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MEMORANDUM FOR Francis Grailand Hall
Division Chief, Administrative and Customer Services Division

From: Ruth Ann Killion
Division Chief, Demographic Statistical Methods Division

Subject: Survey of Income and Program Participation (SIPP) 2004 Panel: Source and Accuracy Statement for Wave 1 - Wave 12 (core) Public Use Files (S&A-9)[1]

Attached is the Source and Accuracy Statement for the twelve waves of the 2004 Survey of Income and Program Participation (SIPP).

Attachment

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[1] This source and accuracy statement can also be accessed through the U.S. Census Bureau website at http://www.census.gov/sipp/source.html .

# SOURCE AND ACCURACY STATEMENT FOR THE SURVEY OF INCOME AND PROGRAM PARTICIPATION 2004 WAVE 1 - WAVE 12 PUBLIC USE FILES

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## SOURCE AND ACCURACY STATEMENT FOR THE SURVEY OF INCOME AND PROGRAM PARTICIPATION 2004 WAVE 1 - WAVE 12 PUBLIC USE FILES[2]

### SOURCE OF DATA

**Source of Data**. The data were collected in the 2004 Panel of the Survey of Income and Program Participation (SIPP). The population represented in the 2004 SIPP (the population universe) is the civilian noninstitutionalized population living in the United States. The institutionalized population, which is excluded from the population universe, is composed primarily of the population in correctional institutions and nursing homes (91 percent of the 4.1 million institutionalized people in Census 2000).

The 2004 Panel of the SIPP sample is located in 351 Primary Sampling Units (PSUs), each consisting of a county or a group of contiguous counties. Of these 351 PSUs, 123 are self-representing (SR) and 228 are non-self-representing (NSR). SR PSUs have a probability of selection of one. NSR PSUs have a probability of selection of less than one. Within PSUs, housing units (HUs) were systematically selected from the master address file (MAF) used for the 2000 decennial census. To account for HUs built within each of the sample areas after the 2000 census, a sample containing clusters of four HUs was drawn from permits issued for construction of residential HUs up until shortly before the beginning of the panel. In jurisdictions that don't issue building permits or have incomplete addresses, we systematically sampled expected clusters of four HUs which were then listed by field personnel.

Sample households within a given panel are divided into four random subsamples of nearly equal size. These subsamples are called rotation groups and one rotation group is interviewed each month. Each household in the sample was scheduled to be interviewed at four-month intervals over a period of roughly four years beginning in February 2004. The reference period for the questions is the four-month period preceding the interview month. The most recent month is designated reference month 4, the earliest month is reference month 1. In general, one cycle of four interview months covering the entire sample, using the same questionnaire, is called a wave. For example, Wave 1 rotation group 1 of the 2004 Panel was interviewed in February 2004 and data for the reference months October 2003 through January 2004 were collected.

In Wave 1, the 2004 SIPP began with a sample of about 62,700 HUs. About 11,300 of these HUs were found to be vacant, demolished, converted to nonresidential use, or otherwise ineligible for the survey. Field Representatives (FRs) were able to obtain interviews for about 43,700 of the eligible HUs. FRs were unable to interview approximately 7,700 eligible HUs in the panel because the occupants: (1) refused to be interviewed; (2) could not be found at home; (3) were

[2] For questions or further assistance with the information provided in this document contact: Tracy Mattingly of the Demographic Statistical Methods Division on (301) 763-6445 or via the e-mail at Tracy.L.Mattingly@census.gov.

temporarily absent; or (4) were otherwise unavailable. Thus, occupants of about 85 percent of all eligible HUs participated in the first interview of the panel.

For subsequent interviews, only original sample people (those in Wave 1 sample households and interviewed in Wave 1) and people living with them are eligible to be interviewed. The SIPP sample includes original sample people if they move to a new address, unless the new address was more than 100 miles from a SIPP sample area. In this case, FRs attempt telephone interviews. Based on these follow-up criteria, FRs were able to interview about 40,600 HUs of the approximately 44,200 eligible HUs for Wave 2, about 39,100 HUs of the approximately 44,600 eligible HUs for Wave 3, about 38,300 HUs of the approximately 44,900 eligible HUs for Wave 4, about 37,400 HUs of the approximately 45,400 eligible HUs for Wave 5, about 36,900 HUs of the approximately 45,600 eligible HUs for Wave 6, about 36,300 HUs of the approximately 45,700 eligible HUs for Wave 7, and about 36,000 HUs of the approximately 45,700 eligible HUs for Wave 8. In each of these waves, FRs were unable to interview some of the eligible housing units because the occupants either directly or indirectly refused to be interviewed in the same manner described for Wave 1 or moved to an unknown address. The rates of non-interviewed housing units due to direct or indirect refusal (Type A rate) were 6.6% for Wave 2, 9.9% for Wave 3, 11.6% for Wave 4, 13.7% for Wave 5, 15.0% for Wave 6, 16.1% for Wave 7, and 16.1% for Wave 8. The rates of non-interviewed HUs due to moving to an unknown address (Type D rate) were 1.4% for Wave 2, 2.5% for Wave 3, 3.1% for Wave 4, 3.7% for Wave 5, 4.1% for Wave 6, 4.5% for Wave 7, and 5.2% for Wave 8.

Because of budget constraints, a 53% sample cut occurred at Wave 9. Essentially, 76 NSR PSUs were dropped from the sample, as well as 33% of the sample in SR PSUs. This resulted in approximately 21,300 eligible HUs for Wave 9. Out of these 21,300 HUs, FRs were able to interview about 16,600 HUs for Wave 9, about 16,200 HUs for Wave 10, about 15,900 for Wave 11, and about 16,000 HUs for Wave 12. After the sample cut, the rates of non-interviewed housing units due to direct or indirect refusal (Type A rate) were 16.9% for Wave 9, 18.5% for Wave 10, 19.7% for Wave 11, and 18.9% for Wave 12. The rates of non-interviewed HUs due to moving to an unknown address (Type D rate) after the sample cut were 5.2% for Wave 9, 5.3% for Wave 10, 5.7% for Wave 11, and 6.4% for Wave 12.

Since SIPP follows all original sample members, those members that form new households are also included in the SIPP sample. This expansion of original households can be estimated within the interviewed sample, but is impossible to determine within the non-interviewed sample. Therefore, a growth factor based on the growth in the known sample is used to estimate the unknown expansion of the non-interviewed households.

Growth factors account for the additional nonresponse stemming from the expansion of non-interviewed households. They are used to get a more accurate estimate of the number of non-interviewed HUs at each wave, called sample loss. To calculate sample loss we use Formula (1):

$$\text{Sample Loss} = \frac{(A_1 \times GF) + A_C + D_C}{I_C + (A_1 \times GF) + A_C + D_C} \tag{1}$$

where $A_1$ is the number of Type A non-interviewed households in Wave 1, $A_C$ is the number of Type A non-interviewed households in the Current Wave, $D_C$ is the number of Type D non-interviewed households in the current wave, $I_C$ is the number of interviewed households in the current wave, and *GF* is the growth factor associated with the current wave.

**Table A. Sample Loss for SIPP 2004**

| Wave | Eligible HUs | Interviewed HUs | Type As | | Type Ds | | Growth Factor | Sample Loss |
|---|---|---|---|---|---|---|---|---|
| | | | Total | Rate | Total | Rate | | |
| 1 | 51363 | 43711 | 7652 | 14.9% | | | | 14.9% |
| 2 | 44150 | 40587 | 2935 | 6.6% | 628 | 1.4% | 1.0227 | 21.9% |
| 3 | 44614 | 39117 | 4395 | 9.9% | 1102 | 2.5% | 1.0356 | 25.5% |
| 4 | 44930 | 38309 | 5208 | 11.6% | 1413 | 3.1% | 1.0427 | 27.6% |
| 5 | 45350 | 37446 | 6229 | 13.7% | 1675 | 3.7% | 1.0490 | 29.8% |
| 6 | 45638 | 36931 | 6830 | 15.0% | 1877 | 4.1% | 1.0540 | 31.2% |
| 7 | 45688 | 36289 | 7342 | 16.1% | 2057 | 4.5% | 1.0571 | 32.5% |
| 8 | 45684 | 35966 | 7358 | 16.1% | 2360 | 5.2% | 1.0599 | 33.1% |
| 9 | 21296 | 16587 | 3608 | 16.9% | 1101 | 5.2% | 1.0619 | 34.0% |
| 10 | 21342 | 16235 | 3919 | 18.5% | 1188 | 5.3% | 1.0636 | 35.5% |
| 11 | 21347 | 15894 | 4173 | 19.7% | 1280 | 5.7% | 1.0653 | 36.9% |
| 12 | 21332 | 15952 | 4024 | 18.9% | 1356 | 6.4% | 1.0668 | 36.6% |

Note that the Wave 1 sample loss rate is the same as the Type A rate since growth factors and Type D (movers) are not applicable until Wave 2.

