



2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book

Section 12: Questionnaire Dwelling Unit-Level and Person Pair-Level Sampling Weight Calibration

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List of Terms and Abbreviations

<i>DU</i>	Dwelling unit.
<i>ev</i>	Extreme value. See Sections 6.1 and 6.2 for more detail.
<i>GEM</i>	Generalized exponential model. See Chapter 4 for more detail.
<i>household-level person pair count</i>	The number of pairs associated with a given domain in a given household. These counts are used as control totals in the poststratification step. See Chapter 11 in the <i>2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 10: Editing and Imputation Report</i> (Center for Behavioral Health Statistics and Quality [CBHSQ], forthcoming a) for details on how these counts are created, and Chapter 5 for details on their use in poststratification.
<i>IQR</i>	Interquartile range.
<i>multiplicity factor</i>	The number of pairs that can be associated with a given respondent (the person of focus in the pair) in a domain of interest. For example, consider a household with a mother, father, and a 13-year-old child. If the mother and child were selected, they would comprise a parent-child (aged 12-14) pair. Although the father was not selected, the child and father would also be considered a possible parent-child (12-14) pair, and to account for this, a multiplicity factor of two would be assigned. This is done to correctly weight pair members so that individuals who are members of more pairs do not receive a weight that is too large and members in fewer pairs do not receive a weight that is too small. See Center for Behavioral Health Statistics and Quality (forthcoming a) for more detail.
<i>nr</i>	Nonresponse.
<i>outwinsor</i>	The proportion of weights trimmed after extreme value adjustment via winsorization.
<i>pair age</i>	Defined by ages of two people, not by a single person (e.g., "12-17, 18 25" is a pair age).
<i>pair domain</i>	A pair relationship in which the target population is defined by one of the pair members, conditional on the attributes of the other pair member.
<i>pair relationship</i>	The relationship between selected pair members.
<i>parent-child</i>	A pair relationship where both pair members identify the other as part of a parent-child relationship or both pair members otherwise are determined to form a parent-child pair (through other evidence or through imputation).
<i>ps</i>	Poststratification.
<i>QDU</i>	Questionnaire dwelling unit: a dwelling unit in which at least one member responded to the questionnaire.
<i>res.pr.ev</i>	Respondent pair extreme value adjustment step. See Section 7.3.5 for more detail.
<i>res.pr.nr</i>	Respondent pair nonresponse adjustment step. See Section 7.3.3 for more detail.
<i>res.pr.ps</i>	Respondent pair poststratification adjustment step. See Section 7.3.4 for more detail.

<i>res.qdu.ev</i>	Respondent questionnaire dwelling unit extreme value adjustment step. See Section 7.2.5 for more detail.
<i>res.qdu.nr</i>	Respondent questionnaire dwelling unit nonresponse adjustment step. See Section 7.2.3 for more detail.
<i>res.qdu.ps</i>	Respondent questionnaire dwelling unit poststratification adjustment step. See Section 7.2.4 for more detail.
<i>SDU</i>	Screener dwelling unit: a household in which screener information is available.
<i>sel.pr.ps</i>	Selected person pair poststratification adjustment step. See Section 7.3.2 for more detail.
<i>sel.qdu.ps</i>	Selected questionnaire dwelling unit poststratification adjustment step. See Section 7.2.2 for more detail.
<i>sibling-sibling</i>	A pair relationship in which the pair members are siblings (reported to be so or otherwise determined to be so).
<i>spouse-spouse</i>	A pair relationship in which the pair members are either married or living together as though married (reported to be so or otherwise determined to be so).
<i>SSR</i>	State sampling region.
<i>UWE</i>	Unequal weighting effect. It refers to the contribution in the design effect due to unequal selection probability and is defined as $1 + [(n - 1)/n] * CV^2$, where CV = coefficient of variation of weights, and n is the sample size.
<i>winsorization</i>	A method of extreme weight adjustment that replaces extreme weights with the critical values used for defining low and high extreme weights.

Overview

This report documents the method of weight calibration used for producing the final set of questionnaire dwelling unit and pair weights for the National Survey on Drug Use and Health (NSDUH) data from 2024. NSDUH is conducted under contract with RTI International.¹ The weighting team faced several challenges in this task and addressed them by resorting to modifications of certain basic statistical ideas, which are listed as follows:

- Under Brewer’s method, high weights may occur because of small pair selection probabilities. In any calibration exercise, some treatment of extreme value (ev) in weights is needed, but there is a danger of introducing too much bias by over-treatment. In the generalized exponential model (GEM), which is described in detail in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 11: Person-Level Sampling Weight Calibration* report (Center for Behavioral Health Statistics and Quality [CBHSQ], forthcoming b), ev control is built in, but one needs to define suitable ev domains that reflect differential pair selection probability so that evs are defined appropriately. If too many design variables are used to define ev domains, then each domain will be very sparse and will not be of much use in defining thresholds for ev. Since the 2002 NSDUH, a hierarchy of domains was defined using pair age (each pair member being in one of the three categories: 12 to 25, 26 to 49, and 50+) and number of people aged 12 to 25 in the household, state, and clusters of states (see Section 6.2 for details).
- Control of evs in weights helps reduce instability of estimates to some extent, but there is a need for methods that do not introduce much bias. In the spirit of the famous suggestion of Hajek (1971) in his comments on Basu’s fabled example of circus elephants, a poststratification adjustment was performed on the estimated number of people belonging to each pair domain. See Section 7.3 for details on the creation of pair domains and their use in the poststratification process.
- In the absence of a suitable source of poststratification controls for the person pair-level weights and the household-level weights, the inherent two-stage interview design² of the survey was capitalized upon to estimate these controls from the large screener sample at the screening interview stage. The dwelling unit sample weight was poststratified to person-level U.S. Census Bureau counts to get more efficient estimated counts for pair and household data.
- The problem of multiplicities complicated the issue of providing one set of final weights. When dealing with person-level parameters involving drug-related behaviors among members of the same household, it is possible for an individual to manifest himself or herself in the pair sample through different pairs. To avoid overcounting, the pair

¹ RTI International is a trade name of Research Triangle Institute. RTI and the RTI logo are U.S. registered trademarks of Research Triangle Institute.

² The screening interview involves listing all eligible household members, along with their basic demographic information. Immediately after completion of the screening, 0, 1, or 2 people in the household are selected to complete the actual questionnaire interview. The first stage of data collection is screening, and the second stage is interviewing.

weights have to be divided by multiplicity factors,³ which tend to be domain specific. For this reason, multiplicity factors for a key set of pair analysis domains also are produced along with a set of final calibrated pair weights. See Chapter 14 in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 10: Editing and Imputation Report* (CBHSQ, forthcoming a).

- Missing items in the respondent questionnaire led to imputation for deriving pair relationships, multiplicity factors, and household counts for Hajek adjustments.

The calibration task described in this report has been in place, with minor modifications, since the 1999 NSDUH, which was then called the National Household Survey on Drug Abuse (NHSDA).⁴ Results from this calibration applied to an earlier survey year were presented at the 2001 Joint Statistical Meetings. The procedures described in the proceedings papers from these presentations can serve as useful supplemental reference material on estimation in the presence of multiplicities and extreme weights (Chromy & Singh, 2001) and on GEM calibration of pair weights (Penne et al., 2001). The experience of using the GEM with person weights is described in an earlier proceedings paper (Chen et al., 2000).

³ The number of pairs that can be associated with a given respondent (the person of focus in the pair) in a domain of interest. See List of Terms and Abbreviations for more detail.

⁴ NHSDA was renamed the National Survey on Drug Use and Health (NSDUH) in the 2002 survey year.

1. Introduction

Traditionally, most household surveys have been designed to measure characteristics of the entire household or to focus on a randomly selected respondent from among those determined to be eligible for the survey. Selecting more than one person from the same household is generally avoided because people from the same household often exhibit the same or similar characteristics and behavioral patterns. The intra-class correlation found among members of the same household leads to a clustering effect on the variance of estimates resulting in less precise estimates compared with estimates of the same sample size from a simple random sample. Selecting only one person per household avoids this clustering effect on the variance. The “one person per household” sampling approach, however, precludes the opportunity to gather information about the relationships among household members. The National Survey on Drug Use and Health (NSDUH) allows for a richer analytic capability of a survey designed to ensure a nonzero pairwise probability of selection among all eligible household members in each sample household. Achieving nonzero probabilities for all pairs within sampled households permits unbiased estimation of the within-dwelling unit (DU) component of variance. Besides providing efficient data collection, this sampling method also facilitates the study of the relationships of social behaviors among members of the same household. This report documents the methodology and development of calibrated weights for the second objective, the study of behavioral relationships among people residing in the same household. The report also describes the development of questionnaire dwelling unit (QDU) weights, which are of independent interest for studying household-level characteristics and are needed for producing household count estimates of the number of people belonging to pair relationship domains for use as poststratification controls for pair weights.

NSDUH allows for estimating characteristics at the person level, pair level, and household or QDU level. This report describes the weight calibration methods used for the pair- and QDU-level respondents. As described in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 11: Person-Level Sampling Weight Calibration* report (Center for Behavioral Health Statistics and Quality [CBHSQ], forthcoming b), NSDUH is an annual survey of about 67,500 people selected from the civilian, noninstitutionalized population aged 12 or older from all 50 states and the District of Columbia. A coordinated sample design was developed for the 2014 through 2024 NSDUHs. The coordinated design facilitated 50 percent overlap in third-stage units (area segments) within each successive 2-year period from 2014 through 2024. This designed sample overlap slightly increased the precision of estimates of year-to-year trends because of the expected small but positive correlation resulting from the overlapping sampled area segments between successive survey years. The 50 percent overlap of segments significantly reduced segment listing costs because only half of the segments needed to be listed for the 2014 through 2024 surveys.

Another modification from the 2005-2013 NSDUH is a change in the sampling strategy of using 8 “large” states to obtain 3,600 respondents and 43 “small” states (including the District of Columbia) to obtain 900 respondents. The 2014-2024 survey sample was designed to yield

- 4,560 completed interviews in California;

- 3,300 completed interviews each in Florida, New York, and Texas;
- 2,400 completed interviews each in Illinois, Michigan, Ohio, and Pennsylvania;
- 1,500 completed interviews each in Georgia, New Jersey, North Carolina, and Virginia;
- 967 completed interviews in Hawaii; and
- 960 completed interviews in each of the remaining 37 states and the District of Columbia.

Under a stratified design with states serving as the primary strata and state sampling regions serving as the secondary strata, census tracts, census block groups within census tracts, segments⁵ within census block groups, and DUs within segments were each selected using probability proportional to size sampling. Also in the 2014-2024 design was the incorporation of census block groups at the second stage of selection to potentially reduce sampling variance and facilitate moving to an address-based sampling design in the future, if desired. NSDUH is sometimes referred to as a two-stage interview sample in which the first interview stage consisted of a large number of screener dwelling units (SDUs; about 200,000) selected to ensure that various age groups (five in all: 12 to 17, 18 to 25, 26 to 34, 35 to 49, and 50+) of eligible individuals were represented adequately in the second interview stage. In the 2014-2024 NSDUH design, added focus (greater sample) was placed on the 26 or older age group to improve estimates of drug use and related health measures for this population. Unlike the 2005-2013 NSDUHs, which allocated state sample equally across the age categories 12 to 17, 18 to 25, and 26 or older, in the 2014-2024 design, the sample was allocated with 25 percent for 12 to 17, 25 percent for 18 to 25, 15 percent for 26 to 34, 20 percent for 35 to 49, and 15 percent for 50 or older. Information collected from SDUs also provided estimates of population controls (as in a two-stage interview sample design) for calibration at levels (such as pair and QDU) for which suitable U.S. Census Bureau-based controls were not available. The second interview stage consisted of the selection of zero, one, or two people from each selected SDU using a modification of Brewer's method such that prescribed sampling rates for the five age groups in each state were achieved with high selection rates for youths (12 to 17) and young adults (18 to 25). [Table 1.1](#) shows the eligible number of selected and responding SDUs, QDUs, pairs, and people for each of the 5 years (2020-2024). The distribution of pair data for different pairs of age groups may vary considerably (see Chapter 3 for details). It is seen that for certain less frequently occurring pairs of age group domains, particularly those with lower response rates, the realized sample size may not be sufficient to yield reliable estimates—for example, the pair of 26-34 and 50+ and the pair of 35-49 and 50+, as shown in [Table 3.1](#). Also, there may be problems of extreme weights due to small pair selection probabilities under Brewer's method that may cause instability of estimates. These and some other estimation issues related to pair data are discussed as follows, along with some adopted solutions.

⁵ In the 2023 and 2024 NSDUHs, a hybrid field enumeration and address-based sampling (ABS) approach was used to construct DU frames within sampled areas. Census block groups (CBGs) or "segments" selected at the second stage of selection were evaluated using a set of ABS coverage criteria. If a CBG met all coverage criteria, the ABS frame was used for the CBG. If a CBG failed one or more coverage criteria, field enumeration was applied to construct the DU frame.

Table 1.1 Sample Sizes; by Sample Unit, 2020-2024

Sample Unit		2020 ¹	2021	2022	2023	2024
SDU	Selected	536,203	1,021,716	864,285	804,971	927,672
	Completed	90,937	220,743	217,457	198,246	203,743
QDU	Selected	44,054	107,439	106,254	95,763	97,013
	Completed	29,200	57,385	57,666	54,321	56,588
Pair	Selected	18,461	44,776	44,535	39,974	40,157
	Completed	7,084	12,465	13,703	13,358	13,653
Person	Selected	62,515	152,215	150,789	135,737	137,170
	Completed	36,284	69,850	71,369	67,679	70,241

QDU = questionnaire dwelling unit; SDU = screener dwelling unit.

¹ In 2020, data collection occurred in only two quarters, thus producing a notably smaller sample size than in other NSDUH years.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2020-2024.

Note that for studying drug-related behavioral relationships among members of the same household, pair data are required because the outcome variable generally is defined with respect to the specific other member selected from the household. However, the parameter of interest is generally at the person level and is not at the pair level. For example, in the parent-child pairs, one may be interested in the proportion of children who have used drugs in the past year who have parents who report talking to their child about drugs. Here the target population consists only of children, not all possible pairs. Note that the pair-level (two people per QDU) sample forms a subsample of the larger person-level (one or two people per QDU) sample, with the QDUs themselves selected from the larger sample of completed SDUs. NSDUH has features of a two-stage interview design, which turns out to be useful for estimating calibration controls for poststratification of household-level weights and person pair-level weights. No other outside source is available for obtaining these controls. For this purpose, the screener-level household weights are poststratified to person-level census counts to obtain more efficient estimated controls for pair and household data.

In estimation for pair domains, two major problems arise: one is that of multiplicities because, for a given domain defined by the pair relationship, when the parameter of interest is at the person level, several possible pairs in the household could be associated with the same person. For example, analysts are interested in an outcome at the person level, the proportion of children who use drugs and whose parents report talking to them about drugs, where the focus is on the child in a parent-child pair. Several parent-child pairs in the household could be associated with the same child. If the household has two parents, the selected child has two inclusion possibilities (one with each parent) in the set of all such parent-child pairs (CBHSQ, forthcoming a). The other problem is that of extreme weights that may arise due to small selection probabilities for certain pair age groups, which may lead to unstable estimates. Each of these issues is discussed in turn.

If several potential pairs in the household are associated with the same person, it is necessary to use the average measure of behavior relationships for each member, which gives rise to multiplicities. Thus, the pair weights need to be divided by the person-level multiplicity factors for each domain of interest, and, therefore, multiplicity factors need to be produced along with the final set of calibrated weights. Because it is not straightforward to create these multiplicities, analyses would have to be necessarily limited to pair relationships where the multiplicities were produced a priori. The Substance Abuse and Mental Health Services Administration (SAMHSA) decided to limit pair analyses to the 14 pair domains listed in [Table 1.2](#). Because no multiplicity was necessary for the spouse-spouse/partner-partner pair relationships (by definition, each pair member could have only one partner or one spouse), multiplicity factors were produced for only 12 of these domains. Note that a single pair relationship might have two domains associated with it, because the parameter of interest might be associated with only one member of the pair (the “focus” member), and the multiplicity would differ depending upon which pair member was the focus member.

Table 1.2 Pair Domains

Pair Relationship	Focus
Parent-child: parent, child aged 12-14	Parent
Parent-child: parent, child aged 12-14	Child
Parent-child: parent, child aged 12-17	Parent
Parent-child: parent, child aged 12-17	Child
Parent-child: parent, child aged 12-20	Parent
Parent-child: parent, child aged 12-20	Child
Parent-child: parent, child aged 15-17	Parent
Parent-child: parent, child aged 15-17	Child
Sibling-sibling: older sibling 15-17, younger sibling 12-14	Older sibling
Sibling-sibling: older sibling 15-17, younger sibling 12-14	Younger sibling
Sibling-sibling: older sibling 18-25, younger sibling 12-17	Older sibling
Sibling-sibling: older sibling 18-25, younger sibling 12-17	Younger sibling
Spouse-spouse or partner-partner, with or without children	No multiplicity necessary
Spouse-spouse or partner-partner, with children aged 0-17	No multiplicity necessary

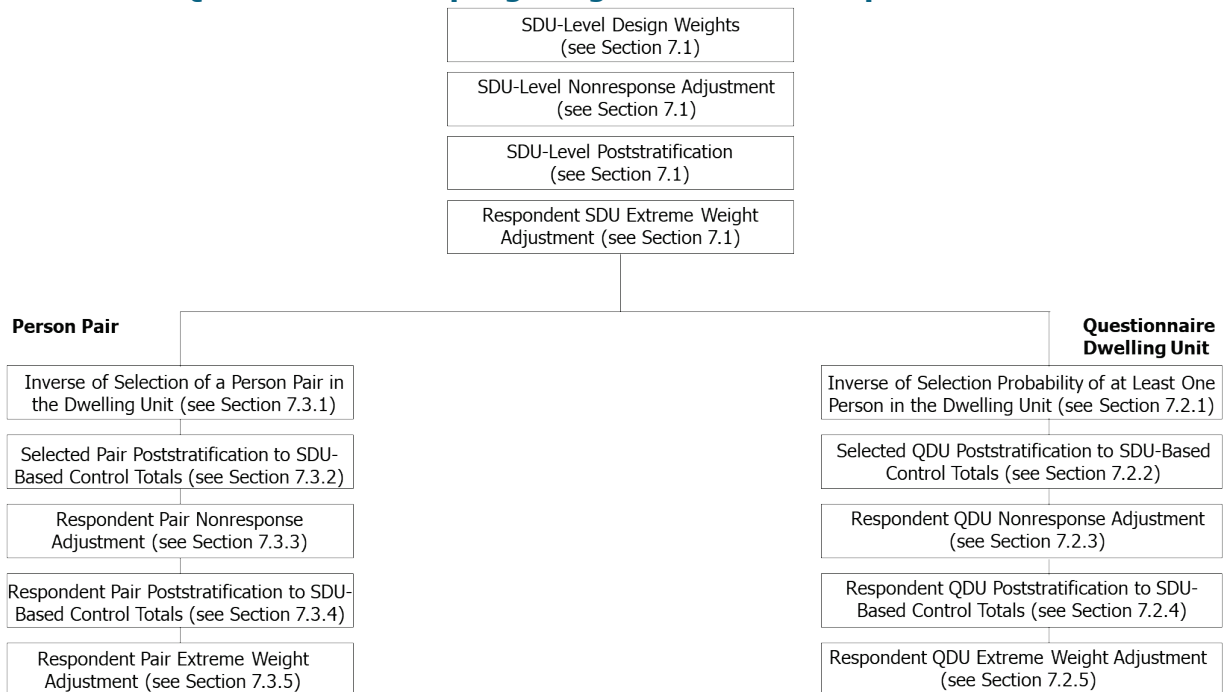
Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Some of the multiplicities, including counts of all possible pairs in a household for a given domain, were used for poststratification. Details are provided in Chapter 5. Additional information on the imputation of pair relationships, multiplicity factors, and household-level person counts for poststratification can be found in the 2024 Editing and Imputation Report (CBHSQ, forthcoming a). Special consideration is required for analysis of pair-level data, and details can be found in *How To Prepare and Analyze Pair Data in the National Survey on Drug Use and Health* (CBHSQ, 2017).

A resolution to the extreme weight problem is to use a Hajek-type modification (Hajek, 1971). This modification essentially entails calibration (like poststratification) to controls for the number of people in households belonging to each domain of interest. These controls can be obtained from the larger sample of singles and pairs (i.e., one or two people selected from DUs). Note, however, that the multiplicity factor, being domain specific, renders the calibration adjustment factor domain specific. This raises the question of finding one set of calibration weights for use with all domains or outcome variables. To get around this problem, a multivariate calibration with respect to a key set of pair domains was performed that simultaneously satisfies all the desired pair domains at once. This type of poststratification then was followed by a repeat poststratification to further control the extreme weights by imposing separate bound restrictions on the initially identified extreme weights.

The generalized exponential model (GEM) method (Folsom & Singh, 2000) was used for calibration of QDU- and pair-level design weights through several steps of adjustment as shown in [Exhibit 1.1](#). In the GEM, treatment of extreme value (ev) weights is built in via the definition of lower and upper bounds for the extreme weights. For pair data, there was a problem defining suitable domains for defining extreme weights, as explained in the following paragraphs.

Exhibit 1.1 QDU and Pair Sampling Weight Calibration Steps



Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

In dealing with extreme weights, it is assumed that they arise due to design (due to an imperfect frame, assignment of very small selection probabilities to some units, or a big weight adjustment factor after calibration) so that they make the sample representative of the population and, hence, do not introduce bias. The only problem is that they may lead to highly

unstable estimates similar to the problem of Basu’s circus elephants (Hajek, 1971).⁶ So, some treatment (such as winsorization⁷) may need to be performed within suitably defined extreme weight domains such that these domains contain units possibly from different strata but with similar sample selection probabilities to avoid the occurrence of extreme weights due to a mix of different designs. The domains must be large enough (e.g., at least size 30) to be able to define evs according to the domain-specific weight distribution. See Chapter 6 for more details on the extreme weight definition. Any ev treatment to increase precision of estimates would introduce some bias. However, this bias can be reduced considerably if the ev treatment is performed under calibration controls. This is what the built-in ev control in the GEM method tries to accomplish.

It follows that the definition of extreme weight domains should depend on factors that affect the selection probabilities of units in the sample, such as state- and age-specific sampling rates, segment selection probabilities, pair age-specific selection probabilities, and household composition. If one tries to define extreme weight domains by taking account of all these factors via cross-classification, it will lead to too many domains with insufficient observations. That is why it is difficult to define suitable extreme weight domains for pair data. In the case of person-level weights, it was less difficult, because state by age group suitably captured the extreme weight domain requirements. The definition of extreme weight domains for pair-level weighting used in the 2024 survey was the same as the one used in the 1999-2022 surveys. The domains were defined as the cross-classification of state, pair age,⁸ and number of people aged 12 to 25 in a household. In particular, the pair age was defined by the age groups of each pair member according to the age categories of 12 to 25, 26 to 49, and 50 or older (resulting in six pair age categories), and the number of people aged 12 to 25 was categorically defined as zero, one, and two or more. For more details, see Chapter 6.

In response to the coronavirus disease 2019 (COVID-19) pandemic, changes were made to the NSDUH sample design and data collection, affecting data collection since the 2020 survey in various ways (CBHSQ, 2022). For 2024, this meant the inclusion of web data collection and

⁶ A circus owner had 50 elephants, and wanted to estimate the total weight to help him make arrangements for shipping. To save time, he only wanted to weigh Sambo (an average sized elephant), and use 50 times its weight as an estimate. However, the circus statistician, being highly conscious of the optimality and unbiasedness of the Horvitz-Thompson (HT) estimator, objected about the potential bias of his estimate because of the purposive selection. Instead, he suggested random selection of an elephant with a very high probability of 99/100 for Sambo, and the rest including Jumbo (the biggest in the herd) with probability 1/4900 each. The circus owner was very unhappy with the statistician’s response of 100/99 times the Sambo’s weight as the estimate if Sambo got selected in this random draw, and was outraged with the response of 4900 times the Jumbo’s weight if Jumbo happened to get selected. It was obvious to the owner that this new estimator was extremely poor, although he didn’t know anything about its unbiasedness. The story had an unhappy ending with the circus statistician losing his job. To alleviate the instability of the HT-estimator, Hajek suggested to multiply it by 50 divided by inverse of the selection probability, which reduces simply to 50 times the weight of the selected elephant.

⁷ Winsorization is a method of ev adjustment that replaces evs with the critical values used for defining low and high evs.

⁸ Pair age in this case should not be confused with the modeling term, which has a finer level breakdown.

accounting for any resulting bias in the modeling. Respondent-level interview pair mode was added as a main effect in the respondent pair poststratification and respondent pair extreme value adjustment models in the 2024 pair weighting. This approach was then applied to the 2021 and 2022 NSDUH data as well, retroactively developing alternative pair-level analysis weights to reflect these changes. Discussion of adding interview pair mode to the modeling is found in Chapter 2.

2. Impact of Multimode Data Collection on Questionnaire Dwelling Unit and Pair-Level Weighting

In response to the coronavirus disease 2019 (COVID-19) pandemic, the Substance Abuse and Mental Health Services Administration approved the use of multimode data collection for the 2020 National Survey on Drug Use and Health (NSDUH). Response propensity is correlated with data collection mode; that is, web data collection tends to have lower response rates than in-person (field) data collection (see [Table 2.1](#)). In 2021-2024 NSDUH weighting, to correct for this potential bias, screening mode was added as a predictor variable in the dwelling unit-level nonresponse adjustment model, and interview mode was added to the person-level nonresponse adjustment model in developing person-level analysis weights. Correspondingly, screening mode was also included as part of the respondent questionnaire dwelling unit and person-pair nonresponse adjustments.

In the 2021 NSDUH, an alternative set of person-level analysis weights was developed by adding interview mode as a main effect in the poststratification adjustment model, with a target of 30 percent of weight sums for web mode and 70 percent of weight sums for field mode. In the 2022-2024 NSDUHs, only one person-level analysis weight with mode controlled in the poststratification adjustment model was developed. This weight was developed because targeted percentages established as part of the survey design of interviews completed via web and field were expected to be around 30 percent and 70 percent, respectively (Center for Behavioral Health Statistics and Quality [CBHSQ], forthcoming b).

As shown in [Table 2.1](#), the unweighted mode distributions vary across the 2022, 2023, and 2024 NSDUHs. The goal is to standardize the weight sum proportions of the pair modes in pair-level analysis weights. To implement an adjustment that includes mode, two technical items need to be determined. First, there are no pair mode targets for the pairs. Second, pairs with mixed mode (i.e., one respondent in the pair completing the survey via the web and the other respondent completing via field) need to be assigned to web-web or field-field pair mode.

Table 2.1 Distribution of Questionnaire Completion Mode among Responding Pairs; 2022-2024

Pair Mode Type	2022	2023	2024
Web-Web	3,988 (29.1%)	2,914 (21.8%)	3,173 (23.2%)
Web-Field	877 (6.4%)	800 (6.0%)	902 (6.6%)
Field-Field	8,838 (64.5%)	9,644 (72.2%)	9,578 (70.2%)
Total	13,703 (100.0%)	13,358 (100.0%)	13,653 (100%)

NOTE: The numbers represent the unweighted count of pairs, and the percentages represent the unweighted percentages. See Center for Behavioral Health Statistics and Quality (forthcoming b) for additional detail. Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2022-2024.

For the target percentages of the weight sum of the pair modes, as shown in [Table 2.1](#), the unweighted percentages of web-web and field-field were close to the 30/70 percent split, although the mixed-mode pairs accounted for about 6 percent in the 2022-2024 NSDUHs. Thus, for the pair weighting, the same 30/70 percent split was followed that was done for the person-level weighting; that is, adding the pair mode as a main effect in the poststratification and extreme value adjustment models, with a target of 30 percent of weight sums for web-web pair mode and 70 percent of weight sums for field-field pair mode.

In assigning mixed-mode pairs to web-web or field-field, mixed pairs within each pair age group combination were randomly assigned based on the unweighted distribution of web-web and field-field cases, as was done in the 2023 pair weighting (see [Table 2.2](#)).

Table 2.2 Person Pair-Level Response Mode (Number of Pairs and Proportions) for Pair Age Groups; 2024

Domain	Web	Field	Mixed	Total
Total	3,173 (23.2%)	9,578 (70.2%)	902 (6.6%)	13,653
<i>Pair Age Group</i>				
12-17, 12-17	271 (14.1%)	1,635 (84.9%)	20 (1.0%)	1,926
12-17, 18-25	158 (11.2%)	1,160 (82.5%)	88 (6.3%)	1,406
12-17, 26-34	47 (8.1%)	493 (85.4%)	37 (6.4%)	577
12-17, 35-49	497 (18.3%)	2,011 (74.0%)	208 (7.7%)	2,716
12-17, 50+	69 (13.9%)	383 (77.1%)	45 (9.1%)	497
18-25, 18-25	537 (26.5%)	1,363 (67.3%)	125 (6.2%)	2,025
18-25, 26-34	162 (27.5%)	391 (66.3%)	37 (6.3%)	590
18-25, 35-49	262 (27.3%)	614 (64.0%)	84 (8.8%)	960
18-25, 50+	208 (34.3%)	346 (57.0%)	53 (8.7%)	607
26-34, 26-34	281 (41.2%)	353 (51.8%)	48 (7.0%)	682
26-34, 35-49	136 (38.4%)	190 (53.7%)	28 (7.9%)	354
26-34, 50+	63 (34.1%)	113 (61.1%)	9 (4.9%)	185
35-49, 35-49	250 (45.2%)	247 (44.7%)	56 (10.1%)	553
35-49, 50+	74 (35.6%)	110 (52.9%)	24 (11.5%)	208
50+, 50+	158 (43.1%)	169 (46.0%)	40 (10.9%)	367

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

As shown in [Table 2.2](#), of the 902 pairs in the 2024 NSDUH responding via different modes, almost half were concentrated in three age combinations: 12-17, 18-25; 12-17, 35-49; and 18-25, 18-25. The mixed-mode proportions varied among pair age groups. Similar patterns were seen in the 2021-2023 NSDUHs (data not shown). Because age group is a design stratum variable and the distribution of mode varied by pair age group, the mixed-mode pairs were randomly assigned to web-web or field-field based on unweighted distribution of web-web and field-field within each pair age group shown in [Table 2.2](#). For additional details see Chapter 2 of CBHSQ (2025b).

3. Questionnaire Dwelling Unit and Pair Selection Probabilities

Similar to the 1999-2001 National Household Surveys on Drug Abuse (NHSDAs) and the 2002-2023 National Surveys on Drug Use and Health (NSDUHs),² the 2024 NSDUH had a two-stage interview design and used a computer-assisted interviewing method. There were five stages of selection: census tracts, census block groups within census tracts, segments within census block groups, dwelling units (DUs) within segments, and people within DUs. Any two survey-eligible people had some nonzero chance of being selected and, when both were selected, they formed a within-household pair. This design feature is of interest to NSDUH researchers because, for example, it allows analysts to examine how the drug use propensity of an individual (in a family) relates to the drug use propensity of other members residing in the same DU (Center for Behavioral Health Statistics and Quality [CBHSQ], 2025a).

For the 1999-2001 surveys, the method used for selecting pairs was as follows. For a given DU, if the sum of the age-specific selection probabilities was larger than 2, then the individual person-selection probabilities were ratio adjusted downward to make the sum equal to 2. If the sum was less than 2, the difference between 2 and the sum of the probabilities was evenly distributed over three dummy people so that the sum of the person probabilities was made to equal 2. Brewer's method was then applied to select a person pair. If the selected pair consisted of two real people, then both people were selected. If the selected pair consisted of one real person and one dummy person, then the real person was selected. If the selected pair consisted of two dummy people, no one was selected from that DU.

Starting with the 2002 NSDUH and continuing through 2024, the pair-sampling algorithm was modified to increase the number of pairs selected in the sample (Chromy & Penne, 2002). DUs with the sum of person selection probabilities greater than or equal to 2 were treated the same as in previous survey years. However, DUs in which the sum of person-level selection probabilities was less than 2 received a slightly different treatment that increased the chance for selecting a pair of real people. Section 3.1 describes the selection process for both types of DUs.

[Table 3.1](#) provides a summary of these NSDUH sampling units: eligible and completed screener dwelling units (SDUs), selected and completed questionnaire dwelling units (QDUs), selected and completed person interviews, and selected and completed person pairs, as well as their response rates. Using a modification of Brewer's method, zero, one, or two individuals were selected per household. Those completed SDUs where at least one person was selected were counted as the selected QDUs. A QDU where two people were selected and both had completed interviews was considered to be a completed person pair. The table provides a breakdown by age group at the person level and age group by selection group (none, single, or pair) at the person pair level.

² This report presents information from the 2024 NSDUH. Prior to 2002, the survey was called the National Household Survey on Drug Abuse (NHSDA).

Table 3.1 QDU and Person Pair Samples: Dwelling Units and People, 2020-2024

Domain	2020			2021			2022			2023			2024		
	Sel. ¹	Resp. ²	% Rate ^{3,4}	Sel. ¹	Resp. ²	% Rate ³	Sel. ¹	Resp. ²	% Rate ³	Sel. ¹	Resp. ²	% Rate ³	Sel. ¹	Resp. ²	% Rate ³
DUs															
Total DUs Screened	536,203	90,937	16.96	1,021,716	220,743	21.61	864,285	217,457	25.16	804,971	198,246	24.63	927,672	203,743	21.96
QDUs															
Total QDUs	44,054	29,200	66.28	107,439	57,385	53.41	106,254	57,666	54.27	95,763	54,321	56.72	97,013	56,588	58.33
People															
Total People	62,515	36,284	58.04	152,215	69,850	45.89	150,789	71,369	47.33	135,737	67,679	49.86	137,170	70,241	51.21
12-17	14,313	6,330	44.23	35,427	13,239	37.37	35,136	14,761	42.01	31,358	14,279	45.54	31,211	13,985	44.81
18-25	15,223	8,915	58.56	37,181	16,460	44.27	37,571	17,173	45.71	34,315	16,211	47.24	34,276	16,744	48.85
26-34	9,684	6,241	64.45	22,880	11,421	49.92	22,940	11,432	49.83	20,572	10,759	52.30	20,960	11,278	53.81
35-49	12,896	8,049	62.41	31,270	15,186	48.56	30,962	15,153	48.94	28,005	14,517	51.84	28,581	15,379	53.81
50+	10,399	6,749	64.90	25,457	13,544	53.20	24,180	12,850	53.14	21,487	11,913	55.44	22,142	12,855	58.06
Non-Pairs⁵															
Total Non-Pairs	72,476	22,117	N/A	175,967	44,920	N/A	172,922	43,963	N/A	158,272	40,963	N/A	163,586	42,935	N/A
0,0	46,883	N/A	N/A	113,304	N/A	N/A	111,203	N/A	N/A	102,483	N/A	N/A	106,730	N/A	N/A
Total Singletons	25,593	22,117	86.42	62,663	44,920	71.69	61,719	43,963	71.23	55,789	40,963	73.42	56,856	42,935	75.52
0, 12-17	3,196	1,998	62.52	8,064	4,977	61.72	8,181	5,473	66.90	7,434	5,200	69.95	7,418	4,937	66.55
0, 18-25	4,697	4,870	103.7	11,730	9,591	81.76	11,801	9,643	81.71	10,696	8,890	83.12	10,667	9,131	85.60
0, 26-34	5,170	4,463	86.32	12,531	8,644	68.98	12,442	8,277	66.52	11,354	7,840	69.05	11,373	8,208	72.17
0, 35-49	5,552	5,262	94.78	13,467	10,378	77.06	13,136	9,896	75.33	11,916	9,274	77.83	12,490	10,035	80.34
0, 50+	6,978	5,524	79.16	16,871	11,330	67.16	16,159	10,674	66.06	14,389	9,759	67.82	14,908	10,624	71.26
Pairs⁶															
Total Pairs	18,461	7,084	38.37	44,776	12,465	27.84	44,535	13,703	30.77	39,974	13,358	33.42	40,157	13,653	34.00
12-17, 12-17	2,165	917	42.36	5,248	1,833	34.93	5,113	2,027	39.64	4,444	1,927	43.36	4,502	1,926	42.78
12-17, 18-25	1,743	599	34.37	4,544	1,174	25.84	4,455	1,361	30.55	4,147	1,352	32.60	4,081	1,406	34.45
12-17, 26-34	712	253	35.53	1,750	469	26.80	1,818	618	33.99	1,600	614	38.38	1,626	577	35.49
12-17, 35-49	3,602	1,377	38.23	8,670	2,416	27.87	8,741	2,721	31.13	7,780	2,742	35.24	7,599	2,716	35.74
12-17, 50+	730	269	36.85	1,903	537	28.22	1,715	534	31.14	1,509	517	34.26	1,483	497	33.51
18-25, 18-25	2,885	1,151	39.90	6,730	1,885	28.01	6,812	2,028	29.77	6,264	1,951	31.15	6,209	2,025	32.61
18-25, 26-34	960	363	37.81	2,110	549	26.02	2,192	645	29.43	2,043	616	30.15	2,073	590	28.46
18-25, 35-49	1,163	455	39.12	3,093	806	26.06	3,205	871	27.18	2,953	868	29.39	3,066	960	31.31
18-25, 50+	890	326	36.63	2,244	570	25.40	2,294	597	26.02	1,948	583	29.93	1,971	607	30.80
26-34, 26-34	1,010	436	43.17	2,276	628	27.59	2,277	686	30.13	1,927	590	30.62	2,052	682	33.24
26-34, 35-49	522	206	39.46	1,196	336	28.09	1,202	339	28.20	1,045	340	32.54	1,111	354	31.86
26-34, 50+	300	85	28.33	741	167	22.54	732	181	24.73	676	169	25.00	673	185	27.49
35-49, 35-49	879	324	36.86	2,015	529	26.25	1,954	575	29.43	1,798	543	30.20	1,820	553	30.38
35-49, 50+	299	101	33.78	814	192	23.59	770	176	22.86	715	207	28.95	675	208	30.81
50+, 50+	601	222	36.94	1,442	374	25.94	1,255	344	27.41	1,125	339	30.13	1,216	367	30.18

DU = dwelling unit; N/A = not applicable; QDU = questionnaire dwelling unit.

¹ Selected pairs are based on the screener age.

² Respondent pairs are based on the questionnaire age and comprise only respondent people.

³ Response rates are unweighted and based only on the total selected and total responding counts of pairs.

⁴ Response rates are based on the category under which respondents were selected and the category under which they responded, which may differ. For example, in the instance where a pair 12-17, 18-25 was selected, but only the 18-25 person responded, that observation is counted in the 12-17, 18-25 selected column and in the 0, 18-25 respondent column. Note that changes due to singleton response versus pair response influence response rates and could create response rates greater than 100 percent among singleton age categories.

⁵ Non-pairs are completed screener dwelling units where zero or one person was selected for the Sel. column and where zero or one person responded for the Resp. column.

⁶ Total pairs are housing units where two people were selected for the Sel. column and where two people responded for the Resp. column.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2020-2024.

3.1 Pair Selection Probability

3.1.1 Case I: DUs with $S \geq 2$

For a given DU, if the sum of the age-specific person selection probabilities (S_h) was larger than 2, then the selection probability was ratio adjusted by a multiplicative adjustment factor so that all probabilities were scaled down to sum to exactly 2. Now, Brewer's method sets the pairwise selection probabilities at

$$P_{h(ij)} = \left[\frac{P_{h(i)}P_{h(j)}}{K} \right] \left[\frac{1}{1-P_{h(i)}} + \frac{1}{1-P_{h(j)}} \right] \quad (3.1)$$

by setting K at

$$K = 2 + \sum_i \frac{P_{h(i)}}{1-P_{h(i)}} \quad (3.2)$$

where $i = i^{\text{th}}$ person in household h (whose selection probability depends on his or her age category: 1, 2, 3, 4, or 5) and

$j = j^{\text{th}}$ person, where $j \neq i$, in household h (whose selection probability depends on his or her age category: 1, 2, 3, 4, or 5),

where age category 1 corresponds to people aged 12 to 17, 2 to people aged 18 to 25, 3 to people aged 26 to 34, 4 to people aged 35 to 49, and 5 to people aged 50 or older.

The sum of the pairwise selection probabilities taken over all unique pairs will be guaranteed to be exactly 1.

$$\sum_i \sum_{j>i} P_{h(ij)} = 1 \quad (3.3)$$

It also guarantees that the sum of the pairwise selection probabilities for an individual is equal to the individual's selection probability

$$\sum_{j \neq i} P_{h(ij)} = P_{h(i)} \quad (3.4)$$

for all values of i .

