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Population Estimates and Projections

Series P-25, No. 984

Evaluation of Population Estimation Procedures for Counties: 1980

by
Gilbert R. Felton

U.S. Department of Commerce
BUREAU OF THE CENSUS

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SYMBOLS USED IN TABLES

— Represents zero or rounds to zero.
B Base less than 75,000.
NA Not available.
X Not applicable.
r Revised.

Evaluation of Population Estimation Procedures for Counties: 1980

INTRODUCTION

This is the last in a series of reports presenting the results of the evaluation of population estimation procedures used by the Bureau of the Census during the 1970 decade. Similar reports were published earlier in *Current Population Reports* to cover the estimates for States (Series P-25, No. 933) and for subcounty areas (Series P-25, No. 963).

After each decennial census, the Bureau of the Census has an opportunity to evaluate the level of accuracy of the population estimates produced between censuses and to review the adequacy of the specific procedures used to prepare the estimates. A major part of the evaluation work is to assess the sensitivity of the estimating methods to gauge population shifts. Modifications in the estimating methods are made if the level of accuracy can be improved beyond what is found for the methods currently in use. In the 1970 test, four standard methods of estimation were evaluated, alone or in combination: The Vital Rates Method, the Component Method II, the Regression Method, and the Composite Method. As a result of the 1970 test, the Vital Rates and the Composite Method were replaced with the Administrative Records Method.

Unlike statistical theory which measures mean error, variances, etc., the errors described in this report represent the average percent difference between the census count and the estimate. Because the census provides population counts for every jurisdiction in the country, it has evolved naturally as a standard of comparison and thus greatly simplifies the evaluations shown here. Also, since current estimates are prepared as a substitute for a census, it is appropriate that the decennial census should serve as the standard of accuracy against which the estimates are evaluated.

Though the census is frequently used as a base, we are concerned with the apparent differences in coverage of the population between 1970 and 1980 and the impact of this upon the evaluations. The purpose of the population estimates is to track changes since the last census. When census results are used to evaluate the estimating methods, differences in census coverage obviously can affect the results of the evaluation. These effects are discussed in this report.

The evaluation program for counties following the 1980 census was a major effort designed to determine the most reliable and useful methods for improving the quality of the estimates. This report covers a summary of earlier county population evaluations, a discussion of problems with the 1980 estimates evaluation, and suggests changes that should be made for the 1980 decade. Consideration has been given to the problem of relating the estimates (based on the 1970 census) to a 1980 census count that appears to have inconsistencies with the 1970 census results. Evaluations have been made both with and without adjustments to compensate for the differential coverage of the two censuses.

EARLIER EVALUATIONS

Population estimates for States began in the 1940's and the first major evaluations of the estimating methods were conducted using the results of the 1950 census. It was not until the 1970 census, however, that the program was broadened to include a comprehensive evaluation of county estimates. Estimates for all counties in the United States were first made for 1966 using the Ratio-Correlation method, the Housing Unit method, and Component Method II. This formed the basis for establishing the Federal-State Cooperative Program for Local Population Estimates (FSCPE) in 1967 and for the evaluation work in 1970. [1] Forty-two States in the FSCPE (covering 2,586 of the 3,142 counties) participated in the test against the 1970 counts. The 1970 test evaluated four estimating methods: The Vital Rates method and Component Method II, which had been tested against the 1960 census for counties with modest success, as well as the Ratio-Correlation method and the Composite method, which had been tested relatively little in 1960.

PROBLEMS WITH 1980 ESTIMATES EVALUATION

Evaluation of the estimating methodology used for counties during the 1970's is more difficult than the earlier tests because of the lack of comparability in coverage between the 1970 and 1980 censuses. This lack of comparability is reflected in the large national error of closure in 1980. The error of closure, the difference between the census count and the estimate for the same date, was 5.2 million for the Nation in 1980. In contrast, the error of closure was quite small in 1960 and 1970 (0.9 million and 0.8 million, respectively) and could be effectively ignored in the evaluation of the county estimates methodology.

To assess the estimates methodology for counties, given the large error of closure, it is necessary to understand the potential sources of the error of closure and to eliminate those not directly related to the estimating methodology. The error of closure may theoretically result from inadequate estimating

[1] See U.S. Bureau of the Census, *Current Population Reports*, Series P-26, No. 21, "Federal-State Cooperative Program for Local Population Estimates: Test Results—April 1, 1970," April 1973, for a description of the Federal State Cooperative Program and the 1970 test.

procedures and/or variations in the completeness of the census counts in 1970 and 1980. Based on analyses of the census results and knowledge of the estimating procedures, it appears likely that the large overall error of closure in 1980 stems more specifically from the omission of undocumented aliens in the estimates, some of whom were counted in the 1980 census, and from an improvement in coverage in the 1980 census over the 1970 count. Also contributing to the error of closure was the possibility of double-counting or erroneously enumerating persons in some areas in 1980. An erroneous enumeration occurs when a person who should not have been counted is counted—for example, persons born after April 1, 1980, persons who died before April 1, 1980, and nonresidents of the United States.

For the 1980 census, the Bureau of the Census made extra efforts to count difficult-to-enumerate groups, which include undocumented residents and minority groups. Analysis of coverage in 1980 suggests some degree of success was achieved in counting both groups. First, research conducted at the Census Bureau has shown that about 2 million undocumented aliens were included in the 1980 census counts.[2] Second, estimates of coverage based on demographic analysis indicate a reduction in the undercount compared to 1970. Among Blacks, the estimates show that the net undercount rate for Blacks dropped from 8 percent in 1970 to about 6 percent in 1980. Among all others (the White-and-other-races population), the net undercount was lowered appreciably from 2 percent in 1970 to under 1 percent in 1980.[3] In sum, about two-thirds of the national error of closure in 1980 could be attributed to the inclusion of undocumented aliens in the census and the remainder due to the improvement in net coverage in 1980.

Thus, in evaluating the estimating methodology used for counties during the 1980's, two approaches were used here. The first is a comparison of the 1980 census counts and the 1980 estimates as computed. Although the comparison is affected by the large national error of closure, it does show how the estimates produced during the 1970's (with some corrections for data errors) looked in 1980. It is also likely that the largest effects of the error of closure on these evaluations are concentrated in a few counties that were most affected by the differential count in 1980. The second approach taken is to add the estimated 1970 undercount by county to the 1970 census and recompute the estimates specific to April 1, 1980. This approach is based on the assumption that the nonestimation error component of the error of closure is due to differential coverage between the two censuses, and that there was complete coverage in 1980. Although it is unlikely that these conditions hold completely, they more closely approximate the true conditions and they eliminate the error of closure at the national level which, coincidentally, was of the same magnitude as the 1970 undercount. However, it should not be concluded that the error of closure is solely due to differential coverage. A more likely explanation is that all three factors mentioned above—undocumented aliens, differential coverage, and double-counting—contributed to the large error.

The illustrative 1970 undercount figures for counties were obtained by using a multiple regression equation relating coverage rates for States (dependent variable) to independent State variables assumed to be related to levels of undercount.[4] The independent variables assumed to be associated with under-enumeration were classified into three broad categories: (1) Measures of the degree of difficulty of enumeration, (2) measures of the mobility of the population, and (3) measures of the socioeconomic status of the population.[5] The undercount adjustment procedure assumes that the State-level association of the independent variables with the undercount all applied to the counties.

UNADJUSTED 1980 TEST RESULTS

Provisional Estimates Used. The provisional Administrative Records method was developed by adding the average change between July 1, 1979 and April 1, 1980 for Component Method II estimates and corresponding estimates for the Ratio-Correlation method to the July 1, 1979 estimate. The provisional 1980 county estimates used in the evaluations were based on the average of estimates from the Administrative Records method, Component Method II, and the Ratio-Correlation method. This was essentially the same procedure used in the latter part of the 1970's in the development of the provisional county estimates published in *Current Population Reports,* Series P-26.

Table A summarizes for all counties the percent difference or error between the estimates and the 1980 census counts. Average absolute percent errors are shown for both the provisional and revised series. For all counties, the difference between the error in the provisional and revised series was only 0.1 percentage point, an acceptable level of difference for using the provisional 1980 estimates rather than the revised figures in the evaluations shown in the rest of this report.

1970-80 Comparisons. In order to gauge any changes in the quality of the estimates that occurred over the 1970-80 period, the comparisons in this section are restricted to two methods (Component Method II and Ratio-Correlation method) that were in use both in 1970 and 1980. Table B

[2]Robert Warren and Jeffrey S. Passel, "A Count of the Uncountable: Estimates of Undocumented Aliens Counted in the 1980 United States Census," revised version of paper presented at the 1983 meeting of the Population Association of America, Pittsburgh, PA; Jeffrey S. Passel and Karen A. Woodrow, "Geographic Distribution of Undocumented Immigrants: Estimates of Undocumented Aliens Counted in the 1980 Census by State," International Migration Review, Vol. 18 (Fall), pp. 642-671.

[3]See forthcoming report, *1980 Census of Population and Housing Evaluation and Research Report,* "The Coverage of Population in the 1980 Census" (series PHC80-E).

[4]Undercount rates for States were estimated by demographic analysis and published in U.S. Bureau of the Census, *Current Population Reports,* Series P-23, No. 65, "Developmental Estimates of the Coverage of the Population of States in the 1970 Census," December 1977.

[5]The independent variables used to develop illustrative estimates of the 1970 census undercount for counties are (1) percent of population of the 100-percent count with one or more allocations, (2) percent of housing units vacant, (3) percent living in different house in 1969, (4) percent occupied units with more than 1.01 persons per room, (5) percent of population 25 years or older with less than 5 years of schooling, and (6) percent of renter-occupied housing units.

Table A. Average Absolute Percent Error of County Population Estimates, by Region, Division, and State—Provisional and Revised: April 1, 1980

(See Definitional section of this report)

Region, division, and State	Average of three methods				"Best average"			
	Unweighted percent error		Weighted percent error		Unweighted percent error		Weighted percent error	
	Provisional	Revised	Provisional	Revised	Provisional	Revised	Provisional	Revised
United States	4.2	4.1	3.1	3.1	3.9	3.8	3.0	2.9
Region:								
Northeast	2.7	2.7	2.2	2.2	2.4	2.4	2.0	1.9
Midwest[1]	3.3	3.2	2.1	2.1	3.1	2.9	2.0	1.8
South	4.9	4.8	4.3	4.2	4.6	4.5	4.2	4.1
West	4.6	4.6	3.5	3.4	4.2	4.2	3.3	3.3
Northeast:								
New England	2.6	2.5	1.7	1.6	2.4	2.2	1.6	1.6
Middle Atlantic	2.8	2.8	2.4	2.4	2.5	2.4	2.1	2.0
Midwest:[1]								
East North Central	3.2	3.1	1.9	1.8	3.0	2.9	1.8	1.7
West North Central	3.5	3.3	2.6	2.6	3.1	2.9	2.3	1.9
South:								
South Atlantic	4.8	4.7	4.6	4.3	4.6	4.5	4.4	4.2
East South Central	4.5	4.5	4.0	4.0	4.3	4.2	3.9	4.0
West South Central	5.2	5.3	4.1	4.1	5.0	4.7	4.0	4.0
West:								
Mountain	4.8	4.8	4.9	4.8	4.0	4.3	4.7	4.6
Pacific	4.3	4.2	2.9	2.9	4.0	4.0	2.8	2.9
New England:								
Maine	2.6	2.4	3.2	3.1	2.5	2.2	3.1	2.8
New Hampshire	3.3	3.2	3.3	3.0	3.1	2.9	3.3	2.9
Vermont	3.2	3.0	2.8	2.6	3.0	2.9	2.7	2.6
Massachusetts	2.2	2.2	1.2	1.2	1.8	1.8	1.1	1.2
Rhode Island	2.9	2.4	3.1	2.5	2.7	2.2	3.1	2.5
Connecticut	1.1	1.2	0.9	1.0	1.1	1.2	0.9	0.9
Middle Atlantic:								
New York	2.4	2.1	2.6	2.6	2.0	1.9	2.4	2.3
New Jersey	2.1	1.9	1.8	1.8	1.5	1.4	1.2	1.2
Pennsylvania	3.4	3.6	2.4	2.5	3.2	3.2	2.1	2.2
East North Central:								
Ohio	2.4	2.0	1.4	1.3	2.2	1.6	1.3	1.2
Indiana	3.4	3.7	2.1	2.4	3.0	3.4	2.0	2.3
Illinois	3.8	3.6	2.2	2.1	3.7	3.6	2.1	2.0
Michigan	3.4	3.3	1.7	1.6	3.2	3.1	1.7	1.5
Wisconsin	2.7	2.7	2.7	2.5	2.7	2.6	2.5	2.2
West North Central:								
Minnesota	2.9	2.7	2.4	2.4	2.5	2.3	2.1	2.1
Iowa	2.1	2.0	1.7	1.6	2.0	1.9	1.6	1.5
Missouri	3.3	3.7	3.3	3.7	3.1	3.1	2.9	3.4
North Dakota	4.2	4.3	3.1	3.2	4.1	4.3	3.0	3.2
South Dakota	4.9	4.8	3.8	3.5	4.8	4.6	3.6	3.5
Nebraska	3.7	3.2	2.4	2.3	3.4	2.9	2.4	2.3
Kansas	3.9	3.3	2.2	1.8	2.9	2.6	1.9	1.8
South Atlantic:								
Delaware	3.9	3.3	2.9	2.4	3.5	2.9	2.9	2.4
Maryland	2.8	2.3	2.2	1.5	2.4	2.1	2.1	1.4
Virginia	4.6	4.3	3.5	3.3	4.6	4.3	3.5	3.3
West Virginia	4.3	4.5	3.8	4.0	4.3	4.5	3.8	4.0
North Carolina	3.8	4.1	3.8	4.0	3.7	3.9	3.7	4.0
South Carolina	5.1	5.2	5.6	5.6	4.9	5.0	5.6	5.6
Georgia	5.4	5.4	5.1	5.2	4.8	4.8	5.1	5.2
Florida	6.5	5.8	6.2	5.6	6.1	5.4	6.2	5.5
East South Central:								
Kentucky	4.7	4.7	4.4	4.3	4.7	4.7	4.3	4.3
Tennessee	4.2	4.7	3.7	4.1	3.8	4.1	3.6	4.1
Alabama	4.3	4.2	3.7	3.5	4.0	3.8	3.7	3.5
Mississippi	4.4	4.1	4.4	4.2	4.3	4.1	4.2	4.2
West South Central:								
Arkansas	5.6	5.5	5.0	5.0	5.6	5.5	4.7	4.7
Louisiana	3.9	3.8	3.3	3.1	3.6	3.3	3.3	3.1
Oklahoma	5.0	4.6	3.8	3.8	4.6	4.3	3.4	3.5
Texas	5.5	5.8	4.3	4.3	5.2	4.9	4.3	4.3
Mountain:								
Montana	5.0	5.2	3.3	3.2	4.1	4.4	2.9	3.0
Idaho	3.9	3.8	4.4	4.3	3.9	3.8	4.1	4.0
Wyoming	3.7	3.8	3.4	3.6	2.8	2.8	2.7	2.9
Colorado	5.1	5.0	3.5	3.3	4.6	4.6	3.2	3.1
New Mexico	5.9	5.6	4.9	4.9	5.1	4.9	4.6	4.6
Arizona	4.9	4.6	6.3	6.1	4.7	4.5	6.3	6.0
Utah	4.2	3.9	4.8	4.9	4.1	3.9	4.7	4.8
Nevada	6.2	6.1	8.9	8.6	6.0	6.0	8.8	8.5
Pacific:								
Washington	3.5	3.4	3.0	3.0	3.5	3.4	2.9	2.9
Oregon	3.0	2.6	3.1	3.3	2.7	2.3	2.9	3.1
California	3.1	3.0	2.9	3.0	2.9	2.9	2.7	2.8
Alaska	9.5	9.3	4.7	3.8	8.8	9.2	4.5	3.8
Hawaii	4.3	4.5	3.4	3.8	2.3	2.4	3.4	3.7

[1]Formerly North Central Region.

shows that the average absolute percent error for the average of the two methods declined by 0.3 percent—from 4.9 percent in 1970 to 4.6 percent in 1980—solely because of the improved performance of Method II. The Ratio-Correlation method actually deteriorated over the period. Extreme errors, i.e., errors of 10 percent or more, decreased by 2 percent and the bias in the estimates shifted from being quite positive in 1970 to being quite negative in 1980 (table B and fig. 1).

The errors were modestly improved for counties in the Midwest and Southern regions of the country, but deteriorated slightly in the Northeast and West. The decline in the proportion of counties with extreme errors accounted for the improvement in the error rates for the two regions. In 1970, about 15 percent of the counties in the South had errors in excess of 10 percent. By 1980, this proportion was down to less than 12 percent. The South reversed its role from the most positively biased region in 1970 to the most negatively biased region in 1980. The Northeast, on the other hand, switched from an unbiased region in 1970 to a region in 1980 where the estimation procedures were likely to understate the population in 70 percent of its counties (table B and fig. 2).

Table B. Measures of Accuracy of County Population Estimates, by Region, Size of County, and Method: April 1, 1970 and April 1, 1980

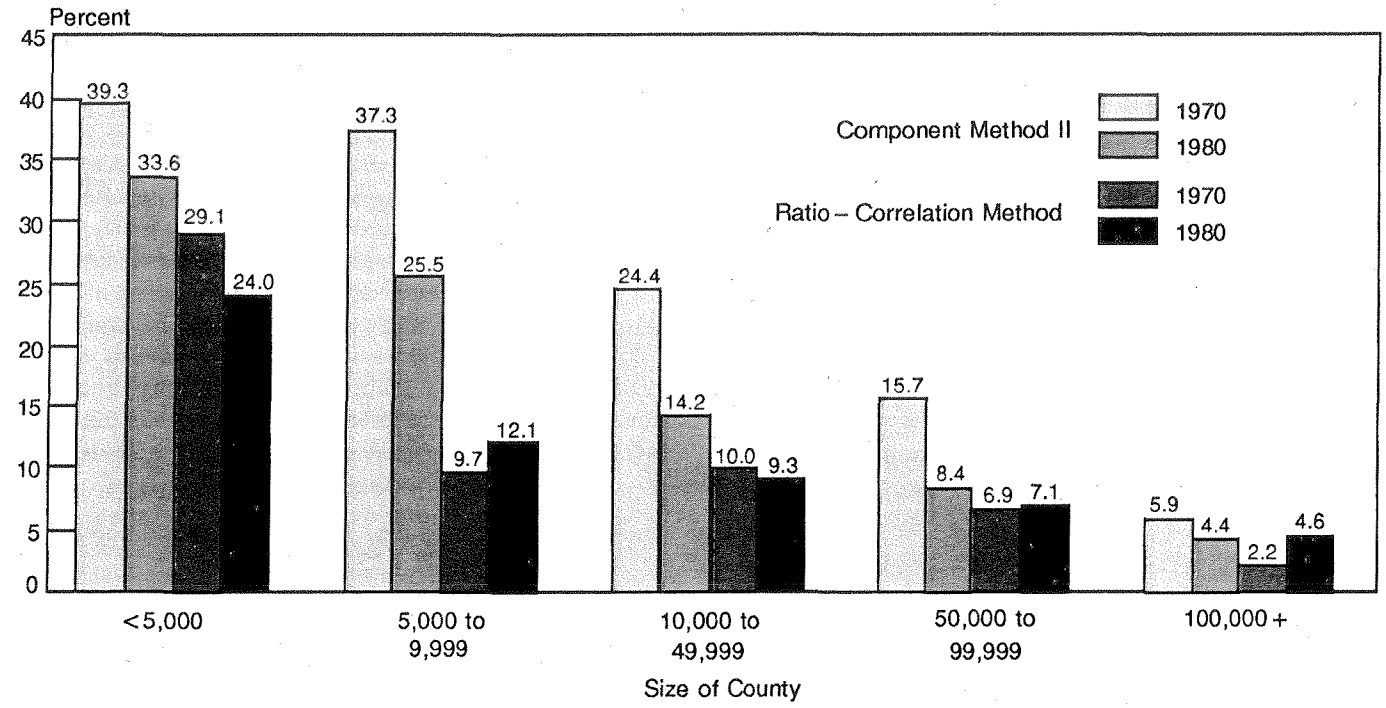
Summary measure	All counties	Region				Population size of county[2]				
		Northeast	Midwest[1]	South	West	Less than 5,000	5,000 to 9,999	10,000 to 49,999	50,000 to 99,999	100,000 or more
Number of counties:										
1980	3,142	217	1,056	1,424	445	292	470	1,588	380	412
1970	2,586	195	887	1,148	356	206	424	1,426	261	269
Average of Estimates[3]										
Average absolute percent error:[4]										
1980	4.6	3.1	3.8	5.2	5.4	7.0	5.6	4.4	4.1	3.3
1970	4.9	3.0	4.5	5.5	5.2	6.7	5.5	5.0	4.1	2.9
Percent of counties with--										
Positive errors:										
1980	33.5	29.0	43.4	22.6	46.7	67.1	48.1	28.0	17.9	28.2
1970	69.0	49.7	60.9	79.7	65.2	(NA)	(NA)	(NA)	(NA)	(NA)
Errors of 10.0 percent or more:										
1980	9.6	1.8	6.3	11.9	13.7	27.1	14.0	8.1	4.7	2.4
1970	11.6	4.6	8.2	14.9	12.9	19.9	13.0	12.3	8.4	2.2
COMPONENT METHOD II										
Average absolute percent error:[4]										
1980	5.8	3.7	5.1	6.3	6.7	9.5	7.3	5.5	4.6	3.5
1970	7.2	4.2	7.1	7.4	8.0	9.6	8.9	7.2	5.4	4.0
Percent of counties with--										
Positive errors:										
1980	34.8	26.3	45.3	25.6	43.6	63.6	47.7	30.0	21.6	30.8
1970	74.0	53.3	70.3	81.4	70.5	(NA)	(NA)	(NA)	(NA)	(NA)
Errors of 10.0 percent or more:										
1980	15.7	4.6	12.5	19.1	17.8	33.6	25.5	14.2	8.4	4.4
1970	24.9	9.7	24.7	26.5	28.9	39.3	37.3	24.4	15.7	5.9
RATIO-CORRELATION METHOD										
Average absolute percent error:[4]										
1980	4.9	3.4	3.8	5.7	5.7	7.6	5.4	4.7	4.5	3.9
1970	4.6	3.5	4.1	4.9	5.7	7.9	4.5	4.6	4.2	3.0
Percent of counties with--										
Positive errors:										
1980	35.3	32.3	42.3	27.0	47.0	62.3	48.3	31.5	20.3	30.1
1970	55.7	47.7	44.9	68.6	45.8	(NA)	(NA)	(NA)	(NA)	(NA)
Errors of 10.0 percent or more:										
1980	10.2	3.2	4.7	14.0	14.6	24.0	12.1	9.3	7.1	4.6
1970	10.3	4.6	7.2	11.8	15.4	29.1	9.7	10.0	6.9	2.2

Note: For 1980, all counties and county equivalents in the country are included in the derivation of the summary measures. For 1970, counties and county equivalents in Alaska, Connecticut, Missouri, New Hampshire, North Dakota, Oregon, Texas, and Wyoming are excluded from the derivation of the summary measures.

NA Not available.

[1]Formerly North Central Region.
[2]Size of county is based on 1980 census counts.
[3]For both 1970 and 1980, the population estimates used in the derivation of the summary measures are based on an average of Component Method II and the Ratio-Correlation method.
[4]Unweighted arithmetic average.

