

**2021-2022**  
**National Survey on Drug Use and Health:**  
**Guide to State Tables and Summary of Small**  
**Area Estimation Methodology**

# Section A: Overview of NSDUH and Model-Based State Estimates

## A.1 Introduction

This document provides information on the model-based small area estimates of substance use and mental health disorders in states based on data from the combined 2021-2022 National Surveys on Drug Use and Health (NSDUHs). Note that the substance use treatment and mental health treatment estimates are based on data from the 2022 NSDUH only because there was no comparable data in 2021 for those measures (see Sections B.12 and B.13 for more details). Titles of all tables and maps indicate the years for which the estimates are produced. The combined 2021-2022 as well as the 2022-only state small area estimates henceforth will be referred as the 2021-2022 state estimates. These estimates are available online along with other related information.<sup>1</sup>

NSDUH is an annual survey of the civilian, noninstitutionalized population aged 12 or older, conducted from January through December, and is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA). The survey collects information from individuals aged 12 or older residing in households, individuals residing in noninstitutionalized group quarters (e.g., shelters, rooming houses, dormitories), and civilians living on military bases. The 2021 and 2022 NSDUHs used multimode data collection, in which respondents completed the survey via the web or in person in eligible locations. In 2022, NSDUH collected data from 71,369 respondents aged 12 or older. Across 2021 and 2022 combined, NSDUH collected data from 141,219 respondents aged 12 or older, from the 50 states and the District of Columbia.

NSDUH 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.<sup>2</sup> A summary of NSDUH's methodology is given in Section A.2. Section A.3 lists all the tables and files associated with the 2021-2022 state estimates. Section A.4 provides details on the suppression criteria used for suppressing the estimates. Information is given in Section A.5 on the confidence intervals and margins of error and how to make interpretations with respect to the small area estimates. Section A.6 discusses related substance use measures and warns users about not drawing conclusions by subtracting small area estimates from two different measures. Section A.7 briefly discusses methodological changes for the 2021 and 2022 NSDUHs.

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<sup>1</sup> Use the NSDUH link on the following webpage: <https://www.samhsa.gov/data/nsduh/state-reports-NSDUH-2022>.

<sup>2</sup> RTI International is a trade name of Research Triangle Institute. RTI and the RTI logo are U.S. registered trademarks of Research Triangle Institute.

The survey-weighted hierarchical Bayes (SWHB) small area estimation (SAE) methodology used in the production of state estimates from the 1999 to 2021<sup>3</sup> surveys also was used in the production of the 2021-2022 state estimates. The SWHB methodology is described in Appendix E of the 2001 state report (Wright, 2003b) and in Folsom and colleagues (1999). A general model description is given in Section B.1 of this document. A list of measures (outcomes) for which small area estimates are produced is given in Section B.2. Predictors used in the 2021-2022 SAE modeling are listed and described in Section B.3. Selection of predictors for SAE modeling is described in Section B.4.

Small area estimates obtained using the SWHB methodology are design consistent (i.e., the small area estimates for states with large sample sizes are close to the robust design-based estimates). Additionally, the national small area estimates<sup>4</sup> are very close to the national design-based estimates. However, to ensure internal consistency, it is desirable to have the national small area estimates exactly match the national design-based estimates. This process is called “benchmarking.” The benchmarked state-level estimates are also potentially less biased than the unbenchmarking state-level estimates. Beginning in 2002, exact benchmarking was introduced, as described in Section B.5. The census region-level estimates in the tables are population-weighted aggregates of the benchmarked state-level estimates. Tables of the estimated numbers of individuals associated with each measure are available online,<sup>5</sup> and an explanation of how these counts and their respective Bayesian confidence intervals<sup>6</sup> are calculated can be found in Section B.6. Section B.7 discusses the method to compute aggregated estimates by combining two age groups. The definition and explanation of the formula used in estimating the marijuana initiation rate are given in Section B.8, whereas Section B.12 contains the associated information for did not receive substance use treatment among those classified as needing treatment.

State estimates for the age groups 12 to 17, 18 to 25, 26 or older, 18 or older, and 12 or older<sup>7</sup> are provided for all measures except for any mental illness (AMI), serious mental illness (SMI), receipt of mental health treatment, major depressive episode (MDE), serious thoughts of suicide, suicide plans, and suicide attempts. Additionally, estimates for youths aged 12 to 17 are not available for past year heroin use because heroin use in the past year for youths aged 12 to 17

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<sup>3</sup> The 2019-2020 state small area estimates were produced, but they have since been removed from SAMHSA’s website. Methodological investigations found that the unusual societal circumstances in 2020 and the resulting methodological revisions to NSDUH data collection have affected the comparability of 2020 estimates with estimates from 2019 and earlier. Consequently, estimates that involve combining data from 2020 with previous years have been removed from the SAMHSA website.

<sup>4</sup> *National small area estimates = Population-weighted averages of state-level small area estimates.*

<sup>5</sup> See Tables 1 to 37 in *2021-2022 National Survey on Drug Use and Health: Model-Based Estimated Totals (in Thousands) (50 States and the District of Columbia)* (CBHSQ, forthcoming b).

<sup>6</sup> Note that in the 2004-2005 NSDUH state report (Wright et al., 2007) and prior reports, the term “prediction interval” (PI) was used to represent uncertainty in the state and regional estimates. However, that term also is used in other applications to estimate future values of a parameter of interest. That interpretation does not apply to NSDUH state report estimates; thus, “prediction interval” was dropped and replaced with “Bayesian confidence interval.”

<sup>7</sup> For major depressive episode (MDE), receipt of mental health treatment, serious thoughts of suicide, suicide plans, and suicide attempts, estimates for people aged 12 or older are not included. For any mental illness (AMI) and serious mental illness (SMI), estimates for youths aged 12 to 17 and people aged 12 or older are not included because youths are not asked these questions.

was extremely rare in the 2021-2022 NSDUHs. As a result, estimates of past year heroin use for people aged 12 or older are also not produced.

Estimates of underage (aged 12 to 20) alcohol use, binge alcohol use, perceptions of great risk from having five or more drinks of an alcoholic beverage once or twice a week, and alcohol use disorder were also produced.<sup>8</sup> Alcohol consumption is expected to differ significantly across the 18 to 25 age group because of the legalization of alcohol at age 21. Therefore, it was decided that it would be useful to produce small area estimates for people aged 12 to 20. A short description of the methodology used to produce underage drinking estimates is provided in Section B.9.

The remainder of Section B covers four additional topics:

- Section B.10 discusses marijuana vaping and its impact on marijuana and marijuana related outcomes.
- Section B.11 discusses the criteria used to define substance use disorder (SUD).
- Section B.12 discusses the definition for the substance use treatment outcomes.
- Section B.13 discusses the production of estimates for AMI, SMI, mental health treatment, MDE, and suicidal behaviors.

In Section C, the 2022 and 2021-2022 combined survey sample sizes, response rates, and population estimates are included in [Tables C.1](#) to [C.6](#).

## **A.2 Summary of NSDUH Methodology**

NSDUH is the primary source of statistical information on the use of tobacco, alcohol, prescription pain relievers, and other substances (e.g., marijuana, cocaine) by the U.S. civilian, noninstitutionalized population aged 12 or older. The survey also includes several series of questions that focus on mental health issues. NSDUH has been ongoing since 1971 and is conducted by the federal government. The survey collects information from residents of households, residents of noninstitutional group quarters (e.g., shelters, rooming houses, dormitories), and civilians living on military bases. NSDUH excludes homeless people who do not use shelters, military personnel on active duty, and residents of institutional group quarters, such as jails and hospitals. From 1999 to 2019, the data were collected via face-to-face (in-person) interviews at a respondent's place of residence using a combination of computer-assisted personal interviewing conducted by an interviewer and audio computer-assisted self-interviewing. Because of the coronavirus disease 2019 (COVID-19) pandemic, an additional web data collection mode was introduced to the 2020 NSDUH and continued to be used in the 2021 and 2022 surveys.

The 2022 sample was selected using the coordinated sample design developed for the 2014 through 2022 NSDUHs. The coordinated sample design is state based, with an independent, multistage area probability sample within each state and the District of Columbia.

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<sup>8</sup> Binge drinking is defined as having five or more drinks (for males) or four or more drinks (for females) on the same occasion on at least 1 day in the 30 days prior to the survey.

This design designates 12 states as large sample states. These 12 states have the following target sample sizes per year: 4,560 interviews in California; 3,300 interviews in Florida, New York, and Texas; 2,400 interviews in Illinois, Michigan, Ohio, and Pennsylvania; and 1,500 interviews in Georgia, New Jersey, North Carolina, and Virginia. Making the sample sizes more proportional to the state population sizes improves the precision of national NSDUH estimates. This change also allows for a more cost-efficient sample allocation to the largest states while slightly increasing the sample sizes in smaller states to improve the precision of state estimates. (Note that the target sample size per year in the small states is 960 interviews, except for Hawaii, where the target sample size is 967 interviews.) The fielded sample sizes for each state in 2021-2022 combined are provided in [Table C.3](#).

Nationally in 2021-2022, a total of approximately 438,200 dwelling units (DUs) were screened, and approximately 141,220 individuals responded within the screened DUs (see [Table C.3](#)). The weighted screening response rate (SRR) was 23.86 percent, the weighted interview response rate (IRR) was 46.84 percent, and the overall weighted response rate (ORR) was 11.17 percent ([Table C.3](#)). The ORRs ranged from 8.45 percent in New Jersey to 17.66 percent in Vermont. Estimates reflect the probability of selection, unit nonresponse, poststratification to known census population estimates, item imputation, and other aspects of the estimation process. These procedures are described in detail in *2021-2022 National Survey on Drug Use and Health: Methodological Resource Book* (CBHSQ, 2023b).

All sampled DUs<sup>2</sup> are screened to confirm eligibility and to select zero, one, or two members to participate in the survey. The weighted SRR is defined as the weighted number of successfully screened DUs<sup>10</sup> divided by the weighted number of eligible DUs, or

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

where  $w_{DU}$  is the inverse of the unconditional probability of selection for the DU and excludes all adjustments for nonresponse and poststratification.

In successfully screened DUs, eligible DU members who were selected were asked to complete the interview. The weighted IRR for NSDUH is defined as the weighted number of respondents divided by the weighted number of selected people, 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  $i$ th person and includes DU-level nonresponse and poststratification adjustments. In an effort to maximize the IRR, all respondents were offered at least a \$30 incentive to encourage them to complete the 2022 NSDUH interview,

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<sup>2</sup> A dwelling unit (DU) in NSDUH refers to either a housing unit or a group quarter listing unit, such as a dormitory room or a shelter bed.

<sup>10</sup> A successfully screened DU is one in which all screening questionnaire items were answered by an adult resident of the DU and either zero, one, or two DU members were selected for the NSDUH interview.

similar to 2021. Some Quarter 4 respondents in 2022 were given a \$5 prepaid screening incentive and/or a \$50 interview incentive as part of an incentives experiment to test whether these changes increased the screening and interview response rates (see Section 2.1.2 in 2022 Methodological Resource Book [CBHSQ, 2023b]). To be considered a completed interview, a respondent must provide enough data to pass the usable case rule.<sup>11</sup>

The weighted ORR is defined as the product of the weighted SRR and the weighted IRR or

$$ORR = SRR \times IRR.$$

For more details on the screening and response rates, see Section 3.3.1 in *2021-2022 National Survey on Drug Use and Health: Methodological Summary and Definitions* (CBHSQ, 2023c).

### A.3 Presentation of Data

This section lists all products associated with the 2021-2022 state estimates. As mentioned earlier, the substance use treatment and mental health treatment estimates are based on data from the 2022 NSDUH only because there was no comparable data in 2021 for the treatment measures, whereas estimates for all other measures are based on the combined 2021-2022 data. Historically, starting with the 2002-2003 state report through the 2018-2019 state report, the state estimates have been produced by pooling 2 years of NSDUH data except for the 2002 state report where estimates were based only on 2002 data. The pooling of a current year's data with a previous year's data to produce state estimates was recommended by an SAE expert panel<sup>12</sup> to increase the precision of year-to-year change estimates (e.g., 2017 to 2018 vs. 2018 to 2019). The panel also noted that a single year of NSDUH data is sufficient to produce reliable state estimates.

The following products exclude age groups 12 to 17 and 12 or older for past year heroin use because in 2021-2022, heroin use among youths aged 12 to 17 was very rare. Additionally, a suppression rule was applied to the state small area estimates, and suppressed estimates are noted by an asterisk (\*) in the various tables discussed below. Information about the suppression criteria can be found in Section A.4. Except for some state estimates for did not receive substance use treatment in the past year among people aged 12 to 17 classified as needing treatment, no other state estimate was suppressed. In addition to this methodology document for the 2021-2022 state estimates, the following products are available at <https://www.samhsa.gov/data/nsduh/state-reports-NSDUH-2022>:

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<sup>11</sup> 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.

<sup>12</sup> The SAE expert panel, convened in 1999 and 2000, had six members: Dr. William Bell of the U.S. Bureau of the Census; Partha Lahiri, Professor of the Joint Program in Survey Methodology at the University of Maryland at College Park; Professor Balgobin Nandram of Worcester Polytechnic Institute; Wesley Schaible, formerly Associate Commissioner for Research and Evaluation at the Bureau of Labor Statistics; Professor J. N. K. Rao of Carleton University; and Professor Alan Zaslavsky of Harvard University.

- 2021-2022 NSDUH: Model-Based Prevalence Estimates (50 States and the District of Columbia) (Tables 1 to 37, by Age Group):** Tables of percentages and associated 95 percent Bayesian confidence intervals are included for youths aged 12 to 17, young adults aged 18 to 25, adults aged 26 or older, adults aged 18 or older, and all people aged 12 or older. Also included are tables for underage (12 to 20) alcohol use, binge alcohol use, perceptions of great risk from having five or more drinks of an alcoholic beverage once or twice a week, and alcohol use disorder. These tables are available in Excel and PDF formats. Suppressed estimates are noted by an asterisk (\*) in the tables (see Section A.4 for more information).
- 2021-2022 NSDUH National Maps of Prevalence Estimates, by State (Figures 1a to 37d):** The color of each state on these U.S. maps indicates how the state ranks relative to other states for each measure. States could fall into one of five groups according to their ranking by quintiles. Because 51 states were ranked for each measure, the middle quintile was assigned to 11 states, and the remaining quintiles were assigned 10 states each. In some cases, a “quintile” could have more or fewer states than desired because two (or more) states had the same estimate (to two decimal places). When such ties occurred at the “boundary” between two quintiles, all the states with the same estimate were conservatively assigned to the lower quintile. Those states with the highest rates for a given measure are in orange, with the exception of the perceptions of risk measures, for which the lowest perceptions of great risk are in orange. Those states with the lowest estimates are in dark blue, with the exception of the perceptions of risk measures, for which the highest perceptions of great risk are in dark blue. These maps are available in HTML and PDF formats. Note that, due to suppression of some state estimates, maps were not produced for the outcome/age group of not receiving substance use treatment among people aged 12 to 17 needing substance use treatment. For more information about the suppression criteria, see Section A.4.
- 2021-2022 NSDUH State Estimates Categorized into Five Groups, by Age Group:** This table shows the ranges of percentages for each outcome categorized into five groups (used to form the U.S. maps described above) from the lowest to highest estimate for youths aged 12 to 17, young adults aged 18 to 25, adults aged 26 or older, adults aged 18 or older, and people aged 12 or older. Also included are ranges for underage (12 to 20) alcohol use, binge alcohol use, perceptions of great risk from having five or more drinks of an alcoholic beverage once or twice a week, and alcohol use disorder. If needed, users can use the estimates given in Tables 1 to 37 in *2021-2022 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia)* (CBHSQ, 2023d) and the ranges of the map groups given in this table to reproduce their own maps using the colors of their choice. This table is available in HTML and PDF formats.
- 2021-2022 NSDUH: Model-Based Estimated Totals (in Thousands) (50 States and the District of Columbia) (Tables 1 to 37):** Tables showing estimated numbers (counts in thousands) and confidence intervals are included for youths aged 12 to 17, young adults aged 18 to 25, adults aged 26 or older, adults aged 18 or older, and people aged 12 or older. Also included are tables for underage (12 to 20) alcohol use, binge alcohol use, perceptions of great risk from having five or more

drinks of an alcoholic beverage once or twice a week, and alcohol use disorder. These tables are available in Excel and PDF formats. Suppressed estimates are noted by an asterisk (\*) in the tables (see Section A.4 for more information).

- **2021-2022 NSDUH State-Specific Tables (Tables 1A to 112B):** Tables are provided for each individual state and the District of Columbia, as well as for the total United States and the four census regions (i.e., Northeast, Midwest, South, and West). The tables (four per area) show the percentages and the numbers of individuals (counts in thousands). These tables are available in HTML and PDF formats. Suppressed estimates are noted by an asterisk (\*) in the tables (see Section A.4 for more information).
- **2021-2022 NSDUH: Other Sources of State-Level Data:** This document compares three outcomes (cigarette use, alcohol use, and binge alcohol use) from NSDUH with data from the Behavioral Risk Factor Surveillance System. This document is available in HTML and PDF formats.
- **2021-2022 NSDUH: Comparison of Population Percentages between the United States, Census Regions, States, and the District of Columbia:** The  $p$  values contained in these tables for each outcome and age group can be used to test the null hypothesis of no difference between population percentages for the following types of comparisons: total United States versus census region, total United States versus state, census region versus census region, census region versus state, and state versus state. These tables are available in Excel format, and the methodology used to compute these  $p$  values is provided in a document published with these Excel tables. This methodology document is available in HTML and PDF formats. Note, if either estimate in the comparison is suppressed, the  $p$  value is not produced.

