# Appendix B. Source and Reliability of the Estimates

## SOURCE OF DATA

Most of the estimates in this report are based on data collected in November 1980 from the Current Population Survey of the Bureau of the Census. Some data were obtained from the November 1964, 1968, 1972, and 1976 CPS published reports. Also included in text table G are counts of official votes cast during the November elections of these years.

**Current Population Survey (CPS).** The monthly CPS deals mainly with labor force data for the civilian noninstitutional population. Questions relating to labor force participation are asked about each member 14 years old and older in each sample household. In addition, supplemental questions are asked about voting and voter registration during the month of November in election years.

The present CPS sample was initially selected from the 1970 census files with coverage in all 50 States and the District of Columbia. The sample is continually updated to reflect new construction. The current CPS sample is located in 629 areas comprising 1,133 counties, independent cities, and minor civil divisions in the Nation. In this sample, approximately 66,500 occupied housing units were eligible for interview. Of this number, about 2,500 occupied units were visited but interviews were not obtained because the occupants were not found at home after repeated calls or were unavailable for some other reason.

Samples for previous sample designs were selected from files from the most recently completed census. The following table provides a description of some aspects of the CPS sample designs in use during the referenced data collection periods:

The estimation procedure used in the CPS survey involved the inflation of the weighted sample results to independent estimates of the total civilian noninstitutional population of the United States by age, race, and sex. These independent estimates were based on statistics from decennial censuses; statistics on births, deaths, immigration and emigration; and statistics on the strength of the Armed Forces.

## RELIABILITY OF SAMPLE ESTIMATES

Estimates based on a sample may differ somewhat from the figures that would have been obtained if a complete census had been taken using the same questionnaires, instructions, and enumerators. There are two types of errors possible in an estimate based on a sample survey: sampling and nonsampling. The standard errors provided for this report primarily 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 full extent of nonsampling error is unknown. Consequently, particular care should be exercised in the interpretation of figures based on a relatively small number of cases or on small differences between estimates.

**Nonsampling variability.** Nonsampling errors can be attributed to many sources, e.g., 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, inability to recall information, errors made in collection such as in recording or coding the data, errors made in processing the data, errors made in estimating values for missing data,

### Description of the Current Population Survey

| Time period | Number of sample areas[1] | Housing units eligible | |
|---|---|---|---|
| | | Interviewed | Not interviewed |
| November 1980 | 629 | 64,000 | 2,500 |
| November 1976 | 461 | 45,000 | 2,000 |
| November 1972 | 461 | 45,000 | 2,000 |
| November 1968 | 449 | 48,000 | 2,000 |
| November 1964 | 357 | 33,500 | 1,500 |

[1]These areas were chosen to provide coverage in each State and the District of Columbia.

and failure to represent all units with the sample (undercoverage).[1]

Undercoverage in the CPS results from missed housing units and missed persons within sample households. Overall undercoverage as compared to the level of the decennial census is about 5 percent. It is known that CPS undercoverage varies with age, sex, and race. Generally, undercoverage is larger for males than for females and larger for Blacks and other races than for Whites. Ratio estimation to independent age-sex-race population controls, as described previously, partially corrects for the bias due to survey undercoverage. However, biases exist in the estimates to the extent that missed persons in missed households or missed persons in interviewed households have different characteristics than interviewed persons in the same age-sex-race group. Further, the independent population controls used have not been adjusted for undercoverage in the 1970 census, which was estimated at 2.5 percent of the population, with similar undercoverage differentials by age, sex, and race as in CPS.

A coverage improvement sample was included in computing CPS estimates beginning in 1978 in order to provide coverage of mobile homes and new construction housing units which previously had no chance for selection in the CPS sample. This sample is composed of approximately 450 sample housing units which represent 237,000 occupied mobile homes and 600,000 new construction housing units. These new construction units are composed of those units where building permits were issued prior to January 1970 and construction was not completed by the time of the 1970 census (i.e., April 1970). The inclusion of this coverage improvement sample in the CPS does not have a significant effect on the estimates. The extent of other sources of housing undercoverage is unknown but believed to be small.

