380	0.0001	1	0.0001
WHODAS and SDS Samples (2008-2012)[2]						
Intercept	-5.7736246	0.3479	-16.5960	0.0000		
Alt PY K6	0.1772067	0.0190	9.3251	0.0000	1	0.0000
PY Suicidal Thoughts	1.8392433	0.1941	9.4781	0.0000	1	0.0000
PY MDE	1.6428623	0.2119	7.7528	0.0000	1	0.0000
Age1830	0.1231266	0.0259	4.7482	0.0000	1	0.0000

Age1830 = recoded age variable; Alt = alternative; *DF* = degrees of freedom; K6 = Kessler-6, a six-item psychological distress scale; MDE = major depressive episode; MHSS = Mental Health Surveillance Study; PY = past year; SDS = Sheehan Disability Scale; SE = standard error; SMI = serious mental illness; WHODAS = eight-item World Health Organization Disability Assessment Schedule.

[1] The *p* value is obtained from the overall model fitting.

[2] The model is fit over the WHODAS and SDS samples in 2008-2012, but is used only to produce predictions for the 2008 SDS sample.

NOTE: Alternative past year K6 score: past year K6 score of < 8 recoded as 0; past year K6 score of 8 to 24 recoded as 1 to 17.

NOTE: Alternative WHODAS score: WHODAS item score of < 2 recoded as 0; WHODAS item score of 2 to 3 recoded as 1, then summed for a score ranging from 0 to 8.

NOTE: Past year suicidal thought: coded as 1 if had serious thoughts of suicide in the past year; coded as 0 otherwise.

NOTE: Past year MDE: coded as 1 if the criteria for past year MDE were met; coded as 0 otherwise.

NOTE: Age1830: coded as age minus 18 if aged 18 to 30; coded as 12 otherwise.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2008-2012.

Appendix C: Other Sources of Mental Health Data

The National Survey on Drug Use and Health (NSDUH) provides estimates of mental disorders and related behavior (mental illness, major depressive episode [MDE], and suicidal thoughts and behavior) for the civilian, noninstitutionalized population aged 12 or older in the United States. A variety of surveys and data systems other than NSDUH also produce estimates of mental health indicators. Integrating information from national data sources, such as those included in this appendix, can provide more complete information about the mental health of the U.S. population. Therefore, it is useful to consider the estimates produced from other data sources when discussing NSDUH estimates. When comparing estimates between surveys, it is important to understand the methodological differences between surveys and the impact that these differences could have on estimates of mental health. That is, the purpose, data collection, and estimation methods for various sources of mental health data are often different, making comparisons between them difficult. Some methodological differences that may affect comparisons include, but are not limited to, the populations covered, timing of data collection, sample design, mode of data collection, instruments used, operational definitions, and estimation methods.

This appendix briefly describes several data systems that produce estimates of mental health indicators and presents selected comparisons of estimates with 2013 NSDUH estimates. Further information about these and other data systems can be found in a report comparing NSDUH mental health data and methods with those from other data sources (Hedden et al., 2012). This appendix also describes surveys on mental health in populations not covered by NSDUH.

NSDUH estimates of any mental illness (AMI) and serious mental illness (SMI) in 2013 that are presented in this appendix are based on the results of changes to estimation procedures in 2012 that were described in Section B.4.3 in Appendix B of this report, in combination with data from NSDUH interviews for all adults that were conducted in 2013. Because of this revised estimation procedure, NSDUH estimates of AMI and SMI in this appendix are not comparable with corresponding estimates from mental health findings reports prior to 2012.

C.1   Definition of Mental Illness

Before comparing estimates of mental illness produced from NSDUH with other surveys, it is useful first to define SMI as specified by the Substance Abuse and Mental Health Services Administration (SAMHSA). SMI among adults aged 18 or older is defined as having a diagnosable mental, behavioral, or emotional disorder (excluding developmental and substance use disorders) of sufficient duration to meet diagnostic criteria specified within the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (American Psychiatric Association [APA], 1994) that has resulted in serious functional impairment, which substantially interferes with or limits one or more major life activities. See the second section of Chapter 2 in this report for the statutory requirement for SAMHSA to develop an operational definition of

SMI. Similarly, NSDUH uses the following operational definition for the estimation of AMI among adults: having (currently or at any time in the past year) a diagnosable mental, behavioral, or emotional disorder (excluding developmental and substance use disorders) of sufficient duration to meet diagnostic criteria specified within the DSM-IV, regardless of functional impairment.

