Chapter 4.
Accuracy of the Microdata Sample Estimates

INTRODUCTION

The data contained in this product are based on the Census 2000 sample. The data summarized from these files are estimates of the actual figures that would have been obtained from a complete count. Estimates derived from the census sample files are expected to differ from the 100-percent figures because they are subject to sampling and nonsampling errors. Sampling error in data arises from the selection of people and housing units included in the sample. Nonsampling error affects both sample and 100-percent data and is introduced as a result of errors that may occur during the data collection and processing phases of the census. This chapter provides a detailed discussion of both types of errors and a description of the estimation procedures.

In the Public Use Microdata Samples (PUMS), the basic unit is an individual housing unit and the people who live in occupied housing units or group quarters. However, microdata records in these samples do not contain names or addresses. A more detailed discussion of methods to protect confidentiality of individual responses follows.

CONFIDENTIALITY OF THE DATA

The Census Bureau has modified or suppressed some data in this data release to protect confidentiality. Title 13, United States Code, Section 9, prohibits the Census Bureau from publishing results in which an individual can be identified. The Census Bureau's internal Disclosure Review Board sets the confidentiality rules for all data releases. A checklist approach is used to ensure that all potential risks to the confidentiality of the data are considered and addressed.

Title 13, United States Code. Title 13 of the United States Code authorizes the Census Bureau to conduct censuses and surveys. Section 9 of the same Title requires that any information collected from the public under the authority of Title 13 be maintained as confidential. Section 214 of Title 13 and Sections 3559 and 3571 of Title 18 of the United States Code provide for the imposition of penalties of up to 5 years in prison and up to $250,000 in fines for wrongful disclosure of confidential census information.

Disclosure limitation. Disclosure limitation is the process for protecting the confidentiality of data. A disclosure of data occurs when someone can use published or released statistical information to identify an individual who provided information under a pledge of confidentiality. Using disclosure limitation procedures, the Census Bureau modifies or removes the characteristics that put confidential information at risk for disclosure. Although it may appear that the PUMS files show information about a specific individual, the Census Bureau has taken steps to disguise the original data while making sure the results are still useful. The techniques used by the Census Bureau to protect confidentiality in tabulations vary, depending on the type of data.

Data swapping. Data swapping is a method of disclosure limitation designed to protect confidentiality in data (the number or percentage of the population with certain characteristics). Data swapping is done by editing the source data or exchanging records for a sample of cases. A sample of households is selected and matched on a set of selected key variables with households in neighboring geographic areas that have similar characteristics. Because the swap often occurs within a neighboring area, there is usually no effect on the marginal totals for the area or for totals that include data from multiple areas. Data swapping procedures were first used in the 1990 census and were also used for Census 2000.

Since microdata records are the actual housing unit and person records, the Census Bureau takes further steps to prevent the identification of specific individuals, households, or housing units. The main disclosure avoidance method used is to limit the geographic detail shown in the files. A

minimum threshold of 10,000 for the national population was set for identification of groups within categorical variables in the state level PUMS files. A geographic area must have a minimum of 100,000 population to be fully identified in the 5 percent file, and 400,000 for the 1 percent sample file. Furthermore, certain variables are topcoded, or the actual values of the characteristics are replaced by a descriptive statistic, such as the mean.

ERRORS IN THE DATA

Statistics in this data product are based on a sample. Therefore, they may differ somewhat from 100-percent figures that would have been obtained if all housing units, people within those housing units, and people living in group quarters had been enumerated using the same questionnaires, instructions, enumerators, and so forth. The sample estimate also would differ from other samples of housing units, people within those housing units, and people living in group quarters. The deviation of a sample estimate from the average of all possible samples is called the sampling error. The standard error of a sample estimate is a measure of the variation among the estimates from all possible samples. Thus, it measures the precision with which an estimate from a particular sample approximates the average result of all possible samples. The sample estimate and its estimated standard error permit the construction of interval estimates with prescribed confidence that the interval includes the average result of all possible samples. The method of calculating standard errors and confidence intervals for the data in this product appears in the section called "Calculation of Standard Errors".

In addition to the variability that arises from the sampling procedures, both sample data and 100percent data are subject to nonsampling error. Nonsampling error may be introduced during any of the various complex operations used to collect and process census data. For example, operations such as editing, reviewing, or handling questionnaires may introduce error into the data. A detailed discussion of the sources of nonsampling error is given in the section on "Nonsampling Error" in this chapter.

Nonsampling error may affect the data in two ways: errors that are introduced randomly will increase the variability of the data and, therefore, should be reflected in the standard error; errors that tend to be consistent in one direction will make both sample and 100-percent data biased in that direction. For example, if respondents consistently tend to underreport their incomes, then the resulting counts of households or families by income category will tend to be understated for the higher income categories and overstated for the lower income categories. Such systematic biases are not reflected in the standard error.

Limitations of the Group Quarters Data

By definition, universes that include the total population include both the household population and the group quarters population. For example, the universe defined as the population 15 years and over includes all people 15 years and over in both households and group quarters.

In previous censuses and in Census 2000, allocation rates for demographic characteristics (such as age, sex, and race) of the group quarters population were similar to those for the total population. However, allocation rates for sample characteristics, such as school enrollment, educational attainment, income, and veteran status for the institutionalized and noninstitutionalized group quarters population have been substantially higher than those for the household population since at least the 1960 Census. A review of the Census 2000 allocation rates for sample characteristics indicated that this trend continued.

Although allocation rates for sample characteristics are higher for the group quarters population, it is important to include the group quarters population in the total population universe. In most areas, the group quarters population represents a small proportion of the total population. As a result, the higher allocation rates associated with the group quarters population have minimal impact on the sample characteristics for the area of interest. In areas where the group quarters population represents a larger percentage of the total population, the Census Bureau cautions data users about the impact higher allocation rates may have on the sample characteristics.

As shown by the allocation rates, in some geographic areas and for some characteristics of interest, a significant amount of data was not reported. These data were assigned using accepted survey methods to account for missing data. In assigning these missing data, the Census Bureau uses data from similar population groups, such as similar types of group quarters. These methods attempt to minimize the effect of missing data. The Census Bureau advises users to review the characteristics for reasonableness and assess the usability of these data.

Calculation of Standard Errors

Totals and percentages. Tables A through E, at the end of this chapter, contain the necessary information for calculating standard errors of sample estimates in this data product. To calculate the standard error, it is necessary to know:

1. The unadjusted standard error for the characteristic (given in Tables A and C for estimated totals from the 5- or the 1-percent sample, respectively, or Tables B and D for estimated percentages from the 5- or the 1-percent sample, respectively) that would result under a simple random sample design of people, housing units, households, or families.

2. The design factor for the geography and the particular characteristic estimated based on the sample design and estimation techniques employed to produce long form data estimates (given in Table E).

The design factor is the ratio of the estimated standard error to the standard error of a simple random sample. The design factors reflect the effects of the actual sample design and the complex ratio estimation procedure used for the Census 2000 sample data.

Note: Design factors for the U.S. and for individual states (including the District of Columbia and Puerto Rico) are included in Table E. Use the state level design factors for estimates at the state level and below. Use the U.S. design factors for all estimates that cross state boundaries.

3. The estimated number of people, housing units, households, or families in the geographic area tabulated.

Use the steps given below to calculate the standard error of an estimated total or percentage contained in this product. A percentage is defined here as a ratio of a numerator to a denominator multiplied by 100 where the numerator is a subset of the denominator. For example, the percentage of Black or African American teachers is the ratio of Black or African American teachers to all teachers multiplied by 100.

1. Obtain the unadjusted standard error from Table A, B, C, or D (or use the formula given below each table) for the estimated total or percentage, respectively.

2. Use Table E to obtain the appropriate design factor, based on the characteristic (Employment status, School enrollment, etc.) and the geography.

3. Multiply the unadjusted standard error by this design factor.

The unadjusted standard errors of zero estimates or of very small estimated totals or percentages will approach zero. This is also the case for very large percentages or estimated totals that are close to the size of the publication areas to which they correspond. Nevertheless, these estimated totals and percentages are still subject to sampling and nonsampling variability, and an estimated standard error of zero (or a very small standard error) is not appropriate. For estimated percentages that are less than 2 or greater than 98, use the unadjusted standard errors in Tables B and D that appear in the "2 or 98" row. For an estimated total using the 5 percent sample that is less than 50 or within 50 of the total size of the publication area, use an unadjusted standard error of 138. For an estimated total using the 1 percent sample that is less than 50 or within 50 of the total size of the publication area, use an unadjusted standard error of 314.

Examples using Tables A through E are given in the section titled "Using Tables to Compute Standard Errors and Confidence Intervals."

Sums and differences. The standard errors estimated from Tables A, B, C, and D are not directly applicable to sums of and differences between two sample estimates. To estimate the standard error of a sum or difference, the tables are to be used somewhat differently in the following three situations:

1. For the sum of, or difference between, a sample estimate and a 100-percent value use the standard error of the sample estimate. The complete count value is not subject to sampling error.