**Sampling variability.** The standard errors given in the following tables are primarily measures of sampling variability, that is, of the variation that occurred by chance because a sample rather than the entire population was surveyed. The sample estimate and its standard error enable one to construct confidence interval—ranges that would include the average result of all possible samples with a known probability. For example, if all possible samples were selected, each of these was surveyed under essentially the same general conditions and using the same sample design, and 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 1.6 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 may or may not be 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.

Standard errors may also be used to perform hypothesis testing, a procedure for distinguishing between population parameters using sample estimates. The most common types of hypotheses appearing in this report are 1) the population parameters are identical or 2) they are different. An example of this would be comparing the voter participation rate of men versus that of women. Tests may be performed at various levels of significance, where a level of significance is the probability of concluding that the parameters are different when, in fact, they are identical.

All statements of comparison in the text have passed a hypothesis test at the 0.10 level of significance or better, and most have passed a hypothesis test at the 0.05 level of significance or better. This means that, for most differences cited in the text, the estimated difference between parameters is greater than twice the standard error of the difference. For the other differences mentioned, the estimated difference between parameters is between 1.6 and 2.0 times the standard error of the difference. When this is the case, the statement of comparison will be qualified in some way, e.g., by use of the phrase "some evidence."

**Comparability with other data.** Caution should be exercised in comparing metropolitan and nonmetropolitan area estimates from CPS from 1976 and later years to each other and to those from earlier years. Methodological and sample design changes have occurred in these recent years resulting in relatively large differences in the metropolitan and nonmetropolitan area estimates.

**Note when using small estimates.** Summary measures from CPS (such as percent distributions) are shown in the report only when the base of the measure is 75,000 or greater. Because of the large standard errors involved, there is little chance that summary measures would reveal useful information when computed on a smaller base. Estimated numbers are shown, however, even though the relative standard errors of these numbers are larger than those for corresponding percentages. These smaller estimates are provided primarily to permit such combinations of the categories as serve each user's need.

## STANDARD ERROR TABLES AND THEIR USE

In order to derive standard errors that would be applicable to a large number of estimates and could be prepared at a moderate cost, a number of approximations were required. Therefore, instead of providing an individual standard

[1] See the section, "Evaluation of the Accuracy of the Data," in the main body of this report for a detailed discussion of nonsampling errors pertaining to voter participation and registration.

error for each estimate, generalized sets of standard errors are provided for various types of characteristics. As a result, the sets of standard errors provided give an indication of the order of magnitude of the standard error of an estimate rather than the precise standard error.

The figures presented in tables B-1 and B-3 provide approximations to standard errors of estimated numbers and estimated percentages for total or White persons; tables B-2 and B-4 provide approximations to standard errors of estimated numbers and estimated percentages for Black persons. Standard errors for intermediate values not shown in the generalized tables of standard errors may be approximated by linear interpolation. Estimated standard errors for specific characteristics cannot be obtained from tables B-1 through B-4 without the use of factors in tables B-5 and B-6. These factors must be applied to the generalized standard errors in order to adjust for the combined effect of sample design and estimation procedure on the value of the characteristic. The standard error tables with which each factor should be used are indicated in tables B-5 and B-6.

Two parameters (denoted "a" and "b") are used to calculate standard errors for each type of characteristic; they are presented in table B-5. These parameters were used to calculate the standard errors in tables B-1 through B-4, and to calculate the factors in table B-5. They also may be used to directly calculate the standard errors for estimated numbers and percentages. Methods for direct computation are given in the following sections.

**Standard errors of estimated numbers.** The approximate standard error, $\sigma_x$, of an estimated number shown in this report can be obtained in two ways. It may be obtained by use of the formula

$$\sigma_x = f\sigma \qquad (1)$$

where f is the appropriate factor from table B-5 or B-6, and $\sigma$ is the standard error on the estimate obtained by interpolation from table B-1 or B-2. Alternatively, standard errors may be approximated by formula (2) from which the standard errors were calculated in tables B-1 and B-2. Use of this formula will provide more accurate results than the use of formula (1) above.

$$\sigma_x = \sqrt{ax^2 + bx} \qquad (2)$$

Here x is the size of the estimate and a and b are the parameters in table B-5 associated with the particular type of characteristic. When calculating standard errors for numbers from cross-tabulations involving different characteristics, use the factor or set of parameters for the characteristic which will give the largest standard error.