Note that the above scheme always selects a pair of two eligible people.

3.1.2 Case II: DUs with $S < 2$

If the sum S of person-level selection probabilities was less than 2, the method used in survey years 1991-2001 consisted of dividing $2 - S$ equally among the three dummy people added to the household, then used Brewer's method to select a pair, as in Case I. However, if the

household had two or more people, a pair of real people was preferred in order to have a greater chance of being selected. To achieve this goal, the individual selection probabilities, $P_{h(i)}$, were scaled upward by the factor F_s such that their sum came close to but did not exceed 2 and such that each person selection probability did not exceed the maximum allowed probability of 0.99. Thus, denoting the revised person selection probabilities by $P'_{h(i)}$, the factor F_s is given by

$$F_s = \text{Min} \left\{ \frac{T(\lambda)}{S}, \frac{0.99}{\max \{P_{h(i)}\}} \right\}, \quad (3.5)$$

where $T(\lambda) = S + \lambda(2 - S)$ and λ is set to 0.25.¹⁰ Note that if λ is chosen as 0, then $F_s = 1$ and the selection scheme would follow that of Case I. The individual person probabilities are scaled upward by the factor F_s so they sum to 2 or sum as close to 2 as possible. Denote S' as the sum of the selection probability after scale adjustment by F_s . If S' is exactly 2, then dummy people are not needed. If S' is less than 2, then three dummy people are added to the DU.

Now, for Brewer's method, set the pairwise selection probabilities similar to Formula 3.1, as

$$P'_{h(ij)} = \left[\frac{P'_{h(i)}P'_{h(j)}}{K'} \right] \left[\frac{1}{1-P'_{h(i)}} + \frac{1}{1-P'_{h(j)}} \right] \quad (3.6)$$

by setting K' at

$$K' = 2 + \sum_i \frac{P'_{h(i)}}{1-P'_{h(i)}}, \quad (3.7)$$

where $P'_{h(i)}$ and $P'_{h(j)}$ are the selection probabilities adjusted by the scaling factor F_s ,

where $i = i^{\text{th}}$ person in the household (whose selection probability depends on his or her age category: 0, 1, 2, 3, 4, or 5),

$j = j^{\text{th}}$, where $j \neq i$, person in the household (whose selection probability depends on his or her age category: 0, 1, 2, 3, 4, or 5), and

where age category 0 corresponds to dummy people, and categories 1 to 5 are defined as in Case I.

¹⁰ Changes to the sample design in 2014 with respect to age group and state necessitated a new value of λ best suited for the 2014 through 2024 design. Using simulation analysis, λ was updated from the previously used 0.5 to 0.25 (CBHSQ, 2025a).

The expression is now $\sum_{j \neq i} P'_{h(ij)} = P'_{h(i)}$. To maintain the original person selection probabilities despite the scale adjustment by F_s , Brewer's method was modified as follows. First, draw a random number, R , from a uniform (0,1) distribution. If $R \leq 1/F_s$, then select a pair using Brewer's method based on Formula 3.6. However, if $R > 1/F_s$, then no people are selected from the household. In this way, the probability for selecting a pair (i,j) in household h becomes $P^*_{h(ij)} = P'_{h(ij)} / F_s$, which, in turn, gives the original person selection probabilities, $P_{h(i)}$. Unlike Case I, where a pair of eligible people was always selected, this adjusted selection scheme allows for zero, one, or two people to be selected from a DU.

3.2 Questionnaire Dwelling Unit Selection Probability

A DU was considered a selected QDU if it had completed the screening interview and had at least one person selected for the questionnaire interview. QDUs with at least one respondent were considered respondent QDUs.

The QDU selection probability was defined as

$$P_h^* = (1 - P_{h(00)}^*), \quad (3.8)$$

where $P_{h(00)}^*$ is the probability of not selecting any person. For the DUs with an unadjusted sum of age-specific selection probabilities larger than or equal to 2 (Case I), $P_{h(00)}^*$ is 0. It follows from Section 3.1, under Case II, $P_{h(00)}^*$ can be calculated as

$$P_{h(00)}^* = \left(1 - \frac{1}{F_s}\right) + \frac{3}{F_s} \left[\frac{P'_{h(0)} P'_{h(0)}}{K'} \right] \left[\frac{1}{1 - P'_{h(0)}} + \frac{1}{1 - P'_{h(0)}} \right], \quad (3.9)$$

where $P'_{h(0)}$ is the selection probability of a dummy person when person selection probabilities are adjusted by F_s .

4. Brief Description of the Generalized Exponential Model

In survey practice, design-based weights are typically adjusted in three steps: (1) for nonresponse (nr) via weighting classes, (2) for poststratification (ps) via raking ratio adjustments, and (3) for extreme values (ev) via winsorization. If weights are not treated for evs, the resulting estimates, although unbiased, will tend to have low precision. The bias introduced by winsorization is alleviated to some extent through ps. The nr adjustment is a correction for bias introduced in estimates based only on responding units, and ps is an adjustment for coverage (typically undercoverage) bias and variance reduction due to correlation between the study and control (usually demographic) variables.

There are limitations in the existing methods of weight adjustment for ev, nr, and ps. It would be desirable to adjust for bias introduced in the ev step (when extreme weights are treated via winsorization) in that the sample distribution for various demographic characteristics is preserved. For the nr step, there are general raking-type methods, such as the scaled constrained exponential model developed by Folsom and Witt (1994), where the lower and upper bounds can be suitably chosen by use of a separate scaling factor. The factor is set as the inverse of the overall response propensity. It would be desirable to have a model for the nr adjustment factor so that the desired lower and upper bounds on the factor are part of the model. Note that the lower bound on the nr adjustment factor should be 1, as it is interpreted as the inverse of the probability of response for a particular unit. For the ps step, on the other hand, the general calibration methods of Deville and Särndal (1992), such as the logit method, allow for built-in lower (L) and upper (U) bounds (for ps, typically $L < 1 < U$). However, it would be desirable to have nonuniform bounds (L_k, U_k) depending on the unit k such that the final adjusted weight, w_k , could be controlled within certain limits. An important application of this feature would be weight adjustments in the presence of ev to allow some control on the final adjustment of the initially identified evs.

A modification of the earlier method of the scaled constrained exponential model of Folsom and Witt (1994), termed as the method of the generalized exponential model (GEM) and proposed by Folsom and Singh (2000), provides a unified approach to the three weight adjustments for ev, nr, and ps, and it has the desired features mentioned earlier. The functional form of the GEM adjustment factor is provided in Appendix A. It generalizes the logit model of Deville and Särndal (1992), typically used for ps, such that the bounds (L, U) may depend on k . Thus, it provides a built-in control on ev during both ps and nr adjustments. In addition, the bounds are internal to the model and can be set to chosen values (e.g., $L_k = 1$ in the nr step). If there is a low frequency of ev in the final ps, then a separate ev step may not be necessary.

In fitting the GEM to a particular problem, the choice of a large number of predictor variables along with tight bounds will have an impact on the resulting unequal weighting effect (UWE) and the proportion of evs. In practice, this leads to somewhat subjective considerations of trade-off between the target set of bounds for a given set of factor effects and the target UWE

and the target proportion of evs. It also may be beneficial to look at the proportion of “outwinsors” (a term coined to signify the extent of residual weights after winsorization), which is probably more realistic in determining the robustness of estimates in the presence of evs.

A large increase in the number of predictor variables in the GEM typically would result in a higher UWE, thus indicating a possible loss in precision. This was checked by comparing SUDAAN®-based (RTI International, 2013) standard errors of a key set of estimates computed from two sets of calibration models, one baseline using only the main effects and the other using the final model. The results are presented in Chapter 8.

To implement the GEM, several steps need to be followed: (1) define and create all the covariates; (2) define the extreme weights; (3) fit the GEM. The details of practical aspects of GEM implementation can be found in Chapters 5 and 6 of this report and Chapter 4 of the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 11: Person-Level Sampling Weight Calibration* report (Center for Behavioral Health Statistics and Quality, forthcoming b).

5. Predictor Variables for the Questionnaire Dwelling Unit and Pair Weight Calibration via the Generalized Exponential Model

Unlike the person-level weight calibration, the control totals for the questionnaire dwelling unit (QDU)-level and person pair-level poststratification are not available from the U.S. Census Bureau. A way around this problem is to take advantage of the two-stage interview nature of the design, in which the screener data provide a large sample containing demographic information that can be used to derive control totals for the QDU-level and person pair-level sampling weight calibrations, as well as for the selected person poststratification adjustment. The stability of control totals from the screener dwelling unit (SDU)-level data can be improved by poststratification of the SDU sample using person-level counts from the census. This was indeed done and is documented in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 11: Person-Level Sampling Weight Calibration* report (Center for Behavioral Health Statistics and Quality [CBHSQ], forthcoming b).

5.1 Questionnaire Dwelling Unit Weight Calibration

After the nonresponse and poststratification adjustments at the SDU level, which are common to the person-level weight calibration, the QDU sample weights were adjusted in three steps: poststratification of selected QDUs, nonresponse adjustment of respondent QDUs, and poststratification of respondent QDUs. The set of initially proposed predictor variables for these adjustments using the generalized exponential model (GEM) were set to be common and to correspond to those used for the SDU nonresponse and poststratification adjustments. The variables are of two types: those used for SDU nonresponse adjustment are 0/1 indicators, whereas those used for SDU poststratification adjustment are counting variables. The variables of the first type (0/1 indicators) are population density,¹¹ group quarters, race/ethnicity of householder, percentage of people in segment who are Black or African American, percentage of people in segment who are Hispanic or Latino, percentage of owner-occupied dwelling units (DUs) in segment, segment-combined median rent and housing value, and household type. Variables of the second type (counting variables) represent the number of eligible people within each DU who fall into the various demographic categories of race, age group, Hispanicity, and sex. Note that the state and quarter variables are represented as binary and counting variables. Thus, not only are DU counts within a specific state or quarter in the QDU sample controlled to the corresponding totals obtained from the SDU sample, but also counts of people living in the DUs in the QDU sample are controlled to totals from the SDU sample. These person-level totals match the census estimates because of the SDU-level poststratification to census counts. It may be noted that in the poststratification of selected QDUs and the nonresponse adjustment of the respondent QDU steps, demographic information from screener data was used in defining

¹¹ Population density, percentage of people in segment who are Black or African American, percentage of people in segment who are Hispanic or Latino, percentage of owner-occupied dwelling units in segment, and segment-combined median rent and housing value were defined using 2010 U.S. Census Bureau data.

covariates, whereas in the poststratification of the selected QDU step, questionnaire demographic information was used.

[Exhibit 5.1](#) lists all predictor variables proposed for QDU-level calibration and identifies them as counting, binary, or both. Various main effects and higher-level factor effects based on the predictor variables were included in the GEM. As stated previously, all adjustment steps at the QDU level used a common set of proposed predictor variables. Proposed variables used in the GEM have been the same since 1999; however, in 2020, the data collection disruption due to the coronavirus disease 2019 (COVID-19) pandemic caused the sample size to be reduced, which led to the exclusion of most three-factor effects. Additionally, in 2020 to 2024, interview mode was added to the QDU-level nonresponse adjustment.

5.2 Pair Weight Calibration

Like QDU, the initial set of weight components in pair weight calibration are the same as the set obtained from the SDU-level weight calibration. The SDU-calibrated weight is multiplied by the pair-level design weight, which in turn was adjusted in four steps: poststratification of selected pairs, nonresponse adjustment of respondent pairs, poststratification of respondent pairs, and the extreme weight adjustment of respondent pairs. All the adjustment steps for pair weights utilized the same set of initially proposed predictor variables, which included a subset of those used for the person-level nonresponse adjustment. This included segment characteristic variables, such as population density, percentage of people in segment who are Black or African American, percentage of people in segment who are Hispanic or Latino, percentage of owner-occupied DUs in segment, and segment-combined median rent and housing value. Also included were pair-specific covariates, such as the demographic characteristics of pair age, pair race/ethnicity, and pair sex, as well as DU characteristics, such as race/ethnicity of householder, household type, household size, and group quarters indicators. State and quarter indicators were included as well. However, for two-factor effects, instead of individual state, state/region was used because of insufficient sample size. This resulted in a 12-level variable where the eight largest sample states were kept separate, and the remainder of states were grouped according to the four census regions. All variables were defined as 0/1 indicators. These proposed predictor variables and their levels are shown in [Exhibit 5.2](#). Similar to the case in the QDU weight calibration, proposed variables used in the GEM have been consistent since 1999, but in 2020 to 2024, screening mode was added to the person pair-level nonresponse adjustment. In addition, interview mode was added to the pair-level poststratification and extreme value adjustment models.

In the poststratification of selected pairs and the nonresponse adjustment of respondent pairs, screener data were used in the definition of the pair-specific variables such as pair age, pair race/ethnicity, and pair sex, whereas in the poststratification and extreme weight adjustment of respondent pairs, these variables were obtained from the questionnaire. There may be discrepancies between the demographic variables between screening and interviewing, but the differences are small. For details, see Section 8.2.2 of the 2024 Person-Level Sampling Weight Calibration report (CBHSQ, forthcoming b). For the latter case, in addition to the variables described earlier, indicator covariates corresponding to selected pair domains were included to

perform Hajek-type ratio adjustments via weight calibration, as mentioned in Chapter 1. The selected pair domains were limited to 10 of the 14 pair domains listed in Chapter 1. (Parent-child pairs where the child was in the 15- to 17-year-old age range and sibling-sibling pairs with focus on the younger child were not included in the poststratification.) The inclusion of these pair domain covariates led to the use of two sets of control totals in the modeling. Details of the construction of these control totals can be found in Appendix B.

Exhibit 5.1 List and Definitions of Levels for QDU-Level Calibration Predictor Variables; 2024

<p>Age^a 1: 12-17, 2: 18-25, 3: 26-34, 4: 35-49, 5: 50+¹</p> <p>Sex^a 1: Male, 2: Female¹</p> <p>Group Quarters Indicator^b 1: College Dorm, 2: Other Group Quarter, 3: Non-Group Quarter¹</p> <p>Hispanicity^a 1: Hispanic or Latino, 2: Non-Hispanic or Latino¹</p> <p>Household Size^a Continuous Variable Count of Individuals Rostered within DU</p> <p>Household Type (Ages of People Rostered within DU)^b 1: 12-17, 18-25, 26+; 2: 12-17, 18-25; 3: 12-17, 26+; 4: 18-25, 26+; 5: 12-17, 6: 18-25; 7: 26+¹</p> <p>Percentage of Owner-Occupied Dwelling Units in Segment (% Owner-Occupied)^b 1: 50-100%,¹ 2: 10-<50%, 3: 0-<10%</p> <p>Percentage of Black or African American in Segments^b 1: 50-100%, 2: 10-<50%, 3: 0-<10%¹</p> <p>Percentage of Hispanics or Latinos in Segments^b 1: 50-100%, 2: 10-<50%, 3: 0-<10%¹</p> <p>Population Density^b 1: MSA 1,000,000 or More, 2: MSA Less than 1,000,000, 3: Non-MSA Urban, 4: Non-MSA Rural¹</p> <p>Quarter^{a,b} 1: Quarter 1, 2: Quarter 2, 3: Quarter 3, 4: Quarter 4¹</p> <p>Screening Mode^{2,b} 1: Web,¹ 2: Field</p> <p>Race (3 Levels)^a 1: White,¹ 2: Black or African American, 3: Other</p> <p>Race (5 Levels)^a 1: White,¹ 2: Black or African American, 3: American Indian or Alaska Native, 4: Asian, 5: Two or More Races</p> <p>Race/Ethnicity of Householder^b 1: Hispanic or Latino White,¹ 2: Hispanic or Latino Black or African American, 3: Hispanic or Latino Other, 4: Non-Hispanic or Latino White, 5: Non-Hispanic or Latino Black or African American, 6: Non-Hispanic or Latino Other</p> <p>Segment-Combined Median Rent and Housing Value (Rent/Housing)^{3,b} 1: First Quintile, 2: Second Quintile, 3: Third Quintile, 4: Fourth Quintile, 5: Fifth Quintile¹</p> <p>States^{4,a,b} Model Group 1: 1: Connecticut, 2: Maine, 3: Massachusetts,¹ 4: New Hampshire, 5: New Jersey, 6: New York, 7: Pennsylvania, 8: Rhode Island, 9: Vermont Model Group 2: 1: Illinois, 2: Indiana, 3: Iowa, 4: Kansas, 5: Michigan, 6: Minnesota, 7: Missouri, 8: Nebraska, 9: North Dakota, 10: Ohio, 11: South Dakota, 12: Wisconsin¹ Model Group 3: 1: Alabama, 2: Arkansas, 3: Delaware, 4: District of Columbia, 5: Florida, 6: Georgia, 7: Kentucky, 8: Louisiana, 9: Maryland, 10: Mississippi, 11: North Carolina,¹ 12: Oklahoma, 13: South Carolina, 14: Tennessee, 15: Texas, 16: Virginia, 17: West Virginia Model Group 4: 1: Alaska, 2: Arizona,¹ 3: California, 4: Colorado, 5: Idaho, 6: Hawaii, 7: Montana, 8: Nevada, 9: New Mexico, 10: Oregon, 11: Utah, 12: Washington, 13: Wyoming</p> <p>State/Region^{3,b} Model Group 1: 1: New York, 2: Pennsylvania, 3: Other¹ Model Group 2: 1: Illinois, 2: Michigan, 3: Ohio, 4: Other¹ Model Group 3: 1: Florida, 2: Texas, 3: Other¹ Model Group 4: 1: California, 2: Other¹</p>

DU = dwelling unit; MSA = metropolitan statistical area; QDU = questionnaire dwelling unit.

¹ The reference level for this variable. This is the level against which effects of other factor levels are measured.

² Screening mode was included in only the res.qdu.nr step.

³ Segment-combined median rent and housing value (also known as the socioeconomic status indicator) is a composite measure based on rent, housing value, and percentage owner-occupied.

⁴ The states or district assigned to a particular model are based on census regions.

^a Counting variable. A count of all people in the household.

^b Binary variable.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit 5.2 List and Definitions of Levels for Person Pair-Level Calibration Predictor Variables; 2024

Group Quarter Indicator

1: College Dorm, 2: Other Group Quarter, 3: Non-Group Quarter¹

Household Size

1: DU with 2 People,¹ 2: DU with 3 People, 3: DU with ≥ 4 People

Pair Age (15 Levels)

1: 12-17 and 12-17,¹ 2: 12-17 and 18-25, 3: 12-17 and 26-34, 4: 12-17 and 35-49, 5: 12-17 and 50+, 6: 18-25 and 18-25, 7: 18-25 and 26-34, 8: 18-25 and 35-49, 9: 18-25 and 50+, 10: 26-34 and 26-34, 11: 26-34 and 35-49, 12: 26-34 and 50+, 13: 35-49 and 35-49, 14: 35-49 and 50+, 15: 50+ and 50+

Pair Age (6 Levels)

1: 12-17 and 12-17,¹ 2: 12-17 and 18-25, 3: 12-17 and 26+, 4: 18-25 and 18-25, 5: 18-25 and 26+, 6: 26+ and 26+

Pair Age (3 Levels)

1: 12-17 and 12-17,¹ 2: 12-17 and 18+, 3: 18+ and 18+

Pair Sex

1: Male and Female,¹ 2: Female and Female, 3: Male and Male

Pair Race/Ethnicity (10 Levels)

1: White and White,¹ 2: White and Black or African American, 3: White and Hispanic or Latino, 4: White and Other, 5: Black or African American and Black or African American, 6: Black or African American and Hispanic or Latino, 7: Black or African American and Other, 8: Hispanic or Latino and Hispanic or Latino, 9: Hispanic or Latino and Other, 10: Other and Other

Pair Race/Ethnicity (5 Levels)

1: Two or More Races Pair, 2: Hispanic or Latino Pair, 3: Black or African American Pair, 4: White Pair,¹ 5: Other Pair

Pair Race/Ethnicity (4 Levels)

1: Two or More Races Pair or Other and Other, 2: Hispanic or Latino Pair, 3: Black or African American Pair, 4: White Pair¹

Percentage of Owner-Occupied Dwelling Units in Segment (% Owner-Occupied)

1: 50-100%,¹ 2: 10-<50%, 3: 0-<10%

Percentage of Segments That Are Black or African American

1: 50-100%, 2: 10-<50%, 3: 0-<10%¹

Percentage of Segments That Are Hispanic or Latino

1: 50-100%, 2: 10-<50%, 3: 0-<10%¹

Segment-Combined Median Rent and Housing Value (Rent/Housing)²

1: First Quintile, 2: Second Quintile, 3: Third Quintile, 4: Fourth Quintile, 5: Fifth Quintile¹

Population Density

1: MSA 1,000,000 or More, 2: MSA Less than 1,000,000, 3: Non-MSA Urban, 4: Non-MSA Rural¹

Quarter

1: Quarter 1, 2: Quarter 2, 3: Quarter 3, 4: Quarter 4¹

Screening Mode³

1: Web,¹ 2: Field

Interview Mode⁴

1: Web,¹ 2: Field

Race/Ethnicity of Householder

1: Hispanic or Latino White,¹ 2: Hispanic or Latino Black or African American, 3: Hispanic or Latino Other, 4: Non-Hispanic or Latino White, 5: Non-Hispanic or Latino Black or African American, 6: Non-Hispanic or Latino Other

Exhibit 5.2 List and Definitions of Levels for Person Pair-Level Calibration Predictor Variables; 2024 (continued)

<p>State/Region</p> <p>Model Group 1: 1: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Rhode Island, Vermont; 2: Alabama, Arkansas, Delaware, District of Columbia, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia, West Virginia;¹ 3: New York; 4: Pennsylvania; 5: Florida; 6: Texas</p> <p>Model Group 2: 1: Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin;¹ 2: Alaska, Arizona, Colorado, Idaho, Hawaii, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming; 3: Michigan; 4: Illinois; 5: Ohio; 6: California</p> <p>States⁵</p> <p>Model Group 1: 1: Alabama, 2: Arkansas, 3: Connecticut, 4: Delaware, 5: District of Columbia, 6: Florida, 7: Georgia, 8: Kentucky, 9: Louisiana, 10: Maine, 11: Maryland,¹ 12: Massachusetts, 13: Mississippi, 14: New Hampshire, 15: New Jersey, 16: New York, 17: North Carolina, 18: Oklahoma, 19: Pennsylvania, 20: Rhode Island, 21: South Carolina, 22: Tennessee, 23: Texas, 24: Vermont, 25: Virginia, 26: West Virginia</p> <p>Model Group 2: 1: Alaska, 2: Arizona,¹ 3: California, 4: Colorado, 5: Idaho, 6: Illinois, 7: Indiana, 8: Iowa, 9: Hawaii, 10: Kansas, 11: Michigan, 12: Minnesota, 13: Missouri, 14: Montana, 15: Nebraska, 16: Nevada, 17: New Mexico, 18: North Dakota, 19: Ohio, 20: Oregon, 21: South Dakota, 22: Utah, 23: Washington, 24: Wisconsin, 25: Wyoming</p> <p>Pair Relationship Associated with Multiplicity</p> <p>1: Parent-Child (12-14)* 2: Parent-Child (12-17)* 3: Parent-Child (12-20)* 4: Parent*-Child (12-14) 5: Parent*-Child (12-17) 6: Parent*-Child (12-20) 7: Sibling (12-14)-Sibling (15-17)* 8: Sibling (12-17)-Sibling (18-25)* 9: Spouse-Spouse/Partner-Partner 10: Spouse-Spouse/Partner-Partner with Children (Younger than 18)</p>
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DU = dwelling unit; MSA = metropolitan statistical area.

¹ The reference level for this variable. This is the level against which effects of other factor levels are measured.

² Segment-combined median rent and housing value (also known as the socioeconomic status indicator) is a composite measure based on rent, housing value, and percentage owner-occupied.

³ Screening mode was included in only the res.pr.nr step.

⁴ Interview mode was included in only the res.pr.ps and res.pr.ev steps.

⁵ The states or district assigned to a particular model are based on combined census regions.

* The pair member focused on.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

6. Definition of Extreme Weights

An important feature of the generalized exponential model (GEM) is the built-in provision of extreme value (ev) treatment. Sampling weights are often classified as extreme (high or low) if they fall outside the interval, median $\pm 3 \times$ interquartile range (IQR). The interval is set for prespecified domains defined usually by design variables corresponding to deep stratification.¹² Similar to previous National Surveys on Drug Use and Health (NSDUHs), for the generalized exponential modeling used in the 2024 NSDUH, a more conservative (narrower) interval was defined, median $\pm 2.5 \times$ IQR. The narrower interval better prevents the adjusted weights from crossing the standard interval boundaries by treating weights near but not outside the commonly used boundaries (i.e., those that have the most potential to become extreme) as extreme as well.

Denote the interval boundaries (or critical values) for low and high evs by $b_{k(l)}$ and $b_{k(u)}$, respectively. For implementing ev control via the GEM, the variable m_k was defined as the minimum of $b_{k(u)} / w_k$ and 1 for high extreme weights, and the maximum of $b_{k(l)} / w_k$ and 1 for low extreme weights, where w_k represents the sampling weight before adjustment, and $b_{k(u)}$ and $b_{k(l)}$ denote the critical values for the extreme weights. Note that under this definition, for high extreme weights, the more extreme the weight is, the smaller m_k will be, and, conversely, for low extreme weights, the more extreme the weight is, the bigger m_k will be. Nonextreme weights had a value of 1 for m_k . The upper and lower bounds for the adjustment factors were defined, respectively, as the product of m_k and the upper and lower boundary parameters of the GEM. The GEM allows inputs of up to three different upper and lower boundary parameters (L_1 and U_1 , L_2 and U_2 , L_3 and U_3) for high, non-, and low extreme weights. By applying a small upper boundary parameter for high extreme weights and a large lower boundary parameter for low extreme weights, the extreme weights can be controlled in the modeling process.

6.1 Questionnaire Dwelling Unit Extreme Weight Domain Definition

For the questionnaire dwelling unit (DU)-level weight adjustment, extreme weights were defined using a nested hierarchy of six domains:

1. State;
2. State sampling region;
3. State by household type;

Levels of household type indicate whether the household has members who are youths, young adults, or adults, where youth signifies 12- to 17-year-olds, young adult 18- to

¹² Deep stratification refers to the stratification that was used in the sample design. In the case of the 2024 survey, deep stratification refers to the cross-classification of state sampling region by age group.

25-year-olds, and adult 26 years or older. Household type has seven categories as listed below:

- a. Youth, Young Adult, Adult;
 - b. Youth, Young Adult;
 - c. Youth, Adult;
 - d. Young Adult, Adult;
 - e. Youth Only;
 - f. Young Adult Only; and
 - g. Adult Only.
4. State sampling region by household type;
 5. State by household type by household size (1, 2, 3, 4+); and
 6. State sampling region by household type by household size.

The hierarchy is used to satisfy the minimum of 30 observations for defining the boundaries for evs. If this sample size requirement is not met at the lower level, then the next level up in the hierarchy is used.

6.2 Person Pair Extreme Weight Domain Definition

The pair selection probability is a function of the selection probability of each person in the pair given by Formula 3.1 or 3.6, depending on the sum of the person selection probabilities within the household as discussed in Section 3.1. This probability can be very small if the selection probabilities of individual members are small. For example, consider a particular selected DU from the 2024 survey. This DU gave rise to a selected pair of respondents, one aged 49 and the other aged 50. The selection probability in this DU was 0.29636 for a respondent aged 26-49 and 0.11473 for a respondent aged 50 or older. Using Formula 3.6 in Chapter 3, the pair selection probability was computed to be 0.00087778. Therefore, the inverse of the selection probability, the pair-level design weight, was 1,139.24. Thus, a small pair selection probability can create a high initial weight, which is the product of the screener DU weight and the person pair design-based weight.

As mentioned in the introduction, it turns out to be difficult to select suitable domains for defining extreme weights for pair-level data. However, as was done for the 1999-2023 surveys, for 2024, the extreme weight definition was based on the following hierarchy of domains:

1. Pair age group¹³ (with three age categories, 12 to 25, 26 to 49, and 50+) by number (0, 1, 2+) of people aged 12 to 25 in the household;
2. State cluster (with five levels [explained as follows]) by pair age group by number (0, 1, 2+) of people aged 12 to 25 in the household;
3. State cluster (with three levels [explained as follows]) by pair age group by number (0, 1, 2+) of people aged 12 to 25 in the household; and

¹³ Pair age in this case should not be confused with the modeling term, which has a finer level breakdown.

4. State by pair age group by number (0, 1, 2+) of people aged 12 to 25 in the household.

The hierarchy was used to satisfy the minimum of 30 observations for defining the boundaries for evs. If this sample size requirement was not met at the lower level, then the next level up in the hierarchy was used.

The considerations behind the aforementioned definition for extreme weight domains are briefly introduced here. The sample design prespecified the person-level selection probability within state by five age groups (12 to 17, 18 to 25, 26 to 34, 35 to 49, 50+). Age groups 12 to 17 and 18 to 25 have a relatively similar selection probability, and the same is true for age groups 26 to 34 and 35 to 49. The 50+ group, however, has a quite different selection probability from the other groups. Furthermore, because the 12 to 17 and 18 to 25 age groups have large selection probabilities, they have a very high chance of being selected if the household has people in these age groups. Therefore, the number of people aged 12 to 25 in the household has a significant impact on the type of pair selected and the pair selection probability. Taking into consideration these design-related features, a suitable domain to define the pair-level extreme weight seems to be given by state by pair age group by number of people aged 12 to 25 in the household.

The hierarchy of domains mentioned earlier was used to satisfy the minimum of 30 observations. However, it was found that for many ev domains, the minimum sample size requirement was not met. To alleviate this problem, states were grouped into a small number of clusters, such as three or five. The assignment of states to clusters was determined by the clustering algorithm in PROC CLUSTER in SAS® (SAS Institute Inc., 2017), where the clustering variable was defined as the average person-level weight (ANALWT2) for each of the five age groups within each state. The choice of the average person-level weight for each group for each state was motivated from the objective of finding a single variable that would reflect the design-based difference in pair selection probabilities across states. Even with clustering of states, the ev domain sample size was insufficient in some cases, so the most general level of the hierarchy, the national level, was required. Furthermore, at the national level, some pair age categories had to be collapsed in forming domains of reasonable sample size to define extreme weights. More specifically, for the national level, all levels of number of people aged 12 to 25 for the pair age groups of 50+, 50+ and 26 to 49, 50+ were collapsed. In addition, levels 1 and 2+ of number of people aged 12 to 25 were combined for the pair age group of 26 to 49, 26 to 49.

7. Weight Calibration at the Questionnaire Dwelling Unit and Pair Levels

The 2024 National Survey on Drug Use and Health (NSDUH) was based on probability sampling so that valid inferences can be made from survey findings about the target population. Probability sampling refers to sampling in which every unit on the frame is given a known, nonzero probability for inclusion in the survey. This is required for unbiased estimation of the population total. The assumption of nonzero inclusion probability for every pair of units in the frame also is required for unbiased variance estimation. The 2014-2024 NSDUH sample design plans slightly modified the 2005-2013 approach, such that the basic sampling plan involved five stages of selection: (1) selection of census tracts within each state sampling region, (2) selection of census block groups within census tracts, (3) the selection of subareas or segments (comprising U.S. Census Bureau blocks) within census block groups, (4) the selection of dwelling units (DUs) within these subareas, and finally, (5) the selection of eligible individuals within DUs. Specific details of the sample design and selection procedures for the sample and changes to the design for this year can be found in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 2: Sample Design and Experience Report* (Center for Behavioral Health Statistics and Quality [CBHSQ], 2025a). As part of the postsurvey data-processing activities, analysis weights that reflected the selection probabilities from various stages of the sample design were calculated for respondents. These sample weights were adjusted at the screener dwelling unit (SDU) (screening sample), questionnaire dwelling unit (QDU), person, and paired respondent levels (the latter three all based around the questionnaire sample) to account for bias due to extreme values (evs), nonresponse (nr), and coverage.

The final sample weights for SDUs and QDU, person, and pair levels for the 2024 samples consisted of products of several factors, each representing a probability of selection at some particular stage or some form of ev, nr, or poststratification (ps) calibration adjustment. The following sections describe the QDU and pair weight components in greater detail. In summary, the first 11 factors were defined for all SDUs and reflected the fully adjusted SDU sample weight. The remaining components branched to reflect QDU and pair selection probabilities, as well as additional adjustments for ev, nr, and ps. Note that the final QDU and pair weights for the 2024 survey sample are the product of all weight components for each type of sample, illustrated in [Exhibits 7.1](#) and [7.2](#).

For QDU data, generalized exponential model (GEM) calibration was applied by partitioning the data into four groups of states: Northeast, South, Midwest, and West, based on census regions in the interest of computational feasibility. Previous experience showed that with current computing power, the large number of variables and records prevented any further reduction of modeling groups.

For pair data, generalized exponential modeling was initially applied by partitioning the pair data into four groups based on census regions. However, there were not enough observations in each group to fit a comprehensive model to reduce bias. Alternatively, a single model was attempted for the whole pair data, but it was rejected as not practical due to computational

limitations. A compromise approach was adopted by combining census regions into two groups: Northeast with South and Midwest with West. This grouping proved manageable and desirable because it assisted in bias reduction, ease of modeling, and workload reduction. [Exhibit 7.3](#) provides more details of the data partition for generalized exponential modeling. The resulting sample sizes of selected and respondent units for the pair and QDU data partitions are shown for the 2019-2024 surveys in [Table 7.1](#).

It may be noted that for the pair data in the 1999, 2000, and 2001 surveys, the built-in ev control feature of the GEM was not used until the final respondent pair ev adjustment step. The reason for this is that the definition for ev domain was not finalized before the pair data calibration process had begun. However, for the 2002-2024 survey pair data, the built-in ev control feature was used for each adjustment step.

Exhibit 7.1 Summary of QDU Sample Weight Components; 2024

SDU Level

Design Weight Components	
#1	Inverse Probability of Selecting Census Tract
#2	Inverse Probability of Selecting Census Block Groups
#3	Inverse Probability of Selecting Segment
#4	Quarter Segment Weight Adjustment
#5	Subsegmentation Inflation Adjustment
#6	Inverse Probability of Selecting SDU
#7	Subsampling of Added SDU Adjustment
#8	SDU Release Adjustment

Weight Adjustment*	
#9	SDU Nonresponse Adjustment (<i>res.sdu.nr</i>)
#10	SDU Poststratification Adjustment (<i>res.sdu.ps</i>)
#11	SDU Extreme Value Adjustment (<i>res.sdu.ev</i>)

QDU Level

Design Weight Component	
#12	Inverse of Selection Probability of at Least One Person in the Dwelling Unit

Weight Adjustment*	
#13	Selecting QDU Poststratification to SDU-Based Control Totals (<i>sel.qdu.ps</i>)
#14	Respondent QDU Nonresponse Adjustment (<i>res.qdu.nr</i>)
#15	Respondent QDU Poststratification to SDU-Based Control Totals (<i>res.qdu.ps</i>)
#16	Respondent QDU Extreme Value Adjustment (<i>res.qdu.ev</i>)

QDU = questionnaire dwelling unit; SDU = screener dwelling unit.

* These adjustments use the generalized exponential model (GEM), which also involves pre- and post-processing in addition to running the GEM macro. See Exhibit 4.1 in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 11: Person-Level Sampling Weight Calibration* report (Center for Behavioral Health Statistics and Quality [CBHSQ], forthcoming b). For computational feasibility, all weight adjustments were done using the four model groups based on census regions defined in [Exhibit 7.3](#). Note that design weight components 1-8 and weight adjustments 9-11 (selected dwelling unit adjustments) are the same as those used in the person-level sampling weight calibration. For details, see the 2024 Person-Level Sampling Weight Calibration report (CBHSQ, forthcoming b).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit 7.2 Summary of Person Pair Sample Weight Components; 2024

SDU Level

Design Weight Components	
#1	Inverse Probability of Selecting Census Tract
#2	Inverse Probability of Selecting Census Block Groups
#3	Inverse Probability of Selecting Segment
#4	Quarter Segment Weight Adjustment
#5	Subsegmentation Inflation Adjustment
#6	Inverse Probability of Selecting SDU
#7	Subsampling of Added SDU Adjustment
#8	SDU Release Adjustment

Weight Adjustment*	
#9	SDU Nonresponse Adjustment (<i>res.sdu.nr</i>)
#10	SDU Poststratification Adjustment (<i>res.sdu.ps</i>)
#11	SDU Extreme Value Adjustment (<i>res.sdu.ev</i>)

Person Pair Level

Design Weight Component	
#12	Inverse of Selection Probability of a Person Pair in SDU

Weight Adjustment*	
#13	Selected Pair Poststratification to SDU-Based Control Totals (<i>sel.pr.ps</i>)
#14	Respondent Pair Nonresponse Adjustment (<i>res.pr.nr</i>)
#15	Respondent Pair Poststratification Adjustment to SDU-Based Control Totals (<i>res.pr.ps</i>)
#16	Respondent Pair Extreme Value Adjustment (<i>res.pr.ev</i>)

SDU = screener dwelling unit.

* These adjustments use the generalized exponential model (GEM), which also involves pre- and post-processing in addition to running the GEM macro. See Exhibit 4.1 in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 11: Person-Level Sampling Weight Calibration* report (Center for Behavioral Health Statistics and Quality [CBHSQ], forthcoming b). For computational feasibility, all weight adjustments were done using the four model groups based on census regions defined in [Exhibit 7.3](#). Note that design weight components 1-8 and weight adjustments 9-11 (selected dwelling unit adjustments) are the same as those used in the person-level sampling weight calibration. For details, see the 2024 Person-Level Sampling Weight Calibration report (CBHSQ, forthcoming b).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit 7.3 U.S. Census Bureau Regions/Model Groups

Model Group	Census Region
QDU	
1	Northeast (9 States) Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont
2	Midwest (12 States) Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin
3	South (16 States and the District of Columbia) Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia
4	West (13 States) Alaska, Arizona, California, Colorado, Idaho, Hawaii, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming
Pair	
1	Northeast + South (25 States and the District of Columbia) Alabama, Arkansas, Connecticut, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maine, Massachusetts, Maryland, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, West Virginia
2	Midwest + West (25 States) Alaska, Arizona, California, Colorado, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oregon, South Dakota, Utah, Washington, Wisconsin, Wyoming

QDU = questionnaire dwelling unit.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table 7.1 Sample Size; by Model Group at QDU and Pair Levels, 2020-2024

Group	2020		2021		2022		2023		2024	
Model Group	Selected QDUs	Completed QDUs	Selected QDUs	Completed QDUs	Selected QDUs	Completed QDUs	Selected QDUs	Completed QDUs	Selected QDUs	Completed QDUs
QDU										
Northeast	9,219	5,760	18,735	9,840	19,454	10,320	18,748	10,550	17,683	10,119
South	13,057	8,862	34,776	19,136	35,990	19,797	31,202	17,805	32,084	18,915
Midwest	10,970	7,383	27,634	14,690	25,351	13,824	22,377	12,600	23,038	13,521
West	10,808	7,195	26,294	13,719	25,459	13,725	23,436	13,366	24,208	14,033
Total	44,054	29,200	107,439	57,385	106,254	57,666	95,763	54,321	97,013	56,588
Model Group	Selected Pairs	Completed Pairs	Selected Pairs	Completed Pairs	Selected Pairs	Completed Pairs	Selected Pairs	Completed Pairs	Selected Pairs	Completed Pairs
Pair										
Northeast + South	9,185	3,561	21,708	6,336	22,439	7,215	20,164	6,879	19,970	6,969
Midwest + West	9,276	3,523	23,068	6,129	22,096	6,488	19,810	6,479	20,187	6,684
Total	18,461	7,084	44,776	12,465	44,535	13,703	39,974	13,358	40,157	13,653

QDU = questionnaire dwelling unit.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2020-2024.

