

2022-2023

**National Surveys on Drug Use and Health:
Other Sources of State-Level Data**

Introduction

A variety of surveys and data systems other than the National Survey on Drug Use and Health (NSDUH) collect data on substance use and mental health. This document briefly describes one of these other data systems that publish state estimates and presents selected comparisons with NSDUH results. The state-level survey that collects data on substance use discussed in this document is the Behavioral Risk Factor Surveillance System (BRFSS), sponsored by the Centers for Disease Control and Prevention (CDC).

Another CDC data system that provides state-level substance use estimates for most but not all states is the Youth Risk Behavior Survey (YRBS). Differences between the YRBS and NSDUH sampling designs, as well as the wider range of age groups used in NSDUH state small area estimates mean that comparisons of estimates are not straightforward. However, ignoring these differences and examining estimates at the national level, the YRBS has generally been shown to have higher estimates than NSDUH (Center for Behavioral Health Statistics and Quality [CBHSQ], 2023).¹ Note that comparisons between the state YRBS estimates and the NSDUH state small area estimates are not presented because of some of the differences discussed above.

When considering the information presented in this document, it is important to understand the methodological differences between the BRFSS and NSDUH and the impact that these differences could have on estimates of substance use and mental health. Several studies have compared NSDUH estimates with estimates from other studies and have evaluated how differences may have been affected by differences in survey methodology (Brener et al., 2006; CBHSQ, 2012; Gfroerer et al., 1997; Grucza et al., 2007; Hennessy & Ginsberg, 2001; Miller et al., 2004). These studies suggest that the goals and approaches of surveys are often different, making comparisons among them difficult. Some methodological differences that have been identified as affecting comparisons include populations covered, sampling methods, mode of data collection, survey setting, questionnaires, and estimation methods.

Because of the coronavirus disease 2019 (COVID-19) pandemic, an additional web data collection mode was introduced to the 2020 NSDUH. The 2022 and 2023 surveys continued the use of multimode data collection procedures that were first implemented in October 2020 for the 2020 NSDUH. For 2022, 42.4 percent of interviews were completed via the web, and 57.6 percent were completed in person. In 2023, 36.1 percent of the interviews were completed via the web, and 63.9 percent were completed in person.²

BRFSS is an annual state-based system of health surveys that collects information using landline and cellular telephones on health-related risk behaviors (including cigarette and alcohol use), chronic health conditions, healthcare access, and use of preventive services among the noninstitutionalized adult population aged 18 or older. During 2022 and 2023, all 50 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands collected BRFSS data

¹ For further details about the YRBS and the Youth Risk Behavior Surveillance System, see the following webpage: <https://www.cdc.gov/healthyouth/data/yrbs/index.htm>.

² For more details about the NSDUH, see Section 2 of *2023 National Survey on Drug Use and Health: Methodological Summary and Definitions* at <https://www.samhsa.gov/data/report/2023-methodological-summary-and-definitions>.

using computer-assisted telephone interviewing (CATI). Note that, in 2023, Kentucky and Pennsylvania were unable to collect enough BRFSS data to meet the minimum requirements for inclusion in the 2023 public dataset. Thus, the estimates shown in this report for Kentucky and Pennsylvania are based only on 2022 data. The 2022-2023 BRFSS state estimates and confidence intervals presented here are design-based (direct) estimates (i.e., each respondent is weighted in a way that accounts for the survey design).³

In both BRFSS and NSDUH, data are collected on the following three substance use measures in each of the 50 states and the District of Columbia:⁴

- past month alcohol use,
- cigarette use (“past month” use for NSDUH and “current” use for BRFSS), and
- past month binge alcohol use.

Note that estimates for these measures are compared in this document. The BRFSS and NSDUH questions that were used for the three measures are shown in the next section.

Past month alcohol use is defined consistently in both BRFSS and NSDUH as having an alcoholic beverage in the past month. Similarly, past month binge alcohol use is defined consistently in the two surveys as drinking five or more drinks (for males) or four or more drinks (for females) on the same occasion (i.e., at the same time or within a couple of hours of each other) on at least 1 day in the past 30 days.

In NSDUH, past month cigarette use is defined as having smoked part or all of a cigarette during the past 30 days (i.e., the 30 days prior to the interview). In BRFSS, the cigarette use measure reported is current cigarette use, which is defined as having smoked at least 100 cigarettes during the lifetime and indicating smoking every day or some days at the time of the survey. Because of these subtle but present differences in definitions, NSDUH’s cigarette use estimates tend to be higher in that they cover two groups of people that the BRFSS estimates would not: (1) respondents who have not smoked 100 cigarettes in their lifetime but had smoked in the past month, and (2) respondents who had smoked a cigarette earlier in the month but were not smoking at the time of the survey.

