# 2009-2010 National Adult Tobacco Survey

# Weighting Methodology Report

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October 11, 2011

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# Introduction[1]

## *Background and Purpose of the National Adult Tobacco Survey*

In 1999, the Office on Smoking and Health (OSH), a division in the Centers for Disease Control and Prevention (CDC), created the National Tobacco Control Program (NTCP) to encourage coordinated efforts nationwide to reduce tobacco-related diseases and deaths. The program provides funding and technical support to State and territorial health departments for comprehensive tobacco control programs. The four goals of the NTCP are to

(1) prevent initiation of tobacco use among young people,
(2) eliminate non-smokers' exposure to second-hand smoke,
(3) promote cessation among adults and young people, and
(4) identify and eliminate tobacco-related health disparities.

The NATS is the first adult tobacco survey designed within the framework provided by the Key Outcome Indicator (KOI) report. As such, it both includes the established measures identified in the KOI report and introduces measures for the new or revised indicators proposed in the KOI report. The NATS also establishes a comprehensive framework for evaluating both the national and State-specific tobacco control programs. As described below, the NATS sample design prescribes a roughly equal target number of completes for each State in order to allow analyses by State. Prior to the NATS, 25 States had independently conducted an Adult Tobacco Survey (ATS) with technical assistance and support from CDC's OSH. After a pilot program in conjunction with the States, OSH started regularly supporting ATS's in 2002. See (Centers for Disease Control and Prevention, 2010) for State ATS data from 2003 to 2007. Thus, the primary purpose of the NATS is to evaluate the CDC's NTCP. OSH developed the NATS to assess the prevalence of tobacco use and the factors promoting and impeding tobacco use among adults. Specifically, the NATS is meant to:

(1) Estimate the extent to which adults engage in tobacco use behaviors.
(2) Assess the degree to which tobacco use behaviors among adults vary as a function of gender, age, and race/ethnicity.

[1] This introduction is reprinted from the 2009-2010 NATS Methodology Report prepared by CDC's OSH and ICF Macro

(3) Estimate the accomplishment of key short-, intermediate-, and long-term tobacco prevention and control outcome indicators found in the *Key Outcome Indicators for Evaluating Comprehensive Tobacco Control Programs* report.
(4) Estimate the degree to which exposure to influences expected to promote or impede tobacco use has its expected effects.
(5) Assess the degree to which response to influences expected to promote or impede tobacco use varies as a function of gender, age, and race/ethnicity.

## *NATS Methodology at a Glance*

The NATS was designed as a stratified, national, landline and cell phone survey of non-institutionalized adults 18 years of age and older. It was designed to yield data representative and comparable at both national and State levels. Each state is divided into at least three strata: a listed landline stratum, a not-listed landline stratum, and a cell phone stratum. Some states have additional landline strata based on counties or county-equivalents. The OSH target number of landline completes per state was 1863. OSH's target number of cell phone completes per state varied in proportion to each state's population. Some states independently added respondents to the OSH targets.

The NATS was implemented from October 20, 2009 to February 28, 2010. Respondent selection varied by phone type. For landline telephone numbers, one adult age 18 and over was randomly selected from households with at least one adult age 18 or over. Adults age 18 and over reached via a cell phone telephone number were selected if a cell phone was the only way they could be reached by telephone at home. We assumed that a cell phone was used only by the person who answered. The exact question was "In your home, is a cell phone the only way you can be reached by telephone?" The data collection protocol for landline telephone numbers specified that telephone numbers without a final disposition code after at least 15 call attempts could be assigned a final disposition code. For cell phone telephone numbers, a final disposition code could be assigned to a telephone number after a minimum of 6 call attempts. The calls had to be appropriately distributed among weekdays, weeknights, and weekends. A total of 118,581 interviews—110,634 landline interviews and 7,947 cell phone interviews—of non-institutionalized adults aged 18 and older were completed.

The landline data were first weighted by the inverse of the probability of selection of the telephone number, a non-response adjustment, and adjustments for number of landlines and number of eligible subjects in a household. The cell phone data were initially weighted by the inverse of the probability of selection of the telephone number and a nonresponse adjustment. Next, the data were poststratified by state to the distributions of various demographic variables and phone type (cell-phone-only users and all others).

# National Adult Tobacco Survey Sample Design[2]

[2] This section is reprinted from the 2009-2010 NATS Methodology Report prepared by CDC's OSH and ICF Macro

The NATS's target population was non-institutionalized adults age 18 and older residing in the 50 States and D.C. The sample was designed with two main objectives:

(1) Precise overall State-level estimates; and

(2) National estimates for subgroups defined by gender, age, and race/ethnicity.

The sample allocation focused on the need for precise estimates at the State level since this required the larger overall sample size between the two main objectives.

### *Sampling Frames*

Respondents were selected from two sampling frames, one for landlines and one for cell phones. Each state was divided into at least three strata: a listed landline stratum, a not-listed landline stratum, and a cell phone stratum. Some states had additional landline strata based on counties or county-equivalents. The listed stratum consists of landline telephone numbers listed in residential directories or in other source databases. The not-listed stratum consists of landline telephone numbers not listed as a residential number in any source database.

The NATS's landline sampling population is listed and not-listed telephone numbers from hundred-blocks with one or more listed telephone numbers. A "hundred block" is a set of 100 telephone numbers with the same area code, prefix, first two digits of the suffix, and all permutations of the last two digits of the suffix, from 00 to 99. A "one-plus block" telephone number is a telephone number from a hundred block with one or more listed household telephone numbers. The landline sampling frame for the national adult tobacco survey is the set of all one-plus block telephone numbers in the US. The cell phone sampling frame is telephone numbers from cellular-dedicated, thousand blocks, sets of telephone numbers with the same area code and prefix. The blocks originated from the Telcordia® LERG. The cellular-dedicated banks were then identified by coding provided on the LERG.

### *Sample Selection*

Telephone numbers listed in residential directories and other database sources are most often working residential numbers, whereas unlisted telephone numbers include large numbers of non-working and non-residential telephone numbers. To leverage this information, the listed stratum was oversampled at a 1.5-to-1 ratio relative to the not-listed stratum. This oversampling increases sampling efficiency by raising the percentage of working residential numbers selected in the sample.

For the landline strata, each State was allocated an equal sample size to ensure adequate precision for survey estimates at the State level. The total target landline sample size of 95,013 was equally distributed among the states, 1,863 each. For the cell phone strata, each state was allocated a sample size in proportion to its population. The total cell phone number of completes was 7,947.

## Overview of the weighting strategy

The landline sample was allocated so that each state had a least 1,863 landline respondents. In contrast, the cell phone sample was allocated proportional to the population size of the state. Consequently, some states have very few cell phone respondents. For states with a small number of cell phone respondents, using both landline and cell phone data results in a large unequal weighting effect, and therefore, large estimated variances of survey estimates and small effective sample sizes.[3]

To accommodate this design, three sets of weights were created. One weight is used when calculating national estimates. It is called WT_NATIONAL on the data file. This weight uses all of the respondents in all of the states. Another weight, called WT_STATE, is used for the state level estimates. In this weight cell phone respondents are assigned a non-zero weight for states with 200 or more cell phone respondents whereas cell phone respondents are assigned a weight of zero in states with less than 200 cell phone respondents. As just described, the cell phone sample members are excluded from the weights in the states with small cell phone sample sizes because their inclusion would result in much larger variances and smaller effective sample sizes. Table 1 contains the number of cell phone respondents in each state; and, states with 200 or more cell phone respondents are in bold. The third weight, called WT_LANDLINE, only uses landline respondents. See Appendix A for a discussion on why the cutoff of 200 was implemented.

An earlier version of the sample weights was released. We recommend using the weights described in this document rather than the first iteration of the weights. This second iteration has a number of refinements that will reduce bias. In the first iteration of the weights, the nonresponse adjustments were simply ratio adjustments within stratum and population density category. In contrast, in this iteration of the weights, a logistic model was used to predict response propensity. This model can distinguish the different response propensities across frame members, not just within broad categories. Consequently, more nonresponse bias is removed. This is particularly important for telephone studies in general because of low response rates and the NATS specifically which has a 37.6% response rate. Also, this iteration of the weights uses many more variables in the poststratification. In the original weights the only categories used in the poststratification were gender, age category and type of telephone usage (cell-only, landline). In addition to these categories, the weights were also poststratified to race/ethnicity, marriage status and educational attainment. These additional poststratification categories are important because many of the important study variables, such as smoking status, are correlated with these additional variables. Inclusion of these variables in the poststratification will reduce coverage bias and nonresponse bias. Finally, another advantage of this weighting approach is that a more current estimate of the percent of the population that is “cell only” was used. These estimates came from the National Health Statistics Report (Blumberg 2011) dated April 20, 2011, and cover from July 2009-June 2010 (which corresponds closely with the NATS data collection period), whereas the old weights used the National Health Statistics Report (Blumberg 2009) dated March 11, 2009, and cover from January 2007-December 2007.

The steps in the calculation of the weights are discussed in the following sections, and are the following:

[3] See the section on Unequal Weighting Effect for a definition of unequal weighting effect and effective sample size.

- Calculation of the initial weight for the landline and cell phone samples,
- Adjustment for nonresponse,
- Adjustment for household size and number of landlines,
- Adjustment for undercoverage using poststratification, and
- Evaluation of the unequal weighting effect nationally and for each state.

# Calculate initial weights for the landline and cell sample:

## *Respondents and nonrespondents*

For respondents and nonrespondents, the initial design weight is calculated:

$$W_{i,j}^{1} = \frac{N_i}{n_i},$$

$W_{i,j}^{1}$ = the initial weight for the $j^{th}$ sample member in stratum *i*.

$N_i$ = the number of records in stratum *i*; and

$n_i$ = the number of records selected in stratum *i*.

There are 229 total strata. Within the landline frame, some states are broken into county groups. These geographical strata are broken into listed and unlisted numbers. Cell phones were only stratified by state.

Within each strata there were between 4 and 8 different samples selected. To calculate the total sample selected in each stratum $(n_i)$ the individual samples, the individual samples were summed. But, the total frame count $(N_i)$ varied over the different samples. The maximum value over all the samples in a stratum was used to calculate the frame count.

## *Unknown response status*

An adjustment for unknown eligibility status was calculated as follows:

$$U_i^{adj} = \frac{n_i^r + n_i^n}{n_i^r + n_i^n + n_i^i},$$

$U_i^{adj}$ = the unknown eligibility weight adjustment.

$n_i^r$ = the number of responders in stratum $i$,

$n_i^n$ = the number of nonresponders in stratum $i$, and

$n_i^i$ = the number of ineligibles in stratum $i$.

Next, the telephone design weight for sampled frame members with unknown eligibility status was calculated as follows:

$$W_{i,j}^{1} = \frac{U_i^{adj} * N_i}{n_i}.$$

Ineligible frame members were then removed.

Appendix B contains a table displaying, for each stratum, the sample selected, the frame count, the initial weight, the unknown adjustment and the initial weight with the unknown adjustment which is applied to the sample members with unknown response status.

# Nonresponse adjustment:

The nonresponse adjustment involves the following steps:

- Ancillary data are appended to the sample frame
- A logistic model is fit in which the outcome is response and the independent variables are the ancillary data
- The nonresponse adjustment, the inverse of the predicted probability of response, is applied to the respondents.

## *Append ancillary data to the sample frame*

The sample frame contains geographical information for each sample member. This information was used to append ancillary data which was then used to model the probability of response. The most precise geographical information that is available for all of the sample members from the cell phone frame is the area code, and for sample members from the landline frame it is county FIPS code. Geolytics, a private company that sells the ancillary data used in the nonresponse adjustment, uses census data and a modeling algorithm to create estimates for various domains at various geographical levels. The county level data sets from Geolytics were used in this weight adjustment, and a weighted average (the weight is the population count) was used to aggregate the blockgroup level data to area code level data.

The following variables are used in the nonresponse adjustment procedure.

- Population density
- Proportion white
- Proportion African-American
- Proportion Hispanic
- Proportion of families below 150% of the poverty line
- Proportion that are high school graduates
- Proportion that completed a Bachelor's degree

The above variables were made categorical by converting the distribution of each variable into its quintiles.