## A.4 Suppression Criteria for State Estimates

Beginning in 2021, suppression is applied to unreliable state estimates. The estimates meeting the suppression criteria discussed here are designated as unreliable and are not shown in tables and are noted by asterisks (\*). The suppression criterion is based on a combination of the relative standard error (RSE) of  $[-\ln(p)]$  or  $[-\ln(1-p)]$  and the effective sample size (EFN), where  $p$  denotes the unbenchmarked small area estimate and  $\ln(p)$  denotes the natural logarithm of  $p$ . For  $p \leq 50$  percent, an RSE of  $[-\ln(p)]$  is used, and for  $p > 50$  percent, an RSE of  $[-\ln(1-p)]$  is used. The separate formulas for  $p \leq 50$  percent and  $p > 50$  percent produce a symmetric suppression rule; that is, if  $p$  is suppressed, then so will  $(1-p)$ . By using the first-order Taylor series approximation method, an estimate of an RSE of  $[-\ln(p)]$  and an RSE of  $[-\ln(1-p)]$  is given by

$$\text{RSE of } [-\ln(p)] = \frac{\sqrt{\text{var}(p)}}{p[-\ln(p)]} \text{ and}$$

$$\text{RSE of } [-\ln(1-p)] = \frac{\sqrt{\text{var}(1-p)}}{(1-p)[- \ln(1-p)]},$$



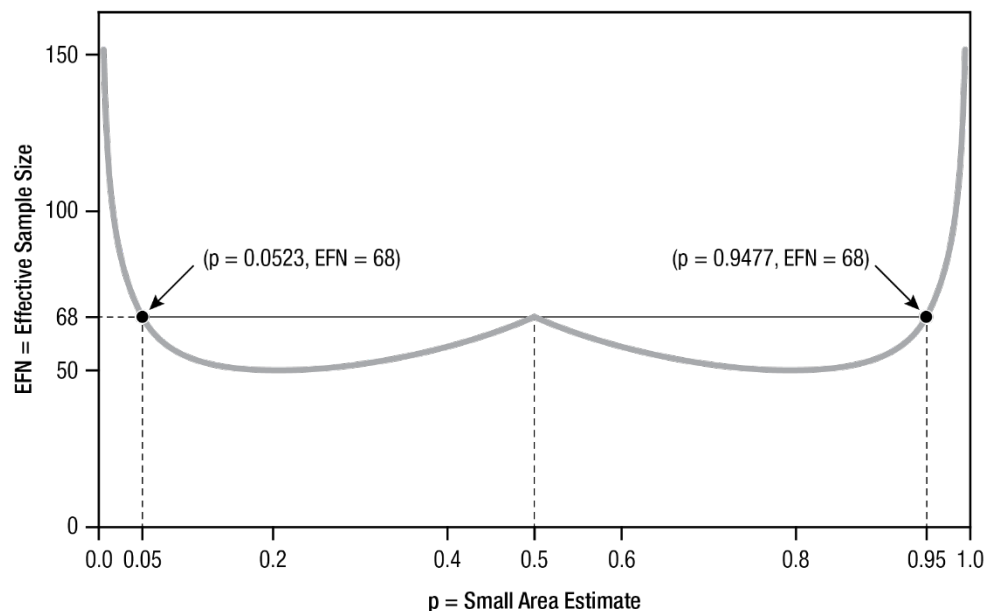
where  $\text{var}(p)$  denotes the posterior variance of  $p$ . The EFN is defined as  $\text{EFN} = \frac{n}{\text{design effect}}$ , where  $n$  denotes the raw sample size and design effect is defined as  $\text{design effect} = \frac{\text{var}(p)}{[p(1-p)/n]}$ ; hence,  $\text{EFN} = \frac{p(1-p)}{\text{var}(p)}$ . A lower bound of 0.2 also was imposed on the design effects (i.e., all design effects that were less than 0.2 were changed to 0.2) to avoid publishing state-by-age group estimates with very small sample sizes or small prevalence estimates.

The following criterion was used to suppress state small area estimates:

- when  $p < 5.23$  percent, then suppress if an RSE of  $[-\ln(p)] > 17.5$  percent;
- when  $5.23 \text{ percent} \leq p \leq 94.77 \text{ percent}$ , then suppress if the  $\text{EFN} \leq 68$ ; and
- when  $p > 94.77$  percent, then suppress if an RSE of  $[-\ln(1-p)] > 17.5$  percent.

The graph shown in [Figure 1](#) describes the relationship between  $p$  and the EFN for an RSE of  $[-\ln(p)] = 17.5$  percent when  $p \leq 50$  percent and for an RSE of  $[-\ln(1-p)] = 17.5$  percent when  $p > 50$  percent. The suppression criterion switches to EFN between 5.23 percent and 94.77 percent so that the EFN is not allowed to fall below the EFN of 68 required at  $p = 50$  percent.

**Figure 1. Small Area Estimate versus Effective Sample Size when the Relative Standard Error Equals 17.5 Percent**



## A.5 Confidence Intervals and Margins of Error

At the top of each of the 37 tables showing state-level model-based estimates<sup>13</sup> is the design-based national estimate along with a 95 percent design-based confidence interval, all of which are based on the survey design, the survey weights, and the reported data. The state estimates are model-based statistics (using SAE methodology) that have been adjusted (benchmarked) such that the population-weighted mean of the estimates across the 50 states and the District of Columbia equals the design-based national estimate. For more details on this benchmarking, see Section B.5. The census region-level estimates are also benchmarked and are obtained by taking the population-weighted mean of the associated state-level benchmarked estimates. Associated with each state and regional estimate is a 95 percent Bayesian confidence interval. These intervals indicate the uncertainty in the estimate due to both sampling variability and model fit. For example, the state with the highest estimate of past month use of marijuana for young adults aged 18 to 25 in 2021-2022 was Vermont, with an estimate of 38.8 percent and a 95 percent Bayesian confidence interval that ranged from 33.2 to 44.7 percent (see Table 3 of the 2021-2022 Model-Based Prevalence Estimates report [CBHSQ, 2023d]). Assuming that sampling and modeling conditions held, the Bayes posterior probability was 0.95 that the true percentage of past month marijuana use in Vermont for young adults aged 18 to 25 in 2021-2022 was between 33.2 and 44.7 percent. As noted earlier in footnote 6, the term “prediction interval” (PI) was used in the 2004-2005 NSDUH state report (Wright et al., 2007) and prior reports to represent uncertainty in the state and regional estimates. However, that term also is used in other applications to estimate future values of a parameter of interest. That interpretation does not apply to NSDUH state model-based estimates, so PI was replaced with “Bayesian confidence interval.”

“Margin of error” is another term used to describe uncertainty in the estimates. For example, if  $(l, u)$  is a 95 percent symmetric confidence interval for the population proportion ( $p$ ) and  $\hat{p}$  is an estimate of  $p$  obtained from the survey data, then the margin of error of  $\hat{p}$  is given by  $(u - \hat{p})$  or  $(\hat{p} - l)$ . When  $(l, u)$  is a symmetric confidence interval,  $(u - \hat{p})$  will be the same as  $(\hat{p} - l)$ . The margin of error will vary for each estimate and will be affected not only by the sample size (e.g., the larger the sample, the smaller the margin of error) but also by the sample design (e.g., telephone surveys using random digit dialing and surveys employing a stratified multistage cluster design will, more than likely, produce a different margin of error) (Scheuren, 2004).

The confidence intervals shown in NSDUH state reports are asymmetric, meaning that the distance between the estimate and the lower confidence limit will not be the same as the distance between the upper confidence limit and the estimate. For example, Utah’s 2021-2022 past month marijuana use estimate is 17.1 percent for young adults aged 18 to 25, with a 95 percent Bayesian confidence interval equal to 13.7 to 21.0 percent (see Table 3 of the 2021-2022 Model-Based Prevalence Estimates report [CBHSQ, 2023d]). Therefore, Utah’s estimate is 3.4 (i.e.,  $17.1 - 13.7$ ) percentage points from the lower 95 percent confidence limit and 3.9 (i.e.,  $21.0 - 17.1$ ) percentage points from the upper limit. These asymmetric confidence intervals work well for small percentages often found in NSDUH state estimate tables and reports while still

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<sup>13</sup> See Tables 1 to 37 in 2021-2022 Model-Based Prevalence Estimates (CBHSQ, 2023d).

being appropriate for larger percentages. Some surveys or polls provide only one margin of error for all reported percentages. This single number is usually calculated by setting the sample percentage estimate ( $\hat{p}$ ) equal to 50 percent, which will produce an upper bound or maximum margin of error. Such an approach would not be feasible in this situation because the NSDUH state estimates vary from less than 1 percent to more than 75 percent; hence, applying a single margin of error to these estimates could significantly overstate or understate the actual precision levels. Therefore, given the differences mentioned above, it is more useful and informative to report the confidence interval for each estimate instead of a margin of error.

When it is indicated that a state has the highest or lowest estimate, it does not imply that the state's estimate is significantly higher or lower than the next highest or lowest state's estimate. Additionally, two significantly different state estimates (at the 5 percent level of significance) may have overlapping 95 percent confidence intervals. For details on a more accurate test to compare state estimates, see *2021-2022 National Survey on Drug Use and Health: Comparison of Population Percentages from the United States, Census Regions, States, and the District of Columbia* (CBHSQ, forthcoming a).

## **A.6 Related Measures**

State estimates are produced for a number of related measures, such as marijuana use in the past month and illicit drug use in the past month, or SMI and AMI. It might appear that one could draw conclusions by subtracting one from the other (e.g., subtracting the percentage who misused pain relievers in the past year from the percentage who misused opioids [misuse of pain relievers or use of heroin] in the past year to find the percentage who used only heroin in the past year but did not misuse pain relievers). Because related measures have been estimated separately with different models, subtracting the percentage of one measure from the percentage of another related measure at the state or census region level can give misleading results, perhaps even a “negative” estimate, and should be avoided. Users are advised to view the estimates along with their respective confidence intervals to get a better idea of the range in which the “true” value of the prevalence rate might fall (see Section A.5 for more details).

However, at the national level, because these estimates are design-based estimates, such comparisons can be made. For example, at the national level, subtracting estimates for cigarette use in the past month from the estimates of tobacco use in the past month will give the estimate of people who did not use cigarettes in the past month but used other forms of tobacco, such as cigars, pipes, or smokeless tobacco, in the past month.

## **A.7 2021 and 2022 NSDUH Methodological Changes and Implication for Estimates**

Similar to the 2020 NSDUH, the COVID-19 pandemic affected data collection for the 2021 and 2022 NSDUHs. The 2021 and 2022 NSDUHs continued the use of multimode data collection procedures that were first implemented in October 2020 for the 2020 NSDUH. Multimode data collection was used for the entire 2021 and 2022 NSDUH samples; however, the proportion of in-person interviews gradually increased from the beginning to the end of 2021. In 2022, more than half of the interviews in Quarter 1 were completed via the web, but for the remaining quarters in 2022, the majority of interviews were completed in person. The multimode

nature of the 2021 and 2022 NSDUHs, however, marks an important methodological change from prior years. This section discusses special methodological issues specific to 2021 and 2022 NSDUHs. More detailed information can be found in Chapter 6 of *2021 National Survey on Drug Use and Health: Methodological Summary and Definitions* (CBHSQ, 2022b).

### **A.7.1 Special Adjustment for the 2021 and 2022 NSDUH Weights**

As discussed earlier in this section, the proportions of interviews that were completed in person or via the web can vary by quarter. These quarterly variations can affect the overall annual proportions of interviews completed in each mode. Throughout 2021, local differences in COVID-19 infection rates affected the availability of in-person data collection. However, in-person data collection for the 2022 NSDUH was permitted in all areas starting in February 2022.

In 2021, 76.6 percent of interviews were completed via the web in Quarter 1 (January through March), but this proportion had decreased to 41.1 percent by Quarter 4 (October through December). Overall for 2021, 54.6 percent of interviews were completed via the web, and 45.4 percent were completed in person.

In 2022, more than half of the interviews in Quarter 1 (52.1 percent) were completed via the web; positive test results for COVID-19 peaked in early January 2022 for the Omicron variant (Centers for Disease Control and Prevention, n.d.). For the remaining quarters in 2022, the majority of interviews were completed in person. The percentages of interviews that were completed via the web were 37.3 percent in Quarter 2 (April to June), 43.7 percent in Quarter 3 (July to September), and 38.6 percent in Quarter 4 (October to December). Overall, 42.4 percent of interviews were completed via the web, and 57.6 percent were completed in person. Analyses conducted for the 2021 NSDUH indicated that key substance use and mental health estimates differed between data collection modes (i.e., web or in person), also known as “mode effects.” See Chapter 6 in the 2021 Methodological Summary and Definitions report (CBHSQ, 2022b).

Once the interviews that are completed via the web or in person stabilize to consistent proportions, any mode effect will also be consistent and will minimally affect changes in estimates over time. However, as the differences by quarter show, the proportions of interviews completed via the web or in person had not stabilized in 2021 and 2022. Consequently, mode effects could distort differences in estimates between 2021 and 2022, unless the analysis weights are adjusted to take into account these different proportions.

The expected proportions when multimode data collection stabilizes are 30 percent of interviews completed via the web and 70 percent completed in person. Therefore, for the 2022 NSDUH weights, mode was included as a main effect in the person-level poststratification adjustment, with a 30 percent target for the web mode and a 70 percent target for the in-person mode to standardize the weighted proportions for each mode. This adjustment was added for the 2022 weighting procedures to facilitate comparisons of estimates over time.

Without this adjustment, the weighted proportions of interviews for 2022 would have been 31.8 percent for the web interviews and 68.2 for in-person interviews. These unadjusted proportions suggest that it would be reasonable to assume that proportions of 30 percent of interviews being completed via the web and 70 percent being completed in person would result

when multimode data collection stabilizes following the end of the COVID-19 public health emergency. Nevertheless, the weights for 2022 still required some adjustment to achieve these targeted proportions for facilitating comparison of estimates between 2022 and future years.

This mode adjustment also was applied to the weights for 2021 to produce revised weights. For 2021, the weighted proportions were 39.2 percent for web interviews and 60.8 percent for in-person interviews. Making a similar adjustment to the 2021 weights to assume the respective 30/70 proportions for web and in-person interviews allows estimates for 2021 to be combined or compared with those in 2022 and future survey years without differences in estimates being confounded by changes in proportions of interviews in each mode. These adjusted 2021 analysis weights were used to produce the 2021-2022 small area estimates.

### **A.7.2 Comparisons with Prior Years**

The 2021 and 2022 NSDUHs used multimode data collection, in which respondents completed the survey in person or via the web. Methodological investigations led to the conclusion that estimates based on multimode data collection since 2021 are not comparable with estimates from 2020 or prior years. Chapter 6 in the *2021 National Survey on Drug Use and Health (NSDUH): Methodological Resource Book* (CBHSQ, 2022a) discusses these methodological investigations in greater detail. Thus, the 2021-2022 small area estimates should not be compared to state estimates from prior years.

# Section B: State Model-Based Estimation Methodology

## B.1 General Model Description

The state small area estimation (SAE) model is a complex mixed<sup>14</sup> (including both fixed and random effects) logistic regression model of the following form:

$$\log[\pi_{aijk} / (1 - \pi_{aijk})] = x'_{aijk} \beta_a + \eta_{ai} + v_{aij},$$

where  $\pi_{aijk}$  is the probability of engaging in the behavior of interest (e.g., using marijuana in the past month) for person- $k$  belonging to age group- $a$  in grouped state sampling region (SSR)- $j$  of state- $i$ .<sup>15</sup> Let  $x_{aijk}$  denote a  $p_a \times 1$  vector of predictor variables (independent variables or fixed effects) associated with age group- $a$  (12 to 17, 18 to 25, 26 to 34, and 35 or older) and  $\beta_a$  denote the associated vector of the regression parameters. The age group-specific vectors of the auxiliary variables are defined for every block group in the nation and include person-level demographic variables, such as race/ethnicity and gender. The vectors of state-level random effects  $\eta_i = (\eta_{1i}, \dots, \eta_{Ai})'$  and grouped SSR-level random effects  $v_{ij} = (v_{1ij}, \dots, v_{Aij})'$  are assumed to be mutually independent with  $\eta_i \sim N_A(0, D_\eta)$  and  $v_{ij} \sim N_A(0, D_\nu)$ , where  $A$  is the total number of individual age groups modeled (generally,  $A = 4$ ). For hierarchical Bayes (HB) estimation purposes, an improper uniform prior distribution is assumed for  $\beta_a$ , and proper Wishart prior distributions are assumed for  $D_\eta^{-1}$  and  $D_\nu^{-1}$ . The HB solution for  $\pi_{aijk}$  involves a series of complex Markov Chain Monte Carlo (MCMC) steps to generate values of the desired fixed and random effects from the underlying joint posterior distribution. The basic

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<sup>14</sup> The use of mixed models (fixed and random effects) allows additional error components (random effects) to be included. These account for differences between states and within-state variations that are not taken into account by the predictor variables (fixed effects) alone. It is also difficult (if not impossible) to produce valid mean squared errors (MSEs) for small area estimates based solely on a fixed-effect national regression model (i.e., synthetic estimation) (Rao, 2003, p. 52). The mixed models produce estimates that are approximately represented by a weighted combination of the direct estimate from the state data and a regression estimate from the national model. The regression coefficients of the national model are estimated using data from all of the states (i.e., borrowing strength), and the regression estimate for a particular state is obtained by applying the national model to the state-specific predictor data. The regression estimate for the state is then combined with the direct estimate from the state data in a weighted combination where the weights are obtained by minimizing the MSE (variance + squared bias) of the small area estimate.

<sup>15</sup> To increase the precision of the estimated random effects at the within-state level, three SSRs from the 2021 and 2022 samples were grouped together to form 250 grouped SSRs. California had 12 grouped SSRs; Florida, New York, and Texas each had 10 grouped SSRs; Illinois, Michigan, Ohio, and Pennsylvania each had 8 grouped SSRs; Georgia, New Jersey, North Carolina, and Virginia each had 5 grouped SSRs; and the rest of the states and the District of Columbia each had 4 grouped SSRs.

process is described in Folsom and colleagues (1999), Shah and colleagues (2000), and Wright (2003a, 2003b).

Once the required number of MCMC samples (1,250 in all) for the parameters of interest are generated and tested for convergence properties (see Raftery & Lewis, 1992), the small area estimates for each race/ethnicity  $\times$  gender cell within a block group can be obtained for each age group. These block group–level small area estimates then can be aggregated using the appropriate population count projections for the desired age group(s) to form state-level small area estimates. These state-level small area estimates are benchmarked to the national design-based estimates as described in Section B.5.

## **B.2 Measures (Outcomes) Modeled**

The following list contains all binary (0,1) measures for which age group–specific state estimates were produced. For measures 26 to 28 and 31 listed as follows, only data from the 2022 National Survey on Drug Use and Health (NSDUH) data were used, and for all other measures, 2021-2022 combined NSDUH data were used to produce estimates.

1. illicit drug use in the past month,
2. marijuana use in the past year,
3. marijuana use in the past month,
4. perceptions of great risk from smoking marijuana once a month,
5. first use of marijuana in the past year among people at risk for initiation of marijuana use,<sup>16</sup>
6. illicit drug use other than marijuana in the past month,
7. cocaine use in the past year,
8. perceptions of great risk from using cocaine once a month,
9. heroin use in the past year,
10. perceptions of great risk from trying heroin once or twice,
11. hallucinogen use in the past year,
12. methamphetamine use in the past year,
13. prescription pain reliever misuse in the past year,
14. opioid misuse in the past year,
15. alcohol use in the past month,<sup>17</sup>
16. binge alcohol use in the past month,<sup>18</sup>

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<sup>16</sup> For details on how this outcome is calculated, see Section B.8 of this document.

<sup>17</sup> Estimates of underage (aged 12 to 20) alcohol use were also produced.

<sup>18</sup> Estimates of underage (aged 12 to 20) binge alcohol use were also produced.