2. For the sum of or difference between two sample estimates, the appropriate standard error is approximately the square root of the sum of the two individual standard errors squared; that is, for standard errors $SE(\hat{X})$ and $SE(\hat{Y})$ of estimates $\hat{X}$ and $\hat{Y}$, respectively:

$$SE(\hat{X} + \hat{Y}) = SE(\hat{X} - \hat{Y}) = \sqrt{[SE(\hat{X})]^2 + [SE(\hat{Y})]^2}$$

This method is, however, an approximation as the two estimates of interest in a sum or a difference are likely to be correlated. If the two quantities X and Y are positively correlated, this method underestimates the standard error of the sum of $\hat{X}$ and $\hat{Y}$ and overestimates the standard error of the difference between the two estimates. If the two estimates are negatively correlated, this method overestimates the standard error of the sum and underestimates the standard error of the difference.

This method may also be used for the sum of or the difference between sample estimates from two censuses or from a census sample and another survey. The standard error for estimates not based on the Census 2000 sample must be obtained from an appropriate source outside of this chapter.

3. For the differences between two estimates, one of which is a subclass of the other, use the tables directly where the calculated difference is the estimate of interest. For example, to determine the estimate of non-Black or African-American teachers, subtract the estimate of Black or African-American teachers from the estimate of total teachers. To determine the standard error of the estimate of non-Black or African-American teachers, apply formula 1 or 3 directly. They are located beneath Tables A and C respectively.

Ratios. Frequently, the statistic of interest is the ratio of two variables, where the numerator is not a subset of the denominator. An example is the ratio of students to teachers in public elementary schools. (Note that this method cannot be used to compute a standard error for a sample mean.) The standard error of the ratio between two sample estimates is estimated as follows:

1. If the ratio is a proportion, then follow the procedure outlined for "totals and percentages."

2. If the ratio is not a proportion, then approximate the standard error using the formula:

$$SE\left(\frac{\hat{X}}{\hat{Y}}\right) = \left(\frac{\hat{X}}{\hat{Y}}\right) \sqrt{\frac{[SE(\hat{X})]^2}{\hat{X}^2} + \frac{[SE(\hat{Y})]^2}{\hat{Y}^2}}$$

Medians. The sampling variability of an estimated median depends on the form of the distribution and the size of its base. The standard error of an estimated median is approximated by constructing a 68-percent confidence interval. Estimate the 68-percent confidence limits of a median based on sample data using the following procedure.

1. Obtain the frequency distribution for the selected variable. Cumulate these frequencies to yield the base.

2. Determine the standard error from:

   a. the 5 percent sample of the estimate of 50 percent from the distribution using the formula:

$$SE(50 \text{ percent}) = \sqrt{\left(\frac{19}{\text{base}} \times 50^2\right)} \times \text{Design Factor}$$

b. the 1-percent sample of the estimate of 50 percent from the distribution using the formula:

$$\text{SE}(50 \text{ percent}) = \sqrt{\left(\frac{99}{\text{base}} \times 50^2\right)} \times \text{Design Factor}$$

3. Subtract from and add to 50 percent the standard error determined in step 2.

$$\text{p_lower} = 50 - \text{SE}(50 \text{ percent})$$

$$\text{p_upper} = 50 + \text{SE}(50 \text{ percent})$$

4. Determine the category in the distribution containing p_lower and the category in the distribution containing p_upper.

If p_lower and p_upper fall in the same category, follow the steps below. If p_lower and p_upper fall in different categories, go to step 7.

- Define A1 as the smallest value in that category.
- Define A2 to be the smallest value in the next (higher) category.
- Define C1 as the cumulative percent of units strictly less than A1.
- Define C2 as the cumulative percent of units strictly less than A2.

5. Use the following formulas with p_lower, p_upper, A1, A2, C1, and C2 to determine lower and upper bounds for a confidence interval about the median:

$$\text{Lower Bound} = \left[\frac{\text{p_lower} - \text{C1}}{\text{C2} - \text{C1}}\right] \times (\text{A2} - \text{A1}) + \text{A1}$$

$$\text{Upper Bound} = \left[\frac{\text{p_upper} - \text{C1}}{\text{C2} - \text{C1}}\right] \times (\text{A2} - \text{A1}) + \text{A1}$$

6. Divide the difference between the lower and upper bounds, determined in step 5, by two to obtain the estimated standard error of the estimated median:

$$\text{SE}(\text{median}) = \frac{\text{Upper Bound} - \text{Lower Bound}}{2}$$

7. For the category:

   a. containing p-lower, define the values A1, A2, C1, and C2 as described in step 4 above. Use these values and the formula in step 5 to obtain the Lower Bound.

   b. containing p-upper, define a new set of values for A1, A2, C1, and C2 as described in step 4. Use these values and the formula in step 5 to obtain the Upper Bound.

8. Use the lower bound and upper bound obtained in step 7 and the formula in step 6 to calculate the standard error of the estimated median.

Means. A mean is defined here as the average quantity of some characteristic (other than the number of people, housing units, households, or families) per person, housing unit, household, or family. For example, a mean could be the average annual income of females age 25 to 34. The standard error of a mean can be approximated by the formula below. Because of the approximation used in developing this formula, the estimated standard error of the mean obtained from this formula will generally underestimate the true standard error.

The formula for estimating the standard error of a mean, $\bar{x}$, from the 5-percent sample is:

$$\text{SE}(\bar{x}) = \sqrt{\left(\frac{19}{\text{base}} \times s^2\right)} \times \text{Design Factor}$$

The formula for estimating the standard error of a mean, $\bar{x}$, from the 1-percent sample is:

$$SE(\bar{x}) = \sqrt{\left(\frac{99}{\text{base}} \times s^2\right)} \times \text{Design Factor}$$

where s^2 is the estimated population variance of the characteristic and the base is the total number of units in the population. The population variance, s^2, may be estimated using data that has been grouped into intervals.

For this method, the range of values for the characteristic is divided into c intervals, where the lower and upper boundaries of interval j are L_j and U_j, respectively. Each person is placed into one of the c intervals such that the value of the characteristic is between L_j and U_j. The estimated population variance, s^2, is then given by:

$$s^2 = \sum_{j=1}^{c} p_j m_j^2 - (\bar{x})^2$$

where p_j is the estimated proportion of people in interval j (based on weighted data) and m_j is the midpoint of the jth interval, calculated as:

$$m_j = \frac{L_j + U_j}{2}.$$

If the cth interval is open-ended, (i.e., no upper interval boundary exists) then approximate m_c by:

$$m_c = \left(\frac{3}{2}\right) L_c.$$

The estimated sample mean, $\bar{x}$, can be obtained using the following formula:

$$\bar{x} = \sum_{j=1}^{c} p_j m_j.$$

Confidence intervals. A sample estimate and its estimated standard error may be used to construct confidence intervals about the estimate. These intervals are ranges that will contain the average value of the estimated characteristic that results over all possible samples, with a known probability.

For example, if all possible samples that could result under the Census 2000 sample design were independently selected and surveyed under the same conditions, and if the estimate and its estimated standard error were calculated for each of these samples, then:

a. 68-percent confidence interval.

   Approximately 68 percent of the intervals from one estimated standard error below the estimate to one estimated standard error above the estimate would contain the average result from all possible samples.

b. 90-percent confidence interval.

   Approximately 90 percent of the intervals from 1.645 times the estimated standard error below the estimate to 1.645 times the estimated standard error above the estimate would contain the average result from all possible samples.

c. 95-percent confidence interval.

   Approximately 95 percent of the intervals from two estimated standard errors below the estimate to two estimated standard errors above the estimate would contain the average result from all possible samples.

The average value of the estimated characteristic that could be derived from all possible samples either is or is not contained in any particular computed interval. Thus, the statement that the average value has a certain probability of falling between the limits of the calculated confidence interval cannot be made. Rather, one can say with a specified probability of confidence that the calculated confidence interval includes the average estimate from all possible samples.

Confidence intervals also may be constructed for the ratio, sum of, or difference between two sample estimates. First compute the ratio, sum, or difference. Next, obtain the standard error of the ratio, sum, or difference (using the formulas given earlier). Finally, form a confidence interval for this estimated ratio, sum, or difference as above. One can then say with specified confidence that this interval includes the ratio, sum, or difference that would have been obtained by averaging the results from all possible samples.

Calculating the confidence interval from the standard error. To calculate the lower and upper bounds of the 90 percent confidence interval around an estimate using the standard error, multiply the standard error by 1.645, then add and subtract the product from the estimate.

$$\text{Lower bound} = \text{Estimate} - (\text{Standard Error} \times 1.645)$$

$$\text{Upper bound} = \text{Estimate} + (\text{Standard Error} \times 1.645)$$

Limitations. Be careful when computing and interpreting confidence intervals. The estimated standard errors given in this chapter do not include all portions of the variability because of nonsampling error that may be present in the data. In addition to sampling variance, the standard errors reflect the effect of simple response variance, but not the effect of correlated errors introduced by enumerators, coders, or other field or processing personnel. Thus, the standard errors calculated represent a lower bound of the total error. As a result, confidence intervals formed using these estimated standard errors might not meet the stated levels of confidence (i.e., 68, 90, or 95 percent). Thus, be careful interpreting the data in this data product based on the estimated standard errors.