## *Fit the logistic model*

For each of the 102 state by frame type (cell phone, land line) combinations, a weighted logistic model was used. The weights $\left(W_{i,j}^{1}\right)$ calculated up to this step and SAS software (PROC SURVEYLOGISTIC) were used to fit the following model:

$$\text{logit}(p_i) = \beta_{i,0} + \beta_{i,1}X_{i,1} + \cdots + \beta_{i,7}X_{i,7}.$$

The index *i* refers to one of the 102 models. The independent variables are the seven variables $(X_1 \cdots X_7)$ in the list above. Then we calculate the probability of response for each sample member:

$$\mathrm{p}_{\mathrm{i,j}} = \frac{1}{1+e^{-\text{logit}(p_{i,j})}}$$

The index *i* refers to one of the 102 models. The index *j* refers to one of the respondents within one of the 102 models.

### *Apply the nonresponse adjustment*

A new weight was calculated as:

$$\mathrm{W}^2_{\mathrm{i,j}} = \mathrm{W}^1_{\mathrm{i,j}} * \frac{1}{\mathrm{P}_{\mathrm{i,j}}}.$$

$\mathrm{W}^2_{\mathrm{i,j}}$ = nonresponse adjusted probability for the *j*th respondent,

$\mathrm{P}_{\mathrm{i,j}}$ = the predicted probability of response for the *j*th respondent from the logistic model.

Because the sum of the nonresponse adjusted weights ( $\sum \mathrm{W}^2_{\mathrm{i,j}}$ ) are not exactly equal to the sum of ( $\sum \mathrm{W}^1_{\mathrm{i,j}}$ ), the following ratio adjustment was made.

$$\mathrm{W}^3_{\mathrm{i,j}} = \frac{\sum \mathrm{W}^1_{\mathrm{i,j}}}{\sum \mathrm{W}^2_{\mathrm{i,j}}} \mathrm{W}^2_{\mathrm{i,j}}.$$

## Adjust for household size and number of phone lines per household:

The landline sample uses a two-stage selection process. First, the household is selected. Then, within a household one subject is randomly chosen from all eligible household members. Additionally, the probability of selecting a landline household is a function of the number of residential lines. So, for respondents sampled on landline phones the weight was adjusted for the number of eligible household members and for the number of residential phone lines in the household. The maximum number of eligible subjects in a household and the maximum number of residential phone lines was truncated in the adjustment is 5, in order to prevent sample members from extremely large households from having a large impact on the weights.

$$\mathrm{W}^4_{\mathrm{i,j}} = \frac{\mathrm{W}^3_{\mathrm{i,j}} * a_{i,j}}{l_{i,j}}$$

where, $a_{i,j}$ = the number of adults in the household of respondent for the *j*th listed frame member in stratum *i*, and

$l_{i,j}$ = the number of landlines in the household of respondent for the *j*th listed frame member in stratum *i*.

The cell phone frame uses a one-stage selection process. Cell phones are generally considered as single user devises, and were treated in this manner for weighting. This is expressed in the sampling methodology by sampling the person who answers the cell phone. Consequently, there is no adjustment for cell phones at this stage. So, for cell phone respondents the fourth weight is equal to the third weight.

$$W_{i,j}^{4} = W_{i,j}^{3}$$

## Poststratification and trimming

Weight trimming is applied to the state level weights before the weights are poststratified to population totals. Very large weights increase the variance of the parameter estimates. The purpose of weight trimming is to constrain the most extreme weights, and thereby reduce variance. The concern with weight trimming is that bias will be introduced. However, when weight trimming is applied, one is willing to accept some increase in bias to achieve a reduction in variance. The following rule was applied for weight trimming. Within each state, the maximum weight was defined as the median weight plus 4 times the inter-quartile range of the weights.

$$\text{Max weight} = \text{Median(WT)} + 4 * (\text{Q3} - \text{Q1})$$

Weights greater than the max weight were truncated to the max weight. This weight trimming rule is similar to the rule applied to data from the CDC study Behavioral Risk Factor Surveillance System and is described in the paper (Izreal 2009).

The purpose of poststratification is to constrain the weights to known population totals. This could remove nonresponse and coverage bias. In the NATS, 60.8% of all respondents are female, whereas 51.4% of the US population 18+ is female. The reason that the NATS has a higher percentage of females than the population is differential nonresponse and coverage error. Males are more likely to be nonrespondents than females, and males are more likely to be cell phone only; consequently, males are in the respondent sample at a lower rate than females. If gender is correlated with a study outcome then nonresponse and coverage error will result in nonresponse bias and coverage bias in the parameter estimate for that outcome. Adjusting the weights to sum to the population totals for gender (and other demographic categories that are correlated with study outcomes) can reduce these sources of bias. Within each state, the weights were adjusted to sum to the distributions of the following demographic variables: age category, gender, race/ethnicity, marriage status and educational attainment. The weights were also adjusted to sum to the distributions of landline and cell phone only telephone usage. The distributions of these variables are displayed in tables 2-6.

The phone usage data were derived from the National Health Statistics Report, Number 39, Blumberg et al (AAPOR 2010). The other data used in the poststratification were obtained from the 2005-2009 American Community Survey 5-year Summary File (ACS 2011).

The SUDAAN software procedure WTADJUST was used to apply a model based approach to poststratify the weights to the population totals.

## *Imputing the poststratification variables*

Imputation was used to replace missing values for the survey responses for the variables used in poststratification. The following table shows the variables and the number of respondents with missing values.

| Variable | Categories | Number of missing values |
|---|---|---|
| Age | 18-24, 25-34, 35-44, 45-54, 55-64, 65+ | 2,840 |
| Gender | Male, female | 173 |
| Race | Hispanic, white alone (non-Hispanic), black alone (non-Hispanic), other race | 1,664 |
| Marriage status | Married, Divorced, Widowed, Other | 1,080 |
| Educational Attainment | Less than high school graduate, , High school graduate but not bachelor's degree, Bachelor's degree or higher | 797 |

For the binary response variable (gender) a logistic model using a logit link function was used. For the other variables with more than two categories (polytomous response) logistic models with cumulative logits were used The fitted the model was used to predict, for subjects with missing values, the probability that subject would respond to the various categories of the variable. These categories were sampled with probability proportion to the predicted probability, and the imputed value is the category selected.

The following are the independent variables used in the imputation modeling procedures:

- State of residence
- Call attempts
- Number of males in household
- Number of females in household
- Gender (not used to impute gender)
- General health
- Smoked 100 cigarettes in life
- Ever smoked
- Employed
- Marital status (not used to impute marital status)
- Income

- Education
- Race/ethnic category (not used to impute race)
- Age category (not used to impute age)

Some of the independent variables (number of call attempts, number of men in the household and number of woman in the household) were collapsed into categories.

The weights will be delivered in a SAS data set containing one record for each respondent. In addition to three weight variables, the imputed poststratification categories will be included on the weight file.

### *Redefining the stratum for "stratum jumpers"*

"Stratum jumpers" is a term used to describe survey respondents that are in a stratum outside of their state of residence because of frame error. For example, it could be the case that a telephone number is sampled in New Jersey, but, the subject resides in Georgia. Then when the data is used to make state level estimates for Georgia one respondent is from a stratum in New Jersey. But, the algorithm for calculating the variance of the point estimate requires 2 subjects from each stratum. Conseqeuntly, the algorithm will fail to converge. To avoid this problem we reassign subjects with a stratum that differs from their state of residence. The stratum variable for these "stratum jumpers" is changed to the stratum in their state of residence with most respondents and with the same phone type (listed, unlisted or cell phone). Redefining the stratum variable for "stratum jumpers" will not affect means. For example, there will be no effect on estimates of smoking prevalence. However, it will affect the estimate of variance. But, this affect will be very small if it is detectable at all.

## Unequal Weighting Effect

The unequal weighting effect (UWE) is an upper bound of the ratio of the variance of an estimate calculated from a survey to the variance one would obtain from a simple random sample with the same sample size. The concept of UWE is described by Paul Biemer in the International Handbook of Survey Methodology. The following is an excerpt from this book.

> "Kish (1965, p.427) derived a formula for determining the maximum increase in variance of an estimate of a population mean due to a weight variation. His formula assumes there is no correlation between the survey weights and the characteristic whose mean is to be estimated. This may be a good approximation for many survey variables because the survey design and weight adjustments are optimized for only a few key characteristics out of hundreds that may be collected in a survey. The actual variance increase will vary across characteristics in the survey and will be smaller for characteristics where the covariance between the observations and the weights are larger. Under these assumptions, Kish obtained the following expression for the unequal weighting effect (UWE) defined as the ratio of the variances of the weighted mean to the variance of the unweighted mean:
>
> $$\text{UWE}=1+cv^2$$

> "Where *cv* is the coefficient of variance of the weights or the sample standard deviation of the weights divided by the sample average weight." (Leeuw, 2008, p. 337)

The effective sample size (ESS) is the sample size divided by the UWE. The ESS is the sample size a simple random sample needs to be to have an equal variance, for variables uncorrelated with the weight, to our design. Let us use Alaska to illustrate UWE and ESS. To make estimates for Alaska we use the 1,836 landline respondents. The UWE is 2.2. Consequently, for estimates not correlated with the weight, the variance will be 2.2 times greater than a simple random sample with 1,836 respondents; the standard error of an estimate will be sqrt(2.2) = 1.48 times greater than what we would observe with a simple random sample with the same sample size. The ESS is 839 (1,836/2.2)[4]. That is, parameters that are uncorrelated with the weights will have the same variance as a simple random sample with a sample size of 839.

The UWE does not take into account the effect of the stratification on the estimates. Stratification usually reduces variance.

Table 1 contains the unequal weighting effects (UWE) and the effective sample sizes (ESS) for the three weights (WT_NATIONAL, WT_STATE, WT_LANDLINE) for the national domain and each state domain.

For national estimates using the weight WT_NATIONAL, the results are in columns UWE and EFF.
For national estimates using the weight WT_LANDLINE, the results are in columns Landline only UWE and Landline only EFF.

For state estimates using the weight WT_STATE, the results are in columns UWE and EFF.
For national estimates using the weight WT_LANDLINE, the results are in columns Landline only UWE and Landline only EFF.

For states with less than 200 cell phone respondents, the weight WT_STATE only contains non-zero weights for landline respondents. As a result, for states with less than 200 cell phone respondents, the weights in WT_STATE are identical to the weights in WT_LANDLINE, and the UWE and EFF for STATE_WT and LANDLINE_WT are also identical. States with more than 200 cell phone respondents are displayed in **bold**. As discussed earlier, cell phone respondents in states with fewer cell phone interviews were not included in the state-level weight because their inclusion resulted in a much larger unequal weighting effect in those states.