17. perceptions of great risk from having five or more drinks of an alcoholic beverage once or twice a week,<sup>19</sup>
18. tobacco product use in the past month,
19. cigarette use in the past month,
20. perceptions of great risk from smoking one or more packs of cigarettes per day,
21. substance use disorder (SUD) in the past year,
22. alcohol use disorder in the past year,<sup>20</sup>
23. drug use disorder in the past year,
24. pain reliever use disorder in the past year,
25. opioid use disorder in the past year,
26. received substance use treatment in the past year,
27. classified as needing substance use treatment in the past year,
28. did not receive substance use treatment in the past year among people classified as needing treatment,
29. any mental illness (AMI) in the past year,
30. serious mental illness (SMI) in the past year,
31. received mental health treatment in the past year,
32. major depressive episode (MDE) in the past year,
33. had serious thoughts of suicide in the past year,
34. made any suicide plans in the past year, and
35. attempted suicide in the past year.

### B.3 Predictors Used in Mixed Logistic Regression Models

Local area data used as potential predictor variables in the mixed logistic regression models were obtained from the following sources:

- *Claritas*. Claritas<sup>21</sup> population projections are used to update age group, gender, and race/ethnicity predictor variables each year.
- *U.S. Census Bureau*. The 2010 census (demographic and geographic variables) and 2020 food stamp participation estimates were used (<https://www.census.gov/data/datasets/time-series/demo/saipe/model-tables.html>). The Census Bureau's Small Area Income and Poverty Estimates program obtains Food Stamp program (now known as the Supplemental Nutrition Assistance Program) participation estimates

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<sup>19</sup> Estimates of underage (aged 12 to 20) perceptions of great risk from having five or more drinks of an alcoholic beverage once or twice a week were also produced.

<sup>20</sup> Estimates of underage (aged 12 to 20) alcohol use disorder in the past year were also produced.

<sup>21</sup> Claritas is a market research firm headquartered in Cincinnati, Ohio (see <https://claritas.com/>).



from the U.S. Department of Agriculture, Food and Nutrition Service. Also, the Census Bureau's 2015-2019 American Community Survey 5-year demographic and socioeconomic variables at the tract level and poverty variable at the county level were used (<https://www.census.gov/programs-surveys/acs/>).

- *Federal Bureau of Investigation*. Uniform Crime Report arrest totals were obtained from <https://www.icpsr.umich.edu/icpsrweb/NACJD/series/57>. The most current data used are from 2016 for most counties, with prior years' data substituted in a few cases.
- *Bureau of Labor Statistics (BLS)*. The 2022 county-level unemployment estimates were used (<https://www.bls.gov/lau/tables.htm>). The BLS uses results from the Current Population Survey (CPS) to provide county-level unemployment estimates. The CPS is a monthly survey of households conducted by the Census Bureau for the BLS.
- *Bureau of Economic Analysis (BEA)*. The 2021 county-level, per capita income estimates were used (<https://www.bea.gov/data/income-saving/personal-income-county-metro-and-other-areas>). These county-level, per capita income estimates are produced by the Regional Income Division of the BEA.
- *National Center for Health Statistics (NCHS)*. Mortality data using International Classification of Diseases, 10th revision (ICD-10), 2013-2018, were used. The ICD-10 death data are from the NCHS at the Centers for Disease Control and Prevention.
- *Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality (CBHSQ; formerly the Office of Applied Studies [OAS])*. Data were used from the National Survey of Substance Abuse Treatment Services (N-SSATS). The 2019 and 2021 data on drug and alcohol treatment were obtained. Most recent data available on maintenance of effort expenditures, block grant awards, cost of services, and total taxable resources data were also used.

Data sources, along with the description of potential predictor variables obtained from each source, are provided in the following lists.

| <b>Claritas Data (Description)</b>           | <b>Claritas Data (Level)</b> |
|--|------------------------------|
| % Population Aged 0 to 19 in Block Group     | Block Group                  |
| % Population Aged 20 to 24 in Block Group    | Block Group                  |
| % Population Aged 25 to 34 in Block Group    | Block Group                  |
| % Population Aged 35 to 44 in Block Group    | Block Group                  |
| % Population Aged 45 to 54 in Block Group    | Block Group                  |
| % Population Aged 55 to 64 in Block Group    | Block Group                  |
| % Population Aged 65 or Older in Block Group | Block Group                  |
| % Non-Hispanic Blacks in Block Group         | Block Group                  |
| % Hispanics in Block Group                   | Block Group                  |
| % Non-Hispanic Other Races in Block Group    | Block Group                  |
| % Non-Hispanic Whites in Block Group         | Block Group                  |
| % Males in Block Group                       | Block Group                  |
| % American Indians, Eskimos, Aleuts in Tract | Tract                        |
| % Asians, Pacific Islanders in Tract         | Tract                        |
| % Population Aged 0 to 19 in Tract           | Tract                        |
| % Population Aged 20 to 24 in Tract          | Tract                        |
| % Population Aged 25 to 34 in Tract          | Tract                        |
| % Population Aged 35 to 44 in Tract          | Tract                        |
| % Population Aged 45 to 54 in Tract          | Tract                        |
| % Population Aged 55 to 64 in Tract          | Tract                        |
| % Population Aged 65 or Older in Tract       | Tract                        |
| % Non-Hispanic Blacks in Tract               | Tract                        |
| % Hispanics in Tract                         | Tract                        |
| % Non-Hispanic Other Races in Tract          | Tract                        |
| % Non-Hispanic Whites in Tract               | Tract                        |
| % Males in Tract                             | Tract                        |
| % Population Aged 0 to 19 in County          | County                       |
| % Population Aged 20 to 24 in County         | County                       |
| % Population Aged 25 to 34 in County         | County                       |
| % Population Aged 35 to 44 in County         | County                       |
| % Population Aged 45 to 54 in County         | County                       |
| % Population Aged 55 to 64 in County         | County                       |
| % Population Aged 65 or Older in County      | County                       |
| % Non-Hispanic Blacks in County              | County                       |
| % Hispanics in County                        | County                       |
| % Non-Hispanic Other Races in County         | County                       |
| % Non-Hispanic Whites in County              | County                       |
| % Males in County                            | County                       |

| <b>American Community Survey (ACS) (Description)</b> | <b>ACS Data (Level)</b> |
|--|-------------------------|
| % Population Who Dropped Out of High School          | Tract                   |
| % Housing Units Built in 1940 to 1949                | Tract                   |
| % Females 16 Years or Older in Labor Force           | Tract                   |
| % Females Never Married                              | Tract                   |
| % Females Separated, Divorced, Widowed, or Other     | Tract                   |
| % One-Person Households                              | Tract                   |

| <b><i>American Community Survey (ACS) (Description)</i></b>       | <b><i>ACS Data (Level)</i></b> |
|---|--------------------------------|
| % Males 16 Years or Older in Labor Force                          | Tract                          |
| % Males Never Married   | Tract                          |
| % Males Separated, Divorced, Widowed, or Other                    | Tract                          |
| % Housing Units Built in 1939 or Earlier                          | Tract                          |
| Average Number of Persons per Room                                | Tract                          |
| % Families below Poverty Level                                    | Tract                          |
| % Households with Public Assistance Income                        | Tract                          |
| % Housing Units Rented  | Tract                          |
| % Population with 9 to 12 Years of School, No High School Diploma | Tract                          |
| % Population with 0 to 8 Years of School                          | Tract                          |
| % Population with Associate's Degree                              | Tract                          |
| % Population with Some College and No Degree                      | Tract                          |
| % Population with Bachelor's, Graduate, Professional Degree       | Tract                          |
| % Housing Units with No Telephone Service Available               | Tract                          |
| % Households with No Vehicle Available                            | Tract                          |
| % Population with No Health Insurance                             | Tract                          |
| Median Rents for Rental Units                                     | Tract                          |
| Median Value of Owner-Occupied Housing Units                      | Tract                          |
| Median Household Income   | Tract                          |
| % Families below the Poverty Level                                | County                         |

| <b><i>Uniform Crime Report (UCR) Data (Description)</i></b> | <b><i>UCR Data (Level)</i></b> |
|---|--------------------------------|
| Drug Possession Arrest Rate                                 | County                         |
| Drug Sale or Manufacture Arrest Rate                        | County                         |
| Drug Violations' Arrest Rate                                | County                         |
| Marijuana Possession Arrest Rate                            | County                         |
| Marijuana Sale or Manufacture Arrest Rate                   | County                         |
| Opium or Cocaine Possession Arrest Rate                     | County                         |
| Opium or Cocaine Sale or Manufacture Arrest Rate            | County                         |
| Other Drug Possession Arrest Rate                           | County                         |
| Other Dangerous Non-Narcotics Arrest Rate                   | County                         |
| Serious Crime Arrest Rate                                   | County                         |
| Violent Crime Arrest Rate                                   | County                         |
| Driving under Influence Arrest Rate                         | County                         |

| <b><i>Other Categorical Data (Description)</i></b>                              | <b><i>Other Categorical Data (Source)</i></b>         | <b><i>Other Categorical Data (Level)</i></b> |
|---|---|--|
| = 1 if Hispanic, = 0 Otherwise  | National Survey on Drug Use and Health (NSDUH) Sample | Person                                       |
| = 1 if Non-Hispanic Black, = 0 Otherwise  | NSDUH Sample  | Person                                       |
| = 1 if Non-Hispanic Other, = 0 Otherwise  | NSDUH Sample  | Person                                       |
| = 1 if Male, = 0 if Female  | NSDUH Sample  | Person                                       |
| = 1 if Metropolitan Statistical Area (MSA) with $\geq 1$ Million, = 0 Otherwise | 2010 Census   | County                                       |
| = 1 if MSA with $< 1$ Million, = 0 Otherwise                                    | 2010 Census   | County                                       |
| = 1 if Non-MSA Urban, = 0 Otherwise   | 2010 Census   | Tract  |

| <b><i>Other Categorical Data (Description)</i></b>                   | <b><i>Other Categorical Data (Source)</i></b> | <b><i>Other Categorical Data (Level)</i></b> |
|--|---|--|
| = 1 if Urban Area, = 0 if Rural Area                                 | 2010 Census                                   | Tract  |
| = 1 if No Cubans in Tract, = 0 Otherwise                             | 2010 Census                                   | Tract  |
| = 1 if No Arrests for Dangerous Non-Narcotics,<br>= 0 Otherwise      | Uniform Crime Report (UCR)                    | County                                       |
| = 1 if No Arrests for Opium or Cocaine Possession,<br>= 0 Otherwise  | UCR   | County                                       |
| = 1 if No Housing Units Built in 1939 or Earlier,<br>= 0 Otherwise   | American Community Survey<br>(ACS)            | Tract  |
| = 1 if No Housing Units Built in 1940 to 1949,<br>= 0 Otherwise      | ACS   | Tract  |
| = 1 if No Households with Public Assistance<br>Income, = 0 Otherwise | ACS   | Tract  |

| <b><i>Miscellaneous Data (Description)</i></b> | <b><i>Miscellaneous Data (Source)</i></b>   | <b><i>Miscellaneous Data (Level)</i></b> |
|--|---|--|
| Alcohol Death Rate, Underlying Cause           | National Center for Health Statistics' International<br>Classification of Diseases, 10th revision (NCHS-<br>ICD-10) | County                                   |
| Cigarette Death Rate, Underlying Cause         | NCHS-ICD-10   | County                                   |
| Drug Death Rate, Underlying Cause              | NCHS-ICD-10   | County                                   |
| Alcohol Treatment Rate                         | National Survey of Substance Abuse Treatment<br>Services (N-SSATS)  | County                                   |
| Alcohol and Drug Treatment Rate                | N-SSATS   | County                                   |
| Drug Treatment Rate                            | N-SSATS   | County                                   |
| Unemployment Rate                              | Bureau of Labor Statistics (BLS)  | County                                   |
| Per Capita Income (in Thousands)               | Bureau of Economic Analysis (BEA)   | County                                   |
| Average Suicide Rate (per 10,000)              | NCHS-ICD-10   | County                                   |
| Food Stamp Participation Rate                  | Census Bureau   | County                                   |
| Single State Agency Maintenance of<br>Effort   | National Association of State Alcohol and Drug<br>Abuse Directors (NASADAD)   | State                                    |
| Block Grant Awards                             | Substance Abuse and Mental Health Services<br>Administration (SAMHSA)   | State                                    |
| Cost of Services Factor Index                  | SAMHSA  | State                                    |
| Total Taxable Resources per Capita<br>Index    | U.S. Department of Treasury   | State                                    |
| % Hispanics Who Are Cuban                      | 2010 Census   | Tract                                    |

The predictor variables used in the SAE models were selected from the set of potential predictors given above using the method described in Section B.4.

## B.4 Selection of Predictor Variables for the SAE Models

Predictor variable selection was done using the 2021-2022 data for all measures (except the substance use treatment and mental health treatment measures, which used only 2022 data), using the following multistep process:<sup>22</sup>

1. For each measure, age group-specific<sup>23</sup> SAS<sup>®</sup> stepwise logistic regression models were fit using the sample data (SAS Institute Inc., 2017). The input list to these models included all linear polynomials (constructed from continuous predictor variables) and other categorical or indicator variables given in Section B.3. All significant predictors were input to step 2, given as follows.
2. Using the sample, all significant predictors from step 1 then were input to PROC HPSPLIT to identify significant complex (at most three-way) interaction terms. PROC HPSPLIT is a SAS procedure that uses decision-tree algorithms to build classification systems. The exhaustive chi-squared automatic interaction detector algorithm was used to create the trees.
3. All the significant variables from step 1, along with their corresponding higher-order polynomials (quadratic and cubic), interaction of gender and race, and the significant interactions detected by PROC HPSPLIT in step 2 then were input to SAS stepwise logistic regression models. All predictors that remained significant then were input to step 4 of variable selection.
4. All significant variables from step 3 were input to fit SUDAAN (RTI International, 2013) logistic regression models, and predictors that remained significant were used in the SAE models described in Section B.1. The race and gender predictors were forced in most of the models.

## B.5 Benchmarking the Age Group–Specific Small Area Estimates

The self-calibration built into the survey-weighted hierarchical Bayes (SWHB) solution ensures the population-weighted average of the state small area estimates will closely match the national design-based estimates. The national design-based estimates in NSDUH are based entirely on survey-weighted data using a direct estimation approach, whereas the state and census region estimates are model based. Given the self-calibration ensured by the SWHB method, for state reports prior to 2002, the standard Bayes prescription was followed; specifically, the posterior mean was used for the point estimate, and the tail percentiles of the posterior distribution were used for the Bayesian confidence interval limits.

Singh and Folsom (2001) extended Ghosh's (1992) results on constrained Bayes estimation to include exact benchmarking to design-based national estimates. In the simplest

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<sup>22</sup> To build parsimonious models, the pooled 2021-2022 data were partitioned into modeling and validation samples. For more information on how the data was partitioned, see the 2002-2003 state SAE report (Wright & Sathe, 2005). Steps 1 to 3 were conducted on the modeling sample, whereas step 4 used the validation sample. Steps 1 to 4 were conducted on 2022 data for predictor variable selection for the substance use treatment and mental health treatment measures. Depending on the step, measure, and age group, significance levels were 1, 3, 5, or 10 percent.

<sup>23</sup> Generally, age groups are 12 to 17, 18 to 25, 26 to 34, and 35 or older. For underage alcohol related outcomes, the age group is 12 to 20.

version of this constrained Bayes solution where only the design-based mean is imposed as a benchmarking constraint, each of the 2021-2022 state-by-age group small area estimates is adjusted by adding the common factor  $\Delta_a = (D_a - P_a)$ , where  $D_a$  is the design-based national estimate and  $P_a$  is the population-weighted mean of the state small area estimates ( $P_{sa}$ ) for age group- $a$ . The exactly benchmarked state- $s$  and age group- $a$  small area estimates then are given by  $\theta_{sa} = P_{sa} + \Delta_a$ . Experience with such additive adjustments suggests that the resulting exactly benchmarked state small area estimates will always be between 0 and 100 percent because the SWHB self-calibration ensures the adjustment factor is small relative to the size of the state-level small area estimates.

Relative to the Bayes posterior mean, these benchmark-constrained state small area estimates are biased by the common additive adjustment factor. Therefore, the posterior mean squared error for each benchmarked state small area estimate has the square of this adjustment factor added to its posterior variance. To achieve the desirable feature of exact benchmarking, this constrained Bayes adjustment factor was implemented for the state-by-age group small area estimates. The associated Bayesian confidence (credible) intervals can be recentered at the benchmarked small area estimates on the logit scale with the symmetric interval end points based on the posterior root mean squared errors. The adjusted 95 percent Bayesian confidence intervals ( $Lower_{sa}, Upper_{sa}$ ) are defined as follows:

$$Lower_{sa} = \exp(L_{sa}) / [1 + \exp(L_{sa})] \text{ and } Upper_{sa} = \exp(U_{sa}) / [1 + \exp(U_{sa})],$$

where

$$L_{sa} = \ln[\theta_{sa} / (1 - \theta_{sa})] - 1.96 * \sqrt{MSE_{sa}},$$

$$U_{sa} = \ln[\theta_{sa} / (1 - \theta_{sa})] + 1.96 * \sqrt{MSE_{sa}}, \text{ and}$$

$$MSE_{sa} = (\ln[P_{sa} / (1 - P_{sa})] - \ln[\theta_{sa} / (1 - \theta_{sa})])^2 + \text{posterior variance of } \ln[P_{sa} / (1 - P_{sa})].$$

The associated posterior coverage probabilities for these benchmarked intervals are very close to the prescribed 0.95 value because the state small area estimates have posterior distributions that can be approximated exceptionally well by a Gaussian distribution after the logit transformation.

## **B.6 Calculation of Estimated Number of Individuals Associated with Each Outcome**

Tables 1 to 37 of *2021-2022 National Survey on Drug Use and Health: Model-Based Estimated Totals (in Thousands) (50 States and the District of Columbia)* (CBHSQ, forthcoming b) show the estimated numbers of individuals associated with each of the 35 measures of interest. To calculate these numbers, the benchmarked small area estimates and associated 95 percent Bayesian confidence intervals are multiplied by the average population across the 2 years (in this case, 2021 and 2022) of the state by the age group of interest ([Tables C.1](#) to [C.6](#) in Section C of

this methodology document). For estimates based only on 2022 data, the corresponding 2022 population counts can be used.

For example, past month use of alcohol among 18- to 25-year-olds in Alabama was 40.59 percent in 2021-2022.<sup>24</sup> The corresponding Bayesian confidence intervals ranged from 35.90 to 45.46 percent. The population count for 18- to 25-year-olds averaged across 2021 and 2022 in Alabama was 526,289 (see [Table C.4](#)). Hence, the estimated number of 18- to 25-year-olds using alcohol in the past month in Alabama was  $0.4059 \times 526,289$ , which is 213,621.<sup>25</sup> The associated Bayesian confidence intervals ranged from  $0.3590 \times 526,289$  (i.e., 188,938) to  $0.4546 \times 526,289$  (i.e., 239,251). Note that when estimates of the number of individuals are calculated for Tables 1 to 37 in the 2021-2022 Model-Based Estimated Totals report (CBHSQ, forthcoming b), the unrounded percentages and population counts are used, then the numbers are reported to the nearest thousand. Hence, the number obtained by multiplying the published estimate with the published population estimate may not exactly match the counts published in these tables because of rounding differences.