This document presents findings comparing 2022-2023 BRFSS state design-based estimates with corresponding 2022-2023 NSDUH state small area estimates⁵ for past month alcohol use, past month binge alcohol use, and cigarette use (“past month” use for NSDUH and “current” use for BRFSS). In [Tables 1, 2, and 3](#) (shown after this text discussion), the 2022-2023 BRFSS state design-based estimates for adults aged 18 or older are shown alongside the 2022-2023 NSDUH small area estimates for the same age group. The BRFSS estimates were calculated using SUDAAN[®] Software for Statistical Analysis of Correlated Data (RTI International, 2013) and the publicly available BRFSS SAS[®] (SAS Institute Inc., 2017) datasets. [Tables 1](#) and [2](#) also include *p* values that indicate whether the BRFSS and NSDUH alcohol use

³ For more details about BRFSS in general, see the following webpage: <https://www.cdc.gov/brfss/>.

⁴ The District of Columbia is referred to as a “state” in this document.

⁵ For more information about NSDUH’s small area estimation, see Section B of *2022-2023 National Surveys on Drug Use and Health: Guide to State Tables and Summary of Small Area Estimation Methodology* at <https://www.samhsa.gov/data/report/2022-2023-nsduh-guide-state-tables-and-summary-sae-methodology>.

and binge alcohol use population percentages are significantly different from each other for a given state. The statistical test used for calculating the *p* values is described in the Methodology for Comparing BRFSS and NSDUH Estimates section. Users are advised to use caution when interpreting these significant differences due to the methodological differences in the two surveys.

Due to definitional differences in the cigarette use measure, no formal statistical tests of differences between NSDUH and BRFSS estimates were produced.

NSDUH and BRFSS Questions

The 2022 and 2023 NSDUH questions that were used to determine past month alcohol use and past month binge alcohol use were as follows:⁶

AL01 Have you **ever**, even once, had a drink of any type of alcoholic beverage? Please do not include times when you only had a sip or two from a drink.

- 1 Yes
- 2 No
- DK/REF⁷

ALLAST3 [IF AL01 = 1 OR ALREF = 1] How long has it been since you **last** drank an alcoholic beverage?

- 1 Within the past 30 days — that is, since [DATEFILL]
- 2 More than 30 days ago but within the past 12 months
- 3 More than 12 months ago

DK/REF

PROGRAMMER: SHOW 12 MONTH CALENDAR

AL08 [IF ALC30DAY = 1 – 30 OR ALCEST30 = (1 – 6, DK OR REF)] During the past 30 days, that is, since [DATEFILL], on how many days did you have [IF RSEX=5 THEN FILL 5 IF RSEX=9 THEN FILL 4] **or more** drinks on the same occasion? By ‘occasion,’ we mean at the same time or within a couple of hours of each other.

OF DAYS: _____ days in the past 30 days [RANGE: 0 - 30]

DK/REF

PROGRAMMER: SHOW 30 DAY CALENDAR

⁶ A PDF of the complete 2023 NSDUH questionnaire is available at <https://www.samhsa.gov/data/report/nsduh-2023-questionnaire>. Note, there were minor differences in the 2022 and 2023 AL08 questions. A PDF of the complete 2022 NSDUH questionnaire is available at <https://www.samhsa.gov/data/report/nsduh-2022-questionnaire>.

⁷ “DK” = “don’t know” and “REF” = “refused.”

The 2022 and 2023 BRFSS questions that were used to determine past month alcohol use and past month binge alcohol use were as follows:⁸

CALC.01 During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage?

INTERVIEWER NOTE: A 40-ounce beer would count as 3 drinks, or a cocktail with 2 shots would count as 2 drinks.

1 __	Days per week
2 __	Days in past 30 days
888	No drinks in past 30 days
777	Don't know / Not sure
999	Refused

CALC.03 Considering all types of alcoholic beverages, how many times during the past 30 days did you have X [CATI X = 5 for men, X = 4 for women] or more drinks on an occasion?

__	Number of times
77	Don't know / Not sure
88	No days
99	Refused

The 2002 and 2023 NSDUH questions that were used to determine past month cigarette use were as follows:

CG01 Have you **ever** smoked part or all of a cigarette?

1	Yes
2	No
DK/REF	

CG05 [IF CG01 = 1 OR CGREF1 = 1] Now think about the past 30 days, that is, from [DATEFILL] up to and including today. During the past 30 days, have you smoked part or all of a cigarette?

1	Yes
2	No
DK/REF	

PROGRAMMER: SHOW 30 DAY CALENDAR

⁸ A PDF of the complete 2023 BRFSS questionnaire is available at <https://www.cdc.gov/brfss/questionnaires/pdf-ques/2023-BRFSS-Questionnaire-508.pdf>.