## *Table 1: Unequal Weighting Effect*

| State FIPS | State | Cell phone respondents | Landline respondents | UWE | Effective Sample Size | Landline only UWE | Landline only Effective Sample Size |
|---|---|---|---|---|---|---|---|
| N/A | National | 7,947 | 110,634 | 4.9 | 24,443 | 6.9 | 16,099 |
| 1 | AL | 68 | 1,902 | 2.5 | 770 | 2.5 | 770 |
| 2 | AK | 13 | 1,836 | 2.2 | 839 | 2.2 | 839 |
| 4 | AZ | 111 | 1,799 | 3.8 | 476 | 3.8 | 476 |
| 5 | AR | 50 | 2,818 | 2.6 | 1,065 | 2.6 | 1,065 |

[4] This is approximate since 2.2 is a rounded value

| State FIPS | State | Cell phone respondents | Landline respondents | UWE | Effective Sample Size | Landline only UWE | Landline only Effective Sample Size |
|---|---|---|---|---|---|---|---|
| **6** | **CA** | **723** | **1,849** | **2.4** | **1,072** | **2.9** | **646** |
| 8 | CO | 145 | 1,816 | 2.6 | 686 | 2.6 | 686 |
| 9 | CT | 56 | 1,839 | 2.7 | 690 | 2.7 | 690 |
| 10 | DE | 18 | 1,966 | 2.4 | 816 | 2.4 | 816 |
| 11 | DC | 26 | 1,870 | 4.0 | 468 | 4.0 | 468 |
| **12** | **FL** | **408** | **1,863** | **1.9** | **1,186** | **3.1** | **595** |
| **13** | **GA** | **231** | **4,683** | **3.0** | **1,616** | **2.8** | **1,650** |
| 15 | HI | 33 | 1,788 | 2.5 | 730 | 2.5 | 730 |
| 16 | ID | 53 | 1,774 | 2.8 | 623 | 2.8 | 623 |
| **17** | **IL** | **245** | **1,805** | **2.0** | **1,039** | **2.8** | **639** |
| 18 | IN | 152 | 1,873 | 2.1 | 879 | 2.1 | 879 |
| 19 | IA | 76 | 2,051 | 2.4 | 856 | 2.4 | 856 |
| 20 | KS | 70 | 1,850 | 2.2 | 843 | 2.2 | 843 |
| 21 | KY | 73 | 1,777 | 2.5 | 707 | 2.5 | 707 |
| **22** | **LA** | **307** | **6,044** | **2.9** | **2,212** | **2.8** | **2,186** |
| 23 | ME | 36 | 1,995 | 2.1 | 928 | 2.1 | 928 |
| 24 | MD | 134 | 1,841 | 2.8 | 647 | 2.8 | 647 |
| 25 | MA | 134 | 1,818 | 2.7 | 667 | 2.7 | 667 |
| 26 | MI | 184 | 1,820 | 2.4 | 766 | 2.4 | 766 |
| 27 | MN | 116 | 1,788 | 2.2 | 821 | 2.2 | 821 |
| 28 | MS | 57 | 1,754 | 2.9 | 603 | 2.9 | 603 |
| 29 | MO | 140 | 1,859 | 2.2 | 833 | 2.2 | 833 |
| 30 | MT | 36 | 1,826 | 2.2 | 819 | 2.2 | 819 |
| 31 | NE | 47 | 1,829 | 2.3 | 784 | 2.3 | 784 |
| 32 | NV | 51 | 1,803 | 2.6 | 694 | 2.6 | 694 |
| 33 | NH | 27 | 1,934 | 2.0 | 964 | 2.0 | 964 |
| **34** | **NJ** | **801** | **3,294** | **2.3** | **1,820** | **3.0** | **1,110** |
| 35 | NM | 62 | 1,791 | 3.0 | 594 | 3.0 | 594 |
| **36** | **NY** | **401** | **1,838** | **2.0** | **1,099** | **2.6** | **699** |
| **37** | **NC** | **204** | **1,815** | **2.5** | **728** | **2.5** | **728** |
| 38 | ND | 29 | 2,192 | 2.4 | 903 | 2.4 | 903 |
| **39** | **OH** | **289** | **1,856** | **1.5** | **1,393** | **2.2** | **862** |
| **40** | **OK** | **526** | **3,123** | **1.6** | **2,288** | **2.2** | **1,390** |
| 41 | OR | 158 | 1,869 | 2.5 | 757 | 2.5 | 757 |
| **42** | **PA** | **252** | **3,181** | **1.7** | **2,046** | **2.0** | **1,579** |
| 44 | RI | 26 | 1,906 | 2.5 | 749 | 2.5 | 749 |
| 45 | SC | 88 | 5,078 | 3.1 | 1,614 | 3.1 | 1,614 |
| 46 | SD | 32 | 1,993 | 2.3 | 864 | 2.3 | 864 |
| 47 | TN | 127 | 1,832 | 2.4 | 750 | 2.4 | 750 |
| **48** | **TX** | **476** | **1,882** | **2.0** | **1,155** | **3.2** | **594** |
| 49 | UT | 83 | 2,025 | 2.6 | 777 | 2.6 | 777 |
| 50 | VT | 23 | 2,041 | 2.1 | 985 | 2.1 | 985 |
| 51 | VA | 177 | 2,271 | 2.6 | 887 | 2.6 | 887 |
| 53 | WA | 196 | 1,850 | 2.2 | 822 | 2.2 | 822 |
| 54 | WV | 45 | 1,770 | 2.2 | 787 | 2.2 | 787 |
| 55 | WI | 112 | 1,825 | 2.1 | 855 | 2.1 | 855 |
| 56 | WY | 20 | 1,732 | 2.5 | 695 | 2.5 | 695 |

## *Table 2: Population Totals by State: Age Categories (age 18+)*

| State | Total | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65+ |
|---|---|---|---|---|---|---|---|
| Alabama | 3,509,577 | 459,914 | 601,870 | 630,875 | 665,660 | 525,127 | 626,131 |
| Alaska | 499,977 | 80,919 | 97,084 | 96,196 | 106,926 | 71,216 | 47,636 |
| Arizona | 4,652,197 | 589,846 | 919,448 | 858,473 | 819,130 | 651,464 | 813,836 |
| Arkansas | 2,136,963 | 271,198 | 376,918 | 375,125 | 393,246 | 322,222 | 398,254 |
| California | 26,868,769 | 3,649,552 | 5,284,454 | 5,339,190 | 5,062,646 | 3,561,732 | 3,971,195 |
| Colorado | 3,646,549 | 490,872 | 699,987 | 711,876 | 726,949 | 519,250 | 497,615 |
| Connecticut | 2,672,367 | 328,175 | 403,751 | 519,164 | 548,747 | 397,735 | 474,795 |
| Delaware | 658,603 | 81,515 | 112,525 | 121,689 | 125,193 | 98,832 | 118,849 |
| DC | 474,441 | 69,898 | 105,778 | 86,657 | 78,308 | 64,251 | 69,549 |
| Florida | 14,167,647 | 1,635,367 | 2,291,105 | 2,517,243 | 2,564,133 | 2,088,829 | 3,070,970 |
| Georgia | 6,983,323 | 952,166 | 1,354,887 | 1,443,696 | 1,326,631 | 958,667 | 947,276 |
| Hawaii | 990,953 | 125,426 | 182,813 | 175,834 | 179,290 | 147,004 | 180,586 |
| Idaho | 1,086,071 | 159,304 | 198,968 | 191,246 | 202,411 | 158,794 | 175,348 |
| Illinois | 9,591,923 | 1,282,601 | 1,756,017 | 1,818,828 | 1,849,893 | 1,333,538 | 1,551,046 |
| Indiana | 4,755,941 | 637,155 | 827,413 | 878,969 | 925,329 | 687,675 | 799,400 |
| Iowa | 2,268,969 | 320,716 | 354,546 | 385,827 | 438,321 | 330,823 | 438,736 |
| Kansas | 2,079,386 | 303,959 | 354,568 | 363,202 | 402,408 | 294,743 | 360,506 |
| Kentucky | 3,241,564 | 415,946 | 565,564 | 600,914 | 625,607 | 485,532 | 548,001 |
| Louisiana | 3,297,180 | 482,389 | 583,680 | 587,240 | 634,469 | 475,091 | 534,311 |
| Maine | 1,036,654 | 118,355 | 147,678 | 184,858 | 216,823 | 171,675 | 197,265 |
| Maryland | 4,271,121 | 532,517 | 738,127 | 845,785 | 865,672 | 625,841 | 663,179 |
| Massachusetts | 5,061,250 | 645,115 | 839,719 | 975,711 | 997,328 | 733,667 | 869,710 |
| Michigan | 7,600,237 | 988,620 | 1,225,685 | 1,419,233 | 1,534,653 | 1,139,998 | 1,292,048 |
| Minnesota | 3,926,248 | 523,046 | 675,511 | 733,404 | 794,863 | 556,360 | 643,064 |
| Mississippi | 2,158,108 | 315,158 | 381,340 | 383,363 | 403,457 | 310,117 | 364,673 |
| Missouri | 4,473,226 | 589,319 | 757,402 | 801,084 | 871,891 | 656,852 | 796,678 |
| Montana | 736,558 | 103,470 | 112,416 | 117,203 | 149,498 | 119,199 | 134,772 |
| Nebraska | 1,326,139 | 194,946 | 224,517 | 228,914 | 254,072 | 187,582 | 236,108 |
| Nevada | 1,887,203 | 223,022 | 378,436 | 372,973 | 347,285 | 279,016 | 286,471 |
| New Hampshire | 1,017,239 | 127,782 | 148,323 | 197,151 | 217,309 | 157,715 | 168,959 |
| New Jersey | 6,578,265 | 735,507 | 1,102,731 | 1,316,847 | 1,329,184 | 953,332 | 1,140,664 |
| New Mexico | 1,460,839 | 201,713 | 263,031 | 253,610 | 275,840 | 218,283 | 248,362 |
| New York | 14,925,614 | 1,877,930 | 2,605,989 | 2,836,735 | 2,881,804 | 2,162,451 | 2,560,705 |
| North Carolina | 6,839,619 | 899,371 | 1,207,653 | 1,321,189 | 1,284,241 | 1,006,095 | 1,121,070 |
| North Dakota | 496,341 | 87,872 | 77,660 | 75,892 | 92,765 | 68,508 | 93,644 |
| Ohio | 8,750,969 | 1,079,419 | 1,468,399 | 1,591,383 | 1,746,072 | 1,302,614 | 1,563,082 |
| Oklahoma | 2,709,105 | 384,844 | 479,169 | 464,155 | 504,889 | 394,707 | 481,341 |
| Oregon | 2,862,879 | 356,297 | 503,583 | 506,038 | 551,749 | 454,323 | 490,889 |
| Pennsylvania | 9,703,855 | 1,193,167 | 1,502,121 | 1,728,848 | 1,916,548 | 1,451,607 | 1,911,564 |
| Rhode Island | 823,719 | 109,997 | 132,505 | 153,275 | 160,925 | 118,568 | 148,449 |

| State | Total | 18-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65+ |
|---|---|---|---|---|---|---|---|
| South Carolina | 3,355,523 | 439,558 | 579,940 | 610,614 | 627,305 | 518,605 | 579,501 |
| South Dakota | 600,114 | 86,327 | 97,856 | 98,075 | 116,095 | 87,542 | 114,219 |
| Tennessee | 4,683,923 | 573,728 | 834,703 | 875,602 | 895,080 | 707,833 | 796,977 |
| Texas | 17,185,928 | 2,463,010 | 3,488,231 | 3,387,812 | 3,201,378 | 2,243,645 | 2,401,852 |
| Utah | 1,826,327 | 340,982 | 414,891 | 320,042 | 302,377 | 213,558 | 234,477 |
| Vermont | 489,395 | 68,299 | 67,537 | 85,347 | 102,398 | 80,347 | 85,467 |
| Virginia | 5,890,260 | 797,902 | 1,044,124 | 1,146,581 | 1,140,502 | 853,293 | 907,858 |
| Washington | 4,918,282 | 628,844 | 895,386 | 923,053 | 971,842 | 739,072 | 760,085 |
| West Virginia | 1,424,575 | 170,890 | 222,254 | 241,313 | 274,982 | 233,643 | 281,493 |
| Wisconsin | 4,279,113 | 585,806 | 687,508 | 785,727 | 860,734 | 620,738 | 738,600 |
| Wyoming | 397,980 | 58,505 | 67,402 | 64,513 | 81,914 | 62,042 | 63,604 |
| | **227,279,008** | **29,838,236** | **40,443,203** | **42,748,574** | **43,646,772** | **32,601,353** | **38,000,870** |