The only two exceptions to this calculation are the production of the estimated numbers of marijuana initiates among the population at risk and the estimated number of those not receiving substance use treatment among those classified as needing treatment. Those estimates cannot be directly calculated as the product of the percentage estimate and the population counts available in Section C. That is because the denominator of the marijuana initiation percentage estimate is defined as the number of persons at risk for marijuana initiation, which is a combination of individuals who never used marijuana and one half of the individuals who initiated in the past 24 months (see Section B.8 for more details). And the denominator of those not receiving substance use treatment who were classified as needing treatment percentage estimate is defined as the number of people classified as needing substance use treatment (see Section B.12 for details).

## B.7 Calculation of Aggregate Age Group Estimates and Limitations

Tables 1 to 37 of *2021-2022 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia)* (CBHSQ, 2023d) show estimates for the following age groups: 12 to 17, 18 to 25, 26 or older, 18 or older, and 12 or older. If a user was interested in producing aggregated estimates, such as for those aged 12 to 25, the aggregated estimates could be calculated using prevalence estimates along with the population totals shown in Section C of this document. However, with the information provided in the tables, the confidence intervals cannot be calculated. Below is an example of the calculation of aggregated estimate for a given state.

In 2021-2022, past month use of alcohol in Alabama among youths aged 12 to 17 was 5.72 percent, and among young adults aged 18 to 25 it was 40.59 percent.<sup>26</sup> The population counts for 12- to 17-year-olds and 18- to 25-year-olds averaged across 2021 and 2022 in Alabama were 393,704 and 526,289, respectively (see [Table C.4](#)). Hence, one would calculate

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<sup>24</sup> See Table 15 in *2021-2022 National Survey of Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia)* (CBHSQ, 2023d).

<sup>25</sup> See Table 15 in the 2021-2022 NSDUH: Model-Based Estimated Totals report (CBHSQ, forthcoming b).

<sup>26</sup> See Table 15 in the 2021-2022 NSDUH: Model-Based Prevalence Estimates report (CBHSQ, 2023d).

the estimate for people aged 12 to 25 by first finding the number of users aged 12 to 25, which is 236,141 ( $[0.0572 \times 393,704] + [0.4059 \times 526,289]$ ), then dividing that number by the population aged 12 to 25 ( $236,141 / [393,704 + 526,289]$ ), which results in a rate of 25.67 percent.

## B.8 Calculation of Initiation of Marijuana Use

Initiation<sup>27</sup> rates typically are calculated as the number of new initiates of a substance during a period of time (such as in the past year) divided by an estimate of the number of person-years of exposure (in thousands). The initiation definition used here employs a simpler form of the at-risk population based on the model-based methodology. This model-based initiation rate (i.e., first use of marijuana in the past year among people at risk for initiation of marijuana use) is defined as follows:

$$\text{Average annual rate} = 100 * \{ [X_1 \div (0.5 * X_1 + X_2)] \div 2 \},$$

where  $X_1$  is the number of marijuana initiates in the past 24 months,  $X_2$  is the number of persons who never used marijuana, and  $(0.5 * X_1 + X_2)$  denotes the at-risk population.

The initiation rate is expressed as a percentage or rate per 100 person-years of exposure. Note that this estimate uses a 2-year time period to accumulate initiation cases from the annual survey. By assuming further that the distribution of first use for the initiation cases is uniform across the 2-year interval, the total number of person-years of exposure is 1 year on average for the initiation cases plus 2 years for all the “never users” at the end of the time period. This approximation to the person-years of exposure permits one to recast the initiation rate as a function of two population prevalence rates—namely, the fraction of people who first used marijuana in the past 2 years and the fraction who had never used marijuana. State and census region estimates, along with the 95 percent Bayesian confidence (credible) intervals, are based on simultaneous modeling of  $X_1$  and  $X_2$  components using the SWHB small area estimation approach. The associated MCMC chains were used to calculate the posterior variance. Note that only initiation rates for marijuana use are provided here.

## B.9 Underage Drinking

To obtain small area estimates for people aged 12 to 20 for past month alcohol use, binge alcohol use, perceptions of great risk from having five or more drinks of an alcoholic beverage once or twice a week, and alcohol use disorder, a separate set of SAE models with predictors selected for the age groups 12 to 17, 18 to 20, 21 to 34, and 35 or older were used. Model-based estimates for people aged 12 to 20 were produced by taking the population-weighted average of the individual age group (12 to 17 and 18 to 20) estimates. Estimates for underage drinking for past month alcohol use, binge alcohol use, perceptions of great risk from having five or more drinks of an alcoholic beverage once or twice a week, and alcohol use disorder were benchmarked to match national design-based estimates for that age group using the process described in Section B.5.

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<sup>27</sup> In NSDUH SAE documents prior to 2016-2017, the term “initiation” was referred to as “incidence.”



## B.10 Marijuana Use

In the 2021 NSDUH, questions about vaping marijuana were added to the emerging issues section of the questionnaire. Respondents who reported that they vaped anything were asked whether they ever vaped marijuana with a vaping device. Additionally, respondents who answered “yes” to ever vaping marijuana were then asked how long it had been since they last vaped marijuana with a vaping device.

To maintain consistent measures across years where possible, a general principle of editing is not to edit across interview sections (except in situations where answers to questions in a previous section govern skip logic in a later section). However, the introduction to the marijuana section of the interview did not mention the use of marijuana with a vaping device as one of the ways people could use marijuana. Therefore, respondents might not have thought about vaping marijuana when they answered the earlier marijuana questions. For this reason, data from these marijuana vaping questions were incorporated into the marijuana use measures and related measures that include marijuana in 2021 NSDUH. If respondents reported that they did not use marijuana in the marijuana section of the questionnaire, but they later reported that they vaped marijuana, they were considered to have used marijuana in their lifetime and in the applicable recency period. For details on marijuana vaping, please refer to Section 3.4.10.3 of CBHSQ (2022b).

The marijuana section of the 2022 NSDUH questionnaire included new questions to assess the variety of ways that people consume marijuana. The following definitional information preceded the question about the use of marijuana in 2022: “The next questions are about marijuana and any cannabis products, sometimes called pot, weed, hashish, or concentrates. Some of the ways these products can be used are smoking (such as in joints, pipes, bong, blunts, or hookahs), vaping (using vape pens, dab pens, tabletop vaporizers, or portable vaporizers), dabbing, eating or drinking, or applying as a lotion.” Additional questions about marijuana vaping were asked in the emerging issues section of the questionnaire, but the overall marijuana measures for 2022 did not take these marijuana vaping data into account since the marijuana section specifically included marijuana vaping as a way marijuana could be used. For details on marijuana vaping, please refer to Section 3.4.15 of CBHSQ (2023d).

## B.11 Substance Use Disorder (SUD)

The NSDUH questionnaire includes questions to measure SUDs for alcohol and drugs. SUD estimates for drugs and alcohol in the 2021-2022 NSDUH were based on the criteria in the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5; American Psychiatric Association [APA], 2013). Respondents were asked SUD questions separately for any drugs or alcohol they used in the 12 months prior to the survey.<sup>28</sup>

SUD questions for drugs applied to marijuana, cocaine (including crack), heroin, hallucinogens, inhalants, methamphetamine, and *any* use of prescription pain relievers, tranquilizers, stimulants, or sedatives. Beginning in 2021, NSDUH respondents who reported

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<sup>28</sup> NSDUH respondents in 2021 and 2022 were asked the respective questions for alcohol use disorder or marijuana use disorder if they reported use of these substances on 6 or more days in the past year.

any use of prescription psychotherapeutic drugs (i.e., pain relievers, tranquilizers, stimulants, or sedatives) in the past year (i.e., not just misuse of prescription drugs) were asked the respective SUD questions for that category of prescription drugs.

DSM-5 includes the following SUD criteria (as measured in the 2021 and 2022 NSDUHs):

1. The substance is often taken in larger amounts or over a longer period than intended.
2. There is a persistent desire or unsuccessful efforts to cut down or control substance use.
3. A great deal of time is spent in activities necessary to obtain the substance, use the substance, or recover from its effects.
4. There is craving, or a strong desire or urge, to use the substance.
5. There is recurrent substance use that results in a failure to fulfill major role obligations at work, school, or home.
6. There is continued substance use despite having persistent or recurrent social or interpersonal problems caused by or exacerbated by the effects of the substance.
7. Important social, occupational, or recreational activities are given up or reduced because of substance use.
8. There is recurrent substance use in situations in which it is physically hazardous.
9. Substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.
10. There is a need for markedly increased amounts of the substance to achieve intoxication or the desired effect, or there is a markedly diminished effect with continued use of the same amount of the substance (i.e., tolerance).
11. There are two components of withdrawal symptoms, either of which meet the overall criterion for withdrawal symptoms:
  - a. There is a required number of withdrawal symptoms that occur when substance use is cut back or stopped following a period of prolonged use.<sup>29</sup>
  - b. The substance or a related substance is used to get over or avoid withdrawal symptoms.<sup>30</sup>

For alcohol, marijuana, cocaine, heroin, and methamphetamine, respondents were classified as having an SUD if they had at least 2 of the 11 criteria in a 12-month period. However, respondents were classified as having a hallucinogen use disorder or an inhalant use

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<sup>29</sup> For alcohol, for example, withdrawal symptoms include (but are not limited to) trouble sleeping, hands trembling, hallucinations (seeing, feeling, or hearing things that are not really there), or feeling anxious.

<sup>30</sup> For alcohol use disorder, for example, this criterion involves the use of alcohol, sedatives, or tranquilizers to get over or avoid alcohol withdrawal symptoms.

disorder if they had at least 2 of the first 10 criteria in the past 12 months; the withdrawal criterion does not apply to hallucinogens and inhalants.

For use or misuse of prescription drugs, the applicable DSM-5 criteria for classifying respondents as having a prescription drug use disorder depends on whether respondents misused prescription drugs or used but did not misuse prescription drugs in the past year. If respondents misused prescription drugs in the past year, they were classified as having a prescription drug use disorder if they had at least 2 of the 11 criteria shown. However, if respondents used but did not misuse prescription drugs in the past year, they were classified as having a prescription drug use disorder if they had at least two of the first *nine* criteria shown above. Criteria 10 (tolerance) and 11 (withdrawal) do not apply to respondents who used but did not misuse these prescription drugs in the past year; tolerance and withdrawal can occur as normal physiological adaptations when people use these prescription drugs appropriately under medical supervision (Hasin et al., 2015).

The following lists the substances that are included in selected SUD measures in the 2021-2022 NSDUH state small area estimates:

- Any SUD in the past year includes data from past year users of alcohol, marijuana,<sup>31</sup> cocaine (including crack), heroin, hallucinogens, inhalants, and methamphetamine, and *any* past year users of prescription psychotherapeutic drugs.
- Alcohol use disorder includes only data from past year users of alcohol.
- Pain reliever use disorder includes data from *any* past year users of prescription pain relievers.
- Drug use disorder includes data from past year users of marijuana, cocaine, heroin, hallucinogens, inhalants, and methamphetamine, and *any* past year users of prescription psychotherapeutic drugs. It does not include people who had an alcohol use disorder in the past year.
- Opioid use disorder includes data from past year users of heroin and *any* past year users of prescription pain relievers. Respondents were not counted as having an opioid use disorder if they did not meet the full SUD criteria for heroin or prescription pain relievers individually. The opioid use disorder estimates do not capture symptoms that arose solely from the use of illegally made fentanyl.

For more information about the SUD definitions based on criteria from DSM-5, see Section 3.4.4.2 of CBHSQ (2023c).

## **B.12 Substance Use Treatment**

The substance use treatment questions underwent considerable revisions for the 2022 NSDUH (see Section 2.2.2 of CBHSQ [2023c]). These revisions were intended to reflect

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<sup>31</sup> NSDUH respondents in 2021 and 2022 were asked the respective questions for alcohol use disorder or marijuana use disorder only if they reported use of these substances on 6 or more days in the past year.

contemporary changes in the delivery of substance use treatment services. The following is a summary of key changes to these questions:

- Respondents who reported any lifetime use of prescription drugs (pain relievers, tranquilizers, stimulants, or sedatives) were eligible to be asked questions about the receipt of substance use treatment. Before 2022, respondents who reported lifetime use but not misuse of prescription drugs were not asked about the receipt of substance use treatment unless they reported lifetime use of alcohol or other drugs (marijuana, cocaine, heroin, hallucinogens, inhalants, or methamphetamine).
- All lifetime users of alcohol or drugs were asked whether they received specific types of treatment services in the past 12 months. Before 2022, respondents who reported the use of alcohol or illicit drugs were not asked about the specific types of treatment they received in the past 12 months unless they first reported that they received any substance use treatment in their lifetime and, if so, whether they received substance use treatment in the past 12 months. These changes meant that more respondents in 2022 were eligible to be asked the questions about the types of treatment they received in the past 12 months.
- Additional inpatient and outpatient locations were provided for respondents to report where they received treatment in the past 12 months.
- The question about the receipt of treatment over the phone or through video (i.e., telehealth treatment) was revised to emphasize that the treatment was from a therapist or other healthcare professional.
- Questions about medication-assisted treatment (MAT) for alcohol or opioid use were added to the section.

Because of these changes, the definition for the receipt of substance use treatment changed for 2022. Estimates for the substance use treatment outcomes in this report are based only on 2022 data.

Receipt of substance use treatment includes the receipt of treatment in the past year for the use of alcohol or drugs in an inpatient location; in an outpatient location; via telehealth; or in a prison, jail, or juvenile detention center. The definition also includes the receipt of MAT for alcohol use or opioid use.

In 2022, relatively large proportions of people who reported that they received inpatient or outpatient treatment in the past 12 months did not indicate the specific substance(s) for which they received treatment in these locations, including treatment for the use of some other drug. Stated another way, these reports of inpatient or outpatient treatment were not substantiated by reports of treatment for the use of specific substances. Specifically, more than one fourth (26.2 percent) of respondents who reported inpatient treatment in the past year did not report the specific substances for which they received treatment as inpatients. Among respondents who reported outpatient treatment in the past year, more than one third (35.0 percent) did not report the specific substances for which they received treatment as outpatients. A “substance unspecified” category was created for these respondents. Because of this issue with unsubstantiated data for inpatient or outpatient treatment for the use of specific substances,

estimates of treatment for the use of alcohol, drugs, or both alcohol and drugs in these locations are likely to be underestimates.

Historically, NSDUH data products have included substance use treatment at a “specialty facility” in the past year as part of the definition for whether people needed substance use treatment. With the changes to the questionnaire in 2022, the term “specialty facility” was dropped from 2022 NSDUH data products. Consequently, the definition of the need for substance use treatment was revised for 2022. Respondents were classified as needing substance use treatment if they had an SUD in the past year, as defined in Section B.11, or they received substance use treatment in the past year, as defined earlier in this section.

The percentage of people not receiving substance use treatment among those classified as needing treatment is defined as follows:

$$100 * X_1 / (X_1 + X_2),$$

where  $X_1$  is the number of people not receiving treatment who needed treatment,  $X_2$  is the number of people receiving treatment who needed treatment, and  $(X_1 + X_2)$  denotes the number of people who needed treatment. State and census region estimates, along with the 95 percent Bayesian confidence (credible) intervals, are based on simultaneous modeling of  $X_1$  and  $X_2$  components using the SWHB small area estimation approach. The associated MCMC chains were used to calculate the posterior variance.

For more information about the substance use treatment outcomes, see Section 3.4.5 of CBHSQ (2023c).

## **B.13 Mental Health Measures**

This section provides a summary of the measurement issues associated with seven mental health outcome variables such as mental illness, MDE, suicidal thoughts and behaviors, and mental health treatment. Additional details can be found in Sections 3.4.6, 3.4.8, 3.4.9, and 3.4.3 of CBHSQ (2023c).

### **B.13.1 Mental Illness**

The binary (0/1) serious mental illness (SMI) and any mental illness (AMI) measures are generated (predicted) by a logistic regression model where parameter estimates from the 2012 SMI model and annually updated associated predictors from NSDUH (i.e., responses to questions in the NSDUH) are used to predict the respondent’s SMI (or AMI) status. The predicted SMI (or AMI) status for all adult NSDUH respondents was used to compute prevalence estimates of SMI (or AMI) nationally as well as at the state level. For details on the 2012 SMI model, see Section 3.4.8.8 of CBHSQ (2023c). The history of SMI and AMI measures since the 2000-2001 state report is described in Section B.13.1 of *2021 National Survey on Drug Use and Health: Guide to State Tables and Summary of Small Area Estimation Methodology* (CBHSQ, 2023a). Note that starting from 2021, the measures used in the mental illness models

were all imputed. Therefore, the source variables (i.e., model predictors) used to create the measures of AMI and SMI had no missing data.

### **B.13.2 Mental Health Treatment**

The mental health treatment questions underwent considerable revisions for the 2022 NSDUH. These revisions were intended to reflect contemporary changes in the delivery of mental health treatment services. The changes also made the content more similar between the alcohol and drug treatment and the mental health services utilization sections of the questionnaire. The following is a summary of key changes to these questions:

- Adolescents aged 12 to 17 and adults aged 18 or older received the same questions about mental health treatment. Before 2022, adolescents and adults received different sets of questions, such that measures differed for adolescents and adults. Consequently, the youth mental health service utilization section was dropped from the 2022 questionnaire.
- The instruction was dropped for respondents not to report mental health treatment associated with their use of alcohol or drugs.
- Terminology was updated, and questions were included about newer treatment options.
- Additional inpatient and outpatient locations were provided for adult respondents to report where they received treatment in the past 12 months. As noted previously, adolescents were asked about the receipt of treatment in these same inpatient and outpatient locations.
- The question about the use of medication that was prescribed to help with people's mental health applied to all respondents, regardless of age. Before 2022, only adults were asked whether they took prescribed medication to help with their mental health.
- The question about treatment received in prison, jail, or a juvenile detention center applied to all respondents, regardless of age. Before 2022, only adolescents were asked whether they received services in a juvenile detention center, prison, or jail.
- The question about the receipt of treatment over the phone or through video (i.e., telehealth treatment) was revised to emphasize that the treatment was from a therapist or other healthcare professional.

Because of these changes, the definition for the receipt of mental health treatment changed for 2022. Estimates based on this outcome is based on only 2022 NSDUH data. Receipt of mental health treatment includes the receipt of treatment in the past year to help people with their mental health, emotions, or behavior that was received in an inpatient location; in an outpatient location; via telehealth; or in a prison, jail, or juvenile detention center. The definition also includes the receipt of prescription medication to help with mental health, emotions, or behavior.

### **B.13.3 Major Depressive Episode (MDE)**

Two sections related to MDE were included in the 2021 and 2022 questionnaires: an adult depression section and an adolescent depression section. These sections were originally derived from DSM-IV criteria for MDE and remained applicable to the more recent DSM-5

criteria. Consistent with the DSM-5 criteria, NSDUH does not exclude MDEs occurring exclusively in the context of bereavement. In addition, no exclusions were made for MDEs caused by medication, alcohol, illicit drugs, or any medical illness.