Clinical interview data on psychiatric disorders and impairment in carrying out daily activities due to these disorders were collected from a subset of adult NSDUH respondents from 2008 to 2012. These clinical data, along with data from the main NSDUH interview on distress and impairment, past year MDE, past year suicidal thoughts, and age, were used to develop models predicting the likelihood of having a mental illness for adults. This prediction model was then used to estimate mental illness among the adult civilian, noninstitutionalized population. See Section B.4.3 in Appendix B of this report for additional details on the estimation procedures for mental illness among adults.

C.2   National Surveys Collecting Data on Mental Health in the Civilian, Noninstitutionalized Population

National Comorbidity Survey (NCS)

Conducted by the University of Michigan's Survey Research Center, the National Comorbidity Survey (NCS) was sponsored by the National Institute of Mental Health (NIMH), the National Institute on Drug Abuse (NIDA), and the W.T. Grant Foundation. It was designed to measure in the general population the prevalence, risk factors, and consequences of psychiatric morbidity and comorbidity. The first wave of the NCS was an interviewer-administered household survey of individuals in the continental United States (i.e., excluding Alaska and Hawaii) that collected data from 8,098 respondents aged 15 to 54 using paper-and-pencil interviewing (PAPI). These responses were weighted to produce nationally representative estimates. 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 estimate the prevalence of mental disorders according to the criteria of the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd revised edition (DSM-III-R) (APA, 1987).

The NCS data allow estimates to be produced from the following classes of disorders: affective disorders, anxiety disorders, substance use disorders, and nonaffective psychosis. A published estimate of the prevalence of having at least one or more of the disorders assessed in the NCS (including substance use disorders) was 29.5 percent in the past 12 months among adults aged 18 to 54 (Kessler et al., 1994). The NSDUH estimate for the prevalence of AMI (excluding substance use disorders) was 18.5 percent in 2013. One difference between the two studies is how they define "one or more disorders"—the NCS included respondents with substance use disorders, and, as noted previously, the operational definition of AMI in NSDUH excludes substance use disorders. Methodological differences between the two surveys that could affect the estimates include the following: (a) *age ranges of the target populations* (18 or older for NSDUH vs. 18 to 54 for the NCS); (b) *the modes of administration* (audio computer-assisted self-interviewing [ACASI] for NSDUH vs. PAPI for the NCS); and (c) *differences in the instruments and estimation methods* used to estimate the prevalence of mental disorders (clinical interview data from a subset of adult respondents in combination with data on age, psychological

distress, functional impairment, suicidal thoughts, and depression for all adult NSDUH respondents vs. the UM-CIDI for the NCS). Furthermore, given that data from the surveys were collected at different times (2013 for NSDUH vs. 1990 to 1992 for the NCS), differences in estimates could reflect changes in population prevalence.

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

National Comorbidity Survey Replication (NCS-R)

There have been several follow-ups to and replications of the original NCS, including a replication study (the National Comorbidity Survey Replication, NCS-R) conducted in 2001 to 2003 with a newly recruited, nationally representative multistage, clustered-area probability sample of 9,282 U.S. respondents aged 18 or older (Kessler et al., 2004a). As in the NCS, the sample for the NCS-R excluded Alaska and Hawaii. Conducted by the University of Michigan's Survey Research Center, the NCS-R was sponsored by the NIMH, with supplemental support from NIDA, SAMHSA, the Robert Wood Johnson Foundation, and the John W. Alden Trust. Interviews were conducted using computer-assisted personal interviewing (CAPI). Unlike the NCS, which used DSM-III-R criteria, the NCS-R used DSM-IV criteria for measuring mental disorders. Specifically, the NCS-R used a modified version of the World Mental Health Version of the Composite International Diagnostic Interview (the WMH-CIDI) (Kessler & Üstün, 2004) to generate diagnoses according to the definitions and criteria of the DSM-IV. Disorders assessed in the NCS-R included anxiety disorders, mood disorders, intermittent explosive disorder, and substance use disorders.

In an analysis of the NCS-R data, respondents with a 12-month mental disorder (excluding a substance use disorder) were identified as having past year SMI if they also had at least one of the following: bipolar I or nonaffective psychosis, suicide attempt, at least two areas in which severe role impairment occurred as measured by the Sheehan Disability Scale (SDS; Leon et al., 1997), or the presence of functional impairment consistent with a Global Assessment of Functioning (GAF) (Endicott et al., 1976) score of 50 or less (Kessler et al., 2006). This produced an estimate of SMI among adults of 5.8 percent in the past year. Furthermore, 26.2 percent of respondents aged 18 or older were estimated to have any disorder in the past 12 months (including substance use disorders) (Kessler et al., 2006); when substance use disorders were excluded, the estimate of any disorder was 24.8 percent (Druss et al., 2009; Kessler et al., 2006). In addition to the SMI estimate of 4.2 percent among adults, the 2013 NSDUH estimated that 18.5 percent of adults had AMI in the past year (see Chapter 2 in this report).