## Table B-1. Standard Errors of Estimated Numbers: Total or White

(68 chances out of 100. Numbers in thousands)

| Estimate | Standard error | Estimate | Standard error |
|---|---|---|---|
| 25 | 8 | 2,500 | 79 |
| 50 | 11 | 5,000 | 110 |
| 75 | 14 | 7,500 | 133 |
| 100 | 16 | 10,000 | 152 |
| 250 | 25 | 25,000 | 223 |
| 500 | 35 | 50,000 | 271 |
| 750 | 43 | 75,000 | 266 |
| 1,000 | 50 | 100,000 | 204 |
| | | 110,000 | 151 |

Note: For a particular characteristic see table B-5 or B-6 for the appropriate factor to apply to the above standard errors.

## Table B-2. Standard Errors of Estimated Numbers: Black and Other Races

(68 chances out of 100. Numbers in thousands)

| Estimate | Standard error | Estimate | Standard error |
|---|---|---|---|
| 25 | 10 | 750 | 51 |
| 50 | 14 | 1,000 | 58 |
| 75 | 17 | 2,500 | 86 |
| 100 | 19 | 5,000 | 106 |
| 250 | 30 | 7,500 | 107 |
| 500 | 42 | 10,000 | 89 |

Note: For a particular characteristic see table B-5 or B-6 for the appropriate factor to apply to the above standard errors.

## Table B-3. Standard Errors of Estimated Percentages: Total or White

(68 chances out of 100)

| Base of estimated percentage (thousands) | Estimated percentage | | | | | |
|---|---|---|---|---|---|---|
| | 2 or 98 | 5 or 95 | 10 or 90 | 20 or 80 | 25 or 75 | 50 |
| 50 | 3.1 | 4.9 | 6.7 | 9.0 | 9.7 | 11.2 |
| 100 | 2.2 | 3.5 | 4.8 | 6.3 | 6.9 | 7.9 |
| 250 | 1.4 | 2.2 | 3.0 | 4.0 | 4.3 | 5.0 |
| 500 | 1.0 | 1.5 | 2.1 | 2.8 | 3.1 | 3.5 |
| 1,000 | 0.7 | 1.1 | 1.5 | 2.0 | 2.2 | 2.5 |
| 5,000 | 0.3 | 0.5 | 0.7 | 0.9 | 1.0 | 1.1 |
| 10,000 | 0.2 | 0.3 | 0.5 | 0.6 | 0.7 | 0.8 |
| 25,000 | 0.14 | 0.2 | 0.3 | 0.4 | 0.4 | 0.5 |
| 50,000 | 0.10 | 0.15 | 0.2 | 0.3 | 0.3 | 0.4 |
| 100,000 | 0.07 | 0.11 | 0.15 | 0.2 | 0.2 | 0.3 |
| 150,000 | 0.06 | 0.09 | 0.12 | 0.2 | 0.2 | 0.2 |

Note: For a particular characteristic see table B-5 or B-6 for the appropriate factor to apply to the above standard errors.

## Table B-4. Standard Errors of Estimated Percentages: Black and Other Races

(68 chances out of 100)

| Base of estimated percentage (thousands) | Estimated percentage | | | | | |
|---|---|---|---|---|---|---|
| | 2 or 98 | 5 or 95 | 10 or 90 | 20 or 80 | 25 or 75 | 50 |
| 50 | 3.8 | 5.9 | 8.1 | 10.9 | 11.8 | 13.6 |
| 100 | 2.7 | 4.2 | 5.8 | 7.7 | 8.3 | 9.6 |
| 250 | 1.7 | 2.6 | 3.6 | 4.9 | 5.3 | 6.1 |
| 500 | 1.2 | 1.9 | 2.6 | 3.4 | 3.7 | 4.3 |
| 750 | 1.0 | 1.5 | 2.1 | 2.8 | 3.0 | 3.5 |
| 1,000 | 0.8 | 1.3 | 1.8 | 2.4 | 2.6 | 3.0 |
| 2,500 | 0.5 | 0.8 | 1.2 | 1.5 | 1.7 | 1.9 |
| 5,000 | 0.4 | 0.6 | 0.8 | 1.1 | 1.2 | 1.4 |
| 10,000 | 0.3 | 0.4 | 0.6 | 0.8 | 0.8 | 1.0 |
| 25,000 | 0.2 | 0.3 | 0.4 | 0.5 | 0.5 | 0.6 |

Note: For a particular characteristic, see table B-5 or B-6 for the appropriate factor to apply to the above standard errors.