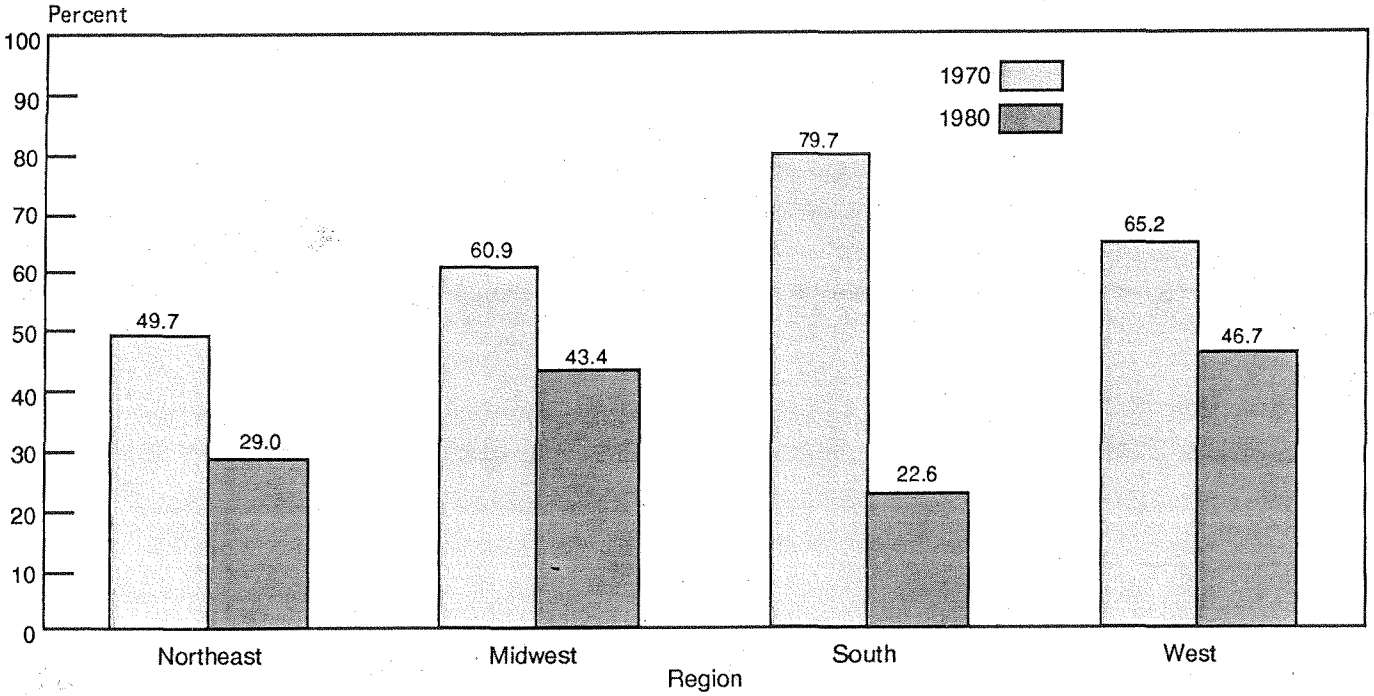
Figure 1. Percent of Counties With Errors of 10 Percent or More, by Size of County: 1970 and 1980



Note: Error refers to the difference between the 1980 census count and the population estimate for the county.

Source: Table B.

Figure 2. Percent of Counties With Positive Errors, by Region: 1970 and 1980



Note: Error refers to the difference between the 1980 census count and the population estimate for the county.

Source: Table B.

Consistent with expectations, population size is a major determinant of accuracy levels. In both 1970 and 1980, smaller counties (under 5,000 population) experienced larger errors (7 percent) while larger counties (greater than 100,000 population) had errors about half that amount. The errors for both the larger and smaller counties worsened over the evaluation period—counties with over 100,000 population at a somewhat higher rate than counties with less than 5,000 population.

There were obvious differences in the performance of the individual methods over the evaluation period. For Component Method II, there was a significant decline in the percent of counties with extreme errors, resulting in the average percent error dropping from 7.2 percent to 5.8 percent in 1980. Improvement was shown in the errors for Method II regardless of region or size of county. Nevertheless, the Ratio-Correlation method proved to be more accurate than Method II regardless of the year or the region of the country. However, the overall error for the Ratio-Correlation method increased slightly from 1970 to 1980 (4.6 to 4.9 percent), largely because of the increase in the errors in the South. In all of the other regions, this method had errors that remained the same or decreased slightly.

Although the Ratio-Correlation method proved to be more accurate than Method II in both 1970 and 1980, the data suggest that the procedure lacks temporal stability; that is, the pattern of the estimates each year from 1970 to 1980 is not smooth.[6] A reexamination of the method for more conclusive evidence at the county level is warranted.

1980 Detailed Results. During the 1970's, the Administrative Records method was added to the other two procedures for estimating county population. Table C indicates that the addition of this third method improved the estimates by reducing the error level from 4.6 percent in the average of Component Method II and the Ratio-Correlation method (table B) to 4.2 percent. The improvement was found for all regions and in all population size categories.

[6]U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 933, p. 7.

Table C. Measures of Accuracy of County Population Estimates, by Region, Size of County, and Method: April 1, 1980

Summary measure	All counties	Region				Population size of county[2]					
		North-east	Midwest[1]	South	West	Less than 5,000	5,000 to 9,999	10,000 to 24,999	25,000 to 49,999	50,000 to 99,000	100,000 or more
Number of counties	3,142	217	1,056	1,424	445	292	470	974	614	380	412
AVERAGE OF ESTIMATES											
Average absolute percent error:											
Unweighted	4.2	2.7	3.3	4.9	4.6	6.1	4.8	4.1	4.0	3.8	3.0
Weighted	3.1	2.2	2.1	4.3	3.5	5.3	4.7	4.1	3.9	3.8	2.7
Percent of counties with--											
Positive errors	31.0	27.2	41.2	19.4	45.8	66.1	46.0	29.2	18.4	16.3	25.7
Errors of 10.0 percent or more	7.1	1.4	4.1	9.4	9.7	18.8	9.4	7.1	5.5	3.2	2.2
COMPONENT METHOD II											
Average absolute percent error:											
Unweighted	5.8	3.7	5.1	6.3	6.7	9.5	7.3	5.6	5.3	4.6	3.5
Weighted	3.7	2.7	2.9	5.0	3.7	8.6	7.2	5.5	5.3	4.5	3.1
Percent of counties with--											
Positive errors	34.8	26.3	45.3	25.6	43.6	63.4	47.7	34.0	23.6	21.6	30.8
Errors of 10.0 percent or more	15.7	4.6	12.5	19.1	17.8	33.6	25.5	15.8	11.6	8.4	4.4
RATIO-CORRELATION METHOD											
Average absolute percent error:											
Unweighted	4.9	3.4	3.8	5.7	5.7	7.6	5.4	4.9	4.4	4.5	3.9
Weighted	3.9	3.3	2.5	5.4	3.9	6.9	5.4	4.8	4.3	4.5	3.6
Percent of counties with--											
Positive errors	35.3	32.3	42.3	27.0	47.0	62.3	48.3	36.1	24.1	20.3	30.1
Errors of 10.0 percent or more	10.2	3.2	4.7	14.0	14.6	24.0	12.1	10.4	7.7	7.1	4.6
ADMINISTRATIVE RECORDS METHOD[3]											
Average absolute percent error:											
Unweighted	4.3	2.5	3.4	5.2	4.8	6.5	4.8	4.4	4.1	3.8	2.9
Weighted	3.2	1.9	2.2	4.4	3.7	5.5	4.8	4.4	4.0	3.8	2.7
Percent of counties with--											
Positive errors	27.8	28.1	38.3	16.2	40.4	55.5	36.0	24.4	17.3	20.8	29.4
Errors of 10.0 percent or more	6.5	0.5	3.3	8.8	9.2	17.1	8.3	7.0	4.1	3.4	1.9

[1]Formerly North Central Region.
[2]Size of county is based on 1980 census counts.
[3]See text for a description of the Administrative Records method.

Size of County. The accuracy of the estimates increased as the population of the county increased, and a great difference was found between the smaller counties and the larger counties (table C). Counties with less than 5,000 population had an average error of 6.1 percent, while the average error was only 3.0 percent for counties with populations of 100,000 or more. Extreme errors (10 percent or more) occurred most often in the smallest counties and least often in the largest counties (19 and 2 percents, respectively). The strength of the directional bias also appeared to be highly correlated with the size of the counties' populations. Approximately two-thirds of the smallest counties had positive errors while only about one-sixth of the counties in the 50,000-to-99,999 population size group and one-fourth of the largest counties overestimated the population.

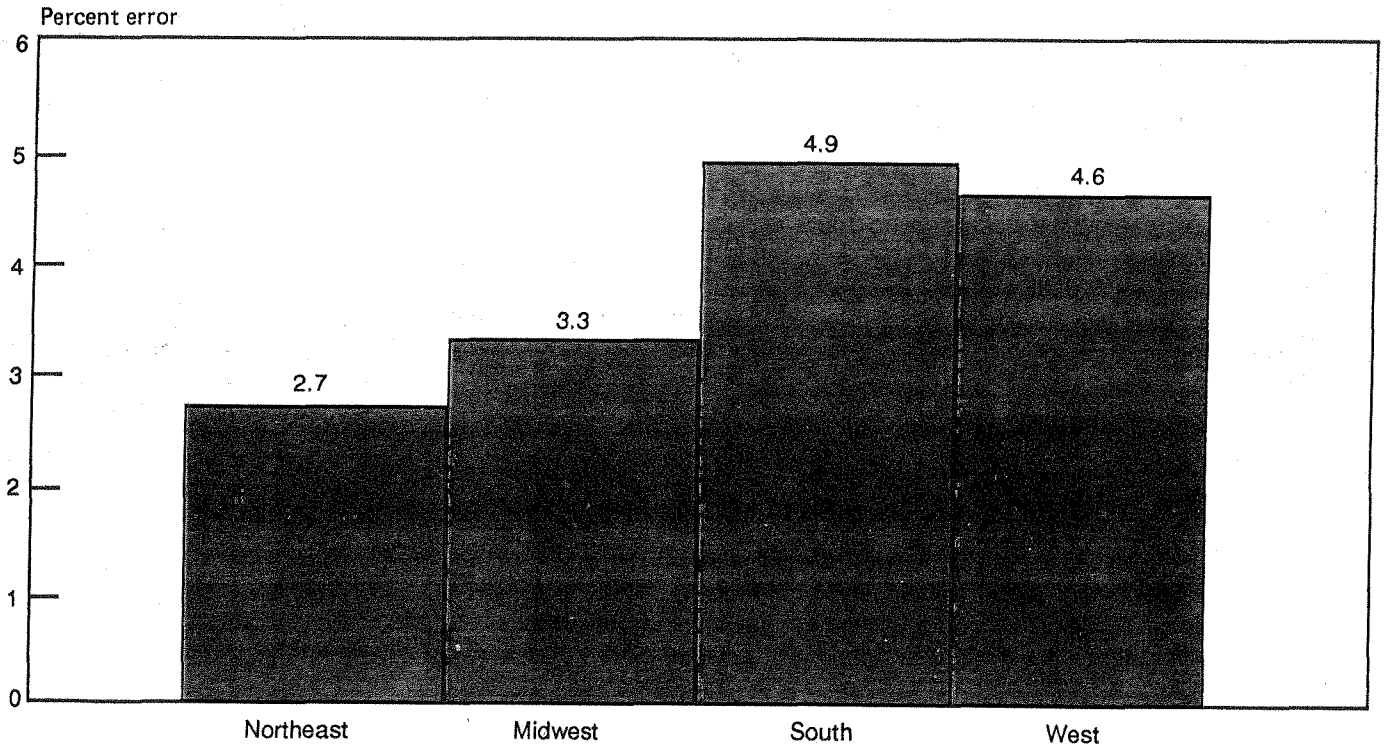
Regional and Divisional Comparisons. Definite differences were apparent when the errors were reviewed by region (table C and fig. 3). The South had the highest average absolute percent error regardless of whether the unweighted or weighted (weighting is by population size in 1980) errors were used as the standard (4.9 and 4.3 percents, respectively). Counties in the Northeast had the lowest unweighted average error (2.7 percent). Almost 10 percent of the counties in the South and West had extreme errors (absolute errors of 10 percent or more). This contrasted with only 4.1 percent of the counties in the Midwest Region and 1.4 percent of the counties in the Northeast. The South was the most negatively biased region of the country with less than 20 percent of the counties having positive errors, while in the West, almost 46 percent of the counties had positive errors.

The general distribution of the errors when examined by division were similar to those observed at regional levels (table D). The proportion of counties with extreme errors, however, ranged from 2.0 percent in the Middle Atlantic counties to 14.3 percent in counties in the West South Central Division. In the South, where the estimation procedures greatly understated population levels, extreme errors were disproportionately located in counties in the West South Central Division, more than one and one-half times the value for the region as a whole.

There also appears to be strong negative bias in the April 1, 1980 county population estimates in most of the divisions. However, it remains to be seen whether this is due to actual regional differences, population size distribution differentials, rates of change, or some other characteristic of subregional geographic units.

Comparison of Individual Methods. The Administrative Records method was the most accurate but the most biased of any single method for estimating county population, while Component Method II was the least accurate with the most extreme errors (table E and fig. 4). Of the four averages, that based on the Ratio-Correlation method and the Administrative Records method estimates was the most reliable (based on unweighted absolute percent errors). However, an average

Figure 3. Percent Error of Estimates, by Region: 1980



Note: Error refers to the difference between the 1980 census count and the population estimate for the county.

Source: Table C.

based on the three methods was not significantly less accurate than an average based on the Administrative Records and Ratio-Correlation methods. No matter what method or average of estimates was chosen, at least 6 percent of the counties had errors greater than 10 percent.[7]

The error structure, as just discussed, was essentially repeated when size of county was taken into account. In counties with less than 5,000 population, Component Method II estimates were the least effective (9.5 percent), while the most accurate estimates were produced using the Administrative Records method or the Administrative Records method averaged either with the Ratio-Correlation method estimates or the Ratio-Correlation method estimates and the Component Method II estimates. For the largest counties (those with 1980 census counts of 100,000 or more), estimates based on the Administrative Records method alone or the average of the Administrative Records method and Component Method II estimates appeared to be the most accurate (2.9 percent), although the other two averages which included the Administrative Records method were not significantly less accurate. Also, it was evident that as the size of county increases, the error rate decreases.

When the individual methods were examined by region, the error pattern was essentially the same as that observed for the Nation as a whole (table C). Regardless of region of the country, the Administrative Records method proved to be the most accurate of the three procedures used to develop the county estimates, followed by the Ratio-Correlation method and last by Component Method II.

The South was the most negatively biased region in the country no matter which estimating procedure was used.

[7]There are exceptions to the average of these estimates in three States: California, Maryland, and Wisconsin. In California, estimates based on the Drivers' License Address Change (DLAC) method were included in the calculations of the estimates for both the provisional and revised estimates. In Maryland, the Income Tax Return method estimates were averaged into the revised estimates. In Wisconsin, the Composite Method estimates were used in the average for all counties, while Component Method II estimates were included only for those counties with a 1970 population of more than 25,000. For evaluation purposes, what is discussed here and shown in the tables as the average of the three methods (four in the case of California) is the provisional estimate as calculated in the 1970's.

Table D. Measures of Accuracy of County Population Estimates, by Division and Method: April 1, 1980

Summary measure	All counties	Division								
		New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Number of counties	3,142	67	150	437	619	590	364	470	279	166
AVERAGE OF ESTIMATES										
Average absolute percent error:										
Unweighted	4.2	2.6	2.8	3.2	3.5	4.8	4.5	5.2	4.8	4.3
Weighted	3.1	1.7	2.4	1.9	2.6	4.6	4.0	4.1	4.9	2.9
Percent of counties with--										
Positive errors	31.0	32.8	24.7	25.2	52.5	17.3	15.9	24.7	50.5	38.0
Errors of 10.0 percent or more	7.1	-	2.0	2.3	5.3	8.6	4.4	14.3	9.3	10.2
COMPONENT METHOD II										
Average absolute percent error:										
Unweighted	5.8	3.5	3.8	4.3	5.6	6.5	5.4	6.7	7.1	6.0
Weighted	3.7	2.1	3.0	2.5	3.7	5.2	4.5	5.1	5.9	2.9
Percent of counties with--										
Positive errors	34.8	31.3	24.0	28.8	56.9	20.5	17.9	38.1	45.5	40.4
Errors of 10.0 percent or more	15.7	3.0	5.3	8.0	15.7	20.0	13.2	22.6	20.1	13.9
RATIO-CORRELATION METHOD										
Average absolute percent error:										
Unweighted	4.9	3.3	3.4	3.6	4.0	4.9	4.8	7.6	6.3	4.7
Weighted	3.9	2.1	3.7	2.2	3.3	5.1	4.6	6.3	5.7	3.2
Percent of counties with--										
Positive errors	35.3	28.4	34.0	26.1	53.8	28.5	27.7	24.5	52.3	38.0
Errors of 10.0 percent or more	10.2	3.0	3.3	2.7	6.1	7.6	8.8	26.0	19.0	7.2
ADMINISTRATIVE RECORDS METHOD[1]										
Average absolute percent error:										
Unweighted	4.3	2.4	2.5	3.4	3.3	5.4	5.0	5.1	4.9	4.6
Weighted	3.2	1.6	2.0	2.0	2.6	4.7	4.1	4.2	4.7	3.3
Percent of counties with--										
Positive errors	27.8	28.4	28.0	29.1	44.7	14.7	14.3	19.4	37.6	45.2
Errors of 10.0 percent or more	6.5	-	0.7	2.7	3.7	9.5	6.0	10.2	9.7	8.4

- Represents zero.

[1]See text for a description of the Administrative Records method.

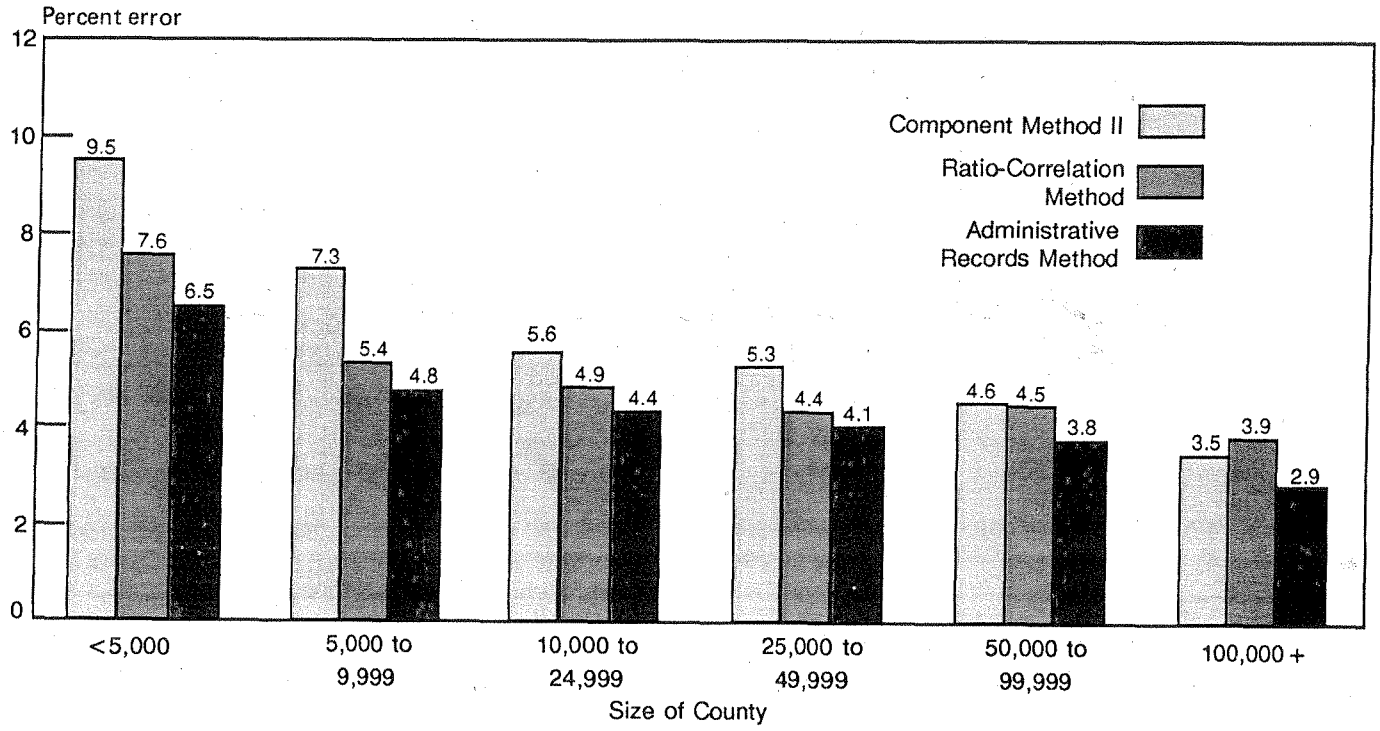
Table E. Measures of Accuracy of County Population Estimates, by Size of County and Combinations of Methods: April 1, 1980

(N = 3,142)

Summary measure	Component Method II (CM)	Ratio-Correlation method (RC)	Administrative Records method[1] (AR)	Average of--			
				CM and RC	CM and AR[1]	RC and AR[1]	CM, RC, and AR[1]
Average absolute percent error:							
Unweighted	5.8	4.9	4.3	4.6	4.5	4.1	4.2
Weighted	3.7	3.9	3.2	3.3	3.2	3.2	3.1
Percent of counties with--							
Positive errors	34.8	35.3	27.8	33.5	30.5	30.4	31.0
Errors of 10.0 percent or more	15.7	10.2	6.5	9.6	8.4	6.5	7.1
Average absolute percent errors by population size of county:[2] [3]							
Less than 5,000	9.5	7.6	6.5	7.0	7.0	6.1	6.1
5,000 to 9,999	7.3	5.4	4.8	5.6	5.3	4.3	4.8
10,000 to 24,999	5.6	4.9	4.4	4.5	4.4	4.1	4.1
25,000 to 49,999	5.3	4.4	4.1	4.3	4.3	3.8	4.0
50,000 to 99,999	4.6	4.5	3.8	4.1	3.9	3.8	3.8
100,000 or more	3.5	3.9	2.9	3.3	2.9	3.1	3.0

[1]See text for a description of the Administrative Records method.
[2]Unweighted arithmetic average.
[3]Size of county is based on 1980 census counts.

Figure 4. Percent Error of Estimates, by Size of County and Method: 1980



Note: Error refers to the difference between the 1980 census count and the population estimate for the county.

Source: Table E.

A further test of the adequacy of the individual estimating procedures was carried out using a different measure—the Coefficient of Effectiveness which is described in appendix A of this report. Similar observations were confirmed when using this measure of reliability (table F).[8]

The most effective single method of estimating the population of counties was the Administrative Records method with a Coefficient of Effectiveness of .627 (based on unweighted average absolute percent errors), Component Method II was at the other extreme with a coefficient of .123. The most effective average of estimates was based on the Ratio-Correlation and Administrative Records methods with a coefficient of .765, followed closely by the average of all three methods with a coefficient of .733. At the regional level, essentially the same pattern was repeated, with the exception of the Northeast where the least effective single method was the Ratio-Correlation method (.204).

In summary, Component Method II was the least accurate single method and the Administrative Records method was the most accurate. Only selected averages of methods were more accurate than the Administrative Records method estimates alone. The accuracy of the estimates was increased as the size of county increased in all methods. The average of estimates based on the Ratio-Correlation and Administrative Records method estimates and the average of all three methods were the most accurate of the averages. The Component Method II errors were more extreme when compared to the other two single methods.

[8]The coefficients were developed by ranking average absolute percent errors at the State level, rather than by ranking the estimates and averages for each individual county and summing the county rankings to the State level.

Rate of Growth. Earlier evaluations have found a direct relationship between the rate of population growth and the accuracy of the population estimates. The greatest accuracy can be achieved for moderately growing counties. Lower levels of error are usually experienced in counties with less rapid population growth than in those undergoing rapid population growth or decline. There may be many reasons for this, but certainly a lag in the changes that may be occurring in the administrative data inputs could be a factor.

The effect of the rate of change can be seen in table G. At the extreme rates of population change (either gain or loss) the average errors are larger. For example, for the 213 counties where the population increased by 50 percent or more between 1970 and 1980, the average error was 7.1 percent. Similarly, the estimates were equally poor for counties with heavy population losses, 5.4 percent for counties losing 10 percent or more of their population.

In addition, the errors vary by size of county and rate of population change (table H). For rapidly growing small counties (under 5,000 population and 30 percent or more growth) the average error was 12 percent, while for rapidly growing larger counties (100,000 population or more) the average error was only 5 percent. In general, the level of accuracy was directly related to population size, but inversely related to rate of growth from 1970 to 1980.

Table F. Coefficient of Effectiveness of Methods for Making County Population Estimates, by Region and Division: April 1, 1980

(Based on unweighted errors)

Region and division	Component Method II (CM)	Ratio-Correlation method (RC)	Administrative Records method[1] (AR)	Average of--			
				CM and RC	CM and AR[1]	RC and AR[1]	CM, RC, and AR[1]
United States, total.....	.123	.343	.627	.413	.495	.765	.733
Region:							
Northeast.....	.296	.204	.741	.361	.620	.602	.676
Midwest[2].....	.021	.347	.688	.333	.472	.910	.729
South.....	.120	.422	.500	.495	.458	.734	.771
West.....	.103	.340	.647	.423	.474	.782	.731
Northeast:							
New England.....	.319	.181	.736	.389	.639	.569	.667
Middle Atlantic.....	.250	.250	.750	.306	.583	.667	.694
Midwest:[2]							
East North Central.....	.033	.417	.517	.433	.417	.917	.767
West North Central.....	.012	.298	.810	.262	.512	.905	.702
South:							
South Atlantic.....	.104	.521	.438	.500	.385	.781	.771
East South Central.....	.167	.458	.271	.688	.396	.708	.813
West South Central.....	.104	.188	.854	.292	.667	.667	.729
West:							
Mountain.....	.146	.198	.635	.427	.552	.781	.760
Pacific.....	.033	.567	.667	.417	.350	.783	.683

[1]See text for a description of the Administrative Records method.
[2]Formerly North Central Region.

Note: The coefficient of effectiveness measures the relative effectiveness of a single method or an average of estimates based on two or more independent estimating techniques against all other single methods and averages. It ranges from 1.000 for complete effectiveness to 0.000 for complete ineffectiveness. See the DEFINITIONS section of this report for a detailed description of this measure.