The public use files include core and supplemental (topical module) data. Core questions are repeated at each interview over the life of the panel. Topical modules include questions which are asked only in certain waves. The 2004 panel topical modules are given in Table 1.

Table 2 indicates the reference months and interview months for the collection of data from each rotation group for the 2004 panel. For example, Wave 1 rotation group 1 of the 2004 panel was interviewed in February 2004 and data for the reference months October 2003 through January 2004 were collected.

**Estimation.** The SIPP estimation procedure involves several stages of weight adjustments to derive the cross-sectional person level weights. First, each person is given a base weight (*BW*) equal to the inverse of the probability of selection of a person's household. Then a noninterview adjustment factor is applied to account for households which were eligible for the sample but which FRs could not interview in Wave 1 ($F_{N1}$). Next, a Duplication Control Factor (*DCF*) is used to adjust for subsampling done in the field when the number of sample units is much larger than expected. A Mover's Weight (*MW*) is applied to adjust for persons in the SIPP universe who move into sample households after Wave 1. The last adjustment is the Second Stage

Adjustment Factor $(F_{2S})$. This adjusts estimates to population controls and equalizes husbands' and wives' weights. The 2004 Panel adjusts weights to both national and state level controls.

The final cross-sectional weight is $FW_c = BW * DCF * F_{N1} * F_{2S}$ for Wave 1 and is $FW_c = IW * F_{N2} * F_{2S}$ for Waves 2+, where $IW$ is either $BW * DCF * F_{N1}$ or $MW$. Additional details of the weighting process are in *SIPP 2004+: Cross-Sectional Weighting Specifications for Wave 1 and Wave 2+.*

**Population Controls.** The 2004 SIPP estimation procedure adjusts weighted sample results to agree with independently derived population estimates of the civilian noninstitutional population. National family type controls are obtained by taking the Current Population Survey (CPS) weights and doing a "March type" family equalization. That is, wives' weights are assigned to husbands and then proportionally adjusted to the weights of persons by month, rotation group, race, sex, age, and by the marital and family status of householders. This attempts to correct for undercoverage and thereby reduces the mean square error of the estimates. The national and state level population controls are obtained directly from the Population Division and are prepared each month to agree with the most current set of population estimates released by the Census Bureau's population estimates and projections program.

The national level controls are distributed by demographic characteristics as follows:

- Age, Sex, and Race (White Alone, Black Alone, and all other groups combined)
- Age, Sex, and Hispanic Origin

The state level controls are distributed by demographic characteristics as follows:

- State by Age and Sex
- State by Hispanic origin
- State by Race (Black Alone, all other groups combined)

The estimates begin with the latest decennial census as the base and incorporate the latest available information on births and deaths along with the latest estimates of net international migration.

The net international migration component in the population estimates includes a combination of:

- Legal migration to the U.S.,
- Emigration of foreign born and native people from the U.S.,
- Net movement between the U.S. and Puerto Rico,
- Estimates of temporary migration, and
- Estimates of net residual foreign-born population, which include unauthorized migration.

Because the latest available information on these components lags the survey date, to develop the estimate for the survey date, it is necessary to make short-term projections of these components.

**Use of Weights.** There are three primary weights for the analysis of SIPP data. The person month weight (one for each reference month) is for analyzing data at the person level. Everyone in the sample in a given reference month has a person month weight. The person month weight of the household reference person is used to analyze data at the household level (a household may consist of related and unrelated persons). The person month weight of the family reference person is the family weight. Use this weight to analyze family level questions. Weights are also available in the public use files for related subfamilies. Chapter 8 of the *SIPP Users' Guide* provides additional information on how to use these weights.

By selecting the appropriate reference month weight an analyst can obtain the average of an item such as income across several calendar months.

> **Example.** Using the proper weights, one can estimate the monthly average number of households in a specified income range over December 2003 to January 2004. To estimate monthly averages of a given measure, e.g., total, mean, over a number of consecutive months, sum the monthly estimates and divide by the number of months. To form an estimate for a particular month, use the reference month weight for the month of interest, summing over all persons or households with the characteristic of interest whose reference period includes the month of interest.

The core wave file does not contain weights for characteristics that involve a person's or household's status over two or more months (such as, number of households with a 50 percent increase in income between December 2003 and January 2004).

**Adjusting Estimates Which Use Less than the Full Sample.** When estimates for months with less than four rotations worth of data are constructed from a wave file, factors greater than 1 must be applied. Multiply the sum by a factor to account for the number of rotations contributing data for the month. This factor equals 4 divided by the number of rotations contributing data for the month. For example, December 2003 data are only available from rotations 1-3 for Wave 1 of the 2004 Panel, so a factor of $4/3 \approx 1.3333$ must be applied. A list of appropriate factors is in Table 3.

## ACCURACY OF ESTIMATES

SIPP estimates are based on a sample; they may differ somewhat from the figures that would have been obtained if a complete census had been taken using the same questionnaire, instructions, and enumerators. There are two types of errors possible in an estimate based on a sample survey: sampling and nonsampling. For a given estimator, the difference between an estimate based on a sample and the estimate that would result if the sample were to include the entire population is known as sampling error. For a given estimator, the difference between the estimate that would result if the sample were to include the entire population and the true population value being estimated is known as nonsampling error. We are able to provide estimates of the magnitude of SIPP sampling error, but this is not true of nonsampling error.

**Nonsampling Error.** Nonsampling errors can be attributed to many sources:

- inability to obtain information about all cases in the sample

- definitional difficulties
- differences in the interpretation of questions
- inability or unwillingness on the part of the respondents to provide correct information
- errors made in the following: collection such as in recording or coding the data, processing the data, estimating values for missing data
- biases resulting from the differing recall periods caused by the interviewing pattern used and undercoverage.

Quality control and edit procedures were used to reduce errors made by respondents, coders and interviewers. More detailed discussions of the existence and control of nonsampling errors in the SIPP can be found in the *SIPP Quality Profile, 1998 SIPP Working Paper Number 230*, issued May 1999.

Undercoverage in SIPP results from missed HUs and missed persons within sample HUs. It is known that undercoverage varies with age, race, and sex. Generally, undercoverage is larger for males than for females and larger for Blacks than for non-Blacks. Ratio estimation to independent age-race-sex population controls partially corrects for the bias due to survey undercoverage. However, biases exist in the estimates to the extent that persons in missed households or missed persons in interviewed households have characteristics different from those of interviewed persons in the same age-race-sex group.

A common measure of survey coverage is the coverage ratio, the estimated population before ratio adjustment divided by the independent population control. Table B below shows SIPP coverage ratios for age-sex-race groups for one month, January 2004, prior to the ratio adjustment. The SIPP coverage ratios exhibit some variability from month to month, but these are a typical set of coverage ratios. Other Census Bureau household surveys [like the CPS] experience similar coverage.

**Comparability with Other Estimates.** Caution should be exercised when comparing this data with data from other SIPP products or with data from other surveys. The comparability problems are caused by such sources as the seasonal patterns for many characteristics, different nonsampling errors, and different concepts and procedures. Refer to the *SIPP Quality Profile* for known differences with data from other sources and further discussions.

**Sampling Variability.** Standard errors indicate the magnitude of the sampling error. They also partially measure the effect of some nonsampling errors in response and enumeration, but do not measure any systematic biases in the data. The standard errors for the most part measure the variations that occurred by chance because a sample rather than the entire population was surveyed.