Differences in estimates of SMI and AMI between the NCS-R and NSDUH could be due in part to various methodological differences between the surveys. In addition to the different years represented in each survey (the NCS-R data were collected in 2001-2002 vs. NSDUH's in 2013), the NCS-R data were collected using interviewer-administered questionnaires, while NSDUH employs self-administration. The NCS-R and NSDUH also used different methods for estimating SMI and AMI. The NSDUH estimates for SMI and AMI were based on statistical prediction models that were developed using clinical and main interview data from a subsample of respondents who were interviewed in 2008 to 2012 (see Section B.4.3 in Appendix B). That is, information derived from the NSDUH interview (age, psychological distress, functional

impairment, suicidal thoughts, and depression) was used for the independent variables in a statistical model that predicts mental illness. The dependent variable was the presence of SMI and was based on in-depth structured clinical interviews conducted by trained clinical interviewers. This model was used to produce estimates of SMI and AMI in the full NSDUH sample. In contrast, the NCS-R measures were directly estimated based on structured, diagnostic interviews by lay interviewers.

The definitions and disorders covered by NSDUH and the NCS-R also differ. Several published estimates of any disorder that used NCS-R data have included individuals with substance use disorders (Kessler et al., 2006), while NSDUH's estimates of AMI exclude people with substance use disorders. The NCS-R also included mental disorders that were not assessed in the subsample of NSDUH adults who received clinical interviews. In addition, several estimates of SMI have been published with NCS-R data using various operational definitions (Kessler et al., 2006) that differ slightly from those that use NSDUH data for estimates of SMI.

Estimates of past year MDE (7.6 percent), serious thoughts of suicide (2.6 percent), and suicide plans (0.7 percent) and attempts (0.4 percent) among adults also have been produced using the NCS-R data. The estimate of past year MDE was lower for the 2013 NSDUH (6.7 percent) compared with the NCS-R's estimate. NSDUH estimates of suicidal thoughts and suicide plans were 3.9 and 1.1 percent, respectively (see Chapter 3). Although the items used to develop the MDE estimate from NSDUH are based on the items used in the NCS-R, slight revisions to the items were required for the ACASI environment. Also, given that data from the surveys were collected at different times (2013 for NSDUH vs. 2001 to 2002 for the NCS-R), the differences in estimates could reflect changes in population prevalence. The different modes of survey administration (ACASI in NSDUH vs. interviewer administration in the NCS-R) also could affect responses to the MDE items.

In addition, the items used in the NCS-R and NSDUH to assess serious thoughts of suicide and suicidal behavior were different. The NCS-R first required respondents to report lifetime suicidal thoughts, plans, or behavior before they were asked whether these occurred in the past 12 months. In NSDUH, adult respondents are asked directly about suicidal thoughts and behavior in the past 12 months.

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

National Comorbidity Survey Replication Adolescent Supplement (NCS-A)

The National Comorbidity Survey Replication Adolescent Supplement (NCS-A) was designed to estimate the lifetime and current prevalence, age of onset, course, and comorbidity of DSM-IV disorders among adolescents in the United States; to identify risk and protective factors for the onset and persistence of these disorders; to describe patterns and correlates of service use for these disorders; and to lay the groundwork for subsequent follow-up studies that can be used to identify early expressions of adult mental disorders. Similar to the NCS-R, the NCS-A was conducted by the University of Michigan's Survey Research Center and was sponsored by the NIMH, with supplemental support from NIDA, SAMHSA, the Robert Wood Johnson Foundation, and the John W. Alden Trust. The NCS-A consisted of a sample, collected from 2001 to 2004, of adolescents aged 13 to 17. The sample included 904 adolescents from

households that participated in the NCS-R and 9,244 respondents from a nationally representative sample of 320 schools (Kessler et al., 2009). Similar to the NCS and NCS-R, the sample for the NCS-A excluded Alaska and Hawaii. All adolescents were interviewed in their homes using CAPI.[40]

Findings from the NCS-A indicated that 8.2 percent of adolescents aged 13 to 17 had major depression or dysthymia[41] in the past 12 months (Kessler et al., 2012). The 2013 NSDUH estimate of MDE in the past year among adolescents aged 12 to 17 was 10.7 percent. Estimates from these surveys could be affected by differences such as mode of administration (ACASI for NSDUH vs. CAPI for the NCS-A) and when the data were collected (2013 for NSDUH vs. 2001 to 2004 for the NCS-A).