7.1 SDU-Level Weight Components

The person-level, QDU-level, and person pair-level weights share 11 weight components as the common initial weight before further adjustments. These 11 weight components for the SDU level correspond to selection probabilities and nr , ps , and ev adjustment factors for 2024. Note that this differs from previous National Household Surveys on Drug Abuse and NSDUHs in that beginning in 2014, a new design-based component was incorporated at the beginning of the process so that corresponding weight component numbers are incremented by 1 when compared with previous survey years with an otherwise similar weighting scheme. The first eight components in the sample weights reflect the probability of selecting the DUs. These components were derived from (1) the probability of selecting the census tract and (2) census block groups within census tract, (3) the probability of selecting the geographic segment within census block groups, (4) a quarter segment weight adjustment, (5) a subsegmentation inflation factor, (6) the probability of selecting a DU from within each counted and listed sampled segment, (7) the probability of inclusion of added DUs, and (8) DU percent release adjustment. The three remaining weight components, #9 through #11, are GEM calibration adjustments accounting for (9) DU nr at the screening level, (10) DU ps to census controls, and (11) DU-level ev adjustment, although in 2024, ev adjustment at this stage was deemed unnecessary, and thus Weight Component #11 was set to 1 for all respondent DUs. For more detailed information on Weight Components #1 through #3 and #5 through #8, refer to the 2024 Sample Design and Experience Report (CBHSQ, 2025), and for more detail on Weight Components #4 and #9 through #11, see the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 11: Person-Level Sampling Weight Calibration* report (CBHSQ, forthcoming b).

Weight Component #2, a component reflecting the selection of one census block group from each selected census tract, was included beginning in 2014. This step was added to allow for possible transitioning to an address-based sampling design in the future. Additional changes to sample allocation and survey design are discussed in detail in CBHSQ (2014).

7.2 QDU Weight Components

[Exhibit 5.1](#) lists the initially proposed predictor variables for the following adjustment steps via the GEM, and [Exhibit 7.4](#) provides the initial covariates for the QDU-level adjustment modeling.

Exhibit 7.4 Covariates for Questionnaire Dwelling Unit Weights; 2024

Variables	Type	Level	Proposed
One-Factor Effects			
Intercept	Binary	1	1
Population Density	Binary	4	3
Group Quarter	Binary	3	2
Race/Ethnicity of Householder	Binary	6	5
Rent/Housing	Binary	5	4
Segment % Black or African American	Binary	3	2
Segment % Hispanic or Latino	Binary	3	2
Segment % Owner-Occupied	Binary	3	2
Household Type	Binary	7	6
State	Both	Model-specific	-
Quarter	Both	4	3
Age Group	Counting	5	4
Race	Counting	5	4
Hispanicity	Counting	2	1
Sex	Counting	2	1
Household Size	Counting	1	1
Screening Mode ¹	Binary	2	1
Two-Factor Effects			
Age × Race (3 Levels)	Counting	5 × 3	8
Age × Hispanicity	Counting	5 × 2	4
Age × Sex	Counting	5 × 2	4
Race (3 Levels) × Hispanicity	Counting	3 × 2	2
Race (3 Levels) × Sex	Counting	3 × 2	2
Hispanicity × Sex	Counting	2 × 2	1
State × Age	Counting	Model-specific	-
State × Race (5 Levels)	Counting	Model-specific	-
State × Sex	Counting	Model-specific	-
State × Hispanicity	Counting	Model-specific	-
% Owner-Occupied × % Black or African American	Binary	3 × 3	4
% Owner-Occupied × % Hispanicity	Binary	3 × 3	4
% Owner-Occupied × Rent/Housing	Binary	3 × 5	8
Rent/Housing × % Black or African American	Binary	5 × 3	8
Rent/Housing × % Hispanicity	Binary	5 × 3	8
Three-Factor Effects			
Race (3 Levels) × Age × Sex	Counting	8	8
State/Region × Age × Sex	Counting	Model-specific	-
State/Region × Age × Hispanicity	Counting	Model-specific	-
State/Region × Age × Race (3 Levels)	Counting	Model-specific	-
State/Region × Hispanicity × Sex	Counting	Model-specific	-
State/Region × Race (3 Levels) × Hispanicity	Counting	Model-specific	-
State/Region × Race (3 Levels) × Sex	Counting	Model-specific	-

¹ Screening mode was included in only the res.qdu.nr step.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.2.1 QDU Weight Component #12: Inverse of Selection Probability of at Least One Person in the Dwelling Unit

The selection of a QDU from all completed SDUs is based on the outcome of a variant of Brewer’s method, which may select zero, one, or two people. Any pair of survey-eligible residents within the DU had some known, nonzero chance of being selected for the survey. The value for Weight Component #12 is equal to the inverse of the probability that at least one person in the DU is selected (see Section 3.2 for details).

[Table 7.2](#) presents the distributions and unequal weighting effect (UWE) for the design-based weight before and after selecting one person in the DU. The UWE increased after incorporating the QDU design weights.

Table 7.2 Distribution for Design-Based Weight and Unequal Weighting Effects before and after Selecting at Least One Person in the Dwelling Unit; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before QDU Selection	3	222	498	949	6,921	681	97,013	1.85
QDU Selection Weights	1.00	1.00	1.27	2.17	11.70	2.10	97,013	N/A
Weight after QDU Selection	3	338	781	1,613	28,863	1,347	97,013	2.76

N/A = not applicable; QDU = questionnaire dwelling unit; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.2.2 QDU Weight Component #13: Selected QDU Poststratification to SDU-Based Control Totals

This ps factor adjusts the weights for selected QDUs to the SDU-based control totals. The SDU-based control totals are obtained by using the calibrated SDU weights. This adjustment step provides more stable controls for the subsequent nr adjustment (Weight Component #14). [Exhibit 5.1](#) lists the initially proposed variables for generalized exponential modeling. The predictor variables are 0/1 indicators or counting variables representing the number of people who fall into a given demographic domain. The counting variables are derived from the screener demographic information. It may be noted that during screening, the only required demographic information was the age of each person rostered. Thus, other demographic information necessary for weight calibration, such as race/ethnicity and sex, may be missing for certain rostered eligible people, so imputation was done to replace these missing data. For more details on the imputation of screener demographic information, see CBHSQ (forthcoming b).

For the four model groups, one per census region, all main effects were kept except for some collapsing within the group quarters and household type, which both had some zero sample

cells. Among two-factor effects, some segment-level variables were collapsed due to singularities, and some state × race variables were collapsed due to convergence problems.

Table 7.3 presents the distributions and UWE before and after the selected QDU-level poststratification adjustment. The UWE decreased slightly after adjustment.

Table 7.3 Weight Distribution and Unequal Weighting Effects before and after Selected Questionnaire Dwelling Unit Poststratification; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before sel.qdu.ps	3	338	781	1,613	28,863	1,347	97,013	2.76
sel.qdu.ps Adjustment Factor	0.21	0.94	1.00	1.07	2.73	1.01	97,013	N/A
Weight after sel.qdu.ps	2	336	780	1,625	23,838	1,351	97,013	2.72

N/A = not applicable; sel.qdu.ps = selected questionnaire dwelling unit poststratification; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.2.3 QDU Weight Component #14: Respondent QDU Nonresponse Adjustment

This nr adjustment step accounts for the failure to obtain respondent person(s) from each selected QDU. The same set of initially proposed predictor variables were used as for the previous adjustment (#13).

The modeling for this step followed a similar pattern of variables kept in the model as in the prior step, although more collapsing occurred among the segment-level variables and state × race interaction.

Table 7.4 presents the distributions and UWEs before and after the QDU-level nonresponse adjustment. The UWE decreased slightly after adjustment.

Table 7.4 Weight Distribution and Unequal Weighting Effects before and after Respondent Questionnaire Dwelling Unit Nonresponse Adjustment; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before res.qdu.nr	4	330	760	1,611	23,838	1,355	56,588	2.81
res.qdu.nr Adjustment Factor	0.68	1.38	1.62	1.97	4.88	1.72	56,588	N/A
Weight after res.qdu.nr	5	528	1,296	2,831	41,637	2,317	56,588	2.74

N/A = not applicable; res.qdu.nr = respondent questionnaire dwelling unit nonresponse; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.2.4 QDU Weight Component #15: Respondent QDU Poststratification to SDU-Based Control Totals

This final ps for all respondent QDUs utilized the same set of initially proposed predictor variables as in previous adjustments. The corresponding control totals were obtained from the SDU-level sample, as was done for Weight Component #13.

All proposed covariates were retained across all model groups for this step. The adjustment was performed on data for both quarters together, and reduced the median and maximum weights, as well as reduced the UWE.

[Table 7.5](#) presents the distributions and UWE before and after respondent QDU poststratification adjustment.

Table 7.5 Weight Distribution and Unequal Weighting Effects before and after Respondent Questionnaire Dwelling Unit Poststratification; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before res.qdu.ps	5	528	1,296	2,831	41,637	2,317	56,588	2.74
res.qdu.ps Adjustment Factor	0.63	1.00	1.00	1.00	4.01	1.00	56,588	N/A
Weight after res.qdu.ps	5	528	1,299	2,834	41,121	2,317	56,588	2.73

N/A = not applicable; res.qdu.ps = respondent questionnaire dwelling unit poststratification; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.2.5 QDU Weight Component #16: Respondent QDU Extreme Value Adjustment

The extreme weight proportions for the final poststratified weights were acceptably low, eliminating the need for the ev adjustment (see [Table 7.6](#)). Weight Component #16 was set to 1 for each responding QDU. This adjustment has not been used since this design was implemented for the 1999 NSDUH but is entered as a placeholder in the event that it may be required. For details on extreme weight proportions at each adjustment step, see Appendix E.

**Table 7.6 Questionnaire Dwelling Unit Weight before and after res.qdu.ps
Extreme Weight Proportions; by Model Group, 2024**

Model Group	Weight	Extreme Weight Proportions		
		Unweighted	Weighted	Outwinors
1. Northeast	Weight before res.qdu.ps	0.89	3.14	0.27
	Weight after res.qdu.ps	0.80	2.63	0.06
2. Midwest	Weight before res.qdu.ps	0.89	4.31	0.41
	Weight after res.qdu.ps	0.76	3.48	0.07
3. South	Weight before res.qdu.ps	0.85	3.15	0.31
	Weight after res.qdu.ps	0.72	2.55	0.10
4. West	Weight before res.qdu.ps	0.73	2.13	0.19
	Weight after res.qdu.ps	0.74	1.99	0.04

res.qdu.ps = respondent questionnaire dwelling unit poststratification.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.2.6 Final QDU Analysis Weight

The final QDU analysis weight (distribution and UWE shown in [Table 7.7](#)) was constructed using the product of the final household weight, which is the product of SDU Weight Components #1 through #11 and QDU Weight Components #12 through #16. This adjusted weight is used for computing estimates of household characteristics.

Table 7.7 Final Weight Distribution of QDU Analysis Weight; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Final QDU Analysis Weight	5	528	1,299	2,834	41,121	2,317	56,588	2.73

QDU = questionnaire dwelling unit; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.3 Pair-Level Weight Components

[Exhibit 5.2](#) lists the initially proposed predictor variables for the following adjustment steps via the GEM, and [Exhibit 7.5](#) provides the initial covariates for the person pair-level adjustment modeling.

Exhibit 7.5 Covariates for Person Pair-Level Weights; 2024

Variables	Level	Proposed
One-Factor Effects		
Intercept	1	1
State	Model-specific	-
Quarter	4	3
Population Density	3	2
Group Quarter	3	2
Household Size	3	2
Pair Age	15	14
Pair Sex	3	2
Pair Race/Ethnicity	10	9
Race/Ethnicity of Householder	6	5
Rent/Housing	5	4
Segment % Black or African American	3	2
Segment % Hispanic or Latino	3	2
% Owner-Occupied	3	2
Pair Relationship ^{1,2}	10	10
Screening Mode ³	2	1
Interview Mode ⁴	2	1
Two-Factor Effects		
Pair Race/Ethnicity (5 Levels) × Pair Age (6 Levels)	5 × 6	20
Pair Race/Ethnicity (5 Levels) × Pair Sex	5 × 3	8
Pair Sex × Pair Age (6 Levels)	3 × 6	10
State/Region × Pair Race/Ethnicity (5 Levels)	Model-specific	-
State/Region × Pair Age (6 Levels)	Model-specific	-
State/Region × Pair Sex	Model-specific	-
Rent/Housing × % Black or African American	5 × 3	8
Rent/Housing × % Hispanic or Latino	5 × 3	8
Rent/Housing × % Owner-Occupied	5 × 3	8
% Owner-Occupied × % Black or African American	3 × 3	4
% Owner-Occupied × % Hispanic or Latino	3 × 3	4
Three-Factor Effects		
Pair Race/Ethnicity (4 Levels) × Pair Sex × Pair Age (3 Levels)	4 × 3 × 3	12

¹ Pair relationship variables are included in only the respondent pair poststratification and respondent pair extreme value adjustment steps.

² Note that pair relationship variables are single category indicators; as such, they do not require a reference level.

³ Screening mode was included in only the res.pr.nr step.

⁴ Interview mode was included in only the res.pr.ps step.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.3.1 Pair Weight Component #12: Inverse of Selection Probability of a Person Pair in the Dwelling Unit

Selection of pairs of individuals from all eligible people residing within the DU is based on the outcome of a variant of Brewer’s method, which may select zero, one, or two people. Any pair of survey-eligible residents within the DU has some known, nonzero chance of being selected for the survey. When two people are selected, a pair is formed. The pair selection probability is determined by Formula 3.1 or Formula 3.6 in Chapter 3. This weight component is the inverse of the selection probability discussed earlier.

As in prior NSDUH years, [Table 7.8](#) illustrates how selecting person pairs within DUs produces high weights and large UWEs.

Table 7.8 Weight Distribution and Unequal Weighting Effects before and after Selection of a Person Pair in the Dwelling Unit; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before Pair Selection in SDU	3	234	521	988	6,921	711	40,157	1.86
Pair Selection Weights	1.02	2.49	4.05	8.81	1,179.55	8.75	40,157	N/A
Weight after Pair Selection in SDU	7	899	2,241	5,677	864,304	6,136	40,157	8.18

N/A = not applicable; SDU = screener dwelling unit; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.3.2 Pair Weight Component #13: Selected Pair Poststratification to SDU-Based Control Totals

Similar to QDU Weight Component #13, this step was motivated by the consideration that the larger sample of all possible pairs provides more stable control totals for the respondent pair nr adjustment. The weights of selected pairs were poststratified to the control totals that derived from calibrated SDU weights of all possible pairs. The pair-level demographic variables for all selected pairs, such as pair age group, pair race/ethnicity, and so on, were derived from screener demographic information.

Modeling covariates were largely retained at proposed levels, although main effect group quarters and three-factor effects were dropped or collapsed for both models due to nonconvergence. [Table 7.9](#) shows a reduced maximum weight and UWE after this adjustment.

Table 7.9 Weight Distribution and Unequal Weighting Effects before and after Selected Pair Poststratification to SDU-Based Controls; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before sel.pr.ps	7	899	2,241	5,677	864,304	6,136	40,157	8.18
sel.pr.ps Adjustment Factor	0.06	0.86	1.06	1.28	2.30	1.08	40,157	N/A
Weight after sel.pr.ps	7	894	2,310	5,911	225,813	6,325	40,157	5.86

N/A = not applicable; sel.pr.ps = selected pair poststratification; SDU = screener dwelling unit; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.3.3 Pair Weight Component #14: Respondent Pair Nonresponse Adjustment

If both people in the selected pair completed interviews successfully, the pair then was considered a respondent pair. This adjustment step accounts for failure to obtain respondent pairs from all selected pairs. In this step, respondent pair weights were adjusted to the control totals based on the full sample of selected pairs. Because of the low response rate of person pairs, this step had a relatively large adjustment on the weights. The same set of proposed predictor variables was used as for Weight Component #13. Similar to Weight Component #13, the pair-level demographic variables for all selected pairs, such as pair age group, pair race/ethnicity, and so on, were derived from screener demographic information.

Again, nearly all covariates were retained in the model with the exception of group quarters and some two-factor segment-level interaction terms, which were collapsed because of convergence issues. Allowing for the lower response rates, the tolerance on the maximum adjustment factor was increased to 10 instead of 5 from prior years. The distribution in [Table 7.10](#) reflects larger weights and increased UWE after adjustment.

Table 7.10 Weight Distribution and Unequal Weighting Effects before and after Respondent Pair Nonresponse Adjustment; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before res.pr.nr	9	846	2,138	5,378	225,813	5,631	13,653	5.92
res.pr.nr Adjustment Factor	0.71	1.80	2.58	3.78	9.95	3.05	13,653	N/A
Weight after res.pr.nr	9	1,986	5,724	16,360	942,752	18,603	13,653	7.04

N/A = not applicable; res.pr.nr = respondent pair nonresponse; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.3.4 Pair Weight Component #15: Respondent Pair Poststratification to SDU-Based Control Totals

This final ps utilized the same set of initially proposed predictor variables as previous adjustment steps. In addition, 10 pair relationship domain-level indicator variables were added to the set of covariates. The control totals for GEM calibration were derived from the SDU sample of all possible pairs of eligible people, as was done for Weight Component #13. The calibration control totals for these 10 domains used household-level person counts and the final QDU weights. As mentioned in Chapter 1, use of these household-level count totals for pair relationship domains in GEM calibration provided Hajek-type weight adjustment in the interest of obtaining more stable estimates. In setting up calibration covariates, multiplicity factors were needed. These factors, as discussed in Chapter 1, are used in constructing estimates for person-level parameters based on pair-related drug behavior. The factors depend on the pair domains of interest. For a selected set of pair domains, multiplicity factors are provided along with the pair-level analysis weights. See Chapter 11 in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 10: Editing and Imputation Report (CBHSQ, forthcoming a)* for more detail on the creation and imputation of missing values in the pair relationship, multiplicity, and household-level person counts. See Chapter 5 for more detail on the use of multiplicities and household-level person counts in ps.

Unlike Weight Components #13 and #14, demographic covariates were based on data from the questionnaire instead of information pulled from the DU screener.

This step retained similar covariates as previous steps—collapsed group quarter variables and collapsed or dropped three-factor effects. However, as stated earlier, the additional domains based on counts were included, and these had no convergence issues, so they were all kept in the models. The UWE decreased slightly after this adjustment, as shown in [Table 7.11](#).

Table 7.11 Weight Distribution and Unequal Weighting Effects before and after Respondent Pair Poststratification to SDU-Based Controls; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before res.pr.ps	9	1,986	5,724	16,360	942,752	18,603	13,653	7.04
res.pr.ps Adjustment Factor	0.14	0.82	1.05	1.24	2.19	1.02	13,653	N/A
Weight after res.pr.ps	7	1,861	5,619	16,552	692,906	18,603	13,653	6.94

N/A = not applicable; res.pr.ps = respondent pair poststratification; SDU = screener dwelling unit; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.3.5 Pair Weight Component #16: Respondent Pair Extreme Weight Adjustment

The extreme weight proportions for the weights up to Weight Component #15 were checked using the extreme weight domains (see Section 6.2). The built-in extreme weight control feature of the GEM implemented in previous adjustment steps successfully reduced the extreme weight proportions, although the values (see [Table 7.12](#)) were higher than the target values (3 percent of unweighted, 15 percent of weighted, and 5 percent of outwinsors—see Section 8.2), so the extreme weight adjustment via the GEM was implemented using the same final set of predictor variables kept in the model for Weight Component #15. This step was successful in further reducing the extreme weight proportion in all model groups, per the distribution information shown in [Table 7.13](#). For details on extreme weight proportions at each adjustment step, see Appendix J.

Table 7.12 Person Pair-Level Weight after res.pr.ps Extreme Weight Proportions; by Model Group, 2024

Model Group	Weight	Extreme Weight Proportions		
		Unweighted	Weighted	Outwinsors
1. Northeast and South	Weight before res.pr.ps	2.51	7.27	1.67
	Weight after res.pr.ps	1.49	5.81	0.49
2. Midwest and West	Weight before res.pr.ps	3.10	11.35	2.16
	Weight after res.pr.ps	1.27	3.86	0.30

res.pr.ps = respondent pair poststratification.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table 7.13 Weight Distribution and Unequal Weighting Effects before and after Respondent Pair Extreme Weight Adjustment; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Weight before res.pr.ev	7	1,861	5,619	16,552	692,906	18,603	13,653	6.94
res.pr.ev Adjustment Factor	0.53	0.98	1.00	1.01	1.26	1.00	13,653	N/A
Weight after res.pr.ev	7	1,862	5,614	16,620	654,196	18,603	13,653	6.88

N/A = not applicable; res.pr.ev = respondent pair extreme value; UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

7.3.6 Final Pair Analysis Weight

The final person-pair level analysis weight was constructed using the product of the final household weight, which is the product of Weight Components #1 through #11 and pair Weight Components #12 through #16. Distribution and UWE of the final pair analysis weight

are shown in [Table 7.14](#). This adjusted weight is used for computing estimates of characteristics of selected pairs within DUs.

Table 7.14 Final Weight Distribution Person Pair Analysis Weight; 2024

Weight	Min	25th Percentile	Median	75th Percentile	Max	Mean	Sample Size	UWE
Final Pair Weight	7	1,862	5,614	16,620	654,196	18,603	13,653	6.88

UWE = unequal weighting effect.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

8. Evaluation of Calibration Weights

During the weight calibration process, several criteria for quality control were implemented to assess model adequacy. This chapter describes the individual procedures and summarizes their results. All tables referred to in this chapter can be found in Appendices D through G and I through L.

8.1 Response Rates

[Table D.1](#) in Appendix D displays the final selected and responding questionnaire dwelling unit (QDU) sample sizes from the 2024 National Survey on Drug Use and Health for various national domains. This table also shows the weighted response rates.¹⁴ Most domains reflect the overall 58.48 percent response rate, with most rates between 45 and 60 percent, although the highest response rate reached 89.13 percent, from the group category of the group quarters variable. The lowest response rate came from the age 12-17 category of the household type variable, with 37.23 percent.

[Table I.1](#) in Appendix I displays the final selected and responding pair-level sample sizes and weighted response rates from the 2024 survey for various national domains. Because of the nature of the pair data, the response rates were lower in all domains examined than at the QDU level, with an overall response rate of 30.27 percent. The response rates range from a low of 24.95 percent in the pair age category 26-34, 50+ to a high of 55.54 percent from the group category of the group quarters variable. This broad range of response rates is probably due to a combination of small sample sizes and response burden as a result of selection of pairs within households among various domains. Like at the QDU level, the top response rates are among the younger respondents (as measured by household type for the QDU data and pair age for the pair data), and the highest response rate being in the group level of the variable group quarters may be driven by this variable including college dormitories.

8.2 Proportions of Extreme Values and Outwinsors

During the stages of modeling adjustments (i.e., nonresponse [nr] and poststratification [ps]), one major issue of concern when deciding the adequacy of a particular model was the extent of the resulting proportions of extreme value (ev) and outwinsor weights (see Sections 6.1 and 6.2 for these definitions). For each weight adjustment step, these proportions are computed before and after the step for various domains. Before adjustment, the product of all weight components is used to compute proportions of evs and outwinsors, whereas after the adjustment, the product includes the new adjustment factor. If the proportion of evs and outwinsors is deemed high (normally 3 percent of unweighted, 15 percent of weighted, and 5 percent of outwinsor), a separate ev treatment step after ps could be performed.

¹⁴ Questionnaire dwelling unit response rates and pair response rates were computed using American Association for Public Opinion Research's (AAPOR's) Response Rate 2. See AAPOR's Standard Definitions (AAPOR, 2016) for more information.

[Tables E.1](#) and [E.2](#) and [Tables J.1](#) through [J.3](#) present percentages of evs at the QDU and pair levels, respectively, for various domains. Unweighted percentages are the percentage of actual counts of units defined as evs relative to the total sample size. Weighted percentages reflect the percentage of total ev weights relative to the total sample weight, whereas outwinsor percentages represent the total amount of residual weight when the weights are trimmed to the critical values (used for ev definition) relative to the total sample weight. For evaluation purposes, the outwinsor percentage is considered the most important of the three percentages, because this gave a measure of the impact of winsorization (or trimming) of ev weights (if this treatment was performed). See Sections 6.1 and 6.2 for the domains that were used to define evs.

8.3 Slippage Rates

The slippage rate for a given domain is defined as the relative percentage difference between the sampling weights and the external control totals, before and after ps. The control totals for QDU and person pair ps are derived from the screener dwelling unit weights, which were poststratified to U.S. Census Bureau population estimates (Center for Behavioral Health Statistics and Quality, forthcoming b). [Table F.1](#) displays QDU national domain-specific weight sums for before and after ps, as well as the desired totals to be met through ps. [Table K.1](#) shows the same for the pair sample. These tables also show the relative percentage difference, or the amount of adjustment necessary (positive or negative) to meet the desired totals. The first relative difference is used explicitly during the ps modeling procedure to identify potential problems for convergence. Large differences in domains with relatively small sample sizes are indicative of potential large adjustment factors, which may cause problems in convergence while satisfying bound constraints. The reason is that adjustments required for one domain may have an adverse effect on another domain when a unit belongs to both.

As an example, consider that [Table F.1](#), for the 2024 QDU domain household size of one, indicates a sample size of 8,563 with a total design-based weight of 36,652,921 and a census total of 35,218,223 with an initial slippage rate of 4.07 percent, which would imply a common weight adjustment approximately equal to 0.960857, if this were the only calibration control. Similarly, looking at pair data in [Table K.1](#), the pair domain category of pair race/ethnicity Black or African American has a sample size of 1,435, a design-based weight of 24,396,335, and a census total of 26,721,564, showing an initial slippage of -8.70 percent. The resultant required adjustment would be approximately equal to 1.095311 if this were the only control. However, in the generalized exponential model (GEM), all controls are simultaneously satisfied under a complex algorithm that allows for different adjustment factors for different units.

8.4 Weight Adjustment Summary Statistics

[Tables G.1](#) and [G.2](#) and [Tables L.1](#) through [L.3](#) display summary statistics on the product of weight components before and after all stages of adjustment for the QDU and person pair, respectively. The summary statistics include sample size (n), minimum (min), maximum (max), median (med), 25th percentile (Q1), 75th percentile (Q3), and the unequal weighting effect (UWE). Note that in [Tables L.2](#) and [L.3](#), the sample size for pair age group, pair race/ethnicity,

and pair sex are slightly different. This is because those variables were defined using screening demographic information in the nr adjustment of respondent pairs, whereas in the ps of respondent pairs, they were defined from questionnaire demographic information. Because UWE is directly affected by weight adjustment factors and extreme weights, these values—along with the percentage of extreme weights as noted in Section 8.2—were used as guidelines for determining model adequacy.

8.5 Sensitivity Analysis of Drug Use Estimates

It is known that, in general, there is a trade-off between bias reduction and variance reduction. For instance, with the GEM (for nr or ps), enlarging a simple model (such as the one with only main effects) has the potential of further reducing the bias. At the same time, this enlargement also may be associated with a corresponding increase in the variance of the estimate due to additional variability caused by estimating the model parameters. To check for possible overfitting of the GEM, a sensitivity analysis for respondent QDU ps for the QDU weights, respondent pair ps, and extreme weight adjustment for the person pair weights was conducted. A simple baseline model was fitted with the same bounds and maximum number of iterations as were used for the chosen (more complex) final model. Then the possibility of substantial changes in point estimates and standard errors (SEs) was examined. For the QDU weights, some household-level characteristics were selected such as family income, number of youths in the household, whether the household had health insurance coverage, and number of people aged 65 or older living in the household. The estimates and SEs are displayed in [Table 8.1](#). For the person pair weights, selected licit and illicit drug use prevalence rates of 12- to 17-year-olds were calculated from parent-child pairs, and estimates and SEs of the estimates based on pair weights are shown in [Tables 8.2a](#) to [8.3b](#). Note that for 2024, the survey item used to calculate estimates in prior years for Tables 8.4-8.7b was not collected; thus, those tables are not available. However, this item returned to the questionnaire for 2025, and those tables are expected to be part of subsequent reports.

As seen in [Table 8.1](#), the estimates and their SEs for the two models (baseline and the final) are generally similar to each other for the QDU weights. However, among the person pair estimates and SEs, there are some differences, but they do not seem significant in general.

Because the sensitivity analyses for QDU- and pair-level calibrated weights seem to indicate that adding more covariates does not introduce an undesirable degree of instability in the estimates or their SEs, the final, more complex GEMs were deemed reasonable.

Table 8.1 Estimates of Totals and SEs for Domains of Interest Based on QDU Sample; 2024

Domain	n	Baseline (B) ¹	Final (F) ²	(B-F)/F% (Estimate)	(B-F)/F% (SE)
<i>Households with Family Income</i>					
\$0-<\$10,000	3,952	8,111,619 (281,431)	8,105,872 (281,507)	0.07	-0.03
\$10,000-<\$20,000	4,921	12,544,116 (373,753)	12,537,764 (373,747)	0.05	0.00
\$20,000-<\$30,000	4,331	10,491,028 (315,021)	10,492,166 (315,715)	-0.01	-0.22
\$30,000-<\$40,000	4,531	11,270,921 (311,591)	11,268,648 (311,693)	0.02	-0.03
\$40,000-<\$50,000	5,060	11,827,528 (308,259)	11,837,274 (308,784)	-0.08	-0.17
\$50,000-<\$75,000	8,216	19,700,723 (446,111)	19,696,291 (446,144)	0.02	-0.01
\$75,000-<\$100,000	6,942	15,656,362 (348,131)	15,651,846 (347,828)	0.03	0.09
\$100,000+	18,635	41,496,992 (768,262)	41,509,427 (768,730)	-0.03	-0.06
<i>Households with Number of Youths (<18)</i>					
0	30,820	91,378,320 (1,342,996)	91,379,533 (1,343,143)	-0.00	-0.01
1	10,521	16,970,701 (331,648)	16,965,294 (331,545)	0.03	0.03
2	9,015	13,911,627 (278,849)	13,919,669 (279,544)	-0.06	-0.25
3	3,963	5,784,025 (154,194)	5,781,897 (154,244)	0.04	-0.03
4+	2,269	3,054,617 (108,893)	3,052,896 (108,967)	0.06	-0.07
<i>Households with Insurance Coverage</i>					
Yes	51,148	120,319,696 (1,597,667)	120,318,380 (1,597,851)	0.00	-0.01
No	5,440	10,779,593 (291,204)	10,780,909 (291,617)	-0.01	-0.14
<i>Households with Number of Older Adults (65+)</i>					
0	45,506	88,155,452 (1,182,784)	88,157,801 (1,182,899)	-0.00	-0.01
1	6,767	26,856,933 (622,585)	26,855,693 (623,219)	0.00	-0.10
2	4,195	15,722,871 (418,917)	15,721,567 (419,071)	0.01	-0.04
3+	120	364,033 (45,527)	364,228 (45,566)	-0.05	-0.09

QDU = questionnaire dwelling unit; SE = standard error.

NOTE: Standard errors of prevalence estimates are provided in parentheses.

¹ Baseline refers to the weight obtained from using a main effects only model for the last step of calibration, res.qdu.ps, and a full model for preceding steps.

² Final refers to the weight obtained using a full model throughout all steps of calibration.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table 8.2a Percentages of Youths (12 to 17) Reporting Lifetime, Past Year, and Past Month Use of Alcohol and Tobacco: Among Mother-Child (12 to 17) Pairs; by Mother Use, 2024

Drug	Mother User	<i>n</i>	Baseline ¹	Final ²
Alcohol				
Lifetime	Yes	1,870	23.58 (1.85)	23.26 (1.83)
	No	362	8.24 (2.15)	8.23 (2.17)
	Overall	2,232	20.81 (1.59)	20.52 (1.58)
Past Year	Yes	1,512	20.44 (2.09)	20.30 (2.07)
	No	720	9.80 (1.73)	9.23 (1.62)
	Overall	2,232	16.95 (1.52)	16.68 (1.50)
Past Month	Yes	1,088	8.62 (1.55)	8.69 (1.57)
	No	1,144	4.50 (1.04)	4.24 (0.95)
	Overall	2,232	6.52 (0.92)	6.45 (0.91)
Cigarettes				
Lifetime	Yes	1,253	9.23 (1.40)	8.59 (1.30)
	No	979	1.78 (0.55)	1.82 (0.59)
	Overall	2,232	5.79 (0.79)	5.43 (0.73)
Past Year	Yes	388	6.39 (2.26)	5.88 (2.02)
	No	1,844	2.09 (0.57)	1.93 (0.52)
	Overall	2,232	2.70 (0.57)	2.48 (0.51)
Past Month	Yes	323	4.61 (1.79)	4.24 (1.61)
	No	1,909	1.17 (0.48)	1.06 (0.42)
	Overall	2,232	1.58 (0.47)	1.43 (0.41)

NOTE: Standard errors of prevalence estimates are provided in parentheses.

¹ Baseline refers to the weight obtained from using a main effects only model for the last two steps of calibration, res.pr.ps and res.pr.ev, and a full model for preceding steps.

² Final refers to the weight obtained using a full model throughout all steps of calibration.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table 8.2b Percentages of Youths (12 to 17) Reporting Lifetime, Past Year, and Past Month Use of Alcohol and Tobacco: Among Father-Child (12 to 17) Pairs; by Father Use, 2024

Drug	Father User	<i>n</i>	Baseline ¹	Final ²
Alcohol				
Lifetime	Yes	1,059	18.30 (1.84)	18.44 (1.91)
	No	150	4.78 (2.19)	4.53 (2.13)
	Overall	1,209	16.24 (1.63)	16.38 (1.69)
Past Year	Yes	852	14.45 (2.03)	14.38 (2.08)
	No	357	6.58 (1.71)	6.46 (1.68)
	Overall	1,209	11.75 (1.49)	11.71 (1.53)
Past Month	Yes	710	7.62 (1.90)	7.73 (1.95)
	No	499	3.48 (1.22)	3.54 (1.28)
	Overall	1,209	5.80 (1.22)	5.92 (1.26)
Cigarettes				
Lifetime	Yes	780	6.09 (1.32)	6.05 (1.34)
	No	429	3.17 (1.50)	3.50 (1.72)
	Overall	1,209	4.93 (1.04)	5.03 (1.10)
Past Year	Yes	246	5.22 (2.38)	5.53 (2.63)
	No	963	2.76 (0.90)	2.88 (0.98)
	Overall	1,209	3.17 (0.86)	3.30 (0.93)
Past Month	Yes	197	1.18 (0.71)	1.08 (0.70)
	No	1,012	0.70 (0.45)	0.60 (0.40)
	Overall	1,209	0.76 (0.40)	0.66 (0.36)

NOTE: Standard errors of prevalence estimates are provided in parentheses.

¹ Baseline refers to the weight obtained from using a main effects only model for the last two steps of calibration, res.pr.ps and res.pr.ev, and a full model for preceding steps.

² Final refers to the weight obtained using a full model throughout all steps of calibration.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table 8.3a Percentages of Youths (12 to 17) Reporting Lifetime, Past Year, and Past Month Use of Any Illicit Drug or Marijuana: Among Mother-Child (12 to 17) Pairs; by Mother Use, 2024

Drug	Mother User	<i>n</i>	Baseline ¹	Final ²
Any Illicit Drug				
Lifetime	Yes	1,225	26.83 (2.55)	26.03 (2.52)
	No	1,007	20.14 (2.06)	19.98 (2.08)
	Overall	2,232	23.73 (1.65)	23.21 (1.64)
Past Year	Yes	551	21.64 (3.43)	20.45 (3.28)
	No	1,681	11.30 (1.23)	11.09 (1.24)
	Overall	2,232	13.54 (1.25)	13.11 (1.23)
Past Month	Yes	360	11.58 (2.78)	11.31 (2.71)
	No	1,872	5.48 (0.78)	5.24 (0.76)
	Overall	2,232	6.26 (0.81)	6.00 (0.77)
Marijuana				
Lifetime	Yes	1,131	16.52 (1.93)	15.85 (1.88)
	No	1,101	7.00 (1.20)	6.87 (1.19)
	Overall	2,232	11.62 (1.14)	11.19 (1.11)
Past Year	Yes	487	12.94 (2.39)	12.20 (2.26)
	No	1,745	8.10 (1.01)	7.85 (1.00)
	Overall	2,232	9.01 (0.94)	8.66 (0.92)
Past Month	Yes	332	9.73 (2.82)	9.46 (2.75)
	No	1,900	4.53 (0.73)	4.34 (0.71)
	Overall	2,232	5.15 (0.72)	4.94 (0.70)

NOTE: Standard errors of prevalence estimates are provided in parentheses.

¹ Baseline refers to the weight obtained from using a main effects only model for the last two steps of calibration, res.pr.ps and res.pr.ev, and a full model for preceding steps.

² Final refers to the weight obtained using a full model throughout all steps of calibration.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table 8.3b Percentages of Youths (12 to 17) Reporting Lifetime, Past Year, and Past Month Use of Any Illicit Drug or Marijuana: Among Father-Child (12 to 17) Pairs; by Father Use, 2024

Drug	Father User	<i>n</i>	Baseline ¹	Final ²
Any Illicit Drug				
Lifetime	Yes	688	29.95 (3.23)	30.54 (3.33)
	No	521	17.17 (2.69)	17.84 (2.82)
	Overall	1,209	23.90 (2.13)	24.52 (2.20)
Past Year	Yes	321	15.73 (2.88)	15.36 (2.84)
	No	888	10.40 (1.55)	10.97 (1.65)
	Overall	1,209	11.71 (1.34)	12.05 (1.39)
Past Month	Yes	237	11.92 (2.98)	11.50 (2.88)
	No	972	3.83 (0.85)	4.09 (0.93)
	Overall	1,209	5.36 (0.90)	5.50 (0.94)
Marijuana				
Lifetime	Yes	635	14.67 (2.03)	14.78 (2.07)
	No	574	4.69 (1.20)	5.11 (1.38)
	Overall	1,209	9.68 (1.20)	9.93 (1.26)
Past Year	Yes	284	14.34 (3.02)	13.90 (2.97)
	No	925	5.65 (1.14)	6.06 (1.24)
	Overall	1,209	7.58 (1.10)	7.81 (1.15)
Past Month	Yes	220	10.22 (2.92)	9.80 (2.79)
	No	989	2.26 (0.64)	2.47 (0.74)
	Overall	1,209	3.71 (0.76)	3.81 (0.81)


NOTE: Standard errors of prevalence estimates are provided in parentheses.

¹ Baseline refers to the weight obtained from using a main effects only model for the last two steps of calibration, res.pr.ps and res.pr.ev, and a full model for preceding steps.

² Final refers to the weight obtained using a full model throughout all steps of calibration.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

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Appendix A: Technical Details about the Generalized Exponential Model

A.1 Distance Function

Let $\Delta(w, d)$ denote the distance between the initial weights $d = \{d_k : k \in s\}$ and the adjusted weights w , with k being the k th unit in the sample and s being the sample selected (e.g., selected dwelling units or selected people). The distance minimized under the generalized exponential model (GEM), subject to calibration constraints, is given by the following distance function:

$$\Delta(w, d) = \sum_{k \in s} \frac{d_k}{A_k} \left\{ (a_k - \ell_k) \log \frac{a_k - \ell_k}{c_k - \ell_k} + (u_k - a_k) \log \frac{u_k - a_k}{u_k - c_k} \right\}, \quad (\text{A.1.1})$$

where $a_k = w_k / d_k$, $A_k = (u_k - \ell_k) / [(u_k - c_k)(c_k - \ell_k)]$ and ℓ_k , c_k , and u_k are prescribed real numbers, where $\ell_k < c_k < u_k$. Let T_x denote the p -vector of control totals corresponding to predictor variables (x_1, \dots, x_p) . Then the calibration constraints for the aforementioned minimization problem are

$$\sum_{k \in s} x_k d_k a_k = T_x. \quad (\text{A.1.2})$$

The solution for the aforementioned minimization problem, if it exists, is given by model parameters λ from the GEM, which is a p -dimensional vector with p as the number of predictor variables; that is,

$$a_k(\lambda) = \frac{\ell_k (u_k - c_k) + u_k (c_k - \ell_k) \exp\{A_k x'_k \lambda\}}{(u_k - c_k) + (c_k - \ell_k) \exp\{A_k x'_k \lambda\}}. \quad (\text{A.1.3})$$

Note that the number of parameters in the GEM should be $\leq n$, where n is the size of the sample s . This is also the dimension of vectors d and w . It follows from Equation A.1.3 that

$$\ell_k < a_k < u_k, k = 1, \dots, n. \quad (\text{A.1.4})$$

The weight adjustment factor achieved by the usual raking ratio algorithm (Singh & Mohl, 1996) can also be derived as a special case of the GEM, noting that for $\ell_k = 0$, $u_k = \infty$, $c_k = 1$, and $k = 1, \dots, n$,

$$\Delta(w, d) = \sum_{k \in s} d_k a_k \log a_k - \sum_{k \in s} d_k (a_k - 1) \quad (\text{A.1.5})$$

and $a_k(\lambda) = \exp(x'_k \lambda)$.

The logit model of Deville and Särndal (1992) is also a special case of the GEM, by setting $\ell_k = L$, $u_k = U$, and $c_k = 1$ for all k . This new GEM was introduced by Folsom and Singh (2000).