| Table B. SIPP Average Coverage Ratios for January 2004 for Age by Race and Sex | | | | | | |
|---|---|---|---|---|---|---|
| **Age** | **White Only** | | **Black Only** | | **Residual** | |
| | Male | Female | Male | Female | Male | Female |
| **<15** | 0.89 | 0.90 | 0.85 | 0.82 | 1.16 | 1.07 |
| **15** | 0.89 | 0.90 | 0.88 | 0.83 | 0.96 | 0.95 |
| **16-17** | 0.90 | 0.88 | 0.75 | 0.84 | 0.93 | 0.89 |
| **18-19** | 0.83 | 0.81 | 0.79 | 0.80 | 0.96 | 0.89 |
| **20-21** | 0.75 | 0.74 | 0.70 | 0.77 | 0.96 | 1.03 |
| **22-24** | 0.75 | 0.77 | 0.75 | 0.73 | 0.95 | 1.06 |
| **25-29** | 0.80 | 0.89 | 0.70 | 0.77 | 0.90 | 0.95 |
| **30-34** | 0.84 | 0.88 | 0.80 | 0.84 | 0.94 | 0.99 |
| **35-39** | 0.89 | 0.92 | 0.80 | 0.83 | 1.00 | 1.06 |
| **40-44** | 0.89 | 0.88 | 0.84 | 0.88 | 1.03 | 0.99 |
| **45-49** | 0.85 | 0.91 | 0.79 | 0.94 | 1.02 | 1.04 |
| **50-54** | 0.92 | 0.91 | 0.80 | 0.89 | 1.04 | 1.09 |
| **55-59** | 0.88 | 0.91 | 0.91 | 0.94 | 0.97 | 1.19 |
| **60-61** | 0.89 | 1.01 | 0.92 | 0.82 | 1.04 | 1.14 |
| **62-64** | 0.92 | 0.97 | 0.76 | 0.97 | 1.15 | 1.07 |
| **65-69** | 0.94 | 0.93 | 0.99 | 1.03 | 1.07 | 1.01 |
| **70-74** | 0.94 | 0.96 | 0.99 | 1.04 | 1.08 | 0.94 |
| **75-79** | 1.04 | 0.98 | 0.93 | 1.08 | 0.84 | 0.95 |
| **80-84** | 0.98 | 0.92 | 0.79 | 0.97 | 0.84 | 0.97 |
| **85+** | 0.94 | 0.85 | 0.74 | 1.00 | 0.79 | 1.03 |

## USES AND COMPUTATION OF STANDARD ERRORS

**Confidence Intervals.** The sample estimate and its standard error enable one to construct a confidence interval. A confidence interval is a range about a given estimate that has a known probability of including the result of a complete enumeration. For example, if all possible samples were selected, each of these being surveyed under essentially the same conditions and using the same sample design, and if an estimate and its standard error were calculated from each sample, then:

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

2. Approximately 90 percent of the intervals from 1.645 standard errors below the estimate to 1.645 standard errors above the estimate would include the average result of all possible samples.

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

The average estimate derived from all possible samples is or is not contained in any particular computed interval. However, for a particular sample, one can say with a specified confidence that the average estimate derived from all possible samples is included in the confidence interval.

**Hypothesis Testing.** Standard errors may also be used for hypothesis testing, a procedure for distinguishing between population characteristics using sample estimates. The most common types of hypotheses tested are 1) the population characteristics are identical versus 2) they are different. Tests may be performed at various levels of significance, where a level of significance is the probability of concluding that the characteristics are different when, in fact, they are identical.

To perform the most common test, compute the difference $X_A - X_B$, where $X_A$ and $X_B$ are sample estimates of the characteristics of interest. A later section explains how to derive an estimate of the standard error of the difference $X_A - X_B$. Let that standard error be $S_{DIFF}$. If $X_A - X_B$ is between $(-1.645 \times S_{DIFF})$ and $(+1.645 \times S_{DIFF})$, no conclusion about the characteristics is justified at the 10 percent significance level. If, on the other hand $X_A - X_B$, is smaller than $(-1.645 \times S_{DIFF})$ or larger than $(+1.645 \times S_{DIFF})$, the observed difference is significant at the 10 percent level. In this event, it is commonly accepted practice to say that the characteristics are different. We recommend that users report only those differences that are significant at the 10 percent level or better. Of course, sometimes this conclusion will be wrong. When the characteristics are the same, there is a 10 percent chance of concluding that they are different.

Note that as more tests are performed, more erroneous significant differences will occur. For example, at the 10 percent significance level, if 100 independent hypothesis tests are performed in which there are no real differences, it is likely that about 10 erroneous differences will occur. Therefore, the significance of any single test should be interpreted cautiously. A Bonferroni correction can be done to account for this potential problem that consists of dividing your stated level of significance by the number of tests you are performing. This correction results in a conservative test of significance.

**Note Concerning Small Estimates and Small Differences.** Because of the large standard errors involved, there is little chance that estimates will reveal useful information when computed on a base smaller than 75,000. For SIPP estimates calculated from Waves 9+, bases smaller than 250,000 will likely yield little useful information. Also, nonsampling error in one or more of the small number of cases providing the estimation can cause large relative error in that particular estimate. Care must be taken in the interpretation of small differences since even a small amount of nonsampling error can cause a borderline difference to appear significant or not, thus distorting a seemingly valid hypothesis test.

**Calculating Standard Errors for SIPP Estimates.** There are three main ways we calculate the Standard Errors (SEs) for SIPP Estimates. They are as follows:

- Direct estimates using replicate weighting methods;
- Generalized variance function parameters (denoted as *a* and *b*); and
- Simplified tables of SEs based on the *a* and *b* parameters.

While the replicate weight methods provide the most accurate variance estimates, this approach requires more computing resources and more expertise on the part of the user. The Generalized Variance Function (GVF) parameters provide a method of balancing accuracy with resource usage as well as smoothing effect on SE estimates across time. SIPP uses the Replicate Weighting Method to produce GVF parameters (see K. Wolter, *Introducation to Variance Estimation*, Chapter 5 for more information). The GVF parameters are used to create the simplified tables of SEs.

**Standard Error Parameters and Tables and Their Use.** Most SIPP estimates have greater standard errors than those obtained through a simple random sample because of its two-stage cluster sample design. To derive standard errors that would be applicable to a wide variety of estimates and could be prepared at a moderate cost, a number of approximations were required.

Estimates with similar standard error behavior were grouped together and two parameters (denoted *a* and *b*) were developed to approximate the standard error behavior of each group of estimates. Because the actual standard error behavior was not identical for all estimates within a group, the standard errors computed from these parameters provide an indication of the order of magnitude of the standard error for any specific estimate. These *a* and *b* parameters vary by characteristic and by demographic subgroup to which the estimate applies. Table 4 provides base *a* and *b* parameters for the core domains to be used for the 2004 Panel Wave 1 to Wave 12 estimates. The base *a* and *b* parameters for the topical modules for Wave 1 to Wave 8 are found in Table 5.

For those users who wish further simplification, we have also provided base standard errors for estimates of totals and percentages in Tables 6 through 9. Note that these base standard errors only apply when data from all four rotations are used and must be adjusted by an *f* factor provided in Table 4. The standard errors resulting from this simplified approach are less accurate. Methods for using these parameters and tables for computation of standard errors are given in the following sections.

**Adjusting Standard Error Parameters for Estimates Which Use Less Than the Full Sample**
If some rotation groups are unavailable to contribute data to a given estimate, then the estimate and its standard error need to be adjusted. The adjustment of the estimate is described in the previous section. The standard error is adjusted by multiplying the appropriate *a* and *b* parameters by a factor equal to 4 divided by the number of rotation groups contributing data to the estimate or it can be taken from Table 3 where the factor is given for each single reference month, October 2003 to March 2007.

Use Table 3 to select the adjustment factor appropriate to the wave. Multiply this factor by the *a* and *b* base parameters of Table 4 to produce *a* and *b* parameters for the variance estimate for a specific subgroup and reference period.

Illustration 1.

Using Table 4 for Wave 1 of the 2004 panel, the base *a* and *b* parameters for total number of households are -0.00002809 and 3,153, respectively. Using Table 3 for Wave 1, the factor for November 2003 is 2 *since only two rotation months of data are available*. So the *a* and *b* parameters for the variance estimate of a white household characteristic in November 2003 based on Wave 1 are:

$$-0.00002809 \times 2 = -0.00005618 \text{ and } 3{,}153 \times 2 = 6{,}306, \text{ respectively.}$$

Similarly, the factor from Table 3 for the last quarter of 2003 is 1.8519, since the only data available are the six rotation months from Wave 1. (Rotation 1 provides three rotation months, rotation 2 provides two rotation months, and rotation 3 provides one rotation month of data.) Thus, the *a* and *b* parameters for the variance estimate of a white household characteristic in the last quarter of 2003 are:

$$-0.00002809 \times 1.8519 = -0.00005202 \text{ and } 3{,}153 \times 1.8519 = 5{,}839, \text{ respectively.}$$

**Standard Errors of Estimated Numbers.** The approximate standard error, $s_x$, of an estimated number of persons, households, families, unrelated individuals and so forth, can be obtained in two ways. Both apply when data from all four rotations are used to make the estimate. However, only Formula (2) should be used when less than four rotations of data are available for the estimate. Note that neither method should be applied to dollar values.

The standard error may be obtained by the use of Formula (2):

$$s_x = f \times s, \tag{2}$$

where $f$ is the appropriate $f$ factor from Table 4, and $s$ is the base standard error on the estimate obtained by interpolation from Tables 6 or 7.