The 2002 and 2003 BRFSS questions that were used to determine current cigarette use were as follows:

CTOB.01 Have you smoked at least 100 cigarettes in your entire life?

- 1 Yes
- 2 No
- 7 Don't know / Not sure
- 9 Refused

INTERVIEWER NOTE: Do not include: electronic cigarettes (e-cigarettes, njoy, bluetip, JUUL), herbal cigarettes, cigars, cigarillos, little cigars, pipes, bidis, kreteks, water pipes (hookahs) or marijuana. 5 packs = 100 cigarettes.

CTOB.02 Do you now smoke cigarettes every day, some days, or not at all?

- 1 Every day
- 2 Some days
- 3 Not at all
- 7 Don't know / Not sure
- 9 Refused

Methodology for Comparing BRFSS and NSDUH Estimates

The methodology used to compare BRFSS and NSDUH estimates is similar to what is described in Section B.7 of *2014-2015 National Survey on Drug Use and Health: Guide to State Tables and Summary of Small Area Estimation Methodology*.⁹ Here, the null hypothesis of no difference is tested, that is, $\pi_b = \pi_n$ (where π_b is the expected value¹⁰ of the BRFSS estimate and π_n is the expected value of the NSDUH estimate), or equivalently the log-odds ratio is zero, that

is, $lor = 0$, where lor is defined as $lor = \ln \left[\frac{\pi_b / (1 - \pi_b)}{\pi_n / (1 - \pi_n)} \right]$, and \ln denotes the natural logarithm.

An estimate of lor is given by $\hat{lor} = \ln \left[\frac{\hat{\pi}_b / (1 - \hat{\pi}_b)}{\hat{\pi}_n / (1 - \hat{\pi}_n)} \right]$, where $\hat{\pi}_b$ and $\hat{\pi}_n$ are the 2022-2023

BRFSS state-level design-based estimates and the 2022-2023 NSDUH state model-based estimates, respectively (as given in [Tables 1](#) and [2](#)). To compute the variance of \hat{lor} , that is,

$v(\hat{lor})$, let $\hat{\theta}_b = \frac{\hat{\pi}_b}{1 - \hat{\pi}_b}$ and $\hat{\theta}_n = \frac{\hat{\pi}_n}{1 - \hat{\pi}_n}$, then

$$v(\hat{lor}) = v \left[\ln(\hat{\theta}_b) \right] + v \left[\ln(\hat{\theta}_n) \right] - 2 \text{cov} \left[\ln(\hat{\theta}_b), \ln(\hat{\theta}_n) \right].$$

⁹ See the following website: <https://www.samhsa.gov/data/report/2014-2015-nsduh-guide-state-tables-and-summary-small-area-estimation-methodology>.

¹⁰ The expected value of an estimate is defined as the mean of the observed values of the estimate over repeated samples.

The covariance term can be assumed to be zero because the BRFSS and NSDUH samples are independent.

The quantity $v[\ln(\hat{\theta}_n)]$ can be obtained by using the 95 percent Bayesian confidence intervals in [Tables 1](#) and [2](#). For this purpose, let $(lower_n, upper_n)$ denote the 95 percent Bayesian confidence interval¹¹ for a given state:

$$v[\ln(\hat{\theta}_n)] = \left(\frac{U_n - L_n}{2 \times 1.96} \right)^2,$$

where $U_n = \ln\left(\frac{upper_n}{1 - upper_n}\right)$ and $L_n = \ln\left(\frac{lower_n}{1 - lower_n}\right)$.

The quantity $v[\ln(\hat{\theta}_b)]$ can be obtained by using the 95 percent confidence intervals in [Tables 1](#) and [2](#). For this purpose, let $(lower_b, upper_b)$ denote the 95 percent BRFSS confidence interval for a given state, then $v(\hat{\pi}_b)$ is given by

$$v(\hat{\pi}_b) = \left(\frac{upper_b - lower_b}{2 \times 1.96} \right)^2.$$

Now, using the first-order Taylor series approximation,¹² $v[\ln(\hat{\theta}_b)]$ can be calculated from $v(\hat{\pi}_b)$ as follows:

$$v[\ln(\hat{\theta}_b)] = v\left[\ln\left(\frac{\hat{\pi}_b}{1 - \hat{\pi}_b}\right)\right] \approx v(\hat{\pi}_b) \times \left(\frac{1}{\hat{\pi}_b(1 - \hat{\pi}_b)}\right)^2.$$

The p value that is given in [Tables 1](#) and [2](#) for testing the null hypothesis of no difference ($lor = 0$) is provided by $p \text{ value} = 2 \times P[Z \geq abs(z)]$, where Z is a standard normal random

variate, $z = \frac{\hat{lor}}{\sqrt{v[\ln(\hat{\theta}_b)] + v[\ln(\hat{\theta}_n)]}}$, and $abs(z)$ denotes the absolute value of z .