Questions on depression permit estimates of MDE to be calculated. Separate sections 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: Adolescent Supplement (NCS-A) (see <https://www.hcp.med.harvard.edu/ncs/>). To make the sections developmentally appropriate for youths, there are minor wording differences in a few questions between the adult and youth sections. Revisions to the questions in both sections were made primarily to reduce the length and to modify the NCS questions, which are interviewer administered, for self-administration in NSDUH.

According to DSM-5, people are classified as having had an MDE<sup>32</sup> in their lifetime if they had at least five or more of symptoms nearly every day (except where noted) 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: (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 at a level observable by others; (6) fatigue or loss of energy; (7) feelings of worthlessness or excessive or inappropriate guilt; (8) diminished ability to think or concentrate or indecisiveness; and (9) recurrent thoughts of death or suicidality (i.e., recurrent suicidal ideation without a specific plan, making a specific plan, or making an attempt). Unlike the other symptoms listed previously, recurrent thoughts of death or suicidality did not need to have occurred nearly every day (APA, 2013).

Respondents who have had an 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. Respondents reporting experiences consistent with them having had an MDE in the past year are asked questions from the Sheehan Disability Scale 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).

Starting in 2021, the variables for MDE among adults were statistically imputed. MDE variables were not statistically imputed for youths aged 12 to 17.

#### **B.13.4 Suicidal Thoughts and Behavior**

The 2021 and 2022 NSDUHs included sets of questions asking adults aged 18 or older whether they had serious thoughts of suicide, made any suicide plans, or had attempted suicide in the past 12 months. All adult respondents were asked whether they made a suicide plan or attempted suicide regardless of whether they reported that they had serious thoughts of suicide in the past 12 months. The two response options were “yes” and “no.” Additionally, beginning in

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<sup>32</sup> “An MDE” refers to the occurrence of at least one MDE, rather than only one MDE. Similarly, reference to “the MDE” in a given period (e.g., the past 12 months) does not mean an individual had only one MDE in that period.

2021, the adult variables for suicidal thoughts and behaviors among adults were statistically imputed.

Additionally, the 2021 and 2022 NSDUHs included sets of questions that asked youths aged 12 to 17 about the same suicidal thoughts and behaviors. Starting with the 2022 NSDUH, questions about adolescents' suicidal thoughts and behaviors in the past 12 months were included in the youth experiences section of the questionnaire instead of in the youth mental health utilization section, which was removed from the 2022 NSDUH questionnaire. However, the wording of the youth suicidal thoughts and behavior questions did not change for 2022. Unlike the questions for adults, the questions about suicidal thoughts and behavior among youths included response choices for "I'm not sure" and "I don't want to answer," in addition to standard response choices of "yes" and "no."

Estimates for suicidal thoughts and behavior among adolescents in national reports and tables for 2022 included estimates for "I'm not sure," and "I don't want to answer," in addition to estimates for "yes" and "no." Measures for suicidal thoughts and behavior among adolescents were not statistically imputed for 2021 or 2022. For the 2021-2022 state small area estimates, estimates for suicidal behaviors reflect the percentage that answered "yes" among all respondents. Respondents who answered "no," "I'm not sure," and "I don't want to answer" were grouped together as the "no" category. Thus the 2021-2022 state small area estimates for suicidal behaviors among adolescents may be underestimated.





# **Section C: Sample Sizes, Response Rates, and Population Estimates**

**Table C.1 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Screening and Interview Response Rates, and Population Estimates, by State, for People Aged 12 or Older: 2022**

| State                | Total Selected DUs | Total Eligible DUs | Total Completed Screeners | Weighted DU Screening Response Rate | Total Selected People | Total Responded | Population Estimate | Weighted Interview Response Rate | Weighted Overall Response Rate |
|----------------------|--------------------|--------------------|---------------------------|-------------------------------------|-----------------------|-----------------|---------------------|----------------------------------|--------------------------------|
| Total U.S.           | 942,540            | 864,290            | 217,460                   | 25.46%                              | 150,790               | 71,370          | 282,007,443         | 47.43%                           | 12.08%                         |
| Northeast            | 172,290            | 158,880            | 41,670                    | 25.11%                              | 27,500                | 12,700          | 49,023,809          | 48.27%                           | 12.12%                         |
| Midwest              | 225,160            | 206,220            | 52,390                    | 26.57%                              | 35,900                | 16,980          | 58,153,166          | 48.57%                           | 12.90%                         |
| South                | 326,390            | 296,880            | 74,460                    | 25.39%                              | 50,390                | 24,640          | 108,107,394         | 48.10%                           | 12.21%                         |
| West                 | 218,700            | 202,300            | 48,940                    | 24.76%                              | 37,010                | 17,050          | 66,723,074          | 44.73%                           | 11.08%                         |
| Alabama              | 14,490             | 13,020             | 4,910                     | 39.86%                              | 3,210                 | 1,300           | 4,277,319           | 38.81%                           | 15.47%                         |
| Alaska               | 13,120             | 11,310             | 2,810                     | 26.05%                              | 2,060                 | 1,030           | 586,642             | 53.39%                           | 13.91%                         |
| Arizona              | 14,840             | 13,330             | 2,900                     | 21.91%                              | 2,270                 | 1,040           | 6,247,365           | 44.86%                           | 9.83%                          |
| Arkansas             | 14,120             | 11,940             | 2,580                     | 20.23%                              | 1,910                 | 970             | 2,545,165           | 51.57%                           | 10.43%                         |
| California           | 49,040             | 47,210             | 10,450                    | 22.95%                              | 8,820                 | 3,840           | 33,125,224          | 43.01%                           | 9.87%                          |
| Colorado             | 16,720             | 15,150             | 3,990                     | 26.22%                              | 2,670                 | 1,190           | 4,973,616           | 44.35%                           | 11.63%                         |
| Connecticut          | 13,970             | 13,070             | 3,490                     | 26.72%                              | 2,220                 | 1,010           | 3,125,542           | 47.24%                           | 12.62%                         |
| Delaware             | 14,180             | 13,150             | 3,990                     | 28.64%                              | 2,400                 | 980             | 871,140             | 42.64%                           | 12.21%                         |
| District of Columbia | 14,610             | 13,900             | 3,440                     | 24.60%                              | 1,370                 | 810             | 573,638             | 57.99%                           | 14.27%                         |
| Florida              | 46,460             | 42,610             | 10,540                    | 25.16%                              | 6,930                 | 3,240           | 19,163,550          | 43.83%                           | 11.03%                         |
| Georgia              | 18,750             | 17,730             | 4,160                     | 25.08%                              | 3,480                 | 1,790           | 9,125,480           | 48.53%                           | 12.17%                         |
| Hawaii               | 15,230             | 14,220             | 3,500                     | 23.56%                              | 2,650                 | 1,070           | 1,188,971           | 40.11%                           | 9.45%                          |
| Idaho                | 13,880             | 12,850             | 3,730                     | 29.75%                              | 2,620                 | 1,260           | 1,621,235           | 45.27%                           | 13.47%                         |
| Illinois             | 32,720             | 30,720             | 6,680                     | 21.40%                              | 5,020                 | 2,140           | 10,687,995          | 43.92%                           | 9.40%                          |
| Indiana              | 14,230             | 12,850             | 3,210                     | 26.20%                              | 2,400                 | 1,300           | 5,729,084           | 56.98%                           | 14.93%                         |
| Iowa                 | 14,990             | 13,690             | 2,880                     | 23.25%                              | 1,900                 | 960             | 2,691,907           | 52.99%                           | 12.32%                         |
| Kansas               | 13,870             | 12,490             | 2,910                     | 24.74%                              | 2,420                 | 1,100           | 2,432,441           | 47.78%                           | 11.82%                         |
| Kentucky             | 15,190             | 13,300             | 3,210                     | 26.58%                              | 2,010                 | 1,130           | 3,776,587           | 57.94%                           | 15.40%                         |
| Louisiana            | 14,420             | 12,510             | 3,140                     | 26.91%                              | 2,050                 | 960             | 3,807,180           | 47.19%                           | 12.70%                         |
| Maine                | 12,800             | 10,870             | 3,970                     | 32.86%                              | 2,130                 | 960             | 1,213,007           | 51.22%                           | 16.83%                         |
| Maryland             | 15,320             | 14,420             | 3,880                     | 28.19%                              | 2,750                 | 1,220           | 5,204,196           | 42.24%                           | 11.91%                         |
| Massachusetts        | 13,850             | 13,130             | 3,660                     | 27.90%                              | 2,430                 | 1,150           | 6,067,069           | 49.92%                           | 13.93%                         |
| Michigan             | 34,110             | 30,590             | 7,940                     | 26.62%                              | 4,880                 | 2,510           | 8,579,825           | 54.48%                           | 14.50%                         |
| Minnesota            | 12,750             | 11,950             | 2,940                     | 23.75%                              | 1,940                 | 880             | 4,825,108           | 45.54%                           | 10.82%                         |
| Mississippi          | 13,570             | 12,100             | 2,860                     | 24.58%                              | 2,150                 | 1,050           | 2,445,002           | 48.62%                           | 11.95%                         |

See notes at end of table.

(continued)

**Table C.1 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Screening and Interview Response Rates, and Population Estimates, by State, for People Aged 12 or Older: 2022 (continued)**

| State          | Total Selected DUs | Total Eligible DUs | Total Completed Screeners | Weighted DU Screening Response Rate | Total Selected People | Total Responded | Population Estimate | Weighted Interview Response Rate | Weighted Overall Response Rate |
|----------------|--------------------|--------------------|---------------------------|-------------------------------------|-----------------------|-----------------|---------------------|----------------------------------|--------------------------------|
| Missouri       | 14,380             | 13,040             | 3,560                     | 28.32%                              | 2,230                 | 1,030           | 5,204,585           | 49.02%                           | 13.88%                         |
| Montana        | 13,370             | 11,660             | 2,580                     | 18.91%                              | 1,570                 | 760             | 956,943             | 55.41%                           | 10.48%                         |
| Nebraska       | 12,210             | 11,280             | 3,110                     | 27.55%                              | 2,410                 | 1,190           | 1,630,830           | 51.41%                           | 14.16%                         |
| Nevada         | 15,910             | 14,900             | 3,180                     | 21.34%                              | 2,700                 | 1,290           | 2,699,194           | 49.83%                           | 10.63%                         |
| New Hampshire  | 14,750             | 13,420             | 4,140                     | 33.96%                              | 2,760                 | 1,200           | 1,221,080           | 49.65%                           | 16.86%                         |
| New Jersey     | 21,510             | 20,490             | 4,720                     | 22.58%                              | 3,370                 | 1,440           | 7,892,006           | 43.03%                           | 9.71%                          |
| New Mexico     | 13,250             | 11,880             | 2,770                     | 24.65%                              | 2,090                 | 1,070           | 1,790,351           | 52.20%                           | 12.87%                         |
| New York       | 39,030             | 36,490             | 8,480                     | 24.23%                              | 6,190                 | 2,830           | 16,876,703          | 47.61%                           | 11.54%                         |
| North Carolina | 20,970             | 19,130             | 3,910                     | 20.96%                              | 2,330                 | 1,240           | 9,019,517           | 52.59%                           | 11.02%                         |
| North Dakota   | 13,190             | 11,550             | 2,570                     | 21.64%                              | 1,780                 | 870             | 639,153             | 48.61%                           | 10.52%                         |
| Ohio           | 36,130             | 34,420             | 10,090                    | 30.50%                              | 6,540                 | 2,910           | 9,942,566           | 43.60%                           | 13.30%                         |
| Oklahoma       | 14,870             | 13,180             | 3,150                     | 23.63%                              | 2,150                 | 950             | 3,319,855           | 53.30%                           | 12.60%                         |
| Oregon         | 13,260             | 12,560             | 3,430                     | 30.46%                              | 2,180                 | 970             | 3,668,673           | 45.58%                           | 13.88%                         |
| Pennsylvania   | 31,800             | 29,640             | 6,770                     | 23.65%                              | 4,560                 | 2,250           | 11,111,386          | 52.00%                           | 12.30%                         |
| Rhode Island   | 12,720             | 11,360             | 2,740                     | 25.32%                              | 1,730                 | 840             | 947,304             | 47.34%                           | 11.99%                         |
| South Carolina | 15,890             | 14,260             | 2,670                     | 17.78%                              | 1,730                 | 840             | 4,477,630           | 50.80%                           | 9.03%                          |
| South Dakota   | 13,340             | 11,470             | 2,360                     | 19.20%                              | 1,780                 | 960             | 747,290             | 55.06%                           | 10.57%                         |
| Tennessee      | 14,500             | 13,550             | 2,970                     | 23.49%                              | 1,960                 | 920             | 5,959,861           | 42.77%                           | 10.05%                         |
| Texas          | 41,660             | 38,000             | 8,410                     | 23.05%                              | 6,970                 | 3,540           | 24,743,557          | 49.36%                           | 11.38%                         |
| Utah           | 12,450             | 11,330             | 3,010                     | 28.88%                              | 3,010                 | 1,530           | 2,763,706           | 54.45%                           | 15.73%                         |
| Vermont        | 11,860             | 10,410             | 3,710                     | 34.49%                              | 2,120                 | 1,020           | 569,711             | 48.29%                           | 16.65%                         |
| Virginia       | 24,200             | 22,540             | 8,010                     | 37.36%                              | 5,440                 | 2,950           | 7,277,607           | 53.65%                           | 20.04%                         |
| Washington     | 15,450             | 14,530             | 4,400                     | 31.80%                              | 3,030                 | 1,280           | 6,610,953           | 42.24%                           | 13.43%                         |
| West Virginia  | 13,190             | 11,540             | 2,630                     | 21.98%                              | 1,530                 | 740             | 1,520,110           | 46.90%                           | 10.31%                         |
| Wisconsin      | 13,240             | 12,170             | 4,150                     | 33.56%                              | 2,610                 | 1,150           | 5,042,382           | 46.91%                           | 15.74%                         |
| Wyoming        | 12,190             | 11,380             | 2,210                     | 19.24%                              | 1,360                 | 730             | 490,202             | 56.11%                           | 10.80%                         |

DU = dwelling unit.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2022.

**Table C.2 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Interview Response Rates, and Population Estimates, by State and Three Age Groups: 2022**

| State                | 12-17                       |                             |                                 | 12-17<br>Weighted<br>Interview<br>Response<br>Rate | 18-25                       |                             |                                 | 18-25<br>Weighted<br>Interview<br>Response<br>Rate | 26+                         |                           |                               | 26+<br>Weighted<br>Interview<br>Response<br>Rate |
|----------------------|-----------------------------|-----------------------------|---------------------------------|--|-----------------------------|-----------------------------|---------------------------------|--|-----------------------------|---------------------------|-------------------------------|--|
|                      | Total<br>Selected<br>People | 12-17<br>Total<br>Responded | 12-17<br>Population<br>Estimate |  | Total<br>Selected<br>People | 18-25<br>Total<br>Responded | 18-25<br>Population<br>Estimate |  | Total<br>Selected<br>People | 26+<br>Total<br>Responded | 26+<br>Population<br>Estimate |  |
| Total U.S.           | 35,140                      | 14,810                      | 25,725,767                      | 41.61%   | 37,570                      | 17,260                      | 34,786,295                      | 44.66%   | 78,080                      | 39,300                    | 221,495,381                   | 48.54%   |
| Northeast            | 6,040                       | 2,490                       | 4,064,785                       | 40.82%   | 6,860                       | 3,010                       | 5,913,044                       | 45.13%   | 14,600                      | 7,210                     | 39,045,980                    | 49.52%   |
| Midwest              | 8,220                       | 3,180                       | 5,397,613                       | 37.60%   | 9,230                       | 4,270                       | 7,297,663                       | 44.76%   | 18,440                      | 9,530                     | 45,457,890                    | 50.52%   |
| South                | 12,250                      | 5,580                       | 10,121,366                      | 44.60%   | 12,080                      | 5,800                       | 13,343,320                      | 46.35%   | 26,070                      | 13,260                    | 84,642,707                    | 48.78%   |
| West                 | 8,630                       | 3,570                       | 6,142,003                       | 40.77%   | 9,400                       | 4,180                       | 8,232,268                       | 41.49%   | 18,980                      | 9,300                     | 52,348,804                    | 45.70%   |
| Alabama              | 770                         | 300                         | 391,986                         | 37.33%   | 820                         | 320                         | 544,551                         | 37.09%   | 1,630                       | 680                       | 3,340,782                     | 39.29%   |
| Alaska               | 460                         | 180                         | 58,578                          | 42.66%   | 540                         | 290                         | 66,882                          | 52.46%   | 1,060                       | 570                       | 461,182                       | 54.73%   |
| Arizona              | 590                         | 240                         | 574,783                         | 43.13%   | 580                         | 250                         | 795,490                         | 41.50%   | 1,110                       | 550                       | 4,877,092                     | 45.66%   |
| Arkansas             | 410                         | 170                         | 246,650                         | 32.98%   | 600                         | 300                         | 322,769                         | 49.90%   | 900                         | 500                       | 1,975,746                     | 54.35%   |
| California           | 1,970                       | 800                         | 3,048,365                       | 39.51%   | 2,130                       | 950                         | 4,085,617                       | 41.12%   | 4,720                       | 2,100                     | 25,991,242                    | 43.70%   |
| Colorado             | 640                         | 280                         | 437,268                         | 44.15%   | 640                         | 260                         | 615,830                         | 38.57%   | 1,390                       | 650                       | 3,920,518                     | 45.31%   |
| Connecticut          | 580                         | 250                         | 270,722                         | 42.39%   | 450                         | 170                         | 389,638                         | 43.16%   | 1,200                       | 590                       | 2,465,182                     | 48.45%   |
| Delaware             | 640                         | 270                         | 73,678                          | 40.89%   | 520                         | 190                         | 96,351                          | 33.78%   | 1,240                       | 530                       | 701,110                       | 44.04%   |
| District of Columbia | 360                         | 200                         | 34,451                          | 52.17%   | 330                         | 190                         | 79,777                          | 56.80%   | 680                         | 420                       | 459,410                       | 58.62%   |
| Florida              | 1,690                       | 750                         | 1,520,786                       | 44.26%   | 1,470                       | 690                         | 2,060,106                       | 42.94%   | 3,770                       | 1,810                     | 15,582,658                    | 43.90%   |
| Georgia              | 760                         | 380                         | 909,666                         | 48.90%   | 960                         | 520                         | 1,165,546                       | 51.70%   | 1,760                       | 890                       | 7,050,269                     | 47.95%   |
| Hawaii               | 610                         | 190                         | 96,599                          | 40.11%   | 630                         | 240                         | 121,033                         | 34.34%   | 1,400                       | 640                       | 971,338                       | 40.83%   |
| Idaho                | 690                         | 300                         | 169,215                         | 43.54%   | 680                         | 310                         | 216,953                         | 41.24%   | 1,260                       | 650                       | 1,235,067                     | 46.24%   |
| Illinois             | 1,220                       | 430                         | 985,793                         | 35.15%   | 1,250                       | 510                         | 1,308,284                       | 40.75%   | 2,550                       | 1,200                     | 8,393,918                     | 45.56%   |
| Indiana              | 470                         | 210                         | 555,198                         | 43.58%   | 770                         | 430                         | 756,747                         | 54.62%   | 1,170                       | 660                       | 4,417,140                     | 58.96%   |
| Iowa                 | 490                         | 180                         | 257,492                         | 36.72%   | 460                         | 230                         | 365,545                         | 50.05%   | 950                         | 550                       | 2,068,870                     | 55.77%   |
| Kansas               | 520                         | 200                         | 245,593                         | 39.23%   | 700                         | 300                         | 332,356                         | 41.19%   | 1,200                       | 600                       | 1,854,493                     | 50.21%   |
| Kentucky             | 530                         | 260                         | 352,199                         | 50.08%   | 510                         | 280                         | 461,094                         | 58.84%   | 980                         | 590                       | 2,963,294                     | 58.73%   |
| Louisiana            | 540                         | 230                         | 368,764                         | 39.40%   | 390                         | 180                         | 472,008                         | 41.91%   | 1,120                       | 550                       | 2,966,408                     | 49.01%   |
| Maine                | 440                         | 170                         | 90,921                          | 28.49%   | 560                         | 230                         | 124,756                         | 38.40%   | 1,130                       | 560                       | 997,330                       | 54.74%   |
| Maryland             | 710                         | 310                         | 473,718                         | 43.98%   | 670                         | 260                         | 595,156                         | 38.47%   | 1,380                       | 650                       | 4,135,321                     | 42.56%   |
| Massachusetts        | 440                         | 170                         | 479,418                         | 38.87%   | 680                         | 320                         | 786,780                         | 48.87%   | 1,310                       | 660                       | 4,800,871                     | 51.16%   |
| Michigan             | 1,240                       | 540                         | 754,736                         | 43.22%   | 1,100                       | 540                         | 1,068,483                       | 51.06%   | 2,540                       | 1,430                     | 6,756,606                     | 56.30%   |
| Minnesota            | 460                         | 170                         | 457,354                         | 33.16%   | 490                         | 210                         | 580,180                         | 37.08%   | 980                         | 500                       | 3,787,574                     | 48.41%   |
| Mississippi          | 550                         | 230                         | 246,906                         | 41.21%   | 440                         | 220                         | 317,528                         | 50.49%   | 1,160                       | 600                       | 1,880,568                     | 49.14%   |

See notes at end of table.