A standard sampling theory text should be helpful if the user needs more information about confidence intervals and nonsampling errors.

Zero or small estimates; very large estimates. The value of almost all Census 2000 characteristics is greater than or equal to zero by definition. The method given previously for calculating confidence intervals relies on large sample theory and may result in negative values for zero or small estimates, which are not admissible for most characteristics. In this case, the lower limit of the confidence interval is set to zero by default. A similar caution holds for estimates of totals that are close to the population total and for estimated proportions near one, where the upper limit of the confidence interval is set to its largest admissible value. In these situations, the level of confidence of the adjusted range of values is less than the prescribed confidence level.

Using Tables to Calculate Standard Errors and Confidence Intervals

Two methods for estimating standard errors of estimated totals and percentages are described in this section. The first method is very simple. This method uses standard errors that have been calculated for specific sizes of estimated totals and percentages given in Tables A through D, presented later in this section. The estimated standard errors shown in Tables A through D were calculated assuming simple random sampling while the microdata sample (and the census sample) were selected using a systematic sampling procedure. The numbers shown in Table E, referred to as design factors, are defined as the ratio of the standard error from the actual sample design to the standard error from a simple random sample.

The standard errors in Tables A through D used in conjunction with the appropriate design factors from Table E produce a reasonable measure of reliability for microdata sample estimates. A second, alternative methodology by which more precise standard errors can be obtained requires additional data processing and file manipulation. This method uses the formulas directly. The trade off is an increase in precision for more data processing. Given the technology available today, the second method is preferable and strongly recommended. However, the standard error tables may be very useful in producing acceptable approximations of the standard errors. On the other hand, for many statistics, particularly from detailed cross-tabulations, standard errors using the second method are applicable to a wider variety of statistics, such as means and ratios.

To produce standard error estimates, one obtains (1) the unadjusted standard error for the characteristic that would result from a simple random sample design (of people, families, or housing units) and estimation methodology; and (2) a design factor, which partially reflects the effects of the actual sample design and estimation procedure used for the Census 2000 public use microdata samples for the geography and the particular characteristic estimated. The design factors provided in this chapter are based on computations from the full census sample and, as such, do not reflect the additional stratification used in the selection of the public use microdata samples (see Chapter 5). In general, these factors provide conservative estimates of the standard error. In addition, these factors only pertain to individual data items (e.g., educational attainment, employment status) and are not entirely appropriate for use with detailed cross-tabulated data. To calculate the approximate standard error of an estimate from the 5-percent or 1-percent sample follow the steps given below.

1. Obtain the unadjusted standard error for the sampling rate used from Table A or C for estimated totals or from Table B or D for estimated percentages. Alternately, the formula given at the bottom of each table may be used to calculate the unadjusted standard error (for sample sizes other than 5- or 1-percent see the subsampling section).

In using Table A or C, or the corresponding formulas for estimated totals, use weighted figures rather than unweighted sample counts to select the appropriate row. To select the applicable column for person characteristics, use the total population in the area being tabulated (not just the total of the universe being examined), or use the total count of housing units if the estimated total is a housing unit characteristic. Similarly, in using Table B or D, or the corresponding formula for estimated percentages, use weighted figures to select the appropriate column.

2. Use Table E to obtain the design factor for the geography and the characteristic (e.g., place of work or educational attainment). If the estimate is a cross-tabulation of more than one characteristic, scan Table E for the appropriate factors and use the largest factor. Multiply the unadjusted standard error from step 1 by this design factor.

Note: All of the following examples use the 5-percent sample.

Example 1— Standard error of a total. Suppose we tally a 5-percent public use microdata sample for state A. Further, suppose that for county A, the sum of the PUMS weights for all people is 131,220.

The sum of the PUMS weights for those people who are age 16 years and over and in the civilian labor force is 59,948, which in the formula below is $\hat{Y}$.

The basic standard error for the estimated total is obtained from Table A, or from the formula given below Table A. To avoid interpolation, the use of the formula will be demonstrated here. The formula for the basic standard error, SE, for the 5-percent sample is:

$$SE\,(\hat{Y}) = \sqrt{19\,(\hat{Y})\left(1 - \frac{\hat{Y}}{N}\right)}$$

So, the basic standard error in example 1 is:

$$SE(59{,}948) = \sqrt{19(59{,}948)\left(1 - \frac{59{,}948}{131{,}220}\right)} \approx 787 \text{ People}$$

The standard error of the estimated 59,948 people 16 years and over who were in the civilian labor force is found by multiplying the basic standard error, 787, by the appropriate design factor (Employment Status) from Table E. Assume the design factor from Table E for employment status for state A is 1.2, thus the standard error is:

$$SE(59{,}948) = 787 \times 1.2 \approx 944 \text{ people}$$

Note that in this example the total weighted count of people in county A of 131,220 was used.

Example 2— Standard error of a percent. Suppose there are 95,763 people in county A in state A aged 16 years and over. The estimated percent of people 16 years and over who were in the civilian labor force, $\hat{p}$, is 62.6. The formula for the unadjusted standard error of a percentage given in Table B, is:

$$SE(\hat{p}) = \sqrt{\frac{19}{B}\hat{p}(100 - \hat{p})}$$

$$SE(62.6) = \sqrt{\frac{19}{95{,}763}62.6(100-62.6)} \approx 0.68 \text{ percentage points}$$

Therefore, the standard error for the estimated 62.6 percent of people 16 years and over, who were in the civilian labor force is 0.68 x 1.2 = 0.82 percentage points. Note that in this example the base, B, is defined as the weighted count of people 16 years old and over, 95,763.

A note of caution concerning numerical values is necessary. Standard errors of percentages derived in this manner are approximate. Calculations can be expressed to several decimal places, but to do so would indicate more precision in the data than is justifiable. Final results should contain no more than two decimal places when the estimated standard error is one percentage point (i.e. 1.00) or more.

Example 3— Computing a confidence interval. In example 1, the standard error of the 59,948 people 16 years and over in county A, in state A who were in the civilian labor force was approximately 944. Thus, a 90-percent confidence interval for this estimated total is:

$$[59{,}948 - (1.645 \times 944)] \text{ to } [59{,}948 + (1.645 \times 944)] \text{ or } [58{,}395,\ 61{,}501]$$

One can say that 90 percent of the intervals constructed from repeated samples of the same population will contain the value obtained by averaging all possible values.

Example 4— Computing a confidence interval for a sum or difference. Suppose the estimate of people in county B, age 16 years and over, who were in the civilian labor force was 69,314 and the estimated total number of people 16 years and over was 116,666. Further, suppose the population of county B was 225,225. Thus, the estimated percentage of people 16 years and over, who were in the civilian labor force is approximately 59.4 percent. The unadjusted standard error from Table B is approximately 0.63 percentage points. Assume Table E shows the design factor to be 1.2 for "Employment Status" for the state containing county B. Thus, the approximate standard error of the percentage (59.4 percent) is 0.63 x 1.2 = 0.76 percentage points.

Now, suppose that one wished to obtain the standard error of the difference between county A and county B of the percentage of people who were 16 years and over and who were in the civilian labor force. The difference in the percentages of interest for the two cities is:

$$62.6 - 59.4 = 3.2 \text{ percentage points.}$$

Using the results of the previous example:

$$SE(3.2) = SE(62.6-59.4) = \sqrt{(0.82)^2 + (0.76)^2} \approx 1.12 \text{ percentage points}$$

The 90-percent confidence interval for the difference is formed as before:

$$[3.20 - (1.645 \times 1.12] \text{ to } [3.20 + (1.645 \times 1.12] \text{ or } [1.36\%,\ 5.04\%]$$

One can say with 90-percent confidence that the interval includes the difference that would have been obtained by averaging the results from all possible samples.

When, as in this example, the interval does not include zero, one can conclude, again with 90-percent confidence, that the difference observed between the two counties for this characteristic is greater than can be attributed to sampling error.

Example 5— Computing the standard error and confidence interval for a ratio. For reasonably large samples, ratio estimates are approximately normally distributed, particularly for the census population. Therefore, if we can calculate the standard error of a ratio estimate, then we can form a confidence interval around the ratio.

Suppose that one wished to obtain the standard error of the ratio of the estimate of people who were 16 years and over and who were in the civilian labor force in county A to the estimate of people who were 16 years and over and who were in the civilian labor force in county B. The ratio of the two estimates of interest is:

$$59{,}948 \,/\, 69{,}314 \approx 0.86$$

$$\mathrm{SE}(0.86) = \left(\frac{59{,}948}{69{,}314}\right)\sqrt{\frac{(944)^2}{(59{,}948)^2} + \frac{(1{,}146)^2}{(69{,}314)^2}} \approx 0.02$$

Using the results above, the 90-percent confidence interval for this ratio would be:

$$[0.86 - (1.645 \times 0.02)] \text{ to } [0.86 + (1.645 \times 0.02)] \text{ or } [0.83, 0.89]$$

Example 6— Computing the standard error and confidence interval of a median. The following example shows the steps for calculating an estimated standard error and confidence interval for the median housing value in a hypothetical city, city C.