## *Table 3: Population Totals by State: Gender (18) and percent cell-only*

| State | Total | Male | Female | Cell only % |
|---|---|---|---|---|
| Alabama | 3,509,577 | 1,668,871 | 1,840,706 | 25.3 |
| Alaska | 499,977 | 261,423 | 238,554 | 19.9 |
| Arizona | 4,652,197 | 2,312,791 | 2,339,406 | 29.4 |
| Arkansas | 2,136,963 | 1,029,846 | 1,107,117 | 35.2 |
| California | 26,868,769 | 13,323,473 | 13,545,296 | 18.2 |
| Colorado | 3,646,549 | 1,825,856 | 1,820,693 | 30.4 |
| Connecticut | 2,672,367 | 1,282,748 | 1,389,619 | 13.6 |
| Delaware | 658,603 | 314,393 | 344,210 | 16.5 |
| DC | 474,441 | 219,579 | 254,862 | 27.7 |
| Florida | 14,167,647 | 6,875,871 | 7,291,776 | 27.3 |
| Georgia | 6,983,323 | 3,378,409 | 3,604,914 | 26.5 |
| Hawaii | 990,953 | 497,438 | 493,515 | 21.8 |
| Idaho | 1,086,071 | 540,975 | 545,096 | 31.7 |
| Illinois | 9,591,923 | 4,658,495 | 4,933,428 | 24.4 |
| Indiana | 4,755,941 | 2,309,439 | 2,446,502 | 25.2 |
| Iowa | 2,268,969 | 1,104,622 | 1,164,347 | 29.2 |
| Kansas | 2,079,386 | 1,019,073 | 1,060,313 | 28.7 |
| Kentucky | 3,241,564 | 1,566,212 | 1,675,352 | 31.5 |
| Louisiana | 3,297,180 | 1,574,713 | 1,722,467 | 26.8 |
| Maine | 1,036,654 | 499,276 | 537,378 | 22.9 |
| Maryland | 4,271,121 | 2,032,738 | 2,238,383 | 18.4 |
| Massachusetts | 5,061,250 | 2,418,058 | 2,643,192 | 16.8 |
| Michigan | 7,600,237 | 3,688,862 | 3,911,375 | 29.2 |
| Minnesota | 3,926,248 | 1,934,180 | 1,992,068 | 25.2 |
| Mississippi | 2,158,108 | 1,025,515 | 1,132,593 | 35.1 |
| Missouri | 4,473,226 | 2,149,145 | 2,324,081 | 22.4 |
| Montana | 736,558 | 365,078 | 371,480 | 19.4 |

| State | Total | Male | Female | Cell only % |
|---|---|---|---|---|
| Nebraska | 1,326,139 | 649,688 | 676,451 | 30.4 |
| Nevada | 1,887,203 | 957,373 | 929,830 | 24.2 |
| New Hampshire | 1,017,239 | 495,942 | 521,297 | 16.0 |
| New Jersey | 6,578,265 | 3,170,753 | 3,407,512 | 12.8 |
| New Mexico | 1,460,839 | 715,267 | 745,572 | 27.2 |
| New York | 14,925,614 | 7,124,681 | 7,800,933 | 17.0 |
| North Carolina | 6,839,619 | 3,294,267 | 3,545,352 | 25.2 |
| North Dakota | 496,341 | 247,618 | 248,723 | 32.3 |
| Ohio | 8,750,969 | 4,201,587 | 4,549,382 | 25.6 |
| Oklahoma | 2,709,105 | 1,318,499 | 1,390,606 | 30.1 |
| Oregon | 2,862,879 | 1,405,986 | 1,456,893 | 30.6 |
| Pennsylvania | 9,703,855 | 4,646,983 | 5,056,872 | 16.5 |
| Rhode Island | 823,719 | 392,485 | 431,234 | 12.8 |
| South Carolina | 3,355,523 | 1,606,879 | 1,748,644 | 25.8 |
| South Dakota | 600,114 | 296,675 | 303,439 | 15.6 |
| Tennessee | 4,683,923 | 2,247,275 | 2,436,648 | 27.9 |
| Texas | 17,185,928 | 8,484,856 | 8,701,072 | 32.5 |
| Utah | 1,826,327 | 908,967 | 917,360 | 24.4 |
| Vermont | 489,395 | 237,762 | 251,633 | 20.3 |
| Virginia | 5,890,260 | 2,857,831 | 3,032,429 | 21.2 |
| Washington | 4,918,282 | 2,431,688 | 2,486,594 | 26.4 |
| West Virginia | 1,424,575 | 688,377 | 736,198 | 20.5 |
| Wisconsin | 4,279,113 | 2,104,516 | 2,174,597 | 25.3 |
| Wyoming | 397,980 | 200,873 | 197,107 | 22.3 |
| | **227,279,008** | **110,563,907** | **116,715,101** | |

## Table 4: Population Totals by State: Race Category (18+)

| State | Total | Hispanic | White alone Not-Hispanic | Black alone | Other race |
|---|---|---|---|---|---|
| Alabama | 3,509,577 | 76,935 | 2,483,494 | 868,684 | 80,464 |
| Alaska | 499,977 | 25,251 | 345,760 | 18,220 | 110,746 |
| Arizona | 4,652,197 | 1,175,706 | 2,977,043 | 155,777 | 343,671 |
| Arkansas | 2,136,963 | 90,938 | 1,678,665 | 305,400 | 61,960 |
| California | 26,868,769 | 8,490,040 | 12,577,310 | 1,644,941 | 4,156,478 |
| Colorado | 3,646,549 | 613,010 | 2,730,336 | 132,681 | 170,522 |
| Connecticut | 2,672,367 | 269,419 | 2,048,239 | 235,453 | 119,256 |
| Delaware | 658,603 | 35,381 | 470,397 | 127,167 | 25,658 |
| DC | 474,441 | 36,907 | 167,198 | 248,619 | 21,717 |
| Florida | 14,167,647 | 2,741,857 | 9,013,851 | 1,965,310 | 446,629 |
| Georgia | 6,983,323 | 453,100 | 4,266,375 | 1,991,431 | 272,417 |
| Hawaii | 990,953 | 68,458 | 265,283 | 23,747 | 633,465 |
| Idaho | 1,086,071 | 87,788 | 954,046 | 5,251 | 38,986 |
| Illinois | 9,591,923 | 1,201,520 | 6,566,298 | 1,324,794 | 499,311 |
| Indiana | 4,755,941 | 197,314 | 4,056,116 | 382,236 | 120,275 |
| Iowa | 2,268,969 | 72,109 | 2,093,437 | 47,648 | 55,775 |
| Kansas | 2,079,386 | 148,754 | 1,729,732 | 110,328 | 90,572 |
| Kentucky | 3,241,564 | 61,097 | 2,888,960 | 228,950 | 62,557 |
| Louisiana | 3,297,180 | 102,561 | 2,125,255 | 981,907 | 87,457 |
| Maine | 1,036,654 | 10,545 | 991,938 | 8,243 | 25,928 |
| Maryland | 4,271,121 | 246,029 | 2,559,800 | 1,192,830 | 272,462 |
| Massachusetts | 5,061,250 | 357,882 | 4,110,189 | 284,037 | 309,142 |
| Michigan | 7,600,237 | 254,306 | 6,062,236 | 991,968 | 291,727 |
| Minnesota | 3,926,248 | 122,820 | 3,455,964 | 146,816 | 200,648 |
| Mississippi | 2,158,108 | 39,963 | 1,332,811 | 746,959 | 38,375 |
| Missouri | 4,473,226 | 113,924 | 3,758,236 | 462,263 | 138,803 |
| Montana | 736,558 | 16,607 | 663,898 | 3,095 | 52,958 |
| Nebraska | 1,326,139 | 80,337 | 1,153,739 | 49,347 | 42,716 |
| Nevada | 1,887,203 | 398,681 | 1,170,794 | 134,160 | 183,568 |
| New Hampshire | 1,017,239 | 21,354 | 958,274 | 9,491 | 28,120 |
| New Jersey | 6,578,265 | 957,560 | 4,233,155 | 852,460 | 535,090 |
| New Mexico | 1,460,839 | 606,122 | 671,367 | 29,734 | 153,616 |
| New York | 14,925,614 | 2,230,565 | 9,358,112 | 2,205,737 | 1,131,200 |
| North Carolina | 6,839,619 | 381,404 | 4,808,321 | 1,386,589 | 263,305 |
| North Dakota | 496,341 | 8,107 | 454,854 | 4,062 | 29,318 |
| Ohio | 8,750,969 | 188,161 | 7,379,820 | 956,341 | 226,647 |
| Oklahoma | 2,709,105 | 164,350 | 2,027,338 | 186,212 | 331,205 |
| Oregon | 2,862,879 | 234,718 | 2,393,753 | 45,242 | 189,166 |
| Pennsylvania | 9,703,855 | 365,475 | 8,123,472 | 924,639 | 290,269 |
| Rhode Island | 823,719 | 76,959 | 673,567 | 39,955 | 33,238 |
| South Carolina | 3,355,523 | 111,708 | 2,268,186 | 900,408 | 75,221 |
| South Dakota | 600,114 | 11,820 | 533,491 | 4,953 | 49,850 |

| State | Total | Hispanic | White alone Not-Hispanic | Black alone | Other race |
|---|---|---|---|---|---|
| Tennessee | 4,683,923 | 138,166 | 3,714,208 | 717,891 | 113,658 |
| Texas | 17,185,928 | 5,522,882 | 8,912,545 | 1,943,311 | 807,190 |
| Utah | 1,826,327 | 181,360 | 1,541,689 | 15,748 | 87,530 |
| Vermont | 489,395 | 5,771 | 468,795 | 3,208 | 11,621 |
| Virginia | 5,890,260 | 340,498 | 4,072,549 | 1,110,826 | 366,387 |
| Washington | 4,918,282 | 372,609 | 3,867,888 | 157,553 | 520,232 |
| West Virginia | 1,424,575 | 12,932 | 1,341,875 | 44,675 | 25,093 |
| Wisconsin | 4,279,113 | 167,974 | 3,752,732 | 219,307 | 139,100 |
| Wyoming | 397,980 | 25,272 | 353,823 | 3,592 | 15,293 |
| | **227,279,008** | **29,715,006** | **156,607,214** | **26,580,196** | **14,376,592** |

## *Table 5: Population Totals by State: Marriage Categories (18+)*

| State | Total | Married | Divorced | Widowed | Other marriage status |
|---|---|---|---|---|---|
| Alabama | 3,509,577 | 1,813,174 | 433,399 | 277,038 | 985,966 |
| Alaska | 499,977 | 244,156 | 62,745 | 18,654 | 174,422 |
| Arizona | 4,652,197 | 2,294,389 | 594,503 | 281,095 | 1,482,210 |
| Arkansas | 2,136,963 | 1,143,860 | 277,078 | 168,633 | 547,392 |
| California | 26,868,769 | 12,708,913 | 2,712,733 | 1,519,321 | 9,927,802 |
| Colorado | 3,646,549 | 1,919,565 | 439,676 | 178,170 | 1,109,138 |
| Connecticut | 2,672,367 | 1,378,271 | 276,237 | 181,617 | 836,242 |
| Delaware | 658,603 | 330,138 | 73,074 | 46,361 | 209,030 |
| District of Columbia | 474,441 | 114,927 | 48,484 | 30,125 | 280,905 |
| Florida | 14,167,647 | 6,989,891 | 1,801,827 | 1,095,985 | 4,279,944 |
| Georgia | 6,983,323 | 3,400,617 | 825,315 | 428,175 | 2,329,216 |
| Hawaii | 990,953 | 494,171 | 95,466 | 63,985 | 337,331 |
| Idaho | 1,086,071 | 639,041 | 132,435 | 58,687 | 255,908 |
| Illinois | 9,591,923 | 4,779,384 | 953,558 | 639,202 | 3,219,779 |
| Indiana | 4,755,941 | 2,545,013 | 595,839 | 319,094 | 1,295,995 |
| Iowa | 2,268,969 | 1,286,265 | 236,859 | 159,908 | 585,937 |
| Kansas | 2,079,386 | 1,151,549 | 240,546 | 138,437 | 548,854 |
| Kentucky | 3,241,564 | 1,730,404 | 412,711 | 241,427 | 857,022 |
| Louisiana | 3,297,180 | 1,563,424 | 386,127 | 251,511 | 1,096,118 |
| Maine | 1,036,654 | 557,550 | 137,443 | 73,008 | 268,653 |
| Maryland | 4,271,121 | 2,081,923 | 427,851 | 273,373 | 1,487,974 |
| Massachusetts | 5,061,250 | 2,416,752 | 483,634 | 339,993 | 1,820,871 |
| Michigan | 7,600,237 | 3,911,926 | 877,378 | 504,107 | 2,306,826 |
| Minnesota | 3,926,248 | 2,163,131 | 384,932 | 225,977 | 1,152,208 |
| Mississippi | 2,158,108 | 1,026,650 | 249,551 | 173,843 | 708,064 |
| Missouri | 4,473,226 | 2,350,357 | 543,473 | 314,138 | 1,265,258 |
| Montana | 736,558 | 389,664 | 94,569 | 48,657 | 203,668 |
| Nebraska | 1,326,139 | 733,118 | 136,179 | 88,631 | 368,211 |