¹¹ For more information about NSDUH's small area estimation confidence intervals, see Section B of *2022-2023 National Surveys on Drug Use and Health: Guide to State Tables and Summary of Small Area Estimation Methodology* at <https://www.samhsa.gov/data/report/2022-2023-nsduh-guide-state-tables-and-summary-sae-methodology>.

¹² The first-order Taylor series approximation is defined as $v[f(x)] \approx v(x)[f'(x)]^2$, where $f'(x)$ is the first-order derivative of $f(x)$. If $f(x) = \ln\left(\frac{x}{1-x}\right)$, then $f'(x) = \left(\frac{1}{x(1-x)}\right)$.

Results: Alcohol Use, Binge Alcohol Use, and Cigarette Use

As seen in [Table 1](#), for past month alcohol use, the 2022-2023 NSDUH estimates and the 2022-2023 BRFSS estimates were statistically significantly different (i.e., at the 5 percent level of significance) for seven states (Arizona, Delaware, Hawaii, Kentucky, Pennsylvania, Texas, and Wyoming).¹³ Also, these two sets of estimates were highly correlated (correlation coefficient = 0.92).

The NSDUH estimates of past month binge alcohol use were significantly larger than the BRFSS estimates for all states (see [Table 2](#)). As noted previously, NSDUH and BRFSS used the same thresholds for binge alcohol use among males and females in the 2022 and 2023 surveys; therefore, these differences can be partly attributed to differences in data collection methodologies of BRFSS and NSDUH. First, the 2022-2023 NSDUHs used audio computer-assisted self-interviewing (ACASI) for in-person data collection and self-administration for web data collection, whereas BRFSS used CATI. Self-administration (including ACASI for in-person data collection) can increase respondent privacy for reporting of sensitive behaviors (such as binge drinking) and therefore may yield higher prevalence estimates than interviewer-administered modes such as CATI (Kreuter et al., 2008; Lind et al., 2013; Tourangeau & Smith, 1996; Turner et al., 1998). Although the NSDUH estimates were larger, these two sets of estimates are moderately correlated (correlation coefficient = 0.75).

[Table 3](#) shows the NSDUH estimates of past month cigarette use and the BRFSS estimates of current cigarette use. Statistical tests to examine significant differences between the NSDUH and BRFSS cigarette use population percentages are not included because the definitions are different, as discussed earlier in this document. Although the NSDUH estimates tended to be larger, these two sets of estimates were highly correlated (correlation coefficient = 0.91).

Sample Size Comparisons

The BRFSS estimates are design based, whereas the NSDUH estimates are model based. Both sets of estimates are based on 2 years of pooled data (2022-2023). The BRFSS sample sizes for a given state were, in general, much larger than the sample sizes for NSDUH. In the 2022-2023 NSDUHs, the 18 or older sample sizes in the states ranged from approximately 1,130 to 6,580 respondents, with a median sample size of 1,680.¹⁴ For the 2022-2023 BRFSSs, states had larger sample sizes as compared with their counterparts in NSDUH. Overall, the BRFSS sample sizes for the states varied from a low of 4,023 respondents in Kentucky¹⁵ to a high of 52,596 in Washington, with a median sample size of 15,579.¹⁶ Sample size differences of this magnitude

¹³ Kentucky and Pennsylvania BRFSS estimates are based only on 2022 data, whereas the NSDUH estimates are based on 2022-2023 data. This difference could contribute to the estimates being significantly different.

¹⁴ See Table C.4 in 2022-2023 Guide to State Tables and Summary of SAE Methodology at <https://www.samhsa.gov/data/report/2022-2023-nsduh-guide-state-tables-and-summary-sae-methodology>.

¹⁵ See note [footnote 13](#).

¹⁶ For details, see https://www.cdc.gov/brfss/annual_data/annual_2023.html.

explain why the NSDUH Bayesian confidence intervals were generally wider than the corresponding BRFSS design-based confidence intervals.