(continued)

**Table C.2 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Interview Response Rates, and Population Estimates, by State and Three Age Groups: 2022 (continued)**

| State          | 12-17                       |                             |                                 | 12-17<br>Weighted<br>Interview<br>Response<br>Rate | 18-25                       |                             |                                 | 18-25<br>Weighted<br>Interview<br>Response<br>Rate | 26+                         |                           |                               | 26+<br>Weighted<br>Interview<br>Response<br>Rate |
|----------------|-----------------------------|-----------------------------|---------------------------------|--|-----------------------------|-----------------------------|---------------------------------|--|-----------------------------|---------------------------|-------------------------------|--|
|                | Total<br>Selected<br>People | 12-17<br>Total<br>Responded | 12-17<br>Population<br>Estimate |  | Total<br>Selected<br>People | 18-25<br>Total<br>Responded | 18-25<br>Population<br>Estimate |  | Total<br>Selected<br>People | 26+<br>Total<br>Responded | 26+<br>Population<br>Estimate |  |
| Missouri       | 530                         | 190                         | 481,597                         | 30.04%   | 500                         | 230                         | 645,571                         | 49.29%   | 1,200                       | 610                       | 4,077,417                     | 51.20%   |
| Montana        | 390                         | 150                         | 83,066                          | 34.20%   | 360                         | 160                         | 116,692                         | 45.64%   | 810                         | 460                       | 757,185                       | 58.97%   |
| Nebraska       | 570                         | 230                         | 165,796                         | 38.31%   | 520                         | 250                         | 217,849                         | 46.95%   | 1,320                       | 710                       | 1,247,185                     | 53.97%   |
| Nevada         | 610                         | 280                         | 245,573                         | 43.77%   | 740                         | 340                         | 298,185                         | 44.49%   | 1,350                       | 670                       | 2,155,437                     | 51.23%   |
| New Hampshire  | 590                         | 210                         | 93,212                          | 34.49%   | 690                         | 250                         | 136,239                         | 36.92%   | 1,490                       | 740                       | 991,629                       | 52.70%   |
| New Jersey     | 860                         | 340                         | 708,270                         | 36.40%   | 850                         | 360                         | 899,264                         | 41.09%   | 1,660                       | 740                       | 6,284,473                     | 44.02%   |
| New Mexico     | 470                         | 220                         | 170,306                         | 47.73%   | 610                         | 270                         | 224,366                         | 40.48%   | 1,010                       | 580                       | 1,395,678                     | 54.60%   |
| New York       | 1,320                       | 570                         | 1,373,572                       | 44.96%   | 1,530                       | 690                         | 2,040,802                       | 43.99%   | 3,340                       | 1,570                     | 13,462,329                    | 48.43%   |
| North Carolina | 610                         | 270                         | 818,763                         | 40.41%   | 470                         | 270                         | 1,112,045                       | 47.36%   | 1,250                       | 700                       | 7,088,709                     | 54.79%   |
| North Dakota   | 350                         | 110                         | 59,877                          | 30.21%   | 530                         | 290                         | 96,152                          | 52.21%   | 900                         | 470                       | 483,124                       | 50.11%   |
| Ohio           | 1,420                       | 550                         | 906,323                         | 38.87%   | 1,710                       | 710                         | 1,200,414                       | 38.31%   | 3,410                       | 1,650                     | 7,835,829                     | 44.93%   |
| Oklahoma       | 510                         | 190                         | 333,916                         | 42.31%   | 540                         | 230                         | 444,406                         | 46.99%   | 1,100                       | 540                       | 2,541,533                     | 55.89%   |
| Oregon         | 510                         | 200                         | 302,608                         | 39.61%   | 620                         | 260                         | 420,835                         | 39.01%   | 1,050                       | 510                       | 2,945,230                     | 47.19%   |
| Pennsylvania   | 960                         | 410                         | 933,709                         | 40.46%   | 1,210                       | 590                         | 1,338,638                       | 49.84%   | 2,390                       | 1,250                     | 8,839,039                     | 53.53%   |
| Rhode Island   | 410                         | 180                         | 72,588                          | 39.08%   | 390                         | 180                         | 124,302                         | 42.95%   | 920                         | 480                       | 750,415                       | 48.94%   |
| South Carolina | 420                         | 150                         | 400,840                         | 29.82%   | 450                         | 230                         | 534,371                         | 45.23%   | 850                         | 460                       | 3,542,419                     | 53.94%   |
| South Dakota   | 390                         | 140                         | 74,872                          | 33.33%   | 500                         | 280                         | 95,190                          | 50.34%   | 900                         | 530                       | 577,227                       | 58.15%   |
| Tennessee      | 440                         | 190                         | 540,524                         | 40.51%   | 520                         | 240                         | 719,991                         | 40.21%   | 1,000                       | 500                       | 4,699,346                     | 43.35%   |
| Texas          | 1,500                       | 720                         | 2,627,942                       | 48.11%   | 1,670                       | 840                         | 3,344,338                       | 48.56%   | 3,810                       | 1,980                     | 18,771,277                    | 49.66%   |
| Utah           | 670                         | 330                         | 335,459                         | 49.66%   | 780                         | 380                         | 455,335                         | 51.77%   | 1,560                       | 810                       | 1,972,912                     | 55.81%   |
| Vermont        | 460                         | 190                         | 42,372                          | 36.58%   | 490                         | 220                         | 72,626                          | 39.64%   | 1,160                       | 610                       | 454,713                       | 50.68%   |
| Virginia       | 1,450                       | 830                         | 653,981                         | 54.80%   | 1,300                       | 630                         | 895,653                         | 46.96%   | 2,700                       | 1,500                     | 5,727,973                     | 54.55%   |
| Washington     | 700                         | 270                         | 572,334                         | 35.09%   | 770                         | 310                         | 755,934                         | 39.12%   | 1,550                       | 700                       | 5,282,685                     | 43.57%   |
| West Virginia  | 360                         | 150                         | 126,598                         | 38.12%   | 430                         | 210                         | 177,630                         | 46.75%   | 740                         | 380                       | 1,215,882                     | 47.71%   |
| Wisconsin      | 570                         | 230                         | 452,984                         | 37.35%   | 720                         | 290                         | 630,892                         | 41.91%   | 1,320                       | 630                       | 3,958,506                     | 48.91%   |
| Wyoming        | 330                         | 140                         | 47,848                          | 39.44%   | 320                         | 180                         | 59,115                          | 52.37%   | 710                         | 420                       | 383,239                       | 58.96%   |

NOTE: Computations in this table are based on a respondent's age at screening. Thus, the data in the Total Responded column(s) could differ from data in other National Survey on Drug Use and Health tables that use the respondent's age recorded during the interview.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2022.

**Table C.3 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Screening and Interview Response Rates, and Population Estimates, by State, for People Aged 12 or Older: 2021 and 2022**

| State                | Total Selected DUs | Total Eligible DUs | Total Completed Screeners | Weighted DU Screening Response Rate | Total Selected People | Total Responded | Population Estimate | Weighted Interview Response Rate | Weighted Overall Response Rate |
|----------------------|--------------------|--------------------|---------------------------|-------------------------------------|-----------------------|-----------------|---------------------|----------------------------------|--------------------------------|
| Total U.S.           | 2,081,370          | 1,886,000          | 438,200                   | 23.86%                              | 303,000               | 141,220         | 280,925,693         | 46.84%                           | 11.17%                         |
| Northeast            | 391,660            | 356,410            | 81,180                    | 22.19%                              | 53,900                | 24,540          | 48,977,164          | 47.54%                           | 10.55%                         |
| Midwest              | 490,570            | 445,810            | 110,410                   | 26.08%                              | 75,020                | 34,800          | 58,087,985          | 47.07%                           | 12.27%                         |
| South                | 720,180            | 644,820            | 147,350                   | 23.50%                              | 99,200                | 48,100          | 107,347,274         | 48.17%                           | 11.32%                         |
| West                 | 478,970            | 438,960            | 99,270                    | 23.63%                              | 74,880                | 33,780          | 66,513,270          | 43.94%                           | 10.38%                         |
| Alabama              | 31,950             | 28,580             | 9,520                     | 36.00%                              | 6,150                 | 2,450           | 4,260,070           | 39.60%                           | 14.26%                         |
| Alaska               | 29,800             | 25,350             | 5,730                     | 22.81%                              | 4,110                 | 2,010           | 586,283             | 50.92%                           | 11.61%                         |
| Arizona              | 33,230             | 29,300             | 6,070                     | 20.42%                              | 4,580                 | 2,010           | 6,201,338           | 43.63%                           | 8.91%                          |
| Arkansas             | 31,260             | 26,030             | 5,580                     | 21.28%                              | 3,910                 | 1,850           | 2,535,421           | 49.42%                           | 10.51%                         |
| California           | 109,070            | 104,600            | 21,980                    | 22.14%                              | 18,540                | 7,920           | 33,112,749          | 42.30%                           | 9.37%                          |
| Colorado             | 33,730             | 30,130             | 7,790                     | 25.97%                              | 5,340                 | 2,360           | 4,949,737           | 45.67%                           | 11.86%                         |
| Connecticut          | 31,110             | 29,170             | 6,470                     | 23.03%                              | 4,240                 | 1,880           | 3,116,144           | 46.63%                           | 10.74%                         |
| Delaware             | 30,740             | 27,550             | 7,320                     | 26.24%                              | 4,410                 | 1,930           | 862,991             | 45.08%                           | 11.83%                         |
| District of Columbia | 33,670             | 31,100             | 7,020                     | 23.83%                              | 2,710                 | 1,580           | 571,519             | 58.97%                           | 14.05%                         |
| Florida              | 100,440            | 89,390             | 19,410                    | 22.94%                              | 12,660                | 5,860           | 18,944,478          | 45.35%                           | 10.41%                         |
| Georgia              | 42,120             | 39,440             | 9,030                     | 24.03%                              | 7,390                 | 3,660           | 9,063,934           | 47.37%                           | 11.38%                         |
| Hawaii               | 34,040             | 31,370             | 7,310                     | 22.78%                              | 5,450                 | 2,150           | 1,186,032           | 39.25%                           | 8.94%                          |
| Idaho                | 29,380             | 26,510             | 6,400                     | 24.43%                              | 4,500                 | 2,120           | 1,602,439           | 46.75%                           | 11.42%                         |
| Illinois             | 72,730             | 68,130             | 13,680                    | 20.57%                              | 10,180                | 4,220           | 10,699,618          | 41.48%                           | 8.53%                          |
| Indiana              | 30,960             | 27,790             | 6,800                     | 26.29%                              | 5,010                 | 2,540           | 5,711,050           | 53.06%                           | 13.95%                         |
| Iowa                 | 31,500             | 28,840             | 6,440                     | 25.41%                              | 4,210                 | 2,020           | 2,687,084           | 49.47%                           | 12.57%                         |
| Kansas               | 30,330             | 27,450             | 7,690                     | 30.14%                              | 6,060                 | 2,770           | 2,427,570           | 45.46%                           | 13.70%                         |
| Kentucky             | 34,140             | 29,860             | 6,930                     | 25.70%                              | 4,260                 | 2,250           | 3,774,627           | 54.68%                           | 14.05%                         |
| Louisiana            | 31,950             | 27,300             | 6,650                     | 26.11%                              | 4,510                 | 2,020           | 3,814,798           | 44.90%                           | 11.72%                         |
| Maine                | 29,200             | 24,510             | 7,760                     | 29.69%                              | 4,240                 | 1,920           | 1,206,541           | 51.18%                           | 15.19%                         |
| Maryland             | 34,750             | 32,670             | 8,270                     | 27.35%                              | 5,740                 | 2,720           | 5,195,630           | 44.56%                           | 12.18%                         |
| Massachusetts        | 32,280             | 30,320             | 6,800                     | 24.39%                              | 4,580                 | 2,070           | 6,058,538           | 46.69%                           | 11.39%                         |
| Michigan             | 75,600             | 67,700             | 17,810                    | 27.52%                              | 11,100                | 5,430           | 8,578,357           | 52.05%                           | 14.32%                         |
| Minnesota            | 28,520             | 26,500             | 5,970                     | 22.27%                              | 3,840                 | 1,740           | 4,814,878           | 45.76%                           | 10.19%                         |
| Mississippi          | 30,920             | 27,030             | 5,530                     | 21.96%                              | 4,020                 | 2,050           | 2,447,134           | 50.78%                           | 11.15%                         |

See notes at end of table.

(continued)

**Table C.3 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Screening and Interview Response Rates, and Population Estimates, by State, for People Aged 12 or Older: 2021 and 2022 (continued)**

| State          | Total Selected DUs | Total Eligible DUs | Total Completed Screeners | Weighted DU Screening Response Rate | Total Selected People | Total Responded | Population Estimate | Weighted Interview Response Rate | Weighted Overall Response Rate |
|----------------|--------------------|--------------------|---------------------------|-------------------------------------|-----------------------|-----------------|---------------------|----------------------------------|--------------------------------|
| Missouri       | 30,840             | 27,280             | 6,660                     | 25.65%                              | 4,090                 | 1,890           | 5,192,973           | 48.24%                           | 12.37%                         |
| Montana        | 28,850             | 25,140             | 4,990                     | 17.87%                              | 3,020                 | 1,460           | 948,083             | 54.46%                           | 9.73%                          |
| Nebraska       | 27,420             | 24,950             | 6,380                     | 26.57%                              | 4,810                 | 2,330           | 1,626,627           | 48.90%                           | 12.99%                         |
| Nevada         | 34,150             | 32,140             | 6,290                     | 20.33%                              | 5,180                 | 2,450           | 2,678,520           | 48.73%                           | 9.91%                          |
| New Hampshire  | 30,230             | 27,170             | 7,540                     | 30.52%                              | 5,020                 | 2,190           | 1,217,900           | 48.36%                           | 14.76%                         |
| New Jersey     | 48,140             | 44,940             | 8,940                     | 19.48%                              | 6,560                 | 2,720           | 7,880,573           | 43.37%                           | 8.45%                          |
| New Mexico     | 28,510             | 25,310             | 5,350                     | 22.32%                              | 4,060                 | 2,090           | 1,785,619           | 51.24%                           | 11.44%                         |
| New York       | 89,810             | 82,630             | 16,010                    | 21.22%                              | 11,890                | 5,530           | 16,896,809          | 47.80%                           | 10.14%                         |
| North Carolina | 47,260             | 42,790             | 8,090                     | 19.31%                              | 4,910                 | 2,560           | 8,950,060           | 51.32%                           | 9.91%                          |
| North Dakota   | 27,340             | 23,930             | 5,400                     | 22.16%                              | 3,690                 | 1,790           | 636,689             | 47.81%                           | 10.59%                         |
| Ohio           | 77,120             | 72,320             | 19,900                    | 28.17%                              | 12,860                | 5,640           | 9,941,073           | 43.15%                           | 12.16%                         |
| Oklahoma       | 31,800             | 28,320             | 6,080                     | 21.58%                              | 4,230                 | 1,920           | 3,303,614           | 52.15%                           | 11.25%                         |
| Oregon         | 29,660             | 27,860             | 8,230                     | 32.08%                              | 5,190                 | 2,240           | 3,663,678           | 43.48%                           | 13.95%                         |
| Pennsylvania   | 72,740             | 67,680             | 13,840                    | 21.52%                              | 9,140                 | 4,320           | 11,084,973          | 50.10%                           | 10.78%                         |
| Rhode Island   | 29,900             | 25,680             | 5,150                     | 21.94%                              | 3,240                 | 1,530           | 947,353             | 47.75%                           | 10.48%                         |
| South Carolina | 33,570             | 29,430             | 5,160                     | 17.33%                              | 3,310                 | 1,680           | 4,434,479           | 53.57%                           | 9.28%                          |
| South Dakota   | 28,700             | 24,530             | 4,790                     | 19.17%                              | 3,510                 | 1,800           | 740,702             | 51.57%                           | 9.89%                          |
| Tennessee      | 32,580             | 29,670             | 5,760                     | 21.25%                              | 3,820                 | 1,790           | 5,918,867           | 46.79%                           | 9.94%                          |
| Texas          | 92,730             | 83,760             | 16,550                    | 20.72%                              | 13,780                | 6,680           | 24,491,600          | 48.32%                           | 10.01%                         |
| Utah           | 29,060             | 26,440             | 6,860                     | 26.77%                              | 6,700                 | 3,360           | 2,735,448           | 53.77%                           | 14.39%                         |
| Vermont        | 28,240             | 24,320             | 8,670                     | 34.28%                              | 5,000                 | 2,400           | 568,333             | 51.52%                           | 17.66%                         |
| Virginia       | 50,670             | 45,940             | 14,610                    | 33.29%                              | 10,010                | 5,410           | 7,253,532           | 53.01%                           | 17.65%                         |
| Washington     | 31,800             | 29,590             | 8,090                     | 29.39%                              | 5,600                 | 2,220           | 6,575,202           | 40.43%                           | 11.88%                         |
| West Virginia  | 29,630             | 25,980             | 5,880                     | 22.95%                              | 3,400                 | 1,680           | 1,524,524           | 45.68%                           | 10.48%                         |
| Wisconsin      | 29,520             | 26,380             | 8,890                     | 34.01%                              | 5,660                 | 2,630           | 5,031,363           | 49.46%                           | 16.82%                         |
| Wyoming        | 27,690             | 25,220             | 4,180                     | 15.97%                              | 2,620                 | 1,400           | 488,142             | 56.75%                           | 9.06%                          |

DU = dwelling unit.