1. Suppose the design factor in Table E for the housing characteristic "Value" is 1.2 for the state containing city C.
2. Obtain the weighted frequency distribution for housing values in city C. The base is the sum of the weighted frequencies (4,227).

Table 1. Frequency Distribution and Cumulative Totals for Housing Value

Housing value	Frequency	Cumulative sum	Cumulative percent
Less than $50,000	1,548	1,548	36.62
$50,000 to $99,999	820	2,368	56.02
$100,000 to $149,999	752	3,120	73.81
$150,000 to $199,999	524	3,644	86.21
$200,000 to $299,999	300	3,944	93.30
$300,000 to $499,999	248	4,192	99.17
$500,000 or more	35	4,227	100.00

3. Determine the standard error of the estimate of 50 percent from the distribution:

$$\mathrm{SE}(50 \text{ percent}) = \sqrt{\left(\frac{19}{4{,}227} \times 50^2\right)} \times 1.2 \approx 4.02$$

4. Calculate a confidence interval with bounds:

$$\text{p_lower} = 50 - 4.02 = 45.98$$

$$\text{p_upper} = 50 + 4.02 = 54.02$$

From the given distribution, the category with the cumulative percent first exceeding 45.98 percent is $50,000 to $99,999. Therefore, A1 = $50,000. C1 is the cumulative percent of housing units with value less than $50,000. As a result, C1 = 36.62 percent.

The category with the cumulative percent that first exceeds 54.02 percent is also $50,000 to $99,999. A2 is the smallest value in the next (higher) category, resulting in A2 = $100,000. C2 is the cumulative percent of housing units with value less than $100,000. Thus, C2 = 56.02 percent.

5. Given the values obtained in earlier steps, calculate the lower and upper bounds of the confidence interval about the median:

$$\text{Lower Bound} = \left[\frac{45.98 - 36.62}{56.02 - 36.62}\right] \text{x } (\$100{,}000 - \$50{,}000) + \$50{,}000$$

$$\text{Upper Bound} = \left[\frac{54.02 - 36.62}{56.02 - 36.62}\right] \text{x } (\$100{,}000 - \$50{,}000) + \$50{,}000$$

The confidence interval is [$74,124, $94,845]

6. The estimated standard error of the median is:

$$\text{SE(median)} = \frac{\$94{,}845 - \$74{,}124}{2} \approx \$10{,}361$$

Example 7— Computing the standard error of a mean. This example shows the steps for calculating the standard error for the average commuting time for those who commute to work in a hypothetical city, city D. The frequency distribution is given in Table 2.

Table 2.Frequency Distribution for Travel Time to Work

Travel time to work	Frequency
Did not work at home:	**776,619**
Less than 5 minutes	14,602
5 to 9 minutes	69,066
10 to 14 minutes	107,161
15 to 19 minutes	138,187
20 to 24 minutes	139,726
25 to 29 minutes	52,879
30 to 34 minutes	120,636
35 to 39 minutes	19,751
40 to 44 minutes	25,791
45 to 59 minutes	50,322
60 to 89 minutes	29,178
90 or more minutes	9,320
Worked at home	**19,986**

1. Cumulating the frequencies over the 12 categories for those who commuted to work (i.e., did not work at home) yields the population count (base) of 776,619 workers age 16 years and over.

2. Find the midpoint m_j for each of the 12 categories. Multiply each category's proportion p_j by the square of the midpoint and sum this product over all categories.

For example, the midpoint of category 1 "Less than 5 minutes" is

$$m_1 = \frac{0+5}{2} = 2.5 \text{ minutes,}$$

while the midpoint of the 12th category "90 or more minutes" is

$$m_{12} = \left(\frac{3}{2}\right) 90 = 135 \text{ minutes.}$$

The proportion of units in the first category, p_1, is

$$p_1 = \frac{14{,}602}{776{,}619} = 0.019.$$

Necessary products for the standard error calculation are given in Table 3 along with totals.

Table 3.Calculations for Travel Time to Work

Travel time to work	p_j	m_j	$p_j m_j^2$	$p_j m_j$
Did not work at home:				
Less than 5 minutes	0.019	2.5	0.119	0.048
5 to 9 minutes	0.089	7	4.361	0.623
10 to 14 minutes	0.138	12	19.872	1.656
15 to 19 minutes	0.178	17	51.442	3.026
20 to 24 minutes	0.180	22	87.120	3.960
25 to 29 minutes	0.068	27	49.572	1.836
30 to 34 minutes	0.155	32	158.720	4.960
35 to 39 minutes	0.025	37	34.225	0.925
40 to 44 minutes	0.033	42	58.212	1.386
45 to 59 minutes	0.065	52	175.760	3.380
60 to 89 minutes	0.038	74.5	210.910	2.831
90 or more minutes	0.012	135	218.700	1.620
Total			**1069.013**	**26.251**

3. To estimate the mean commuting time for people in city D, multiply each category's proportion by its midpoint and sum over all categories in the universe. Table 3 shows an estimated mean travel time to work, $\bar{x}$, of 26 minutes.

4. Calculate the estimated population variance.

$$s^2 = 1069.013 - (26)^2 = 393.013$$

5. Assume the design factor for "Travel time to work" for the state containing city D is 1.3. Use this information and the results from steps 1 through 4 to calculate an estimated standard error for the mean as:

$$SE(\bar{x}) = \sqrt{\left(\frac{19}{776{,}619} \times 393.013\right)} \times 1.3 \approx 0.13 \text{ minutes.}$$

SELECTING AN APPROPRIATE SAMPLE SIZE

One virtue in the use of the Tables A through D for calculating standard errors and confidence intervals is that this method can be employed prior to making any sample tabulation, and thus, can help the user decide whether a 5-percent or 1-percent sample size is most appropriate for a proposed study.

Suppose that in example 1, the 59,948 figure was based on published census sample data. The confidence interval could be calculated as above. In this case, tabulating a 5-percent sample for this particular characteristic would result in a 90-percent confidence interval [58,395, 61,501]. The width of this interval is 3,106. Tabulating from a 1-percent sample for the same characteristic would result in a confidence interval of [56,404, 63,042]. The width of the interval from the 1-percent sample is 7,088 (over two times the width of the confidence interval from the 5-percent sample). A data user may find this information useful in deciding which sample to use.

Another criterion used in making this type of decision is the coefficient of variation (CV). The CV is a measure of reliability and is defined as the ratio of the standard error of the estimate and the absolute value of the expected value of the estimate. To get an estimate of the CV, substitute the estimate itself for the expected value in the CV formula. In this example, if the 59,948 estimate is obtained from the 5-percent sample, the CV would be 1.6 percent. If the 1-percent sample is tallied to get the estimate then the CV would be 3.6 percent. The smaller the CV, the more reliable the estimate. There is no particular rule of thumb that dictates how large a confidence interval or CV is acceptable. This depends on the relative precision necessary for a particular application as balanced against the relative cost of tabulating microdata samples of the various sizes.

USING TABLES A THROUGH D FOR OTHER SAMPLE SIZES

Tables A through D may also be used to approximate the unadjusted standard errors for other sample sizes by adjusting for the sample size desired. The adjustment for sample size is obtained as described below.

Let: f_1 be the sampling rate in any of the Tables A through D, and;
f_2 be the sampling rate for the sample size to be used. The adjustment for sample size can be read from the following table:

Standard Error Sample Size Adjustment Factors for Different Sampling Rates

f_1 = 0.05		f_1 = 0.01	
f_2	Adjustment factor	f_2	Adjustment factor
0.06	0.91	0.009	1.05
0.04	1.12	0.005	1.42
0.03	1.30	0.003	1.83
0.02	1.61	0.002	2.25

For example, if the user were to select a subsample of one half of a 1-percent sample, i.e., f_2 = 0.005, then the standard errors shown in Tables C or D for a 1-percent sample must be multiplied by 1.42 to obtain the standard errors for a 0.005 sample. The factor of 1.42 shows that the standard errors increase by 42 percent when the sample size is halved.

The principle is also applicable when combining microdata samples to achieve a sample size larger than 5 percent. If, for example, both samples are combined for the same area to obtain an estimate of a characteristic, the standard errors for this sample size (i.e., 6 percent) can be obtained by multiplying those shown in Tables A and B by 0.91. Thus, the increase from a 5-percent to a 6-percent sample reduces the standard error by 9 percent.