**Illustration of the computation of the standard error of an estimated number.** Table 8 of this report shows that 14,520,000 never-married persons 18 years and over reported that they voted in the November 1980 election. Using formula (2) with a=—0.000021 and b=2518 from table B-5, the approximate standard error[2] is

$$\sqrt{(-0.000021)(14{,}520{,}000)^2 + (2{,}518)(14{,}520{,}000)} \doteq 179{,}000$$

This means that the 68-percent confidence interval for the number of never-married persons who voted in the November 1980 election is from 14,341,000 to 14,699,000, and the 95-percent confidence interval is from 14,162,000 to 14,878,000.

**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. When the numerator and denominator of the percentage are in different categories, use the factor or parameters from table B-5 or B-6 indicated by the numerator. The approximate standard error, $\sigma_{(x,p)}$, of an estimated percentage can be obtained by use of the formula

$$\sigma_{(x,p)} = f\sigma \qquad (3)$$

In this formula f is the appropriate factor from table B-5 or B-6, and $\sigma$ is the standard error on the estimate from table B-3 or B-4. Alternatively, standard errros may be approximated by formula (4), from which standard errors in tables B-3 and B-4 were calculated; direct computation will give

[2] Using formula (1), table B-1, and the appropriate factor from table B-5, the approximate standard error is 1.0 x 173,000 = 173,000.

## Table B-5. Factors To Be Applied to Generalized Standard Errors in Tables B-1 Through B-4 and "a" and "b" Parameters for Various Characteristics

| Characteristic | Total or White | | | Black and other races | | | Spanish origin | | |
|---|---|---|---|---|---|---|---|---|---|
| | a | b | f[1] | a | b | f[2] | a | b | f[1] |
| Voting, registration, reasons for not voting or registering: | | | | | | | | | |
| CPS counts[3] | -0.000021 | 2518 | 1.0 | -0.000289 | 3686 | 1.0 | -0.000043 | 7469 | 1.7 |
| Official counts | 0 | 0 | 0 | (X) | (X) | (X) | (X) | (X) | (X) |
| Citizenship, household relationship, family heads by presence of own children, marital status, duration of residence, tenure | -0.000021 | 2518 | 1.0 | -0.000289 | 3686 | 1.0 | -0.000043 | 7469 | 1.7 |
| Educational level, employment status, family income of persons, occupation group | -0.000021 | 2518 | 1.0 | -0.000021 | 2518 | 0.8 | -0.000025 | 3851 | 1.2 |
| Characteristics of all persons: | | | | | | | | | |
| Marital status | -0.000017 | 3500 | 1.2 | -0.000210 | 5020 | 1.2 | -0.000043 | 7469 | 1.7 |
| Education of persons | -0.000016 | 2064 | 0.9 | -0.000186 | 2792 | 0.9 | -0.000025 | 3851 | 1.2 |
| Education of family head | -0.000010 | 1389 | 0.7 | -0.000087 | 1255 | 0.6 | -0.000033 | 2397 | 1.0 |
| Employment, not in labor force, occupation | -0.000016 | 2078 | 0.9 | -0.000133 | 2078 | 0.8 | -0.000810 | 1847 | (4) |
| Unemployment | -0.000015 | 1971 | 0.9 | -0.000139 | 2265 | 0.8 | 0.001490 | 1600 | (4) |
| Persons by family income | -0.000020 | 3770 | 1.2 | -0.000178 | 4310 | 1.1 | -0.000067 | 10112 | 2.0 |
| Duration of residence, tenure | -0.000017 | 3500 | 1.2 | -0.000210 | 5020 | 1.2 | -0.000043 | 7469 | 1.7 |
| Household relationship: | | | | | | | | | |
| Head, wife of head | -0.000010 | 1389 | 0.7 | -0.000087 | 1255 | 0.6 | -0.000033 | 2397 | 1.0 |
| Nonrelative or other relative of head | -0.000017 | 3500 | 1.2 | -0.000210 | 5020 | 1.2 | -0.000043 | 7469 | 1.7 |