A.2 Generalized Exponential Model Adjustments for Extreme Value Treatment, Nonresponse, and Poststratification

By choosing the user-specified parameters ℓ_k , c_k , and u_k appropriately, the unified GEM formula (Equation A.1.3) can be justified for all three types of adjustment: extreme value treatment, nonresponse, and poststratification. For extreme value treatment via winsorization, denote the winsorized weights by $\{b_k\}$, where $b_k = d_k$ if d_k is not an extreme weight and $b_k = \text{median}\{d_k\} \pm 3 * \text{IQR}$ if d_k is an extreme weight, where IQR denotes the interquartile range, and the median and quartiles for the weights are defined with respect to a suitable design-based stratum.

For the nonresponse adjustment, let L_1 and U_1 be user-specified lower and upper bounds for high extreme weights, L_2 and U_2 the lower and upper bounds for nonextreme weights, and L_3 and U_3 the lower and upper bounds for low extreme weights. The sample is first divided into two parts: the nonextreme weight subsample and the extreme weight subsample. For nonextreme weights, the following are set: $L_2 = 1$, $C_2 = \rho^{-1}$, and $U_2 = U > \rho^{-1}$, where ρ is the overall response propensity. For extreme weights with high weights, $\ell_k = L_1 m_k$, $c_k = \rho^{-1} m_k$, and $u_k = U_1 m_k$, where $m_k = b_k / d_k$ and $1 \leq L_1 < \rho^{-1} = C_1 < U_1$ are prescribed numbers. Similarly, for extreme weights with low weights, $\ell_k = L_3 m_k$, $c_k = \rho^{-1} m_k$, $u_k = U_3 m_k$, and $1 \leq L_3 < \rho^{-1} = C_3 < U_3$.

For the poststratification adjustment, the following weights are set: for nonextreme weights, $\ell_k = L_2$, $c_k = C_2 = 1$, and $u_k = U_2$; for high extreme weights, $\ell_k = L_1 m_k$, $c_k = m_k$, and $u_k = U_1 m_k$; and similarly, for low extreme weights, $\ell_k = L_3 m_k$, $c_k = m_k$, and $u_k = U_3 m_k$. The extreme value adjustment is identical to poststratification, except for tighter bounds on extreme weights resulting from the final poststratification.

Notice that the GEM allows the flexibility of specifying different bounds for different subsamples. In addition, the lower bound (in the case of nonresponse adjustments) can be made to equal 1 by choosing the center $c_k > 1$.

A.3 Newton-Raphson Steps

Let X denote the $n \times p$ matrix of predictor values, and for the v^{th} iteration,

$$\Gamma_{\phi_v} = \text{diag}\left(d_k \phi_k^{(v)}\right), \phi_k^{(o)} = 1,$$

where $\phi_k^{(v)} = \left[(u_k - a_k^{(v)}) (a_k^{(v)} - \ell_k) \right] / \left[(u_k - c_k) (c_k - \ell_k) \right]$.

Then, for the Newton-Raphson iteration v , the value of the ρ -vector λ is adjusted as

$$\lambda^{(v)} = \lambda^{(v-1)} + \left(X' \Gamma_{\phi, v-1} X \right)^{-1} \left(T_x - \hat{T}_x^{(v-1)} \right),$$

where $\lambda^{(0)} = 0$, and \hat{T}_x is calculated by using Equation A.1.2, in which a_k is calculated by plugging the current λ into Equation A.1.3.

The convergence criterion is based on the Euclidean distance $\left\| T_x - \hat{T}_x^{(v)} \right\|$, which is defined as

$\sqrt{\left(T_x - \hat{T}_x^{(v)} \right)' \left(T_x - \hat{T}_x^{(v)} \right)}$. At each iteration, it is checked to determine whether it is decreasing.

If it is not, a half step is used in the iteration increment for λ .

A.4 Scaled Constrained Exponential Model

In National Household Surveys on Drug Abuse (NHSDAs)¹ prior to 1999, constrained exponential models (CEMs) were used for poststratification, and scaled CEMs were used for nonresponse adjustments. The CEM refers to the logit model of Deville and Särndal (1992), in which lower and upper bounds do not vary with k ; that is, $\ell_k = L$, $u_k = U$, and $c_k = C = 1$, such that $L < 1 < U$. Thus, the CEM is a special case of the GEM. For the nonresponse adjustment, Folsom and Witt (1994) modified the CEM estimating equations by a scaling factor (ρ^{-1} , the inverse of the overall response propensity), such that $1 < \rho^{-1} a_k < \rho^{-1} U$. This implies that choosing L in the CEM as ρ ensures that the scaled adjustment factor for nonresponse is at least 1.

¹ NHSDA was renamed the National Survey on Drug Use and Health (NSDUH) in 2002.

Appendix B: Derivation of Poststratification Control Totals

Unlike for the person-level poststratification adjustment, the control totals for questionnaire dwelling unit (QDU)-level and person pair-level weight calibration could not be derived from the U.S. Census Bureau directly. Estimates of the number of households and person pairs were not available at the domains that needed to be controlled, and person pair population estimates were not available even at a national level. However, by taking advantage of the two-phase design of the National Survey on Drug Use and Health (NSDUH), the screener dwelling unit (SDU) sample weights could be poststratified to census population estimates. The calibrated SDU weights then could be used as stable control totals for the QDU- and person pair-level sample weights. In addition to the SDU weights, the person pair-level weights were calibrated to a second set of controls derived from the questionnaire, called household-level person counts. These controls were applied to pairs who were members of the 10 selected pair domains given as follows:

1. Parent-child pairs, child aged 12 to 14, target population is parents whose children aged 12 to 14 live with them
2. Parent-child pairs, child aged 12 to 14, target population is children aged 12 to 14 living with their parents
3. Parent-child pairs, child aged 12 to 17, target population is parents whose children aged 12 to 17 live with them
4. Parent-child pairs, child aged 12 to 17, target population is children aged 12 to 17 living with their parents
5. Parent-child pairs, child aged 12 to 20, target population is parents whose children aged 12 to 20 live with them
6. Parent-child pairs, child aged 12 to 20, target population is children aged 12 to 20 living with their parents
7. Sibling-sibling pairs, older sibling aged 15 to 17, younger sibling aged 12 to 14, target population is siblings aged 15 to 17 whose siblings are aged 12 to 14
8. Sibling-sibling pairs, older sibling aged 18 to 25, younger sibling aged 12 to 17, target population is siblings aged 18 to 25 whose siblings are aged 12 to 17
9. Spouse-spouse and partner-partner pairs
10. Spouse-spouse and partner-partner pairs with children aged 17 or younger living in the household

B.1 Derivation of Questionnaire Dwelling Unit-Level Poststratification Controls

The derivation of QDU-level poststratification controls was not directly possible. Instead, it had to be based on work done for the person-level calibration. At the person level, weights were calibrated to the desired control totals. These weights then were altered in order to conform to use with QDU-level data.

B.1.1 Person Level

B.1.1.1 Receiving and Deriving Person-Level Poststratification Control Totals

Civilian, noninstitutionalized population estimates for people aged 12 or older were provided by the Population Estimates Program of the U.S. Census Bureau. One state-level file contained estimates of the population broken down by levels of month (12), Hispanicity (2), race (6), sex (2), and age into single-year estimates from people aged 0 to 84, and a combined age group estimate for people aged 85 or older.

The breakdown received from the census did not match the levels of the domains for which control totals were desired. To account for this, levels were collapsed. From these altered data, datasets were created with model group-specific control totals. Observations in these datasets corresponded to a breakdown by quarter (4), Hispanicity (2), race (5), sex (2), age (6), and number of states¹ in the model group (number of states varied according to which census region was represented in the model group).

B.1.1.2 Adjusting Screener Dwelling Unit Data to the Control Totals

In the person-level weighting, the SDU weights were poststratified to meet control totals based on the population estimates received from the census. For NSDUH weighting, a generalized exponential model (GEM) was utilized to calibrate sample weights to multiple control totals. In doing so, each SDU received an adjustment factor, which, when multiplied by the initial weight, produced a final weight. The sum of all final weights corresponded to the civilian, noninstitutionalized population estimate for people aged 12 or older, and the sum of all final weights in a domain corresponded to the control total for that domain. Note that there were a number of controls being calibrated to for each SDU, depending on the domains to which the SDU belonged. The adjusted SDU weight reflected the civilian, noninstitutionalized population estimates for people aged 12 or older and could be utilized as a basis for constructing controls at the QDU and person pair levels.

B.1.2 Questionnaire Dwelling Unit Level

B.1.2.1 Deriving Questionnaire Dwelling Unit-Level Poststratification Control Totals from Adjusted Screener Dwelling Unit Weights

Because there were no controls for QDU-level poststratification available directly, the adjusted SDU weights were used. For these weights to be applicable at the QDU level, the SDU-level data had to be restructured by sorting and summing over the domains to be used in the QDU-level calibration. This step provided a dataset where the summed weight, which still added up to the proper population, was available for every domain to be utilized in the QDU calibration and thus could be used as a control total.

¹ The District of Columbia is included among states.

B.1.2.2 Adjusting Questionnaire Dwelling Unit-Level Data to the Control Totals

As was done for the SDU data, the QDU-level data were adjusted via calibration in the GEM of sample weights to multiple control totals. Each QDU received an adjustment factor, similar to that described for the SDU weight in Section B.1.1.2. The controls utilized in this calibration were based on the SDU weight as described in Section B.1.2.1. The adjusted weight was representative of the civilian, noninstitutionalized population estimates for people aged 12 or older for all domains controlled within the model.

B.2 Derivation of Person Pair-Level Poststratification Controls

B.2.1 Deriving Person Pair-Level Poststratification Control Totals from Adjusted Screener Dwelling Unit Weights and Household-Level Person Counts

Analogous to the QDU weights, some of the person pair controls were based on the SDU weights. However, two sets of control totals were utilized in the model, with one set based on the SDU weights and the other set based on the questionnaire roster.

For most pair data domains—those other than the 10 pair domains based on relationship—the control totals for the poststratification adjustments were obtained from SDU data and were based on the number of possible pairs within SDUs. To obtain these pair counts belonging to various sociodemographic domains, the screener roster information was used to calculate all possible pairs within SDUs. For example, consider an SDU with two people aged 12 to 17 and three people aged 26 to 34. From this household composition, one can construct one pair of people aged 12 to 17, three pairs of people aged 26 to 34, and six pairs of people aged 12 to 17 and 26 to 34. It follows that the total number of possible pairs in this SDU is 10, from which the number of pairs belonging to the domain of interest can be obtained.

On the other hand, for the 10 selected pair domains based on relationship, the control totals for the poststratification adjustments were obtained from the questionnaire roster. This step involved calibrating the pair weights to the number of people in households belonging to each domain of interest. These controls were obtained from the larger sample of singles and pairs (i.e., one or two people selected from dwelling units) and were calculated at the QDU (household) level. The pair weights were adjusted by the appropriate multiplicity. See Chapter 11 in the *2024 National Survey on Drug Use and Health (NSDUH) Methodological Resource Book, Section 10: Editing and Imputation Report* (Center for Behavioral Health Statistics and Quality, forthcoming a) for details on the multiplicity counts and household-level control totals, which are referred to as household-level person counts.

B.2.2 Adjusting Person Pair-Level Data to the Control Totals

Like the SDU- and QDU-level data, the person pair-level data were adjusted via the GEM. The use of two different types of controls required a minor modification to the GEM macro so that both sets of controls might be addressed simultaneously. Similar to the SDU- and QDU-level

poststratification steps, each pair received an adjustment factor, which, when multiplied by the initial weight, produced a final weight. The sum of all final weights corresponded to the civilian, noninstitutionalized population estimate for people aged 12 or older, and the sum of all final weights in a domain corresponded to the control total for that domain.

Appendix C: Generalized Exponential Modeling Summary for the Questionnaire Dwelling Unit Weights

This appendix summarizes each questionnaire dwelling unit (QDU) model group throughout all stages of weight calibration modeling. Unlike much of the other information presented in this report, this appendix provides a model-specific overview of weight calibration, as opposed to a state- or domain-specific one.

For 2024, modeling involved taking four model groups through three adjustment steps: (1) selected dwelling unit poststratification, (2) respondent dwelling unit nonresponse adjustment, and (3) respondent dwelling unit poststratification. After the final poststratification, the adjusted sampling weights were reasonably distributed and did not require the additional treatment of the extreme value step.

Model-specific summary statistics are shown in [Tables C.1a](#) through [C.4b](#). Included in these tables, for each stage of modeling, are the number of factor effects included; the high, low, and nonextreme weight bounds set to provide the upper and lower limits for the generalized exponential model macro; weighted, unweighted, and winsorized weight proportions; the unequal weighting effect (UWE); and weight distributions. The UWE provides an approximate partial measure of variance and provides a summary of how much impact a particular stage of modeling has on the distribution of the new product of weights. For more details on bounds, see Section C.3. At each stage in the modeling, these summary statistics were calculated and utilized to help evaluate the quality of the current weight component under the model chosen.

Occurrences of small sample sizes and exact linear combinations in the realized data led to situations whereby inclusion of all originally proposed levels of covariates in the model was not possible. The text and exhibits in Sections C.1 through C.4 summarize the decisions made with regard to final covariates included in each model. For a list of the proposed initial covariates considered at each stage of modeling, see [Exhibit C.2](#), and for the list of realized final model covariates, see [Exhibits C.1.1](#) through [C.4.3](#). The following sections establish a series of guidelines to assist in their interpretation.

C.1 Final Model Explanatory Variables

For brevity, numeric abbreviations for factor levels are established in [Exhibit 5.1](#) (included here as [Exhibit C.1](#) for easy reference) in Chapter 5. There, a complete list is provided of all variables and associated levels used at any stage of modeling. Note that not all factors or levels were present in all stages of modeling, and the initial set of variables was the same across model groups but may change over stages of modeling. The initial candidates are found in any of the proposed variables columns for a particular stage of weight adjustment. [Exhibits C.1.1](#) through [C.4.3](#) provide lists of the proposed and realized covariates.

To help understand what effects were controlled for at each stage of the modeling, it was useful to create cross-classification tables as shown in Section C.3. Sections C.2 and C.3 explain how to use various exhibits for selected model variables to construct these tables.

Exhibit C.1 Definitions of Levels for QDU-Level Calibration Modeling Variables; 2024

<p>Age^a 1: 12-17, 2: 18-25, 3: 26-34, 4: 35-49, 5: 50+¹</p> <p>Sex^a 1: Male, 2: Female¹</p> <p>Group Quarters Indicator^b 1: College Dorm, 2: Other Group Quarter, 3: Non-Group Quarter¹</p> <p>Hispanicity^a 1: Hispanic or Latino, 2: Non-Hispanic or Latino¹</p> <p>Household Size^a Continuous Variable Count of Individuals Rostered within DU</p> <p>Household Type (Ages of People Rostered within DU)^b 1: 12-17, 18-25, 26+; 2: 12-17, 18-25; 3: 12-17, 26+; 4: 18-25, 26+; 5: 12-17, 6: 18-25; 7: 26+¹</p> <p>Percentage of Owner-Occupied Dwelling Units in Segment (% Owner-Occupied)^b 1: 50-100%,¹ 2: 10-<50%, 3: 0-<10%</p> <p>Percentage of Black or African American in Segments^b 1: 50-100%, 2: 10-<50%, 3: 0-<10%¹</p> <p>Percentage of Hispanics or Latinos in Segments^b 1: 50-100%, 2: 10-<50%, 3: 0-<10%¹</p> <p>Population Density^b 1: MSA 1,000,000 or More, 2: MSA Less than 1,000,000, 3: Non-MSA Urban, 4: Non-MSA Rural¹</p> <p>Quarter^{a,b} 1: Quarter 1, 2: Quarter 2, 3: Quarter 3, 4: Quarter 4¹</p> <p>Screening Mode^{2,b} 1: Web,¹ 2: Field</p> <p>Race (3 Levels)^a 1: White,¹ 2: Black or African American, 3: Other</p> <p>Race (5 Levels)^a 1: White,¹ 2: Black or African American, 3: American Indian or Alaska Native, 4: Asian, 5: Two or More Races</p> <p>Race/Ethnicity of Householder^b 1: Hispanic or Latino White,¹ 2: Hispanic or Latino Black or African American, 3: Hispanic or Latino Other, 4: Non-Hispanic or Latino White, 5: Non-Hispanic or Latino Black or African American, 6: Non-Hispanic or Latino Other</p> <p>Segment-Combined Median Rent and Housing Value (Rent/Housing)^{b,3} 1: First Quintile, 2: Second Quintile, 3: Third Quintile, 4: Fourth Quintile, 5: Fifth Quintile¹</p> <p>States^{a,b,4} Model Group 1: 1: Connecticut, 2: Maine, 3: Massachusetts,¹ 4: New Hampshire, 5: New Jersey, 6: New York, 7: Pennsylvania, 8: Rhode Island, 9: Vermont Model Group 2: 1: Illinois, 2: Indiana, 3: Iowa, 4: Kansas, 5: Michigan, 6: Minnesota, 7: Missouri, 8: Nebraska, 9: North Dakota, 10: Ohio, 11: South Dakota, 12: Wisconsin¹ Model Group 3: 1: Alabama, 2: Arkansas, 3: Delaware, 4: District of Columbia, 5: Florida, 6: Georgia, 7: Kentucky, 8: Louisiana, 9: Maryland, 10: Mississippi, 11: North Carolina,¹ 12: Oklahoma, 13: South Carolina, 14: Tennessee, 15: Texas, 16: Virginia, 17: West Virginia Model Group 4: 1: Alaska, 2: Arizona,¹ 3: California, 4: Colorado, 5: Idaho, 6: Hawaii, 7: Montana, 8: Nevada, 9: New Mexico, 10: Oregon, 11: Utah, 12: Washington, 13: Wyoming</p> <p>State/Region^{b,3} Model Group 1: 1: New York, 2: Pennsylvania, 3: Other¹ Model Group 2: 1: Illinois, 2: Michigan, 3: Ohio, 4: Other¹ Model Group 3: 1: Florida, 2: Texas, 3: Other¹ Model Group 4: 1: California, 2: Other¹</p>

DU = dwelling unit; MSA = metropolitan statistical area; QDU = questionnaire dwelling unit.

¹ The reference level for this variable. This is the level against which effects of other factor levels are measured.

² Screening mode was included in only the res.qdu.nr step.

³ Segment-combined median rent and housing value (also known as the socioeconomic status indicator) is a composite measure based on rent, housing value, and percentage owner occupied.

⁴ The states or district assigned to a particular model are based on census regions.

^a Counting variable. A count of all people in the household.

^b Binary variable.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

C.2 Glossary of Terms Used in the Description of the Variables in the Final Model

This glossary provides a list of general terms. Certain other terms are sometimes used within a particular section.

All levels present. All effects and all levels of the factor under consideration are in the model.

Coll. (*levels*). Collapse these factor effects together. Factor effects that have been collapsed with others manifest themselves jointly in the model.

Conv. If the model is not convergent, dropping or collapsing of variables is performed.

Do the same for (*effects*). Repeat the previous step for all effect levels listed.

Drop all levels. All factor effects are completely removed from the model for all levels and any combinations involving this factor.

Drop level(*s*). Collapse these factor effects into the reference set. The factor effects comprising the dropped levels are manifested jointly with either some or all of the factor effects in the reference set.

Drop level(*s*); sing. During the modeling process, the factor effects listed are removed from the model due to singularity.

Drop level(*s*); zero cnts. During the modeling process, the factor effects listed are removed from the model due to zero sample.

Drop or collapse using*. The asterisk is used as a wild card character to indicate all levels of the factor for that effect.

Factor effect. The factor effect represents the effects of levels considered for one factor, two factors, and higher-order factors.

Hier. One or more of the factor effects in a higher-order interaction is collapsed or dropped in an interaction at a lower order, and the hierarchical effect carries up, either eliminating or combining factors of higher-order interactions with that effect.

Reference/reference set. Factor effects composed of reference levels are not explicitly listed in the set of model variables. However, these effects manifest themselves either separately or in combination with other factors depending on the presence of other factors in the model.

C.3 How to Interpret Collapsing and Dropping of Factor Effects

To help visualize what effects are directly controlled for in the model, one can construct the table that reflects the collapsing scheme employed. The following is a complex example from the 2004 person-level modeling (Chen et al., 2006).

1. Locate the factor effect—Model 9 person nonresponse adjustment.

Three-Factor Effects

State × Age × Race
(3 Levels)

Comments

Coll. (2,1,2) & (2,1,3); hier. Repeat for all levels of age in state (2); hier. Coll. (1,4,2) & (1,4,3); conv. Drop (3,4,2); sing. Drop (3,*,*); conv. Coll. (5,1,2) & (5,1,3); conv. Repeat for all levels of age in state (5).

2. Determine the initial range of possible levels for the variables by referring to the variable definitions. See [Exhibits C.1](#) and [H.1](#) for QDU- and pair-level variable definitions. In addition, the “Levels,” “Proposed,” and “Final” columns will provide counts of all factor effects, all explicitly proposed factors, and all explicitly controlled factors, but these are not necessary for construction of the cross-classification table. The following example is based on person-level variables, but the process is the same.

State (for the model group in question; in this case, Model Group 9)

Model Group 9: 1: Alaska, 2: Hawaii, 3: Oregon, 4: Washington,¹ 5: California

Age

1: 12 to 17, 2: 18 to 25, 3: 26 to 34, 4: 35 to 49, 5: 50+¹

Race (3 Levels)

1: White,¹ 2: Black or African American, 3: Other

3. Construct the cross-classification table.

For example, the initial proposed set of covariates in Race (4 Levels) is defined this way:

Race (4 Levels)	White	Black or African American	Asian	American Indian or Alaska Native
------------------------	--------------	----------------------------------	--------------	---

Shading indicates the reference-level set.

¹ This is the reference level for this variable. This is the level against which effects of other factor levels are measured.

This is the cross-classification table for the initial proposed set of covariates in State × Race (4 Levels):

State × Race (4 Levels)	White	Black or African American	Asian	American Indian or Alaska Native
AK	X	-	-	-
HI	X	-	-	-
OR	X	-	-	-
WA	X	X	X	X
CA	X	-	-	-

Shading and the X symbol indicate the reference-level set.

The cross-classification table of interest for the initial proposed set of covariates in State × Age × Race (3 Levels) is as follows:

State × Age × Race (3 Levels)	White	Black or African American	Other
AK × 12-17	X	-	-
18-25	X	-	-
26-34	X	-	-
35-49	X	-	-
50+	X	X	X
HI × 12-17	X	-	-
18-25	X	-	-
26-34	X	-	-
35-49	X	-	-
50+	X	X	X
OR × 12-17	X	-	-
18-25	X	-	-
26-34	X	-	-
35-49	X	-	-
50+	X	X	X
WA × 12-17	X	X	X
18-25	X	X	X
26-34	X	X	X
35-49	X	X	X
50+	X	X	X
CA × 12-17	X	-	-
18-25	X	-	-
26-34	X	-	-
35-49	X	-	-
50+	X	X	X

Shading and the X symbol indicate the reference-level set.

The number of respondents in the class State × Age × Race (3 Levels) at this stage of modeling would appear within each cell of the table. Construction of the other cross-classification tables follows the same logic and is only necessary to the point of providing understanding of the final table.

4. Use the information under the “Comments” column definition to determine the combination of factors controlled.

One-Factor Effects	Comments
State	All levels present.
Race (4 Levels)	All levels present.
Age	All levels present.

Two-Factor Effects	Comments
State × Age	All levels present.
State × Race (4 Levels)	Coll. (1,3) & (1,4). Do the same for all other states except (2). Coll. (2,2), (2,3), & (2,4).
Age × Race (3 Levels)	All levels present.

The reason for the hier. instruction in the three-factor effect directions is the State × Race (4 Levels) interaction. It indicates a need to maintain the collapsing scheme when setting up any three-factor crosses involving State × Race. Following these directions, the resulting two-factor table to work with is as follows:

State × Race (4 Levels)	White	Black or African American	Asian	American Indian or Alaska Native
AK	X	-	-	-
HI	X	-	-	-
OR	X	-	-	-
WA	X	X	X	X
CA	X	-	-	-

Shading and the X symbol indicate the reference-level set.

Because of the hierarchical effect, several other factor crosses have now been affected by modeling:

Three-Factor Effects	Comments
State × Age × Race (3 Levels)	Coll. (2,1,2) & (2,1,3); hier. Repeat for all levels of age in state (2); hier. Coll. (1,4,2) & (1,4,3); conv. Drop (3,4,2); sing. Drop (3,*,*); conv. Coll. (5,1,2) & (5,1,3); conv. Repeat for all levels of age in state (5).

Construct the complete table, then begin combining blocks as directed. The unshaded cells represent the factors directly controlled for by the model. The shaded cells represent the composite reference set, whose values may be obtained by utilizing the marginal sums, although when changes to the initially proposed set occur, it can make certain reference cell counts indistinguishable.

After the directions are followed, the resulting post-modeling cross-classification table should appear as follows:

State × Age × Race (3 Levels)	White	Black or African American	Other
AK × 12-17	X	-	-
18-25	X	-	-
26-34	X	-	-
35-49	X	-	-
50+	X	X	X
HI × 12-17	X	-	-
18-25	X	-	-
26-34	X	-	-
35-49	X	-	-
50+	X	X	X
OR × 12-17	X	X	X
18-25	X	X	X
26-34	X	X	X
35-49	X	X	X
50+	X	X	X
WA × 12-17	X	X	X
18-25	X	X	X
26-34	X	X	X
35-49	X	X	X
50+	X	X	X
CA × 12-17	X	-	-
18-25	X	-	-
26-34	X	-	-
35-49	X	-	-
50+	X	X	X

Shading and the X symbol indicate the reference-level set.

Exhibit C.2 Covariates for Questionnaire Dwelling Unit Weights; 2024

Variables	Type	Level	Proposed
One-Factor Effects			
Intercept	Binary	1	1
Population Density	Binary	4	3
Group Quarter	Binary	3	2
Race/Ethnicity of Householder	Binary	6	5
Rent/Housing	Binary	5	4
Segment % Black or African American	Binary	3	2
Segment % Hispanic or Latino	Binary	3	2
Segment % Owner-Occupied	Binary	3	2
Household Type	Binary	7	6
State	Both	Model-specific	-
Quarter	Both	4	3
Age Group	Counting	5	4
Race	Counting	5	4
Hispanicity	Counting	2	1
Sex	Counting	2	1
Household Size	Counting	1	1
Screening Mode ¹	Binary	2	1
Two-Factor Effects			
Age × Race (3 Levels)	Counting	5 × 3	8
Age × Hispanicity	Counting	5 × 2	4
Age × Sex	Counting	5 × 2	4
Race (3 Levels) × Hispanicity	Counting	3 × 2	2
Race (3 Levels) × Sex	Counting	3 × 2	2
Hispanicity × Sex	Counting	2 × 2	1
State × Age	Counting	Model-specific	-
State × Race (5 Levels)	Counting	Model-specific	-
State × Sex	Counting	Model-specific	-
State × Hispanicity	Counting	Model-specific	-
% Owner-Occupied × % Black or African American	Binary	3 × 3	4
% Owner-Occupied × % Hispanicity	Binary	3 × 3	4
% Owner-Occupied × Rent/Housing	Binary	3 × 5	8
Rent/Housing × % Black or African American	Binary	5 × 3	8
Rent/Housing × % Hispanicity	Binary	5 × 3	8
Three-Factor Effects			
Race (3 Levels) × Age × Sex	Counting	8	8
State/Region × Age × Sex	Counting	Model-specific	-
State/Region × Age × Hispanicity	Counting	Model-specific	-
State/Region × Age × Race (3 Levels)	Counting	Model-specific	-
State/Region × Hispanicity × Sex	Counting	Model-specific	-
State/Region × Race (3 Levels) × Hispanicity	Counting	Model-specific	-
State/Region × Race (3 Levels) × Sex	Counting	Model-specific	-

¹ Screening mode was included in only the res.qdu.nr step.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix C.1: Model Group 1: Northeast

(Connecticut, Maine, Massachusetts, New Hampshire, New Jersey,
New York, Pennsylvania, Rhode Island, Vermont)

Table C.1a QDU Weight Generalized Exponential Modeling Summary (Model Group 1: Northeast); 2024

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# Covariates ³	Bounds ⁴	
	% Unweighted	% Weighted	% Outwisor			Nominal	Realized
<i>sel.qdu.ps</i>	1.44	5.37	0.96	2.81	243	(0.46, 1.10)	(0.46, 1.10)
	1.06	3.40	0.28	2.83	242	(0.21, 1.56)	(0.21, 1.55)
	-	-	-	-	-	N/A	N/A
<i>res.qdu.nr</i>	1.12	3.76	0.48	2.89	244	(1.00, 1.70)	(1.00, 1.70)
	0.89	3.14	0.27	2.63	242	(1.00, 4.48)	(1.00, 4.45)
	-	-	-	-	-	N/A	N/A
<i>res.qdu.ps</i>	0.89	3.14	0.27	2.63	243	(0.20, 1.10)	(0.97, 1.08)
	0.80	2.63	0.06	2.62	242	(0.20, 5.00)	(0.93, 4.01)
	-	-	-	-	-	N/A	N/A

N/A = not applicable; QDU = questionnaire dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

² Unequal weighting effect (UWE) defined as $1 + \left[\frac{(n-1)}{n} \right] * CV^2$, where CV = coefficient of variation of weights.

³ Number of proposed covariates on top line and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum/minimum values for the generalized exponential model adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step corresponds to the high extreme values, the nonextreme values, and the low extreme values.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table C.1b Distribution of Weight Adjustment Factors and Weight Products (Model Group 1: Northeast); 2024

Statistics	SDU Weight	QDU Design Weight		sel.qdu.ps ¹		res.qdu.nr ¹		res.qdu.ps ¹	
	1-11	duwght12	1-12	duwght13	1-13	duwght14	1-14	duwght15	1-15
Minimum	10	1.00	10	0.21	2	0.79	18	0.66	17
1%	33	1.00	46	0.59	43	1.06	64	0.97	64
5%	63	1.00	92	0.77	89	1.2	143	0.99	143
10%	92	1.00	143	0.84	139	1.27	234	0.99	234
25%	195	1.00	308	0.92	302	1.41	517	1.00	519
Median	528	1.26	766	1.00	753	1.64	1,344	1.00	1,342
75%	928	2.09	1,498	1.08	1,510	2.01	2,742	1.00	2,746
90%	1,332	5.30	2,766	1.18	2,838	2.42	5,100	1.01	5,077
95%	1,632	6.38	4,242	1.26	4,484	2.71	7,821	1.02	7,818
99%	2,389	10.83	8,807	1.41	8,923	3.32	14,485	1.03	14,207
Maximum	6,226	11.70	25,904	1.55	23,838	4.45	32,761	4.01	32,460
<i>n</i>	17,683	N/A	17,683	N/A	17,683	N/A	10,119	N/A	10,119
Mean	635	2.14	1,267	1.00	1,281	1.76	2,238	1.00	2,238
Max/Mean	10	N/A	20	N/A	19	N/A	15	N/A	15

N/A = not applicable; QDU = questionnaire dwelling unit; SDU = screener dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Model Group 1 Overview

Selected Questionnaire Dwelling Unit-Level Poststratification

Of the 243 proposed effects, 242 were kept in the model. Main effects group quarters "College Dorm" and "Other Group Quarter" were combined due to convergence issues.

Respondent Questionnaire Dwelling Unit-Level Nonresponse

Of the 244 proposed effects, 241 were kept in the model. Main effects group quarters "College Dorm" and "Other Group Quarter" and household type "12-17" and "18-25" were combined due to nonconvergence. Main effect Screening Mode was dropped due to nonconvergence.

Respondent Questionnaire Dwelling Unit-Level Poststratification

Of the 243 proposed effects, 242 were kept in the model. Main effects household type "12-17" and "18-25" were combined due to nonconvergence.

**Exhibit C.1.1 Covariates for Questionnaire Dwelling Unit Weights (sel.qdu.ps)
Model Group 1: Northeast; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	60	59	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	1	Coll (1) & (2); zero.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	9	8	8	All levels present.
State (Binary)	9	8	8	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Two-Factor Effects	-	133	133	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	9 × 5	32	32	All levels present.
State × Race	9 × 5	32	32	All levels present.
State × Sex	9 × 2	8	8	All levels present.
State × Hispanicity	9 × 2	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	50	50	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Hispanicity	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Race (3 Levels)	3 × 5 × 3	16	16	All levels present.
State/Region × Hispanicity × Sex	3 × 2 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Hispanicity	3 × 3 × 2	4	4	All levels present.
State/Region × Race (3 Levels) × Sex	3 × 3 × 2	4	4	All levels present.
Total	-	243	242	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

**Exhibit C.1.2 Covariates for Questionnaire Dwelling Unit Weights (res.qdu.nr)
Model Group 1: Northeast; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	61	58	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	1	Coll (1) & (2); zero.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	5	Coll. (5) & (6); zero.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	9	8	8	All levels present.
State (Binary)	9	8	8	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Screening Mode	1	1	0	Drop all; conv.
Two-Factor Effects	-	133	133	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	9 × 5	32	32	All levels present.
State × Race	9 × 5	32	32	All levels present.
State × Sex	9 × 2	8	8	All levels present.
State × Hispanicity	9 × 2	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	50	50	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Hispanicity	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Race (3 Levels)	3 × 5 × 3	16	16	All levels present.
State/Region × Hispanicity × Sex	3 × 2 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Hispanicity	3 × 3 × 2	4	4	All levels present.
State/Region × Race (3 Levels) × Sex	3 × 3 × 2	4	4	All levels present.
Total	-	244	241	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

**Exhibit C.1.3 Covariates for Questionnaire Dwelling Unit Weights (res.qdu.ps)
Model Group 1: Northeast; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	60	59	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	2	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	5	Coll. (5) & (6); zero.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	9	8	8	All levels present.
State (Binary)	9	8	8	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Two-Factor Effects	-	133	133	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	9 × 5	32	32	All levels present.
State × Race	9 × 5	32	32	All levels present.
State × Sex	9 × 2	8	8	All levels present.
State × Hispanicity	9 × 2	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	50	50	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Hispanicity	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Race (3 Levels)	3 × 5 × 3	16	16	All levels present.
State/Region × Hispanicity × Sex	3 × 2 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Hispanicity	3 × 3 × 2	4	4	All levels present.
State/Region × Race (3 Levels) × Sex	3 × 3 × 2	4	4	All levels present.
Total	-	243	242	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix C.2: Model Group 2: Midwest

(Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska,
North Dakota, Ohio, South Dakota, Wisconsin)

Table C.2a QDU Weight Generalized Exponential Modeling Summary (Model Group 2: Midwest); 2024

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# Covariates ³	Bounds ⁴	
	% Unweighted	% Weighted	% Outwisor			Nominal	Realized
<i>sel.qdu.ps</i>	1.40	5.50	0.95	2.52	300	(0.46, 1.10)	(0.46, 1.10)
	0.99	3.06	0.20	2.47	298	(0.43, 1.96)	(0.44, 1.92)
	-	-	-	-	-	N/A	N/A
<i>res.qdu.nr</i>	1.04	3.88	0.50	2.54	301	(1.16, 1.80)	(1.16, 1.80)
	0.64	2.63	0.21	2.32	297	(1.00, 4.95)	(1.00, 4.93)
	-	-	-	-	-	N/A	N/A
<i>res.qdu.ps</i>	0.89	4.31	0.41	2.52	300	(0.98, 1.19)	(0.99, 1.19)
	0.76	3.48	0.07	2.50	297	(0.93, 1.19)	(0.94, 1.14)
	-	-	-	-	-	N/A	N/A

N/A = not applicable; QDU = questionnaire dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

² Unequal weighting effect (UWE) defined as $1 + [(n - 1)/n] * CV^2$, where CV = coefficient of variation of weights.

³ Number of proposed covariates on top line and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum/minimum values for the generalized exponential model adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the nonextreme values, and the low extreme values.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table C.2b Distribution of Weight Adjustment Factors and Weight Products (Model Group 2: Midwest); 2024

Statistics	SDU Weight	QDU Design Weight		sel.qdu.ps ¹		res.qdu.nr ¹		res.qdu.ps ¹	
	1-11	duwght12	1-12	duwght13	1-13	duwght14	1-14	duwght15	1-15
Minimum	15	1.00	16	0.29	11	0.86	18	0.70	14
1%	63	1.00	76	0.66	72	1.14	124	0.98	110
5%	106	1.00	137	0.82	134	1.31	239	0.99	203
10%	146	1.00	192	0.87	188	1.39	330	0.99	285
25%	245	1.00	365	0.94	363	1.55	623	1.00	557
Median	473	1.20	752	1.00	752	1.74	1,309	1.00	1,221
75%	823	2.20	1,409	1.07	1,425	1.99	2,513	1.00	2,499
90%	1,165	4.71	2,628	1.14	2,705	2.27	4,588	1.01	4,671
95%	1,415	6.21	4,028	1.20	4,027	2.49	6,725	1.01	7,027
99%	1,959	9.55	7,673	1.40	7,541	3.04	12,293	1.03	13,195
Maximum	5,647	11.36	25,143	1.92	19,374	4.93	26,318	1.14	22,478
<i>n</i>	23,038	N/A	23,038	N/A	23,038	N/A	13,521	N/A	13,521
Mean	588	2.11	1,207	1.01	1,208	1.80	2,058	1.00	2,058
Max/Mean	10	N/A	21	N/A	16	N/A	13	N/A	11

N/A = not applicable; QDU = questionnaire dwelling unit; SDU = screener dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Model Group 2 Overview

Selected Questionnaire Dwelling Unit-Level Poststratification

Of the 300 proposed effects, 298 were kept in the model. Two-factor effects were modified by combining 10-<50 percent and 50-100 percent Hispanics or Latinos in segments for the 0-<10 percent levels of percent Owner-Occupied due to zero sample and combining 10-<50 percent and 50-100 percent Black or African American in segments for the fourth quintile of Rent/Housing due to singularity.

Respondent Questionnaire Dwelling Unit-Level Nonresponse

Of the 301 proposed effects, 297 were kept in the model. Main effects group quarters "College Dorm" and "Other Group Quarter" were combined, and Screening Mode was dropped due to singularity. Two-factor effects were modified by combining 10-<50 percent and 50-100 percent Hispanics or Latinos in segments for the 0-<10 percent levels of percent Owner-Occupied due to zero sample and combining 10-<50 percent and 50-100 percent Black or African American in segments for the fourth quintile of Rent/Housing due to singularity.

Respondent Questionnaire Dwelling Unit-Level Poststratification

Of the 300 proposed effects, 297 were kept in the model. Main effects group quarters "College Dorm" and "Other Group Quarter" were combined due to zero sample. Two-factor effects were modified by combining 10-<50 percent and 50-100 percent Hispanics or Latinos in segments for the 0-<10 percent levels of percent Owner-Occupied due to convergence problems and combining 10-<50 percent and 50-100 percent Black or African American in segments for the fourth quintile of Rent/Housing due to singularity.