The formula used to compute the sample size adjustment factor is:

$$\text{Adjustment Factor} = \frac{\sqrt{\left(\frac{1}{f_2}\right) - 1}}{\sqrt{\left(\frac{1}{f_1}\right) - 1}}$$

Alternatively, the user may wish to use the following formulas to calculate the unadjusted standard errors directly. For estimated totals the formula is:

$$SE(\hat{Y}) = \sqrt{\left(\frac{1}{f_2} - 1\right)\hat{Y}\left(1 - \left(\frac{\hat{Y}}{N}\right)\right)}$$

where:
N = size of geographic area, and;
$\hat{Y}$ = estimate (weighted) of characteristic total.

Example 1 shows the unadjusted standard error for the figure 59,948 to be 787. Using the above formula with f_2= 0.06 yields an unadjusted standard error of 714 for a 9-percent reduction in the standard error as shown in the above table.

For an estimated percentage the formula is:

$$SE(\hat{Y}) = \sqrt{\left(\frac{1}{f_2} - 1\right)\left(\frac{\hat{p}(100 - \hat{p})}{B}\right)}$$

where:
$\hat{p}$ = estimated percentage, and;
B = base of estimated percentage (weighted estimate).

ESTIMATION OF STANDARD ERRORS DIRECTLY FROM THE MICRODATA SAMPLES

Use of tables or formulas to derive approximate standard errors as discussed above is simple and does not complicate processing. Nonetheless, a more accurate estimate of the standard error can be obtained from the samples themselves, using the random group method. Using this method it is also possible to compute standard errors for mean ratios, indexes, correlation coefficients, or other statistics for which the tables or formulas presented earlier do not apply.

The random group method does increase processing time somewhat since it requires that the statistic of interest, for example a total, be computed separately for each of up to 100 random groups. The variability of that statistic for the sample as a whole is estimated from the variability of the statistic among the various random groups within the sample. The procedure for calculating a standard error by the random group method for various statistics is given below.

Totals. To obtain the standard errors of estimated totals the following method should be used. The random groups estimate of variance of $\hat{X}$ is given by:

$$\text{var}(\hat{X}) = \left(\frac{t}{t-1}\right)\sum_{g=1}^{t}\left[X_g - \frac{1}{t}\left(\sum_{g=1}^{t} x_g\right)\right]^2$$

or the computational formula:

$$\text{var}(\hat{X}) = \left(\frac{t}{t-1}\right)\sum_{g=1}^{t} x_g^2 - t\bar{x}_g^2$$

where:
t = number of random groups, and;
x_g = the weighted microdata sample total of the characteristic of interest from the gth random group.

$$\bar{x}_g = \sum_{g=1}^{t}\frac{x_g}{t}$$

$$\text{SE}(\hat{X}) = \sqrt{\text{var}(\hat{X})}$$

It is suggested that t = 100 for estimating the standard error of a total since, as it is discussed in the next chapter, each of the sample records was assigned a two-digit subsample number sequentially from 00 to 99. The two-digit number can be used to form 100 random groups.

For example, a sample case with 01 as the two-digit number will be in random group 1. All sample cases with 02 as the two-digit number will be in random group 2, etc., up to 00 as the one hundredth random group. The reliability of the random group variance estimator is a function of both the kurtosis of the estimator and the number of groups, t. If t is small, the coefficient of variation (CV) will be large, and therefore, the variance estimator will be of low precision. In general, the larger t is, the more reliable the variance estimator will be.

Percentages, ratios, and means. To obtain the estimated standard error of a percent, ratio, or mean, the following method should be used.

Let

$\hat{r} = \frac{\hat{x}}{\hat{y}}$ be the estimated percent ratio, or mean where:

$\hat{x}$ and $\hat{y}$ = the estimated totals as defined above for the X and Y characteristics.

For the case where both the numerator and the denominator are obtained from the full microdata sample (i.e. the file was not subsampled) then the variance of is given by

$$\text{var}(\hat{r}) = \left(\frac{t}{t-1}\right)\left(\frac{1}{\hat{y}}\right)^2\sum_{g=1}^{t}(x_g - \hat{r}\,y_g)^2$$

where:
t and x_g are defined above,
$\hat{y}$ = the weighted full microdata sample total for the y characteristic, and;
y_g = the corresponding weighted total for the gth random group.

CORRELATION COEFFICIENTS, REGRESSION COEFFICIENTS AND COMPLEX STATISTICS

The random group method for computing the variance of correlation coefficients, regression coefficients, and other complex nonlinear statistics may be expressed as:

$$\text{var}(\hat{A}) = \left(\frac{t}{t-1}\right) \sum_{g=1}^{t} (\hat{A}_g - \hat{A})^2$$

where:
$\hat{A}_g$ = the weighted estimate (at the tabulation area level) of the statistic of interest computed from the gth random group, and;
$\hat{A}$ = corresponding weighted estimate computed from the full microdata sample.

Care must be exercised when using this variance estimator for complex nonlinear statistics as its properties have not been fully explored for such statistics. In particular, the choice of the number of random groups must be considered more carefully. When using the 5-percent sample, use of t=100 for all areas tabulated is recommended. When using the 1-percent sample or samples having a smaller sampling fraction, the user should consider using a smaller number of random groups to ensure that each random group contains at least 25 records. Fewer than 100 random groups can be formed by appropriate combination of the two-digit subsample numbers. For example, to construct 50 random groups assign all records in which the subsample number is 01 or 51 to the first random group; all records in which the subsample number is 02 or 52 to the second random group, etc. Finally, assign all records in which the subsample number is 00 or 50 to random group 50. Ten random groups can be constructed by including all records having subsample numbers with the same "units" digit in a particular random group. For example, subsample numbers 00,10,...,90 would form one random group; subsample numbers 01,11,...,91 would form a second random group, etc.

STANDARD ERRORS FOR SMALL ESTIMATES

Percentage estimates of zero and estimated totals of zero are subject to both sampling and nonsampling error. While the magnitude of the error is difficult to quantify, users should be aware that such estimates are nevertheless subject to both sampling and nonsampling error even though in the case of zero estimates the corresponding random groups estimate of variance will be zero.

Also, the standard error estimates obtained using the random groups method do not include all components of the variability due to nonsampling error that may be present in the data. Therefore, the standard errors calculated using the methods described in this section represent a lower bound for the total error. Data users should be aware that, in general, confidence intervals formed using these estimated standard errors do not meet the stated levels of confidence. Data users are advised to be conservative when making inferences from the data provided in this data product.

NONSAMPLING ERROR

In any large-scale statistical operation, such as Census 2000, human and processing errors occur. These errors are commonly referred to as nonsampling errors. Such errors include: not enumerating every household or every person in the population, failing to obtain all required information from the respondents, obtaining incorrect or inconsistent information, and recording information incorrectly. In addition, errors can occur during the field review of the enumerators' work, during clerical handling of the census questionnaires, or during the electronic data capturing and processing of the questionnaires.

While it is impossible to completely eliminate nonsampling error from an operation as large and complex as the decennial census, the Census Bureau attempts to control the sources of such error during the data collection and processing operations. The primary sources of nonsampling error and the programs instituted to control this error in Census 2000 are described below. The success of these programs, however, was contingent upon how well the instructions were actually carried out during the census.

Types of Nonsampling Error

Nonresponse. Nonresponse to particular questions on the census questionnaire or the failure to obtain any information for a housing unit allows for the introduction of bias into the data because the characteristics of the nonrespondents have not been observed and may differ from those reported by respondents. As a result, any imputation procedure using respondent data may not completely reflect these differences either at the elemental level (individual person or housing unit) or on average. As part of the data processing, people and/or housing units for which sample data were not collected may have their data imputed to ensure a sufficient number of sample people/housing units in a given area. As a result, the imputation rates for some small geographic areas, such as tracts, may be very high. The Census Bureau cautions data users about the impact the higher imputation rates may have on the sample characteristics. Some protection against the introduction of large biases is afforded by minimizing nonresponse. Characteristics for the nonresponses were imputed by using reported data for a person or housing unit with similar characteristics.

Respondent and enumerator error. The person answering the mail questionnaire for a household or responding to the questions posed by an enumerator could serve as a source of error, although the question wording was extensively tested in several experimental studies prior to the census. The mail respondent may overlook or misunderstand a question, or answer a question in a way that cannot be interpreted correctly by the data capture system. Also, the enumerator may: misinterpret or otherwise incorrectly record information given by a respondent, fail to collect some of the information for a person or household, or collect data for households that were not designated as part of the sample. Enumerators were monitored carefully to minimize these types of field enumeration problems. Field staff was prepared for their tasks by using standardized training packages that included hands-on experience with census materials. A sample of the households interviewed by each enumerator was reinterviewed to control for the possibility of fabricated data being submitted by enumerators.

Processing error. The many phases involved in processing the census data represent potential sources for the introduction of nonsampling error. The processing of the census questionnaires completed by enumerators included field review by the crew leader, check-in, and transmittal of completed questionnaires. No field reviews were done on the mail return questionnaires. Error may also be introduced by the misinterpretation of data by the data capture system, or the failure to capture all the information that the respondents or enumerators provided on the forms. Write-in entries go through coding operations, which may also be a source of processing error in the data. Many of the various field, coding, and computer operations undergo a number of quality control checks to help ensure their accurate application.