| State | Total | Married | Divorced | Widowed | Other marriage status |
|---|---|---|---|---|---|
| Nevada | 1,887,203 | 923,518 | 268,622 | 105,948 | 589,115 |
| New Hampshire | 1,017,239 | 556,689 | 121,232 | 62,344 | 276,974 |
| New Jersey | 6,578,265 | 3,360,892 | 563,035 | 467,722 | 2,186,616 |
| New Mexico | 1,460,839 | 707,287 | 186,856 | 92,946 | 473,750 |
| New York | 14,925,614 | 6,678,549 | 1,325,138 | 1,045,881 | 5,876,046 |
| North Carolina | 6,839,619 | 3,555,099 | 719,334 | 467,785 | 2,097,401 |
| North Dakota | 496,341 | 278,409 | 42,037 | 35,270 | 140,625 |
| Ohio | 8,750,969 | 4,489,281 | 1,069,842 | 630,508 | 2,561,338 |
| Oklahoma | 2,709,105 | 1,437,187 | 359,631 | 198,659 | 713,628 |
| Oregon | 2,862,879 | 1,487,900 | 373,393 | 173,093 | 828,493 |
| Pennsylvania | 9,703,855 | 4,935,263 | 915,354 | 778,025 | 3,075,213 |
| Rhode Island | 823,719 | 386,466 | 91,287 | 61,141 | 284,825 |
| South Carolina | 3,355,523 | 1,662,171 | 349,433 | 252,066 | 1,091,853 |
| South Dakota | 600,114 | 328,201 | 63,865 | 42,161 | 165,887 |
| Tennessee | 4,683,923 | 2,435,291 | 609,650 | 339,623 | 1,299,359 |
| Texas | 17,185,928 | 8,749,535 | 1,920,476 | 1,007,953 | 5,507,964 |
| Utah | 1,826,327 | 1,065,668 | 174,478 | 76,061 | 510,120 |
| Vermont | 489,395 | 252,008 | 62,566 | 30,505 | 144,316 |
| Virginia | 5,890,260 | 3,045,131 | 586,202 | 365,648 | 1,893,279 |
| Washington | 4,918,282 | 2,566,946 | 623,640 | 269,354 | 1,458,342 |
| West Virginia | 1,424,575 | 779,622 | 172,125 | 122,299 | 350,529 |
| Wisconsin | 4,279,113 | 2,315,825 | 441,861 | 270,005 | 1,251,422 |
| Wyoming | 397,980 | 222,974 | 51,773 | 23,460 | 99,773 |
| | **227,279,008** | **114,378,135** | **25,025,452** | **15,057,609** | **72,817,812** |

## *Table 6: Population Totals by State: Educational Attainment (18+)*

| State | Less than HS degree | HS degree | Some college but no Bachelors degree | Bachelors Masters or professional degree |
|---|---|---|---|---|
| 3,509,577 | 676,341 | 1,116,021 | 1,028,366 | 688,849 |
| 499,977 | 53,411 | 151,760 | 179,451 | 115,355 |
| 4,652,197 | 783,642 | 1,231,273 | 1,554,383 | 1,082,899 |
| 2,136,963 | 396,574 | 758,823 | 611,908 | 369,658 |
| 26,868,769 | 5,211,569 | 6,224,048 | 8,235,718 | 7,197,434 |
| 3,646,549 | 436,432 | 896,254 | 1,144,534 | 1,169,329 |
| 2,672,367 | 319,077 | 776,283 | 714,172 | 862,835 |
| 658,603 | 92,574 | 213,322 | 186,002 | 166,705 |
| 474,441 | 68,925 | 100,573 | 99,501 | 205,442 |
| 14,167,647 | 2,207,978 | 4,375,463 | 4,251,474 | 3,332,732 |
| 6,983,323 | 1,233,360 | 2,109,813 | 1,932,069 | 1,708,081 |
| 990,953 | 102,070 | 305,607 | 320,877 | 262,399 |

| State | Less than HS degree | HS degree | Some college but no Bachelors degree | Bachelors Masters or professional degree |
|---|---|---|---|---|
| 1,086,071 | 139,925 | 327,574 | 389,683 | 228,889 |
| 9,591,923 | 1,388,771 | 2,719,527 | 2,865,711 | 2,617,914 |
| 4,755,941 | 710,920 | 1,704,813 | 1,385,631 | 954,577 |
| 2,268,969 | 239,524 | 766,076 | 759,250 | 504,119 |
| 2,079,386 | 236,412 | 611,036 | 690,812 | 541,126 |
| 3,241,564 | 628,725 | 1,115,240 | 901,233 | 596,366 |
| 3,297,180 | 650,696 | 1,141,152 | 893,534 | 611,798 |
| 1,036,654 | 114,963 | 368,032 | 304,453 | 249,206 |
| 4,271,121 | 543,632 | 1,176,074 | 1,169,282 | 1,382,133 |
| 5,061,250 | 596,039 | 1,395,097 | 1,308,451 | 1,761,663 |
| 7,600,237 | 990,656 | 2,396,918 | 2,512,277 | 1,700,386 |
| 3,926,248 | 370,443 | 1,109,115 | 1,329,761 | 1,116,929 |
| 2,158,108 | 456,155 | 676,558 | 656,108 | 369,287 |
| 4,473,226 | 661,627 | 1,468,563 | 1,334,098 | 1,008,938 |
| 736,558 | 76,898 | 238,115 | 242,969 | 178,576 |
| 1,326,139 | 142,663 | 397,665 | 460,628 | 325,183 |
| 1,887,203 | 322,645 | 578,760 | 614,611 | 371,187 |
| 1,017,239 | 101,850 | 309,766 | 303,199 | 302,424 |
| 6,578,265 | 877,221 | 1,980,157 | 1,629,477 | 2,091,410 |
| 1,460,839 | 270,522 | 411,086 | 453,410 | 325,821 |
| 14,925,614 | 2,360,205 | 4,268,184 | 3,892,795 | 4,404,430 |
| 6,839,619 | 1,168,119 | 1,988,791 | 2,073,745 | 1,608,964 |
| 496,341 | 53,593 | 141,964 | 187,651 | 113,133 |
| 8,750,969 | 1,190,435 | 3,143,817 | 2,517,056 | 1,899,661 |
| 2,709,105 | 424,080 | 890,799 | 848,778 | 545,448 |
| 2,862,879 | 354,544 | 767,617 | 1,003,132 | 737,586 |
| 9,703,855 | 1,285,244 | 3,634,828 | 2,447,231 | 2,336,552 |
| 823,719 | 132,571 | 236,726 | 231,029 | 223,393 |
| 3,355,523 | 602,352 | 1,068,802 | 967,289 | 717,080 |
| 600,114 | 71,603 | 196,867 | 198,940 | 132,704 |
| 4,683,923 | 846,125 | 1,587,619 | 1,284,642 | 965,537 |
| 17,185,928 | 3,561,894 | 4,660,099 | 5,063,947 | 3,899,988 |
| 1,826,327 | 187,417 | 482,070 | 710,261 | 446,579 |
| 489,395 | 49,002 | 157,856 | 137,141 | 145,396 |
| 5,890,260 | 834,565 | 1,606,165 | 1,655,190 | 1,794,340 |
| 4,918,282 | 565,887 | 1,257,212 | 1,721,986 | 1,373,197 |
| 1,424,575 | 259,296 | 579,710 | 358,815 | 226,754 |
| 4,279,113 | 482,758 | 1,459,393 | 1,345,345 | 991,617 |
| 397,980 | 38,635 | 128,379 | 148,351 | 82,615 |
| **227,279,008** | **35,570,565** | **67,407,462** | **67,256,357** | **57,044,624** |

# Recoded Variables

The following 21 variables are included in the final dataset. These variables are coded as described below.

**Smokstatus_r**: For respondents who reported smoking at least 100 cigarettes in their entire life (smok100), those who reported smoking everyday (smoknow) were recoded as “current everyday smokers”, those who reported smoking some days were recoded as “current some day smokers”, and those who reported not smoking at all were recoded as “former smokers”. Respondents who answered no to smoking at least 100 cigarettes in their entire life were recoded as “never smokers”. Those who answered “don’t know” or “refused” to smoknow or smok100 were recoded as “unknown”.

**Smokstatus2_r**: This recode combines levels from variable smokstatus_r. Those recoded as “current everyday smokers” and “current some day smokers” were combined into “current everyday or some day smokers.” Those recoded as “former smokers” and “never smokers” were combined into “never smoker or former smoker.” Those recoded “unknown” remained “unknown.”

**Smokever_r**: If respondents answered “yes” to question “Have you ever smoked 100 cigarettes in your entire life?”(smokever), recoded “yes”. If respondents answered “no”, recoded “no”. Missing values, “don’t know” and “unknown” responses were recoded “unknown.”

**Mentholcigs2_r**: This recode is non-missing for current smokers, defined as respondents who reported smoking at least 100 cigarettes in their entire life (smok100) and currently smoke everyday or some days (smoknow). Current smokers who reported smoking menthol cigarettes during past 30 days (mentholcigs2) were recoded “yes”. Else if they reported not smoking menthol cigarettes during the past 30 days, they were recoded “no”. Current smokers with missing, “don’t know” and “refused” responses were recoded as “unknown.”

**Cigflavor_r**: This recode is non-missing for current smokers, defined as respondents who reported smoking at least 100 cigarettes in their entire life (smok100) and currently smoke everyday or some days (smoknow). Current smokers who reported smoking flavored cigarettes during past 30 days (cigflavor) were recoded “yes”. Else if they reported not smoking flavored cigarettes during the past 30 days, they were recoded “no”. Current smokers with missing, “don’t know” and “refused” responses were recoded as “unknown.”

**Sltever2_r**: If respondents answered “yes” to question “Have you ever tried chewing tobacco, snuff, or dip, even just one time in your entire life?”(sltever2), recoded “yes”. If respondents answered “no”, recoded “no”. Missing values, “don’t know” and “unknown” responses were recoded “unknown.”

**Currentslt_r**: This recode is non-missing for respondents who answered “yes” or “no” to question “Have you ever tried chewing tobacco, snuff, or dip…?” (sltever2). Respondents who reported 1-30 days of chewing tobacco, snuff, or dip use (sltnodays) were recoded as “yes”, respondents who answered “none” were recoded as “no” and “don’t know” and “refused” responses were recoded as “unknown.”

**Snusever_r**: If respondents answered “yes” to question “Have you ever tried snus, even just one time in your entire life?” (snusever), recoded “yes”. If respondents answered “no”, recoded “no”. Missing values, “don’t know” and “unknown” responses were recoded “unknown.”

**Cigarever_r**: If respondents answered “yes” to question “Have you ever tried smoking cigars, cigarillos, or very small cigars in your entire life, even one or two puffs?” (cigarever), recoded “yes”. If respondents answered “no”, recoded “no”. Missing values, “don’t know” and “unknown” responses were recoded “unknown.”

**Currentcigar_r**: This recode is non-missing for respondents who answered “yes” or “no” to question “Have you ever tried smoking cigars, cigarillos, or very small cigars that look like cigarettes in your entire life?” (cigarever). Respondents who reported 1-30 days of cigar use (cigarnodays) were recoded as “yes”, respondents who answered “none” were recoded as “no”, and “don’t know” and “refused” responses were recoded as “unknown.”

**Pipewtrever_r**: If respondents answered “yes” to question “Have you ever tried smoking tobacco in a water pipe in your entire life, even one or two puffs?” (pipewtrever), recoded “yes”. If respondents answered “no”, recoded “no”. Missing values, “don’t know” and “unknown” responses were recoded “unknown.”