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Table 1 Alcohol Use in the Past Month: Among People Aged 18 or Older, by State: Annual Average Percentages, BRFSS and NSDUH, 2022 and 2023

State	BRFSS (Estimate)	BRFSS (95% Confidence Interval)	NSDUH (Estimate)	NSDUH (95% Confidence Interval)	P Value
Alabama	43.82	(42.37 - 45.28)	45.42	(42.42 - 48.45)	0.351
Alaska	53.13	(51.79 - 54.46)	51.50	(47.97 - 55.02)	0.399
Arizona	51.95	(50.84 - 53.06)	47.20	(43.42 - 51.02)	0.019
Arkansas	43.58	(42.25 - 44.90)	46.26	(42.60 - 49.95)	0.178
California	51.40	(50.37 - 52.43)	52.25	(50.38 - 54.11)	0.434
Colorado	61.18	(60.22 - 62.15)	58.64	(55.53 - 61.68)	0.118
Connecticut	58.22	(57.04 - 59.40)	57.64	(54.01 - 61.19)	0.762
Delaware	53.35	(51.71 - 54.99)	57.35	(54.10 - 60.54)	0.031
District of Columbia	67.45	(65.69 - 69.21)	65.99	(62.55 - 69.27)	0.449
Florida	54.03	(52.69 - 55.36)	52.62	(50.57 - 54.65)	0.257
Georgia	49.56	(48.36 - 50.76)	50.00	(47.19 - 52.81)	0.779
Hawaii	49.94	(48.75 - 51.13)	45.30	(41.63 - 49.03)	0.020
Idaho	47.63	(46.50 - 48.75)	48.51	(44.82 - 52.21)	0.655
Illinois	55.99	(54.58 - 57.39)	57.49	(54.98 - 59.96)	0.305
Indiana	49.50	(48.59 - 50.40)	50.58	(47.56 - 53.61)	0.499
Iowa	56.60	(55.63 - 57.57)	56.14	(52.38 - 59.84)	0.817
Kansas	53.65	(52.68 - 54.61)	57.19	(53.66 - 60.65)	0.058
Kentucky ¹	35.16	(33.04 - 37.29)	46.26	(43.18 - 49.36)	0.000
Louisiana	50.24	(48.94 - 51.54)	51.54	(48.38 - 54.68)	0.457
Maine	54.62	(53.64 - 55.60)	56.42	(52.71 - 60.06)	0.356
Maryland	52.08	(51.14 - 53.02)	52.72	(49.12 - 56.30)	0.735
Massachusetts	58.74	(57.71 - 59.77)	59.03	(55.78 - 62.20)	0.865
Michigan	53.65	(52.66 - 54.64)	53.75	(51.55 - 55.94)	0.935
Minnesota	58.84	(58.03 - 59.64)	56.73	(52.69 - 60.68)	0.309
Mississippi	42.78	(41.34 - 44.21)	42.19	(39.01 - 45.44)	0.747
Missouri	50.95	(49.81 - 52.08)	52.75	(49.06 - 56.40)	0.360
Montana	59.58	(58.53 - 60.63)	55.94	(52.09 - 59.72)	0.070
Nebraska	57.22	(56.25 - 58.18)	55.84	(52.48 - 59.15)	0.437
Nevada	54.64	(52.54 - 56.75)	51.32	(47.96 - 54.66)	0.099
New Hampshire	61.58	(60.28 - 62.88)	62.99	(59.80 - 66.07)	0.417
New Jersey	55.49	(54.34 - 56.63)	54.35	(51.40 - 57.28)	0.481
New Mexico	47.38	(45.72 - 49.05)	48.66	(45.23 - 52.11)	0.512
New York	54.54	(53.71 - 55.37)	53.41	(51.37 - 55.44)	0.313
North Carolina	48.76	(47.25 - 50.26)	49.22	(46.21 - 52.24)	0.786
North Dakota	58.45	(57.16 - 59.73)	59.70	(55.71 - 63.57)	0.555
Ohio	52.21	(51.33 - 53.10)	52.72	(50.57 - 54.87)	0.667
Oklahoma	43.96	(42.86 - 45.07)	44.53	(41.32 - 47.79)	0.744
Oregon	56.54	(55.34 - 57.75)	56.05	(52.35 - 59.67)	0.800
Pennsylvania ¹	51.81	(49.63 - 53.99)	55.71	(53.34 - 58.06)	0.017
Rhode Island	56.89	(55.47 - 58.30)	58.76	(54.97 - 62.45)	0.360
South Carolina	50.66	(49.61 - 51.70)	51.89	(48.06 - 55.71)	0.541
South Dakota	57.70	(55.32 - 60.08)	54.70	(50.92 - 58.43)	0.186
Tennessee	47.92	(46.59 - 49.24)	48.50	(44.97 - 52.05)	0.761
Texas	50.80	(49.57 - 52.03)	47.21	(45.37 - 49.06)	0.002
Utah	33.12	(32.23 - 34.01)	31.14	(28.56 - 33.83)	0.169
Vermont	60.75	(59.54 - 61.95)	63.04	(59.44 - 66.51)	0.233
Virginia	53.38	(52.23 - 54.53)	54.20	(51.72 - 56.66)	0.556
Washington	57.37	(56.78 - 57.96)	56.55	(53.16 - 59.89)	0.639
West Virginia	39.78	(38.54 - 41.03)	40.79	(37.05 - 44.64)	0.621
Wisconsin	59.54	(58.62 - 60.45)	61.84	(58.47 - 65.10)	0.194
Wyoming	51.80	(50.40 - 53.21)	56.45	(52.45 - 60.36)	0.032

BRFSS = Behavioral Risk Factor Surveillance System; NSDUH = National Survey on Drug Use and Health.