Reduction of Nonsampling Error

A number of techniques were implemented during the census planning and development stages to reduce various types of nonsampling errors. Quality assurance methods were used throughout the data collection and processing phases of the census to improve the quality of the data. In addition, the Census Bureau implemented a reinterview program to minimize errors in the data-collection phase for enumerator-filled questionnaires.

Several initiatives were implemented during Census 2000 to minimize the undercoverage of population and housing units and to reduce costs. These programs were developed based on experience from the 1990 decennial census and results from the Census 2000 testing cycle. They included:

- Be Counted questionnaires—unaddressed forms requesting all short form data and a few additional items - were available in public locations for people who believed they were not otherwise counted.
- An introductory letter was sent to all Mailout/Mailback addresses and many addresses in Update/Leave areas prior to the mailing of the census form. A reminder postcard was also sent to these addresses.

- Forms in Spanish and other languages were mailed to those who requested them by returning the introductory letter.
- A well-publicized, toll-free telephone number was available to answer questions about the census forms. Responses from people in households who received a short form could be taken over the telephone.
- Under the Local Update of Census Addresses (LUCA) program, local officials had the opportunity to address specific concerns about the accuracy and completeness of the Master Address File before mailings began.

Resolving Multiple Responses

There were multiple modes of response for Census 2000. Because there were various ways people could initiate their enumeration in the census it was very likely that some people could be enumerated more than once. A special computer process was implemented to control this type of nonsampling error by resolving situations where more than one form was received from a particular housing unit, as designated by its identification (ID). The process consisted of several steps. IDs that had more than one viable returned census form were analyzed to create a household roster. Within each of these IDs, the person records on each return were compared with person records on the other return(s). People included on two or more different returns were marked as such, and only one of the person records was used in the creation of the household roster.

EDITING OF UNACCEPTABLE DATA

The objective of the processing operation was to produce a set of data that describes the population as accurately and clearly as possible. In a major change from past practice, the information on Census 2000 questionnaires generally was not edited for consistency, completeness, or acceptability during field data collection or data capture operations. Census crew leaders and local office clerks reviewed enumerator-filled questionnaires for adherence to specified procedures. Unlike previous censuses, mail return questionnaires were not subjected to clerical review and households were not contacted to collect missing data.

Most census questionnaires received by mail from respondents as well as those filled by enumerators were processed through a new contractor-built image scanning system that used optical mark and character recognition to convert the responses into computer files. The optical character recognition, or OCR, process used several pattern and context checks to estimate accuracy thresholds for each write-in field. The system also used "soft edits" on most interpreted numeric write-in responses to decide whether the field values read by the machine interpretation were acceptable. If the value read had a lower than acceptable accuracy threshold or was outside the soft edit range, the image of the item was displayed to a keyer who then entered the response.

To control the possible creation of erroneous people from questionnaires containing stray marks or completed incorrectly, the data capture system included an edit for the number of people indicated on each mail return and enumerator-filled questionnaire. If the edit failed, the questionnaire image was reviewed at a workstation by an operator. The operator identified erroneous person records and corrected OCR interpretation errors in the population count field.

At Census Bureau headquarters, the mail response data records were subjected to a computer edit that identified households exhibiting a possible coverage problem and those with more than six household members - the maximum number of people who could be enumerated on a mail questionnaire. Attempts were made to contact these households on the telephone to correct the count inconsistency and to collect census data for those people for whom there was no room on the questionnaire.

Incomplete or inconsistent information on the questionnaire data records was assigned acceptable values using imputation procedures during the final automated edit of the collected data. As in previous censuses, the general procedure for changing unacceptable entries was to assign an entry for a person that was consistent with entries for people with similar characteristics. Assigning acceptable codes in place of blanks or unacceptable entries enhances the usefulness of the data.

Another way in which corrections were made during the computer editing process was substitution. Substitution assigned a full set of characteristics for people in a household. If there was an indication that a household was occupied by a specified number of people but the questionnaire contained no information for people within the household, or if the occupants were not listed on the questionnaire, the Census Bureau selected a previously accepted household of the same size with the same demographic characteristics and substituted its full set of characteristics for this household.

USE OF ALLOCATION FLAGS IN THESE FILES

As a result of the editing there are no blank fields or missing data in public use microdata sample files. Each field contains a data value or a "not applicable" indicator, except for the few items where allocation was not appropriate and a "not reported" indicator is included. For every subject item it is possible for the user to differentiate between entries which were allocated, by means of "allocation flags" in the microdata files. For all items it is possible to compute the allocation rate and, if the rate is appreciable, compute the distribution of actually observed values (with allocated data omitted) and compare it with the overall distribution including allocated values. The allocation flags indicate the changes made between observed and final output values.

These flags may indicate up to four possible types of allocations:

a. **Pre-edit.** When the original entry was rejected because it fell outside the range of acceptable values.

b. **Consistency.** Imputed missing characteristics based on other information recorded for the person or housing unit.

c. **Hot Deck.** Supplied the missing information from the record of another person or housing unit.

d. **Cold Deck.** Supplied missing information from a predetermined distribution.

In general, the allocation procedures provide better data than could be obtained by simply weighting up the observed distribution to account for missing values. The procedures reflect local variations in characteristics as well as variations among the strata used in imputation. There are, however, certain circumstances where allocated data may introduce undesirable bias. It may be particularly important to analyze allocations of data in detailed studies of subpopulations or in statistics derived from cross-classification of variables, such as correlation coefficients or measures of regression. The degree of editing required was greater for some subjects than for others. While the allocation procedure was designed to yield appropriate statistics for the overall distribution or for specific subpopulations (the strata used in the allocation process), allocated characteristics will not necessarily have a valid relationship with other observed variables for the same individual. For example, consider a tabulation of people 80 years old and over by income. Income allocations were made separately for different age groupings, including the category 65 years old and over, but not separately for people 80 years old and over.

If people 65 to 70 or 75 are more likely to have significant earnings than people 80 or over, allocated income data for the latter group might be biased upward. Thus, if the rate of allocations for the group is appreciably large, and a bias in the allocated value is evident, it may be desirable to exclude allocated data from the analysis.

It should also be apparent from this illustration that knowledge of the specific allocation procedures is valuable in detailed subject analysis. Descriptions of the editing and allocation procedures for each item are being incorporated in the History of the 2000 Census of Population and Housing to be published later. A user may contact either the Population Division or Housing and Household Economic Statistics Division, Bureau of the Census, if more information is desired on the allocation scheme for a specific subject item.

Table A. Unadjusted Standard Errors for Estimated Totals from Census 2000 5-Percent PUMS

Estimated total[1]	Size of geographic area tabulated[2]							
	100,000	250,000	500,000	750,000	1,000,000	5,000,000	10,000,000	25,000,000
1,000	137	138	138	138	138	138	138	138
2,500	215	217	217	218	218	218	218	218
5,000	300	305	307	307	307	308	308	308
10,000	414	427	432	433	434	435	436	436
15,000	492	518	526	528	530	533	533	534
25,000	597	654	672	678	681	687	688	689
75,000	597	999	1,101	1,132	1,148	1,185	1,189	1,192
100,000		1,068	1,233	1,283	1,308	1,365	1,371	1,376
250,000			1,541	1,780	1,887	2,124	2,152	2,169
500,000				1,780	2,179	2,924	3,004	3,051
750,000					1,887	3,480	3,631	3,718
1,000,000						3,899	4,135	4,271
5,000,000							6,892	8,718
10,000,000								10,677

[1]For estimated totals larger than 10,000,000, the standard error is somewhat larger than the table values. The formula (1) given below should be used to calculate the standard error.

[2]Total count of people, housing units, households, or families in the area if the estimated total is a person, housing unit, household, or family characteristic, respectively.

$$SE(\hat{Y}) = \sqrt{19(\hat{Y})\left(1 - \frac{\hat{Y}}{N}\right)} \quad (1)$$

N = Size of geographic area

$\hat{Y}$ = Estimate of characteristic total

Table B. Unadjusted Standard Errors for Estimated Percentages from Census 2000 5-Percent PUMS (Standard Errors Expressed in Percentage Points)

Estimated percentage	Base (weighted total) of percentage[1]										
	1,000	1,500	2,500	5,000	7,500	10,000	25,000	50,000	100,000	250,000	500,000
2 or 98	1.9	1.6	1.2	0.9	0.7	0.6	0.4	0.3	0.2	0.1	0.1
5 or 95	3.0	2.5	1.9	1.3	1.1	1.0	0.6	0.4	0.3	0.2	0.1
10 or 90	4.1	3.4	2.6	1.8	1.5	1.3	0.8	0.6	0.4	0.3	0.2
15 or 85	4.9	4.0	3.1	2.2	1.8	1.6	1.0	0.7	0.5	0.3	0.2
20 or 80	5.5	4.5	3.5	2.5	2.0	1.7	1.1	0.8	0.6	0.3	0.2
25 or 75	6.0	4.9	3.8	2.7	2.2	1.9	1.2	0.8	0.6	0.4	0.3
30 or 70	6.3	5.2	4.0	2.8	2.3	2.0	1.3	0.9	0.6	0.4	0.3
35 or 65	6.6	5.4	4.2	2.9	2.4	2.1	1.3	0.9	0.7	0.4	0.3
50	6.9	5.6	4.4	3.1	2.5	2.2	1.4	1.0	0.7	0.4	0.3