NOTE: To compute the pooled 2021-2022 weighted response rates, two samples were combined, and the individual year weights were used for the pooled sample. Thus, the response rates presented here are weighted across 2 years of data rather than being a simple average of the 2021 and 2022 individual response rates. The 2021-2022 population estimate is the average of the 2021 and the 2022 population.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2021 and 2022.



**Table C.4 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Interview Response Rates, and Population Estimates, by State and Three Age Groups: 2021 and 2022**

| State                | 12-17                       |                             |                                 | 12-17<br>Weighted<br>Interview<br>Response<br>Rate | 18-25                       |                             |                                 | 18-25<br>Weighted<br>Interview<br>Response<br>Rate | 26+                         |                           |                               | 26+<br>Weighted<br>Interview<br>Response<br>Rate |
|----------------------|-----------------------------|-----------------------------|---------------------------------|--|-----------------------------|-----------------------------|---------------------------------|--|-----------------------------|---------------------------|-------------------------------|--|
|                      | Total<br>Selected<br>People | 12-17<br>Total<br>Responded | 12-17<br>Population<br>Estimate |  | Total<br>Selected<br>People | 18-25<br>Total<br>Responded | 18-25<br>Population<br>Estimate |  | Total<br>Selected<br>People | 26+<br>Total<br>Responded | 26+<br>Population<br>Estimate |  |
| Total U.S.           | 70,560                      | 28,080                      | 25,872,524                      | 40.00%   | 74,750                      | 33,790                      | 34,122,364                      | 43.85%   | 157,690                     | 79,340                    | 220,930,805                   | 48.09%   |
| Northeast            | 11,990                      | 4,600                       | 4,104,598                       | 37.62%   | 13,260                      | 5,710                       | 5,818,780                       | 43.65%   | 28,660                      | 14,230                    | 39,053,787                    | 49.14%   |
| Midwest              | 17,200                      | 6,320                       | 5,440,294                       | 37.23%   | 18,980                      | 8,600                       | 7,200,212                       | 43.18%   | 38,840                      | 19,880                    | 45,447,479                    | 48.88%   |
| South                | 24,090                      | 10,470                      | 10,136,465                      | 43.37%   | 23,830                      | 11,390                      | 13,019,706                      | 46.41%   | 51,280                      | 26,240                    | 84,191,103                    | 49.01%   |
| West                 | 17,290                      | 6,690                       | 6,191,167                       | 38.50%   | 18,690                      | 8,090                       | 8,083,666                       | 40.46%   | 38,910                      | 19,000                    | 52,238,436                    | 45.11%   |
| Alabama              | 1,470                       | 550                         | 393,704                         | 37.93%   | 1,580                       | 630                         | 526,289                         | 37.84%   | 3,100                       | 1,280                     | 3,340,077                     | 40.10%   |
| Alaska               | 950                         | 360                         | 58,826                          | 38.54%   | 1,020                       | 510                         | 66,424                          | 49.99%   | 2,140                       | 1,130                     | 461,034                       | 52.53%   |
| Arizona              | 1,120                       | 450                         | 578,033                         | 40.58%   | 1,160                       | 480                         | 777,664                         | 39.43%   | 2,300                       | 1,080                     | 4,845,642                     | 44.64%   |
| Arkansas             | 830                         | 290                         | 247,411                         | 29.03%   | 1,150                       | 540                         | 316,207                         | 46.76%   | 1,940                       | 1,020                     | 1,971,802                     | 52.57%   |
| California           | 4,190                       | 1,630                       | 3,079,273                       | 38.76%   | 4,450                       | 1,900                       | 4,031,192                       | 40.28%   | 9,910                       | 4,400                     | 26,002,284                    | 43.02%   |
| Colorado             | 1,220                       | 470                         | 441,750                         | 38.68%   | 1,390                       | 560                         | 601,443                         | 39.40%   | 2,740                       | 1,330                     | 3,906,545                     | 47.45%   |
| Connecticut          | 1,070                       | 410                         | 271,722                         | 35.42%   | 860                         | 330                         | 384,205                         | 40.35%   | 2,310                       | 1,130                     | 2,460,217                     | 48.86%   |
| Delaware             | 1,090                       | 450                         | 73,627                          | 38.10%   | 1,100                       | 450                         | 94,266                          | 39.20%   | 2,210                       | 1,030                     | 695,097                       | 46.71%   |
| District of Columbia | 710                         | 350                         | 34,089                          | 48.39%   | 660                         | 400                         | 78,188                          | 62.78%   | 1,350                       | 840                       | 459,242                       | 59.14%   |
| Florida              | 3,030                       | 1,270                       | 1,517,905                       | 42.68%   | 2,810                       | 1,330                       | 1,993,062                       | 45.25%   | 6,820                       | 3,260                     | 15,433,511                    | 45.62%   |
| Georgia              | 1,650                       | 790                         | 911,418                         | 47.44%   | 1,920                       | 990                         | 1,141,805                       | 51.37%   | 3,820                       | 1,880                     | 7,010,711                     | 46.73%   |
| Hawaii               | 1,190                       | 370                         | 97,277                          | 36.84%   | 1,270                       | 490                         | 119,211                         | 36.37%   | 2,990                       | 1,290                     | 969,544                       | 39.83%   |
| Idaho                | 1,250                       | 490                         | 169,856                         | 38.34%   | 1,040                       | 470                         | 205,607                         | 42.13%   | 2,210                       | 1,160                     | 1,226,976                     | 48.77%   |
| Illinois             | 2,400                       | 780                         | 997,988                         | 33.75%   | 2,510                       | 980                         | 1,291,885                       | 37.37%   | 5,270                       | 2,470                     | 8,409,745                     | 43.07%   |
| Indiana              | 1,020                       | 440                         | 557,815                         | 45.38%   | 1,450                       | 740                         | 746,264                         | 51.17%   | 2,540                       | 1,370                     | 4,406,972                     | 54.29%   |
| Iowa                 | 1,100                       | 400                         | 259,019                         | 35.50%   | 930                         | 460                         | 359,075                         | 46.53%   | 2,170                       | 1,170                     | 2,068,990                     | 51.72%   |
| Kansas               | 1,290                       | 510                         | 247,041                         | 40.19%   | 1,680                       | 720                         | 325,321                         | 39.77%   | 3,100                       | 1,530                     | 1,855,208                     | 47.23%   |
| Kentucky             | 1,070                       | 480                         | 353,994                         | 48.56%   | 1,070                       | 560                         | 459,501                         | 52.87%   | 2,110                       | 1,220                     | 2,961,131                     | 55.70%   |
| Louisiana            | 1,110                       | 450                         | 371,784                         | 40.45%   | 940                         | 400                         | 462,611                         | 39.01%   | 2,460                       | 1,180                     | 2,980,404                     | 46.36%   |
| Maine                | 950                         | 350                         | 91,759                          | 32.30%   | 1,080                       | 450                         | 122,906                         | 41.04%   | 2,210                       | 1,120                     | 991,876                       | 54.18%   |
| Maryland             | 1,470                       | 650                         | 475,216                         | 42.41%   | 1,400                       | 610                         | 590,957                         | 42.38%   | 2,880                       | 1,460                     | 4,129,457                     | 45.12%   |
| Massachusetts        | 870                         | 290                         | 484,370                         | 33.99%   | 1,230                       | 540                         | 780,681                         | 45.12%   | 2,480                       | 1,240                     | 4,793,486                     | 48.19%   |
| Michigan             | 2,750                       | 1,100                       | 762,425                         | 39.61%   | 2,540                       | 1,190                       | 1,057,351                       | 47.51%   | 5,810                       | 3,140                     | 6,758,582                     | 54.22%   |
| Minnesota            | 940                         | 320                         | 460,314                         | 33.28%   | 910                         | 410                         | 571,740                         | 40.06%   | 1,980                       | 1,020                     | 3,782,825                     | 48.16%   |
| Mississippi          | 1,040                       | 460                         | 249,074                         | 43.79%   | 820                         | 410                         | 310,305                         | 49.43%   | 2,170                       | 1,180                     | 1,887,755                     | 51.81%   |

See notes at end of table.

(continued)

**Table C.4 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Interview Response Rates, and Population Estimates, by State and Three Age Groups: 2021 and 2022 (continued)**

| State          | 12-17<br>Total<br>Selected<br>People | 12-17<br>Total<br>Responded | 12-17<br>Population<br>Estimate | 12-17<br>Weighted<br>Interview<br>Response<br>Rate | 18-25<br>Total<br>Selected<br>People | 18-25<br>Total<br>Responded | 18-25<br>Population<br>Estimate | 18-25<br>Weighted<br>Interview<br>Response<br>Rate | 26+<br>Total<br>Selected<br>People | 26+<br>Total<br>Responded | 26+<br>Population<br>Estimate | 26+<br>Weighted<br>Interview<br>Response<br>Rate |
|----------------|--------------------------------------|-----------------------------|---------------------------------|--|--------------------------------------|-----------------------------|---------------------------------|--|------------------------------------|---------------------------|-------------------------------|--|
| Missouri       | 980                                  | 330                         | 484,076                         | 34.27%   | 960                                  | 450                         | 633,471                         | 48.00%   | 2,160                              | 1,120                     | 4,075,426                     | 49.98%   |
| Montana        | 760                                  | 260                         | 83,060                          | 33.08%   | 720                                  | 300                         | 113,948                         | 41.29%   | 1,540                              | 900                       | 751,075                       | 58.72%   |
| Nebraska       | 1,090                                | 410                         | 166,489                         | 36.49%   | 1,130                                | 540                         | 215,057                         | 46.21%   | 2,590                              | 1,380                     | 1,245,082                     | 51.02%   |
| Nevada         | 1,170                                | 510                         | 246,070                         | 44.54%   | 1,370                                | 620                         | 291,511                         | 43.63%   | 2,640                              | 1,320                     | 2,140,939                     | 49.91%   |
| New Hampshire  | 1,100                                | 400                         | 94,312                          | 38.00%   | 1,240                                | 480                         | 137,275                         | 40.37%   | 2,680                              | 1,310                     | 986,314                       | 50.39%   |
| New Jersey     | 1,690                                | 610                         | 714,121                         | 33.36%   | 1,720                                | 710                         | 885,791                         | 40.63%   | 3,150                              | 1,400                     | 6,280,661                     | 44.89%   |
| New Mexico     | 910                                  | 420                         | 171,531                         | 43.49%   | 1,120                                | 510                         | 219,619                         | 42.15%   | 2,040                              | 1,160                     | 1,394,469                     | 53.54%   |
| New York       | 2,460                                | 1,010                       | 1,390,382                       | 41.58%   | 2,880                                | 1,350                       | 2,008,152                       | 45.41%   | 6,550                              | 3,170                     | 13,498,275                    | 48.78%   |
| North Carolina | 1,290                                | 560                         | 821,139                         | 43.00%   | 1,010                                | 540                         | 1,085,634                       | 46.13%   | 2,620                              | 1,460                     | 7,043,287                     | 53.05%   |
| North Dakota   | 780                                  | 250                         | 60,108                          | 32.13%   | 990                                  | 520                         | 93,239                          | 51.15%   | 1,910                              | 1,020                     | 483,343                       | 49.02%   |
| Ohio           | 2,860                                | 1,040                       | 913,127                         | 37.29%   | 3,360                                | 1,400                       | 1,191,403                       | 37.53%   | 6,630                              | 3,190                     | 7,836,543                     | 44.68%   |
| Oklahoma       | 1,070                                | 400                         | 334,389                         | 38.65%   | 1,050                                | 440                         | 432,228                         | 46.13%   | 2,120                              | 1,080                     | 2,536,997                     | 55.12%   |
| Oregon         | 1,130                                | 410                         | 305,508                         | 34.86%   | 1,450                                | 590                         | 414,171                         | 39.72%   | 2,610                              | 1,240                     | 2,944,000                     | 44.92%   |
| Pennsylvania   | 1,990                                | 790                         | 941,516                         | 38.04%   | 2,380                                | 1,050                       | 1,303,282                       | 43.90%   | 4,770                              | 2,490                     | 8,840,175                     | 52.29%   |
| Rhode Island   | 760                                  | 280                         | 73,693                          | 34.37%   | 720                                  | 310                         | 123,546                         | 43.14%   | 1,770                              | 940                       | 750,114                       | 49.71%   |
| South Carolina | 810                                  | 300                         | 400,148                         | 36.48%   | 840                                  | 440                         | 518,615                         | 50.82%   | 1,670                              | 940                       | 3,515,715                     | 55.81%   |
| South Dakota   | 790                                  | 270                         | 74,771                          | 34.93%   | 930                                  | 500                         | 93,272                          | 46.86%   | 1,790                              | 1,040                     | 572,660                       | 54.38%   |
| Tennessee      | 940                                  | 350                         | 541,577                         | 38.10%   | 990                                  | 460                         | 704,563                         | 44.24%   | 1,890                              | 970                       | 4,672,727                     | 48.10%   |
| Texas          | 3,090                                | 1,370                       | 2,626,489                       | 45.07%   | 3,280                                | 1,570                       | 3,248,100                       | 46.44%   | 7,420                              | 3,740                     | 18,617,011                    | 49.10%   |
| Utah           | 1,550                                | 700                         | 336,717                         | 45.78%   | 1,630                                | 770                         | 441,684                         | 48.69%   | 3,520                              | 1,890                     | 1,957,046                     | 56.27%   |
| Vermont        | 1,110                                | 460                         | 42,722                          | 39.53%   | 1,160                                | 500                         | 72,942                          | 42.04%   | 2,740                              | 1,440                     | 452,669                       | 54.09%   |
| Virginia       | 2,590                                | 1,400                       | 656,870                         | 52.54%   | 2,380                                | 1,210                       | 882,759                         | 48.60%   | 5,040                              | 2,800                     | 5,713,902                     | 53.73%   |
| Washington     | 1,270                                | 410                         | 575,380                         | 29.81%   | 1,410                                | 520                         | 743,224                         | 35.50%   | 2,930                              | 1,290                     | 5,256,598                     | 42.39%   |
| West Virginia  | 860                                  | 360                         | 127,630                         | 41.95%   | 850                                  | 430                         | 174,617                         | 48.94%   | 1,690                              | 900                       | 1,222,277                     | 45.59%   |
| Wisconsin      | 1,190                                | 480                         | 457,123                         | 38.70%   | 1,580                                | 710                         | 622,136                         | 44.34%   | 2,890                              | 1,450                     | 3,952,104                     | 51.61%   |
| Wyoming        | 580                                  | 230                         | 47,888                          | 40.58%   | 680                                  | 380                         | 57,968                          | 53.02%   | 1,360                              | 800                       | 382,286                       | 59.43%   |

NOTE: Computations in this table are based on a respondent's age at screening. Thus, the data in the Total Responded column(s) could differ from data in other National Survey on Drug Use and Health tables that use the respondent's age recorded during the interview.

NOTE: To compute the pooled 2021-2022 weighted response rates, two samples were combined, and the individual year weights were used for the pooled sample. Thus, the response rates presented here are weighted across 2 years of data rather than being a simple average of the 2021 and 2022 individual response rates. The 2021-2022 population estimate is the average of the 2021 and the 2022 population.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2021 and 2022.

**Table C.5 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Interview Response Rates, and Population Estimates among People Aged 12 to 20, by State: 2021 and 2022**

| State                | 2022                  |                      |                          | 2022 Weighted Interview Response Rate | 2021-2022             |                           |                               | 2021-2022 Weighted Interview Response Rate |
|----------------------|-----------------------|----------------------|--------------------------|---------------------------------------|-----------------------|---------------------------|-------------------------------|--|
|                      | Total Selected People | 2022 Total Responded | 2022 Population Estimate |                                       | Total Selected People | 2021-2022 Total Responded | 2021-2022 Population Estimate |  |
| Total U.S.           | 48,260                | 20,760               | 38,653,784               | 42.64%                                | 96,970                | 39,790                    | 38,873,120                    | 41.26%                                     |
| Northeast            | 8,360                 | 3,510                | 6,183,133                | 42.63%                                | 16,630                | 6,610                     | 6,344,042                     | 39.89%                                     |
| Midwest              | 11,470                | 4,630                | 8,081,912                | 39.47%                                | 23,910                | 9,220                     | 8,122,082                     | 38.56%                                     |
| South                | 16,490                | 7,580                | 15,199,338               | 45.19%                                | 32,520                | 14,430                    | 15,131,110                    | 44.42%                                     |
| West                 | 11,950                | 5,050                | 9,189,401                | 41.23%                                | 23,910                | 9,540                     | 9,275,886                     | 39.40%                                     |
| Alabama              | 1,080                 | 440                  | 658,453                  | 38.77%                                | 2,040                 | 790                       | 622,896                       | 38.98%                                     |
| Alaska               | 660                   | 290                  | 82,643                   | 46.38%                                | 1,320                 | 560                       | 85,591                        | 43.40%                                     |
| Arizona              | 790                   | 340                  | 864,757                  | 44.24%                                | 1,510                 | 610                       | 881,330                       | 41.19%                                     |
| Arkansas             | 610                   | 260                  | 376,770                  | 35.75%                                | 1,250                 | 460                       | 371,859                       | 33.18%                                     |
| California           | 2,740                 | 1,140                | 4,490,808                | 40.17%                                | 5,840                 | 2,360                     | 4,591,929                     | 39.63%                                     |
| Colorado             | 840                   | 350                  | 655,002                  | 41.98%                                | 1,680                 | 640                       | 671,150                       | 38.61%                                     |
| Connecticut          | 730                   | 310                  | 399,395                  | 42.52%                                | 1,360                 | 520                       | 388,517                       | 35.70%                                     |
| Delaware             | 830                   | 340                  | 106,736                  | 39.64%                                | 1,510                 | 620                       | 107,674                       | 39.14%                                     |
| District of Columbia | 430                   | 230                  | 45,371                   | 49.29%                                | 850                   | 420                       | 50,039                        | 51.13%                                     |
| Florida              | 2,190                 | 990                  | 2,290,090                | 44.39%                                | 4,040                 | 1,770                     | 2,357,934                     | 44.64%                                     |
| Georgia              | 1,090                 | 550                  | 1,320,021                | 49.79%                                | 2,330                 | 1,140                     | 1,357,113                     | 49.33%                                     |
| Hawaii               | 840                   | 280                  | 133,774                  | 38.70%                                | 1,640                 | 540                       | 138,552                       | 37.76%                                     |
| Idaho                | 930                   | 400                  | 253,058                  | 41.73%                                | 1,630                 | 640                       | 236,977                       | 37.56%                                     |
| Illinois             | 1,720                 | 630                  | 1,506,623                | 37.11%                                | 3,360                 | 1,130                     | 1,513,395                     | 34.50%                                     |
| Indiana              | 700                   | 330                  | 785,799                  | 44.85%                                | 1,500                 | 660                       | 802,835                       | 45.24%                                     |
| Iowa                 | 670                   | 270                  | 394,371                  | 42.60%                                | 1,450                 | 570                       | 403,986                       | 40.25%                                     |
| Kansas               | 750                   | 300                  | 358,724                  | 40.47%                                | 1,870                 | 760                       | 359,114                       | 40.26%                                     |
| Kentucky             | 710                   | 350                  | 504,010                  | 50.62%                                | 1,450                 | 650                       | 517,281                       | 48.37%                                     |
| Louisiana            | 680                   | 290                  | 562,664                  | 40.71%                                | 1,450                 | 600                       | 552,765                       | 40.77%                                     |
| Maine                | 610                   | 240                  | 132,053                  | 30.92%                                | 1,310                 | 490                       | 137,365                       | 34.40%                                     |
| Maryland             | 950                   | 410                  | 677,104                  | 42.15%                                | 1,970                 | 870                       | 684,156                       | 43.05%                                     |
| Massachusetts        | 680                   | 270                  | 761,710                  | 39.55%                                | 1,300                 | 470                       | 833,843                       | 35.94%                                     |
| Michigan             | 1,590                 | 710                  | 1,093,699                | 44.97%                                | 3,620                 | 1,490                     | 1,122,417                     | 41.50%                                     |
| Minnesota            | 630                   | 250                  | 713,172                  | 34.27%                                | 1,290                 | 470                       | 712,587                       | 35.63%                                     |
| Mississippi          | 720                   | 320                  | 375,568                  | 45.95%                                | 1,340                 | 610                       | 354,412                       | 44.75%                                     |

See notes at end of table.