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

Uniform Reporting System (URS)

The NCS data mentioned previously have been used by the Uniform Reporting System (URS) of the Center for Mental Health Services (CMHS) to produce State-level SMI estimates (Kessler et al., 2003a, 2003b, 2006). Using data from the NCS and the Baltimore site of the Epidemiologic Catchment Area (ECA) research project, methods were developed to estimate SMI (Kessler et al., 1996, 1998, 2001). The definition of SMI was operationalized as respondents having met the following criteria: (1) presence of a "severe" and persistent mental illness as defined by the National Advisory Mental Health Council of the NIMH (National Advisory Mental Health Council, 1993) or (2) respondents with another past 12-month DSM-III-R mental disorder (excluding "V" codes in the DSM,[42] substance use disorder, and developmental disorders) and a planned suicide, attempted suicide, lack of a productive role, serious role impairment, or serious interpersonal impairment (Kessler et al., 1996, 2001). Impairment was assessed using questions that were included in the NCS and the ECA for other purposes (Kessler et al., 2001; Narrow, Rae, Robins, & Regier, 2002). The SMI prevalence for the total population aged 18 or older based on the NCS and the ECA was 5.4 percent (Kessler et al., 1996).

Specifically, the URS selected a method for estimating State-level SMI prevalence that used the combined NCS data and data from the Baltimore site of the ECA by applying a model that controlled for demographic and geographic characteristics and corresponding census data (Kessler et al., 1998, 2004b). CMHS (1999) announced this methodology in the *Federal Register*

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[40] The school sample frame for the NCS-A was used to identify students for sample selection. As for the adolescents from households that participated in the NCS-R, adolescents selected from the school sample were interviewed in their homes.

[41] The DSM-IV (APA, 1994) defines dysthymic disorder in children as a chronically depressed or irritable mood that causes clinically significant functional impairment and occurs most of the day for more days than not for at least 1 year. At least two of the following symptoms must accompany the depressed or irritable mood: (1) poor appetite or overeating; (2) insomnia or hypersomnia; (3) low energy or fatigue; (4) low self-esteem; (5) poor concentration and/or difficulty making decisions; and (6) feelings of hopelessness; there cannot be more than a 2-month period of time when the dysthymia symptoms were in remission. In addition, the diagnosis of dysthymic disorder in children can be made only if the initial 1-year period of symptoms does not include an MDE.

[42] V codes denote conditions that are a focus of clinical attention or treatment but are not attributable to a mental disorder (e.g., marital problems).

as its final procedure for estimating the number of adults with SMI within each State. Through the URS, the CMHS has continued to provide State and national estimates of the prevalence of SMI among the civilian population aged 18 years or older that fixes the national SMI prevalence at 5.4 percent. Estimates of SMI by State are updated annually by applying updated population characteristics when new population data become available through the U.S. Census Bureau. Notably, this estimation method assumes that the prevalence of SMI in the adult population within the modeled demographic and geographic categories is homogeneous across States and does not change over time.

In contrast to the estimated prevalence of 5.4 percent among adults based on the NCS and the ECA, the estimated prevalence of SMI based on 2013 NSDUH data was 4.2 percent among adults. Several important differences between NSDUH and URS that could affect estimates of mental illness warrant discussion. Most importantly, the URS assumes a national prevalence of SMI of 5.4 percent that is based on research conducted in the mid-1990s and the assumption that estimates for Baltimore hold true for the rest of the Nation. In contrast, the 2013 NSDUH estimates are based on a statistical model that used clinical interview data from a subsample of NSDUH respondents that were collected in 2008 to 2012, in combination with data from NSDUH interviews for all adults that were conducted in 2013. Further differences between the two surveys that could affect estimates of SMI include the different methods for measuring functional impairment between the NCS/ECA and NSDUH. The NCS/ECA defined impairment according to information about disability and duration associated with individual disorders, planned or attempted suicide, vocational interference (as measured by unemployment or lost time from work due to mental health issues), and impairment of interpersonal relationships (based on self-reports about confiding relationships, frequency of interactions with friends or relatives, or the quality of interpersonal relationships). The 2013 NSDUH used a reduced set of questions based on a standard screening scale for impairment (see Section B.4.3 in Appendix B) that specifically asked about difficulty in carrying out specific tasks or responsibilities because of their emotions, nerves, or mental health, along with clinical interview information on impairment from a subset of adult respondents. In addition, the NCS and the ECA both were designed to estimate the lifetime prevalence of mental disorders; therefore, the emphasis of the diagnosis was on lifetime over past year assessment. The 2013 NSDUH was designed to estimate past year SMI. Also, SMI estimates using the pooled NCS and ECA data used DSM-III and DSM-III-R diagnostic criteria. NSDUH interview data were based on DSM-IV criteria. Furthermore, the mode of survey administration differed for the NCS and the ECA (interviewer administration) versus the NSDUH (ACASI).