Alternatively, $s_x$ may be approximated by Formula (3):

$$s_x = \sqrt{ax^2 + bx}. \tag{3}$$

This formula was used to calculate the base standard errors in Tables 8 and 9. Here *x* is the size of the estimate and *a* and *b* are the parameters from Table 4 which are associated with the characteristic being estimated (and the wave which applies). Use of Formula (3) will generally provide more accurate results than the use of Formula (2).

<u>Illustration 2.</u>
Suppose SIPP estimates based on Wave 1 of the 2004 panel show that there were 2,000,000 females aged 25 to 44 with a monthly income of greater than $6,000 in January 2004. The appropriate parameters and factor from Table 4 and the appropriate general standard error from Table 6 are:

$a = -0.00003059 \quad b = 3{,}582 \quad f = 1.007 \quad s = 83{,}766$

Using Formula (2), the approximate standard error is:

$$s_x = 1.007 \times 83{,}766 = 84{,}352.$$

Using Formula (3), the approximate standard error is:

$$s_x = \sqrt{(-0.00003059 \times 2{,}000{,}000^2) + (3{,}582 \times 2{,}000{,}000)} = 83{,}914 \quad \textit{females}.$$

Using the standard error based on Formula (3), the approximate 90-percent confidence interval as shown by the data is from 1,861,961 to 2,138,039 females (i.e., 2,000,000 ± 1.645 × 83,914). Therefore, a conclusion that the average estimate derived from all possible samples lies within a range computed in this way would be correct for roughly 90% of all samples.

**Standard Error of a Mean.** A mean is defined here to be the average quantity of some item (other than persons, families, or households) per person, family or household. For example, it could be the average monthly household income of females age 25 to 34. The standard error of a mean can be approximated by Formula (4) below. Because of the approximations used in developing Formula (4), an estimate of the standard error of the mean obtained from this formula will generally underestimate the true standard error. The formula used to estimate the standard error of a mean $\bar{x}$ is:

$$s_{\bar{x}} = \sqrt{\left(\frac{b}{y}\right) s^2}, \tag{4}$$

where $y$ is the size of the base, $s^2$ is the estimated population variance of the item and $b$ is the parameter associated with the particular type of item.

The population variance $s^2$ may be estimated by one of two methods. In both methods, we assume $x_i$ is the value of the item for $i^{th}$ unit. (A unit may be person, family, or household). To use the first method, the range of values for the item is divided into $c$ intervals. The lower and upper boundaries of interval $j$ are $Z_{j-1}$ and $Z_j$, respectively. Each unit, $x_i$, is placed into one of $c$ intervals such that $Z_{j-1} < x_i \le Z_j$. The estimated population mean, $\bar{x}$, and variance, $s^2$, are given by the formulas:

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

$$s^2 = \sum_{j=1}^{c} p_j m_j^2 - \bar{x}^2, \tag{5}$$

where $m_j = (Z_{j-1} + Z_j) / 2$, and $p_j$ is the estimated proportion of units in the interval $j$. The most representative value of the item in the interval $j$ is assumed to be $m_j$. If the interval $c$ is open-ended, or no upper interval boundary exists, then an approximate value for $m_c$ is

$$m_c = \frac{3}{2} Z_{c-1}.$$

In the second method, the estimated population mean, $\bar{x}$, and variance, $s^2$ are given by:

$$\bar{x} = \frac{\sum_{i=1}^{n} w_i x_i}{\sum_{i=1}^{n} w_i}$$

$$s^2 = \frac{\sum_{i=1}^{n} w_i x_i^2}{\sum_{i=1}^{n} w_i} - \bar{x}^2, \tag{6}$$

where there are $n$ units with the item of interest and $w_i$ is the final weight for $i^{th}$ unit. (Note that $\sum w_i = y$. )

Illustration 3.
Suppose that based on Wave 1 data, the distribution of monthly cash income for persons age 25 to 34 during the month of January 2004 is given in Table 10. Using these data, the mean monthly cash income for persons aged 25 to 34 is \$2, 530. Applying Formula (5), the approximate population variance, $s^2$, is:

$$s^2 = \left(\frac{1{,}371}{39{,}851}\right)(150)^2 + \left(\frac{1{,}651}{39{,}851}\right)(450)^2 + \ldots + \left(\frac{1{,}493}{39{,}851}\right)(9{,}000)^2 - (2{,}530)^2 = 3{,}159{,}887.$$

Using Formula (4) and a base $b$ parameter of 3,582, the estimated standard error of a mean $\bar{x}$ is:

$$s_{\bar{x}} = \sqrt{\frac{3{,}582}{39{,}851{,}000} \times 3{,}159{,}887} = \$16.85.$$

Thus, the approximate 90-percent confidence interval as shown by the data ranges from \$2,502.28 to \$2,557.72.

**Standard Error of an Aggregate.** An aggregate is defined to be the total quantity of an item summed over all the units in a group. The standard error of an aggregate can be approximated using Formula (7). As with the estimate of the standard error of a mean, the estimate of the standard error of an aggregate will generally underestimate the true standard error. Let $y$ be the size of the base, $s^2$ be the estimated population variance of the item obtained using Formula (5) or Formula (6) and $b$ be the parameter associated with the particular type of item. The standard error of an aggregate is:

$$s_x = \sqrt{b \times y \times s^2}. \tag{7}$$

**Standard Errors of Estimated Percentages.** The reliability of an estimated percentage, computed using sample data for both numerator and denominator, depends upon both the size of the percentage and the size of the total upon which the percentage is based. Estimated percentages are relatively more reliable than the corresponding estimates of the numerators of the percentages, particularly if the percentages are 50 percent or more, e.g., the percent of people employed is more reliable than the estimated number of people employed. When the numerator and denominator of the percentage have different parameters, use the parameter (and appropriate factor) of the numerator. If proportions are presented instead of percentages, note that the standard error of a proportion is equal to the standard error of the corresponding percentage divided by 100.

There are two types of percentages commonly estimated. The first is the percentage of people sharing a particular characteristic such as the percent of people owning their own home. The second type is the percentage of money or some similar concept held by a particular group of people or held in a particular form. Examples are the percent of total wealth held by people with high income and the percent of total income received by people on welfare.

For the percentage of people, the approximate standard error, $s_{(x,p)}$, of the estimated percentage $p$ can be obtained by the formula:

$$s_{(x,p)} = f \times s, \tag{8}$$

when data from all four rotations are used to estimate $p$. In this formula, $f$ is the appropriate $f$ factor from Table 4 (for the appropriate wave) and $s$ is the base standard error of the estimate from Tables 8 or 9.

Alternatively, it may be approximated by the formula:

$$s_{(x,p)} = \sqrt{\frac{b}{x}\,(p)\,(100-p)}\,, \tag{9}$$

from which the standard errors in Tables 8 and 9 were calculated. Here $x$ is the size of the subclass of social units which is the base of the percentage, $p$ is the percentage ($0 < p < 100$), and $b$ is the parameter associated with the characteristic in the numerator. Use of Formula (9) will give more accurate results than use of Formula (8) above and should be used when data from less than four rotations are used to estimate $p$.

Illustration 4.

Suppose that in January 2004, 6.7 percent of the 16,812,000 persons in nonfarm households with a mean monthly household cash income of $4,000 to $4,999 were black. Using Formula (9), a $b$ parameter of 3,253, and a factor of 1 from Table 3 since all four rotations are used, the approximate standard error is:

$$s_{(x,p)} = \sqrt{\frac{3{,}253}{16{,}812{,}000} \times 6.7 \times (100-6.7)} = 0.35 \textit{ percent.}$$

Consequently, the 90 percent confidence interval as shown by these data is from 6.12 to 7.28 percent.

For percentages of money, a more complicated formula is required. A percentage of money will usually be estimated in one of two ways. It may be the ratio of two aggregates:

$$p_I = 100\left(\frac{x_A}{x_N}\right),$$

or it may be the ratio of two means with an adjustment for different bases:

$$p_I = 100\left(\hat{p}_A\,\frac{\bar{x}_A}{\bar{x}_N}\right),$$

where $x_A$ and $x_N$ are aggregate money figures, $\bar{x}_A$ and $\bar{x}_N$ are mean money figures, and $\hat{p}_A$ is the estimated number in group A divided by the estimated number in group *N*. In either case, we estimate the standard error as

$$s_I = \sqrt{\left(\frac{\hat{p}_A\bar{x}_A}{\bar{x}_N}\right)^2\left[\left(\frac{s_p}{\hat{p}_A}\right)^2 + \left(\frac{s_A}{\bar{x}_A}\right)^2 + \left(\frac{s_B}{\bar{x}_N}\right)^2\right]}, \tag{10}$$

where $s_p$ is the standard error of $\hat{p}_A$, $s_A$ is the standard error of $\bar{x}_A$ and $s_B$ is the standard error of $\bar{x}_N$. To calculate $s_p$, use Formula (9). The standard errors of $\bar{x}_N$ and $\bar{x}_A$ may be calculated using Formula (4).