NOTE: NSDUH estimates along with 95 percent Bayesian confidence (credible) intervals are based on the survey-weighted hierarchical Bayes estimation approach and are generated by Markov Chain Monte Carlo techniques. BRFSS estimates are based on a survey-weighted direct estimation approach.

NOTE: The *p* value is the probability of more extreme values than the observed difference between the BRFSS and NSDUH estimates under the null hypothesis of no difference.

¹ In 2023, Kentucky and Pennsylvania were unable to collect enough BRFSS data to meet the minimum requirements for inclusion in the 2023 annual aggregate dataset. Thus, the BRFSS estimates for Kentucky and Pennsylvania are based on only the 2022 BRFSS data.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health, 2022 and 2023; Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance Systems, 2022 and 2023.

Table 2 Binge Alcohol Use in the Past Month: Among People Aged 18 or Older, by State: Annual Average Percentages, BRFSS and NSDUH, 2022 and 2023

State	BRFSS (Estimate)	BRFSS (95% Confidence Interval)	NSDUH (Estimate)	NSDUH (95% Confidence Interval)	P Value
Alabama	12.81	(11.77 - 13.84)	22.38	(20.05 - 24.91)	0.000
Alaska	17.42	(16.38 - 18.46)	21.06	(18.41 - 23.98)	0.012
Arizona	15.69	(14.84 - 16.54)	23.38	(20.47 - 26.56)	0.000
Arkansas	14.63	(13.63 - 15.62)	21.11	(18.54 - 23.92)	0.000
California	15.69	(14.96 - 16.42)	22.88	(21.42 - 24.40)	0.000
Colorado	18.60	(17.86 - 19.34)	24.79	(22.10 - 27.69)	0.000
Connecticut	15.28	(14.44 - 16.11)	25.30	(22.37 - 28.47)	0.000
Delaware	13.77	(12.60 - 14.95)	24.71	(22.15 - 27.47)	0.000
District of Columbia	26.54	(24.89 - 28.19)	33.05	(29.64 - 36.65)	0.001
Florida	14.50	(13.53 - 15.46)	22.57	(20.99 - 24.24)	0.000
Georgia	14.19	(13.32 - 15.06)	22.87	(20.69 - 25.20)	0.000
Hawaii	18.22	(17.29 - 19.16)	22.21	(19.39 - 25.31)	0.008
Idaho	15.14	(14.27 - 16.01)	22.40	(19.73 - 25.31)	0.000
Illinois	17.70	(16.63 - 18.77)	27.63	(25.50 - 29.86)	0.000
Indiana	14.88	(14.22 - 15.53)	21.49	(19.21 - 23.95)	0.000
Iowa	21.02	(20.20 - 21.83)	25.68	(22.66 - 28.96)	0.003
Kansas	16.56	(15.82 - 17.30)	26.04	(23.01 - 29.32)	0.000
Kentucky ¹	12.78	(11.25 - 14.32)	20.26	(17.88 - 22.85)	0.000
Louisiana	16.40	(15.45 - 17.35)	27.52	(24.82 - 30.40)	0.000
Maine	15.18	(14.44 - 15.93)	21.28	(18.71 - 24.10)	0.000
Maryland	13.17	(12.53 - 13.82)	21.77	(19.19 - 24.58)	0.000
Massachusetts	16.86	(16.10 - 17.62)	25.12	(22.57 - 27.86)	0.000
Michigan	16.06	(15.31 - 16.81)	23.56	(21.85 - 25.36)	0.000
Minnesota	18.37	(17.75 - 19.00)	25.41	(22.32 - 28.76)	0.000
Mississippi	13.29	(12.28 - 14.31)	21.34	(18.93 - 23.95)	0.000
Missouri	17.52	(16.61 - 18.43)	24.07	(21.29 - 27.10)	0.000
Montana	20.54	(19.63 - 21.44)	24.75	(21.90 - 27.84)	0.005
Nebraska	19.16	(18.35 - 19.96)	25.94	(23.28 - 28.78)	0.000
Nevada	16.79	(15.22 - 18.36)	24.55	(21.91 - 27.40)	0.000
New Hampshire	16.21	(15.12 - 17.30)	25.61	(23.10 - 28.29)	0.000
New Jersey	14.97	(14.15 - 15.78)	23.90	(21.56 - 26.40)	0.000
New Mexico	14.15	(12.92 - 15.38)	22.90	(20.26 - 25.79)	0.000
New York	15.72	(15.14 - 16.31)	24.20	(22.42 - 26.07)	0.000
North Carolina	15.12	(14.07 - 16.18)	22.57	(20.12 - 25.23)	0.000
North Dakota	21.90	(20.77 - 23.02)	27.38	(24.12 - 30.90)	0.001
Ohio	17.05	(16.36 - 17.74)	25.76	(23.91 - 27.70)	0.000
Oklahoma	13.62	(12.81 - 14.43)	20.76	(18.32 - 23.44)	0.000
Oregon	16.14	(15.28 - 17.01)	21.75	(19.14 - 24.61)	0.000
Pennsylvania ¹	17.03	(15.47 - 18.59)	24.07	(22.17 - 26.07)	0.000
Rhode Island	16.74	(15.63 - 17.86)	27.47	(24.43 - 30.74)	0.000
South Carolina	15.42	(14.63 - 16.21)	22.24	(19.50 - 25.24)	0.000
South Dakota	19.58	(17.67 - 21.50)	25.51	(22.56 - 28.69)	0.001
Tennessee	14.30	(13.35 - 15.25)	21.31	(18.74 - 24.13)	0.000
Texas	16.71	(15.73 - 17.68)	23.01	(21.49 - 24.61)	0.000
Utah	12.33	(11.66 - 12.99)	14.54	(12.63 - 16.68)	0.032
Vermont	16.94	(16.05 - 17.83)	27.15	(24.13 - 30.39)	0.000
Virginia	15.22	(14.37 - 16.07)	22.43	(20.49 - 24.50)	0.000
Washington	15.66	(15.23 - 16.09)	20.51	(18.12 - 23.12)	0.000
West Virginia	13.13	(12.24 - 14.03)	20.69	(17.87 - 23.84)	0.000
Wisconsin	19.27	(18.51 - 20.04)	30.43	(27.51 - 33.53)	0.000
Wyoming	16.35	(15.22 - 17.48)	24.86	(21.69 - 28.32)	0.000