Table G. Measures of Accuracy of County Population Estimates, by Growth Rate, 1970 to 1980: April 1, 1980

Selected measure of accuracy	All counties	Growth rate, 1970 to 1980 (percent)						
		Loss--		Gain--				
		10.0 or more	0.1 to 9.9	0.0 to 9.9	10.0 to 19.9	20.0 to 29.9	30.0 to 49.9	50.0 or more
Number of counties	3,142	119	441	827	777	432	333	213
AVERAGE OF ESTIMATES								
Average absolute percent error[1]	4.2	5.4	3.3	3.3	3.8	4.7	5.5	7.1
Percent of counties with--								
Errors of 10.0 percent or more	7.1	15.1	3.9	3.9	3.6	7.4	12.0	26.3
Positive errors	31.9	74.8	55.6	34.2	22.4	22.5	18.9	24.4

[1]Unweighted arithmetic average.

Table H. Measures of Accuracy of County Population Estimates, by Growth Rate, 1970 to 1980, and by Size of County: April 1, 1980

Growth, 1970 to 1980	Counties	Population size of county[1]					
		Less than 5,000	5,000 to 9,999	10,000 to 24,999	25,000 to 49,999	50,000 to 99,999	100,000 or more
Number of counties:							
Total	3,142	292	470	974	614	380	412
Loss	560	153	143	135	32	22	75
Gain: Less than 10.0 percent	827	50	131	289	165	83	109
10.0 to 19.9 percent	777	39	95	232	201	115	95
20.0 to 29.9 percent	432	30	41	157	101	69	34
30.0 percent or more	546	20	60	161	115	91	99
Average absolute percent error (unweighted):							
Total	4.2	6.1	4.7	4.1	3.9	3.8	3.0
Loss	3.7	5.4	4.1	3.0	2.6	2.2	1.9
Gain: Less than 10.0 percent	3.3	6.9	4.3	3.3	2.8	2.4	2.0
10.0 to 19.9 percent	3.8	5.0	4.5	4.1	3.4	3.7	3.0
20.0 to 29.9 percent	4.7	5.8	5.2	4.8	4.4	4.2	3.8
30.0 percent or more	6.1	12.0	7.5	5.7	6.5	5.4	4.7
Percent of counties with--							
Errors of 10.0 percent or more:							
Total	7.1	18.8	9.4	7.1	5.5	3.2	2.2
Loss	6.3	15.0	4.9	3.0	3.1	-	-
Gain: Less than 10.0 percent	3.9	24.0	6.9	2.4	2.4	-	-
10.0 to 19.9 percent	3.6	15.4	7.4	4.7	2.0	-	-
20.0 to 29.9 percent	7.4	16.7	17.1	8.3	5.0	2.9	-
30.0 percent or more	17.6	45.0	23.3	21.1	17.4	11.0	9.1
Positive errors:							
Total	31.9	67.8	46.4	29.5	19.4	17.9	27.4
Loss	59.6	75.2	61.5	54.1	43.8	36.4	48.0
Gain: Less than 10.0 percent	34.2	62.0	45.0	31.1	27.3	21.7	36.7
10.0 to 19.9 percent	22.4	61.5	34.7	21.1	16.4	13.0	21.1
20.0 to 29.9 percent	22.5	56.7	34.1	19.7	15.8	18.8	17.6
30.0 percent or more	21.1	55.0	40.0	27.3	9.6	15.4	11.1

- Represents zero or rounds to zero.

[1]Size of county based on 1980 census counts.

Metropolitan-Nonmetropolitan Residence. The pattern of errors was also examined to determine the extent to which the metropolitan-nonmetropolitan character of counties affected the accuracy of the population estimates. Between 1970 and 1980, both the number of extreme errors and the level of average errors improved in nonmetropolitan counties but worsened in metropolitan counties. Yet in 1980, metropolitan areas continued to have lower average errors and fewer extreme errors than nonmetropolitan areas (table I). The increase in the level of errors for metropolitan counties between 1970 and 1980 was the result of higher errors in the South and the West where the methods markedly understated the population (about 2 percent and 1 percent, respectively). In 1970, population estimates for counties in nonmetropolitan areas had a strong tendency to be positively biased and estimates for metropolitan counties tended to be relatively unbiased. In 1980, consistent with the national trend, both metropolitan and nonmetropolitan counties had a strong negative bias. The percent of nonmetropolitan counties with positive errors dropped from 72.2 percent in 1970 to 35.4 percent in 1980—a

drop of almost 37 percentage points in 10 years—while metropolitan areas dropped from 50.9 percent to 26.3 percent during the same period.

In 1970, the Ratio-Correlation method was the best single estimating procedure for both metropolitan and nonmetropolitan counties, with average percent errors of 3.4 and 4.9, respectively. However, the error for this method increased in 1980, 1.3 percentage points for metropolitan areas and 0.1 percentage points for nonmetropolitan counties. This deterioration in the accuracy of the estimates using the Ratio-Correlation method resulted in Method II yielding slightly better estimates in 1980 for nonmetropolitan counties (table J).

With the addition of the Administrative Records method in the middle 1970's, the average absolute percent error of the provisional estimates improved from what was found in 1970. For metropolitan areas in the 1980 estimates, the error based on the average of the three methods declined to 3.7 percent from 4.1 percent for the two-method average in 1970. For nonmetropolitan areas, the error declined to 4.3 percent in 1980 from 4.8 percent in 1970 for the average of two methods. In 1980, the Administrative Records method proved to be the most effective single method to estimate both metropolitan and nonmetropolitan county populations. The Ratio-Correlation method was the least effective method for metropolitan counties and Component Method II was the least effective for nonmetropolitan counties.

Some interesting observations emerged when the size of the counties was related to accuracy levels for metropolitan and nonmetropolitan counties (table L). Except for the size categories under 10,000 population, the average errors for nonmetropolitan counties were generally lower or the same as for metropolitan counties.[9] Although the methods generally provide lower errors for metropolitan than for nonmetropolitan

[9]A review of the errors for the 11 metropolitan counties with populations between 5,000 and 10,000 showed only Manassas Park, VA, to be an outlier (39.4 percent). Here 39.4 percent was very extreme, since it was two and one-half times the next most extreme value for Poquoson, VA (15.7 percent). Occasionally, large errors in data can have drastic effects on estimates for such parameters as averages (means). It should be pointed out that Manassas Park and Poquoson together with Manassas became independent in 1973. As a result, the annual time series of symptomatic data may not be as accurate as those for other counties and county equivalents which were in existence throughout the decade.

Table I. Measures of Accuracy of County Population Estimates, by Region and Metropolitan-Nonmetropolitan Residence: 1970 and 1980

Selected measure of accuracy	All areas	Region			
		Northeast	Midwest[1]	South	West
METROPOLITAN COUNTIES					
Number of counties:					
1980	677	101	197	311	68
1970	393	78	126	140	49
Average of Estimates					
Average absolute percent error:					
1980	4.1	2.5	2.8	5.4	4.2
1970	3.1	2.6	3.1	3.5	2.9
Percent of counties with--					
Positive errors:					
1980	26.3	43.6	40.1	14.8	13.2
1970	50.9	52.6	41.3	61.4	42.9
Errors of 10.0 percent or more:					
1980	6.6	1.0	2.0	11.9	4.4
1970	3.6	2.6	1.6	5.0	6.1
NONMETROPOLITAN COUNTIES					
Number of counties:					
1980	2,465	116	859	1,113	377
1970	2,193	117	761	1,008	307
Average of Estimates					
Average absolute percent error:					
1980	4.8	3.6	4.1	5.2	5.6
1970	5.2	3.3	4.7	5.8	5.5
Percent of counties with--					
Positive errors:					
1980	35.4	16.4	44.1	24.8	52.8
1970	72.2	47.9	64.1	82.2	68.7
Errors of 10.0 percent or more:					
1980	10.4	2.6	7.3	11.9	15.4
1970	13.0	6.0	9.3	16.3	14.3

[1]Formerly North Central Region.

Table J. Percent Error of County Population Estimates, by Method and Metropolitan-Nonmetropolitan Residence: April 1, 1970 and April 1, 1980

Area and percent error	Component method II		Ratio-Correlation method		Average of estimates	
	1970	1980	1970	1980	1970	1980
METROPOLITAN COUNTIES[1]						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1.0 percent	17.3	18.0	20.1	14.0	20.6	19.4
1.0 to 2.9 percent	28.2	27.9	34.6	28.8	41.0	29.2
3.0 to 4.9 percent	22.9	20.5	23.4	22.7	17.6	20.5
5.0 to 9.9 percent	22.1	23.9	18.3	25.6	17.3	24.2
10.0 percent or more	9.4	9.6	3.6	8.9	3.6	6.6
Average absolute percent error	4.5	4.5	3.4	4.7	3.1	4.1
Percent of counties with positive errors	51.4	31.6	50.4	26.6	50.9	26.3
NONMETROPOLITAN COUNTIES[2]						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1.0 percent	9.0	11.3	13.8	13.7	12.3	14.5
1.0 to 2.9 percent	17.1	21.7	28.6	26.1	24.8	26.6
3.0 to 4.9 percent	15.2	20.9	21.7	22.2	21.9	22.3
5.0 to 9.9 percent	31.1	28.8	24.4	27.4	28.0	26.2
10.0 percent or more	27.7	17.4	11.5	10.6	13.0	10.4
Average absolute percent error	7.6	6.1	4.9	5.0	5.2	4.8
Percent of counties with positive errors	78.1	35.7	56.7	37.7	72.2	35.4

[1]For 1970, N = 393; for 1980, N = 667.
[2]For 1970, N = 2,193; for 1980, N = 2,465.

Table K. Percent Error of County Population Estimates, by Combinations of Methods and Metropolitan-Nonmetropolitan Residence: April 1, 1980

Area and percent error	Component Method II (CM)	Ratio-Correlation method (RC)	Administrative Records method[1] (AR)	Average of--			
				CM and RC	CM and AR[1]	RC and AR[1]	CM, RC, and AR[1]
METROPOLITAN COUNTIES[2] [3]							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1.0 percent	18.0	14.0	20.2	19.4	21.3	19.9	19.8
1.0 to 2.9 percent	27.9	28.8	34.1	29.2	31.3	31.8	33.8
3.0 to 4.9 percent	20.5	22.7	20.4	20.5	21.4	18.9	20.5
5.0 to 9.9 percent	23.9	25.6	19.9	24.2	21.3	22.9	20.2
10.0 percent or more	9.6	8.9	5.3	6.6	4.7	6.5	5.6
Average absolute percent error	4.6	4.7	3.8	4.1	3.7	3.9	3.7
Percent of counties with positive errors	31.6	26.6	27.8	26.3	26.9	24.5	24.8
NONMETROPOLITAN COUNTIES[2] [4]							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than 1.0 percent	11.3	13.7	14.0	14.5	13.8	16.3	15.5
1.0 to 2.9 percent	21.7	26.1	28.1	26.6	27.5	30.0	29.2
3.0 to 4.9 percent	20.9	22.2	23.0	22.3	21.9	23.3	23.2
5.0 to 9.9 percent	28.8	27.4	28.1	26.2	27.4	23.8	24.5
10.0 percent or more	17.4	10.6	6.8	10.4	9.4	6.5	7.5
Average absolute percent error	6.1	5.0	4.5	4.8	4.7	4.1	4.3
Percent of counties with positive errors	35.7	37.7	27.9	35.4	31.5	32.0	32.7

[1]See text for a description of the Administrative Records method.
[2]As defined in the 1980 census.
[3]N = 677.
[4]N = 2,465.

counties, the evidence is inconclusive as to whether the metropolitan nature of the county or the size of the county is the most important factor in determining the accuracy of the estimates (table L and fig. 5).

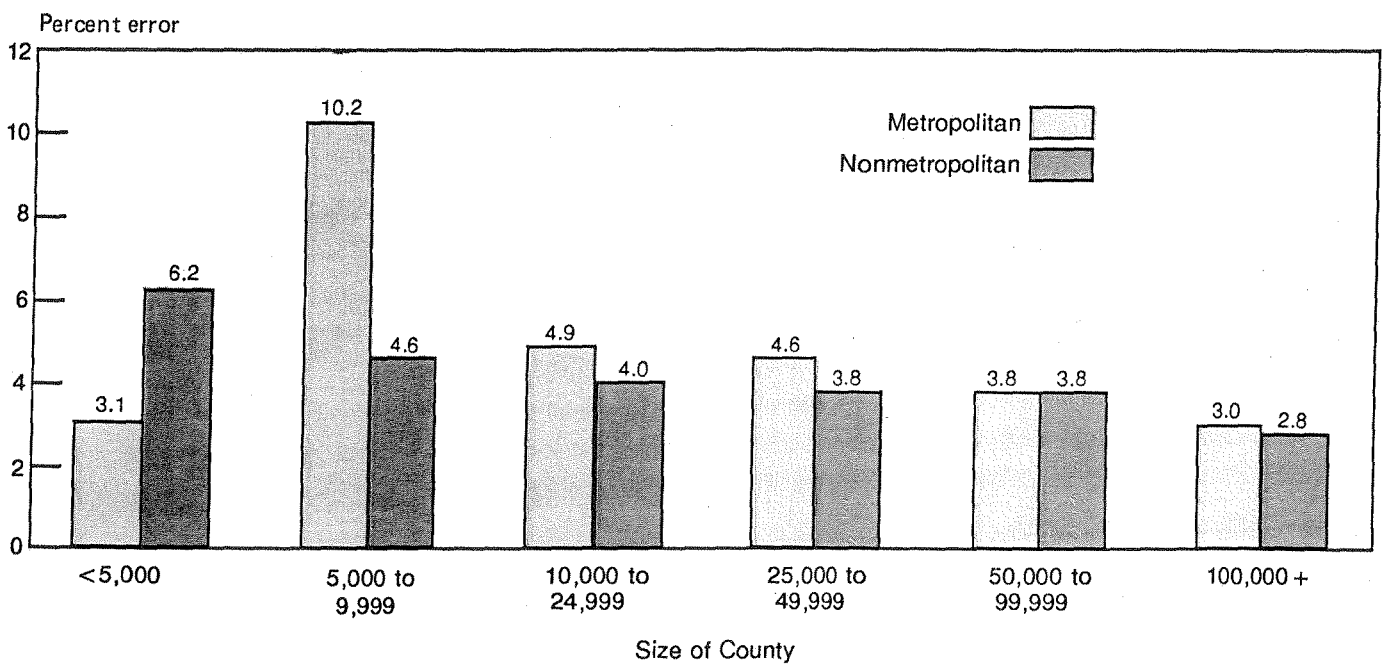
Table L. Measures of the Accuracy of County Population Estimates, by Size of County and Metropolitan-Nonmetropolitan Residence: April, 1980

Selected measure of accuracy	All counties	Population size of county: Less than 5,000	5,000 to 9,999	10,000 to 24,999	25,000 to 49,999	50,000 to 99,999	100,000 or more
Number of counties:							
Metropolitan[1]	677	3	11	55	111	136	361
Nonmetropolitan	2,465	289	459	919	503	244	51
Average absolute percent error:							
Unweighted:							
Metropolitan	3.7	3.1	10.2	4.9	4.6	3.8	3.0
Nonmetropolitan	4.3	6.2	4.6	4.0	3.8	3.8	2.8
Weighted:							
Metropolitan	2.9	3.2	9.7	4.9	4.6	3.8	2.7
Nonmetropolitan	3.8	5.4	4.5	4.0	3.8	3.8	2.7
Percent of counties with--							
Positive errors:							
Metropolitan	24.8	66.7	45.5	27.3	17.1	19.9	27.7
Nonmetropolitan	32.7	66.1	46.0	29.3	18.9	14.3	11.8
Errors of 10.0 percent or more:							
Metropolitan	5.6	-	45.5	12.7	8.1	5.9	2.5
Nonmetropolitan	7.5	19.0	8.5	6.7	5.0	1.6	-

- Represents zero.

[1]As defined in the 1980 census.

Figure 5. Percent Error of Estimates, by Size of County and Residence: 1980



Note: Error refers to the difference between the 1980 census count and the population estimate for the county. See text for explanation of peak in metropolitan errors.

Source: Table L.

ADJUSTED TEST RESULTS

Appendix tables D-1 through D-5 show the errors in the estimates after the adjustments for census comparability in 1970 and 1980. Some slight improvement in the overall accuracy of the 1980 county estimates was noted when the adjustments were made. The errors based on the average of the three methods declined by 0.4 percentage points—from 4.2 percent to 3.8 percent (table D-1). In the adjusted results, the errors for counties in the South are much lower and counties in the Northeast show modest improvement, but counties in the West deteriorated. Errors for counties in the Midwest region, however, did not change. Counties in the West had the largest error (5.6 percent), while the North Central counties had the smallest (2.5 percent) errors.

Weighting the average percent error by population in the 1980 census (table D-2) resulted in the overall county error dropping by 0.7 percent, from 3.1 percent to 2.4 percent. Regional county differences largely disappeared, with a range of only 0.7 percent between counties in the South (2.9 percent) and counties in the remaining regions (2.2 percent). The range for the unadjusted errors was 2.2 percent, with counties in the South unmistakably the worst estimated.

CONCLUSION

The Administrative Records method has emerged as the single most effective procedure for making population estimates, while Component Method II was at the other extreme. The best estimates were produced by averaging the results of independent estimates based on the Ratio-Correlation method and the Administrative Records method. In a few States, Component Method II estimates averaged with one or both of the other methods were superior to estimates of any single method. In other States, different combinations using various size classes of counties proved effective, while in still other States adding local estimates to the average estimates proved superior.

These and other findings from the evaluations were used by the Census Bureau staff and the State participants in the Federal-State Cooperative Program for Local Population Estimates to make modifications in the estimating methods for the 1980's. The results of the evaluations were used (1) to revise specific methods and (2) to determine which single method or average of methods worked best for counties in each State. The decision as to which methods were to be used was made jointly by the Census Bureau and the State participants after the evaluation results and modified procedures were reviewed. Perhaps the most important change that occurred as a result of the evaluations was the elimination of Method II as an estimating method for counties in all but a few States.

Although the adjustment for differential coverge in the 1970 and 1980 censuses was an important step in a full evaluation of the estimating methods, and the patterns of errors shifted somewhat when the adjustments were made, it was concluded that the two sets of results confirmed each other in suggesting changes that should be made in the estimating methods. Both sets of results were reviewed by the staffs of the Census Bureau and the State agencies. Conflicts in the changes recommended by the adjusted and unadjusted findings were rare.

The search for new methods, for new ways of looking at old methods, or modifications to existing methods will continue through the 1980's. The results of the present evaluations for counties have posed new questions and problems for further inquiry. For example, although the Ratio-Correlation method proved more accurate than Method II in both 1970 and 1980, the errors suggest that the Ratio-Correlation procedure may lack the desired level of stability from year to year.

Further, during the analysis of the county regression equations for each State, a high degree of multicollinearity among the independent variables was observed and standardization of the variables did not appear to significantly reduce the multicollinearity problem. Ridge regression was also examined as a possible alternative to the Ratio-Correlation procedure as it now exists. Another application of regression would be a stratification scheme in those States with large numbers of counties. Also, the impact of differential weighting of the independent estimates used in the average of estimates is being examined.

The results of the 1980 estimates evaluation program have resulted in some changes in the estimating procedures and have suggested some additional research during the 1980's. Moreover, the ideas that have emerged have become important background information for State participants and the Bureau staff in developing future plans for county population estimates. The results of the 1980 evaluations also have tended to confirm the observations made in previous tests.

Table 1. Unweighted Average Absolute Percent Error of County Population Estimates, by Method, for Regions, Divisions, and States: April 1, 1980

Part A. All Counties

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	5.8	4.9	4.3	4.6	4.5	4.1	4.2
Region:								
Northeast	217	3.7	3.4	2.5	3.1	2.8	2.7	2.7
Midwest[1]	1,056	5.1	3.8	3.4	3.8	3.7	3.1	3.3
South	1,424	6.3	5.7	5.2	5.2	5.2	5.0	4.9
West	445	6.7	5.7	4.8	5.4	5.1	4.4	4.6
Northeast:								
New England	67	3.5	3.3	2.4	2.9	2.6	2.7	2.6
Middle Atlantic	150	3.8	3.4	2.5	3.2	2.9	2.7	2.8
Midwest:[1]								
East North Central	437	4.3	3.6	3.4	3.4	3.5	3.0	3.2
West North Central	619	5.6	4.0	3.3	4.1	3.8	3.1	3.5
South:								
South Atlantic	590	6.5	4.9	5.4	5.1	5.4	4.7	4.8
East South Central	364	5.4	4.8	5.0	4.5	4.8	4.4	4.5
West South Central	470	6.7	7.6	5.1	5.8	5.1	5.8	5.2
West:								
Mountain	279	7.1	6.3	4.9	5.9	5.2	4.5	4.8
Pacific	166	6.0	4.7	4.6	4.6	4.9	4.2	4.3
New England:								
Maine	16	3.5	3.0	2.5	2.9	2.8	2.5	2.6
New Hampshire	10	3.1	3.5	3.6	3.1	3.3	3.5	3.3
Vermont	14	5.6	3.2	3.1	3.8	3.7	3.0	3.2
Massachusetts	14	2.4	4.1	1.8	2.6	1.8	2.8	2.2
Rhode Island	5	3.3	3.4	2.0	3.4	2.7	2.7	2.9
Connecticut	8	2.2	2.3	1.2	1.3	1.2	1.4	1.1
Middle Atlantic:								
New York	62	3.8	2.5	2.2	2.7	2.7	2.0	2.4
New Jersey	21	2.1	4.2	2.4	2.4	1.5	3.0	2.1
Pennsylvania	67	4.4	4.0	2.8	4.0	3.5	3.2	3.4
East North Central:								
Ohio	88	3.6	2.6	3.2	2.4	3.2	2.2	2.4
Indiana	92	5.0	2.9	3.5	3.6	3.9	3.0	3.4
Illinois	102	4.6	4.1	3.7	4.0	3.8	3.7	3.8
Michigan	83	4.0	3.6	3.6	3.6	3.6	3.2	3.4
Wisconsin	72	3.9	4.7	3.2	3.4	3.0	2.8	2.7
West North Central:								
Minnesota	87	4.7	3.2	2.9	3.4	3.2	2.5	2.9
Iowa	99	3.5	2.8	2.3	2.5	2.4	2.0	2.1
Missouri	115	5.2	4.0	3.6	4.1	3.7	3.1	3.3
North Dakota	53	5.9	4.8	4.1	4.7	4.4	4.1	4.2
South Dakota	67	6.2	6.2	4.5	5.5	4.8	5.0	4.9
Nebraska	93	6.5	5.1	3.4	4.4	4.3	3.4	3.7
Kansas	105	7.7	3.2	3.2	5.1	4.6	2.9	3.9
South Atlantic:								
Delaware	3	3.6	4.8	4.4	3.7	3.5	4.6	3.9
Maryland	24	4.0	2.9	3.3	3.0	3.3	2.4	2.8
Virginia	136	6.6	4.6	6.3	4.8	5.4	4.8	4.6
West Virginia	55	5.1	4.6	4.9	4.4	4.6	4.6	4.3
North Carolina	100	4.8	4.3	4.0	4.0	4.2	3.7	3.8
South Carolina	46	5.9	5.3	5.2	5.4	5.4	4.9	5.1
Georgia	159	8.1	5.2	5.7	6.0	6.3	4.8	5.4
Florida	67	7.6	6.5	6.3	6.8	6.8	6.1	6.5
East South Central:								
Kentucky	120	5.1	4.9	5.3	4.7	4.9	4.9	4.7
Tennessee	95	5.7	4.4	4.3	4.5	4.8	3.8	4.2
Alabama	67	6.0	4.3	4.9	4.6	5.1	4.0	4.3
Mississippi	82	4.8	5.4	5.4	4.3	4.4	5.0	4.4
West South Central:								
Arkansas	75	7.0	7.1	5.3	6.2	5.6	5.7	5.6
Louisiana	64	5.3	4.2	3.6	4.4	4.1	3.6	3.9
Oklahoma	77	7.4	5.4	5.2	5.8	5.4	4.6	5.0
Texas	254	6.8	9.2	5.4	6.1	5.2	6.8	5.5
Mountain:								
Montana	57	7.8	6.3	4.8	6.6	5.1	4.1	5.0
Idaho	44	4.9	6.6	4.7	4.5	4.1	4.5	3.9
Wyoming	23	6.7	3.9	3.3	4.7	4.3	2.8	3.7
Colorado	63	8.0	5.6	5.4	6.1	6.0	4.6	5.1
New Mexico	32	8.4	8.8	4.1	7.9	5.5	5.1	5.9
Arizona	14	5.1	6.8	6.7	4.7	5.4	5.7	4.9
Utah	29	6.2	5.0	4.9	4.6	5.0	4.1	4.2
Nevada	17	8.4	8.7	6.2	7.3	6.0	6.8	6.2
Pacific:								
Washington	39	5.1	5.0	3.5	4.0	4.0	3.6	3.5
Oregon	36	5.2	3.8	2.8	3.6	3.5	2.7	3.0
California	58	4.7	3.3	2.9	3.5	3.4	2.9	3.1
Alaska	29	10.4	8.7	11.6	8.8	10.5	9.8	9.5
Hawaii	4	8.2	2.1	3.0	5.1	5.5	2.3	4.3

[1]Formerly North Central Region.