It should be noted that there is frequently some correlation between $\hat{p}_A$, $\bar{x}_N$, and $\bar{x}_A$. Depending on the magnitude and sign of the correlations, the standard error will be over or underestimated.

<u>Illustration 5.</u>
Suppose that in January 2004, 9.8% of the households own rental property, the mean value of rental property is \$72,121, the mean value of assets is \$78,734, and the corresponding standard errors are 0.18%, \$5,468, and \$2,703, respectively. In total there are 86,790,000 households. Then, the percent of all household assets held in rental property is:

$$100\left(0.098\times\frac{72{,}121}{78{,}734}\right) = 9.0\%.$$

Using Formula (10), the appropriate standard error is:

$$s_I = \sqrt{\left(\frac{0.098\times 72{,}121}{78{,}734}\right)^2\left[\left(\frac{0.0018}{0.098}\right)^2 + \left(\frac{5{,}468}{72{,}121}\right)^2 + \left(\frac{2{,}703}{78{,}734}\right)^2\right]} = 0.7\%.$$

**Standard Error of a Difference.** The standard error of a difference between two sample estimates is approximately equal to

$$s_{(x-y)} = \sqrt{s_x^{\,2} + s_y^{\,2}}\,, \tag{11}$$

where $s_x$ and $s_y$ are the standard errors of the estimates $x$ and $y$. The estimates can be numbers, percents, ratios, etc. The above formula assumes that the correlation coefficient between the characteristics estimated by $x$ and $y$ is zero. If the correlation is really positive (negative), then this assumption will tend to cause overestimates (underestimates) of the true standard error.

Illustration 6.
Suppose that for January 2004 SIPP estimates show the number of persons age 35-44 years with monthly cash income of \$4,000 to \$4,999 was 4,880,200 and the number of persons age 25-34 years with monthly cash income of \$4,000 to \$4,999 in the same time period was 4,810,800. Then, using the parameters $a = -0.00001583$ and $b = 3{,}582$ from Table 4 and Formula (3), the standard errors of these numbers are approximately 130,782 and 129,869, respectively. The difference in sample estimates is 69,400 and using Formula (11), the approximate standard error of the difference is:

$$\sqrt{130{,}782^2 + 129{,}869^2} = 184{,}309.$$

Suppose that it is desired to test at the 10 percent significance level whether the number of persons with monthly cash income of \$4,000 to \$4,999 was different for people age 35-44 years than for people age 25-34 years. To perform the test, compare the difference of 69,400 to the product $1.645 \times 184{,}309 = 303{,}188$. Since the difference is not greater than 1.645 times the standard error of the difference, the data show that the two age groups are not significantly different at the 10 percent significance level.

**Standard Error of a Median.** The median quantity of some item such as income for a given group of people is that quantity such that at least half the group have as much or more and at least half the group have as much or less. The sampling variability of an estimated median depends upon the form of the distribution of the item as well as the size of the group. To calculate standard errors on medians, the procedure described below may be used.

The median, like the mean, can be estimated using either data which have been grouped into intervals or ungrouped data. If grouped data are used, the median is estimated using Formulas (12) or (13) with $p = 0.5$. If ungrouped data are used, the data records are ordered based on the value of the characteristic, then the estimated median is the value of the characteristic such that the weighted estimate of 50 percent of the subpopulation falls at or below that value and 50 percent is at or above that value. Note that the method of standard error computation which is presented here requires the use of grouped data. Therefore, it should be easier to compute the median by grouping the data and using Formulas (12) or (13).

An approximate method for measuring the reliability of an estimated median is to determine a confidence interval about it. (See the section on sampling variability for a general discussion of confidence intervals.) The following procedure may be used to estimate the 68-percent confidence limits and hence the standard error of a median based on sample data.

1. Determine, using either Formula (8) or Formula (9), the standard error of an estimate of 50 percent of the group.

2. Add to and subtract from 50 percent the standard error determined in step 1.

3. Using the distribution of the item within the group, calculate the quantity of the item such that the percent of the group with more of the item is equal to the smaller percentage found in step 2. This quantity will be the upper limit for the 68-percent confidence interval. In a similar fashion, calculate the quantity of the item such that the percent of the group with more of the item is equal to the larger percentage found in step 2. This quantity will be the lower limit for the 68-percent confidence interval.

4. Divide the difference between the two quantities determined in step 3 by two to obtain the standard error of the median.

To perform step 3, it will be necessary to interpolate. Different methods of interpolation may be used. The most common are simple linear interpolation and Pareto interpolation. The appropriateness of the method depends on the form of the distribution around the median. If density is declining in the area, then we recommend Pareto interpolation. If density is fairly constant in the area, then we recommend linear interpolation. Note, however, that Pareto interpolation can never be used if the interval contains zero or negative measures of the item of interest. Interpolation is used as follows. The quantity of the item such that $p$ percent have more of the item is:

$$X_{pN} = A_1 \times \exp\left[\left(\frac{\ln(pN / N_1)}{\ln(N_2 / N_1)}\right) \ln\left(\frac{A_2}{A_1}\right)\right], \tag{12}$$

if Pareto Interpolation is indicated and:

$$X_{pN} = \left[A_1 + \left(\frac{PN-N_1}{N_2-N_1}\right)(A_2-A_1)\right], \tag{13}$$

if linear interpolation is indicated, where:

| | |
|---|---|
| $N$ | is the size of the group, |
| $A_1$ and $A_2$ | are the lower and upper bounds, respectively, of the interval in which $X_{pN}$ falls |
| $N_1$ and $N_2$ | are the estimated number of group members owning more than $A_1$ and $A_2$, respectively |
| exp | refers to the exponential function and |
| ln | refers to the natural logarithm function |

Illustration 7.
To illustrate the calculations for the sampling error on a median, we return to Table 10. The median monthly income for this group is \$2,158. The size of the group is 39,851,000.

1. Using Formula (9), the standard error of 50 percent on a base of 39,851,000 is about 0.5 percentage points.

2. Following step 2, the two percentages of interest are 49.5 and 50.5.

3. By examining Table 10, we see that the percentage 49.5 falls in the income interval from \$2,000 to \$2,499. (Since 55.5% receive more than \$2,000 per month, the dollar value corresponding to 49.5 must be between \$2,000 and \$2,500.) Thus, $A_1$ = \$2,000, $A_2$ = \$2,500, $N_1$ = 22,106,000, and $N_2$ = 16,307,000.

In this case, we decided to use Pareto interpolation. Therefore, using Formula (12), the upper bound of a 68% confidence interval for the median is

$$\$2{,}000 \times \exp\left[\frac{\ln((0.495 \times 39{,}851{,}000)\ /\ 22{,}106{,}000)}{\ln(16{,}307{,}000/22{,}106{,}000)} \times \ln\left(\frac{2{,}500}{2{,}000}\right)\right] = \$2{,}174.$$

Also by examining Table 10, we see that 50.5 falls in the same income interval. Thus, $A_1$, $A_2$, $N_1$ and $N_2$ are the same. We also use Pareto interpolation for this case. So the lower bound of a 68% confidence interval for the median is

$$\$2{,}000 \times \exp\left[\frac{\ln((0.505 \times 39{,}851{,}000)/22{,}106{,}000)}{\ln(16{,}307{,}000/22{,}106{,}000)} \times \ln\left(\frac{2{,}500}{2{,}000}\right)\right] = \$2{,}142.$$

Thus, the 68-percent confidence interval on the estimated median is from \$2,142 to \$2,174.

4. Then the approximate standard error of the median is

$$\frac{\$2{,}174 - \$2{,}142}{2} = \$16.$$

**Standard Errors of Ratios of Means and Medians.** The standard error for a ratio of means or medians is approximated by:

$$s_{\frac{x}{y}} = \sqrt{\left(\frac{x}{y}\right)^2 \left[\left(\frac{s_y}{y}\right)^2 + \left(\frac{s_x}{x}\right)^2\right]}, \tag{14}$$

where $x$ and $y$ are the means or medians, and $s_x$ and $s_y$ are their associated standard errors. Formula (14) assumes that the means are not correlated. If the correlation between the population means estimated by $x$ and $y$ are actually positive (negative), then this procedure will tend to produce overestimates (underestimates) of the true standard error for the ratio of means.