**Exhibit C.2.1 Covariates for Questionnaire Dwelling Unit Weights (sel.qdu.ps)
Model Group 2: Midwest; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	66	66	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	2	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	9	11	11	All levels present.
State (Binary)	9	11	11	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Two-Factor Effects	-	163	161	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	12 × 5	44	44	All levels present.
State × Race	12 × 5	44	44	All levels present.
State × Sex	12 × 2	11	11	All levels present.
State × Hispanicity	12 × 2	11	11	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	3	Coll. (3,1) & (3,2); zero.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	7	Coll (4,1) & (4,2); sing.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	71	71	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	4 × 5 × 2	12	12	All levels present.
State/Region × Age × Hispanicity	4 × 5 × 2	12	12	All levels present.
State/Region × Age × Race (3 Levels)	4 × 5 × 3	24	24	All levels present.
State/Region × Hispanicity × Sex	4 × 2 × 2	3	3	All levels present.
State/Region × Race (3 Levels) × Hispanicity	4 × 3 × 2	6	6	All levels present.
State/Region × Race (3 Levels) × Sex	4 × 3 × 2	6	6	All levels present.
Total	-	300	298	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

**Exhibit C.2.2 Covariates for Questionnaire Dwelling Unit Weights (res.qdu.nr)
Model Group 2: Midwest; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	67	65	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	1	Coll. (1) & (2); zero.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	9	11	11	All levels present.
State (Binary)	9	11	11	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Screening Mode	2	1	0	Drop all; zero.
Two-Factor Effects	-	163	161	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	12 × 5	44	44	All levels present.
State × Race	12 × 5	44	44	All levels present.
State × Sex	12 × 2	11	11	All levels present.
State × Hispanicity	12 × 2	11	11	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	3	Coll. (3,1) & (3,2); zero.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	7	Coll (4,1) & (4,2); sing.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	71	71	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	4 × 5 × 2	12	12	All levels present.
State/Region × Age × Hispanicity	4 × 5 × 2	12	12	All levels present.
State/Region × Age × Race (3 Levels)	4 × 5 × 3	24	24	All levels present.
State/Region × Hispanicity × Sex	4 × 2 × 2	3	3	All levels present.
State/Region × Race (3 Levels) × Hispanicity	4 × 3 × 2	6	6	All levels present.
State/Region × Race (3 Levels) × Sex	4 × 3 × 2	6	6	All levels present.
Total	-	301	297	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

**Exhibit C.2.3 Covariates for Questionnaire Dwelling Unit Weights (res.qdu.ps)
Model Group 2: Midwest; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	66	65	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	1	Coll. (1) & (2); zero.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	9	11	11	All levels present.
State (Binary)	9	11	11	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Two-Factor Effects	-	163	161	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	12 × 5	44	44	All levels present.
State × Race	12 × 5	44	44	All levels present.
State × Sex	12 × 2	11	11	All levels present.
State × Hispanicity	12 × 2	11	11	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	3	Coll. (3,1) & (3,2); zero.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	7	Coll (4,1) & (4,2); sing.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	71	71	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	4 × 5 × 2	12	12	All levels present.
State/Region × Age × Hispanicity	4 × 5 × 2	12	12	All levels present.
State/Region × Age × Race (3 Levels)	4 × 5 × 3	24	24	All levels present.
State/Region × Hispanicity × Sex	4 × 2 × 2	3	3	All levels present.
State/Region × Race (3 Levels) × Hispanicity	4 × 3 × 2	6	6	All levels present.
State/Region × Race (3 Levels) × Sex	4 × 3 × 2	6	6	All levels present.
Total	-	300	297	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix C.3: Model Group 3: South

(Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia)

Table C.3a QDU Weight Generalized Exponential Modeling Summary (Model Group 3: South); 2024

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# Covariates ³	Bounds ⁴	
	% Unweighted	% Weighted	% Outwisor			Nominal	Realized
<i>sel.qdu.ps</i>	1.15	4.15	0.65	2.68	339	(0.73, 1.10)	(0.73, 1.10)
	0.67	1.94	0.13	2.63	339	(0.25, 2.36)	(0.26, 2.28)
	-	-	-	-	-	N/A	N/A
<i>res.qdu.nr</i>	0.77	2.58	0.26	2.70	340	(1.00, 2.50)	(1.01, 2.50)
	0.83	2.84	0.30	2.59	339	(1.00, 4.20)	(1.00, 4.90)
	-	-	-	-	-	N/A	N/A
<i>res.qdu.ps</i>	0.85	3.15	0.31	2.68	339	(0.20, 1.80)	(0.97, 1.80)
	0.72	2.55	0.10	2.67	339	(0.20, 5.00)	(0.71, 2.97)
	-	-	-	-	-	N/A	N/A

N/A = not applicable; QDU = questionnaire dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

² Unequal weighting effect (UWE) defined as $1 + [(n - 1)/n] * CV^2$, where *CV* = coefficient of variation of weights.

³ Number of proposed covariates on top line and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum/minimum values for the generalized exponential model adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the nonextreme values, and the low extreme values.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table C.3b Distribution of Weight Adjustment Factors and Weight Products (Model Group 3: South); 2024

Statistics	SDU Weight	QDU Design Weight		sel.qdu.ps ¹		res.qdu.nr ¹		res.qdu.ps ¹	
	1-11	duwght12	1-12	duwght13	1-13	duwght14	1-14	duwght15	1-15
Minimum	3	1.00	3	0.26	3	0.81	6	0.63	5
1%	24	1.00	37	0.69	35	1.11	59	0.95	52
5%	76	1.00	111	0.82	109	1.27	184	0.99	167
10%	127	1.00	183	0.88	182	1.36	317	0.99	282
25%	253	1.00	392	0.94	387	1.52	666	1.00	616
Median	564	1.31	917	1.00	910	1.71	1,548	1.00	1,503
75%	1,156	2.29	1,960	1.07	1,979	1.95	3,405	1.00	3,348
90%	1,807	4.92	3,690	1.13	3,744	2.22	6,357	1.01	6,514
95%	2,264	5.94	5,437	1.18	5,467	2.43	9,202	1.02	9,400
99%	3,501	9.74	10,491	1.33	10,304	2.93	17,403	1.04	17,900
Maximum	6,921	11.40	28,863	2.28	22,548	4.19	38,449	2.97	41,121
<i>n</i>	32,084	N/A	32,084	N/A	32,084	N/A	18,915	N/A	18,915
Mean	810	2.14	1,599	1.00	1,599	1.76	2,712	1.00	2,712
Max/Mean	9	N/A	471	N/A	531	N/A	471	N/A	564

N/A = not applicable; QDU = questionnaire dwelling unit; SDU = screener dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Model Group 3 Overview

Selected Questionnaire Dwelling Unit-Level Poststratification

All 339 proposed effects were kept in the model.

Respondent Questionnaire Dwelling Unit-Level Nonresponse

Of the 340 proposed effects, 339 were kept in the model. Main effect Screening Mode was dropped due to singularity.

Respondent Questionnaire Dwelling Unit-Level Poststratification

All 339 proposed effects were kept in the model.

**Exhibit C.3.1 Covariates for Questionnaire Dwelling Unit Weights (sel.qdu.ps)
Model Group 3: South; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	76	76	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	2	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	17	16	16	All levels present.
State (Binary)	17	16	16	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Two-Factor Effects	-	213	213	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	17 × 5	64	64	All levels present.
State × Race	17 × 5	64	64	All levels present.
State × Sex	17 × 2	16	16	All levels present.
State × Hispanicity	17 × 2	16	16	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	50	50	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Hispanicity	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Race (3 Levels)	3 × 5 × 3	16	16	All levels present.
State/Region × Hispanicity × Sex	3 × 2 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Hispanicity	3 × 3 × 2	4	4	All levels present.
State/Region × Race (3 Levels) × Sex	3 × 3 × 2	4	4	All levels present.
Total	-	339	339	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

**Exhibit C.3.2 Covariates for Questionnaire Dwelling Unit Weights (res.qdu.nr)
Model Group 3: South; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	77	76	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	2	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	17	16	16	All levels present.
State (Binary)	17	16	16	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Screening Mode	2	1	0	Drop all; zero.
Two-Factor Effects	-	213	213	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	17 × 5	64	64	All levels present.
State × Race	17 × 5	64	64	All levels present.
State × Sex	17 × 2	16	16	All levels present.
State × Hispanicity	17 × 2	16	16	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	50	50	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Hispanicity	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Race (3 Levels)	3 × 5 × 3	16	16	All levels present.
State/Region × Hispanicity × Sex	3 × 2 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Hispanicity	3 × 3 × 2	4	4	All levels present.
State/Region × Race (3 Levels) × Sex	3 × 3 × 2	4	4	All levels present.
Total	-	340	339	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

**Exhibit C.3.3 Covariates for Questionnaire Dwelling Unit Weights (res.qdu.ps)
Model Group 3: South; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	76	76	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	2	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	17	16	16	All levels present.
State (Binary)	17	16	16	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Two-Factor Effects	-	213	213	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	17 × 5	64	64	All levels present.
State × Race	17 × 5	64	64	All levels present.
State × Sex	17 × 2	16	16	All levels present.
State × Hispanicity	17 × 2	16	16	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	50	50	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Hispanicity	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Race (3 Levels)	3 × 5 × 3	16	16	All levels present.
State/Region × Hispanicity × Sex	3 × 2 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Hispanicity	3 × 3 × 2	4	4	All levels present.
State/Region × Race (3 Levels) × Sex	3 × 3 × 2	4	4	All levels present.
Total	-	339	339	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix C.4: Model Group 4: West

(Alaska, Arizona, California, Colorado, Idaho, Hawaii, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming)

Table C.4a QDU Weight Generalized Exponential Modeling Summary (Model Group 4: West); 2024

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# Covariates ³	Bounds ⁴	
	% Unweighted	% Weighted	% Outwisor			Nominal	Realized
<i>sel.qdu.ps</i>	1.54	6.48	1.21	2.91	270	(0.70, 1.10)	(0.70, 1.10)
	0.91	2.73	0.13	2.81	264	(0.67, 2.78)	(0.68, 2.73)
	-	-	-	-	-	(0.97, 1.19)	(0.97, 1.19)
<i>res.qdu.nr</i>	1.53	4.63	0.60	3.00	271	(1.07, 1.80)	(1.07, 1.80)
	0.73	2.13	0.19	2.96	265	(1.00, 4.11)	(1.00, 4.08)
	-	-	-	-	-	N/A	N/A
<i>res.qdu.ps</i>	0.73	2.13	0.19	2.96	270	(0.99, 1.11)	(0.99, 1.11)
	0.74	1.99	0.04	2.95	264	(0.96, 1.13)	(0.97, 1.13)
	-	-	-	-	-	N/A	N/A

N/A = not applicable; QDU = questionnaire dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

² Unequal weighting effect (UWE) defined as $1 + [(n-1)/n] * CV^2$, where CV = coefficient of variation of weights.

³ Number of proposed covariates on top line and number finalized after modeling.

⁴ There are six sets of bounds for each modeling step. Nominal bounds are used in defining maximum/minimum values for the generalized exponential model adjustment factors. The realized bound is the actual adjustment produced by the modeling. The set of three bounds listed for each step correspond to the high extreme values, the nonextreme values, and the low extreme values.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table C.4b Distribution of Weight Adjustment Factors and Weight Products (Model Group 4: West); 2024

Statistics	SDU Weight	QDU Design Weight		sel.qdu.ps ¹		res.qdu.nr ¹		res.qdu.ps ¹	
	1-11	duwght12	1-12	duwght13	1-13	duwght14	1-14	duwght15	1-15
Minimum	9	1.00	9	0.30	9	0.68	9	0.69	9
1%	32	1.00	41	0.78	40	1.06	52	0.98	52
5%	62	1.00	82	0.86	81	1.14	117	0.99	117
10%	91	1.00	130	0.89	128	1.21	184	0.99	184
25%	182	1.00	278	0.94	279	1.35	415	1.00	416
Median	432	1.24	676	1.00	680	1.63	1,077	1.00	1,080
75%	882	2.10	1,469	1.06	1,489	2.00	2,554	1.00	2,554
90%	1,449	3.84	2,782	1.13	2,822	2.41	5,058	1.01	5,057
95%	1,858	5.64	4,066	1.19	4,067	2.70	7,515	1.01	7,519
99%	2,817	8.82	8,000	1.39	8,009	3.29	14,776	1.03	14,792
Maximum	5,805	11.22	25,137	2.73	18,392	4.08	35,769	1.13	35,900
<i>n</i>	24,208	N/A	24,208	N/A	24,208	N/A	14,033	N/A	14,033
Mean	631	1.99	1,203	1.01	1,212	1.73	2,091	1.00	2,091
Max/Mean	9	N/A	21	N/A	15	N/A	17	N/A	17

N/A = not applicable; QDU = questionnaire dwelling unit; SDU = screener dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Model Group 4 Overview

Selected Questionnaire Dwelling Unit-Level Poststratification

Of the 270 proposed effects, 264 were kept in the model. Main effects were retained at proposed levels. Two-factor effects were modified by combining 10-<50 percent and 50-100 percent Black or African American for the 0-<10 and 10-<50 percent levels of percent Owner-Occupied and for all quintiles of Rent/Housing.

Respondent Questionnaire Dwelling Unit-Level Nonresponse

Of the 271 proposed effects, 265 were kept in the model. Two-factor effects were modified by combining 10-<50 percent and 50-100 percent Black or African American for the 0-<10 and 10-<50 percent levels of percent Owner-Occupied and for all quintiles of Rent/Housing.

Respondent Questionnaire Dwelling Unit-Level Poststratification

Of the 270 proposed effects, 264 were kept in the model. Main effects were retained at proposed levels. Two-factor effects were modified by combining 10-<50 percent and 50-100 percent Black or African American for the 0-<10 and 10-<50 percent levels of percent Owner-Occupied and for all quintiles of Rent/Housing.

**Exhibit C.4.1 Covariates for Questionnaire Dwelling Unit Weights (sel.qdu.ps)
Model Group 4: West; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	68	68	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	2	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	13	12	12	All levels present.
State (Binary)	13	12	12	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Two-Factor Effects	-	173	167	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	13 × 5	48	48	All levels present.
State × Race	13 × 5	48	48	All levels present.
State × Sex	13 × 2	12	12	All levels present.
State × Hispanicity	13 × 2	12	12	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	2	Coll. (2,1) & (2,2), (3,1) & (3,2); zero.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	4	Coll. (1,1) & (1,2), (2,1) & (2,2), (3,1) & (3,2); zero. Coll. (4,1) & (4,2); sing.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	29	29	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	2 × 5 × 2	4	4	All levels present.
State/Region × Age × Hispanicity	2 × 5 × 2	4	4	All levels present.
State/Region × Age × Race (3 Levels)	2 × 5 × 3	8	8	All levels present.
State/Region × Hispanicity × Sex	2 × 2 × 2	1	1	All levels present.
State/Region × Race (3 Levels) × Hispanicity	2 × 3 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Sex	2 × 3 × 2	2	2	All levels present.
Total	-	270	264	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

**Exhibit C.4.2 Covariates for Questionnaire Dwelling Unit Weights (res.qdu.nr)
Model Group 4: West; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	69	69	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	2	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	13	12	12	All levels present.
State (Binary)	13	12	12	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Screening Mode	2	1	1	All levels present.
Two-Factor Effects	-	173	167	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	13 × 5	48	48	All levels present.
State × Race	13 × 5	48	48	All levels present.
State × Sex	13 × 2	12	12	All levels present.
State × Hispanicity	13 × 2	12	12	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	2	Coll. (2,1) & (2,2), (3,1) & (3,2); zero.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	4	Coll. (1,1) & (1,2), (2,1) & (2,2), (3,1) & (3,2); zero. Coll. (4,1) & (4,2); sing.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	29	29	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	2 × 5 × 2	4	4	All levels present.
State/Region × Age × Hispanicity	2 × 5 × 2	4	4	All levels present.
State/Region × Age × Race (3 Levels)	2 × 5 × 3	8	8	All levels present.
State/Region × Hispanicity × Sex	2 × 2 × 2	1	1	All levels present.
State/Region × Race (3 Levels) × Hispanicity	2 × 3 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Sex	2 × 3 × 2	2	2	All levels present.
Total	-	271	265	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

**Exhibit C.4.3 Covariates for Questionnaire Dwelling Unit Weights (res.qdu.ps)
Model Group 4: West; 2024**

Variables	Levels	Proposed	Final	Comments
One-Factor Effects	-	68	68	-
Intercept	1	1	1	All levels present.
Group Quarter	3	2	2	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Household Type	7	6	6	All levels present.
Household Size	1	1	1	All levels present.
Rent/Housing	5	4	4	All levels present.
Population Density	4	3	3	All levels present.
% Black or African American	3	2	2	All levels present.
% Hispanic or Latino	35	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
State (Count)	13	12	12	All levels present.
State (Binary)	13	12	12	All levels present.
Quarter (Count)	4	3	3	All levels present.
Quarter (Binary)	4	3	3	All levels present.
Age Group	5	4	4	All levels present.
Race	5	4	4	All levels present.
Hispanicity	2	1	1	All levels present.
Sex	2	1	1	All levels present.
Two-Factor Effects	-	173	167	-
Age × Race (3 Levels)	5 × 3	8	8	All levels present.
Age × Hispanicity	5 × 2	4	4	All levels present.
Age × Sex	5 × 2	4	4	All levels present.
Race (3 Levels) × Hispanicity	3 × 2	2	2	All levels present.
Race (3 Levels) × Sex	3 × 2	2	2	All levels present.
Hispanicity × Sex	2 × 2	1	1	All levels present.
State × Age	13 × 5	48	48	All levels present.
State × Race	13 × 5	48	48	All levels present.
State × Sex	13 × 2	12	12	All levels present.
State × Hispanicity	13 × 2	12	12	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	2	Coll. (2,1) & (2,2), (3,1) & (3,2); zero.
% Owner-Occupied × % Hispanicity	3 × 3	4	4	All levels present.
% Owner-Occupied × Rent/Housing	3 × 5	8	8	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	4	Coll. (1,1) & (1,2), (2,1) & (2,2), (3,1) & (3,2); zero. Coll. (4,1) & (4,2); sing.
Rent/Housing × % Hispanicity	5 × 3	8	8	All levels present.
Three-Factor Effects	-	29	29	-
Race (3 Levels) × Age × Sex	3 × 5 × 2	8	8	All levels present.
State/Region × Age × Sex	2 × 5 × 2	4	4	All levels present.
State/Region × Age × Hispanicity	2 × 5 × 2	4	4	All levels present.
State/Region × Age × Race (3 Levels)	2 × 5 × 3	8	8	All levels present.
State/Region × Hispanicity × Sex	2 × 2 × 2	1	1	All levels present.
State/Region × Race (3 Levels) × Hispanicity	2 × 3 × 2	2	2	All levels present.
State/Region × Race (3 Levels) × Sex	2 × 3 × 2	2	2	All levels present.
Total	-	270	264	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix D: Evaluation of Calibration Weights: Questionnaire Dwelling Unit-Level Response Rates

Table D.1 QDU-Level Response Rates; 2024

Domain	Selected QDU	Respondent QDU	% Interview Response Rate ¹
Total	97,013	56,588	58.48
<i>Census Region</i>			
Northeast	17,683	10,119	60.02
South	32,084	18,915	58.81
Midwest	23,038	13,521	58.38
West	24,208	14,033	56.78
<i>Quarter</i>			
Quarter 1	24,236	14,026	58.59
Quarter 2	27,893	16,441	59.28
Quarter 3	24,484	14,417	58.42
Quarter 4	20,400	11,704	57.62
<i>Household Type</i>			
12-17, 18-25, 26+	7,510	4,415	57.95
12-17, 18-25	138	73	51.38
12-17, 26+	20,607	10,992	53.15
18-25, 26+	17,178	9,686	55.01
12-17	23	10	37.23
18-25	6,691	4,228	61.85
26+	44,866	27,184	59.65
<i>Race/Ethnicity of Householder</i>			
Hispanic or Latino White	13,853	7,810	56.15
Hispanic or Latino Black or African American	1,073	636	58.19
Hispanic or Latino Other	2,268	1,329	58.86
Non-Hispanic or Latino White	59,685	34,881	58.78
Non-Hispanic or Latino Black or African American	11,209	6,763	60.17
Non-Hispanic or Latino Other	8,925	5,169	57.35
<i>% Hispanic or Latino in Segment</i>			
50-100%	7,748	4,603	59.18
10-<50%	24,265	14,142	59.25
<10%	65,000	37,843	58.04

Table D.1 QDU-Level Response Rates; 2024 (continued)

Domain	Selected QDU	Respondent QDU	% Interview Response Rate ¹
<i>% Black or African American in Segment</i>			
50-100%	6,360	3,881	59.80
10-<50%	19,919	11,746	59.08
<10%	70,734	40,961	58.17
<i>% Owner-Occupied DUs in Segment</i>			
50-100%	72,154	41,386	57.24
10-<50%	21,616	13,145	61.48
<10%	3,243	2,057	64.38
<i>Combined Median Rent/Housing Value</i>			
1st Quintile	15,717	9,538	60.95
2nd Quintile	23,733	14,127	59.15
3rd Quintile	21,817	12,684	58.44
4th Quintile	20,781	11,740	57.16
5th Quintile	14,965	8,499	57.23
<i>Population Density</i>			
Large MSA	42,124	24,395	58.23
Medium to Small MSA	49,490	28,967	58.32
Non-MSA, Urban	2,600	1,593	62.63
Non-MSA, Rural	2,799	1,633	61.29
<i>Group Quarters</i>			
Group	257	218	89.13
Non-Group	96,756	56,370	58.43
<i>Household Size</i>			
One	12,437	8,563	67.30
Two	39,457	23,287	56.45
Three	23,878	12,859	52.31
Four or More	21,241	11,879	54.64

DU = dwelling unit; MSA = metropolitan statistical area; QDU = questionnaire dwelling unit; SDU = screener dwelling unit.

¹ The weight used for calculating the response rate includes SDU- and QDU-level design weights, SDU nonresponse and poststratification adjustments, and selected QDU poststratification adjustment. This weight is the product of WT1*...*WT11*DUWT12*DUWT13.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix E: Evaluation of Calibration Weights: Questionnaire Dwelling Unit-Level Proportions of Extreme Weights and Outwinsors

Table E.1 Selected QDU-Level Proportions of Extreme Values and Outwinsors; 2024

Domain	n	SDU-Level Weights (SDUWT: WT1*...*WT11)			Before sel.qdu.ps (SDUWT*DUWT12)			After sel.qdu.ps (SDUWT*DUWT12*DUWT13)		
		% Unweighted	% Weighted ¹	% Outwinsor ²	% Unweighted	% Weighted ¹	% Outwinsor ²	% Unweighted	% Weighted ¹	% Outwinsor ²
Total	97,013	0.90	2.58	0.41	1.36	5.17	0.89	0.88	2.61	0.17
<i>Census Region</i>										
Northeast	17,683	1.04	2.77	0.41	1.44	5.37	0.96	1.06	3.40	0.28
South	32,084	0.68	2.17	0.35	1.15	4.15	0.65	0.67	1.94	0.13
Midwest	23,038	0.95	2.70	0.48	1.40	5.50	0.95	0.99	3.06	0.20
West	24,208	1.04	3.03	0.47	1.54	6.48	1.21	0.91	2.73	0.13
<i>Quarter</i>										
Quarter 1	24,236	0.84	2.59	0.44	1.17	4.23	0.74	0.79	2.20	0.16
Quarter 2	27,893	0.44	1.18	0.17	0.74	3.25	0.57	0.48	1.51	0.11
Quarter 3	24,484	0.72	1.98	0.34	1.29	5.03	0.80	0.72	2.27	0.13
Quarter 4	20,400	1.80	4.56	0.71	2.50	8.13	1.46	1.72	4.45	0.27
<i>Household Type</i>										
12-17, 18-25, 26+	7,510	1.11	3.93	0.71	1.11	3.93	0.71	0.87	2.78	0.18
12-17, 18-25	138	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-17, 26+	20,607	0.78	2.42	0.41	0.78	2.43	0.42	0.77	2.31	0.18
18-25, 26+	17,178	0.90	2.82	0.42	0.93	2.82	0.40	0.72	2.20	0.15
12-17	23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-25	6,691	1.06	2.73	0.45	0.97	2.34	0.39	0.87	1.58	0.17
26+	44,866	0.90	2.29	0.36	1.90	6.18	1.08	0.99	2.77	0.17
<i>Race/Ethnicity of Householder</i>										
Hispanic or Latino White	13,853	0.96	2.24	0.36	1.09	3.83	0.80	0.80	2.40	0.15
Hispanic or Latino Black or African American	1,073	1.77	6.59	1.57	1.58	7.33	1.91	1.21	4.17	0.44
Hispanic or Latino Other	2,268	0.53	2.47	0.56	0.44	4.31	1.13	0.35	2.00	0.32
Non-Hispanic or Latino White	59,685	0.62	1.77	0.23	1.29	4.94	0.81	0.71	2.18	0.12
Non-Hispanic or Latino Black or African American	11,209	1.32	3.38	0.61	1.39	5.17	0.85	1.13	3.28	0.26
Non-Hispanic or Latino Other	8,925	2.11	6.47	1.22	2.43	8.86	1.61	1.89	5.02	0.38

Table E.1 Selected QDU-Level Proportions of Extreme Values and Outwinsors; 2024 (continued)

Domain	SDU-Level Weights (SDUWT: WT1*...*WT11)			Before sel.qdu.ps (SDUWT*DUWT12)			After sel.qdu.ps (SDUWT*DUWT12*DUWT13)			
	<i>n</i>	% Unweighted	% Weighted ¹	% Outwinsor ²	% Unweighted	% Weighted ¹	% Outwinsor ²	% Unweighted	% Weighted ¹	% Outwinsor ²
<i>% Hispanic or Latino in Segment</i>										
50-100%	7,748	0.41	0.88	0.16	0.58	2.29	0.40	0.40	1.09	0.07
10-<50%	24,265	0.96	2.64	0.33	1.24	4.34	0.64	0.76	2.08	0.14
<10%	65,000	0.93	2.80	0.50	1.50	5.89	1.07	0.98	3.03	0.20
<i>% Black or African American in Segment</i>										
50-100%	6,360	1.10	3.51	0.58	1.21	4.95	0.78	1.37	4.91	0.41
10-<50%	19,919	0.78	2.39	0.35	1.14	4.67	0.71	0.76	2.47	0.19
<10%	70,734	0.91	2.56	0.42	1.43	5.34	0.96	0.87	2.45	0.14
<i>% Owner-Occupied DUs in Segment</i>										
50-100%	72,154	0.75	2.18	0.36	1.28	4.89	0.85	0.82	2.50	0.14
10-<50%	21,616	1.16	3.27	0.50	1.44	5.66	0.93	0.98	2.97	0.26
<10%	3,243	2.50	5.44	0.78	2.65	7.46	1.43	1.48	2.50	0.25
<i>Combined Median Rent/Housing Value</i>										
1st Quintile	15,717	1.25	3.05	0.52	1.80	5.65	1.02	1.01	2.33	0.15
2nd Quintile	23,733	0.82	2.26	0.37	1.24	5.48	0.95	0.80	2.71	0.18
3rd Quintile	21,817	0.69	2.10	0.32	1.11	4.25	0.69	0.76	2.57	0.18
4th Quintile	20,781	0.74	2.39	0.37	1.02	4.29	0.71	0.79	2.55	0.14
5th Quintile	14,965	1.18	3.35	0.55	1.91	6.43	1.16	1.16	2.83	0.20
<i>Population Density</i>										
Large MSA	42,124	0.89	2.55	0.37	1.28	4.74	0.78	0.90	2.74	0.18
Medium to Small MSA	49,490	0.73	2.38	0.43	1.17	4.97	0.87	0.72	2.37	0.16
Non-MSA, Urban	2,600	1.92	3.40	0.55	2.81	7.38	1.59	1.81	2.01	0.12
Non-MSA, Rural	2,799	3.07	5.29	0.90	4.57	12.70	2.51	2.39	3.99	0.22
<i>Group Quarters</i>										
Group	257	0.39	0.99	0.13	1.17	2.44	0.34	0.39	0.78	0.00
Non-Group	96,756	0.90	2.58	0.41	1.36	5.17	0.89	0.88	2.61	0.17
<i>Household Size</i>										
One	12,437	0.62	1.87	0.26	1.64	6.47	0.99	0.71	2.28	0.13
Two	39,457	0.96	2.37	0.38	1.75	5.63	1.05	1.04	2.97	0.19
Three	23,878	0.75	2.12	0.34	0.84	2.80	0.52	0.69	1.94	0.14
Four or More	21,241	1.12	3.77	0.63	1.06	3.67	0.58	0.89	2.85	0.21

DU = dwelling unit; MSA = metropolitan statistical area; PS = poststratification adjustment; QDU = questionnaire dwelling unit; SDU = screener dwelling unit; sel = selected.

¹ Weighted extreme value proportion: $100 * \sum_k W_{ek} / \sum_k W_k$, where W_{ek} denotes the weight for extreme values, and W_k denotes the weight for both extreme values and nonextreme values.

² Outwinsor weight proportion: $100 * \sum_k (W_{ek} - b_k) / \sum_k W_k$, where b_k denotes the winsorized weight.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table E.2 Respondent QDU-Level Proportions of Extreme Values and Outwinsors; 2024

Domain	Before res.qdu.nr (SDUWT*DUWT12*DUWT13)			After res.qdu.nr (SDUWT*DUWT12*...*DUWT14)			Final Weight: After res.qdu.ps (SDUWT*DUWT12*...*DUWT15)			
	<i>n</i>	% Unweighted	% Weighted ¹	% Outwinsor ²	% Unweighted	% Weighted ¹	% Outwinsor ²	% Unweighted	% Weighted ¹	% Outwinsor ²
Total	56,588	1.09	3.51	0.43	0.84	3.17	0.30	0.75	2.64	0.08
<i>Census Region</i>										
Northeast	10,119	1.12	3.76	0.48	0.89	3.14	0.27	0.80	2.63	0.06
South	18,915	0.77	2.58	0.26	0.85	3.15	0.31	0.72	2.55	0.10
Midwest	13,521	1.04	3.88	0.50	0.89	4.31	0.41	0.76	3.48	0.07
West	14,033	1.53	4.63	0.60	0.73	2.13	0.19	0.74	1.99	0.04
<i>Quarter</i>										
Quarter 1	14,026	0.90	2.71	0.32	0.82	3.19	0.34	0.69	2.39	0.09
Quarter 2	16,441	0.57	1.81	0.29	0.40	1.59	0.16	0.39	1.40	0.06
Quarter 3	14,417	0.95	3.17	0.30	0.78	2.90	0.24	0.66	2.45	0.06
Quarter 4	11,704	2.20	6.42	0.80	1.54	4.99	0.46	1.44	4.32	0.10
<i>Household Type</i>										
12-17, 18-25, 26+	4,415	0.77	2.57	0.22	0.68	2.95	0.41	0.68	2.59	0.13
12-17, 18-25	73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-17, 26+	10,992	0.89	2.39	0.25	0.50	1.83	0.24	0.49	1.71	0.09
18-25, 26+	9,686	0.91	2.80	0.25	0.65	2.27	0.28	0.56	1.92	0.05
12-17	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-25	4,228	0.97	2.15	0.28	1.02	2.86	0.42	0.85	2.42	0.19
26+	27,184	1.30	3.90	0.49	1.04	3.54	0.30	0.92	2.91	0.07
<i>Race/Ethnicity of Householder</i>										
Hispanic or Latino White	7,810	0.85	2.77	0.40	0.78	2.52	0.25	0.77	2.29	0.05
Hispanic or Latino Black or African American	636	1.57	4.77	0.38	0.79	2.59	0.46	0.79	2.24	0.11
Hispanic or Latino Other	1,329	0.38	2.46	0.51	0.30	1.91	0.14	0.23	2.30	0.63
Non-Hispanic or Latino White	34,881	1.00	3.21	0.36	0.79	3.03	0.23	0.63	2.32	0.03
Non-Hispanic or Latino Black or African American	6,763	1.12	3.76	0.38	0.80	3.41	0.36	0.83	3.15	0.10
Non-Hispanic or Latino Other	5,169	2.11	6.55	1.01	1.41	5.08	0.82	1.55	4.89	0.33
<i>% Hispanic or Latino in Segment</i>										
50-100%	4,603	0.39	1.44	0.17	0.26	0.91	0.09	0.28	0.83	0.02
10-<50%	14,142	1.10	3.21	0.31	0.80	2.62	0.30	0.81	2.39	0.08
<10%	37,843	1.16	3.91	0.51	0.92	3.69	0.32	0.79	2.97	0.08

Table E.2 Respondent QDU-Level Proportions of Extreme Values and Outwinors; 2024 (continued)

Domain	Before res.qdu.nr (SDUWT*DUWT12*DUWT13)			After res.qdu.nr (SDUWT*DUWT12*...*DUWT14)			Final Weight: After res.qdu.ps (SDUWT*DUWT12*...*DUWT15)			
	<i>n</i>	% Unweighted	% Weighted ¹	% Outwinor ²	% Unweighted	% Weighted ¹	% Outwinor ²	% Unweighted	% Weighted ¹	% Outwinor ²
% Black or African American in Segment										
50-100%	3,881	1.08	4.26	0.45	0.67	3.30	0.35	0.70	3.10	0.10
10-<50%	11,746	0.95	3.85	0.41	0.85	3.29	0.41	0.80	2.86	0.12
<10%	40,961	1.13	3.34	0.43	0.85	3.12	0.26	0.74	2.53	0.06
% Owner-Occupied DUs in Segment										
50-100%	41,386	1.06	3.59	0.45	0.89	3.42	0.28	0.78	2.82	0.06
10-<50%	13,145	1.09	3.34	0.37	0.68	2.38	0.28	0.66	2.07	0.07
<10%	2,057	1.60	3.07	0.38	0.78	2.86	0.66	0.78	2.43	0.30
Combined Median Rent/Housing Value										
1st Quintile	9,538	1.45	3.87	0.51	0.68	2.51	0.19	0.70	2.42	0.05
2nd Quintile	14,127	0.91	3.18	0.40	0.69	2.66	0.26	0.64	2.40	0.07
3rd Quintile	12,684	0.95	3.58	0.42	0.78	3.12	0.24	0.61	2.31	0.09
4th Quintile	11,740	0.93	2.94	0.31	0.75	2.94	0.30	0.66	2.37	0.05
5th Quintile	8,499	1.40	4.17	0.51	1.46	4.61	0.49	1.33	3.77	0.13
Population Density										
Large MSA	24,395	0.94	3.19	0.36	0.85	2.77	0.28	0.79	2.32	0.06
Medium to Small MSA	28,967	0.96	3.62	0.43	0.72	3.58	0.30	0.62	2.92	0.09
Non-MSA, Urban	1,593	2.82	3.76	0.65	1.44	1.64	0.13	1.26	1.47	0.02
Non-MSA, Rural	1,633	3.74	6.92	1.11	2.02	5.56	0.72	2.02	5.06	0.18
Group Quarters										
Group	218	0.92	3.93	0.79	0.92	2.75	0.58	1.38	4.40	0.31
Non-Group	56,370	1.09	3.51	0.42	0.84	3.17	0.30	0.75	2.64	0.08
Household Size										
One	8,563	0.95	2.81	0.30	1.04	3.98	0.35	0.98	3.45	0.09
Two	23,287	1.33	4.48	0.62	1.04	3.38	0.29	0.88	2.65	0.07
Three	12,859	0.94	2.63	0.24	0.44	1.39	0.16	0.44	1.39	0.04
Four or More	11,879	0.87	2.83	0.25	0.72	2.81	0.38	0.66	2.36	0.11

DU = dwelling unit; MSA = metropolitan statistical area; nr = nonresponse adjustment; ps = poststratification adjustment; QDU = questionnaire dwelling unit; res = respondent; SDU = screener dwelling unit.

¹ Weighted extreme value proportion: $100 * \sum_k W_{ek} / \sum_k W_k$, where W_{ek} denotes the weight for extreme values, and W_k denotes the weight for both extreme values and nonextreme values.

² Outwinor weight proportion: $100 * \sum_k (W_{ek} - b_k) / \sum_k W_k$, where b_k denotes the winsorized weight.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix F: Evaluation of Calibration Weights: Questionnaire Dwelling Unit-Level Slippage Rates

Table F.1 QDU-Level Slippage Rates; 2024

Domain	<i>n</i>	Initial Total (<i>I</i>) ¹	Final Total (<i>F</i>) ²	Control from SDU Weights (<i>C</i>)	(<i>I - C</i>)/ <i>C</i> %	(<i>F - C</i>)/ <i>C</i> %
Total	56,588	131,099,289	131,099,289	131,099,289	0.00	-0.00
<i>Census Region</i>						
Northeast	10,119	22,644,713	22,644,713	22,644,713	0.00	-0.00
South	18,915	51,294,905	51,294,905	51,294,905	0.00	-0.00
Midwest	13,521	27,821,405	27,821,405	27,821,405	0.00	-0.00
West	14,033	29,338,267	29,338,267	29,338,267	0.00	-0.00
<i>Quarter</i>						
Quarter 1	14,026	32,847,250	32,847,250	32,847,250	0.00	-0.00
Quarter 2	16,441	32,653,662	32,653,662	32,653,662	0.00	0.00
Quarter 3	14,417	32,866,522	32,866,522	32,866,522	0.00	-0.00
Quarter 4	11,704	32,731,855	32,731,855	32,731,855	0.00	-0.00
<i>Household Type</i>						
12-17, 18-25, 26+	4,415	5,389,402	5,389,402	5,389,402	0.00	-0.00
12-17, 18-25	73	104,311	104,311	104,311	0.00	0.00
12-17, 26+	10,992	13,865,450	13,865,450	13,865,450	0.00	-0.00
18-25, 26+	9,686	14,048,843	14,048,843	14,048,843	0.00	-0.00
12-17	10	19,531	20,880	20,880	-6.46	-0.00
18-25	4,228	5,320,225	5,318,876	5,318,876	0.03	-0.00
26+	27,184	92,351,528	92,351,528	92,351,528	0.00	-0.00
<i>Race/Ethnicity of Householder</i>						
Hispanic or Latino White	7,810	17,681,890	17,681,890	17,681,890	0.00	0.00
Hispanic or Latino Black or African American	636	1,097,344	1,097,344	1,097,344	0.00	0.00
Hispanic or Latino Other	1,329	1,578,420	1,578,420	1,578,420	0.00	0.00
Non-Hispanic or Latino White	34,881	82,935,631	82,935,631	82,935,631	0.00	-0.00
Non-Hispanic or Latino Black or African American	6,763	16,626,097	16,626,097	16,626,097	0.00	0.00
Non-Hispanic or Latino Other	5,169	11,179,907	11,179,907	11,179,907	0.00	-0.00
<i>% Hispanic or Latino in Segment</i>						
50-100%	4,603	9,938,168	9,938,168	9,938,168	0.00	0.00
10-<50%	14,142	38,202,286	38,202,286	38,202,286	0.00	-0.00
<10%	37,843	82,958,835	82,958,835	82,958,835	0.00	-0.00
<i>% Black or African American in Segment</i>						
50-100%	3,881	8,286,774	8,286,774	8,286,774	0.00	0.00
10-<50%	11,746	29,415,132	29,415,132	29,415,132	0.00	0.00
<10%	40,961	93,397,382	93,397,382	93,397,382	0.00	-0.00
<i>% Owner-Occupied DUs in Segment</i>						
50-100%	41,386	96,693,660	96,693,660	96,693,660	0.00	-0.00
10-<50%	13,145	28,857,752	28,857,752	28,857,752	0.00	-0.00
<10%	2,057	5,547,877	5,547,877	5,547,877	0.00	-0.00

Table F.1 QDU-Level Slippage Rates; 2024 (continued)

Domain	<i>n</i>	Initial Total (<i>I</i>) ¹	Final Total (<i>F</i>) ²	Control from SDU Weights (<i>C</i>)	(<i>I</i> - <i>C</i>)/ <i>C</i> %	(<i>F</i> - <i>C</i>)/ <i>C</i> %
<i>Combined Median Rent/Housing Value</i>						
1st Quintile	9,538	20,546,069	20,546,069	20,546,069	0.00	0.00
2nd Quintile	14,127	28,695,757	28,695,757	28,695,757	0.00	-0.00
3rd Quintile	12,684	28,259,859	28,259,859	28,259,859	0.00	-0.00
4th Quintile	11,740	28,612,635	28,612,635	28,612,635	0.00	0.00
5th Quintile	8,499	24,984,969	24,984,969	24,984,969	0.00	-0.00
<i>Population Density</i>						
Large MSA	24,395	69,380,512	69,380,512	69,380,512	0.00	-0.00
Medium to Small MSA	28,967	54,169,129	54,169,128	54,169,129	0.00	-0.00
Non-MSA, Urban	1,593	3,307,280	3,307,280	3,307,280	0.00	0.00
Non-MSA, Rural	1,633	4,242,369	4,242,369	4,242,369	-0.00	0.00
<i>Group Quarters</i>						
Group	218	199,453	199,453	199,453	0.00	-0.00
Non-Group	56,370	130,899,836	130,899,836	130,899,836	0.00	-0.00
<i>Household Size</i>						
One	8,563	36,652,921	36,637,663	35,218,223	4.07	4.03
Two	23,287	57,215,665	57,218,196	58,948,340	-2.94	-2.94
Three	12,859	20,231,040	20,252,713	20,449,358	-1.07	-0.96
Four or More	11,879	16,999,663	16,990,717	16,483,368	3.13	3.08

DU = dwelling unit; MSA = metropolitan statistical area; QDU = questionnaire dwelling unit; SDU = screener dwelling unit.

¹ WT1*...*WT11*DUWT12*...*DUWT14 (before QDU poststratification and QDU extreme value adjustment).