[1]Factors in this column should be applied to tables B-1 and B-3.
[2]Factors in this column should be applied to tables B-2 and B-4.
[3]For 1964 data, multiply parameters by 1.5 and factors by 1.22.
[4]To obtain standard errors for this characteristic, use formula (2).

X Not applicable.

more accurate results than use of the standard error tables and the factors.

$$\sigma_{(x,p)} = \sqrt{\frac{b}{x} \cdot p\,(100-p)} \qquad (4)$$

Here x is the size of the subclass of persons, families and unrelated individuals, households, or householders which is the base of the percentage, p is the percentage ($0 \leq p \leq 100$), and b is the parameter in table B-5 associated with the particular type of characteristic in the numerator of the percentage.

**Illustration of the computation of the standard error of an estimated percentage.** Table 8 shows that of these 14,520,000 never-married persons 18 years and over who reported that they voted, 7,082,000 or 48.8 percent were female. Using formula (4) and the appropriate b parameter from table B-5, 2,518, the standard error[3] on an estimate of 48.8 percent is

$$\sqrt{\frac{2518}{14{,}520{,}000}\,(48.8)\,(51.2)} \doteq 0.7 \text{ percent}$$

[3]Using formula (3), table B-3 and the appropriate factor from table B-5, the approximate standard error is also 0.7 percent.

This means that the 68-percent confidence interval for the percentage of never-married persons 18 years and over reporting that they voted who were female is from 48.1 to 49.5 percent, and the 95-percent confidence interval is from 47.4 to 50.2 percent.

**Standard error of a difference.** For a difference between two sample estimates, the standard error is approximately equal to

$$\sigma_{(x-y)} = \sqrt{\sigma_x^2 + \sigma_y^2} \qquad (5)$$

where $\sigma_x$ and $\sigma_y$ are the standard errors of the estimates x and y; the estimates can be of numbers, percents, ratios, etc. This will represent the actual standard errors quite accurately for the difference between two estimates of the same characteristics in two different areas, or for the difference between separate and uncorrelated characteristics in the same area. If, however, there is a high positive (negative) correlation between the two characteristics, the formula will overestimate (underestimate) the true standard error.

**Illustration of the computation of the standard error of a difference.** Table 2 of this report shows that in the November

## Table B-6. Factors to Obtain Standard Errors for Voting and Registration Characteristics for States, Census Divisions, Regions, and Individual SMSA's