**Standard Errors Using SAS or SPSS.** Standard errors and their associated variance, calculated by SAS or SPSS statistical software package, do not accurately reflect the SIPP's complex sample design. Erroneous conclusions will result if these standard errors are used directly. We provide adjustment factors by characteristics that should be used to correctly compensate for likely under-estimates. The factors called DEFF available in Table 4, must be applied to SAS or SPSS generated variances. The square root of DEFF can be directly applied to similarly generated standard errors. These factors approximate design effects which adjust statistical measures for sample designs more complex than simple random sample.

## TABLES

| Table 1. 2004 Panel Topical Modules | | | |
|---|---|---|---|
| **W1** | • Recipiency History<br>• Employment History | **W5** | • Adult Well-Being<br>• Child Support Agreements<br>• Functional Limitations/Disabilities-Adult<br>• Functional Limitations/Disabilities-Child<br>• Support for Non-household members<br>• School Enrollment & Financing<br>• Employer-Provided Health Benefits |
| **W2** | • Work Disability<br>• Marital History<br>• Fertility History<br>• Household Relationships<br>• Education & Training History<br>• Migration History | **W6** | • Assets and Liabilities<br>• Real Estate, Dependent Care, and Vehicles<br>• Mortgage, Stocks, Int Acct, Rental, Val Bus, Other<br>• Medical Expenses/Utilization of Health Care Services<br>• Work-related Expenses<br>• Child Support Paid |
| **W3** | • Child Well-Being<br>• Work-related Expenses<br>• Child Support Paid<br>• Medical Expenses/Utilization of Health Care Services<br>• Assets and Liabilities<br>• Real Estate, Dependent Care, and Vehicles<br>• Mortgage, Stocks, Int Acct, Rental, Val Bus, Other | **W7** | • Annual Income & Retirement Accounts<br>• Taxes<br>• Informal Care Giving<br>• Retirement & Pension Plan Coverage |
| **W4** | • Annual Income & Retirement Accounts<br>• Taxes<br>• Child Care<br>• Work Schedule | **W8** | • Welfare Reform<br>• Child Care<br>• Child Well-Being |

## Table 2. SIPP Panel 2004 Reference Months (horizontal) for Each Interview Month (vertical)

| Month of Interview | Wave / Rotation | 2003 | | | 2004 | | | | | | | | | | | | 2005 | | | | | | | | | | | | 2006 | | | | | | | | | | | | 2007 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4th Quarter | | | 1St Quarter | | | 2nd Quarter | | | 3rd Quarter | | | 4Th Quarter | | | 1St Quarter | | | 2nd Quarter | | | 3rd Quarter | | | 4Th Quarter | | | 1St Quarter | | | 2nd Quarter | | | 3rd Quarter | | | 4Th Quarter | | | 1St Quarter | | | 2nd Quarter | | | 3rd Quarter | | | 4Th Quarter | | |
| | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| Feb 04 | 1/1 | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | 1/2 | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Apr | 1/3 | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | 1/4 | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jun | 2/1 | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | 2/2 | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | 2/3 | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | 2/4 | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Oct | 3/1 | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | 3/2 | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | 3/3 | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan 05 | 3/4 | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | 4/1 | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | 4/2 | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Apr | 4/3 | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | 4/4 | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jun | 5/1 | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | 5/2 | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | 5/3 | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | 5/4 | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Oct | 6/1 | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | 6/2 | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | 6/3 | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan 06 | 6/4 | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | 7/1 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | 7/2 | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | |
| Apr | 7/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | |
| May | 7/4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | |
| Jun | 8/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | |
| July | 8/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | |
| Aug | 8/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | |
| Sep | 8/4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | |
| Oct | 9/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | |
| Nov | 9/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | |
| Dec | 9/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | | |
| Jan 07 | 9/4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | | |
| Feb | 10/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | | |
| Mar | 10/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | | |
| Apr | 10/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | | |
| May | 10/4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | | |
| Jun | 11/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | | |
| Jul | 11/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | | |
| Aug | 11/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | | |
| Sep | 11/4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | | |
| Oct | 12/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | | |
| Nov | 12/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | | |
| Dec | 12/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | |
| Jan 08 | 12/4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 |

| Table 3. Factors to be Used When Using Less Than Full Sample | |
|---|---|
| **Number of Available Rotation Months[3]** | **Factor** |
| **Monthly Estimate** | |
| 1 | 4.0000 |
| 2 | 2.0000 |
| 3 | 1.3333 |
| 4 | 1.0000 |
| **Quarterly Estimate** | |
| 6 | 1.8519 |
| 8 | 1.4074 |
| 9 | 1.2222 |
| 10 | 1.0494 |
| 11 | 1.0370 |
| 12 | 1.0000 |

[3] The number of available rotation months for a given estimate is the sum of the number of rotations available for each month of the estimates.

| Table 4. SIPP Generalized Variance Parameters for the 2004 Panel, Wave 1 | | | | |
|---|---|---|---|---|
| **Domain** | **Parameters** | | | |
| | ***a*** | ***b*** | **DEFF** | ***f*** |
| **Poverty and Program Participation,** Persons 15+ | | | | |
| Total | -0.00001545 | 3,497 | 1.76 | 0.995 |
| Male | -0.00003203 | 3,497 | | |
| Female | -0.00002986 | 3,497 | | |
| **Income and Labor Force Participation**, Persons 15+ | | | | |
| Total | -0.00001583 | 3,582 | 1.80 | 1.007 |
| Male | -0.00003281 | 3,582 | | |
| Female | -0.00003059 | 3,582 | | |
| **Other**, Persons 0+ | | | | |
| Total (or White) | -0.00001231 | 3,533 | 1.78 | 1.000 |
| Male | -0.00002519 | 3,533 | | |
| Female | -0.00002407 | 3,533 | | |
| **Black**, Persons 0+ | -0.00009050 | 3,253 | 1.64 | 0.960 |
| Male | -0.00019519 | 3,253 | | |
| Female | -0.00016874 | 3,253 | | |
| **Hispanic,** Persons 0+ | -0.00011811 | 4,736 | 2.38 | 1.158 |
| Male | -0.00023067 | 4,736 | | |
| Female | -0.00024207 | 4,736 | | |
| **Households** | | | | |
| Total (or White) | -0.00002809 | 3,153 | 1.59 | 1.000 |
| Black | -0.00022908 | 3,153 | | |
| Hispanic | -0.00026942 | 3,153 | | |

Notes on Domain Usage for Table 4:

| | |
|---|---|
| Poverty and Program Participation | Use these parameters for estimates concerning poverty rates, welfare program participation (e.g., foodstamp, SSI, TANF), and other programs for adults with low incomes. |
| Income and Labor Force | These parameters are for estimates concerning income, sources of income, labor force participation, economic well being other than poverty, employment related estimates (e.g., occupation, hours worked a week), and other income, job, or employment related estimates. |
| Other Persons | Use the “Other Persons” parameters for estimates of total (or white) persons aged 0+ in the labor force, and all other characteristics not specified in this table, for the total or white population. |
| Black/Hispanic Persons | Use these parameters for estimates of Black and Hispanic persons 0+. |
| Households | Use these parameters for all household level estimates. |

| Table 4. (Continued) SIPP Generalized Variance Parameters for the 2004 Panel, Wave 2 to Wave 4 File | | | | |
|---|---|---|---|---|
| **Domain** | **Parameters** | | | |
| | ***a*** | ***b*** | **DEFF** | ***f*** |
| **Poverty and Program Participation,** Persons 15+ | | | | |
| Total | -0.00001806 | 4,155 | 2.09 | 1.084 |
| Male | -0.00003736 | 4,155 | | |
| Female | -0.00003495 | 4,155 | | |
| **Income and Labor Force Participation,** Persons 15+ | | | | |
| Total | -0.00001829 | 4,209 | 2.12 | 1.091 |
| Male | -0.00003784 | 4,209 | | |
| Female | -0.00003540 | 4,209 | | |
| **Other** Persons 0+ | | | | |
| Total (or White) | -0.00001456 | 4,234 | 2.13 | 1.095 |
| Male | -0.00002975 | 4,234 | | |
| Female | -0.00002850 | 4,234 | | |
| **Black** Persons 0+ | -0.00010749 | 3,924 | 1.97 | 1.054 |
| Male | -0.00023121 | 3,924 | | |
| Female | -0.00020087 | 3,924 | | |
| **Hispanic** Persons 0+ | -0.00014490 | 6,028 | 3.03 | 1.306 |
| Male | -0.00028231 | 6,028 | | |
| Female | -0.00029771 | 6,028 | | |
| **Households** | | | | |
| Total (or White) | -0.00003296 | 3,769 | 1.89 | 1.093 |
| Black | -0.00026726 | 3,769 | | |
| Hispanic | -0.00030744 | 3,769 | | |