² WT1*...*WT11*DUWT12*...*DUWT16 (after QDU poststratification and QDU extreme value adjustment).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix G: Evaluation of Calibration Weights: Questionnaire Dwelling Unit-Level Weight Summary Statistics

Table G.1 Selected QDU-Level Weight Summary Statistics; 2024

Domain	SDU-Level Weights (SDUWT: WT1*...*WT11)							Before sel.qdu.ps (SDUWT*DUWT12)					After sel.qdu.ps (SDUWT*DUWT12*DUWT13)						
	<i>n</i>	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²
Total	97,013	3	222	498	949	6,921	1.85	3	338	781	1,613	28,863	2.76	2	336	780	1,625	23,838	2.72
<i>Census Region</i>																			
Northeast	17,683	10	195	528	928	6,226	1.72	10	308	766	1,498	25,904	2.81	2	302	753	1,510	23,838	2.83
South	32,084	3	253	564	1,155	6,921	1.88	3	392	917	1,960	28,863	2.68	3	387	910	1,979	22,548	2.63
Midwest	23,038	15	245	473	823	5,647	1.57	16	365	752	1,409	25,143	2.52	11	363	752	1,425	19,374	2.47
West	24,208	9	182	432	882	5,805	1.94	9	278	676	1,469	25,137	2.91	9	279	680	1,489	18,392	2.81
<i>Quarter</i>																			
Quarter 1	24,236	5	235	503	950	6,905	1.82	5	359	805	1,607	25,143	2.64	3	353	796	1,621	20,294	2.65
Quarter 2	27,893	4	190	429	829	5,673	1.85	5	291	672	1,384	25,647	2.78	2	289	675	1,390	20,380	2.74
Quarter 3	24,484	3	219	492	938	5,765	1.85	3	329	770	1,607	28,863	2.84	3	324	762	1,609	19,281	2.80
Quarter 4	20,400	5	266	620	1,127	6,921	1.79	5	407	961	1,953	28,684	2.66	5	409	962	1,982	23,838	2.56
<i>Household Type</i>																			
12-17, 18-25, 26+	7,510	7	240	537	1,004	6,921	1.85	7	240	537	1,004	6,921	1.85	6	238	527	1,009	6,386	1.83
12-17, 18-25	138	38	255	637	1,066	3,369	1.65	38	255	637	1,066	3,369	1.65	25	255	627	1,025	3,550	1.69
12-17, 26+	20,607	3	214	484	921	6,905	1.88	3	216	491	930	6,905	1.88	3	215	491	933	7,559	1.88
18-25, 26+	17,178	5	245	546	1,026	6,692	1.81	6	272	615	1,146	6,692	1.81	2	268	605	1,142	6,990	1.82
12-17	23	48	279	777	1,415	2,488	1.65	49	279	785	1,430	2,513	1.65	66	251	781	1,429	2,709	1.68
18-25	6,691	5	218	482	974	5,647	1.97	5	246	539	1,096	6,148	1.96	3	239	537	1,081	6,092	1.98
26+	44,866	4	217	481	919	5,744	1.82	14	568	1,296	2,628	28,863	2.30	10	570	1,302	2,676	23,838	2.25
<i>Race/Ethnicity of Householder</i>																			
Hispanic or Latino White	13,853	4	326	683	1,147	6,108	1.62	6	409	876	1,576	19,866	2.32	7	407	879	1,597	20,353	2.29
Hispanic or Latino Black or African American	1,073	12	193	421	831	5,673	2.03	12	242	548	1,184	11,811	2.60	13	245	579	1,273	13,610	2.68
Hispanic or Latino Other	2,268	6	145	304	575	4,933	2.20	8	182	394	824	21,474	3.24	2	177	391	810	11,185	2.95
Non-Hispanic or Latino White	59,685	3	209	458	880	6,734	1.86	3	336	779	1,643	28,863	2.81	3	335	779	1,649	23,838	2.77
Non-Hispanic or Latino Black or African American	11,209	6	274	580	1,085	5,292	1.74	7	390	860	1,791	22,523	2.65	7	376	849	1,813	20,294	2.64
Non-Hispanic or Latino Other	8,925	5	191	469	1,006	6,921	2.10	5	274	697	1,526	25,904	2.91	3	272	710	1,557	22,548	2.79
<i>% Hispanic or Latino in Segment</i>																			
50-100%	7,748	14	343	666	1,080	4,153	1.51	14	435	892	1,547	19,495	2.22	12	447	910	1,594	19,374	2.18
10-<50%	24,265	4	286	631	1,207	6,905	1.79	5	413	970	1,962	24,509	2.53	5	408	967	1,996	23,838	2.48
<10%	65,000	3	199	435	846	6,921	1.87	3	307	717	1,487	28,863	2.92	2	305	713	1,494	22,548	2.87

Table G.1 Selected QDU-Level Weight Summary Statistics; 2024 (continued)

Domain	SDU-Level Weights (SDUWT: WT1*...*WT11)							Before sel.qdu.ps (SDUWT*DUWT12)					After sel.qdu.ps (SDUWT*DUWT12*DUWT13)						
	n	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²
% Black or African American in Segment																			
50-100%	6,360	5	236	518	950	5,765	1.71	5	362	790	1,531	23,053	2.75	5	343	778	1,543	22,548	2.81
10-<50%	19,919	4	267	591	1,076	6,905	1.75	5	400	880	1,779	24,509	2.62	5	399	881	1,803	21,733	2.58
<10%	70,734	3	212	467	915	6,921	1.89	3	323	756	1,568	28,863	2.80	2	322	755	1,579	23,838	2.75
% Owner-Occupied DUs in Segment																			
50-100%	72,154	3	222	484	912	6,921	1.86	3	339	770	1,581	28,684	2.76	2	337	769	1,597	22,535	2.72
10-<50%	21,616	4	209	519	1,021	5,673	1.84	6	316	786	1,633	28,863	2.83	5	311	780	1,634	23,838	2.77
<10%	3,243	12	365	699	1,383	4,988	1.67	15	478	1,073	2,128	23,053	2.34	11	489	1,094	2,243	22,548	2.26
Combined Median Rent/Housing Value																			
1st Quintile	15,717	10	243	504	892	6,692	1.73	10	364	768	1,511	23,745	2.77	6	356	763	1,519	20,294	2.73
2nd Quintile	23,733	6	213	457	839	6,905	1.82	6	315	707	1,434	28,684	2.84	2	308	696	1,436	22,548	2.80
3rd Quintile	21,817	4	194	460	953	6,734	1.88	7	292	756	1,564	25,137	2.75	5	289	758	1,587	23,838	2.74
4th Quintile	20,781	11	236	503	994	5,673	1.84	16	357	799	1,643	24,509	2.69	10	354	798	1,667	20,380	2.65
5th Quintile	14,965	3	261	616	1,148	6,921	1.84	3	405	985	2,037	28,863	2.63	3	412	998	2,078	19,844	2.53
Population Density																			
Large MSA	42,124	3	339	699	1,156	6,921	1.65	3	501	1,045	1,976	28,863	2.43	3	501	1,050	2,016	22,548	2.39
Medium to Small MSA	49,490	6	171	359	744	6,734	1.99	6	255	591	1,282	28,684	3.05	2	251	590	1,275	23,838	2.99
Non-MSA, Urban	2,600	21	234	399	716	5,940	1.95	25	332	663	1,508	22,413	3.05	16	332	656	1,504	19,207	2.95
Non-MSA, Rural	2,799	12	293	514	850	5,765	1.75	21	441	818	1,750	23,745	2.84	18	432	805	1,758	17,486	2.72
Group Quarters																			
Group	257	50	314	459	643	2,324	1.45	81	369	592	1,067	5,739	1.93	69	344	478	974	4,098	1.91
Non-Group	96,756	3	222	498	950	6,921	1.85	3	338	782	1,614	28,863	2.76	2	336	781	1,627	23,838	2.71
Household Size																			
One	12,437	6	210	472	905	5,339	1.85	20	652	1,634	3,635	28,863	2.37	19	653	1,631	3,720	23,838	2.32
Two	39,457	4	216	477	916	5,673	1.84	7	408	941	1,941	25,904	2.21	6	409	939	1,970	16,848	2.17
Three	23,878	5	225	503	963	6,127	1.83	5	263	601	1,150	18,885	2.02	2	261	598	1,158	8,811	2.00
Four or More	21,241	3	242	546	1,023	6,921	1.86	3	252	568	1,073	7,642	1.89	3	250	561	1,070	7,559	1.89

DU = dwelling unit; MSA = metropolitan statistical area; ps = poststratification adjustment; QDU = questionnaire dwelling unit; SDU = screener dwelling unit; sel = selected; UWE = unequal weighting effect.

¹ Q1 and Q3 refer to the first and third quartile of the weight distribution.

² UWE is defined as $1 + [(n - 1)/n] * CV^2$, where CV = coefficient of variation of weights.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table G.2 Respondent QDU-Level Weight Summary Statistics; 2024

Domain	Before res.qdu.nr (SDUWT*DUWT12*DUWT13)							After res.qdu.nr (SDUWT*DUWT12*...*DUWT14)							Final Weight: After res.qdu.ps (SDUWT*DUWT12*...*DUWT15)				
	n	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²
Total	56,588	4	330	760	1,611	23,838	2.81	5	528	1,296	2,831	41,637	2.74	5	528	1,299	2,834	41,121	2.73
<i>Census Region</i>																			
Northeast	10,119	12	309	768	1,565	23,838	2.89	18	517	1,344	2,742	32,761	2.63	17	519	1,342	2,746	32,460	2.62
South	18,915	4	382	885	1,946	22,548	2.70	5	616	1,500	3,351	41,637	2.68	5	616	1,503	3,348	41,121	2.67
Midwest	13,521	11	354	729	1,409	19,374	2.54	15	556	1,219	2,496	24,749	2.52	14	557	1,221	2,499	22,478	2.50
West	14,033	9	263	639	1,416	18,392	3.00	9	415	1,077	2,554	35,769	2.96	9	416	1,080	2,554	35,900	2.96
<i>Quarter</i>																			
Quarter 1	14,026	5	350	779	1,622	19,437	2.75	6	568	1,347	2,852	41,637	2.69	6	569	1,346	2,852	41,121	2.67
Quarter 2	16,441	4	287	662	1,392	20,380	2.81	5	451	1,113	2,414	35,073	2.74	5	451	1,111	2,417	35,083	2.74
Quarter 3	14,417	5	312	731	1,574	19,281	2.92	7	499	1,251	2,782	35,769	2.85	7	500	1,251	2,784	35,900	2.85
Quarter 4	11,704	6	401	934	1,960	23,838	2.65	7	662	1,630	3,495	38,019	2.56	7	665	1,637	3,494	35,728	2.54
<i>Household Type</i>																			
12-17, 18-25, 26+	4,415	6	234	521	996	6,386	1.85	6	360	857	1,706	9,493	1.93	6	360	857	1,705	9,527	1.92
12-17, 18-25	73	69	310	624	1,061	2,454	1.58	124	515	1,205	1,820	4,706	1.62	124	506	1,205	1,799	4,672	1.62
12-17, 26+	10,992	4	214	489	919	6,672	1.89	5	356	856	1,771	14,208	1.98	5	357	856	1,773	12,377	1.98
18-25, 26+	9,686	9	256	566	1,102	6,990	1.87	10	418	1,006	2,061	10,686	1.92	9	418	1,004	2,067	9,564	1.91
12-17	10	66	236	614	895	2,244	1.80	66	473	1,204	3,500	5,005	1.78	67	880	1,571	3,508	5,009	1.63
18-25	4,228	6	222	495	1,067	6,092	2.04	11	350	790	1,787	12,194	2.02	11	349	790	1,786	11,857	2.02
26+	27,184	10	533	1,236	2,591	23,838	2.34	15	846	2,012	4,445	41,637	2.33	15	846	2,015	4,458	41,121	2.32
<i>Race/Ethnicity of Householder</i>																			
Hispanic or Latino White	7,810	10	398	872	1,584	20,353	2.35	15	676	1,519	2,825	36,352	2.35	15	677	1,517	2,834	35,900	2.34
Hispanic or Latino Black or African American	636	13	248	570	1,244	9,156	2.57	16	403	979	2,297	16,411	2.52	17	400	978	2,301	16,625	2.52
Hispanic or Latino Other	1,329	9	168	376	768	11,185	3.09	10	271	621	1,376	15,877	3.06	9	268	614	1,370	23,461	3.21
Non-Hispanic or Latino White	34,881	4	328	759	1,642	23,838	2.86	5	526	1,296	2,874	41,637	2.79	5	527	1,299	2,878	41,121	2.78
Non-Hispanic or Latino Black or African American	6,763	15	372	812	1,776	19,374	2.73	16	581	1,357	3,005	34,331	2.68	15	580	1,356	3,005	32,460	2.66
Non-Hispanic or Latino Other	5,169	6	261	680	1,492	22,548	2.90	9	436	1,125	2,704	35,519	2.84	9	435	1,132	2,718	29,955	2.81
<i>% Hispanic or Latino in Segment</i>																			
50-100%	4,603	12	437	899	1,577	19,374	2.23	14	696	1,481	2,716	27,288	2.21	14	698	1,484	2,712	27,537	2.21
10-<50%	14,142	6	398	952	1,997	23,838	2.58	9	644	1,598	3,454	36,352	2.51	9	643	1,600	3,465	35,900	2.50
<10%	37,843	4	299	689	1,472	22,548	2.96	5	480	1,173	2,607	41,637	2.89	5	480	1,174	2,608	41,121	2.88

Table G.2 2024 NSDUH Respondent QDU-Level Weight Summary Statistics (continued)

Domain	Before res.qdu.nr (SDUWT*DUWT12*DUWT13)							After res.qdu.nr (SDUWT*DUWT12*...*DUWT14)					Final Weight: After res.qdu.ps (SDUWT*DUWT12*...*DUWT15)						
	n	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²	Min	Q1 ¹	Med	Q3 ¹	Max	UWE ²
% Black or African American in Segment																			
50-100%	3,881	5	334	741	1,471	22,548	2.96	9	493	1,178	2,491	32,577	2.93	9	493	1,179	2,497	32,460	2.92
10-<50%	11,746	6	392	859	1,796	19,374	2.61	6	610	1,461	3,100	35,519	2.59	6	611	1,466	3,106	32,174	2.57
<10%	40,961	4	315	736	1,567	23,838	2.86	5	512	1,263	2,791	41,637	2.77	5	512	1,264	2,795	41,121	2.76
% Owner-Occupied DUs in Segment																			
50-100%	41,386	4	332	748	1,575	20,996	2.82	5	540	1,294	2,839	41,637	2.76	5	539	1,298	2,840	41,121	2.75
10-<50%	13,145	8	301	766	1,624	23,838	2.86	12	469	1,246	2,709	34,331	2.76	12	469	1,243	2,709	32,460	2.75
<10%	2,057	19	486	1,080	2,204	22,548	2.33	24	728	1,659	3,468	35,519	2.32	24	728	1,654	3,487	25,194	2.28
Combined Median Rent/Housing Value																			
1st Quintile	9,538	6	351	755	1,513	17,536	2.78	6	545	1,221	2,517	29,980	2.77	6	546	1,220	2,520	30,208	2.76
2nd Quintile	14,127	9	300	671	1,417	22,548	2.88	9	468	1,139	2,452	36,352	2.82	9	469	1,141	2,450	35,728	2.82
3rd Quintile	12,684	8	283	737	1,578	23,838	2.81	10	466	1,254	2,744	33,494	2.73	9	467	1,256	2,750	32,130	2.73
4th Quintile	11,740	10	348	781	1,671	20,380	2.76	17	571	1,379	3,049	35,769	2.67	17	570	1,381	3,057	35,900	2.66
5th Quintile	8,499	4	404	956	2,069	19,844	2.66	5	685	1,696	3,723	41,637	2.55	5	685	1,700	3,734	41,121	2.53
Population Density																			
Large MSA	24,395	4	478	1,023	2,021	22,548	2.47	5	777	1,777	3,547	35,769	2.38	5	777	1,777	3,554	35,900	2.38
Medium to Small MSA	28,967	6	249	579	1,257	23,838	3.09	6	404	971	2,190	41,637	3.07	6	404	973	2,196	41,121	3.06
Non-MSA, Urban	1,593	16	342	659	1,508	19,207	2.96	38	514	1,044	2,417	32,036	3.05	37	513	1,043	2,415	32,073	3.05
Non-MSA, Rural	1,633	18	449	821	1,761	17,486	2.85	20	698	1,371	2,903	25,706	2.72	20	697	1,377	2,929	25,729	2.69
Group Quarters																			
Group	218	69	344	553	1,061	4,098	1.91	77	380	650	1,201	4,571	1.83	76	385	660	1,190	4,558	1.82
Non-Group	56,370	4	330	761	1,614	23,838	2.81	5	530	1,300	2,838	41,637	2.74	5	530	1,303	2,840	41,121	2.73
Household Size																			
One	8,563	19	626	1,567	3,603	23,838	2.36	21	907	2,355	5,522	41,637	2.45	21	910	2,360	5,517	41,121	2.44
Two	23,287	6	387	879	1,870	16,848	2.24	11	597	1,442	3,185	32,036	2.35	11	598	1,442	3,191	32,073	2.34
Three	12,859	5	252	577	1,117	8,811	2.02	6	421	1,025	2,143	18,272	2.14	6	421	1,025	2,147	18,317	2.13
Four or More	11,879	4	242	542	1,045	6,667	1.91	5	407	964	1,971	13,132	2.03	5	408	966	1,972	12,885	2.02

DU = dwelling unit; MSA = metropolitan statistical area; nr = nonresponse adjustment; ps = poststratification adjustment; QDU = questionnaire dwelling unit; res = respondent; SDU = screener dwelling unit; UWE = unequal weighting effect.

¹ Q1 and Q3 refer to the first and third quartile of the weight distribution.

² UWE is defined as $1 + [(n - 1)/n] * CV^2$, where CV = coefficient of variation of weights.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix H: Generalized Exponential Modeling Summary for the Pair Weights

This appendix summarizes each model group throughout all stages of weight calibration modeling. Unlike much of the other information presented in this report, this section provides a model-specific overview of weight calibration, as opposed to a domain-specific one.

For 2024, modeling involved taking two model groups through four adjustment steps: (1) selected pair poststratification, (2) pair nonresponse adjustment, (3) responding pair poststratification, and (4) responding pair extreme value adjustment.

Model-specific summary statistics are shown in [Tables H.1a](#) through [H.2b](#). Included in these tables, for each stage of modeling, are the number of factor effects included in the final model; the high, low, and nonextreme weight bounds set to provide the upper and lower limits for the generalized exponential model macro; the weighted, unweighted, and winsorized weight proportions; the unequal weighting effect (UWE); and weight distributions. The UWE provides an approximate partial measure of variance and provides a summary of how much impact a particular stage of modeling has on the distribution of the new product of weights. At each stage in the modeling, these summary statistics were calculated and utilized to help evaluate the quality of the weight component under the model chosen.

Occurrences of small sample sizes and exact linear combinations in the realized data led to situations whereby modeling inclusion of all originally proposed levels of covariates in the model was not possible. The text and exhibits in Sections H.1 and H.2 summarize the decisions made with regard to final covariates included in each model. For the list of proposed initial covariates considered at each stage of modeling, see [Exhibit H.2](#). For the list of realized final model covariates, see [Exhibits H.1.1](#) to [H.2.4](#). For guidelines on interpreting these exhibits, see Appendix C.

H.1 Final Model Explanatory Variables

For brevity, numeric abbreviations for factor levels are established in [Exhibit 5.2](#) (included here as [Exhibit H.1](#) for easy reference). A complete list of all variables and associated levels used at any stage of modeling is provided. Note that not all factors or levels are present in all stages of modeling, and the initial set of variables is the same across model groups but may change for an adjustment step of modeling. The initial candidates are found in any of the proposed variable columns for a particular stage of weight adjustment.

Exhibit H.1 Definitions of Levels for Person Pair-Level Calibration Modeling Variables; 2024

Group Quarter Indicator

1: College Dorm, 2: Other Group Quarter, 3: Non-Group Quarter¹

Household Size

2: DU with 2 People,¹ 3: DU with 3 People, 4: DU with ≥ 4 People

Pair Age (15 Levels)

1: 12-17 and 12-17,¹ 2: 12-17 and 18-25, 3: 12-17 and 26-34, 4: 12-17 and 35-49, 5: 12-17 and 50+, 6: 18-25 and 18-25, 7: 18-25 and 26-34, 8: 18-25 and 35-49, 9: 18-25 and 50+, 10: 26-34 and 26-34, 11: 26-34 and 35-49, 12: 26-34 and 50+, 13: 35-49 and 35-49, 14: 35-49 and 50+, 15: 50+ and 50+

Pair Age (6 Levels)

1: 12-17 and 12-17,¹ 2: 12-17 and 18-25, 3: 12-17 and 26+, 4: 18-25 and 18-25, 5: 18-25 and 26+, 6: 26+ and 26+

Pair Age (3 Levels)

1: 12-17 and 12-17,¹ 2: 12-17 and 18+, 3: 18+ and 18+

Pair Sex

1: Male and Female,¹ 2: Female and Female, 3: Male and Male

Pair Race/Ethnicity (10 Levels)

1: White and White,¹ 2: White and Black or African American, 3: White and Hispanic or Latino, 4: White and Other, 5: Black or African American and Black or African American, 6: Black or African American and Hispanic or Latino, 7: Black or African American and Other, 8: Hispanic or Latino and Hispanic or Latino, 9: Hispanic or Latino and Other, 10: Other and Other

Pair Race/Ethnicity (5 Levels)

1: Two or More Races Pair, 2: Hispanic or Latino Pair, 3: Black or African American Pair, 4: White Pair,¹ 5: Other Pair

Pair Race/Ethnicity (4 Levels)

1: Two or More Races Pair or Other and Other, 2: Hispanic or Latino Pair, 3: Black or African American Pair, 4: White Pair¹

Percentage of Owner-Occupied Dwelling Units in Segment (% Owner-Occupied)

1: 50-100%,¹ 2: 10-<50%, 3: 0-<10%

Percentage of Segments That Are Black or African American

1: 50-100%, 2: 10-<50%, 3: 0-<10%¹

Percentage of Segments That Are Hispanic or Latino

1: 50-100%, 2: 10-<50%, 3: 0-<10%¹

Segment-Combined Median Rent and Housing Value (Rent/Housing)²

1: First Quintile, 2: Second Quintile, 3: Third Quintile, 4: Fourth Quintile, 5: Fifth Quintile¹

Population Density

1: MSA 1,000,000 or More, 2: MSA Less than 1,000,000, 3: Non-MSA Urban, 4: Non-MSA Rural¹

Quarter

1: Quarter 1, 2: Quarter 2, 3: Quarter 3, 4: Quarter 4¹

Screening Mode³

1: Web,¹ 2: Field

Interview Mode⁴

1: Web,¹ 2: Field

Race/Ethnicity of Householder

1: Hispanic or Latino White,¹ 2: Hispanic or Latino Black or African American, 3: Hispanic or Latino Other, 4: Non-Hispanic or Latino White, 5: Non-Hispanic or Latino Black or African American, 6: Non-Hispanic or Latino Other

Exhibit H.1 Definitions of Levels for Person Pair-Level Calibration Modeling Variables; 2024 (continued)

<p>State/Region</p> <p>Model Group 1: 1: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Rhode Island, Vermont; 2: Alabama, Arkansas, Delaware, District of Columbia, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia, West Virginia;¹ 3: New York; 4: Pennsylvania; 5: Florida; 6: Texas</p> <p>Model Group 2: 1: Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin;¹ 2: Alaska, Arizona, Colorado, Idaho, Hawaii, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming; 3: Michigan; 4: Illinois; 5: Ohio; 6: California</p> <p>States⁵</p> <p>Model Group 1: 1: Alabama, 2: Arkansas, 3: Connecticut, 4: Delaware, 5: District of Columbia, 6: Florida, 7: Georgia, 8: Kentucky, 9: Louisiana, 10: Maine, 11: Maryland,¹ 12: Massachusetts, 13: Mississippi, 14: New Hampshire, 15: New Jersey, 16: New York, 17: North Carolina, 18: Oklahoma, 19: Pennsylvania, 20: Rhode Island, 21: South Carolina, 22: Tennessee, 23: Texas, 24: Vermont, 25: Virginia, 26: West Virginia</p> <p>Model Group 2: 1: Alaska, 2: Arizona,¹ 3: California, 4: Colorado, 5: Idaho, 6: Illinois, 7: Indiana, 8: Iowa, 9: Hawaii, 10: Kansas, 11: Michigan, 12: Minnesota, 13: Missouri, 14: Montana, 15: Nebraska, 16: Nevada, 17: New Mexico, 18: North Dakota, 19: Ohio, 20: Oregon, 21: South Dakota, 22: Utah, 23: Washington, 24: Wisconsin, 25: Wyoming</p> <p>Pair Relationship Associated with Multiplicity</p> <p>1: Parent-Child (12-14)* 2: Parent-Child (12-17)* 3: Parent-Child (12-20)* 4: Parent*-Child (12-14) 5: Parent*-Child (12-17) 6: Parent*-Child (12-20) 7: Sibling (12-14)-Sibling (15-17)* 8: Sibling (12-17)-Sibling (18-25)* 9: Spouse-Spouse/Partner-Partner 10: Spouse-Spouse/Partner-Partner with Children (Younger than 18)</p>

DU = dwelling unit; MSA = metropolitan statistical area.

¹ The reference level for this variable. This is the level against which effects of other factor levels are measured.

² Segment-combined median rent and housing value (also known as the socioeconomic status indicator) is a composite measure based on rent, housing value, and percentage owner occupied.

³ Screening mode was included in only the res.pr.nr step.

⁴ Interview mode was included in only the res.pr.ps and res.pr.ev steps.

⁵ The states or district assigned to a particular model are based on census regions.

* The pair member focused on.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit H.2 Covariates for Pair Weights; 2024

Variables	Level	Proposed
One-Factor Effects		
Intercept	1	1
State	Model-specific	-
Quarter	4	3
Population Density	3	2
Group Quarter	3	2
Household Size	3	2
Pair Age	15	14
Pair Sex	4	2
Pair Race/Ethnicity	10	9
Race/Ethnicity of Householder	6	5
Rent/Housing	5	4
Segment % Black or African American	3	2
Segment % Hispanic or Latino	3	2
% Owner-Occupied	3	2
Pair Relationship ^{1,2}	10	10
Screening Mode ³	2	1
Interview Mode ⁴	2	1
Two-Factor Effects		
Pair Race/Ethnicity (5 Levels) × Pair Age (6 Levels)	5 × 6	20
Pair Race/Ethnicity (5 Levels) × Pair Sex	5 × 3	8
Pair Sex × Pair Age (6 Levels)	3 × 6	10
State/Region × Pair Race/Ethnicity (5 Levels)	Model-specific	-
State/Region × Pair Age (6 Levels)	Model-specific	-
State/Region × Pair Sex	Model-specific	-
Rent/Housing × % Black or African American	5 × 3	8
Rent/Housing × % Hispanic or Latino	5 × 3	8
Rent/Housing × % Owner-Occupied	5 × 3	8
% Owner-Occupied × % Black or African American	3 × 3	4
% Owner-Occupied × % Hispanic or Latino	3 × 3	4
Three-Factor Effects		
Pair Race/Ethnicity (4 Levels) × Pair Sex × Pair Age (3 Levels)	4 × 3 × 3	12

¹ Pair relationship variables are included in only the respondent pair poststratification and respondent pair extreme value adjustment steps.

² Note that pair relationship variables are single category indicators; as such, they do not require a reference level.

³ Screening mode was included in only the res.pr.nr step.

⁴ Interview mode was included in only the res.pr.ps and res.pr.ev step.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix H.1: Model Group 1: Northeast and South

(Alabama, Arkansas, Connecticut, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maine, Massachusetts, Maryland, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, West Virginia)

Table H.1a Pair Weight Generalized Exponential Modeling Summary (Model Group 1: Northeast and South); 2024

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# Covariates ³	Bounds ⁴	
	% Unweighted	% Weighted	% Winsorized			Nominal	Realized
<i>sel.pr.ps</i>	3.30	15.04	5.90	7.48	213	(0.30, 1.10)	(0.30, 1.10)
	0.64	2.04	0.25	5.86	201	(0.28, 2.20)	(0.29, 2.17)
	-	-	-	-	-	N/A	N/A
<i>res.pr.nr</i>	1.51	5.91	0.83	5.67	214	(1.25, 3.50)	(1.25, 3.50)
	2.45	6.79	1.57	6.79	213	(1.00, 9.69)	(1.00, 9.66)
	-	-	-	-	-	N/A	N/A
<i>res.pr.ps</i>	2.51	7.27	1.67	6.79	224	(0.33, 1.10)	(0.33, 1.10)
	1.49	5.81	0.49	6.88	212	(0.21, 1.74)	(0.21, 1.74)
	-	-	-	-	-	N/A	N/A
<i>res.pr.ev</i>	1.49	5.81	0.49	6.88	224	(0.99, 1.10)	(0.99, 1.10)
	0.04	1.35	0.02	6.82	212	(0.93, 1.20)	(0.93, 1.18)
	-	-	-	-	-	N/A	N/A

N/A = not applicable; UWE = unequal weighting effect.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

² UWE is defined as $1 + [(n-1)/n] * CV^2$, where CV = coefficient of variation of weights.

³ Number of proposed covariates on top line and number finalized after modeling.

⁴ Nominal bounds are used in defining maximum/minimum values for the generalized exponential model adjustment factors. The realized bound is the actual adjustment produced by the modeling. The first set of bounds listed is for high extreme values, the second is for nonextreme values, and the third is for low extreme values.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table H.1b Distribution of Weight Adjustment Factors and Weight Products (Model Group 1: Northeast and South); 2024

Statistics	SDU Weight	Pair Selection Prob		sel.pr.ps ¹		res.pr.nr ¹		res.pr.ps ¹		res.pr.ev ¹	
	1-11	pairwt12	1-12	pairwt13	1-13	pairwt14	1-14	pairwt15	1-15	pairwt16	1-16
Minimum	3	1.02	7	0.11	7	0.73	18	0.19	21	0.61	21
1%	33	1.05	91	0.32	98	1.04	171	0.22	123	0.88	120
5%	77	1.31	250	0.57	259	1.18	470	0.38	390	0.96	383
10%	122	1.51	412	0.70	411	1.31	844	0.57	747	0.97	737
25%	252	2.51	993	0.87	987	1.72	2,138	0.83	2,040	0.98	2,043
Median	579	4.01	2,472	1.06	2,530	2.48	6,169	1.07	6,057	1.00	6,075
75%	1,104	9.03	6,326	1.28	6,501	3.65	17,456	1.25	17,590	1.02	17,671
90%	1,718	18.57	14,609	1.50	15,336	5.28	43,820	1.40	43,749	1.04	44,138
95%	2,208	31.58	24,985	1.64	26,656	6.39	79,505	1.48	83,024	1.05	82,172
99%	3,506	67.95	68,706	1.88	75,532	8.46	252,869	1.61	247,163	1.09	245,552
Maximum	6,921	1,090.40	552,522	2.17	225,813	9.66	942,752	1.74	692,906	1.18	654,196
<i>n</i>	19,970	N/A	19,970	N/A	19,970	N/A	6,969	N/A	6,969	N/A	6,969
Mean	792	8.97	6,736	1.08	6,968	2.93	19,967	1.02	19,976	1.00	19,967
Max/Mean	9	N/A	82	N/A	32	N/A	47	N/A	35	N/A	33

N/A = not applicable; SDU = screener dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Model Group 1 Overview

Selected Pair-Level Poststratification

In the selected pair-level poststratification step, 201 of 213 proposed factors were retained in the final model. All main and two-factor effects were retained at proposed levels. None of the 12 three-factor effects were kept in the model because of convergence problems.

Respondent Pair-Level Nonresponse

In the respondent pair-level nonresponse step, 213 of 214 proposed factors were retained in the final model. Main effects group quarters "College Dorm" and "Other Group Quarter" were combined due to convergence problems. All other main and two-factor effects were retained at proposed levels. All three-factor effects were kept at proposed levels.

Respondent Pair-Level Poststratification

In the respondent pair-level poststratification step, 212 of 224 proposed factors were retained in the final model. All main and two-factor effects were retained at proposed levels. None of the 12 three-factor effects were kept in the model because of convergence problems.

Respondent Pair-Level Extreme Value Adjustment

This step used the same variables as in the respondent pair-level poststratification step.

Exhibit H.1.1 Covariates for Pair Weights (sel.pr.ps) Model Group 1: Northeast and South; 2024

Variables	Level	Proposed	Final	Comments
One-Factor Effects	-	76	76	-
Intercept	1	1	1	All levels present.
State	26	25	25	All levels present.
Quarter	4	3	3	All levels present.
Population Density	4	3	3	All levels present.
Group Quarter	3	2	2	All levels present.
Household Size	3	2	2	All levels present.
Pair Age	15	14	14	All levels present.
Pair Sex	3	2	2	All levels present.
Pair Race/Ethnicity	10	9	9	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Rent/Housing	5	4	4	All levels present.
Segment % Black or African American	3	2	2	All levels present.
Segment % Hispanic or Latino	3	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
Two-Factor Effects	-	125	125	-
Pair Race/Ethnicity (5 Levels) × Pair Age (6 Levels)	5 × 6	20	20	All levels present.
Pair Race/Ethnicity (5 Levels) × Pair Sex	5 × 3	8	8	All levels present.
Pair Sex × Pair Age (6 Levels)	3 × 6	10	10	All levels present.
State/Region × Pair Race/Ethnicity (5 Levels)	6 × 5	20	20	All levels present.
State/Region × Pair Age (6 Levels)	6 × 6	25	25	All levels present.
State/Region × Pair Sex	6 × 3	10	10	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanic or Latino	5 × 3	8	8	All levels present.
Rent/Housing × % Owner-Occupied	5 × 3	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanic or Latino	3 × 3	4	4	All levels present.
Three-Factor Effects	-	12	0	-
Pair Race/Ethnicity (4 Levels) × Pair Sex × Pair Age (3 Levels)	4 × 3 × 3	12	0	Drop all; conv.
Total	-	213	201	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit H.1.2 Covariates for Pair Weights (res.pr.nr) Model Group 1: Northeast and South; 2024

Variables	Level	Proposed	Final	Comments
One-Factor Effects	-	77	76	-
Intercept	1	1	1	All levels present.
State	26	25	25	All levels present.
Quarter	4	3	3	All levels present.
Population Density	4	3	3	All levels present.
Group Quarter	3	2	1	Coll. (1) & (2); conv.
Household Size	3	2	2	All levels present.
Pair Age	15	14	14	All levels present.
Pair Sex	3	2	2	All levels present.
Pair Race/Ethnicity	10	9	9	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Rent/Housing	5	4	4	All levels present.
Segment % Black or African American	3	2	2	All levels present.
Segment % Hispanic or Latino	3	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
Screening Mode	2	1	1	All levels present.
Two-Factor Effects	-	125	125	-
Pair Race/Ethnicity (5 Levels) × Pair Age (6 Levels)	5 × 6	20	20	All levels present.
Pair Race/Ethnicity (5 Levels) × Pair Sex	5 × 3	8	8	All levels present.
Pair Sex × Pair Age (6 Levels)	3 × 6	10	10	All levels present.
State/Region × Pair Race/Ethnicity (5 Levels)	6 × 5	20	20	All levels present.
State/Region × Pair Age (6 Levels)	6 × 6	25	25	All levels present.
State/Region × Pair Sex	6 × 3	10	10	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanic or Latino	5 × 3	8	8	All levels present.
Rent/Housing × % Owner-Occupied	5 × 3	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanic or Latino	3 × 3	4	4	All levels present.
Three-Factor Effects	-	12	12	-
Pair Race/Ethnicity (4 Levels) × Pair Sex × Pair Age (3 Levels)	4 × 3 × 3	12	12	All levels present.
Total	-	214	213	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit H.1.3 Covariates for Pair Weights (res.pr.ps) Model Group 1: Northeast and South; 2024

Variables	Level	Proposed	Final	Comments
One-Factor Effects	-	87	87	-
Intercept	1	1	1	All levels present.
State	26	25	25	All levels present.
Quarter	4	3	3	All levels present.
Population Density	4	3	3	All levels present.
Group Quarter	3	2	2	All levels present.
Household Size	3	2	2	All levels present.
Pair Age	15	14	14	All levels present.
Pair Sex	3	2	2	All levels present.
Pair Race/Ethnicity	10	9	9	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Rent/Housing	5	4	4	All levels present.
Segment % Black or African American	3	2	2	All levels present.
Segment % Hispanic or Latino	3	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
Pair Relationship	10	10	10	All levels present.
Interview Mode	2	1	1	All levels present.
Two-Factor Effects	-	125	125	-
Pair Race/Ethnicity (5 Levels) × Pair Age (6 Levels)	5 × 6	20	20	All levels present.
Pair Race/Ethnicity (5 Levels) × Pair Sex	5 × 3	8	8	All levels present.
Pair Sex × Pair Age (6 Levels)	3 × 6	10	10	All levels present.
State/Region × Pair Race/Ethnicity (5 Levels)	6 × 5	20	20	All levels present.
State/Region × Pair Age (6 Levels)	6 × 6	25	25	All levels present.
State/Region × Pair Sex	6 × 3	10	10	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	8	All levels present.
Rent/Housing × % Hispanic or Latino	5 × 3	8	8	All levels present.
Rent/Housing × % Owner-Occupied	5 × 3	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanic or Latino	3 × 3	4	4	All levels present.
Three-Factor Effects	-	12	0	-
Pair Race/Ethnicity (4 Levels) × Pair Sex × Pair Age (3 Levels)	4 × 3 × 3	12	0	Drop all; conv.
Total	-	224	212	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit H.1.4 Covariates for Pair Weights (res.pr.ev) Model Group 1: Northeast and South; 2024

This step used the same variables as in the respondent pair-level poststratification step in [Exhibit H.1.3](#).

Appendix H.2: Model Group 2: Midwest and West

(Alaska, Arizona, California, Colorado, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oregon, South Dakota, Utah, Washington, Wisconsin, Wyoming)

Table H.2a Pair Weight Generalized Exponential Modeling Summary (Model Group 2: Midwest and West); 2024

Modeling Step ¹	Extreme Weight Proportions			UWE ²	# Covariates ³	Bounds ⁴	
	% Unweighted	% Weighted	% Winsorized			Nominal	Realized
<i>sel.pr.ps</i>	3.93	16.91	6.74	9.00	212	(0.33, 1.10)	(0.33, 1.10)
	0.78	2.63	0.32	5.72	199	(0.20, 2.34)	(0.21, 2.30)
	-	-	-	-	-	N/A	N/A
<i>res.pr.nr</i>	1.42	6.54	0.67	6.17	213	(1.23, 3.50)	(1.23, 3.50)
	3.16	11.07	2.09	7.30	212	(1.00, 9.97)	(1.01, 9.95)
	-	-	-	-	-	N/A	N/A
<i>res.pr.ps</i>	3.10	11.35	2.16	7.30	223	(0.36, 1.10)	(0.36, 1.10)
	1.27	3.86	0.30	6.93	210	(0.21, 2.19)	(0.21, 2.19)
	-	-	-	-	-	N/A	N/A
<i>res.pr.ev</i>	1.27	3.86	0.30	6.93	223	(0.98, 1.10)	(0.98, 1.10)
	0.03	0.04	0.00	6.86	210	(0.93, 1.30)	(0.93, 1.26)
	-	-	-	-	-	N/A	N/A

N/A = not applicable; UWE = unequal weighting effect.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

² UWE is defined as $1 + [(n-1)/n] * CV^2$, where CV = coefficient of variation of weights.

³ Number of proposed covariates on top line and number finalized after modeling.

⁴ Nominal bounds are used in defining maximum/minimum values for the generalized exponential model adjustment factors. The realized bound is the actual adjustment produced by the modeling. The first set of bounds listed is for high extreme values, the second is for nonextreme values, and the third is for low extreme values.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table H.2b Distribution of Weight Adjustment Factors and Weight Products (Model Group 2: Midwest and West); 2024

Statistics	SDU Weight	Pair Selection		sel.pr.ps ¹		res.pr.nr ¹		res.pr.ps ¹		res.pr.ev ¹	
	1-11	pairwt12	1-12	pairwt13	1-13	pairwt14	1-14	pairwt15	1-15	pairwt16	1-16
Minimum	9	1.02	14	0.06	9	0.71	9	0.14	7	0.53	7
1%	40	1.02	100	0.29	86	1.10	156	0.26	94	0.89	93
5%	81	1.28	221	0.56	206	1.30	409	0.40	325	0.96	326
10%	118	1.46	356	0.68	338	1.50	727	0.55	597	0.97	601
25%	219	2.46	817	0.86	822	1.90	1,832	0.81	1,689	0.99	1,704
Median	470	4.09	2,040	1.06	2,105	2.70	5,182	1.03	5,158	1.00	5,164
75%	879	8.67	5,018	1.28	5,326	3.90	15,018	1.23	15,439	1.01	15,427
90%	1,345	17.58	11,820	1.50	12,425	5.60	38,621	1.44	38,017	1.04	37,750
95%	1,683	31.67	20,595	1.64	22,314	6.90	67,488	1.56	67,119	1.06	67,971
99%	2,656	63.97	57,767	1.86	61,631	9.30	197,477	1.98	202,425	1.21	204,609
Maximum	5,805	1,179.55	864,304	2.30	187,316	10.00	821,318	2.19	674,150	1.26	582,155
<i>n</i>	20,187	N/A	20,187	N/A	20,187	N/A	6,684	N/A	6,684	N/A	6,684
Mean	631	8.53	5,542	1.07	5,689	3.17	17,181	1.02	17,181	1.00	17,181
Max/Mean	9	N/A	156	N/A	33	N/A	48	N/A	39	N/A	34

N/A = not applicable; SDU = screener dwelling unit.