BRFSS = Behavioral Risk Factor Surveillance System; NSDUH = National Survey on Drug Use and Health.

NOTE: Binge alcohol use is defined as drinking five or more drinks (for males) or four or more drinks (for females) on the same occasion (i.e., at the same time or within a couple of hours of each other) on at least 1 day in the past 30 days.

NOTE: NSDUH estimates along with 95 percent Bayesian confidence (credible) intervals are based on the survey-weighted hierarchical Bayes estimation approach and are generated by Markov Chain Monte Carlo techniques. BRFSS estimates are based on a survey-weighted direct estimation approach.

NOTE: The *p* value is the probability of more extreme values than the observed difference between the BRFSS and NSDUH estimates under the null hypothesis of no difference.

¹ In 2023, Kentucky and Pennsylvania were unable to collect enough BRFSS data to meet the minimum requirements for inclusion in the 2023 annual aggregate dataset. Thus, the BRFSS estimates for Kentucky and Pennsylvania are based on only the 2022 BRFSS data.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health, 2022 and 2023; Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance Systems, 2022 and 2023.

Table 3 Cigarette Use: Among People Aged 18 or Older, by State: Annual Average Percentages, BRFSS and NSDUH, 2022 and 2023

State	BRFSS ¹ (Estimate)	BRFSS ¹ (95% Confidence Interval)	NSDUH ² (Estimate)	NSDUH ² (95% Confidence Interval)
Alabama	14.93	(13.87 - 15.99)	22.61	(20.05 - 25.39)
Alaska	15.62	(14.68 - 16.57)	15.09	(12.96 - 17.50)
Arizona	11.18	(10.48 - 11.88)	15.79	(13.41 - 18.49)
Arkansas	16.80	(15.81 - 17.79)	21.52	(18.81 - 24.51)
California	9.08	(8.50 - 9.66)	9.96	(8.88 - 11.16)
Colorado	10.42	(9.83 - 11.02)	13.27	(11.30 - 15.53)
Connecticut	9.19	(8.52 - 9.85)	13.73	(11.56 - 16.24)
Delaware	12.08	(11.06 - 13.10)	16.90	(14.70 - 19.37)
District of Columbia	10.19	(8.95 - 11.43)	12.57	(10.55 - 14.92)
Florida	10.90	(10.10 - 11.70)	13.19	(11.86 - 14.66)
Georgia	12.29	(11.51 - 13.06)	17.88	(15.90 - 20.04)
Hawaii	9.49	(8.80 - 10.17)	13.07	(10.85 - 15.65)
Idaho	11.06	(10.34 - 11.78)	14.03	(11.86 - 16.53)
Illinois	11.49	(10.57 - 12.42)	15.68	(13.93 - 17.60)
Indiana	15.28	(14.64 - 15.93)	19.12	(16.97 - 21.48)
Iowa	14.22	(13.53 - 14.90)	16.45	(14.02 - 19.20)
Kansas	14.21	(13.52 - 14.89)	16.42	(14.01 - 19.16)
Kentucky ³	17.39	(15.73 - 19.05)	21.72	(19.30 - 24.34)
Louisiana	16.23	(15.28 - 17.18)	22.40	(19.90 - 25.11)
Maine	14.46	(13.72 - 15.20)	17.60	(15.18 - 20.30)
Maryland	9.34	(8.81 - 9.88)	12.44	(10.47 - 14.71)
Massachusetts	10.12	(9.46 - 10.78)	11.41	(9.64 - 13.46)
Michigan	14.40	(13.70 - 15.11)	17.33	(15.75 - 19.02)