| Table 4. (Continued) SIPP Generalized Variance Parameters for the 2004 Panel, Wave 5 to Wave 8 File | | | | |
|---|---|---|---|---|
| **Domain** | **Parameters** | | | |
| | ***a*** | ***b*** | **DEFF** | ***f*** |
| **Poverty and Program Participation,** Persons 15+ | | | | |
| Total | -0.00002001 | 4,660 | 2.34 | 1.148 |
| Male | -0.00004138 | 4,660 | | |
| Female | -0.00003874 | 4,660 | | |
| **Income and Labor Force Participation,** Persons 15+ | | | | |
| Total | -0.00001938 | 4,514 | 2.27 | 1.130 |
| Male | -0.00004008 | 4,514 | | |
| Female | -0.00003752 | 4,514 | | |
| **Other,** Persons 0+ | | | | |
| Total (or White) | -0.00001599 | 4,693 | 2.36 | 1.153 |
| Male | -0.00003267 | 4,693 | | |
| Female | -0.00003130 | 4,693 | | |
| **Black,** Persons 0+ | -0.00011694 | 4,318 | 2.17 | 1.106 |
| Male | -0.00025188 | 4,318 | | |
| Female | -0.00021829 | 4,318 | | |
| **Hispanic,** Persons 0+ | -0.00016261 | 6,984 | 3.51 | 1.406 |
| Male | -0.00031731 | 6,984 | | |
| Female | -0.00033355 | 6,984 | | |
| **Households** | | | | |
| Total (or White) | -0.00003589 | 4,147 | 2.08 | 1.147 |
| Black | -0.00028996 | 4,147 | | |
| Hispanic | -0.00032503 | 4,147 | | |

| Table 4. (Continued) SIPP Generalized Variance Parameters for the 2004 Panel, Wave 9 to Wave 12 File | | | | |
|---|---|---|---|---|
| **Domain** | **Parameters** | | **DEFF** | ***f*** |
| | ***a*** | ***b*** | | |
| **Poverty and Program Participation,** Persons 15+ | | | | |
| Total | -0.00004350 | 10,303 | 2.41 | 1.708 |
| Male | -0.00008984 | 10,303 | | |
| Female | -0.00008434 | 10,303 | | |
| **Income and Labor Force Participation,** Persons 15+ | | | | |
| Total | -0.00004054 | 9,601 | 2.24 | 1.648 |
| Male | -0.00008372 | 9,601 | | |
| Female | -0.00007859 | 9,601 | | |
| **Other,** Persons 0+ | | | | |
| Total (or White) | -0.00003490 | 10,387 | 2.43 | 1.715 |
| Male | -0.00007126 | 10,387 | | |
| Female | -0.00006840 | 10,387 | | |
| **Black,** Persons 0+ | -0.00029489 | 11,062 | 2.58 | 1.769 |
| Male | -0.00063453 | 11,062 | | |
| Female | -0.00055094 | 11,062 | | |
| **Hispanic,** Persons 0+ | -0.00028246 | 12,747 | 2.98 | 1.899 |
| Male | -0.00054931 | 12,747 | | |
| Female | -0.00058146 | 12,747 | | |
| **Households** | | | | |
| Total (or White) | -0.00007450 | 8,765 | 2.05 | 1.667 |
| Black | -0.00058983 | 8,765 | | |
| Hispanic | -0.00065172 | 8,765 | | |

Notes: (1) The *a* and *b* parameters are higher than those in Waves 1-8 because of the 53% sample cut that occurred for Waves 9+.

(2) The effective Sampling Interval associated with the 53% sample cut for Waves 9+ is 4282.

| Table 5. Topical Module Generalized Variance Parameters for the 2004 | | |
|---|---|---|
| **Characteristics** | **Parameters** | |
| | ***a*** | ***b*** |
| **Employment History, Wave 1** | | |
| Both Sexes, Age 18+ | -0.00001583 | 3,582 |
| Male, Age 18+ | -0.00003281 | 3,582 |
| Female, Age 18+ | -0.00003059 | 3,582 |
| | | |
| **Recipiency History, Wave 1** | | |
| Both Sexes, Age 18+ | -0.00001545 | 3,497 |
| Male, Age 18+ | -0.00003203 | 3,497 |
| Female, Age 18+ | -0.00002986 | 3,497 |
| | | |
| **Fertility History, Wave 2** | | |
| Women | -0.00002695 | 3,185 |
| Births | -0.00004916 | 5,807 |
| | | |
| **Education History, Wave 2** | -0.00001897 | 4,338 |
| | | |
| **Marital History, Wave 2** | | |
| Some Household Members | -0.00002873 | 6,564 |
| All Household Members | -0.00002652 | 7,976 |
| | | |
| **Migration History, Wave 2** | -0.00002129 | 4,856 |
| | | |
| **Assets and Liabilities** | | |
| Wave 3 | -0.00001956 | 4,495 |
| Wave 6 | -0.00002076 | 4,831 |
| | | |
| **Child Well-Being (Under 18)** | | |
| Wave 3 | -0.00005695 | 4,176 |
| Wave 8 | -0.00006638 | 4,882 |
| | | |
| **Child Care (Age 0 to 15)** | | |
| Wave 4 | -0.00006287 | 4,589 |
| Wave 8 | -0.00006765 | 5,020 |
| | | |
| **Child Support, Wave 5** | -0.00004819 | 5,791 |
| | | |
| **Support for Non-Household Members, Wave 5** | -0.00002499 | 5,791 |
| | | |
| **Health and Disability, Wave 5** | -0.00002381 | 7,247 |
| | | |
| **Welfare Reform, Wave 8** | -0.00005981 | 13508 |

| Table 6. Base Standard Errors of Estimated Numbers of Household or Families | | | |
|---|---|---|---|
| Size of Estimate | Standard Error | Size of Estimate | Standard Error |
| 200,000 | 25,089 | 30,000,000 | 263,266 |
| 300,000 | 30,714 | 40,000,000 | 284,914 |
| 500,000 | 39,617 | 50,000,000 | 295,677 |
| 750,000 | 48,466 | 60,000,000 | 296,742 |
| 1,000,000 | 55,901 | 70,000,000 | 288,217 |
| 2,000,000 | 78,700 | 80,000,000 | 269,191 |
| 3,000,000 | 95,949 | 90,000,000 | 237,152 |
| 5,000,000 | 122,730 | 95,000,000 | 214,529 |
| 7,500,000 | 148,551 | 99,500,000 | 188,747 |
| 10,000,000 | 169,473 | 105,000,000 | 146,194 |
| 15,000,000 | 202,422 | 110,000,000 | 83,313 |
| 25,000,000 | 247,525 | 112,246,000 | 1052 |

Note: These estimates are calculations using the Household Total(or White) *a* and *b* parameters from Table 4.

| Table 7. Base Standard Errors of Estimated Numbers of Persons | | | |
|---|---|---|---|
| Size of Estimate | Standard Error | Size of Estimate | Standard Error |
| 200,000 | 26,573 | 110,000,000 | 489,570 |
| 300,000 | 32,539 | 120,000,000 | 496,685 |
| 500,000 | 37,566 | 130,000,000 | 501,249 |
| 750,000 | 51,408 | 140,000,000 | 503,333 |
| 1,000,000 | 59,335 | 150,000,000 | 502,966 |
| 2,000,000 | 83,766 | 160,000,000 | 500,144 |
| 3,000,000 | 102,412 | 170,000,000 | 494,824 |
| 5,000,000 | 131,747 | 180,000,000 | 486,925 |
| 7,500,000 | 160,640 | 190,000,000 | 476,318 |
| 10,000,000 | 184,659 | 200,000,000 | 462,817 |
| 15,000,000 | 224,110 | 210,000,000 | 446,160 |
| 25,000,000 | 283,956 | 220,000,000 | 425,977 |
| 30,000,000 | 308,076 | 230,000,000 | 401,735 |
| 40,000,000 | 348,746 | 240,000,000 | 372,645 |
| 50,000,000 | 381,936 | 250,000,000 | 337,454 |
| 60,000,000 | 409,468 | 260,000,000 | 293,980 |
| 70,000,000 | 432,425 | 270,000,000 | 237,720 |
| 80,000,000 | 451,504 | 275,000,000 | 201,572 |
| 90,000,000 | 467,182 | 280,000,000 | 155,358 |
| 100,000,000 | 479,792 | 286,997,543 | 4158 |

Notes: (1) These estimates are calculations using the Other Persons 0+ *a* and *b* parameters from Table 4.