¹ For a key to modeling abbreviations, see Chapter 7, [Exhibit 7.1](#).

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Model Group 2 Overview

Selected Pair-Level Poststratification

In the selected pair-level poststratification step, 199 of 212 proposed factors were retained in the final model. All main effects were retained at proposed levels. The fourth quartile of two-factor effects Segment-Combined Median Rent and Housing Value (Rent/Housing) combined the 10-<50 percent and 50-100 percent levels of Percent Black or African American due to singularity. All other two-factor effects were retained at proposed levels. None of the 12 three-factor effects were kept in the model because of convergence problems.

Respondent Pair-Level Nonresponse

In the respondent pair-level nonresponse step, 212 of 213 proposed factors were retained in the final model. The fourth quartile of two-factor effects Segment-Combined Median Rent and Housing Value (Rent/Housing) dropped the 10-<50 percent level of Percent Black or African American. All other two-factor effects were retained at proposed levels. All main and three-factor effects were kept at proposed levels.

Respondent Pair-Level Poststratification

In the respondent pair-level poststratification step, 210 of 223 proposed factors were retained in the final model. All main effects were retained at proposed levels. The fourth quartile of two-factor effects Segment-Combined Median Rent and Housing Value (Rent/Housing) combined the 10-<50 percent and 50-100 percent levels of Percent Black or African American due to singularity. All other two-factor effects were retained at proposed levels. None of the 12 three-factor effects were kept in the model because of convergence problems.

Respondent Pair-Level Extreme Value Adjustment

This step used the same variables as in the respondent pair-level poststratification step.

Exhibit H.2.1 Covariates for Pair Weights (sel.pr.ps) Model Group 2: Midwest and West; 2024

Variables	Level	Proposed	Final	Comments
One-Factor Effects	-	75	75	-
Intercept	1	1	1	All levels present.
State	25	24	24	All levels present.
Quarter	4	3	3	All levels present.
Population Density	4	3	3	All levels present.
Group Quarter	3	2	2	All levels present.
Household Size	3	2	2	All levels present.
Pair Age	15	14	14	All levels present.
Pair Sex	3	2	2	All levels present.
Pair Race/Ethnicity	10	9	9	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Rent/Housing	5	4	4	All levels present.
Segment % Black or African American	3	2	2	All levels present.
Segment % Hispanic or Latino	3	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
Two-Factor Effects	-	125	124	-
Pair Race/Ethnicity (5 Levels) × Pair Age (6 Levels)	5 × 6	20	20	All levels present.
Pair Race/Ethnicity (5 Levels) × Pair Sex	5 × 3	8	8	All levels present.
Pair Sex × Pair Age (6 Levels)	3 × 6	10	10	All levels present.
State/Region × Pair Race/Ethnicity (5 Levels)	6 × 5	20	20	All levels present.
State/Region × Pair Age (6 Levels)	6 × 6	25	25	All levels present.
State/Region × Pair Sex	6 × 3	10	10	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	7	Coll. (4,1) & (4,2); sing.
Rent/Housing × % Hispanic or Latino	5 × 3	8	8	All levels present.
Rent/Housing × % Owner-Occupied	5 × 3	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanic or Latino	3 × 3	4	4	All levels present.
Three-Factor Effects	-	12	0	-
Pair Race/Ethnicity (4 Levels) × Pair Sex × Pair Age (3 Levels)	4 × 3 × 3	12	0	Drop all; conv.
Total	-	212	199	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit H.2.2 Covariates for Pair Weights (res.pr.nr) Model Group 2: Midwest and West; 2024

Variables	Level	Proposed	Final	Comments
One-Factor Effects	-	76	76	-
Intercept	1	1	1	All levels present.
State	25	24	24	All levels present.
Quarter	4	3	3	All levels present.
Population Density	4	3	3	All levels present.
Group Quarter	3	2	2	All levels present.
Household Size	3	2	2	All levels present.
Pair Age	15	14	14	All levels present.
Pair Sex	3	2	2	All levels present.
Pair Race/Ethnicity	10	9	9	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Rent/Housing	5	4	4	All levels present.
Segment % Black or African American	3	2	2	All levels present.
Segment % Hispanic or Latino	3	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
Screening Mode	2	1	1	All levels present.
Two-Factor Effects	-	125	124	-
Pair Race/Ethnicity (5 Levels) × Pair Age (6 Levels)	5 × 6	20	20	All levels present.
Pair Race/Ethnicity (5 Levels) × Pair Sex	5 × 3	8	8	All levels present.
Pair Sex × Pair Age (6 Levels)	3 × 6	10	10	All levels present.
State/Region × Pair Race/Ethnicity (5 Levels)	6 × 5	20	20	All levels present.
State/Region × Pair Age (6 Levels)	6 × 6	25	25	All levels present.
State/Region × Pair Sex	6 × 3	10	10	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	7	Drop (4,1); sing.
Rent/Housing × % Hispanic or Latino	5 × 3	8	8	All levels present.
Rent/Housing × % Owner-Occupied	5 × 3	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanic or Latino	3 × 3	4	4	All levels present.
Three-Factor Effects	-	12	12	-
Pair Race/Ethnicity (4 Levels) × Pair Sex × Pair Age (3 Levels)	4 × 3 × 3	12	12	All levels present.
Total	-	213	212	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit H.2.3 Covariates for Pair Weights (res.pr.ps) Model Group 2: Midwest and West; 2024

Variables	Level	Proposed	Final	Comments
One-Factor Effects	-	86	86	-
Intercept	1	1	1	All levels present.
State	26	24	24	All levels present.
Quarter	4	3	3	All levels present.
Population Density	4	3	3	All levels present.
Group Quarter	3	2	2	All levels present.
Household Size	3	2	2	All levels present.
Pair Age	15	14	14	All levels present.
Pair Sex	3	2	2	All levels present.
Pair Race/Ethnicity	10	9	9	All levels present.
Race/Ethnicity of Householder	6	5	5	All levels present.
Rent/Housing	5	4	4	All levels present.
Segment % Black or African American	3	2	2	All levels present.
Segment % Hispanic or Latino	3	2	2	All levels present.
% Owner-Occupied	3	2	2	All levels present.
Pair Relationship	10	10	10	All levels present.
Interview Mode	2	1	1	All levels present.
Two-Factor Effects	-	125	124	-
Pair Race/Ethnicity (5 Levels) × Pair Age (6 Levels)	5 × 6	20	20	All levels present.
Pair Race/Ethnicity (5 Levels) × Pair Sex	5 × 3	8	8	All levels present.
Pair Sex × Pair Age (6 Levels)	3 × 6	10	10	All levels present.
State/Region × Pair Race/Ethnicity (5 Levels)	6 × 5	20	20	All levels present.
State/Region × Pair Age (6 Levels)	6 × 6	25	25	All levels present.
State/Region × Pair Sex	6 × 3	10	10	All levels present.
Rent/Housing × % Black or African American	5 × 3	8	7	Coll. (4,1) & (4,2); sing.
Rent/Housing × % Hispanic or Latino	5 × 3	8	8	All levels present.
Rent/Housing × % Owner-Occupied	5 × 3	8	8	All levels present.
% Owner-Occupied × % Black or African American	3 × 3	4	4	All levels present.
% Owner-Occupied × % Hispanic or Latino	3 × 3	4	4	All levels present.
Three-Factor Effects	-	12	0	-
Pair Race/Ethnicity (4 Levels) × Pair Sex × Pair Age (3 Levels)	4 × 3 × 3	12	0	Drop all; conv.
Total	-	223	210	-

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Exhibit H.2.4 Covariates for Pair Weights (res.pr.ev) Model Group 2: Midwest and West; 2024

This step used the same variables as in the respondent pair-level poststratification step in [Exhibit H.2.3](#).

Appendix I: Evaluation of Calibration Weights: Pair-Level Response Rates

Table I.1 Person Pair-Level Response Rates; 2024

Domain	Selected Pairs	Respondent Pairs	% Interview Response Rate ¹
Total	40,157	13,653	30.27
<i>Pair Age Group</i>			
12-17, 12-17	4,502	1,936	44.48
12-17, 18-25	4,081	1,397	35.45
12-17, 26-34	1,626	573	36.93
12-17, 35-49	7,599	2,733	35.82
12-17, 50+	1,483	491	31.59
18-25, 18-25	6,209	2,043	31.55
18-25, 26-34	2,073	580	26.28
18-25, 35-49	3,066	974	30.68
18-25, 50+	1,971	600	27.34
26-34, 26-34	2,052	681	31.03
26-34, 35-49	1,111	344	28.17
26-34, 50+	673	176	24.95
35-49, 35-49	1,820	556	28.70
35-49, 50+	675	203	30.68
50+, 50+	1,216	366	26.29
<i>Pair Race/Ethnicity</i>			
Hispanic or Latino	8,418	2,966	30.83
Black or African American	4,076	1,633	33.72
White	19,795	6,363	29.59
Other	3,260	1,106	27.33
White & Black or African American	465	174	29.44
White & Hispanic or Latino	1,781	602	32.33
White & Other	1,466	485	32.04
Black or African American & Hispanic or Latino	285	105	29.73
Black or African American & Other	272	95	27.38
Hispanic or Latino & Other	339	124	27.17
<i>Pair Sex</i>			
Male, Male	8,493	2,680	27.25
Female, Female	8,823	3,264	33.38
Male, Female	22,841	7,709	30.24
<i>Household Size</i>			
Two	9,455	3,190	30.11
Three	12,092	4,024	28.46
Four or More	18,610	6,439	31.17

Table I.1 Person Pair-Level Response Rates; 2024 (continued)

Domain	Selected Pairs	Respondent Pairs	% Interview Response Rate ¹
<i>Census Region</i>			
Northeast	7,159	2,212	26.52
South	12,811	4,757	33.03
Midwest	9,550	3,138	30.33
West	10,637	3,546	28.72
<i>Quarter</i>			
Quarter 1	9,941	3,328	29.72
Quarter 2	11,574	3,904	29.34
Quarter 3	10,227	3,570	31.89
Quarter 4	8,415	2,851	30.13
<i>% Hispanic or Latino in Segment</i>			
50-100%	4,058	1,551	33.52
10-<50%	10,497	3,591	30.26
<10%	25,602	8,511	29.62
<i>% Black or African American in Segment</i>			
50-100%	2,523	1,023	35.49
10-<50%	8,296	2,970	29.58
<10%	29,338	9,660	30.02
<i>% Owner-Occupied DUs in Segment</i>			
50-100%	30,198	10,070	29.98
10-<50%	8,714	3,121	30.82
<10%	1,245	462	39.33
<i>Combined Median Rent/Housing Value</i>			
1st Quintile	6,484	2,396	35.65
2nd Quintile	9,934	3,545	33.22
3rd Quintile	9,094	3,074	29.82
4th Quintile	8,647	2,779	27.34
5th Quintile	5,998	1,859	26.61
<i>Population Density</i>			
Large MSA	17,802	6,085	29.52
Medium to Small MSA	20,274	6,901	30.80
Non-MSA, Urban	1,023	351	38.16
Non-MSA, Rural	1,058	316	31.77
<i>Group Quarters</i>			
Group	98	61	55.54
Non-Group	40,059	13,592	30.25

DU = dwelling unit, MSA = metropolitan statistical area.

¹ The weight used for calculating the response rate includes screener dwelling unit (SDU)- and pair-level design weights, SDU nonresponse and poststratification adjustments, and selected pair poststratification adjustment. This weight is the product of WT1*...*WT11*PRWT12*PRWT13.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix J: Evaluation of Calibration Weights: Pair-Level Proportions of Extreme Values and Outwinsors

Table J.1 Selected Pair-Level Proportions of Extreme Values and Outwinsors; 2024

Domain	SDU-Level Weights ¹ (SDUWT: WT1*...*WT11)			Before sel.pr.ps ¹ (SDUWT*PRWT12)			After sel.pr.ps ¹ (SDUWT*PRWT12*PRWT13)			
	<i>n</i>	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³
Total	40,157	0.88	2.97	0.49	3.38	16.87	7.17	0.80	4.80	0.97
<i>Pair Age Group</i>										
12-17, 12-17	4,502	0.69	2.93	0.41	3.60	17.95	6.31	0.11	0.36	0.02
12-17, 18-25	4,081	0.83	2.77	0.50	6.22	28.62	11.99	0.34	1.33	0.09
12-17, 26-34	1,626	0.68	1.66	0.28	1.29	10.03	2.82	0.49	1.27	0.18
12-17, 35-49	7,599	0.70	2.62	0.47	1.36	8.43	2.56	0.47	1.95	0.23
12-17, 50+	1,483	0.54	2.33	0.41	1.01	7.48	2.14	0.34	0.75	0.06
18-25, 18-25	6,209	1.03	3.36	0.53	6.67	30.88	12.68	0.93	3.04	0.28
18-25, 26-34	2,073	1.69	5.41	0.93	2.65	10.59	2.63	1.40	3.51	0.30
18-25, 35-49	3,066	0.95	2.84	0.46	3.88	20.54	8.10	1.47	2.73	0.28
18-25, 50+	1,971	0.81	2.47	0.35	1.83	13.46	6.60	0.81	1.84	0.20
26-34, 26-34	2,052	1.02	2.44	0.31	0.93	5.03	1.55	0.54	1.39	0.22
26-34, 35-49	1,111	1.26	3.30	0.68	2.25	17.88	11.85	1.53	4.49	1.09
26-34, 50+	673	1.19	4.92	0.67	3.12	19.37	6.15	1.63	10.66	2.54
35-49, 35-49	1,820	0.77	2.61	0.62	2.03	20.30	11.02	1.10	2.76	0.37
35-49, 50+	675	1.33	5.56	0.81	4.44	22.08	7.19	2.96	11.31	2.53
50+, 50+	1,216	0.58	1.46	0.17	3.95	19.54	9.70	2.30	9.55	2.28
<i>Pair Race/Ethnicity</i>										
Hispanic or Latino	8,418	0.74	2.30	0.36	2.64	14.92	6.40	0.59	4.61	1.07
Black or African American	4,076	1.15	3.28	0.54	3.80	16.03	5.80	1.57	8.43	1.37
White	19,795	0.60	2.10	0.30	3.39	16.44	6.84	0.54	3.15	0.63
Other	3,260	2.27	7.91	1.52	5.31	25.47	11.02	1.47	7.50	1.78
White & Black or African American	465	1.51	5.16	0.98	4.52	7.86	2.63	2.15	3.42	0.25
White & Hispanic or Latino	1,781	0.95	2.18	0.29	2.75	19.69	9.35	0.95	10.66	1.97
White & Other	1,466	1.30	4.62	0.85	2.73	17.37	10.70	1.02	4.91	1.06
Black or African American & Hispanic or Latino	285	1.05	5.21	0.86	2.46	11.21	3.45	2.81	6.76	1.27
Black or African American & Other	272	1.10	5.28	1.06	4.04	18.76	6.57	1.10	0.81	0.01
Hispanic or Latino & Other	339	1.18	6.31	1.60	2.95	12.00	4.76	0.29	0.37	0.01
<i>Pair Sex</i>										
Male, Male	8,493	1.04	3.43	0.63	4.13	15.80	5.36	1.02	3.91	0.76
Female, Female	8,823	0.86	3.46	0.55	3.90	16.88	6.61	0.67	3.93	0.73
Male, Female	22,841	0.83	2.61	0.41	2.91	17.18	7.85	0.77	5.31	1.10
<i>Household Size</i>										
Two	9,455	0.66	2.06	0.32	0.44	1.07	0.16	0.18	0.91	0.12
Three	12,092	0.67	1.83	0.28	1.19	15.27	7.52	0.72	2.84	0.27
Four or More	18,610	1.13	4.11	0.70	6.30	24.76	10.18	1.18	7.41	1.66

Table J.1 Selected Pair-Level Proportions of Extreme Values and Outwinsors; 2024 (continued)

Domain	SDU-Level Weights ¹ (SDUWT: WT1*...*WT11)			Before sel.pr.ps ¹ (SDUWT*PRWT12)			After sel.pr.ps ¹ (SDUWT*PRWT12*PRWT13)			
	<i>n</i>	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³
<i>Census Region</i>										
Northeast	7,159	1.01	2.82	0.48	3.77	16.65	6.88	0.66	3.93	0.71
South	12,811	0.92	3.04	0.51	3.15	16.60	6.70	0.77	4.85	1.16
Midwest	9,550	0.67	2.22	0.37	3.27	15.28	6.04	0.92	3.84	0.66
West	10,637	0.94	3.61	0.56	3.52	18.54	8.83	0.84	6.00	1.10
<i>Quarter</i>										
Quarter 1	9,941	0.98	3.43	0.58	3.45	17.86	8.46	0.78	4.84	1.11
Quarter 2	11,574	0.41	1.21	0.13	2.32	13.59	5.51	0.51	2.93	0.56
Quarter 3	10,227	0.66	2.23	0.42	3.32	15.81	6.27	0.69	4.84	0.92
Quarter 4	8,415	1.70	5.02	0.82	4.84	20.18	8.42	1.37	6.56	1.28
<i>% Hispanic or Latino in Segment</i>										
50-100%	4,058	0.30	0.85	0.13	1.92	10.29	4.24	0.49	5.36	1.29
10-<50%	10,497	1.10	3.36	0.49	3.60	20.83	9.86	0.79	5.83	1.20
<10%	25,602	0.89	3.18	0.56	3.53	15.88	6.16	0.86	4.10	0.78
<i>% Black or African American in Segment</i>										
50-100%	2,523	0.87	3.07	0.72	3.13	14.56	5.66	1.23	5.48	0.73
10-<50%	8,296	0.94	3.13	0.47	3.27	18.66	8.17	0.90	4.73	1.01
<10%	29,338	0.87	2.92	0.48	3.44	16.52	6.98	0.74	4.76	0.98
<i>% Owner-Occupied DUs in Segment</i>										
50-100%	30,198	0.75	2.65	0.44	3.06	16.67	7.18	0.81	5.06	1.06
10-<50%	8,714	1.19	3.74	0.62	4.10	18.23	7.38	0.88	4.04	0.65
<10%	1,245	1.85	4.70	0.73	6.27	13.19	5.53	0.00	0.00	0.00
<i>Combined Median Rent/Housing Value</i>										
1st Quintile	6,484	1.20	3.35	0.69	4.10	19.23	8.25	0.76	3.29	0.68
2nd Quintile	9,934	0.67	2.53	0.41	2.97	15.15	5.84	0.71	5.37	0.95
3rd Quintile	9,094	0.66	2.34	0.39	3.18	20.38	9.78	0.73	4.14	0.88
4th Quintile	8,647	0.73	2.62	0.38	2.98	13.84	5.33	0.69	5.24	0.96
5th Quintile	5,998	1.43	4.42	0.66	4.18	15.95	6.59	1.28	5.63	1.34
<i>Population Density</i>										
Large MSA	17,802	0.87	2.96	0.43	3.12	17.05	7.57	0.85	5.37	1.18
Medium to Small MSA	20,274	0.72	2.68	0.49	3.34	16.56	6.91	0.66	4.13	0.77
Non-MSA, Urban	1,023	1.96	5.13	1.00	5.87	20.50	6.16	0.98	0.97	0.07
Non-MSA, Rural	1,058	3.31	6.05	1.16	6.33	14.81	3.25	2.55	5.69	0.27
<i>Group Quarters</i>										
Group	98	0.00	0.00	0.00	4.08	11.77	3.16	1.02	1.37	0.19
Non-Group	40,059	0.88	2.98	0.49	3.38	16.88	7.17	0.80	4.80	0.97

DU = dwelling unit; MSA = metropolitan statistical area; pr = pair; ps = poststratification adjustment; SDU = screener dwelling unit; sel = selected.

¹ This step used demographic variables from screener data for all selected person pairs.

² Weighted extreme value proportion: $100 * \sum_k w_{ek} / \sum_k w_k$, where w_{ek} denotes the weight for extreme values, and w_k denotes the weight for both extreme values and nonextreme values.

³ Outwinsor weight proportion: $100 * \sum_k (w_{ek} - b_k) / \sum_k w_k$, where b_k denotes the winsorized weight.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table J.2 Respondent Pair-Level Proportions of Extreme Values and Outwinsors (res.pr.nr); 2024

Domain	Before res.pr.nr ¹ (SDUWT*PRWT12*PRWT13)				After res.pr.nr ¹ (SDUWT*PRWT12*...*PRWT14)		
	<i>n</i>	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³
Total	13,653	1.64	11.13	2.08	2.89	11.55	2.64
<i>Pair Age Group</i>							
12-17, 12-17	1,936	0.26	0.85	0.06	0.57	4.16	0.99
12-17, 18-25	1,397	1.57	4.05	0.39	3.94	16.17	3.22
12-17, 26-34	573	1.05	2.69	0.30	1.57	6.74	0.79
12-17, 35-49	2,733	1.21	5.47	0.55	1.35	5.78	1.02
12-17, 50+	491	1.63	8.15	0.62	1.22	4.41	0.96
18-25, 18-25	2,043	1.37	3.77	0.52	6.12	23.04	5.67
18-25, 26-34	580	2.76	7.39	0.70	5.17	19.56	5.07
18-25, 35-49	974	2.77	8.65	0.89	4.11	10.55	2.17
18-25, 50+	600	2.67	9.48	1.26	2.17	8.32	1.82
26-34, 26-34	681	1.32	10.27	1.37	2.20	13.25	2.07
26-34, 35-49	344	2.03	5.63	1.29	5.52	16.97	4.94
26-34, 50+	176	2.84	18.26	4.41	2.84	15.58	2.90
35-49, 35-49	556	2.88	20.97	5.68	2.88	18.89	3.88
35-49, 50+	203	6.40	30.13	8.36	2.46	10.97	1.94
50+, 50+	366	3.55	12.87	1.60	2.46	9.85	3.23
<i>Pair Race/Ethnicity</i>							
Hispanic or Latino	2,966	1.08	8.64	1.66	2.12	12.89	3.71
Black or African American	1,633	2.82	13.37	2.48	1.96	9.99	1.84
White	6,363	1.37	10.58	1.98	3.14	9.44	1.72
Other	1,106	2.80	12.62	2.04	4.70	23.85	6.47
White & Black or African American	174	0.57	0.17	0.04	5.75	14.32	2.94
White & Hispanic or Latino	602	1.99	22.44	4.50	2.33	11.17	2.64
White & Other	485	2.27	12.40	2.76	2.89	7.44	1.56
Black or African American & Hispanic or Latino	105	0.95	2.52	0.48	3.81	12.35	3.18
Black or African American & Other	95	2.11	23.19	2.65	5.26	9.75	2.89
Hispanic or Latino & Other	124	0.81	1.23	0.01	0.81	2.71	0.77
<i>Pair Sex</i>							
Male, Male	2,680	1.57	7.90	1.39	5.71	19.67	5.15
Female, Female	3,264	1.59	8.85	1.21	2.21	10.10	1.92
Male, Female	7,709	1.69	12.71	2.54	2.21	9.61	2.11
<i>Household Size</i>							
Two	3,190	0.44	2.04	0.19	0.60	3.19	0.83
Three	4,024	1.14	7.02	0.89	2.46	7.85	1.56
Four or More	6,439	2.55	16.72	3.38	4.30	16.94	3.93

Table J.2 Respondent Pair-Level Proportions of Extreme Values and Outwinsors (res.pr.nr); 2024 (continued)

Domain	Before res.pr.nr ¹ (SDUWT*PRWT12*PRWT13)			After res.pr.nr ¹ (SDUWT*PRWT12*...*PRWT14)			
	<i>n</i>	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³
Census Region							
Northeast	2,212	0.99	9.24	1.74	2.62	7.17	1.27
South	4,757	2.02	11.69	2.44	2.50	10.20	2.59
Midwest	3,138	1.31	6.49	1.31	3.47	11.03	2.14
West	3,546	1.83	14.97	2.28	3.07	16.79	3.98
Quarter							
Quarter 1	3,328	1.53	11.12	2.19	2.88	9.68	1.95
Quarter 2	3,904	1.08	6.73	0.95	2.54	9.69	2.35
Quarter 3	3,570	1.26	12.67	2.83	1.96	8.65	2.65
Quarter 4	2,851	3.02	13.75	2.27	4.56	18.05	3.58
% Hispanic or Latino in Segment							
50-100%	1,551	0.71	10.69	2.55	1.74	11.29	2.07
10-<50%	3,591	1.67	10.86	1.77	2.84	16.06	4.29
<10%	8,511	1.80	11.38	2.15	3.13	9.05	1.82
% Black or African American in Segment							
50-100%	1,023	2.35	14.35	2.35	1.86	8.23	1.33
10-<50%	2,970	1.38	7.83	1.62	2.96	14.65	3.73
<10%	9,660	1.65	11.77	2.19	2.98	10.91	2.42
% Owner-Occupied DUs in Segment							
50-100%	10,070	1.69	11.70	2.22	2.97	11.29	2.65
10-<50%	3,121	1.60	9.68	1.68	2.92	13.22	2.76
<10%	462	0.87	1.40	0.28	1.08	2.10	0.35
Combined Median Rent/Housing Value							
1st Quintile	2,396	1.46	12.40	2.55	1.75	6.69	1.00
2nd Quintile	3,545	1.66	14.71	3.04	1.86	9.38	2.31
3rd Quintile	3,074	1.37	8.94	1.83	3.22	12.17	2.55
4th Quintile	2,779	1.30	10.49	1.78	3.45	14.77	3.51
5th Quintile	1,859	2.80	8.35	0.91	4.95	13.35	3.39
Population Density							
Large MSA	6,085	1.76	10.68	2.08	2.66	12.55	3.12
Medium to Small MSA	6,901	1.46	11.01	1.80	2.94	9.45	2.02
Non-MSA, Urban	351	1.71	12.97	5.14	2.28	7.31	1.65
Non-MSA, Rural	316	3.16	19.64	3.12	6.96	24.68	2.36
Group Quarters							
Group	61	1.64	2.46	0.77	0.00	0.00	0.00
Non-Group	13,592	1.64	11.14	2.08	2.91	11.56	2.64

DU = dwelling unit; MSA = metropolitan statistical area; nr = nonresponse adjustment; pr = pair; res = respondent; SDU = screener dwelling unit.

¹ This step used demographic variables from screener data for all responding person pairs.

² Weighted extreme value proportion: $100 * \sum_k w_{ek} / \sum_k w_k$, where w_{ek} denotes the weight for extreme values, and w_k denotes the weight for both extreme values and nonextreme values.

³ Outwinsor weight proportion: $100 * \sum_k (w_{ek} - b_k) / \sum_k w_k$, where b_k denotes the winsorized weight.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table J.3 Respondent Pair-Level Proportions of Extreme Values and Outwinsors (res.pr.ps and res.pr.ev); 2024

Domain	Before res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT14)			After res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT15)			Final Weight: After res.pr.ev ¹ (SDUWT*PRWT12*...*PRWT16)			
	<i>n</i>	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³
	Total	13,653	2.80	9.12	1.89	1.38	4.93	0.40	0.04	0.76
<i>Pair Age Group</i>										
12-17, 12-17	1,926	0.62	4.74	1.16	0.47	2.35	0.18	0.00	0.00	0.00
12-17, 18-25	1,406	3.84	15.64	3.01	1.42	4.57	0.32	0.00	0.00	0.00
12-17, 26-34	577	1.56	6.60	0.82	0.00	0.00	0.00	0.00	0.00	0.00
12-17, 35-49	2,716	1.36	5.83	1.05	0.81	3.37	0.18	0.04	0.08	0.00
12-17, 50+	497	1.21	4.27	0.91	1.21	4.21	0.45	0.00	0.00	0.00
18-25, 18-25	2,025	5.88	22.20	5.61	2.32	6.42	0.46	0.00	0.00	0.00
18-25, 26-34	590	5.08	19.00	5.01	3.22	7.36	0.84	0.00	0.00	0.00
18-25, 35-49	960	4.38	11.84	2.37	1.67	3.49	0.36	0.00	0.00	0.00
18-25, 50+	607	1.98	7.59	1.59	1.98	4.52	0.54	0.16	0.11	0.00
26-34, 26-34	682	2.05	8.32	1.89	1.03	4.77	0.67	0.00	0.00	0.00
26-34, 35-49	354	6.21	25.66	5.79	2.26	10.53	1.88	0.00	0.00	0.00
26-34, 50+	185	1.08	5.83	1.15	1.08	1.78	0.07	0.00	0.00	0.00
35-49, 35-49	553	2.35	6.65	1.30	2.35	11.22	0.43	0.36	6.07	0.08
35-49, 50+	208	0.96	3.51	0.44	2.88	8.34	0.78	0.00	0.00	0.00
50+, 50+	367	2.18	8.44	1.54	0.54	2.80	0.04	0.27	1.34	0.02
<i>Pair Race/Ethnicity</i>										
Hispanic or Latino	2,940	2.14	10.63	2.40	0.78	6.08	0.26	0.03	1.16	0.02
Black or African American	1,435	2.02	9.33	1.65	1.95	7.29	1.15	0.07	0.09	0.00
White	5,841	2.81	6.35	1.04	1.47	3.74	0.23	0.05	1.05	0.01
Other	985	4.16	20.10	5.01	3.65	9.07	1.14	0.00	0.00	0.00
White & Black or African American	186	6.45	15.02	3.06	3.76	6.19	0.19	0.00	0.00	0.00
White & Hispanic or Latino	728	2.61	7.77	1.87	0.96	3.27	0.21	0.00	0.00	0.00
White & Other	855	3.63	10.20	2.54	0.12	0.58	0.01	0.00	0.00	0.00
Black or African American & Hispanic or Latino	172	3.49	9.59	2.39	0.58	2.81	0.07	0.00	0.00	0.00
Black or African American & Other	289	4.15	10.65	2.95	0.00	0.00	0.00	0.00	0.00	0.00
Hispanic or Latino & Other	222	2.25	2.73	0.46	0.00	0.00	0.00	0.00	0.00	0.00
<i>Pair Sex</i>										
Male, Male	2,672	5.46	18.12	4.30	2.58	7.43	0.51	0.07	1.39	0.02
Female, Female	3,275	2.26	8.59	1.89	1.07	3.70	0.27	0.03	0.05	0.00
Male, Female	7,706	2.10	6.58	1.18	1.10	4.56	0.41	0.03	0.78	0.01
<i>Household Size</i>										
Two	3,190	0.66	3.39	0.85	0.69	2.27	0.26	0.00	0.00	0.00
Three	4,024	2.58	9.20	1.63	1.14	4.28	0.38	0.02	0.04	0.00
Four or More	6,439	3.99	11.60	2.47	1.88	6.40	0.47	0.06	1.42	0.02

Table J.3 Respondent Pair-Level Proportions of Extreme Values and Outwinsors (res.pr.ps and res.pr.ev); 2024 (continued)

Domain	Before res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT14)			After res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT15)			Final Weight: After res.pr.ev ¹ (SDUWT*PRWT12*...*PRWT16)			
	<i>n</i>	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³
<i>Census Region</i>										
Northeast	2,212	2.58	5.23	1.18	0.99	3.47	0.46	0.00	0.00	0.00
South	4,757	2.48	8.20	1.90	1.72	6.90	0.50	0.06	1.97	0.03
Midwest	3,138	3.35	9.63	2.07	1.43	3.64	0.39	0.06	0.10	0.00
West	3,546	2.88	12.62	2.23	1.13	4.02	0.23	0.00	0.00	0.00
<i>Quarter</i>										
Quarter 1	3,328	2.76	7.20	1.37	1.29	4.75	0.38	0.03	1.01	0.02
Quarter 2	3,904	2.48	8.72	1.81	1.02	3.96	0.32	0.03	0.04	0.00
Quarter 3	3,570	1.85	6.63	1.55	1.40	4.57	0.37	0.06	1.02	0.02
Quarter 4	2,851	4.45	13.80	2.83	1.96	6.41	0.53	0.04	0.97	0.01
<i>% Hispanic or Latino in Segment</i>										
50-100%	1,551	1.55	4.37	0.98	0.39	2.87	0.21	0.00	0.00	0.00
10-<50%	3,591	2.76	14.09	2.82	1.59	7.24	0.46	0.06	1.54	0.02
<10%	8,511	3.04	7.25	1.55	1.48	4.03	0.40	0.04	0.47	0.01
<i>% Black or African American in Segment</i>										
50-100%	1,023	1.86	5.90	1.17	0.68	1.65	0.23	0.00	0.00	0.00
10-<50%	2,970	2.96	12.92	2.72	1.65	8.08	0.65	0.07	1.18	0.02
<10%	9,660	2.85	8.25	1.71	1.38	4.26	0.34	0.03	0.70	0.01
<i>% Owner-Occupied DUs in Segment</i>										
50-100%	10,070	2.87	9.11	1.90	1.42	4.90	0.40	0.04	0.65	0.01
10-<50%	3,121	2.82	9.60	1.98	1.41	5.32	0.40	0.03	1.26	0.02
<10%	462	1.08	2.10	0.32	0.43	0.87	0.09	0.00	0.00	0.00
<i>Combined Median Rent/Housing Value</i>										
1st Quintile	2,396	1.79	6.32	1.13	1.38	3.31	0.25	0.08	0.13	0.00
2nd Quintile	3,545	1.78	5.94	1.38	1.13	3.05	0.28	0.00	0.00	0.00
3rd Quintile	3,074	3.09	8.41	1.23	1.17	6.96	0.52	0.03	1.11	0.02
4th Quintile	2,779	3.27	12.12	2.57	1.44	4.91	0.41	0.04	1.10	0.02
5th Quintile	1,859	4.84	12.23	3.08	2.15	5.99	0.50	0.05	1.31	0.01
<i>Population Density</i>										
Large MSA	6,085	2.51	10.01	2.10	1.40	6.12	0.49	0.05	1.32	0.02
Medium to Small MSA	6,901	2.88	7.34	1.59	1.25	3.04	0.29	0.01	0.02	0.00
Non-MSA, Urban	351	2.28	7.31	1.71	1.71	1.05	0.06	0.00	0.00	0.00
Non-MSA, Rural	316	6.96	17.70	2.17	3.80	10.65	0.40	0.32	0.36	0.00
<i>Group Quarters</i>										
Group	61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-Group	13,592	2.81	9.12	1.90	1.39	4.93	0.40	0.04	0.76	0.01

Table J.3 Respondent Pair-Level Proportions of Extreme Values and Outwinsors (res.pr.ps and res.pr.ev); 2024 (continued)

Domain	Before res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT14)			After res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT15)			Final Weight: After res.pr.ev ¹ (SDUWT*PRWT12*...*PRWT16)			
	<i>n</i>	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³	% Unweighted	% Weighted ²	% Outwinsor ³
<i>Pair Relationship Domain⁴</i>										
Parent-Child (12-14)	1,907	1.52	7.32	1.27	0.89	3.38	0.25	0.00	0.00	0.00
Parent-Child (12-17)	3,441	1.34	5.64	1.09	0.81	3.44	0.23	0.03	0.05	0.00
Parent-Child (12-20)	4,150	1.90	6.94	1.34	0.84	3.31	0.25	0.02	0.04	0.00
Sibling (12-14)-Sibling (15-17)	1,094	0.73	5.89	1.34	0.37	1.17	0.05	0.00	0.00	0.00
Sibling (12-17)-Sibling (18-25)	1,294	3.94	15.91	3.07	1.47	4.80	0.33	0.00	0.00	0.00
Spouse-Spouse/Partner-Partner	2,638	1.44	5.31	0.91	0.83	4.11	0.22	0.08	1.67	0.02
Spouse-Spouse/Partner-Partner with Children (Younger Than 18)	1,151	1.56	6.57	1.25	1.82	8.76	0.56	0.17	4.48	0.06

DU = dwelling unit; ev = extreme value adjustment; MSA = metropolitan statistical area; pr = pair; ps = poststratification adjustment; res = respondent; SDU = screener dwelling unit.

¹ This step used demographic variables from questionnaire data for all responding person pairs.

² Weighted extreme value proportion: $100 * \frac{\sum_k w_{ek}}{\sum_k w_k}$, where w_{ek} denotes the weight for extreme values, and w_k denotes the weight for both extreme values and nonextreme values.

³ Outwinsor weight proportion: $100 * \frac{\sum_k (w_{ek} - b_k)}{\sum_k w_k}$, where b_k denotes the winsorized weight.