Table 1. Unweighted Average Absolute Percent Error of County Population Estimates, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part B. Counties With Populations of Less Than 5,000

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	292	9.5	7.6	6.5	7.0	7.0	6.1	6.1
Region:								
Northeast	1	4.1	0.1	4.9	2.1	0.4	2.4	0.2
Midwest[1]	120	9.2	6.3	5.6	6.5	6.7	5.3	5.8
South	78	10.1	9.0	6.0	6.9	6.9	6.3	5.9
West	93	9.4	8.2	8.4	7.9	7.5	6.8	6.7
Northeast:								
New England	1	4.1	0.1	4.9	2.1	0.4	2.4	0.2
Middle Atlantic	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Midwest:[1]								
East North Central	4	12.1	17.5	16.9	11.8	12.8	15.1	11.6
West North Central	116	9.1	5.8	5.1	6.3	6.4	5.0	5.6
South:								
South Atlantic	18	11.0	10.4	6.3	8.2	7.5	6.7	6.8
East South Central	6	5.4	3.9	4.4	4.6	4.8	4.1	4.5
West South Central	54	10.3	9.1	6.1	6.7	6.9	6.5	5.8
West:								
Mountain	71	8.1	7.9	7.2	7.0	6.0	5.7	5.5
Pacific	22	13.5	8.9	12.1	10.6	12.1	10.3	10.7
New England:								
Maine	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	1	4.1	0.1	4.9	2.1	0.4	2.4	0.2
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
East North Central:								
Ohio	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Illinois	1	6.8	4.0	9.2	1.4	1.2	6.6	2.1
Michigan	1	12.7	18.1	29.1	15.4	20.9	23.6	20.0
Wisconsin	2	14.4	24.0	14.7	15.3	14.6	15.1	12.2
West North Central:								
Minnesota	2	4.3	5.8	2.2	5.1	3.3	4.0	4.1
Iowa	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	3	2.5	3.9	5.3	0.7	3.9	0.7	1.3
North Dakota	22	7.4	6.0	5.9	6.1	6.0	5.4	5.5
South Dakota	26	5.9	6.4	5.4	5.3	5.1	5.7	5.2
Nebraska	33	10.6	6.7	5.3	6.7	7.2	5.1	6.0
Kansas	30	12.3	4.4	4.5	7.6	7.6	4.3	6.3
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	4	7.4	9.6	6.8	7.8	5.6	7.4	7.0
West Virginia	1	0.8	4.7	2.0	2.0	1.4	1.4	0.7
North Carolina	1	1.7	4.5	6.2	3.1	2.3	0.9	(Z)
South Carolina	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Georgia	10	15.1	13.7	6.3	10.5	9.5	8.2	8.4
Florida	2	7.2	1.4	7.3	2.9	7.3	3.0	4.4
East South Central:								
Kentucky	2	9.3	2.8	7.9	6.0	8.6	5.3	6.7
Tennessee	3	4.5	4.8	3.5	4.7	3.9	4.0	4.2
Alabama	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Mississippi	1	0.1	3.2	0.4	1.6	0.3	1.8	1.2
West South Central:								
Arkansas	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Louisiana	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Oklahoma	4	18.5	8.4	6.0	12.7	11.3	7.2	10.3
Texas	50	9.6	9.2	6.1	6.2	6.6	6.5	5.5
Mountain:								
Montana	21	9.4	9.0	7.4	8.3	6.7	5.6	6.3
Idaho	10	6.1	8.5	8.2	4.9	6.5	7.1	5.4
Wyoming	2	10.4	2.2	4.2	6.3	6.0	2.3	4.2
Colorado	18	7.2	5.3	8.4	5.8	5.8	4.9	4.3
New Mexico	6	6.6	14.3	5.9	10.4	4.3	6.4	6.2
Arizona	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	8	5.8	3.3	6.4	3.5	4.7	4.3	3.7
Nevada	6	12.5	13.0	5.5	11.0	7.7	8.4	8.1
Pacific:								
Washington	3	9.2	6.0	5.8	7.1	7.4	5.6	6.7
Oregon	3	16.3	2.9	2.5	8.4	8.7	2.6	5.9
California	2	27.8	5.1	8.1	15.5	13.7	6.6	10.2
Alaska	14	11.8	11.5	16.0	11.2	13.7	13.4	12.6
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 1. Unweighted Average Absolute Percent Error of County Population Estimates, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part C. Counties With Populations of 5,000 to 9,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	470	7.3	5.4	4.8	5.6	5.3	4.3	4.8
Region:								
Northeast	7	7.0	5.8	4.9	4.8	5.3	4.3	4.4
Midwest[1]	180	6.3	4.4	3.6	4.9	4.3	3.3	3.9
South	204	7.6	6.0	5.8	5.7	5.7	5.1	5.2
West	79	9.0	6.5	4.8	6.8	6.2	4.5	5.6
Northeast:								
New England	3	9.8	9.9	3.8	7.4	5.3	6.9	6.0
Middle Atlantic	4	5.0	2.7	5.7	2.9	5.3	2.4	3.2
Midwest:[1]								
East North Central	31	5.1	4.9	5.0	4.7	4.5	4.3	4.4
West North Central	149	6.6	4.2	3.3	4.9	4.2	3.1	3.8
South:								
South Atlantic	89	8.0	5.2	6.5	5.8	6.5	5.2	5.5
East South Central	46	5.6	5.4	5.5	4.8	4.9	4.5	4.6
West South Central	69	8.4	7.4	5.2	6.2	5.3	5.3	5.2
West:								
Mountain	58	9.2	7.1	4.6	7.3	6.1	4.6	5.7
Pacific	21	8.6	4.9	5.3	5.5	6.3	4.4	5.2
New England:								
Maine	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	1	13.5	3.5	0.7	5.0	6.4	2.1	3.1
Massachusetts	2	7.9	13.1	5.3	8.6	4.7	9.2	7.5
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	1	5.4	2.2	3.5	1.6	4.5	0.7	2.3
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	3	4.8	2.9	6.4	3.3	5.6	3.0	3.6
East North Central:								
Ohio	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	5	6.0	3.9	6.6	4.9	6.0	5.2	5.3
Illinois	13	5.3	5.6	5.2	5.1	5.1	5.3	5.0
Michigan	10	5.0	4.1	4.5	4.4	4.2	3.2	3.8
Wisconsin	3	3.4	6.2	3.6	4.2	0.6	2.0	2.1
West North Central:								
Minnesota	10	6.9	3.0	3.5	4.9	4.9	2.9	4.1
Iowa	15	5.2	3.3	2.7	4.0	2.9	2.2	2.7
Missouri	23	6.6	3.8	5.0	4.7	4.7	3.1	3.9
North Dakota	16	5.4	4.6	3.1	4.1	3.4	3.3	3.4
South Dakota	24	7.1	6.5	3.7	6.4	5.1	4.8	5.2
Nebraska	30	5.1	3.9	2.7	3.5	3.2	2.3	2.7
Kansas	31	8.8	3.8	2.7	6.1	5.1	2.9	4.5
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	29	7.5	5.3	7.7	5.5	6.6	5.6	5.5
West Virginia	7	5.9	4.2	5.6	3.6	4.8	4.3	3.5
North Carolina	8	5.5	3.8	3.6	3.7	4.4	3.2	3.4
South Carolina	1	2.0	7.4	4.0	2.7	3.0	1.7	0.4
Georgia	38	9.8	5.6	6.5	7.1	7.4	5.6	6.4
Florida	6	5.4	4.4	6.0	4.9	5.7	5.2	5.3
East South Central:								
Kentucky	24	5.3	5.2	5.7	4.7	4.9	5.0	4.7
Tennessee	12	5.9	4.0	5.1	3.8	4.9	2.8	3.7
Alabama	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Mississippi	10	5.9	7.7	5.5	6.1	4.9	5.4	5.2
West South Central:								
Arkansas	9	9.0	10.2	5.3	9.6	6.4	7.2	7.7
Louisiana	3	7.0	7.9	5.8	7.4	5.9	6.8	6.6
Oklahoma	12	11.6	6.5	4.6	8.6	6.6	3.6	6.1
Texas	45	7.5	7.1	5.4	4.8	4.8	5.3	4.4
Mountain:								
Montana	15	8.3	6.1	4.2	7.1	5.1	3.5	5.1
Idaho	11	5.8	8.1	4.1	5.1	4.4	4.1	3.7
Wyoming	6	8.0	5.5	3.9	6.5	5.4	4.4	5.2
Colorado	15	14.1	8.7	5.5	11.1	9.6	7.0	9.1
New Mexico	3	12.5	5.7	3.6	9.1	5.8	2.4	5.7
Arizona	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	4	5.2	6.5	4.6	2.1	4.9	2.9	1.9
Nevada	4	7.1	6.0	5.8	5.1	4.5	4.5	4.7
Pacific:								
Washington	5	7.6	4.4	4.8	5.2	5.5	4.5	5.0
Oregon	5	9.7	3.6	3.1	5.0	6.4	2.1	4.3
California	2	6.1	4.3	5.3	5.2	5.7	4.8	5.3
Alaska	9	9.1	6.0	6.9	6.0	6.9	5.6	5.8
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 1. Unweighted Average Absolute Percent Error of County Population Estimates, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part D. Counties With Populations of 10,000 to 24,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	974	5.6	4.9	4.4	4.5	4.4	4.1	4.1
Region:								
Northeast	11	6.8	5.2	3.4	5.2	4.7	4.0	4.2
Midwest[1]	344	4.6	3.8	3.3	3.6	3.5	3.0	3.1
South	511	6.2	5.5	5.3	5.1	5.1	4.9	4.8
West	108	5.5	5.2	3.9	4.5	4.1	3.9	3.9
Northeast:								
New England	4	5.8	4.0	4.3	4.9	4.6	3.7	4.1
Middle Atlantic	7	7.4	5.8	2.9	5.4	4.8	4.2	4.2
Midwest:[1]								
East North Central	121	5.1	4.3	4.2	4.1	4.3	3.6	3.8
West North Central	223	4.4	3.4	2.9	3.3	3.0	2.6	2.8
South:								
South Atlantic	188	6.7	4.4	5.7	5.0	5.5	4.5	4.7
East South Central	157	5.4	4.8	5.3	4.5	4.9	4.5	4.5
West South Central	166	6.4	7.5	5.0	5.6	5.0	5.8	5.1
West:								
Mountain	79	5.7	5.2	3.9	4.7	4.2	3.9	4.0
Pacific	29	4.9	5.3	3.8	3.8	3.8	3.9	3.4
New England:								
Maine	1	1.9	1.9	3.5	1.9	0.8	0.8	0.1
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	3	7.1	4.7	4.6	5.9	5.9	4.7	5.5
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	2	5.6	1.8	1.2	2.2	2.2	1.5	1.1
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	5	8.2	7.5	3.6	6.7	5.9	5.3	5.5
East North Central:								
Ohio	11	5.3	4.4	4.6	2.5	5.0	2.2	2.5
Indiana	30	6.1	3.6	4.8	4.6	5.2	4.0	4.5
Illinois	37	4.6	4.4	4.0	4.3	3.9	4.1	4.1
Michigan	21	4.4	4.5	4.3	3.9	4.2	4.0	4.0
Wisconsin	22	5.2	5.0	3.4	4.0	3.6	2.6	2.9
West North Central:								
Minnesota	39	4.3	3.3	2.7	3.1	2.8	2.4	2.7
Iowa	60	3.5	2.8	2.5	2.4	2.6	2.2	2.3
Missouri	57	5.4	3.8	3.3	4.1	3.6	2.8	3.2
North Dakota	10	4.5	3.6	3.2	3.6	3.6	3.2	3.3
South Dakota	14	6.1	5.5	4.9	4.7	4.8	4.8	4.5
Nebraska	19	3.8	5.0	2.0	3.6	2.5	3.1	2.8
Kansas	24	3.7	1.8	2.4	2.5	2.3	1.9	2.0
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	3	3.0	2.9	3.1	2.4	3.0	2.5	2.3
Virginia	50	6.5	3.8	6.4	4.6	5.2	4.5	4.3
West Virginia	18	5.6	5.1	6.5	5.1	5.7	5.7	5.4
North Carolina	26	5.2	5.0	3.7	4.2	3.9	3.8	3.8
South Carolina	11	5.7	4.0	4.7	4.5	5.0	4.2	4.6
Georgia	61	7.8	3.9	5.8	5.5	6.0	4.0	4.9
Florida	19	7.7	6.5	6.7	6.7	6.8	6.3	6.4
East South Central:								
Kentucky	56	4.9	4.5	5.4	4.4	4.9	4.8	4.6
Tennessee	34	6.8	4.6	4.6	4.9	5.6	3.8	4.4
Alabama	26	6.0	4.8	4.9	4.6	4.9	3.7	4.1
Mississippi	41	4.7	5.2	6.0	4.1	4.5	5.3	4.5
West South Central:								
Arkansas	38	8.3	6.6	5.6	6.3	6.3	5.5	5.7
Louisiana	23	5.5	3.7	3.6	4.1	4.2	3.2	3.7
Oklahoma	26	5.5	4.2	5.0	4.3	4.6	3.8	3.9
Texas	79	6.0	10.0	5.1	6.2	4.7	7.3	5.6
Mountain:								
Montana	14	6.7	3.5	2.8	4.8	4.2	3.1	4.0
Idaho	14	3.4	4.9	3.4	3.5	2.3	2.9	2.7
Wyoming	9	7.2	3.4	2.7	4.2	4.3	2.1	3.4
Colorado	17	4.3	4.8	3.7	3.7	3.8	3.5	3.5
New Mexico	9	8.0	8.9	5.8	7.4	6.5	6.8	6.8
Arizona	3	2.8	6.3	5.1	4.3	2.3	5.5	3.6
Utah	9	7.9	5.8	4.1	6.4	5.8	3.8	5.0
Nevada	4	4.1	6.4	7.8	4.1	4.3	7.1	4.5
Pacific:								
Washington	7	4.8	5.6	2.8	3.6	3.0	3.1	2.3
Oregon	8	3.4	4.3	2.0	2.0	1.9	2.6	1.8
California	10	3.5	4.7	2.7	3.0	2.7	3.2	2.7
Alaska	4	11.9	7.9	11.8	9.8	11.8	9.8	10.5
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 1. Unweighted Average Absolute Percent Error of County Population Estimates, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part E. Counties With Populations of 25,000 to 49,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	614	5.3	4.4	4.1	4.3	4.3	3.8	4.0
Region:								
Northeast	47	4.6	3.1	2.5	3.6	3.2	2.6	3.0
Midwest[1]	206	4.3	3.0	3.1	3.1	3.3	2.6	2.8
South	316	5.9	5.3	5.1	5.1	5.1	4.9	4.9
West	45	6.0	5.2	2.9	4.5	4.1	3.5	3.8
Northeast:								
New England	19	3.7	2.8	2.3	2.8	2.7	2.4	2.5
Middle Atlantic	28	5.2	3.2	2.7	4.1	3.6	2.7	3.4
Midwest:[1]								
East North Central	127	4.5	3.1	3.4	3.3	3.7	2.8	3.1
West North Central	79	4.0	2.9	2.6	2.7	2.7	2.2	2.2
South:								
South Atlantic	126	6.1	4.5	5.0	4.7	5.2	4.4	4.5
East South Central	92	5.8	4.4	4.8	4.7	5.0	4.3	4.6
West South Central	98	5.8	7.2	5.5	6.0	5.2	6.1	5.6
West:								
Mountain	24	7.1	5.1	2.5	5.3	4.4	3.3	4.1
Pacific	21	4.8	5.2	3.4	3.7	3.8	3.8	3.5
New England:								
Maine	9	2.4	2.7	1.8	2.3	2.0	2.0	2.1
New Hampshire	4	3.9	1.9	3.7	2.5	3.6	2.8	2.9
Vermont	5	5.1	3.2	2.3	3.2	2.8	2.3	2.6
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	1	7.2	5.5	2.2	6.4	4.7	3.9	5.0
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	12	4.6	1.7	2.2	3.0	2.9	1.6	2.4
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	16	5.7	4.4	3.0	4.9	4.1	3.6	4.1
East North Central:								
Ohio	31	4.2	3.2	4.6	3.1	4.2	3.2	3.3
Indiana	32	5.3	2.4	3.2	3.6	3.9	2.6	3.2
Illinois	24	5.0	3.7	3.3	4.0	3.8	3.4	3.7
Michigan	19	4.7	3.1	3.2	3.7	3.8	2.7	3.4
Wisconsin	21	3.1	3.1	2.2	1.9	2.2	1.7	1.6
West North Central:								
Minnesota	25	5.0	3.0	2.7	3.2	3.3	2.1	2.6
Iowa	14	2.3	2.4	1.6	1.5	1.5	1.4	1.1
Missouri	18	4.2	3.8	3.4	3.7	3.2	3.4	3.2
North Dakota	1	3.6	1.3	2.2	1.1	2.9	0.5	1.5
South Dakota	1	1.6	1.2	1.0	0.2	0.3	1.1	0.2
Nebraska	8	3.2	3.4	1.7	0.9	2.1	1.6	1.1
Kansas	12	4.5	2.1	3.2	3.0	2.4	2.3	2.1
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	6	7.6	3.3	4.8	4.5	5.4	3.1	4.1
Virginia	28	7.7	5.6	6.8	5.4	6.6	5.6	5.3
West Virginia	18	4.3	4.9	3.8	4.1	3.5	4.1	3.7
North Carolina	25	5.0	3.5	4.2	4.0	4.5	3.6	3.9
South Carolina	14	5.5	4.6	4.2	4.9	4.7	4.3	4.6
Georgia	28	5.6	3.7	4.9	4.1	5.0	3.7	4.2
Florida	7	9.6	7.1	5.6	8.3	7.6	6.3	7.4
East South Central:								
Kentucky	26	5.7	5.6	5.1	5.3	5.1	5.2	5.2
Tennessee	28	5.6	4.0	4.1	4.6	4.9	3.9	4.4
Alabama	20	7.0	2.9	5.4	4.5	5.9	3.5	4.5
Mississippi	18	5.0	4.9	4.9	4.2	4.4	4.7	4.4
West South Central:								
Arkansas	18	4.7	6.3	4.7	4.8	4.3	5.0	4.4
Louisiana	17	5.9	4.0	4.0	4.9	4.8	3.8	4.5
Oklahoma	25	6.5	6.0	6.1	5.8	5.4	5.8	5.5
Texas	38	5.8	9.9	6.0	7.2	5.7	7.8	6.7
Mountain:								
Montana	3	4.3	3.1	1.6	2.7	2.6	2.3	2.1
Idaho	3	3.3	5.3	2.2	4.3	2.7	3.7	3.6
Wyoming	4	2.2	3.7	3.9	2.7	1.8	2.5	2.1
Colorado	3	15.9	4.8	4.0	8.5	10.0	2.9	6.8
New Mexico	6	11.6	7.4	1.5	8.4	6.5	4.2	6.1
Arizona	1	2.3	3.3	4.0	0.5	0.9	3.6	1.7
Utah	3	5.5	5.9	2.4	5.4	3.6	4.1	4.4
Nevada	1	2.2	2.3	(Z)	2.2	1.1	1.1	1.5
Pacific:								
Washington	9	5.4	6.4	3.9	3.9	4.4	4.0	3.8
Oregon	5	3.1	4.1	3.0	3.4	2.7	3.6	3.2
California	6	4.4	5.0	3.6	3.3	3.6	4.1	3.3
Alaska	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Hawaii	1	9.7	2.0	0.3	5.8	4.7	0.8	3.8

[1]Formerly North Central Region.

Table 1. Unweighted Average Absolute Percent Error of County Population Estimates, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part F. Counties With Populations of 50,000 to 99,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	380	4.6	4.5	3.8	4.1	3.9	3.8	3.8
Region:								
Northeast	51	3.7	3.4	3.1	3.5	3.2	3.1	3.2
Midwest[1]	97	3.2	3.2	2.7	2.7	2.7	2.5	2.5
South	180	5.5	5.5	4.7	5.1	4.8	4.9	4.8
West	52	4.9	4.7	3.6	4.2	4.0	3.4	3.7
Northeast:								
New England	13	3.1	3.8	3.0	3.2	3.0	3.4	3.2
Middle Atlantic	38	3.9	3.3	3.1	3.5	3.3	3.0	3.2
Midwest:[1]								
East North Central	72	3.4	3.2	2.9	2.8	2.9	2.6	2.7
West North Central	25	2.6	3.0	2.2	2.4	1.9	2.1	1.9
South:								
South Atlantic	89	6.2	5.0	5.0	5.3	5.3	4.7	5.0
East South Central	45	4.7	5.0	4.4	4.6	4.4	4.6	4.5
West South Central	46	5.0	6.9	4.4	5.1	4.3	5.4	4.7
West:								
Mountain	27	5.5	5.7	4.5	4.8	4.9	4.2	4.4
Pacific	25	4.2	3.6	2.7	3.5	3.1	2.6	2.9
New England:								
Maine	2	5.2	1.9	3.3	3.6	4.2	2.6	3.5
New Hampshire	4	2.2	5.7	4.0	3.9	3.1	4.8	3.9
Vermont	3	4.0	3.5	4.0	3.7	4.0	3.8	3.8
Massachusetts	1	1.4	5.7	1.3	3.6	1.4	3.5	2.8
Rhode Island	2	2.5	1.5	1.3	2.0	1.9	1.4	1.8
Connecticut	1	2.8	3.5	0.9	0.4	0.9	2.2	0.6
Middle Atlantic:								
New York	22	4.0	2.2	2.8	3.0	3.2	2.2	2.7
New Jersey	4	2.3	4.0	4.2	3.1	2.8	3.8	3.2
Pennsylvania	12	4.3	5.1	3.2	4.7	3.7	4.1	4.2
East North Central:								
Ohio	23	3.5	2.3	2.5	2.5	2.8	1.9	2.4
Indiana	13	4.0	3.1	2.2	1.9	2.7	2.0	2.0
Illinois	9	4.0	3.7	4.1	3.7	3.9	3.9	3.9
Michigan	14	3.8	3.6	3.4	3.6	3.6	3.2	3.4
Wisconsin	13	1.9	4.1	2.9	2.8	2.1	2.9	2.5
West North Central:								
Minnesota	4	2.3	2.8	1.6	1.9	1.6	2.0	1.7
Iowa	5	2.7	1.8	2.5	1.5	2.3	1.4	1.2
Missouri	6	3.6	3.8	2.6	3.4	2.4	2.9	2.7
North Dakota	4	3.0	2.8	1.7	2.9	2.3	2.2	2.5
South Dakota	1	0.6	6.1	2.3	3.4	0.8	1.9	1.5
Nebraska	1	4.0	6.4	3.0	5.2	0.5	1.7	2.5
Kansas	4	1.1	2.2	2.3	1.4	1.0	1.5	1.1
South Atlantic:								
Delaware	2	3.9	6.7	5.8	4.5	4.1	6.2	5.0
Maryland	6	3.7	2.5	2.8	2.9	2.9	2.1	2.5
Virginia	11	6.4	3.2	4.8	4.3	4.5	3.5	3.9
West Virginia	9	6.0	4.3	4.6	5.1	5.3	4.5	4.9
North Carolina	27	4.9	4.2	4.3	4.1	4.5	4.0	4.1
South Carolina	10	8.1	6.6	7.2	7.3	7.2	6.2	6.8
Georgia	12	6.2	5.0	5.2	5.1	5.5	5.1	5.1
Florida	12	9.3	8.8	6.0	8.7	7.6	6.9	7.6
East South Central:								
Kentucky	9	4.3	4.7	4.1	4.4	4.0	4.3	4.2
Tennessee	13	4.3	5.1	4.0	4.5	4.0	4.4	4.3
Alabama	14	5.7	5.3	5.1	5.3	5.3	5.1	5.2
Mississippi	9	4.2	4.9	4.4	3.9	3.7	4.4	3.8
West South Central:								
Arkansas	9	4.5	7.8	5.7	5.8	4.9	6.6	5.8
Louisiana	12	5.1	4.3	2.6	4.2	3.4	3.3	3.6
Oklahoma	6	4.5	4.6	4.1	2.7	3.4	3.9	2.4
Texas	19	5.3	8.7	5.0	6.2	4.8	6.7	5.7
Mountain:								
Montana	3	3.6	4.7	2.4	4.1	2.1	2.8	2.9
Idaho	5	5.1	4.2	3.7	4.7	4.4	4.0	4.4
Wyoming	2	5.6	3.2	2.3	4.4	3.9	2.8	3.7
Colorado	1	0.9	1.7	2.4	1.3	1.6	2.0	1.6
New Mexico	7	6.6	6.7	2.9	5.8	4.7	3.7	4.5
Arizona	8	5.9	7.3	7.5	4.8	6.7	5.5	5.1
Utah	1	7.0	4.4	8.0	5.7	7.5	6.2	6.5
Nevada	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pacific:								
Washington	5	2.9	3.5	1.2	2.8	1.8	2.3	2.1
Oregon	9	2.7	4.3	2.8	2.9	2.3	2.5	2.3
California	8	5.1	3.5	3.1	3.9	3.6	3.0	3.5
Alaska	1	4.0	3.9	1.8	3.9	2.9	2.9	3.2
Hawaii	2	10.9	1.3	4.0	5.8	7.5	2.4	5.2

[1]Formerly North Central Region.