National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)

The first wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) was conducted using CAPI in 2001 and 2002 by the U.S. Bureau of the Census for the National Institute on Alcohol Abuse and Alcoholism (NIAAA). The NESARC sample of adults aged 18 or older was designed to make inferences for the adult civilian, noninstitutionalized population of the United States, including Alaska, Hawaii, and the District of Columbia, and including people living in noninstitutional group quarters. NESARC is longitudinal in design. 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, in which 34,653 respondents were reinterviewed (Grant & Dawson, 2006; NIAAA, 2010).

A 1-year data collection period for NESARC-III began in 2012 with a new cohort of approximately 46,500 adults.

NESARC contains assessments of alcohol and illegal drug use, dependence and abuse, and associated mental disorders. NESARC included an extensive set of questions based on DSM-IV criteria (APA, 1994) and was designed to assess the presence of symptoms of alcohol or drug dependence or abuse in people's lifetimes and during the prior 12 months. In addition, estimates of the prevalence of major mental disorders based on the DSM-IV 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. Mood disorders assessed in NESARC included major depression, dysthymia, mania, and hypomania. Anxiety disorders that were assessed included panic disorder (with or without agoraphobia), social phobia, specific phobia, and generalized anxiety disorder (Grant et al., 2004).

Based on Wave 1 of the NESARC data, 9.2 percent of adults were estimated to have a DSM-IV mood disorder in the past year, and 11.1 percent were estimated to have a DSM-IV anxiety disorder in that period. In addition, 7.1 percent of adults were estimated to have had MDE in the past year based on the 2001-2002 NESARC data (Compton, Conway, Stinson, & Grant, 2006; Grant et al., 2004). The estimate of past year MDE among adults in the 2013 NSDUH was 6.7 percent. The NESARC estimate excluded depressive symptoms induced by substance use, a medical illness, or bereavement; these exclusions were not made for the NSDUH estimate of MDE.[43] In addition, the main NSDUH interview does not include questions to assess anxiety disorders or mood disorders other than MDE. A number of other methodological differences also may contribute to differences in estimates produced by NSDUH and NESARC, including differences in the mode of data collection (questions about sensitive topics in NSDUH are self-administered, while similar questions are interviewer administered in NESARC), mental health instrumentation, and time frames of data collection.

National Survey of Children's Health (NSCH)

The National Survey of Children's Health (NSCH) is a cross-sectional telephone survey of households in the United States with at least one child aged 0 to 17 years living in the household at the time of the interview. The NSCH provides national and State-level prevalence estimates for a variety of physical, emotional, and behavioral child health indicators among children in the United States. The survey most recently was conducted during 2011 and 2012, with previous administrations in 2003 to 2004 and 2007 to 2008. Primary funding for the 2011-2012 NSCH was provided by the Maternal and Child Health Bureau within the Health Resources and Services Administration. The National Center for Health Statistics (NCHS) within the Centers for Disease Control and Prevention (CDC) oversaw the sampling and telephone interviews. The NSCH collects data using random-digit-dialing (RDD) methods from a large national probability sample in all 50 States and the District of Columbia (e.g., nearly 96,000 child-level interviews nationally in 2011 and 2012, with approximately 1,850 interviews per

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[43] The NESARC estimate reported by Grant et al. (2004) excluded substance-induced depression, while the estimate reported by Compton et al. (2006) did not. However, Compton et al. noted that the prevalence of substance-induced depression was low and not likely to have a large effect on estimates of MDE.

State). Beginning with the 2011-2012 NSCH, the survey included a dual-frame sample for landline and cellular phone numbers.[44] Households containing one or more children aged 0 to 17 years are identified from sampled telephone numbers, and one child within these households is randomly selected to be the subject of the interview. The adult parent or guardian in the household who knows the most about the child's health and health care is asked to complete an interview using computer-assisted telephone interviewing (CATI); in addition to English, respondents could complete the interview in Spanish, Mandarin, Cantonese, Vietnamese, or Korean.[45] NSCH results are weighted to represent the population of noninstitutionalized children aged 0 to 17 years nationally and in each State.