[1]For a percentage and/or base of a percentage not shown in the table, use the formula (2) given below to calculate the standard error.

$$SE(\hat{p}) = \sqrt{\frac{19}{B}\hat{p}(100 - \hat{p})} \quad (2)$$

B = Base of estimated percentage

$\hat{p}$ = Estimated percentage

Table C. Unadjusted Standard Errors for Estimated Totals from Census 2000 1-Percent PUMS

Estimated total[1]	Size of geographic area tabulated[1]							
	100,000	250,000	500,000	750,000	1,000,000	5,000,000	10,000,000	25,000,000
1,000	313	314	314	314	314	315	315	315
2,500	491	495	496	497	497	497	497	497
5,000	686	696	700	701	702	703	703	703
10,000	944	975	985	988	990	994	994	995
15,000	1,123	1,181	1,200	1,206	1,209	1,217	1,218	1,218
25,000	1,362	1,492	1,533	1,547	1,553	1,569	1,571	1,572
75,000	1,362	2,280	2,512	2,585	2,621	2,704	2,715	2,721
100,000		2,437	2,814	2,929	2,985	3,115	3,131	3,140
250,000			3,518	4,062	4,308	4,849	4,912	4,950
500,000				4,062	4,975	6,675	6,857	6,965
750,000					4,308	7,944	8,287	8,487
1,000,000						8,899	9,439	9,749
5,000,000							15,732	19,900
10,000,000								24,372

[1]For estimated totals larger than 10,000,000, the standard error is somewhat larger than the table values. The formula (3) given below should be used to calculate the standard error.

[2]Total count of people, housing units, households, or families in the area if the estimated total is a person, housing unit, household, or family characteristic, respectively.

$$SE(\hat{Y}) = \sqrt{99(\hat{Y})\left(1 - \frac{\hat{Y}}{N}\right)} \quad (3)$$

N = Size of geographic area

$\hat{Y}$ = Estimate of characteristic total

Table D. Unadjusted Standard Errors for Estimated Percentages from Census 2000 1-Percent PUMS (Standard Errors Expressed in Percentage Points)

Estimated percentage	Base (weighted total) of percentage[1]										
	1,000	1,500	2,500	5,000	7,500	10,000	25,000	50,000	100,000	250,000	500,000
2 or 98	4.4	3.6	2.8	2.0	1.6	1.4	0.9	0.6	0.4	0.3	0.2
5 or 95	6.9	5.6	4.3	3.1	2.5	2.2	1.4	1.0	0.7	0.4	0.3
10 or 90	9.4	7.7	6.0	4.2	3.4	3.0	1.9	1.3	0.9	0.6	0.4
15 or 85	11.2	9.2	7.1	5.0	4.1	3.6	2.2	1.6	1.1	0.7	0.5
20 or 80	12.6	10.3	8.0	5.6	4.6	4.0	2.5	1.8	1.3	0.8	0.6
25 or 75	13.6	11.1	8.6	6.1	5.0	4.3	2.7	1.9	1.4	0.9	0.6
30 or 70	14.4	11.8	9.1	6.4	5.3	4.6	2.9	2.0	1.4	0.9	0.6
35 or 65	15.0	12.3	9.5	6.7	5.5	4.7	3.0	2.1	1.5	0.9	0.7
50	15.7	12.8	9.9	7.0	5.7	5.0	3.1	2.2	1.6	1.0	0.7

[1]For a percentage and/or base of a percentage not shown in the table, use the formula (4) given below to calculate the standard error.

$$SE(\hat{p}) = \sqrt{\frac{99}{B}\hat{p}(100 - \hat{p})} \quad (4)$$

B = Base of estimated percentage

$\hat{p}$ = Estimated percentage

Table E. Census 2000 PUMS Standard Error Design Factors—United States

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.2
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Alabama

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.1
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Alaska

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	1.9
Hispanic or Latino.	1.9
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.5
Residence in 1995	1.9
Year of entry	1.5
Language spoken at home and ability to speak English	1.3
Educational attainment	1.2
School enrollment	1.3
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.0
Subfamily type and presence of children	1.2
Grandparent status and responsibility for grandchild	1.3
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.1
Number of workers in family in 1999	1.2
Place of work	1.2
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.2
Private vehicle occupancy	1.3
Type of income in 1999	1.3
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.2
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.1
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Arizona

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.3
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.2
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.8
Language spoken at home and ability to speak English	1.6
Educational attainment	1.3
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.2
Family type	2.3
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.2
Industry	1.4
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.4
Means of transportation to work	1.4
Travel time to work	1.4
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.3
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.3
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Arkansas

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—California

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.3
Hispanic or Latino	2.3
Marital status	1.1
Household type and relationship	1.2
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	2.1
Year of entry	1.7
Language spoken at home and ability to speak English	1.6
Educational attainment	1.3
School enrollment	1.5
Type of residence (urban/rural)	1.7
Household type	1.2
Family type	2.4
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.3
Industry	1.4
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.4
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Colorado

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Connecticut

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.6
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.4
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.6
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Delaware

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.2
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	1.9
Year of entry	1.6
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.5
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. **Census 2000 PUMS Standard Error Design Factors—District of Columbia**

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	1.9
Hispanic or Latino	1.8
Marital status	1.2
Household type and relationship	1.2
Disabled and employment disability	1.3
Ancestry	1.6
Place of birth	1.5
Citizenship status	1.5
Residence in 1995	1.8
Year of entry	1.6
Language spoken at home and ability to speak English	1.6
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	N/A
Household type	1.2
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.3
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.3
Number of workers in family in 1999	1.2
Place of work	1.4
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.3
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	N/A
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.1
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.1
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.1
Mortgage status and selected monthly owner costs	1.1
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Florida

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.2
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.2
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.6
Educational attainment	1.3
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.2
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.2
Industry	1.4
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.4
Means of transportation to work	1.4
Travel time to work	1.4
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.3
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.2
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Georgia

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.2
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.9
Language spoken at home and ability to speak English	1.5
Educational attainment	1.3
School enrollment	1.5
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.3
Subfamily type and presence of children	1.4
Grandparent status and responsibility for grandchild	1.5
Employment status	1.2
Industry	1.4
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.4
Means of transportation to work	1.4
Travel time to work	1.4
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.3
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.8
Units in structure	1.1
Tenure	1.2
Occupancy status	1.5
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Hawaii

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.2
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.6
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.6
Language spoken at home and ability to speak English	1.6
Educational attainment	1.3
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.2
Family type	2.4
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.3
Industry	1.3
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.7
Units in structure	1.1
Tenure	1.2
Occupancy status	1.2
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.1
Plumbing facilities	1.1
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Idaho

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Illinois

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.2
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.6
Educational attainment	1.2
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.3
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Indiana

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.8
Units in structure	1.1
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Iowa

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.0
Subfamily type and presence of children	1.2
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.0
Occupancy status	1.4
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.1
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Kansas

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.8
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Kentucky

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	1.9
Hispanic or Latino	1.9
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Louisiana

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.6
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.1
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Maine

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	1.7
Hispanic or Latino	1.7
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.5
Residence in 1995	1.9
Year of entry	1.4
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.3
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.0
Subfamily type and presence of children	1.2
Grandparent status and responsibility for grandchild	1.3
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.3
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.6
Units in structure	1.1
Tenure	1.1
Occupancy status	1.1
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Maryland

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Massachusetts

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.6
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Michigan

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	1.2
Hispanic or Latino	2.0
Marital status	2.0
Household type and relationship	1.0
Disabled and employment disability	1.1
Ancestry	1.3
Place of birth	1.8
Citizenship status	1.4
Residence in 1995	1.6
Year of entry	1.9
Language spoken at home and ability to speak English	1.6
Educational attainment	1.4
School enrollment	1.2
Type of residence (urban/rural)	1.4
Household type	1.5
Family type	1.1
Subfamily type and presence of children	2.1
Grandparent status and responsibility for grandchild	1.2
Employment status	1.4
Industry	1.2
Occupation	1.3
Class of worker	1.2
Usual hours worked per week and weeks worked in 1999	1.3
Number of workers in family in 1999	1.2
Place of work	1.2
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.3
Household income in 1999	1.4
Family income in 1999	1.2
Poverty status in 1999 (people)	1.2
Poverty status in 1999 (families)	1.5
Military service and veteran status	1.2
HOUSING	
Age of householder	1.1
Race of householder	1.2
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	1.1
Units in structure	0.7
Tenure	1.0
Occupancy status	1.1
Value	1.3
Gross rent	1.1
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.1
Kitchen facilities	1.1
Plumbing facilities	0.9
House heating fuel	1.1
Telephone service available	1.2
Vehicles available	1.0
Year householder moved into unit	1.1
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Minnesota