Table 1. Unweighted Average Absolute Percent Error of County Population Estimates, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part G. Counties With Populations of 100,000 or More

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II, and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	412	3.5	3.9	2.9	3.3	2.9	3.1	3.0
Region:								
Northeast	100	2.8	3.1	1.9	2.5	2.1	2.3	2.1
Midwest[1]	109	2.8	2.6	1.9	2.5	2.1	2.1	2.2
South	135	4.3	5.7	4.2	4.5	4.0	4.6	4.2
West	68	4.0	3.4	3.3	3.4	3.5	3.2	3.3
Northeast:								
New England	27	2.5	2.6	1.8	2.1	1.9	2.0	1.8
Middle Atlantic	73	2.9	3.3	2.0	2.5	2.1	2.3	2.2
Midwest:[1]								
East North Central	82	2.7	2.3	1.6	2.2	2.0	1.7	1.9
West North Central	27	3.4	3.8	2.6	3.3	2.7	3.0	2.9
South:								
South Atlantic	80	4.6	5.0	4.3	4.5	4.2	4.4	4.3
East South Central	18	3.5	4.3	3.5	3.3	3.4	3.7	3.3
West South Central	37	4.2	8.0	4.2	5.3	3.9	5.4	4.6
West:								
Mountain	20	5.3	5.0	4.8	4.7	4.7	4.8	4.8
Pacific	48	3.5	2.8	2.7	2.8	2.9	2.5	2.7
New England:								
Maine	4	5.6	4.3	3.5	4.3	4.3	3.9	3.9
New Hampshire	2	3.6	2.2	2.7	2.9	3.1	2.5	2.9
Vermont	1	2.1	0.9	0.5	0.6	0.8	0.7	0.3
Massachusetts	11	1.5	2.3	1.1	1.4	1.3	1.5	1.2
Rhode Island	2	2.3	4.3	2.6	3.3	2.4	3.4	3.0
Connecticut	7	2.1	2.1	1.3	1.5	1.3	1.3	1.2
Middle Atlantic:								
New York	25	3.1	3.1	1.8	2.5	2.2	2.2	2.1
New Jersey	17	2.1	4.3	2.0	2.2	1.2	2.7	1.8
Pennsylvania	31	3.1	3.0	2.1	2.8	2.5	2.2	2.5
East North Central:								
Ohio	23	2.2	1.3	1.3	1.4	1.5	1.0	1.2
Indiana	12	2.2	2.2	1.2	2.2	1.6	1.7	1.8
Illinois	18	3.6	2.8	2.1	3.0	2.6	2.2	2.5
Michigan	18	2.0	2.0	1.3	1.8	1.5	1.5	1.5
Wisconsin	11	3.6	3.6	2.7	3.5	2.9	3.0	3.1
West North Central:								
Minnesota	7	3.9	3.0	4.4	3.2	3.8	3.4	3.4
Iowa	5	2.5	2.4	0.8	2.2	1.1	1.1	1.3
Missouri	8	3.7	6.6	3.0	4.9	3.3	4.8	4.2
North Dakota	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Dakota	1	2.6	5.8	0.6	4.2	1.6	3.2	3.0
Nebraska	2	1.6	2.1	2.6	1.5	1.7	2.3	1.9
Kansas	4	4.7	2.0	1.8	2.2	2.4	1.4	1.7
South Atlantic:								
Delaware	1	3.2	1.1	1.5	2.1	2.3	1.3	1.9
Maryland	9	2.3	2.8	2.6	2.4	2.3	2.2	2.2
Virginia	14	3.1	3.9	2.8	2.8	2.2	2.5	2.2
West Virginia	2	1.6	0.9	1.8	1.1	1.6	1.3	1.4
North Carolina	13	3.4	4.7	3.8	3.8	3.5	4.0	3.6
South Carolina	10	4.9	6.1	5.4	5.3	5.1	5.6	5.4
Georgia	10	6.5	7.2	4.6	6.1	4.8	5.9	5.6
Florida	21	6.5	5.9	6.2	6.2	6.3	6.0	6.1
East South Central:								
Kentucky	3	3.9	3.8	3.5	3.9	3.8	3.7	3.8
Tennessee	5	3.3	4.4	2.5	3.3	2.7	3.3	3.1
Alabama	7	3.2	4.2	3.3	3.1	3.0	3.8	3.1
Mississippi	3	4.1	4.8	5.2	3.5	4.6	4.4	4.0
West South Central:								
Arkansas	1	0.8	4.1	1.6	2.4	1.2	2.9	2.2
Louisiana	9	3.5	4.0	3.6	3.9	3.0	3.5	3.3
Oklahoma	4	5.3	4.6	4.2	4.4	4.2	3.6	4.0
Texas	23	4.5	10.1	4.6	6.1	4.4	6.7	5.3
Mountain:								
Montana	1	2.8	4.0	1.7	3.4	2.2	2.9	2.8
Idaho	1	5.4	10.6	7.0	8.0	6.2	8.8	7.7
Wyoming	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Colorado	9	4.7	3.1	3.4	3.0	3.4	3.1	3.1
New Mexico	1	3.0	6.3	3.8	4.6	3.4	5.0	4.4
Arizona	2	6.8	7.4	7.4	7.2	7.1	7.4	7.3
Utah	4	4.4	4.8	5.0	4.6	4.7	4.9	4.8
Nevada	2	10.7	8.8	9.0	9.8	9.8	8.9	9.5
Pacific:								
Washington	10	3.7	4.0	3.5	3.5	3.6	3.0	3.2
Oregon	6	3.9	2.9	3.3	3.2	3.5	2.7	3.1
California	30	3.5	2.3	2.3	2.6	2.7	2.2	2.5
Alaska	1	1.6	2.7	2.2	0.6	0.3	2.5	1.1
Hawaii	1	1.5	4.0	3.4	2.7	2.4	3.7	3.0

[1]Formerly North Central Region.

Table 2. Weighted Average Absolute Percent Error of County Population Estimates, by Method, for Regions, Divisions, and States: April 1, 1980

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	3.7	3.9	3.2	3.3	3.2	3.2	3.1
Region:								
Northeast	217	2.7	3.3	1.9	2.6	2.0	2.3	2.2
Midwest[1]	1,056	2.9	2.5	2.2	2.4	2.3	2.1	2.1
South	1,424	5.0	5.4	4.4	4.5	4.4	4.5	4.3
West	445	3.7	3.9	3.7	3.5	3.5	3.6	3.5
Northeast:								
New England	67	2.1	2.1	1.6	1.8	1.7	1.7	1.7
Middle Atlantic	150	3.0	3.7	2.0	2.8	2.1	2.5	2.4
Midwest:[1]								
East North Central	437	2.5	2.2	2.0	2.1	2.1	1.9	1.9
West North Central	619	3.7	3.3	2.6	3.0	2.7	2.5	2.6
South:								
South Atlantic	590	5.2	5.1	4.7	4.7	4.6	4.7	4.6
East South Central	364	4.5	4.6	4.1	4.1	4.0	4.2	4.0
West South Central	470	5.1	6.3	4.2	4.5	4.3	4.5	4.1
West:								
Mountain	279	5.9	5.7	4.7	5.3	5.0	4.9	4.9
Pacific	166	2.9	3.2	3.3	2.9	3.0	3.1	2.9
New England:								
Maine	16	4.6	3.3	3.0	3.6	3.6	3.1	3.2
New Hampshire	10	3.3	3.4	3.4	3.3	3.3	3.4	3.3
Vermont	14	4.4	2.9	2.7	3.1	3.2	2.7	2.8
Massachusetts	14	1.3	1.9	1.0	1.3	1.1	1.3	1.2
Rhode Island	5	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Connecticut	8	1.7	1.3	1.1	1.1	1.1	0.9	0.9
Middle Atlantic:								
New York	62	3.2	3.8	2.0	3.0	2.4	2.7	2.6
New Jersey	21	2.0	4.3	2.2	2.0	1.2	2.9	1.8
Pennsylvania	67	3.2	3.1	1.9	3.0	2.3	2.1	2.4
East North Central:								
Ohio	88	2.2	1.5	1.8	1.5	1.8	1.3	1.4
Indiana	92	3.2	2.3	2.1	2.4	2.4	2.0	2.1
Illinois	102	2.7	2.3	2.2	2.3	2.3	2.1	2.2
Michigan	83	2.0	2.1	1.8	1.9	1.8	1.7	1.7
Wisconsin	72	3.1	4.0	2.6	3.2	2.5	2.7	2.7
West North Central:								
Minnesota	87	3.8	2.4	2.7	2.7	2.9	2.1	2.4
Iowa	99	2.9	2.5	1.8	2.1	1.9	1.6	1.7
Missouri	115	3.5	4.5	2.9	3.8	2.9	3.5	3.3
North Dakota	53	4.3	3.6	2.8	3.6	3.2	3.0	3.1
South Dakota	67	4.7	5.4	3.4	4.4	3.6	3.9	3.8
Nebraska	93	3.5	3.7	2.6	2.6	2.5	2.5	2.4
Kansas	105	4.7	2.2	2.4	2.8	2.6	1.9	2.2
South Atlantic:								
Delaware	3	3.4	2.9	2.9	2.9	2.9	2.9	2.9
Maryland	24	2.3	2.8	2.2	2.4	2.1	2.3	2.2
Virginia	136	4.8	4.5	4.2	3.9	3.8	3.9	3.5
West Virginia	55	4.4	4.0	4.1	3.9	3.9	4.0	3.8
North Carolina	100	4.0	4.6	3.7	4.0	3.7	3.9	3.8
South Carolina	46	5.8	6.0	5.7	5.7	5.6	5.6	5.6
Georgia	159	6.9	5.7	5.0	5.5	5.2	5.1	5.1
Florida	67	6.4	6.3	6.4	6.2	6.4	6.2	6.2
East South Central:								
Kentucky	120	4.7	4.7	4.3	4.5	4.3	4.4	4.4
Tennessee	95	4.3	4.5	3.5	3.9	3.6	3.8	3.7
Alabama	67	4.6	4.3	3.8	3.8	4.0	3.8	3.7
Mississippi	82	4.5	5.3	5.3	4.2	4.4	5.0	4.4
West South Central:								
Arkansas	75	5.1	6.6	4.9	5.3	4.7	5.4	5.0
Louisiana	64	4.0	3.9	3.4	3.8	3.3	3.3	3.3
Oklahoma	77	6.0	4.1	4.0	4.5	4.1	3.4	3.8
Texas	254	5.2	7.4	4.3	4.6	4.5	5.0	4.3
Mountain:								
Montana	57	5.0	4.3	2.5	4.4	3.1	2.9	3.3
Idaho	44	4.6	6.1	4.2	4.9	4.1	4.6	4.4
Wyoming	23	5.4	3.7	3.0	4.1	3.7	2.7	3.4
Colorado	63	5.8	3.5	3.3	3.7	3.9	3.2	3.5
New Mexico	32	6.3	6.9	3.4	6.0	4.7	4.6	4.9
Arizona	14	5.9	7.4	6.9	6.3	6.3	6.8	6.3
Utah	29	5.3	5.0	4.7	5.0	4.9	4.7	4.8
Nevada	17	9.3	9.3	8.8	9.1	8.8	9.0	8.9
Pacific:								
Washington	39	3.9	3.5	3.3	3.2	3.5	2.9	3.0
Oregon	36	4.0	3.7	3.2	3.4	3.3	2.9	3.1
California	58	2.6	3.0	3.3	2.7	2.9	3.1	2.9
Alaska	29	5.7	5.2	5.6	4.5	4.7	5.2	4.7
Hawaii	4	3.4	3.5	3.4	3.4	3.4	3.4	3.4

[1]Formerly North Central Region.

Table 3. Percent of Counties With Positive Percent Errors, by Method, for Regions, Divisions, and States: April 1, 1980

Part A. All Counties

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	34.8	35.3	27.8	33.5	30.5	30.4	31.0
Region:								
Northeast	217	26.3	32.3	28.1	29.0	28.6	26.7	27.2
Midwest[1]	1,056	45.3	42.3	38.3	43.4	42.8	39.5	41.2
South	1,424	25.6	27.0	16.2	22.6	18.7	19.1	19.4
West	445	43.6	47.0	40.4	46.7	40.2	46.5	45.8
Northeast:								
New England	67	31.3	28.4	28.4	32.8	34.3	26.9	32.8
Middle Atlantic	150	24.0	34.0	28.0	27.3	26.0	26.7	24.7
Midwest:[1]								
East North Central	437	28.8	26.1	29.1	26.1	28.1	26.1	25.2
West North Central	619	56.9	53.8	44.7	55.6	53.2	48.9	52.5
South:								
South Atlantic	590	20.5	28.5	14.7	19.8	14.6	19.2	17.3
East South Central	364	17.9	27.7	14.3	18.7	14.0	18.1	15.9
West South Central	470	38.1	24.5	19.4	29.1	27.4	19.8	24.7
West:								
Mountain	279	45.5	52.3	37.6	51.6	41.2	52.3	50.5
Pacific	166	40.4	38.0	45.2	38.6	38.6	36.7	38.0
New England:								
Maine	16	31.3	25.0	12.5	25.0	25.0	12.5	25.0
New Hampshire	10	(Z)	10.0	10.0	(Z)	(Z)	10.0	10.0
Vermont	14	21.4	7.1	14.3	21.4	28.6	7.1	21.4
Massachusetts	14	64.3	50.0	50.0	64.3	71.4	50.0	57.1
Rhode Island	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	8	50.0	75.0	87.5	75.0	62.5	87.5	75.0
Middle Atlantic:								
New York	62	24.2	45.2	33.9	37.1	30.6	33.9	30.6
New Jersey	21	38.1	52.4	42.9	42.9	38.1	52.4	38.1
Pennsylvania	67	19.4	17.9	17.9	13.4	17.9	11.9	14.9
East North Central:								
Ohio	88	21.6	38.6	23.9	26.1	21.6	26.1	19.3
Indiana	92	27.2	17.4	15.2	23.9	22.8	13.0	21.7
Illinois	102	17.6	7.8	11.8	7.8	8.8	5.9	4.9
Michigan	83	34.9	41.0	37.3	41.0	38.6	44.6	42.2
Wisconsin	72	48.6	30.6	68.1	37.5	58.3	50.0	45.8
West North Central:								
Minnesota	87	70.1	54.0	46.0	62.1	63.2	51.7	58.6
Iowa	99	52.5	56.6	36.4	51.5	41.4	44.4	44.4
Missouri	115	37.4	32.2	23.5	32.2	27.0	19.1	26.1
North Dakota	53	64.2	75.5	56.6	73.6	64.2	77.4	73.6
South Dakota	67	56.7	62.7	58.2	62.7	64.2	67.2	62.7
Nebraska	93	58.1	40.9	52.7	53.8	60.2	51.6	52.7
Kansas	105	66.7	69.5	53.3	67.6	65.7	55.2	66.7
South Atlantic:								
Delaware	3	33.3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	24	20.8	37.5	12.5	25.0	12.5	37.5	16.7
Virginia	136	26.5	39.0	25.0	27.9	24.3	31.6	28.7
West Virginia	55	21.8	10.9	10.9	14.5	14.5	9.1	9.1
North Carolina	100	17.0	31.0	14.0	22.0	11.0	20.0	17.0
South Carolina	46	13.0	19.6	4.3	8.7	8.7	13.0	10.9
Georgia	159	22.6	31.4	12.6	22.6	13.2	15.7	18.2
Florida	67	11.9	14.9	11.9	4.5	9.0	7.5	4.5
East South Central:								
Kentucky	120	20.0	16.7	12.5	15.8	14.2	14.2	15.0
Tennessee	95	10.5	32.6	10.5	16.8	7.4	17.9	9.5
Alabama	67	17.9	31.3	16.4	22.4	14.9	20.9	20.9
Mississippi	82	23.2	35.4	19.5	22.0	20.7	22.0	20.7
West South Central:								
Arkansas	75	20.0	28.0	14.7	25.3	17.3	20.0	21.3
Louisiana	64	28.1	29.7	26.6	25.0	23.4	26.6	23.4
Oklahoma	77	45.5	36.4	18.2	45.5	32.5	26.0	35.1
Texas	254	43.7	18.5	19.3	26.4	29.9	16.1	22.8
Mountain:								
Montana	57	57.9	75.4	43.9	63.2	47.4	70.2	63.2
Idaho	44	36.4	40.9	29.5	45.5	36.4	40.9	45.5
Wyoming	23	47.8	52.2	47.8	47.8	47.8	43.5	52.2
Colorado	63	46.0	46.0	44.4	52.4	42.9	49.2	46.0
New Mexico	32	53.1	62.5	40.6	65.6	50.0	68.8	65.6
Arizona	14	14.3	21.4	7.1	21.4	(Z)	21.4	14.3
Utah	29	37.9	48.3	31.0	48.3	44.8	51.7	51.7
Nevada	17	47.1	41.2	29.4	35.3	29.4	41.2	35.3
Pacific:								
Washington	39	41.0	25.6	33.3	28.2	33.3	20.5	28.2
Oregon	36	44.4	16.7	44.4	41.7	41.7	19.4	30.6
California	58	31.0	43.1	46.6	34.5	32.8	43.1	39.7
Alaska	29	58.6	72.4	62.1	62.1	58.6	72.4	62.1
Hawaii	4	(Z)	25.0	25.0	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 3. Percent of Counties With Positive Percent Errors, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part B. Counties With Populations of Less Than 5,000