If the sampled child in the household is aged 2 to 17, the parent being interviewed is asked whether a doctor or other health professional ever told the parent that the child had specific mental health conditions, including depression. If the parent reported being told that the child ever had depression, the parent is asked whether the child currently has depression, and if so, whether the adult would describe the child's depression as mild, moderate, or severe. Based on NSCH data for 2011 and 2012, the estimated prevalence of current depression nationally among adolescents aged 12 to 17 was 4.0 percent, and 1.8 percent of adolescents were described as currently having moderate or severe depression.[46] The 2013 NSDUH estimate of MDE in the past year among adolescents aged 12 to 17 was 10.7 percent, and 7.7 percent had MDE with severe impairment.

Methodological differences between the two surveys that could affect the estimates of depression among adolescents include the following: (a) *the modes of administration and available languages* (ACASI in English or Spanish for NSDUH vs. CATI and availability of the interview in Asian languages in addition to English or Spanish for the NSCH); (b) *the source of information* about an adolescent's health (direct self-reports from an adolescent respondent in NSDUH vs. parental reports in NSCH); (c) *differences in measures* for estimating the prevalence and severity of depression (specific symptoms of depression, frequency of symptoms, and interference of depression with adolescents' life activities [see Section B.4.4 in Appendix B] in NSDUH vs. reports in the NSCH of whether the parent was told that the child had depression and the parent's self-assessment of the severity of current depression); and (d) *differences in the reference period* for recent depression (past 12 months in NSDUH vs. "currently" in the NSCH). Response rates also have been higher in NSDUH than in the NSCH (e.g., 38.2 percent for the landline sample in 2011 and 2012, 15.5 percent for the cellular phone sample, and 23.0 percent for the combined dual-frame sample) (NCHS, 2013), which could result in differential nonresponse bias patterns in the two surveys.

For further details, see the NSCH Web site at http://www.cdc.gov/nchs/slaits/nsch.htm.

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[44] The NSCH used the same sampling frame as the CDC's National Immunization Survey (NIS) and immediately followed the NIS interview in selected households, using the NIS sample for efficiency and economy.

[45] Most interviews in 2011 or 2012 that were not conducted in English were conducted in Spanish (NCHS, 2013).

[46] NSCH data can be analyzed online at http://www.childhealthdata.org/learn/NSCH by selecting "Browse the Data" and "Browse by Survey & Topic." Data on current depression for a given year of the NSCH are available by selecting "Physical and Dental Health" from "Child Health Measures," then selecting "Prevalence of current depression, age 2-17 years" from the list of topics for "1.9b: Prevalence of current chronic health conditions." The online analysis tool allows estimates to be shown by age group.

C.3 Surveys of Populations Not Covered by NSDUH

Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS)

The Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS) is a multicomponent epidemiologic and neurobiological study to generate evidence-based recommendations to inform health promotion, risk reduction, and suicide prevention efforts in the U.S. Army. A primary aim of the study is to increase knowledge about determinants of suicidal thoughts and behaviors among soldiers. Army STARRS is supported through the Henry M. Jackson Foundation under a cooperative agreement between the NIMH and a consortium of scientific collaborators at the Uniformed Services University of the Health Sciences, the University of California San Diego, Harvard Medical School, and the University of Michigan, with additional collaborating scientists and consultants from the NIMH and the Army. Army STARRS includes six component studies: (1) the Historical Administrative Data Study (HADS), an integrated analysis of over 200 administrative data systems to provide data on significant administrative predictors of suicides among the more than 1.6 million soldiers who were on active duty during 2004 through 2009; (2) the Soldier Health Outcomes Study A (SHOS-A), a retrospective case-control study of soldiers who made nonfatal suicide attempts; (3) the Soldier Health Outcomes Study B (SHOS-B), a case-control study of soldiers whose suicide attempts were fatal; (4) the New Soldier Study (NSS), a cross-sectional survey in 2011 and 2012 of new soldiers in the 2 days after their arrival for Basic Combat Training (BCT); (5) the All-Army Study (AAS), a cross-sectional survey in 2011 and 2012 of active-duty personnel other than those in BCT; and (6) the Pre-Post Deployment Survey (PPDS), in which NSS and AAS respondents are tracked longitudinally through their administrative records to obtain information on outcomes, such as suicide fatalities, nonfatal suicide attempts of sufficient severity to come to the attention of the military health care system, and treatment in the military health care system for mental illness. More information about these component studies can be found in Kessler et al. (2013).