Minnesota	12.60	(12.04 - 13.15)	13.98	(11.75 - 16.55)
Mississippi	16.50	(15.40 - 17.61)	22.31	(19.70 - 25.17)
Missouri	16.02	(15.18 - 16.87)	20.65	(17.96 - 23.63)
Montana	13.75	(12.97 - 14.53)	15.68	(13.33 - 18.36)
Nebraska	12.41	(11.76 - 13.05)	13.67	(11.52 - 16.16)
Nevada	14.51	(12.91 - 16.11)	17.10	(14.89 - 19.56)
New Hampshire	10.77	(9.91 - 11.63)	13.70	(11.79 - 15.87)
New Jersey	9.70	(9.03 - 10.37)	11.36	(9.74 - 13.20)
New Mexico	13.85	(12.69 - 15.00)	17.45	(15.06 - 20.12)
New York	10.26	(9.77 - 10.76)	13.62	(12.29 - 15.08)
North Carolina	13.86	(12.72 - 15.01)	17.01	(14.79 - 19.48)
North Dakota	14.10	(13.15 - 15.05)	17.94	(15.11 - 21.17)
Ohio	16.11	(15.45 - 16.77)	20.43	(18.68 - 22.31)
Oklahoma	15.71	(14.89 - 16.53)	21.08	(18.43 - 24.01)
Oregon	11.50	(10.74 - 12.26)	15.84	(13.44 - 18.58)
Pennsylvania ³	14.92	(13.24 - 16.60)	16.74	(15.07 - 18.56)
Rhode Island	10.61	(9.78 - 11.45)	15.36	(12.96 - 18.12)
South Carolina	13.66	(12.93 - 14.39)	18.22	(15.64 - 21.12)
South Dakota	14.55	(12.87 - 16.23)	18.19	(15.56 - 21.15)
Tennessee	17.72	(16.69 - 18.76)	19.48	(16.97 - 22.26)
Texas	11.61	(10.86 - 12.37)	15.96	(14.63 - 17.39)
Utah	6.29	(5.81 - 6.76)	8.94	(7.46 - 10.67)
Vermont	12.19	(11.35 - 13.04)	14.93	(12.73 - 17.44)
Virginia	11.60	(10.87 - 12.33)	14.03	(12.44 - 15.79)
Washington	9.47	(9.12 - 9.82)	13.32	(11.35 - 15.58)
West Virginia	20.72	(19.64 - 21.79)	26.46	(23.25 - 29.93)
Wisconsin	13.07	(12.45 - 13.68)	15.76	(13.53 - 18.29)
Wyoming	14.72	(13.70 - 15.74)	18.59	(15.75 - 21.81)

BRFSS = Behavioral Risk Factor Surveillance System; NSDUH = National Survey on Drug Use and Health.

NOTE: NSDUH estimates along with 95 percent Bayesian confidence (credible) intervals are based on the survey-weighted hierarchical Bayes estimation approach and are generated by Markov Chain Monte Carlo techniques. BRFSS estimates are based on a survey-weighted direct estimation approach.

¹ BRFSS respondents were classified as current smokers if they reported having smoked at least 100 cigarettes during their lifetime and indicated that they smoked every day or some days at the time of the survey.

² NSDUH respondents were classified as past month cigarette users if they smoked all or part of a cigarette during the past 30 days.

³ In 2023, Kentucky and Pennsylvania were unable to collect enough BRFSS data to meet the minimum requirements for inclusion in the 2023 annual aggregate dataset. Thus, the BRFSS estimates for Kentucky and Pennsylvania are based on only the 2022 BRFSS data.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health, 2022 and 2023; Centers for Disease Control and Prevention (CDC), Behavioral Risk Factor Surveillance Systems, 2022 and 2023.