(continued)

**Table C.5 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Interview Response Rates, and Population Estimates among People Aged 12 to 20, by State: 2021 and 2022 (continued)**

| State          | 2022                  |                      |                          | 2022 Weighted Interview Response Rate | 2021-2022             |                           |                               | 2021-2022 Weighted Interview Response Rate |
|----------------|-----------------------|----------------------|--------------------------|---------------------------------------|-----------------------|---------------------------|-------------------------------|--|
|                | Total Selected People | 2022 Total Responded | 2022 Population Estimate |                                       | Total Selected People | 2021-2022 Total Responded | 2021-2022 Population Estimate |  |
| Missouri       | 700                   | 260                  | 716,726                  | 35.63%                                | 1,290                 | 460                       | 700,159                       | 37.65%                                     |
| Montana        | 510                   | 200                  | 123,220                  | 37.00%                                | 980                   | 350                       | 121,320                       | 33.05%                                     |
| Nebraska       | 750                   | 310                  | 250,314                  | 39.80%                                | 1,480                 | 590                       | 249,876                       | 39.24%                                     |
| Nevada         | 890                   | 400                  | 361,653                  | 42.48%                                | 1,680                 | 740                       | 361,815                       | 44.05%                                     |
| New Hampshire  | 830                   | 300                  | 136,615                  | 35.11%                                | 1,550                 | 570                       | 138,404                       | 38.46%                                     |
| New Jersey     | 1,170                 | 470                  | 1,026,389                | 37.94%                                | 2,310                 | 880                       | 1,073,257                     | 37.24%                                     |
| New Mexico     | 710                   | 330                  | 262,958                  | 45.22%                                | 1,340                 | 600                       | 249,706                       | 42.34%                                     |
| New York       | 1,810                 | 800                  | 2,139,725                | 46.06%                                | 3,410                 | 1,480                     | 2,166,954                     | 43.61%                                     |
| North Carolina | 800                   | 380                  | 1,258,366                | 41.96%                                | 1,640                 | 750                       | 1,187,258                     | 43.01%                                     |
| North Dakota   | 550                   | 210                  | 92,781                   | 37.64%                                | 1,130                 | 420                       | 92,178                        | 37.85%                                     |
| Ohio           | 2,020                 | 780                  | 1,337,530                | 38.64%                                | 4,050                 | 1,510                     | 1,364,433                     | 37.10%                                     |
| Oklahoma       | 700                   | 270                  | 450,622                  | 43.30%                                | 1,430                 | 540                       | 460,739                       | 40.44%                                     |
| Oregon         | 730                   | 300                  | 489,363                  | 39.80%                                | 1,630                 | 620                       | 470,912                       | 37.25%                                     |
| Pennsylvania   | 1,370                 | 620                  | 1,404,957                | 44.95%                                | 2,860                 | 1,180                     | 1,418,015                     | 40.55%                                     |
| Rhode Island   | 550                   | 250                  | 119,823                  | 41.53%                                | 1,010                 | 390                       | 119,271                       | 36.66%                                     |
| South Carolina | 570                   | 210                  | 574,747                  | 33.60%                                | 1,090                 | 440                       | 576,245                       | 39.41%                                     |
| South Dakota   | 560                   | 240                  | 105,822                  | 38.51%                                | 1,090                 | 420                       | 108,209                       | 39.10%                                     |
| Tennessee      | 630                   | 260                  | 855,369                  | 40.95%                                | 1,260                 | 490                       | 814,451                       | 39.05%                                     |
| Texas          | 2,090                 | 1,030                | 3,947,692                | 48.85%                                | 4,290                 | 1,950                     | 3,936,941                     | 45.76%                                     |
| Utah           | 920                   | 450                  | 511,882                  | 49.58%                                | 2,080                 | 940                       | 508,680                       | 46.51%                                     |
| Vermont        | 610                   | 250                  | 62,466                   | 34.92%                                | 1,510                 | 630                       | 68,416                        | 38.83%                                     |
| Virginia       | 1,930                 | 1,060                | 1,006,140                | 52.66%                                | 3,420                 | 1,840                     | 989,195                       | 52.23%                                     |
| Washington     | 970                   | 380                  | 897,395                  | 38.12%                                | 1,770                 | 590                       | 892,683                       | 32.48%                                     |
| West Virginia  | 500                   | 210                  | 189,615                  | 38.65%                                | 1,160                 | 500                       | 190,152                       | 42.64%                                     |
| Wisconsin      | 840                   | 340                  | 726,352                  | 38.88%                                | 1,780                 | 730                       | 692,892                       | 39.57%                                     |
| Wyoming        | 430                   | 180                  | 62,888                   | 41.33%                                | 810                   | 340                       | 65,240                        | 43.17%                                     |

NOTE: Computations in this table are based on a respondent’s age at screening. Thus, the data in the Total Responded column(s) could differ from data in other National Survey on Drug Use and Health tables that use the respondent’s age recorded during the interview.

NOTE: To compute the pooled 2021-2022 weighted response rates, two samples were combined, and the individual year weights were used for the pooled sample. Thus, the response rates presented here are weighted across 2 years of data rather than being a simple average of the 2021 and 2022 individual response rates. The 2021-2022 population estimate is the average of the 2021 population and the 2022 population.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2021 and 2022.

**Table C.6 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Interview Response Rates, and Population Estimates among People Aged 18 or Older, by State: 2021 and 2022**

| State                | 2022                  |                      |                          | 2022 Weighted Interview Response Rate | 2021-2022             |                           |                               | 2021-2022 Weighted Interview Response Rate |
|----------------------|-----------------------|----------------------|--------------------------|---------------------------------------|-----------------------|---------------------------|-------------------------------|--|
|                      | Total Selected People | 2022 Total Responded | 2022 Population Estimate |                                       | Total Selected People | 2021-2022 Total Responded | 2021-2022 Population Estimate |  |
| Total U.S.           | 115,650               | 56,560               | 256,281,676              | 48.01%                                | 232,440               | 113,140                   | 255,053,169                   | 47.52%                                     |
| Northeast            | 21,460                | 10,210               | 44,959,024               | 48.94%                                | 41,910                | 19,940                    | 44,872,567                    | 48.44%                                     |
| Midwest              | 27,680                | 13,810               | 52,755,553               | 49.71%                                | 57,820                | 28,480                    | 52,647,691                    | 48.10%                                     |
| South                | 38,140                | 19,060               | 97,986,028               | 48.45%                                | 75,110                | 37,630                    | 97,210,809                    | 48.66%                                     |
| West                 | 28,380                | 13,480               | 60,581,071               | 45.13%                                | 57,600                | 27,090                    | 60,322,102                    | 44.49%                                     |
| Alabama              | 2,440                 | 1,000                | 3,885,333                | 38.97%                                | 4,680                 | 1,910                     | 3,866,366                     | 39.77%                                     |
| Alaska               | 1,600                 | 850                  | 528,064                  | 54.46%                                | 3,160                 | 1,640                     | 527,458                       | 52.21%                                     |
| Arizona              | 1,680                 | 800                  | 5,672,582                | 45.03%                                | 3,460                 | 1,560                     | 5,623,305                     | 43.93%                                     |
| Arkansas             | 1,500                 | 800                  | 2,298,515                | 53.67%                                | 3,090                 | 1,560                     | 2,288,009                     | 51.73%                                     |
| California           | 6,850                 | 3,040                | 30,076,859               | 43.36%                                | 14,360                | 6,290                     | 30,033,476                    | 42.66%                                     |
| Colorado             | 2,030                 | 910                  | 4,536,348                | 44.37%                                | 4,120                 | 1,890                     | 4,507,988                     | 46.36%                                     |
| Connecticut          | 1,650                 | 770                  | 2,854,820                | 47.71%                                | 3,170                 | 1,470                     | 2,844,422                     | 47.71%                                     |
| Delaware             | 1,760                 | 720                  | 797,462                  | 42.80%                                | 3,320                 | 1,480                     | 789,363                       | 45.76%                                     |
| District of Columbia | 1,010                 | 610                  | 539,188                  | 58.36%                                | 2,000                 | 1,230                     | 537,430                       | 59.67%                                     |
| Florida              | 5,240                 | 2,490                | 17,642,764               | 43.79%                                | 9,630                 | 4,590                     | 17,426,573                    | 45.58%                                     |
| Georgia              | 2,720                 | 1,420                | 8,215,815                | 48.48%                                | 5,740                 | 2,870                     | 8,152,516                     | 47.36%                                     |
| Hawaii               | 2,030                 | 880                  | 1,092,371                | 40.11%                                | 4,260                 | 1,780                     | 1,088,755                     | 39.46%                                     |
| Idaho                | 1,930                 | 960                  | 1,452,020                | 45.48%                                | 3,250                 | 1,640                     | 1,432,584                     | 47.79%                                     |
| Illinois             | 3,800                 | 1,710                | 9,702,202                | 44.88%                                | 7,780                 | 3,440                     | 9,701,630                     | 42.30%                                     |
| Indiana              | 1,940                 | 1,090                | 5,173,887                | 58.35%                                | 3,990                 | 2,110                     | 5,153,236                     | 53.86%                                     |
| Iowa                 | 1,410                 | 780                  | 2,434,415                | 54.89%                                | 3,100                 | 1,620                     | 2,428,065                     | 50.96%                                     |
| Kansas               | 1,900                 | 900                  | 2,186,849                | 48.82%                                | 4,780                 | 2,260                     | 2,180,529                     | 46.09%                                     |
| Kentucky             | 1,490                 | 870                  | 3,424,388                | 58.74%                                | 3,180                 | 1,770                     | 3,420,633                     | 55.32%                                     |
| Louisiana            | 1,510                 | 730                  | 3,438,416                | 48.04%                                | 3,400                 | 1,580                     | 3,443,014                     | 45.36%                                     |
| Maine                | 1,690                 | 790                  | 1,122,086                | 53.01%                                | 3,290                 | 1,570                     | 1,114,782                     | 52.74%                                     |
| Maryland             | 2,040                 | 910                  | 4,730,478                | 42.07%                                | 4,270                 | 2,070                     | 4,720,413                     | 44.77%                                     |
| Massachusetts        | 1,990                 | 980                  | 5,587,651                | 50.84%                                | 3,710                 | 1,770                     | 5,574,168                     | 47.77%                                     |
| Michigan             | 3,640                 | 1,970                | 7,825,089                | 55.57%                                | 8,350                 | 4,330                     | 7,815,932                     | 53.29%                                     |
| Minnesota            | 1,470                 | 710                  | 4,367,754                | 46.85%                                | 2,900                 | 1,420                     | 4,354,564                     | 47.07%                                     |
| Mississippi          | 1,600                 | 820                  | 2,198,096                | 49.34%                                | 2,990                 | 1,590                     | 2,198,060                     | 51.49%                                     |

See notes at end of table.

(continued)

**Table C.6 Survey Sample Sizes (Rounded to the Nearest 10), Weighted Interview Response Rates, and Population Estimates among People Aged 18 or Older, by State: 2021 and 2022 (continued)**

| State          | 2022                  |                      |                          | 2022 Weighted Interview Response Rate | 2021-2022             |                           |                               | 2021-2022 Weighted Interview Response Rate |
|----------------|-----------------------|----------------------|--------------------------|---------------------------------------|-----------------------|---------------------------|-------------------------------|--|
|                | Total Selected People | 2022 Total Responded | 2022 Population Estimate |                                       | Total Selected People | 2021-2022 Total Responded | 2021-2022 Population Estimate |  |
| Missouri       | 1,700                 | 840                  | 4,722,988                | 50.92%                                | 3,120                 | 1,560                     | 4,708,897                     | 49.71%                                     |
| Montana        | 1,180                 | 610                  | 873,876                  | 57.31%                                | 2,260                 | 1,190                     | 865,023                       | 56.43%                                     |
| Nebraska       | 1,840                 | 960                  | 1,465,034                | 52.90%                                | 3,720                 | 1,920                     | 1,460,139                     | 50.30%                                     |
| Nevada         | 2,090                 | 1,010                | 2,453,621                | 50.43%                                | 4,010                 | 1,940                     | 2,432,450                     | 49.16%                                     |
| New Hampshire  | 2,180                 | 990                  | 1,127,868                | 50.84%                                | 3,920                 | 1,790                     | 1,123,588                     | 49.20%                                     |
| New Jersey     | 2,510                 | 1,100                | 7,183,737                | 43.66%                                | 4,860                 | 2,110                     | 7,166,453                     | 44.35%                                     |
| New Mexico     | 1,620                 | 860                  | 1,620,045                | 52.66%                                | 3,150                 | 1,680                     | 1,614,088                     | 52.03%                                     |
| New York       | 4,870                 | 2,260                | 15,503,130               | 47.85%                                | 9,430                 | 4,520                     | 15,506,426                    | 48.36%                                     |
| North Carolina | 1,720                 | 960                  | 8,200,755                | 53.73%                                | 3,620                 | 1,990                     | 8,128,921                     | 52.14%                                     |
| North Dakota   | 1,440                 | 760                  | 579,276                  | 50.44%                                | 2,910                 | 1,540                     | 576,581                       | 49.36%                                     |
| Ohio           | 5,130                 | 2,370                | 9,036,243                | 44.06%                                | 9,990                 | 4,590                     | 9,027,946                     | 43.73%                                     |
| Oklahoma       | 1,640                 | 770                  | 2,985,939                | 54.56%                                | 3,160                 | 1,530                     | 2,969,225                     | 53.75%                                     |
| Oregon         | 1,670                 | 770                  | 3,366,065                | 46.15%                                | 4,060                 | 1,830                     | 3,358,170                     | 44.29%                                     |
| Pennsylvania   | 3,600                 | 1,840                | 10,177,677               | 53.04%                                | 7,150                 | 3,540                     | 10,143,457                    | 51.20%                                     |
| Rhode Island   | 1,320                 | 660                  | 874,716                  | 48.05%                                | 2,490                 | 1,250                     | 873,660                       | 48.84%                                     |
| South Carolina | 1,310                 | 700                  | 4,076,790                | 52.81%                                | 2,500                 | 1,380                     | 4,034,331                     | 55.20%                                     |
| South Dakota   | 1,390                 | 820                  | 672,418                  | 57.15%                                | 2,720                 | 1,530                     | 665,932                       | 53.34%                                     |
| Tennessee      | 1,520                 | 740                  | 5,419,337                | 42.97%                                | 2,880                 | 1,440                     | 5,377,289                     | 47.61%                                     |
| Texas          | 5,480                 | 2,820                | 22,115,615               | 49.50%                                | 10,690                | 5,310                     | 21,865,111                    | 48.71%                                     |
| Utah           | 2,340                 | 1,190                | 2,428,246                | 55.08%                                | 5,150                 | 2,660                     | 2,398,730                     | 54.87%                                     |
| Vermont        | 1,660                 | 830                  | 527,339                  | 49.21%                                | 3,900                 | 1,940                     | 525,611                       | 52.47%                                     |
| Virginia       | 3,990                 | 2,120                | 6,623,626                | 53.53%                                | 7,410                 | 4,010                     | 6,596,661                     | 53.06%                                     |
| Washington     | 2,330                 | 1,010                | 6,038,619                | 42.97%                                | 4,340                 | 1,810                     | 5,999,822                     | 41.50%                                     |
| West Virginia  | 1,170                 | 600                  | 1,393,512                | 47.60%                                | 2,540                 | 1,320                     | 1,396,894                     | 46.00%                                     |
| Wisconsin      | 2,040                 | 920                  | 4,589,398                | 47.91%                                | 4,470                 | 2,160                     | 4,574,240                     | 50.61%                                     |
| Wyoming        | 1,030                 | 590                  | 442,354                  | 58.05%                                | 2,040                 | 1,180                     | 440,254                       | 58.55%                                     |

NOTE: Computations in this table are based on a respondent's age at screening. Thus, the data in the Total Responded column(s) could differ from data in other National Survey on Drug Use and Health tables that use the respondent's age recorded during the interview.

NOTE: To compute the pooled 2021-2022 weighted response rates, two samples were combined, and the individual year weights were used for the pooled sample. Thus, the response rates presented here are weighted across 2 years of data rather than being a simple average of the 2021 and 2022 individual response rates. The 2021-2022 population estimate is the average of the 2021 population and the 2022 population.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2021 and 2022.

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## **Section E: List of Contributors**

This National Survey on Drug Use and Health (NSDUH) document was prepared by the Center for Behavioral Health Statistics and Quality (CBHSQ), Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services (HHS), and by RTI International, Research Triangle Park, North Carolina. Work by RTI was performed under Contract No. HHSS283201700002C. Marlon Daniel served as government project officer and as the contracting officer representative.

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