⁴ Parent-child (15-17) was not included here because extreme values were not controlled within this domain.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix K: Evaluation of Calibration Weights: Pair-Level Slippage Rates

Table K.1 Respondent Pair-Level Slippage Rates; 2024

Domain	<i>n</i>	Initial Total (<i>I</i>) ¹	Final Total (<i>F</i>) ²	Control Total from SDU (<i>C</i>)	(<i>I</i> - <i>C</i>)/ <i>C</i> %	(<i>F</i> - <i>C</i>)/ <i>C</i> %
Total	13,653	253,987,049	253,987,049	253,987,049	0.00	-0.00
<i>Pair Age Group</i>						
12-17, 12-17	1,926	7,796,501	7,797,033	7,797,033	-0.01	0.00
12-17, 18-25	1,406	9,076,019	9,058,535	9,058,535	0.19	0.00
12-17, 26-34	577	5,084,456	4,978,465	4,978,465	2.13	0.00
12-17, 35-49	2,716	30,435,904	30,721,326	30,721,326	-0.93	0.00
12-17, 50+	497	14,772,843	14,298,641	14,298,641	3.32	-0.00
18-25, 18-25	2,025	12,937,747	12,975,349	12,975,349	-0.29	0.00
18-25, 26-34	590	7,978,977	7,862,343	7,862,343	1.48	0.00
18-25, 35-49	960	17,038,432	17,617,939	17,617,939	-3.29	0.00
18-25, 50+	607	22,589,091	22,548,773	22,548,773	0.18	0.00
26-34, 26-34	682	11,971,998	12,221,084	12,221,084	-2.04	-0.00
26-34, 35-49	354	9,693,039	9,652,436	9,652,436	0.42	-0.00
26-34, 50+	185	16,250,444	16,143,937	16,143,937	0.66	0.00
35-49, 35-49	553	20,730,112	20,632,796	20,632,796	0.47	0.00
35-49, 50+	208	20,640,656	20,696,728	20,696,728	-0.27	0.00
50+, 50+	367	46,990,831	46,781,664	46,781,664	0.45	-0.00
<i>Pair Race/Ethnicity</i>						
Hispanic or Latino	2,940	53,588,126	54,295,098	54,295,098	-1.30	0.00
Black or African American	1,435	24,396,335	26,721,564	26,721,564	-8.70	-0.00
White	5,841	115,298,765	121,894,106	121,894,106	-5.41	0.00
Other	985	21,071,570	22,369,968	22,369,968	-5.80	0.00
White & Black or African American	186	3,552,779	3,290,466	3,290,466	7.97	0.00
White & Hispanic or Latino	728	14,147,752	11,733,359	11,733,359	20.58	0.00
White & Other	855	12,648,896	8,424,315	8,424,315	50.15	-0.00
Black or African American & Hispanic or Latino	172	2,923,712	1,742,691	1,742,691	67.77	0.00
Black or African American & Other	289	3,144,352	1,672,642	1,672,642	87.99	0.00
Hispanic or Latino & Other	222	3,214,763	1,842,841	1,842,841	74.45	0.00
<i>Pair Sex</i>						
Male, Male	2,672	47,702,003	46,820,638	46,820,638	1.88	-0.00
Female, Female	3,275	46,733,075	46,837,246	46,837,246	-0.22	0.00
Male, Female	7,706	159,551,971	160,329,165	160,329,165	-0.48	0.00
<i>Pair Relationship Domain^{3,4,5}</i>						
Parent-Child (12-14)*	1,907	12,625,771	12,960,689	12,960,689	-2.58	0.00
Parent-Child (12-17)*	3,441	25,008,070	25,814,125	25,814,125	-3.12	0.00
Parent-Child (15-17)*	1,534	12,382,299	12,853,435	12,853,435	-3.67	0.00
Parent-Child (12-20)*	4,150	35,663,752	35,260,995	35,260,995	1.14	0.00
Parent*-Child (12-14)	1,907	19,590,812	19,911,268	19,911,268	-1.61	0.00
Parent*-Child (12-17)	3,441	32,052,259	33,035,137	33,035,137	-2.98	0.00
Parent*-Child (15-17)	1,534	19,072,130	19,752,385	19,657,267	-2.98	0.48
Parent*-Child (12-20)	4,150	42,480,846	40,993,389	40,993,389	3.63	0.00
Sibling (12-14)-Sibling (15-17)*	1,094	4,155,181	4,188,913	4,188,913	-0.81	0.00
Sibling (12-17)-Sibling (18-25)*	1,294	6,648,272	6,684,596	6,684,596	-0.54	0.00
Spouse-Spouse/Partner-Partner	2,638	76,454,296	75,052,202	75,052,202	1.87	0.00
Spouse-Spouse/Partner-Partner with Children (Younger Than 18)	1,151	24,382,597	27,976,576	27,976,576	-12.85	0.00

Table K.1 Respondent Pair-Level Slippage Rates; 2024 (continued)

Domain	<i>n</i>	Initial Total (<i>I</i>) ¹	Final Total (<i>F</i>) ²	Control Total from SDU (<i>C</i>)	(<i>I</i> - <i>C</i>)/ <i>C</i> %	(<i>F</i> - <i>C</i>)/ <i>C</i> %
Household Size						
Two	3,190	58,948,340	58,948,340	58,948,340	0.00	0.00
Three	4,024	61,348,075	61,348,075	61,348,075	0.00	0.00
Four or More	6,439	133,690,635	133,690,635	133,690,635	0.00	-0.00
Census Region						
Northeast	2,212	43,843,408	43,843,408	43,843,408	0.00	0.00
South	4,757	95,305,801	95,305,801	95,305,801	0.00	-0.00
Midwest	3,138	48,714,524	48,714,524	48,714,524	0.00	0.00
West	3,546	66,123,316	66,123,316	66,123,316	0.00	-0.00
Quarter						
Quarter 1	3,328	62,255,780	62,255,780	62,255,780	0.00	0.00
Quarter 2	3,904	63,698,470	63,698,470	63,698,470	0.00	-0.00
Quarter 3	3,570	63,516,051	63,516,051	63,516,051	0.00	0.00
Quarter 4	2,851	64,516,748	64,516,748	64,516,748	0.00	0.00
% Hispanic or Latino in Segment						
50-100%	1,551	28,900,117	28,900,117	28,900,117	0.00	0.00
10-<50%	3,591	81,353,465	81,353,465	81,353,465	0.00	-0.00
<10%	8,511	143,733,467	143,733,467	143,733,467	0.00	0.00
% Black or African American in Segment						
50-100%	1,023	15,871,795	15,871,795	15,871,795	0.00	0.00
10-<50%	2,970	55,120,648	55,120,648	55,120,648	0.00	-0.00
<10%	9,660	182,994,607	182,994,607	182,994,607	0.00	-0.00
% Owner-Occupied DUs in Segment						
50-100%	10,070	200,882,236	200,882,236	200,882,236	0.00	-0.00
10-<50%	3,121	49,877,154	49,877,154	49,877,154	0.00	0.00
<10%	462	3,227,659	3,227,659	3,227,659	0.00	0.00
Combined Median Rent/Housing Value						
1st Quintile	2,396	38,448,043	38,448,042	38,448,043	0.00	-0.00
2nd Quintile	3,545	54,189,350	54,189,349	54,189,349	0.00	0.00
3rd Quintile	3,074	56,746,431	56,746,431	56,746,431	0.00	0.00
4th Quintile	2,779	56,914,421	56,914,421	56,914,421	-0.00	0.00
5th Quintile	1,859	47,688,805	47,688,805	47,688,805	0.00	0.00
Population Density						
Large MSA	6,085	142,133,885	142,133,885	142,133,885	0.00	0.00
Medium to Small MSA	6,901	99,434,122	99,434,122	99,434,122	0.00	-0.00
Non-MSA, Urban	351	5,493,532	5,493,532	5,493,532	0.00	-0.00
Non-MSA, Rural	316	6,925,510	6,925,510	6,925,510	-0.00	0.00
Group Quarters						
Group	61	149,835	149,835	149,835	0.00	0.00
Non-Group	13,592	253,837,214	253,837,214	253,837,214	0.00	-0.00

DU = dwelling unit, MSA = metropolitan statistical area, SDU = screener dwelling unit.

¹ WT1*...*WT11*PRWT12*...*PRWT14 (before respondent person pair poststratification and respondent person pair extreme value adjustment).

² WT1*...*WT11*PRWT12*...*PRWT16 (after respondent person pair poststratification and respondent person pair extreme value adjustment).

³ The member of the pair that is the focus is designated with an asterisk (*).

⁴ The parent-child (15-17) pair domains were not controlled for within the modeling and thus have higher slippage rates than the other domains listed. However, because these domains are a subset of other controlled domains, the rates are not large.

⁵ Slippage rates were not calculated for the sibling-sibling domains with the younger child as the focus because no household counts for this domain were calculated. Household counts are required to construct the appropriate control totals.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Appendix L: Evaluation of Calibration Weights: Pair-Level Weight Summary Statistics

Table L.1 Selected Pair-Level Weight Summary Statistics; 2024

Domain	SDU-Level Weights ¹ (SDUWT: WT1*...*WT11)							Before sel.pr.ps ¹ (SDUWT*PRWT12)					After sel.pr.ps ¹ (SDUWT*PRWT12*PRWT13)						
	n	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Total	40,157	3	234	521	988	6,921	1.86	7	899	2,241	5,677	864,304	8.18	7	894	2,310	5,911	225,813	5.86
<i>Pair Age Group</i>																			
12-17, 12-17	4,502	3	208	478	925	6,600	1.93	7	409	1,008	2,061	41,287	2.99	7	421	1,053	2,264	17,525	2.37
12-17, 18-25	4,081	7	242	553	1,008	6,921	1.80	17	547	1,244	2,579	73,265	3.40	13	591	1,396	2,930	23,381	2.19
12-17, 26-34	1,626	7	248	523	976	4,075	1.75	47	842	1,879	3,605	76,338	3.44	44	728	1,709	3,439	52,116	2.95
12-17, 35-49	7,599	6	223	486	930	6,905	1.92	37	960	2,244	4,612	107,456	3.13	27	917	2,230	4,853	66,139	2.86
12-17, 50+	1,483	12	230	537	1,016	5,974	1.85	124	2,489	5,812	11,191	107,537	2.71	162	2,518	5,888	12,177	103,973	2.49
18-25, 18-25	6,209	5	235	527	1,038	5,647	1.91	14	474	1,115	2,395	77,247	3.70	13	505	1,189	2,673	23,252	2.39
18-25, 26-34	2,073	10	255	575	1,104	6,692	1.86	78	996	2,321	4,455	78,676	3.04	47	874	2,177	4,677	51,475	2.89
18-25, 35-49	3,066	6	254	546	1,023	5,694	1.79	32	1,323	3,083	6,513	233,220	3.84	39	1,339	3,197	7,017	52,297	2.55
18-25, 50+	1,971	8	258	549	1,045	5,058	1.82	122	2,919	6,459	12,980	552,522	4.09	118	3,073	6,745	13,823	124,000	2.49
26-34, 26-34	2,052	12	232	530	957	5,562	1.83	105	1,688	3,935	7,341	153,057	3.22	74	1,548	3,560	7,120	152,933	3.31
26-34, 35-49	1,111	28	243	519	1,004	5,264	1.84	209	2,162	4,940	9,939	654,460	11.22	157	2,123	5,056	10,662	124,842	2.92
26-34, 50+	673	10	284	623	1,059	4,011	1.67	365	6,902	15,308	27,159	435,236	2.99	285	7,112	15,923	28,381	210,356	2.50
35-49, 35-49	1,820	7	220	480	910	5,765	1.90	194	2,167	5,081	10,375	476,518	7.51	156	2,143	5,133	11,688	207,203	4.45
35-49, 50+	675	21	228	543	982	4,556	1.83	717	6,409	14,720	28,829	260,461	2.76	881	8,148	18,722	39,395	225,813	2.35
50+, 50+	1,216	8	226	508	964	4,002	1.76	476	10,574	24,714	46,610	864,304	2.89	529	11,963	25,668	51,704	212,780	1.98
<i>Pair Race/Ethnicity</i>																			
Hispanic or Latino	8,418	6	284	608	1,102	6,108	1.70	9	1,037	2,518	6,011	654,460	7.56	9	1,030	2,603	6,314	213,835	5.27
Black or African American	4,076	7	270	572	1,084	4,175	1.75	17	947	2,266	5,431	266,485	5.61	13	973	2,424	6,134	204,349	5.66
White	19,795	3	225	490	913	6,734	1.88	7	878	2,162	5,586	609,017	8.11	7	871	2,175	5,657	225,813	5.96
Other	3,260	5	189	472	1,056	6,921	2.17	14	715	2,024	5,554	864,304	11.43	9	757	2,228	6,018	221,202	6.58
White & Black or African American	465	9	244	542	1,104	4,005	1.89	43	974	2,651	5,922	226,822	6.12	30	989	2,625	6,274	225,664	6.28
White & Hispanic or Latino	1,781	10	224	517	1,011	5,317	1.88	33	866	2,327	6,020	388,705	9.00	29	845	2,286	5,933	201,382	6.62
White & Other	1,466	9	192	421	842	4,745	1.97	30	755	2,076	5,387	552,522	11.95	18	797	2,074	5,373	184,182	6.03
Black or African American & Hispanic or Latino	285	21	247	551	1,026	5,673	2.01	79	1,026	2,264	5,772	75,654	3.51	93	1,059	2,345	6,746	72,541	3.34
Black or African American & Other	272	36	225	474	897	5,410	2.00	64	973	2,251	6,256	110,569	5.12	73	960	2,258	5,677	124,830	5.10
Hispanic or Latino & Other	339	14	163	400	863	5,159	2.17	64	721	2,028	5,365	156,814	6.62	39	676	1,962	5,840	121,756	5.45

Table L.1 Selected Pair-Level Weight Summary Statistics; 2024 (continued)

Domain	SDU-Level Weights ¹ (SDUWT: WT1*...*WT11)							Before sel.pr.ps ¹ (SDUWT*PRWT12)					After sel.pr.ps ¹ (SDUWT*PRWT12*PRWT13)						
	<i>n</i>	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
<i>Pair Sex</i>																			
Male, Male	8,493	6	245	529	994	6,692	1.88	8	864	2,087	5,134	317,528	5.87	9	906	2,255	5,446	204,349	5.37
Female, Female	8,823	3	227	513	992	6,921	1.89	7	842	2,079	4,994	552,522	6.49	9	843	2,142	5,188	213,835	5.47
Male, Female	22,841	5	233	521	984	6,600	1.85	7	938	2,377	6,144	864,304	8.87	7	909	2,406	6,384	225,813	5.93
<i>Household Size</i>																			
Two	9,455	7	226	496	944	5,673	1.85	28	930	2,374	6,368	123,859	4.17	18	748	2,015	5,942	168,785	4.97
Three	12,092	6	226	501	963	5,631	1.86	9	743	1,861	4,284	609,017	11.63	9	767	1,925	4,588	225,664	6.68
Four or More	18,610	3	243	544	1,025	6,921	1.87	7	1,007	2,477	6,402	864,304	8.40	7	1,106	2,740	6,765	225,813	5.74
<i>Census Region</i>																			
Northeast	7,159	10	221	544	965	6,226	1.73	14	877	2,140	5,512	544,900	8.46	13	823	2,225	5,602	221,202	6.43
South	12,811	3	267	600	1,205	6,921	1.90	7	1,067	2,671	6,829	552,522	7.03	7	1,072	2,711	6,973	225,813	5.58
Midwest	9,550	15	248	489	846	5,647	1.58	30	868	1,980	4,588	500,894	6.71	27	890	2,068	4,947	167,896	5.08
West	10,637	9	189	449	928	5,805	1.93	14	759	2,103	5,432	864,304	10.13	9	753	2,157	5,662	187,316	6.01
<i>Quarter</i>																			
Quarter 1	9,941	5	250	534	1,001	6,905	1.82	14	934	2,301	5,720	654,460	8.31	13	936	2,384	5,856	210,356	5.54
Quarter 2	11,574	5	200	449	865	5,673	1.86	7	769	1,933	4,907	864,304	8.51	7	793	2,015	5,181	213,835	5.98
Quarter 3	10,227	3	227	501	967	5,765	1.87	11	883	2,202	5,617	471,675	7.78	13	852	2,194	5,633	225,813	6.41
Quarter 4	8,415	6	281	647	1,159	6,921	1.81	7	1,072	2,707	6,903	609,017	7.78	9	1,111	2,848	7,151	207,447	5.32
<i>% Hispanic or Latino in Segment</i>																			
50-100%	4,058	14	346	674	1,102	3,911	1.51	28	1,256	2,920	6,834	251,716	5.29	24	1,146	2,777	6,760	213,835	5.34
10-<50%	10,497	7	286	638	1,243	6,905	1.83	14	1,073	2,859	7,091	864,304	9.23	9	1,067	2,868	7,374	225,664	5.47
<10%	25,602	3	209	453	872	6,921	1.89	7	799	1,950	4,932	552,522	7.48	7	821	2,042	5,225	225,813	6.03
<i>% Black or African American in Segment</i>																			
50-100%	2,523	6	253	533	994	5,765	1.71	20	969	2,242	5,374	161,145	5.12	13	967	2,410	5,811	186,359	5.48
10-<50%	8,296	6	272	602	1,102	6,905	1.78	7	1,001	2,421	6,013	864,304	9.39	9	972	2,460	6,264	211,511	5.58
<10%	29,338	3	224	493	956	6,921	1.90	7	864	2,189	5,605	654,460	8.00	7	870	2,256	5,809	225,813	5.98
<i>% Owner-Occupied DUs in Segment</i>																			
50-100%	30,198	3	232	510	956	6,921	1.88	7	916	2,267	5,767	864,304	8.42	7	957	2,419	6,164	225,813	5.77
10-<50%	8,714	6	224	534	1,053	5,673	1.82	17	797	2,110	5,296	544,900	7.65	9	783	2,161	5,492	211,511	5.87
<10%	1,245	20	374	708	1,315	4,968	1.68	24	1,131	2,632	6,105	129,985	4.19	13	485	1,224	2,808	61,902	4.08
<i>Combined Median Rent/Housing Value</i>																			
1st Quintile	6,484	10	260	527	940	6,692	1.76	14	930	2,161	5,193	654,460	9.25	9	938	2,250	5,476	212,780	6.02
2nd Quintile	9,934	6	223	478	880	6,905	1.85	9	824	2,042	4,931	500,894	7.69	9	784	2,044	5,144	225,813	6.15
3rd Quintile	9,094	7	203	500	1,004	6,734	1.88	17	813	2,156	5,687	864,304	11.09	13	784	2,123	5,553	207,667	6.28
4th Quintile	8,647	15	245	514	1,008	5,673	1.86	23	917	2,306	5,906	552,522	6.56	18	937	2,440	6,140	225,664	5.79
5th Quintile	5,998	3	277	638	1,180	6,921	1.86	7	1,118	2,807	7,246	527,367	5.68	7	1,277	3,137	7,802	210,356	4.84

Table L.1 Selected Pair-Level Weight Summary Statistics; 2024 (continued)

Domain	SDU-Level Weights ¹ (SDUWT: WT1*...*WT11)							Before sel.pr.ps ¹ (SDUWT*PRWT12)					After sel.pr.ps ¹ (SDUWT*PRWT12*PRWT13)						
	<i>n</i>	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Population Density																			
Large MSA	17,802	3	351	720	1,197	6,921	1.66	7	1,321	3,130	7,434	864,304	7.05	7	1,343	3,208	7,697	225,664	4.98
Medium to Small MSA	20,274	6	177	372	771	6,734	2.03	9	649	1,619	4,167	654,460	9.51	9	657	1,677	4,388	211,511	6.80
Non-MSA, Urban	1,023	21	245	412	726	5,940	2.02	37	904	2,001	4,781	258,204	7.51	29	881	1,967	5,224	225,813	6.30
Non-MSA, Rural	1,058	39	307	535	895	5,765	1.71	83	1,091	2,397	5,647	235,961	5.84	117	1,159	2,631	6,262	212,780	5.92
Group Quarters																			
Group	98	87	261	355	662	1,940	1.64	156	729	962	1,729	33,646	5.11	154	589	838	1,710	20,072	3.31
Non-Group	40,059	3	234	522	989	6,921	1.86	7	901	2,247	5,689	864,304	8.17	7	897	2,317	5,921	225,813	5.85

DU = dwelling unit; MSA = metropolitan statistical area; pr = pair; ps = poststratification; SDU = screener dwelling unit; sel = selected; UWE = unequal weighting effect.

¹ This step used demographic variables from screener data for all selected person pairs.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ UWE is defined as $1 + [(n - 1)/n] * CV^2$, where *CV* = coefficient of variation of weights.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table L.2 Respondent Pair-Level Weight Summary Statistics (res.pr.nr); 2024

Domain	Before res.pr.nr ¹ (SDUWT*PRWT12*PRWT13)						After res.pr.nr ¹ (SDUWT*PRWT12*...*PRWT14)						
	<i>n</i>	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Total	13,653	9	846	2,138	5,378	225,813	5.92	9	1,986	5,724	16,360	942,752	7.04
<i>Pair Age Group</i>													
12-17, 12-17	1,936	9	455	1,127	2,298	17,269	2.38	9	869	2,137	4,974	49,588	2.80
12-17, 18-25	1,397	24	571	1,394	3,026	23,381	2.26	60	1,375	3,608	8,217	60,130	2.52
12-17, 26-34	573	44	795	1,840	3,625	31,442	2.75	97	1,733	4,238	9,505	126,007	3.22
12-17, 35-49	2,733	44	933	2,260	4,918	53,459	2.73	49	2,252	5,820	13,562	184,380	3.06
12-17, 50+	491	187	2,419	5,841	11,287	87,713	2.48	465	6,733	17,682	35,535	253,612	2.54
18-25, 18-25	2,043	26	472	1,104	2,578	19,797	2.49	42	1,181	3,014	7,823	119,011	2.93
18-25, 26-34	580	69	805	1,880	4,371	37,458	2.85	93	2,345	6,776	16,902	213,106	3.18
18-25, 35-49	974	78	1,268	2,947	6,636	49,271	2.62	116	3,191	8,428	22,358	199,382	2.79
18-25, 50+	600	118	2,833	6,130	12,470	95,954	2.45	355	8,877	20,661	48,567	339,253	2.55
26-34, 26-34	681	74	1,446	3,376	6,905	152,933	3.44	90	3,820	8,600	20,567	521,507	3.85
26-34, 35-49	344	253	1,995	4,591	8,499	100,632	3.27	363	5,848	12,874	28,363	338,656	3.54
26-34, 50+	176	890	7,488	14,095	26,440	174,219	2.45	2,900	25,891	54,583	110,318	680,067	2.37
35-49, 35-49	556	162	1,912	4,739	10,224	184,182	4.89	198	5,970	14,248	34,735	682,521	5.15
35-49, 50+	203	899	8,148	17,476	38,077	225,813	2.53	2,347	27,068	60,852	138,631	669,767	2.18
50+, 50+	366	529	9,937	22,735	43,795	212,780	2.03	1,038	34,876	76,783	169,926	942,752	2.22
<i>Pair Race/Ethnicity</i>													
Hispanic or Latino	2,966	22	998	2,396	5,760	179,334	5.11	25	2,248	6,111	16,793	942,752	7.54
Black or African American	1,633	13	853	2,105	5,126	168,785	5.84	18	1,668	4,559	13,500	594,795	7.30
White	6,363	9	843	2,077	5,285	225,813	6.03	23	2,142	6,025	16,986	680,067	6.59
Other	1,106	9	679	1,878	5,139	151,413	6.22	9	1,600	4,757	15,866	814,640	8.58
White & Black or African American	174	64	841	2,701	5,896	72,176	3.92	154	1,807	8,320	18,869	256,560	4.04
White & Hispanic or Latino	602	39	735	1,932	5,388	201,382	8.23	53	1,660	4,765	15,037	530,749	7.75
White & Other	485	37	721	2,032	5,518	184,182	6.89	47	1,570	4,881	16,068	357,191	6.69
Black or African American & Hispanic or Latino	105	93	984	2,133	4,612	39,015	3.23	97	2,938	6,183	20,149	140,214	3.07
Black or African American & Other	95	154	958	2,332	5,281	82,806	4.76	231	2,603	8,929	20,140	222,725	3.61
Hispanic or Latino & Other	124	39	524	1,594	4,293	46,555	3.48	80	1,250	3,927	18,026	240,680	4.67
<i>Pair Sex</i>													
Male, Male	2,680	9	860	2,049	4,948	179,334	4.87	9	2,042	5,807	16,080	942,752	6.52
Female, Female	3,264	9	776	1,998	4,913	168,785	5.26	24	1,780	4,782	13,428	597,016	6.78
Male, Female	7,709	13	878	2,253	5,877	225,813	6.14	18	2,084	6,108	17,816	821,318	7.02
<i>Household Size</i>													
Two	3,190	26	677	1,878	5,215	168,785	5.02	42	1,492	4,603	14,810	471,858	6.37
Three	4,024	9	713	1,789	4,133	185,986	6.18	9	1,728	4,746	13,156	623,960	7.15
Four or More	6,439	9	1,062	2,586	6,315	225,813	5.93	23	2,505	6,875	19,155	942,752	7.08

Table L.2 Respondent Pair-Level Weight Summary Statistics (res.pr.nr); 2024 (continued)

Domain	Before res.pr.nr ¹ (SDUWT*PRWT12*PRWT13)							After res.pr.nr ¹ (SDUWT*PRWT12*...*PRWT14)					
	<i>n</i>	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Census Region													
Northeast	2,212	42	745	1,922	4,928	184,182	6.47	42	1,822	5,888	17,177	521,507	6.82
South	4,757	9	1,094	2,646	6,581	225,813	5.36	18	2,297	6,291	17,627	942,752	6.78
Midwest	3,138	30	828	1,971	4,842	162,577	4.79	48	1,973	5,390	14,879	458,261	5.35
West	3,546	9	630	1,879	4,803	187,316	7.06	9	1,680	4,945	15,224	821,318	8.41
Quarter													
Quarter 1	3,328	13	839	2,168	5,385	207,558	5.83	18	2,077	6,000	16,855	682,521	6.28
Quarter 2	3,904	9	743	1,898	4,829	168,785	5.42	9	1,774	5,015	14,522	821,318	7.11
Quarter 3	3,570	16	797	2,008	5,132	225,813	6.88	24	1,790	4,849	14,420	942,752	7.90
Quarter 4	2,851	9	1,133	2,699	6,422	185,986	5.19	39	2,628	7,361	19,781	814,640	6.61
% Hispanic or Latino in Segment													
50-100%	1,551	30	1,108	2,660	6,369	207,558	5.58	48	2,248	6,154	17,845	669,767	6.92
10-<50%	3,591	9	971	2,598	6,795	185,986	5.38	9	2,194	6,654	19,544	942,752	7.24
<10%	8,511	9	770	1,895	4,789	225,813	6.19	13	1,853	5,262	14,836	643,313	6.68
% Black or African American in Segment													
50-100%	1,023	13	880	2,136	4,947	168,785	6.18	18	1,745	4,649	13,082	521,507	7.68
10-<50%	2,970	9	898	2,243	5,522	179,334	5.07	33	2,059	5,848	16,614	942,752	7.04
<10%	9,660	9	827	2,109	5,380	225,813	6.14	9	1,988	5,822	16,680	821,318	6.98
% Owner-Occupied DUs in Segment													
50-100%	10,070	9	931	2,281	5,715	225,813	5.81	9	2,219	6,262	17,697	942,752	6.75
10-<50%	3,121	9	679	1,939	4,912	184,182	5.95	13	1,631	4,794	14,153	814,640	7.68
<10%	462	13	414	1,090	2,506	61,902	5.50	18	794	2,271	6,020	143,081	5.32
Combined Median Rent/Housing Value													
1st Quintile	2,396	9	939	2,167	5,286	212,780	6.41	9	1,857	4,773	13,651	594,795	7.60
2nd Quintile	3,545	9	767	1,956	4,831	225,813	6.69	13	1,689	4,763	13,336	682,521	7.32
3rd Quintile	3,074	13	741	2,012	5,262	158,504	6.07	18	1,867	5,502	15,558	821,318	7.70
4th Quintile	2,779	38	845	2,155	5,322	187,316	6.23	42	2,094	6,541	18,144	942,752	7.35
5th Quintile	1,859	9	1,141	2,801	7,077	147,304	3.94	23	3,295	8,874	25,384	638,101	4.83
Population Density													
Large MSA	6,085	9	1,169	2,832	6,719	207,558	5.07	18	2,740	7,574	21,121	942,752	6.31
Medium to Small MSA	6,901	9	639	1,626	4,206	185,986	6.55	9	1,505	4,255	12,395	680,067	7.40
Non-MSA, Urban	351	48	928	1,954	5,254	225,813	8.16	49	1,874	4,493	12,048	339,676	6.68
Non-MSA, Rural	316	206	1,281	2,828	6,433	212,780	6.87	216	2,721	7,416	19,542	571,184	7.63
Group Quarters													
Group	61	154	472	743	1,219	20,072	4.52	441	817	858	1,538	33,092	5.16
Non-Group	13,592	9	852	2,151	5,388	225,813	5.91	9	2,010	5,769	16,485	942,752	7.02

DU = dwelling unit; MSA = metropolitan statistical area; nr = nonresponse adjustment; pr = pair; res = respondent; SDU = screener dwelling unit; UWE = unequal weighting effect.

¹ This step used demographic variables from screener data for all selected person pairs.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ UWE is defined as $1 + [(n - 1)/n] * CV^2$, where CV = coefficient of variation of weights.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.

Table L.3 Respondent Pair-Level Weight Summary Statistics (res.pr.ps and res.pr.ev); 2024

Domain	Before res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT14)							After res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT15)							Final Weight: After res.pr.ev ¹ (SDUWT*PRWT12*...*PRWT16)				
	<i>n</i>	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Total	13,653	9	1,986	5,724	16,360	942,752	7.04	7	1,861	5,619	16,552	692,906	6.94	7	1,862	5,614	16,620	654,196	6.88
Pair Age Group																			
12-17, 12-17	1,926	9	873	2,135	4,988	49,588	2.84	7	721	1,881	4,940	58,292	3.06	7	716	1,883	4,970	50,457	3.04
12-17, 18-25	1,406	60	1,374	3,606	8,240	60,130	2.50	22	1,240	3,460	8,171	54,234	2.46	21	1,243	3,425	8,152	50,524	2.45
12-17, 26-34	577	97	1,724	4,297	9,701	126,007	3.17	31	1,677	4,260	10,049	93,054	3.02	30	1,657	4,278	10,123	94,030	3.04
12-17, 35-49	2,716	49	2,257	5,806	13,511	184,380	3.06	21	2,177	5,507	13,481	161,985	3.19	21	2,144	5,497	13,448	163,187	3.17
12-17, 50+	497	465	7,138	17,845	35,930	279,852	2.61	130	6,236	14,862	34,676	306,564	2.86	127	6,135	14,952	34,879	306,191	2.86
18-25, 18-25	2,025	42	1,195	3,025	7,855	119,011	2.93	26	1,163	3,077	8,186	50,203	2.58	24	1,161	3,085	8,239	48,688	2.56
18-25, 26-34	590	93	2,301	6,343	16,553	213,106	3.30	48	2,180	6,197	16,391	145,389	2.94	48	2,187	6,130	16,106	146,314	2.96
18-25, 35-49	960	116	3,135	8,336	21,753	199,382	2.83	77	3,101	8,471	22,425	157,287	2.79	74	3,048	8,605	22,916	150,713	2.78
18-25, 50+	607	355	8,893	20,794	48,426	339,253	2.51	429	8,039	20,265	50,775	382,217	2.49	436	8,136	20,545	51,149	367,377	2.49
26-34, 26-34	682	90	3,814	8,552	20,528	521,507	3.91	116	3,729	9,184	21,020	546,316	3.89	114	3,694	9,169	21,045	541,139	3.85
26-34, 35-49	354	363	5,269	12,914	28,323	338,656	3.49	327	5,695	15,082	29,662	281,417	3.11	323	5,656	15,262	30,898	265,996	2.94
26-34, 50+	185	2,161	23,354	52,922	108,893	680,067	2.40	2,057	22,142	52,581	112,987	590,985	2.27	2,032	21,824	52,876	110,989	570,605	2.27
35-49, 35-49	553	198	5,961	13,986	34,575	682,521	5.12	227	5,243	13,587	32,693	692,906	5.40	221	5,169	13,706	32,868	627,361	5.28
35-49, 50+	208	2,347	24,956	58,786	123,253	669,767	2.27	2,130	22,687	53,151	132,764	674,150	2.38	2,052	22,746	53,202	131,198	582,155	2.36
50+, 50+	367	1,038	34,247	76,892	171,659	942,752	2.22	848	33,693	80,416	167,851	679,057	2.13	837	33,603	79,321	171,259	654,196	2.12
Pair Race/Ethnicity																			
Hispanic or Latino	2,940	48	2,220	6,052	16,868	942,752	7.58	22	2,269	6,292	17,233	679,057	7.14	21	2,248	6,243	17,288	632,399	7.00
Black or African American	1,435	18	1,745	4,679	14,053	594,795	7.12	23	1,794	5,411	15,847	636,909	6.79	22	1,742	5,309	15,898	654,196	6.83
White	5,841	23	2,139	6,089	17,242	680,067	6.63	26	2,355	6,766	18,884	692,906	6.36	24	2,393	6,791	19,079	627,361	6.29
Other	985	9	1,726	5,351	16,517	814,640	8.38	10	1,911	5,686	19,690	560,823	6.71	10	1,933	5,732	19,716	572,798	6.71
White & Black or African American	186	65	1,951	8,466	18,869	256,560	3.98	34	1,906	7,136	17,041	209,038	4.21	33	1,874	7,003	16,728	207,259	4.22
White & Hispanic or Latino	728	53	1,778	5,396	15,876	530,749	7.21	28	1,133	3,891	13,641	505,789	7.94	27	1,118	3,869	13,434	518,011	8.04
White & Other	855	47	1,673	4,528	14,962	357,191	6.03	15	808	2,472	8,163	336,559	7.81	14	804	2,527	8,181	331,361	7.78
Black or African American & Hispanic or Latino	172	101	2,120	6,467	18,604	353,425	5.80	43	904	2,931	9,817	200,647	6.30	42	883	2,939	10,034	205,113	6.30
Black or African American & Other	289	69	1,406	3,975	10,928	222,725	4.43	22	508	1,671	5,454	128,064	5.49	21	492	1,698	5,503	128,110	5.53
Hispanic or Latino & Other	222	25	1,130	3,775	14,951	240,680	5.22	7	463	1,850	7,351	189,357	6.49	7	463	1,860	7,250	187,329	6.46

Table L.3 Respondent Pair-Level Weight Summary Statistics (res.pr.ps and res.pr.ev); 2024 (continued)

Domain	Before res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT14)						After res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT15)						Final Weight: After res.pr.ev ¹ (SDUWT*PRWT12*...*PRWT16)						
	n	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
<i>Pair Sex</i>																			
Male, Male	2,672	9	2,024	5,840	16,378	942,752	6.45	10	1,968	6,097	17,334	679,057	5.88	10	1,982	6,102	17,318	654,196	5.86
Female, Female	3,275	24	1,784	4,748	13,400	597,016	6.71	9	1,659	4,665	13,273	572,569	6.79	9	1,662	4,674	13,300	563,725	6.78
Male, Female	7,706	18	2,086	6,129	17,803	821,318	7.06	7	1,943	5,974	17,854	692,906	7.02	7	1,944	5,971	17,815	632,399	6.94
<i>Household Size</i>																			
Two	3,190	42	1,492	4,603	14,810	471,858	6.37	21	1,469	4,722	15,044	458,257	6.33	21	1,483	4,729	14,922	462,976	6.33
Three	4,024	9	1,728	4,746	13,156	623,960	7.15	9	1,610	4,587	13,017	635,242	7.59	9	1,584	4,606	13,010	632,399	7.58
Four or More	6,439	23	2,505	6,875	19,155	942,752	7.08	7	2,320	6,831	19,357	692,906	6.77	7	2,333	6,848	19,558	654,196	6.67
<i>Census Region</i>																			
Northeast	2,212	42	1,822	5,888	17,177	521,507	6.82	21	1,722	5,670	17,062	560,823	6.96	21	1,695	5,649	17,137	572,798	6.94
South	4,757	18	2,297	6,291	17,627	942,752	6.78	22	2,193	6,245	17,767	692,906	6.84	21	2,188	6,244	17,722	654,196	6.77
Midwest	3,138	48	1,973	5,390	14,879	458,261	5.35	21	1,827	5,312	15,272	459,179	5.45	22	1,820	5,316	15,256	465,352	5.45
West	3,546	9	1,680	4,945	15,224	821,318	8.41	7	1,588	4,997	15,692	674,150	7.75	7	1,594	4,990	15,641	582,155	7.64
<i>Quarter</i>																			
Quarter 1	3,328	18	2,077	6,000	16,855	682,521	6.28	21	1,952	5,814	17,479	692,906	6.21	21	1,969	5,850	17,441	627,361	6.16
Quarter 2	3,904	9	1,774	5,015	14,522	821,318	7.11	7	1,659	4,985	14,728	636,909	7.29	7	1,649	5,004	14,791	654,196	7.27
Quarter 3	3,570	24	1,790	4,849	14,420	942,752	7.90	22	1,649	4,858	15,136	679,057	7.55	21	1,666	4,856	15,130	632,399	7.46
Quarter 4	2,851	39	2,628	7,361	19,781	814,640	6.61	32	2,469	7,632	19,991	674,542	6.48	31	2,467	7,672	20,023	625,061	6.40
<i>% Hispanic or Latino in Segment</i>																			
50-100%	1,551	48	2,248	6,154	17,845	669,767	6.92	22	2,135	6,191	17,927	674,150	7.33	21	2,109	6,152	17,703	582,155	7.27
10-<50%	3,591	9	2,194	6,654	19,544	942,752	7.24	10	2,036	6,716	19,933	679,057	6.75	10	2,013	6,782	20,010	654,196	6.65
<10%	8,511	13	1,853	5,262	14,836	643,313	6.68	7	1,756	5,182	15,000	692,906	6.76	7	1,762	5,185	14,943	627,361	6.73
<i>% Black or African American in Segment</i>																			
50-100%	1,023	18	1,745	4,649	13,082	521,507	7.68	23	1,500	4,262	13,098	572,569	8.75	22	1,465	4,177	13,015	563,725	8.81
10-<50%	2,970	33	2,059	5,848	16,614	942,752	7.04	22	1,855	5,758	16,915	679,057	6.58	21	1,857	5,775	17,071	654,196	6.48
<10%	9,660	9	1,988	5,822	16,680	821,318	6.98	7	1,914	5,729	16,848	692,906	6.90	7	1,915	5,745	16,956	632,399	6.84
<i>% Owner-Occupied DUs in Segment</i>																			
50-100%	10,070	9	2,219	6,262	17,697	942,752	6.75	7	2,101	6,241	17,869	679,057	6.64	7	2,106	6,234	17,815	654,196	6.59
10-<50%	3,121	13	1,631	4,794	14,153	814,640	7.68	9	1,452	4,833	14,599	692,906	7.55	9	1,449	4,817	14,618	627,361	7.48
<10%	462	18	794	2,271	6,020	143,081	5.32	22	679	1,965	5,694	186,764	6.23	21	660	1,937	5,646	185,654	6.26
<i>Combined Median Rent/Housing Value</i>																			
1st Quintile	2,396	9	1,857	4,773	13,651	594,795	7.60	10	1,738	4,820	13,642	636,909	8.07	10	1,743	4,777	13,604	654,196	8.18
2nd Quintile	3,545	13	1,689	4,763	13,336	682,521	7.32	7	1,482	4,597	13,507	590,985	7.36	7	1,470	4,568	13,448	570,605	7.38
3rd Quintile	3,074	18	1,867	5,502	15,558	821,318	7.70	9	1,701	5,358	15,692	692,906	7.79	9	1,705	5,332	15,858	627,361	7.57
4th Quintile	2,779	42	2,094	6,541	18,144	942,752	7.35	21	2,028	6,644	18,930	679,057	6.54	22	2,053	6,707	19,232	632,399	6.45
5th Quintile	1,859	23	3,295	8,874	25,384	638,101	4.83	36	3,239	8,899	24,775	674,542	4.85	36	3,286	8,937	25,250	625,061	4.82

Table L.3 Respondent Pair-Level Weight Summary Statistics (res.pr.ps and res.pr.ev); 2024 (continued)

Domain	Before res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT14)							After res.pr.ps ¹ (SDUWT*PRWT12*...*PRWT15)					Final Weight: After res.pr.ev ¹ (SDUWT*PRWT12*...*PRWT16)						
	<i>n</i>	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³	Min	Q1 ²	Med	Q3 ²	Max	UWE ³
Population Density																			
Large MSA	6,085	18	2,740	7,574	21,121	942,752	6.31	22	2,517	7,656	21,102	692,906	6.01	21	2,511	7,721	21,107	632,399	5.91
Medium to Small MSA	6,901	9	1,505	4,255	12,395	680,067	7.40	7	1,426	4,205	12,535	636,909	7.69	7	1,436	4,230	12,604	654,196	7.70
Non-MSA, Urban	351	49	1,874	4,493	12,048	339,676	6.68	21	1,670	4,717	13,503	336,559	6.25	21	1,655	4,604	13,435	331,361	6.25
Non-MSA, Rural	316	216	2,721	7,416	19,542	571,184	7.63	104	2,933	6,604	18,921	605,139	8.50	100	3,011	6,571	19,477	614,650	8.55
Group Quarters																			
Group	61	441	817	858	1,538	33,092	5.16	350	864	1,006	1,599	23,110	3.71	345	888	1,043	1,683	22,598	3.67
Non-Group	13,592	9	2,010	5,769	16,485	942,752	7.02	7	1,888	5,656	16,612	692,906	6.92	7	1,883	5,650	16,713	654,196	6.86
Pair Relationship Domain⁴																			
Parent-Child (12-14)	1,907	53	2,126	5,346	13,295	244,231	3.63	26	2,004	5,298	13,381	228,964	3.77	25	2,011	5,279	13,245	230,713	3.78
Parent-Child (12-17)	3,441	49	2,315	6,101	14,612	244,231	3.44	21	2,249	5,974	14,993	306,564	3.61	21	2,245	5,969	14,989	306,191	3.60
Parent-Child (12-20)	4,150	49	2,532	6,653	16,843	281,697	3.62	21	2,387	6,452	16,503	306,564	3.63	21	2,393	6,434	16,516	306,191	3.62
Sibling (12-14)-Sibling (15-17)	1,094	13	918	2,204	4,944	49,588	2.93	20	774	1,900	5,106	50,210	3.07	21	764	1,886	5,163	50,457	3.07
Sibling (12-17)-Sibling (18-25)	1,294	60	1,370	3,627	8,240	55,883	2.48	22	1,235	3,436	8,261	54,234	2.42	21	1,212	3,383	8,189	49,484	2.41
Spouse-Spouse/ Partner-Partner	2,638	42	2,235	6,944	22,970	821,318	6.57	26	2,072	6,677	22,864	692,906	6.68	24	2,072	6,727	23,019	632,399	6.61
Spouse-Spouse/ Partner-Partner with Children (Younger Than 18)	1,151	47	2,455	6,681	17,792	638,101	7.73	44	2,896	8,442	21,605	692,906	7.46	43	2,871	8,466	22,195	627,361	7.33

DU = dwelling unit; ev = extreme value adjustment; MSA = metropolitan statistical area; pr = pair; ps = poststratification adjustment; res = respondent; SDU = screener dwelling unit; UWE = unequal weighting effect.

¹ This step used demographic variables from questionnaire data for all selected person pairs.

² Q1 and Q3 refer to the first and third quartile of the weight distribution.

³ UWE is defined as $1 + [(n - 1)/n] * CV^2$, where CV = coefficient of variation of weights.

⁴ Parent-child (15-17) was not included here because extreme values were not controlled within this domain.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2024.



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