The questionnaires for both the NSS and AAS were self-administered in group sessions and collected information on physical health (including periods of insomnia and chronic pain); eight internalizing mental disorders (major depressive disorder, bipolar disorder, panic disorder, generalized anxiety disorder, posttraumatic stress disorder, specific phobia, social phobia, and obsessive-compulsive disorder); three externalizing mental disorders (attention-deficit/hyperactivity disorder, intermittent explosive disorder, and substance use disorder) (Nock et al., 2014); receipt of mental health services; substance use; and suicidal thoughts and behaviors. Assessment of mental or substance use disorders was based on DSM-IV criteria for the lifetime, past 12-month, and past 30-day periods, except that disorders were assessed without regard to diagnostic hierarchy or organic exclusion rules (Kessler et al., 2014). The NSS questionnaire used computer-assisted self-interviewing (CASI) and was administered on laptop computers. The AAS questionnaire was shorter than the NSS questionnaire (i.e., designed for a single 90-minute group administration instead of two 90-minute administrations for the NSS), and it was designed for CASI administration or as a paper-and-pencil questionnaire. In addition, the NSS included neurocognitive tests and blood samples for genetic testing that were obtained from consenting participants as part of the physical examination process prior to the beginning of BCT. The AAS did not collect neurocognitive data or physical specimens for genetic testing. Both NSS and AAS respondents were asked for consent to link their Army or Department of

Defense (DoD) administrative records to their questionnaire responses and to participate in to-be-determined future longitudinal data collections (Kessler et al., 2013).

Based on AAS data from 5,428 soldiers who completed questionnaires and consented to linkage of questionnaire responses with administrative records, 25.1 percent of respondents met criteria for any mental or substance use disorder in the past 30 days, including 15.0 percent for any internalizing disorders, 18.4 percent for any externalizing disorders, and 11.1 percent for multiple disorders (internalizing or externalizing). About three fourths of cases with any disorder in the past 30 days (76.6 percent) reported an age at onset prior to enlistment (Kessler et al., 2014). Lifetime estimates for suicidal thoughts and behaviors were 13.9 percent for having suicidal thoughts, 5.3 percent for making a suicide plan, and 2.4 percent for making a (nonfatal) suicide attempt (Nock et al., 2014).

For further details, see the Army STARRS Web site at http://www.armystarrs.org/.

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

The 2011 Department of Defense (DoD) Health Related Behaviors Survey of Active Duty Military Personnel (HRB Survey) was updated extensively since its last iteration in 2008. For the first time, the survey was administered using a Web-based individual self-administered questionnaire rather than through an onsite group administration of paper-and-pencil questionnaires. Because of this change in survey administration, the 2011 sample was no longer clustered geographically. The questionnaire also was revised to allow the use of skip logic to reduce respondent burden and additional alignment with questions in national surveys of civilian populations. The 2011 HRB survey sample consisted of 39,877 active-duty, nondeployed service members in the Army, Navy, Marine Corps, Air Force, and Coast Guard (Barlas, Higgins, Pflieger, & Diecker, 2013). The survey provides information about the use of alcohol, illicit drugs, and tobacco and about mental health issues among military personnel. Because of changes to procedures for sampling, data collection (including questionnaire changes), weighting, data processing, and analysis, estimates from the 2011 HRB survey are not directly comparable with estimates from prior HRB survey administrations. Consequently, the 2011 HRB survey represents a new baseline.

In 2011, 9.6 percent of military personnel in all services (including the Coast Guard) reported symptoms that suggested a high level of depression in the past week, 3.9 percent reported suicidal ideation (i.e., suicidal thoughts) in the past year, and 0.5 percent reported a suicide attempt in that period. In addition, 25.6 percent of military personnel perceived the need for mental health counseling in the past year, and 24.9 percent received counseling (Barlas et al., 2013).

National Inmate Survey (NIS)

The National Inmate Surveys were conducted in 2007 (NIS-1), in 2008-2009 (NIS-2), and in 2011-2012 (NIS-3). They fulfill the requirements of the Prison Rape Elimination Act of 2003 for the Bureau of Justice Statistics (BJS) to provide a list of prisons and jails according to the prevalence of sexual victimization. Questions about mental health were included for the first

time in the NIS-3. The BJS also added a companion survey on drug and alcohol use and treatment to each of these surveys. Inclusion of the companion survey on substance use and treatment was designed to prevent facility staff from knowing whether inmates were selected to receive the survey on sexual victimization or the companion survey and also was intended to provide more recent information on substance use and related issues among correctional populations in the United States compared with the Surveys of Inmates in State and Federal Correctional Facilities (see the next survey summary in this appendix).