**Pipeothever_r**: If respondents answered “yes” to question “Have you ever tried smoking tobacco in a pipe other than a water pipe in your entire life, even one or two puffs?” (pipeothever), recoded “yes”. If respondents answered “no”, recoded “no”. Missing values, “don’t know” and “unknown” responses were recoded “unknown.”

**Qtlineawr_r**: Non-users of tobacco (qtlineawrnt) and users (qtlineawrt) were asked “Are you aware of any telephone quitline services that are available to help people quit using tobacco?” Those who responded “yes” for variable qtlineawrnt or qtlineawrt were recoded “yes.” Those who responded “no” for variable qtlineawrnt or qtlineawrt were recoded as “no”. Else respondents were recoded as “unknown.”

**Qtattempt_r**: This recode is non-missing for current smokers, defined as respondents who reported smoking at least 100 cigarettes in their entire life (smok100) and currently smoke everyday or some days (smoknow). Current smokers who reported 1-76 times stopped smoking for one day or longer (qt12mos) were recoded as “yes”, those who answered “none” were recoded as “no”, and “don’t know” and “refused” were recoded as “unknown.”

**Qteffect_r**: Respondents who answered “yes” to at least one of the following questions: “The last time you tried to quit smoking, did you call a telephone quitline?” (qtline), “The last time you tried to quit smoking, did you use a class or program, to help you quit?” (qtclasspgm), “The last time you tried to quit smoking, did you use one-on-one counseling from a health professional to help you quit?” (qtcounsl), or “The last time you tried to quit smoking, did you use any of the following medications…?” (qtmed2) were recoded “yes”. If respondents answered “no” to all above questions, recoded “no”. Else respondents were recoded as missing.

**Qtwant_r**: This recode is non-missing for current smokers, defined as respondents who reported smoking at least 100 cigarettes in their entire life (smok100) and currently smoke everyday or some days (smoknow). Current smokers who reported wanting to quit smoking cigarettes for good (qtwant) were recoded “yes”. Else if they reported not wanting to quit smoking cigarettes for good, they were recoded “no”. Missing, “don’t know” and “refused” responses were recoded as “unknown.”

**Hcwaskadv_r**: If respondents answered “yes” to questions “In the past 12 months did any doctor, dentist, nurse, or other health professional advise you to quit smoking cigarettes or using any other tobacco products?” (hcwadvise2) or “In the past 12 months, did any doctor, dentist, nurse, or other health professional ask if you smoke cigarettes or use any other tobacco products?” (hcwask) then respondents were recoded “yes.” If respondents answered “no” to both above questions or “no” to hcwask then respondents were recoded as “no.” Else respondents were recoded as “unknown.”

**Homerules2_r**: When asked “Not counting decks, porches, or garages, inside your home is smoking…?” (homerules2), respondents who answered “Always allowed” were recoded as “Always allowed.” Those who responded “Allowed only at some times or in some places” were recoded as “Allowed only at some times or in some places” and those who responded “Never allowed” were recoded as “Never allowed.” Missing values, “don’t know” and “unknown” responses were recoded “unknown.”

**Worksmokind_r**: When asked “At your workplace, is smoking in indoor areas…?” (worksmokind), respondents who answered “Always allowed” were recoded as “Always allowed.” Those who responded “Allowed only at some times or in some places” were recoded as “Allowed only at some times or in some places” and those who responded “Never allowed” were recoded as “Never allowed.” Missing values remained coded as missing values and “don’t know” and “unknown” responses were recoded “unknown.”

**Worksmokout_r**: When asked “At your workplace, is smoking in outdoor areas…?” (worksmokout), respondents who answered “Always allowed” were recoded as “Always allowed.” Those who responded “Allowed only at some times or in some places” were recoded as “Allowed only at some times or in some places” and those who responded “Never allowed” were recoded as “Never allowed.” Missing values remained coded as missing values and “don’t know” and “unknown” responses were recoded “unknown.”

**Shsvehpol_r**: When asked “Not counting motocycles, in the vehicles that you or family members who live with you own or lease, is smoking …?” (shsvehpol), respondents who answered “Always allowed in all vehicles” were recoded as “Always allowed in all vehicles.” Those who responded “Sometimes allowed in at least one vehicle” were recoded as “Sometimes allowed in at least one vehicle” and those who responded “Never allowed in any vehicle” were recoded as “Never allowed in any vehicle.” Missing values, “don’t know,” “Respondent's family does not own or lease a vehicle,” and “unknown” responses were recoded “unknown.”

The following 14 variables are used in the weighing process:
SEQNO_C: this is the ID variable, a unique identifier for each respondent
STATERES: 2 digit state abbreviation
STATE_FIPS: State FIPS code
STRATUM: Identifies the stratum. The strata are combinations of county group and phone type
GEOSTRS_SAMP: County group—some states have only 1 county group
DENSTRS_SAMP: Phone type (1=listed, 2=unlisted, 9=cell)
CELL: indicates cell phone
IMP_EDUCATION: imputed education variable used in poststratification
IMP_MARITIAL: imputed marital variable used in poststratification
IMP_RACE: imputed race variable used in poststratification
IMP_GENDER: imputed gender variable used in poststratification
IMP_AGE_CAT: imputed age category variable used in poststratification
WT_NATIONAL: Weight used for making national estimates
WT_STATE: Weight used for making state estimates—state with 200 or more cell phone respondents use both landline and cell phone respondents, whereas, states with less than 200 cell phone respondents only use landline respondents
WT_LANDLINE: Weight that uses only landline respondents

# Formats

The weights will be delivered in a SAS data set containing one record for each respondent. In additional to weight variables, the imputed poststratification categories will be included.
The following are the formats for the various levels of the imputed poststratification variables.

```
proc format;
 value imp_age_catf
 1="18-24"
 2="25-34"
 3="35-44"
 4="45-54"
 5="55-64"
 6="65+";
 value imp_genderf
 1="Male"
 2="Female";
 value imp_racef
 1="White only(non-Hispanic)"
 2="Black only(non-Hispanic)"
 3="Hispanic"
 4="Other";
 value imp_maritalf
 1="Married"
 2="Divorced"
 3="Widowed"
 4="Other";
 value imp_education
 1="Less then HS degree"
 2="HS degree"

 4="BS or higher";
run;
```

# References

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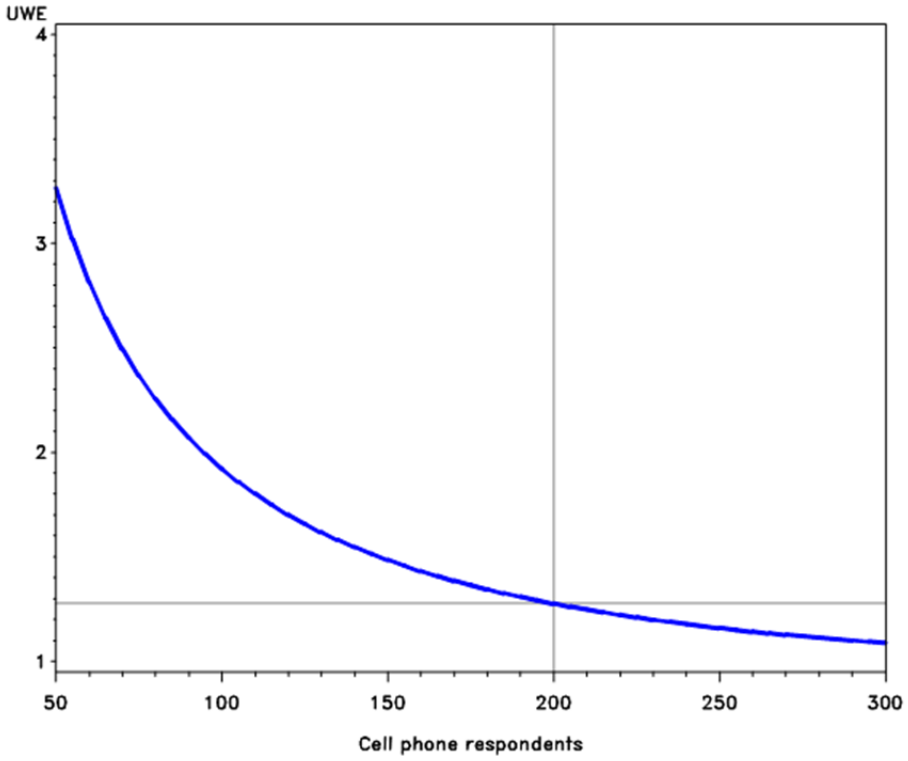
# Appendix A: Cutoff of 200 cell phone respondents

For states with very few cell phone respondents, including cell phone respondents would result in large unequal weighting effects, and consequently, large variance for population estimates. For example, In Alaska there were only 13 cell phone respondents and 20% of Alaskans are cell phone only. Consequently, if we included cell phones, we would use 13 respondents to make estimates on 20% of the population of Alaska. The resulting unequal weighting effect (UWE) exclusively attributed to this disproportionate sampling of cell phones would be 6.3. This UWE will be multiplied by the other causes of UWE resulting in a huge UWE and poor precision of population estimates. To avoid this problem we do not include cell phone respondents when we make state level estimates for Alaska.

We are tasked with creating a cutoff point when we will accept the increase in variance, from the under sample of cell phones to avoid the coverage error from excluding cell phones. We choose 200. This number is arbitrary, as any cutoff will be, but, it is not without good reason. Each state has a different distribution of cell-only and landline population members. But, if a state had 1,863 total respondents and 27% cell-only population percentage then the graph below displays the increase in UWE attributed exclusively to the disproportionate sampling of cell phones as a result of sampling cell phones as the number of cell phones goes from 50 to 300. Consequently, selecting a lower bound of 200 limits the increase in UWE to about 1.28. In this example the UWE is only the UWE attributed to the disproportionate sampling of cell phone only and landline subjects. That is, it does not account for the other sources of UWE.