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	292	63.4	62.3	55.5	67.1	63.4	62.0	66.1
Region:								
Northeast	1	(Z)	(Z)	100.0	(Z)	100.0	100.0	100.0
Midwest[1]	120	67.5	67.5	66.7	73.3	74.2	72.5	75.0
South	78	56.4	44.9	38.5	50.0	50.0	32.1	43.6
West	93	64.5	71.0	54.8	74.2	60.2	73.1	73.1
Northeast:								
New England	1	(Z)	(Z)	100.0	(Z)	100.0	100.0	100.0
Middle Atlantic	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Midwest:[1]								
East North Central	4	75.0	25.0	50.0	50.0	50.0	25.0	25.0
West North Central	116	67.2	69.0	67.2	74.1	75.0	74.1	76.7
South:								
South Atlantic	18	38.9	72.2	38.9	38.9	38.9	44.4	44.4
East South Central	6	(Z)	(Z)	16.7	(Z)	(Z)	(Z)	(Z)
West South Central	54	68.5	40.7	40.7	59.3	59.3	31.5	48.1
West:								
Mountain	71	59.2	71.8	49.3	73.2	54.9	73.2	71.8
Pacific	22	81.8	68.2	72.7	77.3	77.3	72.7	77.3
New England:								
Maine	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	1	(Z)	(Z)	100.0	(Z)	100.0	100.0	100.0
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
East North Central:								
Ohio	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Illinois	1	100.0	(Z)	(Z)	100.0	(Z)	(Z)	(Z)
Michigan	1	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Wisconsin	2	50.0	(Z)	50.0	(Z)	50.0	(Z)	(Z)
West North Central:								
Minnesota	2	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Iowa	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	3	33.3	66.7	33.3	66.7	33.3	33.3	33.3
North Dakota	22	72.7	90.9	72.7	86.4	77.3	90.9	90.9
South Dakota	26	61.5	73.1	69.2	76.9	73.1	84.6	80.8
Nebraska	33	66.7	33.3	57.6	63.6	75.8	54.5	63.6
Kansas	30	70.0	86.7	73.3	73.3	76.7	76.7	80.0
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	4	50.0	75.0	50.0	75.0	75.0	75.0	75.0
West Virginia	1	100.0	(Z)	100.0	(Z)	100.0	(Z)	(Z)
North Carolina	1	100.0	100.0	(Z)	100.0	(Z)	(Z)	(Z)
South Carolina	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Georgia	10	30.0	70.0	40.0	30.0	30.0	50.0	50.0
Florida	2	(Z)	100.0	(Z)	(Z)	(Z)	(Z)	(Z)
East South Central:								
Kentucky	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Tennessee	3	(Z)	(Z)	33.3	(Z)	(Z)	(Z)	(Z)
Alabama	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Mississippi	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West South Central:								
Arkansas	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Louisiana	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Oklahoma	4	75.0	50.0	50.0	75.0	75.0	50.0	50.0
Texas	50	68.0	40.0	40.0	58.0	58.0	30.0	48.0
Mountain:								
Montana	21	57.1	85.7	33.3	66.7	38.1	76.2	71.4
Idaho	10	60.0	80.0	70.0	100.0	70.0	80.0	90.0
Wyoming	2	100.0	100.0	50.0	100.0	50.0	50.0	50.0
Colorado	18	55.6	50.0	61.1	66.7	55.6	66.7	61.1
New Mexico	6	83.3	100.0	33.3	100.0	66.7	83.3	100.0
Arizona	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	8	50.0	62.5	62.5	62.5	87.5	75.0	75.0
Nevada	6	50.0	50.0	33.3	50.0	33.3	66.7	50.0
Pacific:								
Washington	3	66.7	66.7	33.3	33.3	33.3	33.3	33.3
Oregon	3	100.0	33.3	66.7	100.0	100.0	33.3	100.0
California	2	100.0	50.0	50.0	100.0	100.0	50.0	100.0
Alaska	14	78.6	78.6	85.7	78.6	78.6	92.9	78.6
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 3. Percent of Counties With Positive Percent Errors, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part C. Counties With Populations of 5,000 to 9,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	470	47.7	48.3	36.0	48.1	43.0	43.0	46.0
Region:								
Northeast	7	42.9	28.6	42.9	28.6	57.1	42.9	57.1
Midwest[1]	180	56.1	51.7	42.2	56.7	51.1	48.3	52.2
South	204	37.3	40.7	25.0	36.3	31.4	32.8	34.8
West	79	55.7	62.0	49.4	60.8	53.2	57.0	59.5
Northeast:								
New England	3	33.3	33.3	33.3	66.7	66.7	33.3	66.7
Middle Atlantic	4	50.0	25.0	50.0	(Z)	50.0	50.0	50.0
Midwest:[1]								
East North Central	31	32.3	22.6	32.3	29.0	38.7	22.6	29.0
West North Central	149	61.1	57.7	44.3	62.4	53.7	53.7	57.0
South:								
South Atlantic	89	29.2	44.9	24.7	33.7	23.6	34.8	32.6
East South Central	46	26.1	47.8	30.4	34.8	32.6	39.1	34.8
West South Central	69	55.1	30.4	21.7	40.6	40.6	26.1	37.7
West:								
Mountain	58	53.4	63.8	46.6	60.3	50.0	55.2	58.6
Pacific	21	61.9	57.1	57.1	61.9	61.9	61.9	61.9
New England:								
Maine	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	1	100.0	(Z)	(Z)	100.0	100.0	(Z)	100.0
Massachusetts	2	(Z)	50.0	50.0	50.0	50.0	50.0	50.0
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	1	(Z)	100.0	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	3	66.7	(Z)	66.7	(Z)	66.7	66.7	66.7
East North Central:								
Ohio	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	5	40.0	20.0	(Z)	20.0	20.0	(Z)	20.0
Illinois	13	23.1	(Z)	7.7	7.7	15.4	(Z)	7.7
Michigan	10	50.0	50.0	60.0	60.0	70.0	60.0	60.0
Wisconsin	3	(Z)	33.3	100.0	33.3	66.7	33.3	33.3
West North Central:								
Minnesota	10	80.0	70.0	50.0	80.0	60.0	60.0	60.0
Iowa	15	60.0	53.3	13.3	60.0	40.0	40.0	53.3
Missouri	23	43.5	43.5	17.4	39.1	17.4	21.7	30.4
North Dakota	16	68.8	81.3	56.3	75.0	68.8	87.5	75.0
South Dakota	24	70.8	70.8	66.7	70.8	70.8	75.0	70.8
Nebraska	30	46.7	36.7	56.7	50.0	50.0	46.7	46.7
Kansas	31	71.0	64.5	41.9	74.2	67.7	54.8	67.7
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	29	41.4	62.1	41.4	48.3	37.9	51.7	41.4
West Virginia	7	28.6	14.3	(Z)	28.6	14.3	14.3	28.6
North Carolina	8	12.5	50.0	25.0	25.0	12.5	37.5	25.0
South Carolina	1	(Z)	100.0	(Z)	100.0	(Z)	100.0	100.0
Georgia	38	23.7	36.8	15.8	23.7	15.8	23.7	26.3
Florida	6	33.3	33.3	33.3	33.3	33.3	33.3	33.3
East South Central:								
Kentucky	24	29.2	37.5	29.2	25.0	29.2	37.5	33.3
Tennessee	12	8.3	50.0	33.3	25.0	25.0	33.3	16.7
Alabama	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Mississippi	10	40.0	70.0	30.0	70.0	50.0	50.0	60.0
West South Central:								
Arkansas	9	22.2	22.2	(Z)	22.2	22.2	(Z)	22.2
Louisiana	3	66.7	66.7	100.0	66.7	66.7	100.0	66.7
Oklahoma	12	58.3	75.0	16.7	66.7	58.3	41.7	58.3
Texas	45	60.0	17.8	22.2	35.6	37.8	22.2	33.3
Mountain:								
Montana	15	80.0	86.7	53.3	80.0	66.7	80.0	80.0
Idaho	11	27.3	36.4	36.4	36.4	27.3	27.3	36.4
Wyoming	6	50.0	50.0	66.7	50.0	66.7	33.3	50.0
Colorado	15	46.7	66.7	46.7	60.0	46.7	60.0	60.0
New Mexico	3	66.7	66.7	66.7	66.7	66.7	100.0	66.7
Arizona	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	4	25.0	50.0	25.0	75.0	25.0	25.0	50.0
Nevada	4	75.0	75.0	25.0	50.0	50.0	50.0	50.0
Pacific:								
Washington	5	80.0	60.0	40.0	60.0	60.0	60.0	60.0
Oregon	5	80.0	(Z)	80.0	60.0	80.0	40.0	60.0
California	2	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Alaska	9	33.3	77.8	44.4	55.6	44.4	66.7	55.6
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 3. Percent of Counties With Positive Percent Errors, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part D. Counties With Populations of 10,000 to 24,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	974	34.0	36.1	24.4	32.0	28.4	29.3	29.2
Region:								
Northeast	11	18.2	18.2	(Z)	27.3	9.1	9.1	18.2
Midwest[1]	344	40.1	42.7	32.3	41.0	37.8	36.3	37.8
South	511	26.0	28.8	14.5	21.5	17.0	19.4	18.0
West	108	53.7	51.9	49.1	53.7	54.6	55.6	55.6
Northeast:								
New England	4	25.0	25.0	(Z)	25.0	(Z)	(Z)	25.0
Middle Atlantic	7	14.3	14.3	(Z)	28.6	14.3	14.3	14.3
Midwest:[1]								
East North Central	121	19.8	25.6	25.6	24.0	23.1	26.4	23.1
West North Central	223	51.1	52.0	35.9	50.2	45.7	41.7	45.7
South:								
South Atlantic	188	21.3	31.9	15.4	21.3	14.9	20.2	18.1
East South Central	157	21.7	33.1	14.0	22.9	15.3	21.0	19.7
West South Central	166	35.5	21.1	13.9	20.5	21.1	16.9	16.3
West:								
Mountain	79	51.9	55.7	41.8	53.2	49.4	59.5	55.7
Pacific	29	58.6	41.4	69.0	55.2	69.0	44.8	55.2
New England:								
Maine	1	100.0	100.0	(Z)	100.0	(Z)	(Z)	100.0
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	2	50.0	(Z)	(Z)	50.0	50.0	(Z)	50.0
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	5	(Z)	20.0	(Z)	20.0	(Z)	20.0	(Z)
East North Central:								
Ohio	11	(Z)	72.7	(Z)	36.4	(Z)	36.4	18.2
Indiana	30	13.3	16.7	3.3	13.3	6.7	10.0	10.0
Illinois	37	10.8	8.1	10.8	2.7	5.4	5.4	2.7
Michigan	21	38.1	52.4	47.6	57.1	47.6	52.4	52.4
Wisconsin	22	36.4	18.2	72.7	36.4	63.6	54.5	50.0
West North Central:								
Minnesota	39	69.2	53.8	46.2	69.2	69.2	56.4	66.7
Iowa	60	50.0	65.0	33.3	53.3	40.0	51.7	46.7
Missouri	57	38.6	36.8	29.8	29.8	31.6	21.1	26.3
North Dakota	10	50.0	60.0	30.0	60.0	40.0	50.0	50.0
South Dakota	14	28.6	42.9	28.6	28.6	35.7	35.7	28.6
Nebraska	19	63.2	42.1	52.6	52.6	57.9	47.4	52.6
Kansas	24	58.3	62.5	33.3	66.7	54.2	37.5	58.3
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	3	(Z)	33.3	(Z)	33.3	(Z)	33.3	(Z)
Virginia	50	20.0	32.0	26.0	18.0	22.0	32.0	24.0
West Virginia	18	22.2	11.1	(Z)	16.7	11.1	(Z)	11.1
North Carolina	26	23.1	46.2	23.1	30.8	19.2	34.6	26.9
South Carolina	11	18.2	27.3	(Z)	9.1	9.1	18.2	9.1
Georgia	61	24.6	34.4	9.8	27.9	11.5	11.5	18.0
Florida	19	15.8	26.3	21.1	5.3	10.5	15.8	5.3
East South Central:								
Kentucky	56	21.4	10.7	10.7	17.9	16.1	10.7	14.3
Tennessee	34	11.8	52.9	11.8	26.5	5.9	26.5	17.6
Alabama	26	26.9	61.5	23.1	42.3	26.9	46.2	46.2
Mississippi	41	26.8	29.3	14.6	14.6	14.6	14.6	12.2
West South Central:								
Arkansas	38	15.8	23.7	15.8	21.1	15.8	23.7	18.4
Louisiana	23	21.7	39.1	17.4	17.4	17.4	30.4	17.4
Oklahoma	26	50.0	34.6	19.2	46.2	23.1	23.1	30.8
Texas	79	44.3	10.1	10.1	12.7	24.1	7.6	10.1
Mountain:								
Montana	14	64.3	78.6	57.1	71.4	64.3	71.4	64.3
Idaho	14	42.9	35.7	7.1	35.7	35.7	42.9	42.9
Wyoming	9	44.4	66.7	66.7	44.4	66.7	66.7	77.8
Colorado	17	52.9	47.1	47.1	52.9	47.1	52.9	47.1
New Mexico	9	55.6	66.7	55.6	66.7	55.6	77.8	66.7
Arizona	3	33.3	(Z)	33.3	33.3	(Z)	(Z)	(Z)
Utah	9	55.6	77.8	33.3	66.7	55.6	88.9	77.8
Nevada	4	50.0	25.0	25.0	25.0	25.0	25.0	25.0
Pacific:								
Washington	7	57.1	14.3	57.1	42.9	71.4	14.3	28.6
Oregon	8	62.5	12.5	62.5	37.5	75.0	25.0	37.5
California	10	60.0	70.0	90.0	80.0	70.0	80.0	90.0
Alaska	4	50.0	75.0	50.0	50.0	50.0	50.0	50.0
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 3. Percent of Counties With Positive Percent Errors, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part E. Counties With Populations of 25,000 to 49,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	614	23.6	24.1	17.3	21.7	18.7	16.4	18.4
Region:								
Northeast	47	14.9	17.0	14.9	8.5	12.8	6.4	6.4
Midwest[1]	206	35.0	27.7	23.3	28.6	28.6	20.4	24.8
South	316	16.5	22.8	12.0	18.4	13.3	14.6	15.5
West	45	31.1	24.4	28.9	26.7	17.8	22.2	22.2
Northeast:								
New England	19	15.8	21.1	15.8	10.5	15.8	10.5	10.5
Middle Atlantic	28	14.3	14.3	14.3	7.1	10.7	3.6	3.6
Midwest:[1]								
East North Central	127	23.6	20.5	16.5	17.3	19.7	14.2	15.7
West North Central	79	53.2	39.2	34.2	46.8	43.0	30.4	39.2
South:								
South Atlantic	126	14.3	25.4	10.3	16.7	11.1	18.3	14.3
East South Central	92	6.5	21.7	12.0	12.0	6.5	9.8	7.6
West South Central	98	28.6	20.4	14.3	26.5	22.4	14.3	24.5
West:								
Mountain	24	29.2	29.2	20.8	29.2	12.5	25.0	20.8
Pacific	21	33.3	19.0	38.1	23.8	23.8	19.0	23.8
New England:								
Maine	9	22.2	22.2	11.1	11.1	22.2	11.1	11.1
New Hampshire	4	(Z)	25.0	25.0	(Z)	(Z)	25.0	25.0
Vermont	5	20.0	20.0	20.0	20.0	20.0	(Z)	(Z)
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	12	16.7	16.7	25.0	8.3	8.3	8.3	(Z)
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	16	12.5	12.5	6.3	6.3	12.5	(Z)	6.3
East North Central:								
Ohio	31	12.9	35.5	3.2	16.1	9.7	12.9	6.5
Indiana	32	21.9	9.4	12.5	18.8	18.8	6.3	18.8
Illinois	24	16.7	8.3	8.3	8.3	4.2	4.2	4.2
Michigan	19	21.1	42.1	10.5	26.3	21.1	26.3	26.3
Wisconsin	21	52.4	9.5	57.1	19.0	52.4	28.6	28.6
West North Central:								
Minnesota	25	68.0	40.0	44.0	48.0	56.0	32.0	44.0
Iowa	14	57.1	42.9	50.0	64.3	42.9	35.7	50.0
Missouri	18	22.2	5.6	5.6	27.8	16.7	5.6	16.7
North Dakota	1	100.0	(Z)	100.0	100.0	100.0	100.0	100.0
South Dakota	1	100.0	(Z)	(Z)	100.0	100.0	(Z)	(Z)
Nebraska	8	37.5	75.0	25.0	25.0	37.5	62.5	25.0
Kansas	12	66.7	66.7	41.7	58.3	50.0	33.3	58.3
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	6	16.7	33.3	16.7	16.7	16.7	50.0	16.7
Virginia	28	10.7	32.1	7.1	21.4	7.1	21.4	21.4
West Virginia	18	16.7	16.7	27.8	11.1	22.2	22.2	5.6
North Carolina	25	12.0	28.0	4.0	16.0	4.0	16.0	16.0
South Carolina	14	14.3	21.4	7.1	14.3	14.3	14.3	21.4
Georgia	28	21.4	28.6	10.7	21.4	14.3	14.3	10.7
Florida	7	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
East South Central:								
Kentucky	26	11.5	11.5	7.7	7.7	(Z)	3.8	3.8
Tennessee	28	(Z)	17.9	(Z)	10.7	(Z)	7.1	(Z)
Alabama	20	(Z)	25.0	20.0	10.0	5.0	10.0	5.0
Mississippi	18	16.7	38.9	27.8	22.2	27.8	22.2	27.8
West South Central:								
Arkansas	18	27.8	44.4	22.2	44.4	22.2	27.8	33.3
Louisiana	17	29.4	23.5	17.6	29.4	29.4	17.6	29.4
Oklahoma	25	36.0	24.0	8.0	32.0	28.0	16.0	32.0
Texas	38	23.7	5.3	13.2	13.2	15.8	5.3	13.2
Mountain:								
Montana	3	(Z)	33.3	33.3	(Z)	(Z)	33.3	(Z)
Idaho	3	33.3	33.3	33.3	33.3	33.3	33.3	33.3
Wyoming	4	50.0	25.0	(Z)	50.0	(Z)	25.0	25.0
Colorado	3	33.3	33.3	33.3	66.7	33.3	(Z)	33.3
New Mexico	6	16.7	50.0	16.7	33.3	16.7	50.0	33.3
Arizona	1	100.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	3	33.3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nevada	1	(Z)	(Z)	100.0	(Z)	(Z)	(Z)	(Z)
Pacific:								
Washington	9	55.6	(Z)	33.3	22.2	33.3	(Z)	33.3
Oregon	5	20.0	(Z)	(Z)	20.0	(Z)	(Z)	(Z)
California	6	16.7	66.7	66.7	33.3	33.3	66.7	33.3
Alaska	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Hawaii	1	(Z)	(Z)	100.0	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 3. Percent of Counties With Positive Percent Errors, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part F. Counties With Populations of 50,000 to 99,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	380	21.6	20.3	20.8	17.9	17.9	17.4	16.3
Region:								
Northeast	51	9.8	25.5	19.6	17.6	13.7	19.6	15.7
Midwest[1]	97	35.1	22.7	33.0	23.7	32.0	21.6	22.7
South	180	18.9	15.6	12.2	12.8	12.2	11.1	10.6
West	52	17.3	26.9	28.8	25.0	15.4	28.8	25.0
Northeast:								
New England	13	7.7	15.4	15.4	15.4	7.7	15.4	15.4
Middle Atlantic	38	10.5	28.9	21.1	18.4	15.8	21.1	15.8
Midwest:[1]								
East North Central	72	30.6	22.2	30.6	25.0	27.8	20.8	23.6
West North Central	25	48.0	24.0	40.0	20.0	44.0	24.0	20.0
South:								
South Atlantic	89	15.7	14.6	9.0	11.2	10.1	7.9	7.9
East South Central	45	20.0	11.1	8.9	6.7	11.1	8.9	6.7
West South Central	46	23.9	21.7	21.7	21.7	17.4	19.6	19.6
West:								
Mountain	27	14.8	22.2	14.8	25.9	14.8	29.6	25.9
Pacific	25	20.0	32.0	44.0	24.0	16.0	28.0	24.0
New England:								
Maine	2	50.0	50.0	50.0	50.0	50.0	50.0	50.0
New Hampshire	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	1	(Z)	100.0	100.0	100.0	(Z)	100.0	100.0
Middle Atlantic:								
New York	22	13.6	40.9	27.3	27.3	22.7	27.3	22.7
New Jersey	4	25.0	25.0	50.0	25.0	25.0	50.0	25.0
Pennsylvania	12	(Z)	8.3	(Z)	(Z)	(Z)	(Z)	(Z)
East North Central:								
Ohio	23	13.0	26.1	21.7	26.1	17.4	13.0	17.4
Indiana	13	61.5	15.4	38.5	46.2	53.8	15.4	38.5
Illinois	9	11.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Michigan	14	21.4	14.3	28.6	(Z)	21.4	21.4	14.3
Wisconsin	13	53.8	46.2	61.5	46.2	46.2	53.8	46.2
West North Central:								
Minnesota	4	75.0	25.0	(Z)	25.0	50.0	25.0	25.0
Iowa	5	40.0	40.0	60.0	(Z)	40.0	20.0	(Z)
Missouri	6	33.3	(Z)	16.7	16.7	16.7	(Z)	16.7
North Dakota	4	25.0	25.0	25.0	25.0	25.0	25.0	25.0
South Dakota	1	(Z)	(Z)	100.0	(Z)	100.0	(Z)	(Z)
Nebraska	1	100.0	100.0	(Z)	100.0	100.0	100.0	100.0
Kansas	4	75.0	25.0	100.0	25.0	75.0	50.0	25.0
South Atlantic:								
Delaware	2	50.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	6	16.7	33.3	16.7	16.7	(Z)	50.0	16.7
Virginia	11	36.4	27.3	18.2	27.3	18.2	(Z)	27.3
West Virginia	9	11.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
North Carolina	27	14.8	22.2	11.1	22.2	14.8	11.1	11.1
South Carolina	10	(Z)	10.0	10.0	(Z)	10.0	10.0	(Z)
Georgia	12	8.3	(Z)	(Z)	(Z)	8.3	(Z)	(Z)
Florida	12	16.7	8.3	8.3	(Z)	8.3	(Z)	(Z)
East South Central:								
Kentucky	9	22.2	22.2	(Z)	11.1	11.1	11.1	11.1
Tennessee	13	30.8	7.7	7.7	7.7	15.4	7.7	7.7
Alabama	14	14.3	(Z)	7.1	(Z)	7.1	(Z)	(Z)
Mississippi	9	11.1	22.2	22.2	11.1	11.1	22.2	11.1
West South Central:								
Arkansas	9	22.2	22.2	11.1	11.1	11.1	11.1	11.1
Louisiana	12	33.3	25.0	41.7	33.3	25.0	33.3	33.3
Oklahoma	6	33.3	33.3	(Z)	50.0	16.7	16.7	16.7
Texas	19	15.8	15.8	21.1	10.5	15.8	15.8	15.8
Mountain:								
Montana	3	(Z)	(Z)	33.3	(Z)	(Z)	33.3	(Z)
Idaho	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Wyoming	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Colorado	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Mexico	7	57.1	42.9	42.9	71.4	57.1	57.1	71.4
Arizona	8	(Z)	37.5	(Z)	25.0	(Z)	37.5	25.0
Utah	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nevada	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pacific:								
Washington	5	(Z)	40.0	40.0	(Z)	(Z)	40.0	20.0
Oregon	9	22.2	33.3	55.6	33.3	22.2	22.2	22.2
California	8	37.5	25.0	50.0	37.5	25.0	37.5	37.5
Alaska	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Hawaii	2	(Z)	50.0	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 3. Percent of Counties With Positive Percent Errors, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part G. Counties With Populations of 100,000 or More

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	412	30.8	30.1	29.4	28.2	27.2	28.9	25.7
Region:								
Northeast	100	40.0	45.0	40.0	45.0	43.0	40.0	41.0
Midwest[1]	109	47.7	43.1	52.3	41.3	46.8	50.5	44.0
South	135	19.3	14.1	11.1	13.3	8.9	11.1	8.1
West	68	13.2	19.1	13.2	11.8	8.8	13.2	8.8
Northeast:								
New England	27	55.6	40.7	44.4	55.6	59.3	44.4	51.9
Middle Atlantic	73	34.2	46.6	38.4	41.1	37.0	38.4	37.0
Midwest:[1]								
East North Central	82	45.1	40.2	50.0	41.5	43.9	50.0	42.7
West North Central	27	55.6	51.9	59.3	40.7	55.6	51.9	48.1
South:								
South Atlantic	80	20.0	12.5	10.0	11.3	8.8	7.5	7.5
East South Central	18	22.2	11.1	(Z)	11.1	5.6	11.1	5.6
West South Central	37	16.2	18.9	18.9	18.9	10.8	18.9	10.8
West:								
Mountain	20	10.0	5.0	5.0	5.0	5.0	5.0	(Z)
Pacific	48	14.6	25.0	16.7	14.6	10.4	16.7	12.5
New England:								
Maine	4	25.0	(Z)	(Z)	25.0	25.0	(Z)	25.0
New Hampshire	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	1	100.0	(Z)	(Z)	100.0	100.0	(Z)	100.0
Massachusetts	11	81.8	54.5	54.5	72.7	81.1	54.5	63.6
Rhode Island	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	7	57.1	71.4	85.7	71.4	71.4	85.7	71.4
Middle Atlantic:								
New York	25	36.0	64.0	48.0	60.0	48.0	56.0	52.0
New Jersey	17	41.2	58.8	41.2	47.1	41.2	52.9	41.2
Pennsylvania	31	29.0	25.8	29.0	22.6	25.8	16.1	22.6
East North Central:								
Ohio	23	52.2	39.1	65.2	34.8	52.2	52.2	39.1
Indiana	12	33.3	41.7	33.3	41.7	41.7	41.7	41.7
Illinois	18	27.8	16.7	27.8	16.7	22.2	16.7	11.1
Michigan	18	44.4	38.9	44.4	55.6	38.9	61.1	55.6
Wisconsin	11	72.7	81.8	81.8	72.7	72.7	90.9	81.8
West North Central:								
Minnesota	7	57.1	85.7	57.1	57.1	57.1	85.7	71.4
Iowa	5	60.0	20.0	80.0	20.0	60.0	20.0	20.0
Missouri	8	50.0	37.5	37.5	37.5	50.0	37.5	37.5
North Dakota	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Dakota	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nebraska	2	100.0	50.0	50.0	50.0	50.0	50.0	50.0
Kansas	4	50.0	75.0	100.0	50.0	75.0	75.0	75.0
South Atlantic:								
Delaware	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	9	33.3	44.4	11.1	33.3	22.2	22.2	22.2
Virginia	14	35.7	28.6	21.4	21.4	28.6	21.4	21.4
West Virginia	2	50.0	(Z)	(Z)	50.0	(Z)	(Z)	(Z)
North Carolina	13	15.4	7.7	15.4	7.7	(Z)	7.7	7.7
South Carolina	10	20.0	10.0	(Z)	(Z)	(Z)	(Z)	(Z)
Georgia	10	20.0	(Z)	10.0	10.0	(Z)	(Z)	(Z)
Florida	21	4.8	(Z)	4.8	(Z)	4.8	(Z)	(Z)
East South Central:								
Kentucky	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Tennessee	5	20.0	20.0	(Z)	(Z)	(Z)	20.0	(Z)
Alabama	7	42.9	(Z)	(Z)	28.6	14.3	(Z)	14.3
Mississippi	3	(Z)	33.3	(Z)	(Z)	(Z)	33.3	(Z)
West South Central:								
Arkansas	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Louisiana	9	22.2	11.1	22.2	11.1	11.1	(Z)	(Z)
Oklahoma	4	25.0	(Z)	75.0	25.0	25.0	50.0	25.0
Texas	23	13.0	26.1	8.7	21.7	8.7	21.7	13.0
Mountain:								
Montana	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Idaho	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Wyoming	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Colorado	9	22.2	11.1	11.1	11.1	11.1	11.1	(Z)
New Mexico	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Arizona	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nevada	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pacific:								
Washington	10	10.0	20.0	10.0	20.0	10.0	10.0	10.0
Oregon	6	16.7	16.7	(Z)	33.3	(Z)	(Z)	(Z)
California	30	13.3	30.0	23.3	10.0	13.3	23.3	16.7
Alaska	1	100.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Hawaii	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 4. Percent of Counties With Absolute Error of 5 Percent or More, by Method, for Regions, Divisions, and States: April 1, 1980

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method[1]	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method[1]	Ratio-Correlation and Administrative Records method[1]	Component Method II, Ratio-Correlation, and Administrative Records method[1]
United States	3,142	43.4	37.2	32.8	35.4	34.5	30.1	30.7
Region:								
Northeast	217	27.2	21.2	7.4	17.1	14.3	14.3	11.5
Midwest[1]	1,056	37.6	27.7	22.3	26.6	24.4	18.7	20.7
South	1,424	49.4	44.8	44.9	43.0	45.2	41.3	40.6
West	445	46.1	43.4	31.7	40.9	34.2	29.4	31.9
Northeast:								
New England	67	23.9	20.9	7.5	10.4	13.4	11.9	7.5
Middle Atlantic	150	28.7	21.3	7.3	20.0	14.7	15.3	13.3
Midwest:[2]								
East North Central	437	34.3	26.1	24.9	23.6	22.2	17.2	18.3
West North Central	619	39.9	28.8	20.4	28.8	26.0	19.7	22.5
South:								
South Atlantic	590	51.5	39.0	45.6	42.4	48.0	38.8	40.5
East South Central	364	44.8	38.5	45.1	39.6	44.0	33.5	37.6
West South Central	470	50.4	57.0	43.8	46.4	42.6	50.4	43.0
West:								
Mountain	279	48.7	49.1	34.8	46.6	36.9	31.9	36.9
Pacific	166	41.6	33.7	26.5	31.3	29.5	25.3	23.5
New England:								
Maine	16	31.4	12.6	(Z)	12.5	12.5	6.3	6.3
New Hampshire	10	20.0	30.0	20.0	(Z)	20.0	30.0	(Z)
Vermont	14	49.9	21.4	14.3	21.4	28.6	14.3	14.3
Massachusetts	14	7.1	28.6	7.1	7.1	7.1	14.3	14.3
Rhode Island	5	20.0	40.0	(Z)	20.0	(Z)	(Z)	(Z)
Connecticut	8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	62	32.3	8.1	6.5	19.4	16.1	8.1	11.3
New Jersey	21	4.8	28.6	4.8	9.5	4.8	28.6	4.8
Pennsylvania	67	32.8	31.3	9.0	23.9	16.4	17.9	17.9
East North Central:								
Ohio	88	25.0	13.6	22.7	9.1	15.9	5.7	6.8
Indiana	92	43.5	20.7	26.1	26.1	29.3	20.7	25.0
Illinois	102	39.2	35.3	27.5	36.3	23.5	28.4	26.5
Michigan	83	32.5	27.7	24.1	25.3	27.7	14.5	19.3
Wisconsin	72	29.2	33.3	23.6	18.1	12.5	13.9	11.1
West North Central:								
Minnesota	87	29.9	17.2	18.4	27.6	21.8	6.9	16.1
Iowa	99	23.2	13.1	8.1	10.1	10.1	6.1	6.1
Missouri	115	39.1	33.9	24.3	27.8	26.1	19.1	20.9
North Dakota	53	39.6	39.6	30.2	34.0	34.0	35.8	34.0
South Dakota	67	44.8	46.3	26.9	38.8	34.3	35.8	37.3
Nebraska	93	44.1	37.6	19.4	26.9	24.7	24.7	18.3
Kansas	105	58.1	22.9	21.0	41.0	36.2	21.0	33.3
South Atlantic:								
Delaware	3	33.3	66.7	66.7	33.3	33.3	66.7	33.3
Maryland	24	33.3	16.7	20.8	4.2	25.0	4.2	4.2
Virginia	136	50.0	36.0	47.1	34.6	44.1	32.4	36.0
West Virginia	55	49.1	40.0	40.0	38.2	34.5	40.0	38.2
North Carolina	100	40.0	31.0	33.0	34.0	38.0	25.0	31.0
South Carolina	46	54.3	50.0	52.2	52.2	52.2	50.0	45.7
Georgia	159	59.7	40.9	51.6	49.7	56.6	47.2	45.9
Florida	67	59.7	50.7	55.2	64.2	67.2	55.2	62.7
East South Central:								
Kentucky	120	42.5	40.8	49.2	42.5	47.5	40.8	45.0
Tennessee	95	52.6	35.8	37.9	42.1	43.2	25.3	34.7
Alabama	67	47.8	32.8	44.8	35.8	52.2	23.9	31.3
Mississippi	82	36.6	42.7	47.6	35.4	32.9	40.2	35.4
West South Central:								
Arkansas	75	53.3	60.0	53.3	57.3	56.0	53.3	52.0
Louisiana	64	42.2	31.3	25.0	31.3	23.4	26.6	25.0
Oklahoma	77	49.4	39.0	41.6	44.2	44.2	41.6	42.9
Texas	254	52.0	68.1	46.5	47.6	42.9	58.3	44.9
Mountain:								
Montana	57	59.6	45.6	35.1	54.4	40.4	19.3	36.8
Idaho	44	36.4	59.1	38.6	38.6	29.5	36.4	29.5
Wyoming	23	39.1	21.7	21.7	30.4	26.1	13.0	26.1
Colorado	63	46.0	41.3	33.3	41.3	36.5	33.3	34.9
New Mexico	32	56.3	68.8	21.9	62.5	37.5	34.4	43.8
Arizona	14	50.0	64.3	71.4	50.0	57.1	64.3	57.1
Utah	29	44.8	41.4	31.0	37.9	34.5	31.0	31.0
Nevada	17	58.8	64.7	47.1	64.7	47.1	52.9	58.8
Pacific:								
Washington	39	38.5	38.5	23.1	28.2	28.2	20.5	15.4
Oregon	36	30.6	33.3	16.7	22.2	19.4	19.4	16.7
California	58	37.9	22.4	19.0	22.4	20.7	19.0	15.5
Alaska	29	62.1	55.2	62.1	58.6	58.6	55.2	55.2
Hawaii	4	75.0	(Z)	(Z)	75.0	50.0	(Z)	50.0

[1]See text for a description of the Administrative Records method as it is used here.
[2]Formerly North Central Region.