| Type of residence | Factors[1] | Type of residence | Factors[1] |
|---|---|---|---|
| STATES | | CENSUS DIVISIONS | |
| Alabama | 1.04 | New England | 0.91 |
| Alaska | 0.30 | Middle Atlantic | 1.03 |
| Arizona | 0.98 | East North Central | 1.01 |
| Arkansas | 0.90 | West North Central | 0.93 |
| California | 1.02 | South Atlantic | 1.03 |
| | | East South Central | 1.02 |
| Colorado | 0.88 | West South Central | 1.04 |
| Connecticut | 1.00 | Mountain | 0.83 |
| Delaware | 0.58 | Pacific | 1.01 |
| District of Columbia | 0.69 | | |
| Florida | 1.03 | REGIONS[2] | |
| Georgia | 1.04 | Northeast | 1.00 |
| Hawaii | 0.66 | North Central | 1.01 |
| Idaho | 0.57 | South | 1.03 |
| Illinois | 1.03 | West | 0.96 |
| Indiana | 1.03 | | |
| | | SMSA'S | |
| Iowa | 0.98 | | |
| Kansas | 0.89 | Anaheim-Santa Clara-Garden Grove | 1.09 |
| Kentucky | 1.04 | Atlanta | 1.09 |
| Louisiana | 1.02 | Baltimore | 1.09 |
| Maine | 0.69 | Boston | 1.00 |
| | | Buffalo | 1.09 |
| Maryland | 1.10 | | |
| Massachusetts | 0.93 | Chicago | 1.09 |
| Michigan | 1.03 | Cincinnati, Oh.-In.-Ky. | 1.06 |
| Minnesota | 1.06 | Cleveland | 1.09 |
| Mississippi | 0.88 | Dallas-Fort Worth | 1.09 |
| | | Denver | 0.94 |
| Missouri | 1.03 | | |
| Montana | 0.53 | Detroit | 1.09 |
| Nebraska | 0.84 | Houston | 1.09 |
| Nevada | 0.55 | Indianapolis | 1.09 |
| New Hampshire | 0.68 | Kansas City, Mo.-Kans. | 1.01 |
| | | Los Angeles-Long Beach | 1.09 |
| New Jersey | 1.02 | | |
| New Mexico | 0.65 | Miami | 1.09 |
| New York | 1.03 | Milwaukee | 1.09 |
| North Carolina | 1.08 | Minneapolis-St. Paul | 1.09 |
| North Dakota | 0.48 | Nassau-Suffolk | 1.09 |
| | | New Orleans | 1.09 |
| Ohio | 1.02 | | |
| Oklahoma | 1.05 | New York | 1.06 |
| Oregon | 1.06 | Newark | 1.09 |
| Pennsylvania | 1.02 | Paterson-Clifton-Passaic | 1.09 |
| Rhode Island | 0.74 | Philadelphia, Pa.-N.J. | 1.09 |
| | | Phoenix | 0.85 |
| South Carolina | 1.02 | | |
| South Dakota | 0.49 | Pittsburgh | 1.09 |
| Tennessee | 1.04 | Portland, Ore.-Wash. | 0.87 |
| Texas | 1.06 | Riverside-San Bernardino-Ontario | 1.09 |
| Utah | 0.62 | St. Louis | 1.09 |
| | | San Diego | 1.09 |
| Vermont | 0.49 | | |
| Virginia | 1.11 | San Francisco-Oakland | 1.09 |
| Washington | 1.05 | San Jose | 1.09 |
| West Virginia | 0.87 | Seattle-Everett | 0.98 |
| Wisconsin | 1.06 | Tampa-St. Petersburg | 1.09 |
| Wyoming | 0.40 | Washington, D.C.-Md.-Va. | 0.97 |

[1]To obtain standard errors of estimated numbers, do the following: (1) Apply the factor of interest (State, census division, region or SMSA) to the generalized standard error table B-1. (2) To obtain estimates by race, multiply the number obtained in step (1) by 1.0 for total or White, 1.21 for Black or 1.72 for Spanish. To obtain standard errors of estimated percentages for total or White, apply the factor of interest from this table to table B-3; for Black, apply the factor to table B-4; and for Spanish, multiply the factor times 1.72 and apply the result to table B-3.

[2]To obtain standard errors for regions cross tabulated by metro and nonmetro data, multiply the regional factor by 1.00 for metro data and 1.50 for non-metro data.

Note: The appropriate factor from table B-5 must still be applied to obtain the standard error for the characteristic of interest.

1980 election, 48.2 percent of the Black voting-age population in the South (8,507,000) voted as compared to 61.6 percent of the Black voting-age population in the North Central Region (3,174,000). The estimated difference between the two regions is 13.4 percent. Using formula (3), table B-4 and the factor 1.03 for the South from table B-6, the standard error on the 48.2 percent of Black voters in the South is 1.1 percent. Using formula (3), table B-4 and the factor 1.01 for the North Central Region from table B-6, the standard error on 61.6 percent is 1.7 percent. Therefore, the standard error of the estimated difference of 13.4 percent is about

$$\sqrt{(1.1)^2 + (1.7)^2} \doteq 2.0 \text{ percent}$$

This means that the 68-percent confidence interval for the difference is 11.4 to 15.4 percent, and the 95-percent confidence interval is 9.4 to 17.4 percent.

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