# Appendix B: Initial weights

| State FIPS | Geographical stratum | Phone type Listed=1; unlisted=2; cell=9 | n selected | Frame count | WT1 | Unknown adjustment | WT1 with Unknown adjustment |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 15,957 | 1,353,056 | 84.8 | 0.408 | 34.6 |
| 1 | 1 | 2 | 24,753 | 3,146,019 | 127.1 | 0.028 | 3.6 |
| 1 | 1 | 9 | 3,503 | 9,010,000 | 2572.1 | 0.097 | 249.1 |
| 2 | 2 | 1 | 4,876 | 94,337 | 19.3 | 0.580 | 11.2 |
| 2 | 2 | 2 | 26,024 | 753,303 | 28.9 | 0.078 | 2.3 |
| 2 | 2 | 9 | 594 | 1,586,000 | 2670.0 | 0.086 | 229.4 |
| 4 | 3 | 1 | 11,068 | 1,199,738 | 108.4 | 0.464 | 50.3 |
| 4 | 3 | 2 | 25,292 | 4,022,899 | 159.1 | 0.056 | 8.8 |
| 4 | 3 | 9 | 4,723 | 7,476,000 | 1582.9 | 0.182 | 288.4 |
| 5 | 4 | 1 | 18,648 | 695,778 | 37.3 | 0.463 | 17.3 |
| 5 | 4 | 2 | 32,862 | 1,840,991 | 56.0 | 0.030 | 1.7 |
| 5 | 4 | 9 | 2,148 | 4,925,000 | 2292.8 | 0.101 | 231.3 |
| 6 | 5 | 1 | 10,818 | 6,294,268 | 581.8 | 0.448 | 260.6 |
| 6 | 5 | 2 | 28,512 | 24,875,620 | 872.5 | 0.086 | 75.1 |
| 6 | 5 | 9 | 44,593 | 45,938,000 | 1030.2 | 0.209 | 215.4 |
| 8 | 6 | 1 | 10,420 | 1,136,197 | 109.0 | 0.471 | 51.4 |
| 8 | 6 | 2 | 22,580 | 3,691,218 | 163.5 | 0.043 | 7.1 |
| 8 | 6 | 9 | 6,169 | 6,419,000 | 1040.5 | 0.195 | 202.4 |
| 9 | 7 | 1 | 15,357 | 1,065,623 | 69.4 | 0.464 | 32.2 |
| 9 | 7 | 2 | 22,593 | 2,350,477 | 104.0 | 0.037 | 3.8 |
| 9 | 7 | 9 | 4,458 | 4,104,000 | 920.6 | 0.176 | 161.8 |
| 10 | 8 | 9 | 1,166 | 1,153,000 | 988.9 | 0.154 | 152.4 |
| 10 | 9 | 1 | 2,972 | 41,987 | 14.1 | 0.472 | 6.7 |
| 10 | 9 | 2 | 3,748 | 80,231 | 21.4 | 0.050 | 1.1 |
| 10 | 10 | 1 | 7,571 | 149,352 | 19.7 | 0.437 | 8.6 |
| 10 | 10 | 2 | 13,189 | 389,120 | 29.5 | 0.036 | 1.1 |
| 10 | 11 | 1 | 3,448 | 69,002 | 20.0 | 0.472 | 9.5 |
| 10 | 11 | 2 | 4,022 | 123,141 | 30.6 | 0.067 | 2.0 |
| 11 | 12 | 1 | 11,739 | 153,894 | 13.1 | 0.392 | 5.1 |
| 11 | 12 | 2 | 40,491 | 795,506 | 19.6 | 0.027 | 0.5 |
| 11 | 12 | 9 | 875 | 1,494,000 | 1707.4 | 0.235 | 400.8 |
| 12 | 13 | 1 | 16,165 | 4,810,088 | 297.6 | 0.391 | 116.3 |
| 12 | 13 | 2 | 29,945 | 13,372,612 | 446.6 | 0.039 | 17.3 |
| 12 | 13 | 9 | 23,388 | 24,916,000 | 1065.3 | 0.175 | 186.5 |
| 13 | 14 | 9 | 11,685 | 14,560,000 | 1246.0 | 0.159 | 197.8 |
| 13 | 15 | 1 | 2,461 | 68,755 | 27.9 | 0.319 | 8.9 |
| 13 | 15 | 2 | 4,469 | 186,351 | 41.7 | 0.024 | 1.0 |
| 13 | 16 | 1 | 1,851 | 129,988 | 70.2 | 0.417 | 29.3 |
| 13 | 16 | 2 | 3,549 | 373,512 | 105.2 | 0.037 | 3.9 |
| 13 | 17 | 1 | 1,922 | 223,103 | 116.1 | 0.394 | 45.7 |
| 13 | 17 | 2 | 3,628 | 630,474 | 173.8 | 0.022 | 3.8 |
| 13 | 18 | 1 | 1,780 | 155,560 | 87.4 | 0.385 | 33.7 |
| 13 | 18 | 2 | 4,520 | 597,340 | 132.2 | 0.017 | 2.3 |
| 13 | 19 | 1 | 2,310 | 123,272 | 53.4 | 0.466 | 24.9 |
| 13 | 19 | 2 | 3,900 | 313,843 | 80.5 | 0.035 | 2.8 |

| State FIPS | Geographical stratum | Phone type Listed=1; unlisted=2; cell=9 | n selected | Frame count | WT1 | Unknown adjustment | WT1 with Unknown adjustment |
|---|---|---|---|---|---|---|---|
| 13 | 20 | 1 | 2,207 | 263,760 | 119.5 | 0.371 | 44.3 |
| 13 | 20 | 2 | 3,523 | 632,938 | 179.7 | 0.028 | 5.0 |
| 13 | 21 | 1 | 1,625 | 245,146 | 150.9 | 0.361 | 54.4 |
| 13 | 21 | 2 | 4,885 | 1,103,367 | 225.9 | 0.015 | 3.4 |
| 13 | 22 | 1 | 2,220 | 216,674 | 97.6 | 0.412 | 40.2 |
| 13 | 22 | 2 | 2,730 | 400,402 | 146.7 | 0.035 | 5.1 |
| 13 | 23 | 1 | 2,048 | 132,768 | 64.8 | 0.466 | 30.2 |
| 13 | 23 | 2 | 2,962 | 289,595 | 97.8 | 0.041 | 4.0 |
| 13 | 24 | 1 | 1,784 | 110,565 | 62.0 | 0.468 | 29.0 |
| 13 | 24 | 2 | 2,926 | 271,935 | 92.9 | 0.038 | 3.5 |
| 13 | 25 | 1 | 2,297 | 154,751 | 67.4 | 0.442 | 29.8 |
| 13 | 25 | 2 | 2,683 | 273,046 | 101.8 | 0.045 | 4.6 |
| 13 | 26 | 1 | 1,923 | 111,513 | 58.0 | 0.482 | 27.9 |
| 13 | 26 | 2 | 2,427 | 212,272 | 87.5 | 0.034 | 3.0 |
| 13 | 27 | 1 | 2,192 | 139,654 | 63.7 | 0.423 | 27.0 |
| 13 | 27 | 2 | 2,938 | 281,774 | 95.9 | 0.036 | 3.4 |
| 13 | 28 | 1 | 1,520 | 34,062 | 22.4 | 0.516 | 11.6 |
| 13 | 28 | 2 | 2,860 | 95,938 | 33.5 | 0.048 | 1.6 |
| 13 | 29 | 1 | 1,930 | 60,959 | 31.6 | 0.486 | 15.4 |
| 13 | 29 | 2 | 5,649 | 150,747 | 26.7 | 0.048 | 1.3 |
| 13 | 30 | 1 | 1,784 | 83,876 | 47.0 | 0.514 | 24.2 |
| 13 | 30 | 2 | 2,956 | 212,942 | 72.0 | 0.051 | 3.7 |
| 13 | 31 | 1 | 1,764 | 95,530 | 54.2 | 0.443 | 24.0 |
| 13 | 31 | 2 | 3,426 | 278,913 | 81.4 | 0.031 | 2.5 |
| 13 | 32 | 1 | 1,790 | 88,063 | 49.2 | 0.441 | 21.7 |
| 13 | 32 | 2 | 4,000 | 295,437 | 73.9 | 0.030 | 2.2 |
| 15 | 33 | 1 | 11,133 | 186,839 | 16.8 | 0.422 | 7.1 |
| 15 | 33 | 2 | 42,627 | 1,072,851 | 25.2 | 0.053 | 1.3 |
| 15 | 33 | 9 | 1,757 | 1,566,000 | 891.3 | 0.264 | 235.2 |
| 16 | 34 | 1 | 9,723 | 315,850 | 32.5 | 0.461 | 15.0 |
| 16 | 34 | 2 | 21,417 | 1,035,850 | 48.4 | 0.041 | 2.0 |
| 16 | 34 | 9 | 1,908 | 2,117,000 | 1109.5 | 0.143 | 158.5 |
| 17 | 35 | 1 | 12,971 | 3,066,102 | 236.4 | 0.446 | 105.5 |
| 17 | 35 | 2 | 28,129 | 9,965,150 | 354.3 | 0.032 | 11.3 |
| 17 | 35 | 9 | 15,915 | 19,360,000 | 1216.5 | 0.146 | 178.2 |
| 18 | 36 | 1 | 10,777 | 1,818,823 | 168.8 | 0.507 | 85.5 |
| 18 | 36 | 2 | 17,243 | 4,358,395 | 252.8 | 0.031 | 7.7 |
| 18 | 36 | 9 | 7,874 | 9,020,000 | 1145.5 | 0.156 | 178.7 |
| 19 | 37 | 1 | 11,406 | 865,906 | 75.9 | 0.521 | 39.5 |
| 19 | 37 | 2 | 22,314 | 2,535,694 | 113.6 | 0.019 | 2.2 |
| 19 | 37 | 9 | 3,805 | 5,039,000 | 1324.3 | 0.113 | 149.9 |
| 20 | 38 | 1 | 9,432 | 741,140 | 78.6 | 0.525 | 41.3 |
| 20 | 38 | 2 | 16,308 | 1,920,660 | 117.8 | 0.031 | 3.6 |
| 20 | 38 | 9 | 3,497 | 4,923,000 | 1407.8 | 0.087 | 122.3 |
| 21 | 39 | 1 | 12,283 | 1,159,487 | 94.4 | 0.493 | 46.5 |
| 21 | 39 | 2 | 21,137 | 2,980,215 | 141.0 | 0.030 | 4.2 |
| 21 | 39 | 9 | 5,413 | 6,705,000 | 1238.7 | 0.117 | 144.3 |
| 22 | 40 | 9 | 27,979 | 8,160,000 | 291.6 | 0.097 | 28.4 |

| State FIPS | Geographical stratum | Phone type Listed=1; unlisted=2; cell=9 | n selected | Frame count | WT1 | Unknown adjustment | WT1 with Unknown adjustment |
|---|---|---|---|---|---|---|---|
| 22 | 41 | 1 | 5,404 | 195,909 | 36.3 | 0.424 | 15.4 |
| 22 | 41 | 2 | 17,366 | 944,591 | 54.4 | 0.016 | 0.9 |
| 22 | 42 | 1 | 6,575 | 168,967 | 25.7 | 0.465 | 11.9 |
| 22 | 42 | 2 | 12,655 | 486,978 | 38.5 | 0.026 | 1.0 |
| 22 | 43 | 1 | 6,597 | 102,502 | 15.5 | 0.455 | 7.1 |
| 22 | 43 | 2 | 12,783 | 298,908 | 23.4 | 0.024 | 0.6 |
| 22 | 44 | 1 | 6,512 | 148,065 | 22.7 | 0.435 | 9.9 |
| 22 | 44 | 2 | 11,398 | 388,981 | 34.1 | 0.024 | 0.8 |
| 22 | 45 | 1 | 5,540 | 79,262 | 14.3 | 0.464 | 6.6 |
| 22 | 45 | 2 | 10,600 | 228,510 | 21.6 | 0.020 | 0.4 |
| 22 | 46 | 1 | 6,027 | 80,502 | 13.4 | 0.443 | 5.9 |
| 22 | 46 | 2 | 10,803 | 217,539 | 20.1 | 0.027 | 0.5 |
| 22 | 47 | 1 | 6,097 | 156,726 | 25.7 | 0.419 | 10.8 |
| 22 | 47 | 2 | 11,303 | 436,249 | 38.6 | 0.025 | 1.0 |
| 22 | 48 | 1 | 6,469 | 100,771 | 15.6 | 0.406 | 6.3 |
| 22 | 48 | 2 | 12,011 | 280,430 | 23.3 | 0.026 | 0.6 |
| 22 | 49 | 1 | 6,379 | 145,465 | 22.8 | 0.468 | 10.7 |
| 22 | 49 | 2 | 8,231 | 283,811 | 34.5 | 0.034 | 1.2 |
| 23 | 50 | 1 | 9,673 | 400,943 | 41.4 | 0.494 | 20.5 |
| 23 | 50 | 2 | 17,987 | 1,101,275 | 61.2 | 0.047 | 2.9 |
| 23 | 50 | 9 | 1,822 | 1,747,000 | 958.8 | 0.127 | 121.5 |
| 24 | 51 | 1 | 12,854 | 1,563,478 | 121.6 | 0.441 | 53.6 |
| 24 | 51 | 2 | 22,366 | 4,077,838 | 182.3 | 0.040 | 7.2 |
| 24 | 51 | 9 | 7,098 | 7,453,000 | 1050.0 | 0.188 | 197.8 |
| 25 | 52 | 1 | 12,820 | 1,996,144 | 155.7 | 0.471 | 73.3 |
| 25 | 52 | 2 | 18,200 | 4,240,129 | 233.0 | 0.033 | 7.8 |
| 25 | 52 | 9 | 8,364 | 9,044,000 | 1081.3 | 0.156 | 168.2 |
| 26 | 53 | 1 | 12,496 | 2,933,616 | 234.8 | 0.427 | 100.3 |
| 26 | 53 | 2 | 22,544 | 7,917,843 | 351.2 | 0.024 | 8.3 |
| 26 | 53 | 9 | 12,460 | 16,169,000 | 1297.7 | 0.130 | 169.3 |
| 27 | 54 | 1 | 9,871 | 1,486,305 | 150.6 | 0.512 | 77.1 |
| 27 | 54 | 2 | 18,749 | 4,228,188 | 225.5 | 0.028 | 6.3 |
| 27 | 54 | 9 | 6,531 | 7,398,000 | 1132.8 | 0.150 | 169.4 |
| 28 | 55 | 1 | 16,751 | 688,174 | 41.1 | 0.375 | 15.4 |
| 28 | 55 | 2 | 29,419 | 1,810,598 | 61.5 | 0.028 | 1.7 |
| 28 | 55 | 9 | 3,613 | 5,865,000 | 1623.3 | 0.073 | 117.7 |
| 29 | 56 | 1 | 10,195 | 1,665,251 | 163.3 | 0.508 | 83.0 |
| 29 | 56 | 2 | 16,595 | 4,061,560 | 244.7 | 0.036 | 8.9 |
| 29 | 56 | 9 | 7,372 | 8,151,000 | 1105.7 | 0.149 | 165.2 |
| 30 | 57 | 1 | 7,805 | 222,714 | 28.5 | 0.518 | 14.8 |
| 30 | 57 | 2 | 19,465 | 826,553 | 42.5 | 0.048 | 2.0 |
| 30 | 57 | 9 | 1,307 | 1,987,000 | 1520.3 | 0.072 | 109.1 |
| 31 | 58 | 1 | 11,043 | 454,837 | 41.2 | 0.531 | 21.9 |
| 31 | 58 | 2 | 23,667 | 1,460,663 | 61.7 | 0.022 | 1.4 |
| 31 | 58 | 9 | 2,200 | 2,932,000 | 1332.7 | 0.095 | 126.6 |
| 32 | 59 | 1 | 11,144 | 449,045 | 40.3 | 0.432 | 17.4 |
| 32 | 59 | 2 | 26,926 | 1,615,755 | 60.0 | 0.072 | 4.3 |
| 32 | 59 | 9 | 3,266 | 3,250,000 | 995.1 | 0.218 | 216.6 |