The NIS used a two-stage probability sample design first to select State and Federal correctional facilities,[47] then to select inmates within sampled facilities. At least one facility in every State was selected; Federal facilities were grouped together and treated like a State for sampling purposes. The sample design also ensured a sufficient number of women in the sample. Samples were restricted to confinement facilities (i.e., institutions in which fewer than 50 percent of the inmates were regularly permitted to leave for work, study, or treatment without being accompanied by facility staff). The NIS samples also excluded community-based facilities, such as halfway houses, group homes, and work release centers. Inmates aged 18 or older within sampled facilities were randomly selected for the interview.

The NIS-3 was conducted in 233 State and Federal prisons, 358 local jails, and 15 special facilities (military, Indian country, and U.S. Immigration and Customs Enforcement) between February 2011 and May 2012. A total of 106,532 inmates participated in NIS-3 (either survey form), including 43,721 State or Federal prison inmates, 61,351 jail inmates, and 1,460 inmates in special facilities. Overall NIS-3 response rates for both survey forms were 60 percent for prison inmates and 61 percent for jail inmates (Beck, Berzofsky, Caspar, & Krebs, 2013). Details for the NIS-1 and NIS-2 are discussed in Appendix C of the 2013 NSDUH national findings report (CBHSQ, 2014d).

The interviews used CAPI for general background information at the beginning of the interview and ACASI for the remainder. Respondents completed the ACASI portion of the interview in private, with the interviewer either leaving the room or moving away from the computer. Sampled inmates were randomly assigned to receive the sexual victimization survey or the companion survey on substance use and treatment. The NIS-3 included questions on the following mental health issues: (a) psychological distress in the past 30 days, based on the Kessler-6 (K6) questions (see Section B.4.3 in Appendix B of this report for a list of the K6 questions); (b) occurrence of specific mental disorders in the lifetime and past 12-month periods; (c) whether respondents had ever been told that they had specific mental disorders; and (d) mental health service utilization. Substance use questions in the companion survey were based on items from past inmate surveys conducted by the BJS, such as the 2004 Survey of Inmates in State Correctional Facilities (SISCF), and included questions about lifetime and first use of drugs or alcohol, being under the influence of drugs or alcohol at the time of their current offense, substance use prior to being admitted to the facility, problems associated with substance use, and treatment for the use of drugs or alcohol.

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[47] This selection was based on adult confinement facilities identified in the 2005 Census of State and Federal Adult Correctional Facilities, supplemented with updated information from Web sites maintained by each State's Department of Corrections.

An estimated 36.6 percent of prison inmates and 43.7 percent of jail inmates in the NIS-3 reported having ever been told by a mental health professional that they had a mental disorder (manic depression, bipolar disorder, other depressive disorder, schizophrenia or another psychotic disorder, posttraumatic stress disorder, or an anxiety or personality disorder). More than a third of inmates (35.8 percent of prison inmates and 39.2 percent of jail inmates) reported that they received counseling or therapy for these problems. An estimated 15.4 percent of prisoners and 19.7 percent of jail inmates reported taking prescription medication for a behavioral health condition at the time of the offense for which they were currently being held. Inmates who had ever been told by a mental health professional that they had a mental disorder were more likely than other inmates to report sexual victimization while they were incarcerated (Beck et al., 2013).

For further details about the NIS, see the BJS's "All Data Collections" Web page at http://bjs.ojp.usdoj.gov/index.cfm?ty=dca. Results from the drug and alcohol use and treatment surveys from NIS-1 and NIS-2 are expected in 2015. Release of additional mental health findings is expected in late 2014 or early 2015. Upon release of the findings, data will be made available at the National Archive of Criminal Justice Data at http://www.icpsr.umich.edu/NACJD/.

Survey 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) have provided 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 SISCF was conducted for the BJS by the U.S. Census Bureau, which also conducted the SIFCF for the BJS and the Federal Bureau of Prisons. 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. These surveys provide detailed information on criminal offenders, particularly special populations such as drug and alcohol users and offenders who have mental disorders. Systematic random sampling was used to select the inmates, and the SISCF and SIFCF in 2004 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.

In 2004, 56 percent of inmates in State prisons and 45 percent of inmates in Federal prisons had a mental disorder in the past year. More than two fifths of State prisoners (43 percent) reported symptoms of mania disorder, 24 percent reported symptoms of major depression, and 15 percent reported symptoms of a psychotic disorder. Comparable percentages for inmates in Federal prisons were 35, 16, and 10 percent, respectively (James & Glaze, 2006). However, these inmate surveys asked about depression symptoms only for the past 12 months and did not assess the duration of symptoms. Therefore, measures of depression from these surveys are not strictly comparable with measures of MDE in NSDUH.

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

Appendix D: References

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Appendix E: List of Contributors

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