(2) To calculate the standard for another domain multiply the standard error from this table by the appropriate *f* factor from Table 4.

| Table 8. Base Standard Errors for Percentages of Households or Families | | | | | | |
|---|---|---|---|---|---|---|
| **Base of Estimated Percentages** | **Estimated Percentages** | | | | | |
| | **≤1 or ≥99** | **2 or 98** | **5 or 95** | **10 or 90** | **25 or 75** | **50** |
| 200,000 | 1.25% | 1.76% | 2.74% | 3.77% | 5.44% | 6.28% |
| 300,000 | 1.02% | 1.44% | 2.23% | 3.08% | 4.44% | 5.13% |
| 500,000 | 0.79% | 1.11% | 1.73% | 2.38% | 3.44% | 3.97% |
| 750,000 | 0.65% | 0.91% | 1.41% | 1.95% | 2.81% | 3.24% |
| 1,000,000 | 0.56% | 0.79% | 1.22% | 1.68% | 2.43% | 2.81% |
| 2,000,000 | 0.40% | 0.56% | 0.87% | 1.19% | 1.72% | 1.99% |
| 3,000,000 | 0.32% | 0.45% | 0.71% | 0.97% | 1.40% | 1.62% |
| 5,000,000 | 0.25% | 0.35% | 0.55% | 0.75% | 1.09% | 1.26% |
| 7,500,000 | 0.20% | 0.29% | 0.45% | 0.62% | 0.89% | 1.03% |
| 10,000,000 | 0.18% | 0.25% | 0.39% | 0.53% | 0.77% | 0.89% |
| 15,000,000 | 0.14% | 0.20% | 0.32% | 0.43% | 0.63% | 0.72% |
| 25,000,000 | 0.11% | 0.16% | 0.24% | 0.34% | 0.49% | 0.56% |
| 30,000,000 | 0.10% | 0.14% | 0.22% | 0.31% | 0.44% | 0.51% |
| 40,000,000 | 0.09% | 0.12% | 0.19% | 0.27% | 0.38% | 0.44% |
| 50,000,000 | 0.08% | 0.11% | 0.17% | 0.24% | 0.34% | 0.40% |
| 60,000,000 | 0.07% | 0.10% | 0.16% | 0.22% | 0.31% | 0.36% |
| 70,000,000 | 0.07% | 0.09% | 0.15% | 0.20% | 0.29% | 0.34% |
| 80,000,000 | 0.06% | 0.09% | 0.14% | 0.19% | 0.27% | 0.31% |
| 90,000,000 | 0.06% | 0.08% | 0.13% | 0.18% | 0.26% | 0.30% |
| 105,000,000 | 0.05% | 0.08% | 0.12% | 0.16% | 0.24% | 0.27% |
| 110,000,000 | 0.05% | 0.07% | 0.12% | 0.16% | 0.23% | 0.27% |
| 112,236,860 | 0.05% | 0.07% | 0.12% | 0.16% | 0.23% | 0.27% |

Note: These estimates are calculations using the Households Total (or White) *b* parameter from Table 4.

| Table 9. Base Standard Errors for Percentages of Persons | | | | | | |
|---|---|---|---|---|---|---|
| **Base of Estimated Percentages** | **Estimated Percentages** | | | | | |
| | **≤1 or ≥99** | **2 or 98** | **5 or 95** | **10 or 90** | **25 or 75** | **50** |
| 200,000 | 1.32% | 1.86% | 2.90% | 3.99% | 5.76% | 6.65% |
| 300,000 | 1.08% | 1.52% | 2.37% | 3.26% | 4.70% | 5.43% |
| 500,000 | 0.84% | 1.18% | 1.83% | 2.52% | 3.64% | 4.20% |
| 750,000 | 0.68% | 0.96% | 1.50% | 2.06% | 2.97% | 3.43% |
| 1,000,000 | 0.59% | 0.83% | 1.30% | 1.78% | 2.57% | 2.97% |
| 2,000,000 | 0.42% | 0.59% | 0.92% | 1.26% | 1.82% | 2.10% |
| 3,000,000 | 0.34% | 0.48% | 0.75% | 1.03% | 1.49% | 1.72% |
| 5,000,000 | 0.26% | 0.37% | 0.58% | 0.80% | 1.15% | 1.33% |
| 7,500,000 | 0.22% | 0.30% | 0.47% | 0.65% | 0.94% | 1.09% |
| 10,000,000 | 0.19% | 0.26% | 0.41% | 0.56% | 0.81% | 0.94% |
| 15,000,000 | 0.15% | 0.21% | 0.33% | 0.46% | 0.66% | 0.77% |
| 25,000,000 | 0.12% | 0.17% | 0.26% | 0.36% | 0.51% | 0.59% |
| 30,000,000 | 0.11% | 0.15% | 0.24% | 0.33% | 0.47% | 0.54% |
| 40,000,000 | 0.09% | 0.13% | 0.20% | 0.28% | 0.41% | 0.47% |
| 50,000,000 | 0.08% | 0.12% | 0.18% | 0.25% | 0.36% | 0.42% |
| 60,000,000 | 0.08% | 0.11% | 0.17% | 0.23% | 0.33% | 0.38% |
| 70,000,000 | 0.07% | 0.10% | 0.15% | 0.21% | 0.31% | 0.36% |
| 100,000,000 | 0.06% | 0.08% | 0.13% | 0.18% | 0.26% | 0.30% |
| 110,000,000 | 0.06% | 0.08% | 0.12% | 0.17% | 0.25% | 0.28% |
| 120,000,000 | 0.05% | 0.08% | 0.12% | 0.16% | 0.23% | 0.27% |
| 130,000,000 | 0.05% | 0.07% | 0.11% | 0.16% | 0.23% | 0.26% |
| 140,000,000 | 0.05% | 0.07% | 0.11% | 0.15% | 0.22% | 0.25% |
| 150,000,000 | 0.05% | 0.07% | 0.10% | 0.15% | 0.21% | 0.24% |
| 160,000,000 | 0.05% | 0.07% | 0.10% | 0.14% | 0.20% | 0.23% |
| 170,000,000 | 0.05% | 0.06% | 0.10% | 0.14% | 0.20% | 0.23% |
| 180,000,000 | 0.04% | 0.06% | 0.10% | 0.13% | 0.19% | 0.22% |
| 190,000,000 | 0.04% | 0.06% | 0.09% | 0.13% | 0.19% | 0.22% |
| 200,000,000 | 0.04% | 0.06% | 0.09% | 0.13% | 0.18% | 0.21% |
| 210,000,000 | 0.04% | 0.06% | 0.09% | 0.12% | 0.18% | 0.21% |
| 220,000,000 | 0.04% | 0.06% | 0.09% | 0.12% | 0.17% | 0.20% |
| 230,000,000 | 0.04% | 0.05% | 0.09% | 0.12% | 0.17% | 0.20% |
| 240,000,000 | 0.04% | 0.05% | 0.08% | 0.12% | 0.17% | 0.19% |
| 250,000,000 | 0.04% | 0.05% | 0.08% | 0.11% | 0.16% | 0.19% |
| 280,000,000 | 0.04% | 0.05% | 0.08% | 0.11% | 0.15% | 0.18% |
| 286,997,543 | 0.03% | 0.05% | 0.08% | 0.11% | 0.15% | 0.18% |

Notes: (1) These estimates are calculations using the Other Persons 0+ *a* and *b* parameter from Table 4.

(2) To calculate the standard for another domain multiply the standard error from this table by the appropriate *f* factor from Table 4.

**Table 10. Distribution of Monthly Cash Income Among People 25 to 34 Years Old**
**(Not Actual Data, Only Use for Calculation Illustrations)**

| | Interval of Monthly Cash Income | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under $300 | $300 to $599 | $600 to $899 | $900 to $1,199 | $1,200 to $1,499 | $1,500 to $1,999 | $2,000 to $2,499 | $2,500 to $2,999 | $3,000 to $3,499 | $3,500 to $3,999 | $4,000 to $4,999 | $5,000 to $5,999 | $6,000 and Over |
| Number of People in Each Interval (in thousands) | 1,371 | 1,651 | 2,259 | 2,734 | 3,452 | 6,278 | 5,799 | 4,730 | 3,723 | 2,519 | 2,619 | 1,223 | 1,493 |
| Cumulative Number of People with at Least as Much as Lower Bound of Each Interval (in thousands) | 39,851 (Total People) | 38,480 | 36,829 | 34,570 | 31,836 | 28,384 | 22,106 | 16,307 | 11,577 | 7,854 | 5,335 | 2,716 | 1,493 |
| Percent of People with at Least as Much as Lower Bound of Each Interval | 100 | 96.6 | 92.4 | 86.7 | 79.9 | 71.2 | 55.5 | 40.9 | 29.1 | 19.7 | 13.4 | 6.8 | 3.7 |