| State FIPS | Geographical stratum | Phone type Listed=1; unlisted=2; cell=9 | n selected | Frame count | WT1 | Unknown adjustment | WT1 with Unknown adjustment |
|---|---|---|---|---|---|---|---|
| 33 | 60 | 1 | 10,635 | 398,721 | 37.5 | 0.479 | 18.0 |
| 33 | 60 | 2 | 16,545 | 923,368 | 55.8 | 0.046 | 2.5 |
| 33 | 60 | 9 | 1,763 | 1,862,000 | 1056.2 | 0.110 | 116.0 |
| 34 | 61 | 1 | 24,695 | 2,255,431 | 91.3 | 0.443 | 40.5 |
| 34 | 61 | 2 | 51,685 | 7,080,669 | 137.0 | 0.047 | 6.5 |
| 34 | 61 | 9 | 78,380 | 11,830,000 | 150.9 | 0.148 | 22.4 |
| 35 | 62 | 1 | 11,299 | 376,304 | 33.3 | 0.437 | 14.6 |
| 35 | 62 | 2 | 26,351 | 1,304,660 | 49.5 | 0.048 | 2.4 |
| 35 | 62 | 9 | 2,516 | 2,750,000 | 1093.0 | 0.167 | 182.2 |
| 36 | 63 | 1 | 12,631 | 4,575,154 | 362.2 | 0.461 | 166.8 |
| 36 | 63 | 2 | 26,549 | 14,371,041 | 541.3 | 0.045 | 24.2 |
| 36 | 63 | 9 | 24,615 | 25,435,000 | 1033.3 | 0.198 | 205.1 |
| 37 | 64 | 1 | 11,707 | 2,405,509 | 205.5 | 0.454 | 93.3 |
| 37 | 64 | 2 | 20,153 | 6,188,794 | 307.1 | 0.042 | 13.0 |
| 37 | 64 | 9 | 11,455 | 12,788,000 | 1116.4 | 0.160 | 178.1 |
| 38 | 65 | 1 | 10,488 | 178,662 | 17.0 | 0.571 | 9.7 |
| 38 | 65 | 2 | 24,132 | 611,216 | 25.3 | 0.028 | 0.7 |
| 38 | 65 | 9 | 883 | 1,738,000 | 1968.3 | 0.091 | 180.0 |
| 39 | 66 | 1 | 10,398 | 3,054,737 | 293.8 | 0.521 | 153.2 |
| 39 | 66 | 2 | 20,832 | 9,170,081 | 440.2 | 0.038 | 16.6 |
| 39 | 66 | 9 | 14,351 | 16,113,000 | 1122.8 | 0.160 | 179.1 |
| 40 | 67 | 1 | 18,005 | 916,510 | 50.9 | 0.503 | 25.6 |
| 40 | 67 | 2 | 32,305 | 2,463,593 | 76.3 | 0.047 | 3.5 |
| 40 | 67 | 9 | 28,254 | 6,109,000 | 216.2 | 0.113 | 24.5 |
| 41 | 68 | 1 | 7,739 | 778,542 | 100.6 | 0.516 | 51.9 |
| 41 | 68 | 2 | 19,351 | 2,909,148 | 150.3 | 0.055 | 8.3 |
| 41 | 68 | 9 | 4,860 | 4,620,000 | 950.6 | 0.211 | 201.0 |
| 42 | 69 | 1 | 16,852 | 3,587,338 | 212.9 | 0.521 | 110.9 |
| 42 | 69 | 2 | 26,888 | 8,582,049 | 319.2 | 0.051 | 16.2 |
| 42 | 69 | 9 | 15,861 | 15,949,000 | 1005.5 | 0.150 | 151.1 |
| 44 | 70 | 1 | 11,908 | 304,734 | 25.6 | 0.530 | 13.6 |
| 44 | 70 | 2 | 16,832 | 646,460 | 38.4 | 0.045 | 1.7 |
| 44 | 70 | 9 | 1,398 | 1,261,000 | 902.0 | 0.185 | 167.0 |
| 45 | 71 | 9 | 5,632 | 6,261,000 | 1111.7 | 0.146 | 162.1 |
| 45 | 72 | 1 | 4,924 | 129,319 | 26.3 | 0.498 | 13.1 |
| 45 | 72 | 2 | 7,616 | 301,657 | 39.6 | 0.039 | 1.6 |
| 45 | 73 | 1 | 4,935 | 252,199 | 51.1 | 0.474 | 24.2 |
| 45 | 73 | 2 | 7,545 | 579,981 | 76.9 | 0.033 | 2.5 |
| 45 | 74 | 1 | 4,512 | 249,242 | 55.2 | 0.503 | 27.8 |
| 45 | 74 | 2 | 7,428 | 614,959 | 82.8 | 0.043 | 3.5 |
| 45 | 75 | 1 | 5,311 | 143,344 | 27.0 | 0.490 | 13.2 |
| 45 | 75 | 2 | 8,999 | 365,514 | 40.6 | 0.048 | 1.9 |
| 45 | 76 | 1 | 5,189 | 84,071 | 16.2 | 0.503 | 8.1 |
| 45 | 76 | 2 | 8,791 | 215,810 | 24.5 | 0.048 | 1.2 |
| 45 | 77 | 1 | 5,372 | 108,613 | 20.2 | 0.497 | 10.0 |
| 45 | 77 | 2 | 10,678 | 326,215 | 30.6 | 0.041 | 1.2 |
| 45 | 78 | 1 | 4,740 | 157,239 | 33.2 | 0.461 | 15.3 |
| 45 | 78 | 2 | 8,550 | 426,317 | 49.9 | 0.040 | 2.0 |

| State FIPS | Geographical stratum | Phone type Listed=1; unlisted=2; cell=9 | n selected | Frame count | WT1 | Unknown adjustment | WT1 with Unknown adjustment |
|---|---|---|---|---|---|---|---|
| 45 | 79 | 1 | 4,973 | 70,898 | 14.3 | 0.467 | 6.7 |
| 45 | 79 | 2 | 9,307 | 200,872 | 21.6 | 0.057 | 1.2 |
| 46 | 80 | 1 | 10,159 | 215,449 | 21.2 | 0.522 | 11.1 |
| 46 | 80 | 2 | 25,031 | 791,278 | 31.6 | 0.020 | 0.6 |
| 46 | 80 | 9 | 1,104 | 1,602,000 | 1451.1 | 0.105 | 151.8 |
| 47 | 81 | 1 | 13,116 | 1,718,449 | 131.0 | 0.453 | 59.4 |
| 47 | 81 | 2 | 20,784 | 4,088,561 | 196.7 | 0.029 | 5.7 |
| 47 | 81 | 9 | 7,819 | 9,003,000 | 1151.4 | 0.180 | 207.6 |
| 48 | 82 | 1 | 15,817 | 5,576,892 | 352.6 | 0.387 | 136.6 |
| 48 | 82 | 2 | 29,153 | 15,392,508 | 528.0 | 0.031 | 16.4 |
| 48 | 82 | 9 | 28,696 | 34,521,000 | 1203.0 | 0.179 | 215.2 |
| 49 | 83 | 1 | 10,418 | 507,525 | 48.7 | 0.495 | 24.1 |
| 49 | 83 | 2 | 20,422 | 1,492,375 | 73.1 | 0.038 | 2.8 |
| 49 | 83 | 9 | 3,203 | 3,343,000 | 1043.7 | 0.177 | 184.3 |
| 50 | 84 | 1 | 8,003 | 184,063 | 23.0 | 0.531 | 12.2 |
| 50 | 84 | 2 | 16,117 | 549,729 | 34.1 | 0.056 | 1.9 |
| 50 | 84 | 9 | 894 | 843,000 | 943.0 | 0.104 | 98.3 |
| 51 | 85 | 9 | 9,697 | 10,694,000 | 1102.8 | 0.167 | 184.2 |
| 51 | 86 | 1 | 2,731 | 313,760 | 114.9 | 0.510 | 58.6 |
| 51 | 86 | 2 | 3,779 | 647,340 | 171.3 | 0.053 | 9.1 |
| 51 | 87 | 1 | 3,144 | 565,530 | 179.9 | 0.519 | 93.4 |
| 51 | 87 | 2 | 6,366 | 1,732,370 | 272.1 | 0.033 | 8.9 |
| 51 | 88 | 1 | 2,682 | 369,060 | 137.6 | 0.532 | 73.3 |
| 51 | 88 | 2 | 4,128 | 848,142 | 205.5 | 0.041 | 8.5 |
| 51 | 89 | 1 | 2,702 | 375,428 | 138.9 | 0.453 | 63.0 |
| 51 | 89 | 2 | 4,708 | 984,117 | 209.0 | 0.031 | 6.5 |
| 51 | 90 | 1 | 2,748 | 440,018 | 160.1 | 0.488 | 78.1 |
| 51 | 90 | 2 | 5,232 | 1,251,769 | 239.3 | 0.036 | 8.6 |
| 53 | 91 | 1 | 9,724 | 1,512,291 | 155.5 | 0.479 | 74.4 |
| 53 | 91 | 2 | 21,026 | 4,896,262 | 232.9 | 0.049 | 11.3 |
| 53 | 91 | 9 | 8,197 | 7,838,000 | 956.2 | 0.221 | 211.0 |
| 54 | 92 | 1 | 9,651 | 442,605 | 45.9 | 0.531 | 24.4 |
| 54 | 92 | 2 | 15,519 | 1,066,514 | 68.7 | 0.075 | 5.2 |
| 54 | 92 | 9 | 2,448 | 2,235,000 | 913.0 | 0.117 | 107.0 |
| 55 | 93 | 1 | 10,109 | 1,710,594 | 169.2 | 0.523 | 88.4 |
| 55 | 93 | 2 | 16,021 | 4,061,045 | 253.5 | 0.027 | 6.8 |
| 55 | 93 | 9 | 7,097 | 8,704,000 | 1226.4 | 0.100 | 122.6 |
| 56 | 94 | 1 | 8,522 | 113,289 | 13.3 | 0.494 | 6.6 |
| 56 | 94 | 2 | 21,028 | 414,717 | 19.7 | 0.043 | 0.9 |
| 56 | 94 | 9 | 743 | 1,601,000 | 2154.8 | 0.063 | 135.0 |