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.8
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.3
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.0
Hispanic or Latino householder	1.0
Type of residence (urban/rural)	0.7
Units in structure	0.9
Tenure	1.0
Occupancy status	1.2
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.1
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.1
Year householder moved into unit	1.1
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Mississippi

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.8
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.3
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.0
Hispanic or Latino householder	1.0
Type of residence (urban/rural)	0.7
Units in structure	0.9
Tenure	1.0
Occupancy status	1.2
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.1
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.1
Year householder moved into unit	1.1
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Missouri

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.1
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Montana

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	1.9
Hispanic or Latino	1.9
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.5
Residence in 1995	1.9
Year of entry	1.3
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.0
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.1
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Nebraska

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.8
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.0
Hispanic or Latino householder	1.0
Type of residence (urban/rural)	0.8
Units in structure	0.9
Tenure	1.0
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.1
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.1
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.1
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Nevada

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.3
Hispanic or Latino	2.3
Marital status	1.1
Household type and relationship	1.2
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.6
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.7
Educational attainment	1.3
School enrollment	1.6
Type of residence (urban/rural)	1.5
Household type	1.2
Family type	2.3
Subfamily type and presence of children	1.4
Grandparent status and responsibility for grandchild	1.5
Employment status	1.3
Industry	1.4
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.3
Number of workers in family in 1999	1.3
Place of work	1.4
Means of transportation to work	1.4
Travel time to work	1.4
Time leaving home to go to work	1.4
Private vehicle occupancy	1.4
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.3
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.2
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.3
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—New Hampshire

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	1.9
Hispanic or Latino	1.9
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.6
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.3
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.1
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—New Jersey

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.2
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.6
Educational attainment	1.2
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.5
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—New Mexico

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.2
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.6
Language spoken at home and ability to speak English	1.5
Educational attainment	1.3
School enrollment	1.5
Type of residence (urban/rural)	1.8
Household type	1.1
Family type	2.3
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.4
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.4
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.8
Units in structure	1.1
Tenure	1.2
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.1
Plumbing facilities	1.2
House heating fuel	1.2
Telephone service available	1.2
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—New York

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.2
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.2
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.6
Educational attainment	1.3
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.2
Family type	2.3
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.1
Tenure	1.2
Occupancy status	1.4
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—North Carolina

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	1.9
Year of entry	1.9
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.8
Units in structure	1.1
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—North Dakota

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	1.9
Year of entry	1.9
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.8
Units in structure	1.1
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Ohio

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.6
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.2
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.3
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.0
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.1
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.1
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Oklahoma

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.5
Residence in 1995	1.8
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.2
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.3
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.2
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.1
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Oregon

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.6
Educational attainment	1.2
School enrollment	1.5
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Pennsylvania

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Rhode Island

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.1
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.1
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—South Carolina

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.1
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.2
Telephone service available	1.2
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—South Dakota

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	2.0
Hispanic or Latino	2.0
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.6
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.3
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.0
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.3
Employment status	1.1
Industry	.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.0
Hispanic or Latino householder	1.0
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.0
Occupancy status	1.2
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.2
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Tennessee

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.8
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.1
Tenure	1.1
Occupancy status	1.4
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Texas

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.3
Hispanic or Latino	2.2
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.9
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.6
Educational attainment	1.2
School enrollment	1.5
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.3
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.6
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.3
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Utah

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.3
Hispanic or Latino	2.3
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	2.0
Place of birth	1.5
Citizenship status	1.7
Residence in 1995	2.1
Year of entry	1.9
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.7
Household type	1.1
Family type	2.3
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.5
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.4
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.4
Means of transportation to work	1.4
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.4
Type of income in 1999	1.5
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.1
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Vermont

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	1.8
Hispanic or Latino	1.7
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.5
Residence in 1995	1.9
Year of entry	1.6
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.3
Type of residence (urban/rural)	1.4
Household type	1.1
Family type	2.0
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.3
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.1
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.4
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.6
Units in structure	1.0
Tenure	1.1
Occupancy status	1.4
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.1
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Virginia

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Washington

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.3
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.4
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	2.0
Year of entry	1.7
Language spoken at home and ability to speak English	1.5
Educational attainment	1.2
School enrollment	1.5
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.2
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.3
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.3
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.3
Family income in 1999	1.3
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.3
Military service and veteran status	1.2
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.2
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—West Virginia

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.2
Race	1.8
Hispanic or Latino	1.8
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.4
Citizenship status	1.5
Residence in 1995	1.9
Year of entry	1.5
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.3
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.3
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.2
Hispanic or Latino householder	1.2
Type of residence (urban/rural)	0.7
Units in structure	1.1
Tenure	1.1
Occupancy status	1.3
Value	1.2
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.1
Plumbing facilities	1.2
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Wisconsin

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.1
Hispanic or Latino	2.1
Marital status	1.1
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.8
Place of birth	1.5
Citizenship status	1.6
Residence in 1995	1.9
Year of entry	1.7
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.5
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.2
Grandparent status and responsibility for grandchild	1.4
Employment status	1.2
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.0
Hispanic or Latino householder	1.0
Type of residence (urban/rural)	0.7
Units in structure	1.0
Tenure	1.0
Occupancy status	1.4
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.1
Rooms, bedrooms	1.1
Kitchen facilities	0.9
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.0
Vehicles available	1.1
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.2
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Wyoming

Characteristic	Design factor
POPULATION	
Age	1.3
Sex	1.2
Race	2.0
Hispanic or Latino	2.1
Marital status	1.0
Household type and relationship	1.1
Disabled and employment disability	1.3
Ancestry	1.7
Place of birth	1.4
Citizenship status	1.5
Residence in 1995	1.9
Year of entry	1.5
Language spoken at home and ability to speak English	1.4
Educational attainment	1.2
School enrollment	1.4
Type of residence (urban/rural)	1.6
Household type	1.1
Family type	2.1
Subfamily type and presence of children	1.2
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.3
Occupation	1.2
Class of worker	1.3
Usual hours worked per week and weeks worked in 1999	1.2
Number of workers in family in 1999	1.2
Place of work	1.3
Means of transportation to work	1.3
Travel time to work	1.3
Time leaving home to go to work	1.3
Private vehicle occupancy	1.3
Type of income in 1999	1.4
Household income in 1999	1.2
Family income in 1999	1.2
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.2
Military service and veteran status	1.1
HOUSING	
Age of householder	1.2
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.8
Units in structure	1.0
Tenure	1.1
Occupancy status	1.3
Value	1.1
Gross rent	1.2
Household income in 1999	1.2
Year structure built	1.2
Rooms, bedrooms	1.2
Kitchen facilities	1.0
Plumbing facilities	1.1
House heating fuel	1.2
Telephone service available	1.1
Vehicles available	1.2
Year householder moved into unit	1.2
Mortgage status and monthly mortgage costs	1.1
Mortgage status and selected monthly owner costs	1.2
Gross rent as a percentage of household income in 1999	1.2
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.2

Table E. Census 2000 PUMS Standard Error Design Factors—Puerto Rico

Characteristic	Design factor
POPULATION	
Age	1.2
Sex	1.1
Race	1.9
Hispanic or Latino	1.6
Marital status	1.0
Household type and relationship	1.0
Disabled and employment disability	1.2
Ancestry	1.5
Place of birth	1.3
Citizenship status	1.5
Residence in 1995	1.8
Year of entry	1.4
Language spoken at home and ability to speak English	1.4
Educational attainment	1.1
School enrollment	1.3
Type of residence (urban/rural)	1.6
Household type	1.0
Family type	2.1
Subfamily type and presence of children	1.2
Grandparent status and responsibility for grandchild	1.4
Employment status	1.1
Industry	1.2
Occupation	1.1
Class of worker	1.2
Usual hours worked per week and weeks worked in 1999	1.1
Number of workers in family in 1999	1.1
Place of work	1.2
Means of transportation to work	1.2
Travel time to work	1.2
Time leaving home to go to work	1.2
Private vehicle occupancy	1.2
Type of income in 1999	1.3
Household income in 1999	1.1
Family income in 1999	1.1
Poverty status in 1999 (people)	1.5
Poverty status in 1999 (families)	1.1
Military service and veteran status	1.1
HOUSING	
Age of householder	1.1
Race of householder	1.1
Hispanic or Latino householder	1.1
Type of residence (urban/rural)	0.7
Units in structure	1.1
Tenure	1.1
Occupancy status	1.2
Value	1.1
Gross rent	1.1
Household income in 1999	1.1
Year structure built	1.1
Rooms, bedrooms	1.1
Kitchen facilities	1.1
Plumbing facilities	1.1
House heating fuel	1.1
Telephone service available	1.1
Vehicles available	1.1
Year householder moved into unit	1.1
Mortgage status and monthly mortgage costs	1.1
Mortgage status and selected monthly owner costs	1.1
Gross rent as a percentage of household income in 1999	1.1
Household income in 1999 by selected monthly owner costs as a percentage of income in 1999	1.1