Table 5. Percent of Counties With Absolute Error of 10 Percent or More, by Method, for Regions, Divisions, and States: April 1, 1980

Part A. All Counties

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	15.7	10.2	6.5	9.6	8.4	6.5	7.1
Region:								
Northeast	217	4.6	3.2	0.5	1.8	1.4	1.4	1.4
Midwest[1]	1,056	12.5	4.7	3.3	6.3	6.1	2.6	4.1
South	1,424	19.1	14.0	8.8	11.9	10.3	9.8	9.4
West	445	17.8	14.6	9.2	13.7	11.5	8.1	9.7
Northeast:								
New England	67	3.0	3.0	(Z)	1.5	(Z)	1.5	(Z)
Middle Atlantic	150	5.3	3.3	0.7	2.0	2.0	1.3	2.0
Midwest:[1]								
East North Central	437	8.0	2.7	2.7	2.3	3.2	2.1	2.3
West North Central	619	15.7	6.1	3.7	9.2	8.1	2.9	5.3
South:								
South Atlantic	590	20.0	7.6	9.5	10.8	11.0	7.1	8.6
East South Central	364	13.2	8.8	6.0	7.1	6.3	5.8	4.4
West South Central	470	22.6	26.0	10.2	17.0	12.3	16.2	14.3
West:								
Mountain	279	20.1	19.0	9.7	16.1	12.2	8.6	9.3
Pacific	166	13.9	7.2	8.4	9.6	10.2	7.2	10.2
New England:								
Maine	16	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	10	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	14	7.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	14	7.1	14.3	(Z)	7.1	(Z)	7.1	(Z)
Rhode Island	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	62	8.1	1.6	(Z)	(Z)	1.6	(Z)	(Z)
New Jersey	21	(Z)	4.8	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	67	4.5	4.5	1.5	4.5	3.0	3.0	4.5
East North Central:								
Ohio	88	3.4	2.3	2.3	1.1	2.3	2.3	2.3
Indiana	92	12.0	1.1	3.3	3.3	5.4	2.2	2.2
Illinois	102	5.9	(Z)	1.0	2.0	2.9	1.0	2.0
Michigan	83	12.0	3.6	4.8	2.4	2.4	2.4	2.4
Wisconsin	72	6.9	8.3	2.8	2.8	2.8	2.8	2.8
West North Central:								
Minnesota	87	11.5	1.1	3.4	1.1	4.6	(Z)	1.1
Iowa	99	2.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	115	14.8	8.7	2.6	9.6	6.1	2.6	4.3
North Dakota	53	18.9	7.5	3.8	17.0	13.2	5.7	11.3
South Dakota	67	14.9	17.9	14.9	13.4	14.9	11.9	10.4
Nebraska	93	18.3	8.6	4.3	10.8	10.8	3.2	7.5
Kansas	105	29.5	2.9	1.0	16.2	11.4	1.0	6.7
South Atlantic:								
Delaware	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	24	4.2	(Z)	(Z)	4.2	4.2	(Z)	4.2
Virginia	136	19.9	7.4	14.7	10.3	13.2	11.8	10.3
West Virginia	55	10.9	5.5	7.3	3.6	1.8	3.6	3.6
North Carolina	100	7.0	6.0	2.0	3.0	3.0	2.0	2.0
South Carolina	46	13.0	8.7	8.7	8.7	6.5	4.3	4.3
Georgia	159	30.2	5.7	11.3	17.6	16.4	5.7	11.3
Florida	67	34.3	19.4	11.9	17.9	19.4	16.4	17.9
East South Central:								
Kentucky	120	13.3	7.5	8.3	7.5	5.8	6.7	4.2
Tennessee	95	12.6	6.3	2.1	4.2	5.3	3.2	2.1
Alabama	67	19.4	3.0	6.0	6.0	9.0	3.0	4.5
Mississippi	82	8.5	18.3	7.3	11.0	6.1	9.8	7.3
West South Central:								
Arkansas	75	28.0	21.3	6.7	16.0	12.0	13.3	12.0
Louisiana	64	9.4	7.8	3.1	9.4	6.3	3.1	6.3
Oklahoma	77	23.4	14.3	13.0	18.2	14.3	14.3	15.6
Texas	254	24.0	35.4	12.2	18.9	13.4	20.9	16.5
Mountain:								
Montana	57	21.1	12.3	7.0	17.5	7.0	3.5	3.5
Idaho	44	6.8	20.5	4.5	4.5	6.8	9.1	4.5
Wyoming	23	26.1	13.0	4.3	21.7	13.0	4.3	8.7
Colorado	63	22.2	11.1	14.3	19.0	15.9	9.5	14.3
New Mexico	32	28.1	43.8	9.4	28.1	15.6	12.5	12.5
Arizona	14	7.1	21.4	7.1	(Z)	7.1	7.1	(Z)
Utah	29	20.7	13.8	10.3	10.3	20.7	6.9	10.3
Nevada	17	29.4	35.3	23.5	23.5	11.8	23.5	23.5
Pacific:								
Washington	39	10.3	10.3	5.1	5.1	5.1	5.1	5.1
Oregon	36	11.1	(Z)	(Z)	5.6	8.3	(Z)	5.6
California	58	6.9	(Z)	(Z)	3.4	3.4	(Z)	1.7
Alaska	29	34.5	27.6	41.4	34.5	34.5	34.5	41.4
Hawaii	4	25.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 5. Percent of Counties With Absolute Error of 10 Percent or More, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part B. Counties With Populations of Less Than 5,000

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	292	33.6	24.0	17.1	27.1	24.0	15.8	18.8
Region:								
Northeast	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Midwest[1]	120	34.2	15.0	12.5	27.5	25.8	10.0	17.5
South	78	39.7	33.3	19.2	25.6	23.1	20.5	17.9
West	93	28.0	28.0	21.5	28.0	22.6	19.4	21.5
Northeast:								
New England	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Midwest:[1]								
East North Central	4	50.0	75.0	50.0	50.0	50.0	50.0	50.0
West North Central	116	33.6	12.9	11.2	26.7	25.0	8.6	16.4
South:								
South Atlantic	18	44.4	27.8	11.1	33.3	16.7	27.8	27.8
East South Central	6	16.7	(Z)	16.7	(Z)	16.7	(Z)	(Z)
West South Central	54	40.7	38.9	22.2	25.9	25.9	20.4	16.7
West:								
Mountain	71	25.4	28.2	18.3	25.4	18.3	14.1	14.1
Pacific	22	36.4	27.3	31.8	36.4	36.4	36.4	45.5
New England:								
Maine	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
East North Central:								
Ohio	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Illinois	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Michigan	1	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Wisconsin	2	50.0	100.0	50.0	50.0	50.0	50.0	50.0
West North Central:								
Minnesota	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Iowa	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
North Dakota	22	27.3	13.6	9.1	27.3	27.3	13.6	22.7
South Dakota	26	15.4	19.2	23.1	15.4	23.1	11.5	11.5
Nebraska	33	36.4	15.2	12.1	27.3	24.2	9.1	18.2
Kansas	30	56.7	6.7	3.3	40.0	30.0	3.3	16.7
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	4	25.0	25.0	25.0	50.0	(Z)	25.0	25.0
West Virginia	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
North Carolina	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Carolina	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Georgia	10	60.0	40.0	10.0	40.0	30.0	40.0	40.0
Florida	2	50.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
East South Central:								
Kentucky	2	50.0	(Z)	50.0	(Z)	50.0	(Z)	(Z)
Tennessee	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Alabama	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Mississippi	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West South Central:								
Arkansas	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Louisiana	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Oklahoma	4	75.0	50.0	25.0	50.0	50.0	25.0	25.0
Texas	50	38.0	38.0	22.0	24.0	24.0	20.0	16.0
Mountain:								
Montana	21	28.6	28.6	14.3	19.0	9.5	4.8	4.8
Idaho	10	10.0	20.0	20.0	10.0	20.0	30.0	20.0
Wyoming	2	50.0	(Z)	(Z)	50.0	50.0	(Z)	(Z)
Colorado	18	22.2	11.1	27.8	27.8	16.7	16.7	16.7
New Mexico	6	16.7	100.0	16.7	66.7	16.7	16.7	16.7
Arizona	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	8	25.0	(Z)	12.5	12.5	25.0	12.5	12.5
Nevada	6	50.0	66.7	16.7	33.3	33.3	16.7	33.3
Pacific:								
Washington	3	33.3	33.3	33.3	33.3	33.3	33.3	33.3
Oregon	3	66.7	(Z)	(Z)	33.3	33.3	(Z)	33.3
California	2	50.0	(Z)	(Z)	50.0	50.0	(Z)	50.0
Alaska	14	28.6	35.7	42.9	35.7	35.7	50.0	50.0
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 5. Percent of Counties With Absolute Error of 10 Percent or More, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part C. Counties With Populations of 5,000 to 9,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate: Component Method II	Single estimate: Ratio-Correlation method	Single estimate: Administrative Records method	Average of estimates: Component Method II and Ratio-Correlation method	Average of estimates: Component Method II and Administrative Records method	Average of estimates: Ratio-Correlation and Administrative Records method	Average of estimates: Component Method II, Ratio-Correlation, and Administrative Records method
United States	470	25.5	12.1	8.3	14.0	11.7	7.9	9.4
Region:								
Northeast	7	42.9	28.6	(Z)	14.3	14.3	14.3	(Z)
Midwest[1]	180	20.6	5.6	2.2	7.2	7.2	2.8	4.4
South	204	27.5	15.2	12.7	16.7	12.7	11.3	12.3
West	79	30.4	17.7	11.4	22.8	19.0	10.1	13.9
Northeast:								
New England	3	66.7	66.7	(Z)	33.3	(Z)	33.3	(Z)
Middle Atlantic	4	25.0	(Z)	(Z)	(Z)	25.0	(Z)	(Z)
Midwest:[1]								
East North Central	31	12.9	(Z)	6.5	3.2	6.5	3.2	3.2
West North Central	149	22.1	6.7	1.3	8.1	7.4	2.7	4.7
South:								
South Atlantic	89	30.3	9.0	18.0	19.1	16.9	7.9	14.6
East South Central	46	15.2	8.7	10.9	8.7	2.2	8.7	2.2
West South Central	69	31.9	27.5	7.2	18.8	14.5	17.4	15.9
West:								
Mountain	58	27.6	20.7	8.6	22.4	15.5	10.3	10.3
Pacific	21	38.1	9.5	19.0	23.8	28.6	9.5	23.8
New England:								
Maine	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	1	100.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	2	50.0	100.0	(Z)	50.0	(Z)	50.0	(Z)
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	3	33.3	(Z)	(Z)	(Z)	33.3	(Z)	(Z)
East North Central:								
Ohio	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	5	20.0	(Z)	20.0	(Z)	20.0	20.0	(Z)
Illinois	13	15.4	(Z)	(Z)	7.7	7.7	(Z)	7.7
Michigan	10	10.0	(Z)	10.0	(Z)	(Z)	(Z)	(Z)
Wisconsin	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West North Central:								
Minnesota	10	40.0	(Z)	(Z)	(Z)	10.0	(Z)	(Z)
Iowa	15	13.3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	23	17.4	8.7	(Z)	8.7	13.0	4.3	8.7
North Dakota	16	18.8	6.3	(Z)	12.5	(Z)	(Z)	(Z)
South Dakota	24	20.8	20.8	8.3	16.7	12.5	12.5	12.5
Nebraska	30	10.0	6.7	(Z)	(Z)	3.3	(Z)	(Z)
Kansas	31	38.7	(Z)	(Z)	12.9	9.7	(Z)	6.5
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	29	27.6	10.3	20.7	17.2	13.8	10.3	13.8
West Virginia	7	28.6	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
North Carolina	8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Carolina	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Georgia	38	42.1	10.5	23.7	28.9	26.3	7.9	21.1
Florida	6	16.7	16.7	16.7	16.7	16.7	16.7	16.7
East South Central:								
Kentucky	24	16.7	4.2	12.5	8.3	(Z)	8.3	(Z)
Tennessee	12	16.7	(Z)	16.7	(Z)	8.3	8.3	(Z)
Alabama	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Mississippi	10	10.0	30.0	(Z)	20.0	(Z)	10.0	10.0
West South Central:								
Arkansas	9	33.3	55.6	11.1	33.3	11.1	33.3	22.2
Louisiana	3	(Z)	33.3	(Z)	33.3	(Z)	33.3	33.3
Oklahoma	12	41.7	25.0	8.3	41.7	8.3	8.3	25.0
Texas	45	31.1	22.2	6.7	8.9	17.8	15.6	11.1
Mountain:								
Montana	15	20.0	(Z)	(Z)	20.0	6.7	(Z)	(Z)
Idaho	11	18.2	36.4	(Z)	9.1	9.1	9.1	(Z)
Wyoming	6	33.3	16.7	16.7	33.3	16.7	16.7	16.7
Colorado	15	40.0	33.3	20.0	40.0	33.3	20.0	33.3
New Mexico	3	33.3	33.3	(Z)	33.3	33.3	(Z)	(Z)
Arizona	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	4	25.0	25.0	(Z)	(Z)	(Z)	(Z)	(Z)
Nevada	4	25.0	(Z)	25.0	(Z)	(Z)	25.0	(Z)
Pacific:								
Washington	5	40.0	20.0	20.0	20.0	20.0	20.0	20.0
Oregon	5	40.0	(Z)	(Z)	20.0	40.0	(Z)	20.0
California	2	50.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Alaska	9	33.3	11.1	33.3	33.3	33.3	11.1	33.3
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1] Formerly North Central Region.

Table 5. Percent of Counties With Absolute Error of 10 Percent or More, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part D. Counties With Populations of 10,000 to 24,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	974	15.8	10.4	7.0	8.9	7.9	6.9	7.1
Region:								
Northeast	11	9.1	9.1	(Z)	9.1	9.1	9.1	9.1
Midwest[1]	344	9.9	4.4	3.2	4.1	4.1	2.3	2.9
South	511	20.0	14.1	9.4	11.9	10.2	10.0	9.6
West	108	15.7	12.0	8.3	10.2	9.3	6.5	8.3
Northeast:								
New England	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic	7	14.3	14.3	(Z)	14.3	14.3	14.3	14.3
Midwest:[1]								
East North Central	121	14.0	5.8	5.0	4.1	5.0	3.3	4.1
West North Central	223	7.6	3.6	2.2	4.0	3.6	1.8	2.2
South:								
South Atlantic	188	20.7	6.4	11.7	10.1	12.2	8.0	8.5
East South Central	157	15.3	10.8	7.0	8.9	7.6	7.6	6.4
West South Central	166	23.5	25.9	9.0	16.9	10.2	14.5	13.9
West:								
Mountain	79	17.7	13.9	7.6	11.4	10.1	6.3	8.9
Pacific	29	10.3	6.9	10.3	6.9	6.9	6.9	6.9
New England:								
Maine	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	5	20.0	20.0	(Z)	20.0	20.0	20.0	20.0
East North Central:								
Ohio	11	9.1	9.1	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	30	26.7	3.3	6.7	10.0	10.0	3.3	6.7
Illinois	37	5.4	(Z)	2.7	(Z)	2.7	2.7	2.7
Michigan	21	14.3	9.5	9.5	4.8	4.8	4.8	4.8
Wisconsin	22	13.6	13.6	4.5	4.5	4.5	4.5	4.5
West North Central:								
Minnesota	39	5.1	2.6	2.6	(Z)	5.1	(Z)	(Z)
Iowa	60	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	57	19.3	7.0	3.5	10.5	5.3	3.5	3.5
North Dakota	10	10.0	(Z)	(Z)	10.0	10.0	(Z)	10.0
South Dakota	14	7.1	14.3	14.3	7.1	7.1	14.3	7.1
Nebraska	19	10.5	5.3	(Z)	5.3	5.3	(Z)	5.3
Kansas	24	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	50	16.0	2.0	14.0	4.0	10.0	10.0	8.0
West Virginia	18	5.6	11.1	16.7	5.6	5.6	11.1	11.1
North Carolina	26	15.4	11.5	(Z)	3.8	(Z)	3.8	3.8
South Carolina	11	18.2	9.1	9.1	9.1	9.1	(Z)	(Z)
Georgia	61	27.9	(Z)	11.5	16.4	18.0	3.3	8.2
Florida	19	36.8	26.3	21.1	21.1	26.3	26.3	21.1
East South Central:								
Kentucky	56	12.5	8.9	7.1	8.9	5.4	8.9	5.4
Tennessee	34	17.6	11.8	(Z)	8.8	11.8	2.9	5.9
Alabama	26	30.8	(Z)	7.7	3.8	7.7	3.8	3.8
Mississippi	41	7.3	19.5	12.2	12.2	7.3	12.2	9.8
West South Central:								
Arkansas	38	42.1	18.4	5.3	18.4	15.8	13.2	13.2
Louisiana	23	13.0	8.7	4.3	8.7	8.7	(Z)	8.7
Oklahoma	26	15.4	7.7	7.7	11.5	11.5	7.7	7.7
Texas	79	20.3	40.5	12.7	20.3	7.6	21.5	17.7
Mountain:								
Montana	14	21.4	7.1	7.1	21.4	7.1	7.1	7.1
Idaho	14	(Z)	7.1	(Z)	(Z)	(Z)	(Z)	(Z)
Wyoming	9	33.3	11.1	(Z)	22.2	11.1	(Z)	11.1
Colorado	17	11.8	(Z)	5.9	(Z)	5.9	(Z)	(Z)
New Mexico	9	33.3	44.4	22.2	11.1	22.2	22.2	22.2
Arizona	3	(Z)	33.3	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	9	33.3	22.2	11.1	22.2	33.3	11.1	22.2
Nevada	4	(Z)	25.0	25.0	25.0	(Z)	25.0	25.0
Pacific:								
Washington	7	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Oregon	8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
California	10	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Alaska	4	75.0	50.0	75.0	50.0	50.0	50.0	50.0
Hawaii	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 5. Percent of Counties With Absolute Error of 10 Percent or More, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part E. Counties With Populations of 25,000 to 49,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	614	11.6	7.7	4.1	6.8	7.2	4.7	5.5
Region:								
Northeast	47	6.4	2.1	(Z)	2.1	(Z)	(Z)	2.1
Midwest[1]	206	6.3	1.5	1.9	2.4	2.9	1.0	1.9
South	316	15.8	12.0	6.6	10.4	11.1	8.2	8.5
West	45	11.1	11.1	(Z)	6.7	6.7	2.2	4.4
Northeast:								
New England	19	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic	28	10.7	3.6	(Z)	3.6	(Z)	(Z)	3.6
Midwest:[1]								
East North Central	127	5.5	0.8	1.6	1.6	3.1	1.6	1.6
West North Central	79	7.6	2.5	2.5	3.8	2.5	(Z)	2.5
South:								
South Atlantic	126	16.7	6.3	5.6	10.3	11.9	4.8	7.1
East South Central	92	15.2	7.6	3.3	6.5	8.7	3.3	4.3
West South Central	98	15.3	23.5	11.2	14.3	12.2	17.3	14.3
West								
Mountain	24	12.5	12.5	(Z)	8.3	8.3	4.2	8.3
Pacific	21	9.5	9.5	(Z)	4.8	4.8	(Z)	(Z)
New England:								
Maine	9	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	12	16.7	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	16	6.3	6.3	(Z)	6.3	(Z)	(Z)	6.3
East North Central:								
Ohio	31	3.2	3.2	6.5	3.2	6.5	6.5	6.5
Indiana	32	6.3	(Z)	(Z)	(Z)	3.1	(Z)	(Z)
Illinois	24	4.2	(Z)	(Z)	4.2	4.2	(Z)	(Z)
Michigan	19	15.8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Wisconsin	21	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West North Central:								
Minnesota	25	12.0	(Z)	4.0	4.0	4.0	(Z)	4.0
Iowa	14	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	18	5.6	5.6	5.6	5.6	5.6	(Z)	5.6
North Dakota	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Dakota	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nebraska	8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Kansas	12	16.7	8.3	(Z)	8.3	(Z)	(Z)	(Z)
South Atlantic:								
Delaware	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	6	16.7	(Z)	(Z)	16.7	16.7	(Z)	16.7
Virginia	28	28.6	14.3	17.9	14.3	28.6	21.4	14.3
West Virginia	18	11.1	5.6	5.6	5.6	(Z)	(Z)	(Z)
North Carolina	25	4.0	4.0	4.0	4.0	8.0	(Z)	4.0
South Carolina	14	7.1	7.1	(Z)	7.1	(Z)	(Z)	(Z)
Georgia	28	14.3	(Z)	(Z)	7.1	7.1	(Z)	3.6
Florida	7	57.1	14.3	(Z)	42.9	28.6	(Z)	28.6
East South Central:								
Kentucky	26	15.4	11.5	3.8	7.7	11.5	3.8	7.7
Tennessee	28	10.7	3.6	(Z)	(Z)	(Z)	(Z)	(Z)
Alabama	20	20.0	(Z)	5.0	10.0	15.0	(Z)	5.0
Mississippi	18	16.7	16.7	5.6	11.1	11.1	11.1	5.6
West South Central:								
Arkansas	18	5.6	11.1	11.1	5.6	5.6	5.6	5.6
Louisiana	17	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Oklahoma	25	20.0	12.0	20.0	16.0	20.0	24.0	20.0
Texas	38	21.1	44.7	7.9	21.1	13.2	23.7	18.4
Mountain:								
Montana	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Idaho	3	(Z)	33.3	(Z)	(Z)	(Z)	(Z)	(Z)
Wyoming	4	(Z)	25.0	(Z)	(Z)	(Z)	(Z)	(Z)
Colorado	3	33.3	(Z)	(Z)	33.3	33.3	(Z)	33.3
New Mexico	6	33.3	16.7	(Z)	16.7	16.7	16.7	16.7
Arizona	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nevada	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pacific:								
Washington	9	11.1	22.2	(Z)	(Z)	(Z)	(Z)	(Z)
Oregon	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
California	6	16.7	(Z)	(Z)	16.7	16.7	(Z)	(Z)
Alaska	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Hawaii	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 5. Percent of Counties With Absolute Error of 10 Percent or More, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part F. Counties With Populations of 50,000 to 99,999

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	380	8.4	7.1	3.4	4.7	3.7	4.2	3.2
Region:								
Northeast	51	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Midwest[1]	97	2.1	1.0	(Z)	(Z)	(Z)	(Z)	(Z)
South	180	13.3	11.7	6.1	8.3	6.7	7.8	6.1
West	52	7.7	7.7	1.9	3.8	1.9	1.9	(Z)
Northeast:								
New England	13	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic	38	5.3	2.6	2.6	2.6	2.6	2.6	2.6
Midwest:[1]								
East North Central	72	2.8	1.4	(Z)	(Z)	(Z)	(Z)	(Z)
West North Central	25	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South:								
South Atlantic	89	18.0	11.2	7.9	7.9	7.9	7.9	6.7
East South Central	45	4.4	8.9	4.4	4.4	2.2	4.4	2.2
West South Central	46	13.0	15.2	4.3	13.0	8.7	10.9	8.7
West:								
Mountain	27	11.1	14.8	3.7	7.4	3.7	3.7	(Z)
Pacific	25	4.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New England:								
Maine	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	22	9.1	(Z)	(Z)	(Z)	4.5	(Z)	(Z)
New Jersey	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	12	(Z)	8.3	8.3	8.3	(Z)	8.3	8.3
East North Central:								
Ohio	23	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	13	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Illinois	9	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Michigan	14	14.3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Wisconsin	13	(Z)	7.7	(Z)	(Z)	(Z)	(Z)	(Z)
West North Central:								
Minnesota	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Iowa	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	6	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
North Dakota	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Dakota	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nebraska	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Kansas	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Atlantic:								
Delaware	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	6	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	11	18.2	9.1	9.1	9.1	9.1	9.1	9.1
West Virginia	9	11.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
North Carolina	27	7.4	7.4	3.7	3.7	3.7	3.7	(Z)
South Carolina	10	30.0	20.0	30.0	20.0	20.0	20.0	20.0
Georgia	12	25.0	(Z)	8.3	(Z)	(Z)	(Z)	(Z)
Florida	12	41.7	41.7	8.3	25.0	25.0	25.0	25.0
East South Central:								
Kentucky	9	(Z)	(Z)	11.1	(Z)	(Z)	(Z)	(Z)
Tennessee	13	7.7	7.7	(Z)	7.7	(Z)	7.7	(Z)
Alabama	14	7.1	14.3	7.1	7.1	7.1	7.1	7.1
Mississippi	9	(Z)	11.1	(Z)	(Z)	(Z)	(Z)	(Z)
West South Central:								
Arkansas	9	11.1	22.2	(Z)	11.1	11.1	11.1	11.1
Louisiana	12	16.7	8.3	(Z)	16.7	8.3	(Z)	(Z)
Oklahoma	6	16.7	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Texas	19	10.5	21.1	10.5	15.8	10.5	21.1	15.8
Mountain:								
Montana	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Idaho	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Wyoming	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Colorado	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Mexico	7	28.6	28.6	(Z)	28.6	(Z)	(Z)	(Z)
Arizona	8	12.5	25.0	12.5	(Z)	12.5	12.5	(Z)
Utah	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nevada	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pacific:								
Washington	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Oregon	9	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
California	8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Alaska	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Hawaii	2	50.0	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table 5. Percent of Counties With Absolute Error of 10 Percent or More, by Method, for Regions, Divisions, and States: April 1, 1980—Continued

Part G. Counties With Populations of 100,000 or More

(For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	412	4.4	4.6	1.9	2.4	1.0	2.4	2.2
Region:								
Northeast	100	1.0	2.0	(Z)	(Z)	(Z)	(Z)	(Z)
Midwest[1]	109	4.6	2.8	0.9	1.8	(Z)	(Z)	(Z)
South	135	6.7	8.1	3.7	5.2	2.2	6.7	5.9
West	68	4.4	4.4	2.9	1.5	1.5	1.5	1.5
Northeast:								
New England	27	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic	73	1.4	2.7	(Z)	(Z)	(Z)	(Z)	(Z)
Midwest:[1]								
East North Central	82	3.7	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West North Central	27	7.4	11.1	3.7	7.4	(Z)	(Z)	(Z)
South:								
South Atlantic	80	8.8	2.5	2.5	2.5	2.5	2.5	2.5
East South Central	18	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West South Central	37	5.4	24.3	8.1	13.5	2.7	18.9	16.2
West:								
Mountain	20	10.0	15.0	10.0	5.0	5.0	5.0	5.0
Pacific	48	2.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New England:								
Maine	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	11	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Rhode Island	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	7	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	25	4.0	4.0	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	17	(Z)	5.9	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	31	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
East North Central:								
Ohio	23	4.3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Indiana	12	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Illinois	18	5.6	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Michigan	18	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Wisconsin	11	9.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West North Central:								
Minnesota	7	14.3	(Z)	14.3	(Z)	(Z)	(Z)	(Z)
Iowa	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	8	12.5	37.5	(Z)	25.0	(Z)	(Z)	(Z)
North Dakota	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Dakota	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Nebraska	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Kansas	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Atlantic:								
Delaware	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	9	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Virginia	14	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West Virginia	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
North Carolina	13	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
South Carolina	10	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Georgia	10	20.0	10.0	(Z)	10.0	(Z)	(Z)	(Z)
Florida	21	23.8	4.8	9.5	4.8	9.5	9.5	9.5
East South Central:								
Kentucky	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Tennessee	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Alabama	7	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Mississippi	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
West South Central:								
Arkansas	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Louisiana	9	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Oklahoma	4	(Z)	25.0	25.0	(Z)	(Z)	25.0	25.0
Texas	23	8.7	34.8	8.7	21.7	4.3	26.1	21.7
Mountain:								
Montana	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Idaho	1	(Z)	100.0	(Z)	(Z)	(Z)	(Z)	(Z)
Wyoming	-	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Colorado	9	11.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Mexico	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Arizona	2	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Utah	4	(Z)	25.0	25.0	(Z)	25.0	(Z)	(Z)
Nevada	2	50.0	50.0	50.0	50.0	(Z)	50.0	50.0
Pacific:								
Washington	10	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Oregon	6	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
California	30	3.3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Alaska	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Hawaii	1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Appendix A. Definitions

The technical terms used in this report are defined below. Statements and derivations of mathematical formulas can be found in appendix B.

Accuracy. The accuracy of a population estimate is measured in terms of its relative position with respect to the corresponding census count (i.e., the closer an estimate is to its corresponding census count, the more accurate the estimate is considered). Definitions of the measures of accuracy of population estimates used in this report are listed below. The measures of accuracy presented here are not exhaustive and other analysts might wish to use additional procedures to determine the accuracy of postcensal population estimates.

1. Average absolute percent error (deviation). The average absolute percent error measures the average percent error between the estimates and their corresponding census counts without regard to sign. It is calculated by summing the absolute values of the percent errors for all observations and dividing this sum by the number of observations in the universe. Because no consideration is given for the size of the individual observations, areas with small populations have the same impact on the overall average as areas with large populations. Throughout the text and tables in this report, the average absolute percent error may also be referred to as the "unweighted" average absolute error.

2. Extreme errors. An estimation error is considered extreme if its absolute value of the percent error exceeds some predetermined threshold chosen on the basis of its population and/or geographic level. Ten percent has been used as the threshold in this report.

3. Bias. There are many different measurement criteria for bias found in statistics. However, the one measure most often cited in the literature on estimates evaluations consists of comparing the number of areas which have positive deviations with those which have negative deviations. If the estimation errors are about evenly distributed between positive and negative errors, no real bias exists. Conversely, if the number of positive or negative errors significantly exceeds 50 percent of all the areas, then the estimates are considered biased and the direction of the bias is determined by the sign of the majority of the errors.

Administrative Records method. This is an estimation procedure in which each of the components of population change (births, deaths, net internal migration, immigration from abroad, and group quarters change) are estimated separately and then added to a previous estimate or to the latest census count to yield estimates of the total resident population on the estimate date. Data on resident births and deaths are used to measure natural increase; statistics reflecting inmates of institutions, college students and military barracks populations are used to estimate group quarters populations; data from the Immigration and Naturalization Service are used to estimate legal immigration from abroad; and changes in geographic location of exemptions on matched individual Federal income tax returns are used to estimate net internal migration to the household population. For States and counties, the net internal migration rates are made specific to the household population under 65 years old, with data on Medicare enrollees used to estimate the population 65 years old and over. Estimates of the net movement of the military barracks population to the household population are also made at the State and county levels.[1]

Average of methods. This term, as used during the 1970's and more appropriately called an average of estimates, is an arithmetic average of population estimates produced by two or more independent estimating methods.

Coefficient of Effectiveness. The coefficient of effectiveness is developed by ranking (scoring) the absolute percent errors of estimates based on single methods and averages for each observation. The highest score is assigned to that single method or average of estimates which has the smallest absolute percent error. (If there are *n* single methods and combinations of methods for each area in the universe, the highest score is *n-1* and the lowest score is zero.) For counties, the number of single methods and combinations of methods is seven. If two or more methods have identical absolute percent errors, they are assigned the average score of the positions they would have occupied. The scores for each individual method and average of estimates is summed for all areas in the universe and divided by the theoretic best score. (The theoretic best score is the number of observations multiplied by the highest score, *n-1*.) Hence, an individual method or average of estimates would be completely effective if its coefficient of effectiveness was 1 and completely ineffective if its coefficient of effectiveness was zero.

[1]For a more detailed description of the Administrative Records method see U.S. Bureau of the Census, *Current Population Reports,* Series P-25, No. 699, "Population and Per Capita Money Income Estimates for Local Areas: Detailed Methodology and Evaluation," June 1980.

Component Method II. Component Method II is an estimating technique similar to the Administrative Records method in that each of the components of population change is estimated separately. The various estimates of the components are added to the latest decennial census count to arrive at an estimate of the total population. Most of the components estimated in this method are identical to those in the Administrative Records method. However, there are three important differences between the Administrative Records method computations and those for Component Method II:

1. The net internal migration component for the household population under 65 years old in Component Method II is developed by estimating the net migration of the school-age population using elementary school enrollment. This school-age net migration rate, modified by past migration relationships of the school-age population to the household population under 65 years old, is then applied to the migration base of the household population under 65 years old.

2. Legal immigration from abroad is assumed to be incorporated in the school enrollment statistics and is not explicitly accounted for in Component Method II.

3. The base of the Component Method II estimates is the 1970 census counts, whereas the base of the Administrative Records method estimates is the previous set of estimates.

Controls. Controls are sets of figures or estimates to which subcategories are adjusted on a pro rata basis. The decision to adjust estimates for subcategories to independently generated estimates for the universe was made on the basis of previous tests of methods.

Evaluation. An evaluation of the estimates involves the determination of errors of the estimates as they were produced in the previous decade, their magnitude, direction, and geographic patterns and locations.

Federal-State Cooperative Program for Local Population Estimates (FSCPE). This program, established jointly by the Bureau of the Census and the individual States in 1967, fosters cooperation between the two levels of government in the preparation and publication of subnational population estimates.[2] The original objective of the FSCPE was the joint preparation and publication of annual county population estimates. However, events occurring during the 1970's in the use of population estimates for Federal and State funding purposes have caused the FSCPE to expand beyond its original objective. Currently, agencies in 50 States and the Commonwealth of Puerto Rico have been designated by the governors of their respective jurisdictions to work with the Bureau of the Census under the auspices of the FSCPE.[3]

Immigrants from abroad. This component of the population, obtained from the U.S. Immigration and Naturalization Service, is a tabulation of those persons who come into the United States on resident alien status with the intent of becoming citizens of the United States. It excludes citizens of other countries who come into the United States on student, business, or travel visas, as well as those who enter the United States illegally.

Institution and college populations. Members of this group consist of inmates of prisons and long-term health care facilities, persons training at Job Corps Centers, and college students residing in dormitories.[4] For the most part, the data on institutional and college populations are collected from the individual institutions and colleges by the State FSCPE participants.

At the State level it is assumed that, except for persons participating in Job Corps Center programs, all other institutional and college populations are from within the same States. Consequently, only changes in Job Corps Center participants are included as a component of change in the computation of State population estimates. At the county and State levels, residents of nursing homes are excluded on the assumption that such persons are also included in the Medicare enrollee statistics which are used to estimate the population 65 years old and over.

Military barracks population. This population subgroup includes military personnel residing in dormitory facilities such as barracks and bachelor officers' quarters and military personnel living on or temporarily ashore from ships berthed in the United States. It excludes military personnel living in on-base family quarters; those living off-base or on duty overseas, regardless of where they live; and those members of the Armed Forces on board ships which are deployed in foreign waters. These data are collected from base commanders of the individual military installations.

Household population. This population subgroup consists of all residents not living in group quarters (i.e., not residing in institutions, colleges, or military barracks). It does not include citizens of the United States residing temporarily or permanently overseas.

Ratio-Correlation method. This is an estimation technique in which a multiple regression equation is used to relate changes in two or more data series (independent variables or symptomatic indicators) to estimated changes in population

[2]For a more detailed description of the Federal-State Cooperative Program for Local Population Estimates, see U.S. Bureau of the Census, *Current Population Reports,* Series P-26, No. 21, "Federal-State Cooperative Program for Local Population Estimates Test Results—April 1, 1970," April 1973, appendix C., and U.S. Bureau of the Census, *Current Population Reports,* Series P-26, No. 118, "Federal-State Cooperative Program for Local Population Estimates—Status Report January 1975," July 1975.

[3]For a current list of the officially designated participating State FSCPE agencies and the key contact persons, see appendix E of this report.

[4]Although college dormitory populations are desirable for inclusion in this population subgroup, in fact, complete college dormitory resident counts are very difficult to collect. Consequently, change in college full-time enrollment is used as a surrogate for change in college dormitory population.

(dependent variable). In the Ratio-Correlation procedure, the variables (both dependent and independent) are expressed as the ratios of percentage shares of the subarea to the universe in the estimate year to the corresponding percentage shares for the base year (previous census year). A separate regression equation was prepared for each State using the best available symptomatic data for estimating the county populations within the State. The estimates were made specific to the total household population, with estimates of the group quarters populations under 65 years old developed to be consistent with the Administrative Records method and Component Method II estimates. Finally, with the exception of Hawaii, the provisional Ratio-Correlation method estimates are developed using the same equations as are used in the preparation of the revised estimates based on this procedure.[5] The data used in the development of these estimates are collected annually by the State FSCPE participants for counties in their respective States.

Resident population. In developing estimates of the population for all geographic levels, the resident population definition is used. This is the same definition used in the decennial and special censuses and is based on a "usual place of residence" concept. Persons residing in group quarters facilities such as prisons and long-term health care facilities and persons living away from home while attending college or in the Armed Forces are counted where they actually reside rather than at their "home." On the other hand, persons temporarily away from home (for less than 6 months) while in an institution with a usual short term of confinement, on temporary duty status at their job, in transit to a new location, or on vacation are counted at their usual residence.

[5]With the exception of the provisional county population estimates for July 1, 1979 and April 1, 1980, only a handful of States used the Ratio-Correlation method in the development of provisional county estimates. For those 2 years, provisional county population estimates were prepared for all counties in the country by the Ratio-Correlation method. In cases where actual symptomatic data were not available for the development of provisional Ratio-Correlation method estimates, the data were estimated using Gregory-Newton extrapolation or other data extension techniques.

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Appendix B. Statement and Derivation of Mathematical Formulas Used To Assess the Accuracy of Postcensal Population Estimates

The following statement and derivation of the mathematical formulas used to assess the accuracy of postcensal population estimates corresponds to the definitions of the accuracy measures found in appendix A. In deriving the various measures of accuracy, the following definitions will be universally applicable:

a. The letters *i, j,* and *k* represent place, county, and State, respectively.

b. Estimation error is defined as

$$\varepsilon_{ijk} = \hat{P}_{ijk} - P_{ijk} \qquad (1)$$

where

ε_{ijk} = the estimation error

$\hat{P}_{ijk}$ = the postcensal population estimate on April 1, 1980

P_{ijk} = the 1980 census count

c. The percent error ($p_{\varepsilon ijk}$) is defined by

$$P_{\varepsilon ijk} = \left[\frac{\varepsilon_{ijk}}{p_{ijk}} \right] 100 \qquad (2)$$

Given the above definitions, the measures of the accuracy of postcensal population estimates can be stated as follows:

Average Absolute Percent Error. The computational form of the average absolute percent error (or deviation) is given as

$$\left| \bar{P}_{\varepsilon ijk} \right| = \frac{\sum_{i=1}^{N} \left| P_{\varepsilon ijk} \right|}{N} \qquad (3)$$

where $\left| \bar{p}_{\varepsilon ijk} \right|$ denotes the average absolute percent error.

Extreme Errors. Let *t* denote a predetermined threshold for geographic level *L*, above which a percent error is considered "extreme." Then the total number of extreme errors (EE_L) for all areas of geographic level *L* are determined by

$$EE_L = \sum_{ijk \,\varepsilon\, L} \sigma_{ijk} \qquad (4)$$

where

$$\sigma_{ijk} = \begin{cases} 1 \text{ if } \left| p_{\varepsilon ijk} \right| \geqslant t \text{ for } ijk\, \varepsilon L \\ 0 \text{ otherwise} \end{cases}$$

Bias. The bias term (B_L) over the geographic areas *L, as used in this report, is developed as*

$$B_L = \left[\frac{\sum_{ijk\,\varepsilon\, L} \sigma_{ijk}}{\sum 1} \right] 100 \qquad (5)$$

where

$$\sigma_{ijk} = \begin{cases} 1 \text{ if } p_{\varepsilon ijk} \geqslant 0 \text{ for } ijk\varepsilon L \\ 0 \text{ otherwise} \end{cases}$$

Average Growth Rate. The average growth rate, G_{ijk}, *has the computational form*

$$G_{ijk} = \frac{\sum_{i=1}^{N} \left[\frac{p80_{ijk} - p70_{ijk}}{p70_{ijk}} \right] 100}{N}$$

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Appendix C. Regression Variables and Beta Coefficients for Regression Equations Used To Estimate County Populations for the 1970's

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
Alabama	Civilian	Y-Intercept	0.2033	0.82324	0.05665	97.80206
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.5060			
		State income tax returns	0.0594			
		Automobile registrations	0.2213			
Alaska	Civilian	Y-Intercept	0.2087	0.56498	0.15679	16.88385
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.5125			
		Births (3-year averages)	0.3309			
Arizona	Resident	Y-Intercept	-0.1995	0.99161	0.04523	393.85102
		Births (2-year averages)	0.2583			
		Deaths (2-year averages)	0.1333			
		Motor vehicle registrations	0.7995			
Arkansas	Civilian	Y-Intercept	0.0575	0.89841	0.04243	154.76510
		Births (3-year averages)	0.1893			
		Deaths (3-year averages)	0.1831			
		Total employment	0.3921			
		Passenger car registrations	0.1664			
California[1]	Civilian	Y-Intercept	0.0136	NA	NA	NA
		Births plus deaths (2-year averages)	0.2534			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.1158			
		Automobile registrations	0.4573			
		Voter registrations	0.1553			
Colorado	Resident	Y-Intercept	0.1047	0.95615	0.06240	316.19485
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.6702			
		Births (2-year averages)	0.0272			
		Sales tax	0.0667			
		Deaths (2-year averages)	0.1081			

See footnotes at end of table.

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
Connecticut[2] .	Resident	Y-Intercept	-0.2443	0.94374	0.02965	50.32245
		Births (3-year sums)	0.2983			
		Deaths (3-year sums)	0.2470			
		Motor vehicle registrations	0.4776			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2239			
Delaware[3] . . .	Civilian	Y-Intercept	0.1874	0.92687	0.03887	31.68527
		Births (2-year averages)	0.4365			
		Deaths (2-year averages)	-0.1181			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2977			
		Automobile registrations	0.2254			
Florida	Resident	Y-Intercept	0.0084	0.98547	0.02935	1424.56548
		Births (2-year sums)	0.0784			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.1319			
		Occupied housing units	0.7774			
Georgia[4]	Civilian	Y-Intercept	0.0596	0.93015	0.04709	509.31616
		Births (3-year averages)	0.1334			
		Deaths (3-year averages)	0.0454			
		Automobile registrations	0.3942			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3528			
Hawaii[5]	Civilian	Y-Intercept	0.0569	0.78213	0.10985	9.87247
		Births (2-year averages)	0.0713			
		Deaths (2-year averages)	0.0830			
		Elementary school membership, grades 1 through 6	0.3153			
		Telephone hookups	0.4218			
Idaho	Resident	Y-Intercept	0.0399	0.77596	0.06534	33.76939
		Births (3-year averages)	0.4045			
		Deaths (3-year averages)	0.1738			
		Covered employment	0.0868			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2837			

See footnotes at end of table.

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
Illinois	Civilian	Y-Intercept	0.0890	0.85925	0.04625	199.42838
		Births (2-year sums)	0.1297			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2507			
		Passenger car registrations	0.5461			
Indiana	Resident	Y-Intercept	0.1318	0.88328	0.03424	164.59883
		Births (3-year sums)	0.2040			
		Deaths (3-year sums)	0.0553			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3854			
		Automobile registrations	0.2305			
Iowa	Resident	Y-Intercept	0.1004	0.82300	0.02788	86.48000
		Total vehicle registrations	0.3513			
		Births (3-year sums)	0.0837			
		Deaths (3-year sums)	0.0681			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2815			
		Businesses paying retail sales tax(average annual)	0.1061			
Kansas	Resident	Y-Intercept	-0.0131	0.88694	0.04278	196.12416
		Births (3-year averages)	0.0788			
		Deaths (3-year averages)	0.0404			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2563			
		Automobile and truck registrations	0.6328			
Kentucky	Civilian	Y-Intercept	0.1123	0.82419	0.05447	134.77610
		Births (3-year sums)	0.2788			
		Deaths (3-year sums)	0.0636			
		Automobile registrations	0.2126			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3289			
Louisiana	Civilian	Y-Intercept	0.0188	0.92879	0.04345	260.84087
		Births (3-year sums)	0.2500			
		Deaths (3 year sums)	0.2357			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.4935			

See footnotes at end of table.

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
Maine[6]	Resident	Y-Intercept	0.2084	0.58165	0.07793	21.31872
		Births (2-year sums)	0.2011			
		Deaths (2-year sums)	0.2391			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3524			
Maryland	Resident	Y-Intercept	0.0202	0.98407	0.02770	222.39360
		Births (2-year averages)	0.2202			
		Deaths (2-year averages)	-0.0158			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.4915			
		Automobile registrations	0.2411			
		Individual State income tax returns	0.0416			
Massachusetts	Civilian	Y-Intercept	0.0954	0.97722	0.02086	96.51755
		Births (3-year sums)	0.0696			
		Deaths (3-year sums)	0.1279			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.1429			
		Automobile registrations	0.5772			
Michigan	Resident	Y-Intercept	0.0363	0.81694	0.05740	117.51737
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.1479			
		Vital events—births plus deaths (3-year averages)	0.4888			
		Automobile registrations	0.3578			
Minnesota	Civilian	Y-Intercept	0.1422	0.96642	0.03115	589.99236
		Births (3-year averages)	0.1296			
		Deaths (3-year averages)	-0.0736			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3343			
		Motor vehicle registrations	0.4646			
Mississippi	Civilian	Y-Intercept	0.0489	0.87184	0.05148	176.87700
		Covered employment	-0.0177			
		Births (2-year averages)	0.3461			
		Motor vehicle registrations	0.6098			

See footnotes at end of table.

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
Missouri[7] . . .	Civilian	Y-Intercept	0.1959	0.83655	0.06259	140.74644
		Births (2-year averages)	0.1012			
		Deaths (2-year averages)	0.1733			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.4189			
		Motor vehicle registrations	0.1165			
Montana	Civilian	Y-Intercept	0.1764	0.91459	0.04545	185.61858
		Births (3-year sums)	0.2217			
		Deaths (3-year sums)	0.0734			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.5131			
Nebraska . . .	Resident	Y-Intercept	0.0655	0.93577	0.03896	320.53324
		Drivers' licenses	0.6166			
		School census in grades kindergarten through 12	0.1208			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.1725			
		Social Security beneficiaries	0.0333			
Nevada	Resident	Y-Intercept	0.0094	0.97096	0.04301	100.31121
		Births (2-year sums)	-0.0284			
		Deaths (2-year sums)	-0.0301			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3458			
		Motor vehicle registrations	0.7118			
New Hampshire	Civilian	Y-Intercept	0.1590	0.97169	0.02250	68.64812
		Per capita tax on population 18 to 64 years old	0.4875			
		Births (3-year averages)	0.2008			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.1568			
New Jersey . .	Civilian	Y-Intercept	-0.2189	0.96488	0.03923	109.89528
		Passenger vehicle registrations . .	0.5688			
		Births (2-year sums)	0.2334			
		Covered employment	0.1694			
		Housing units	0.2388			

See footnotes at end of table.

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
New Mexico .	Civilian	Y-Intercept	0.3865	0.78396	0.07321	33.86943
		Births (2-year averages)	0.1896			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.4371			
		Covered employment	-0.0337			
New York . . .	Resident	Y-Intercept	0.0203	0.93743	0.03847	213.50607
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.1847			
		Births (2-year averages)	0.2283			
		Deaths (2-year averages)	0.1528			
		Passenger car registrations	0.4406			
North Carolina	Civilian	Y-Intercept	0.1986	0.89863	0.03504	283.66928
		Births (3-year sums)	0.2945			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3436			
		Automobile registrations	0.1613			
North Dakota .	Resident	Y-Intercept	0.2560	0.90696	0.03670	159.22188
		Automobile registrations	0.2456			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3296			
		Births (3-year sums)	0.1607			
Ohio	Resident	Y-Intercept	-0.0805	0.90486	0.02829	266.30604
		Births (2-year averages)	0.2723			
		Passenger car registrations	0.5276			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2831			
Oklahoma . . .	Civilian	Y-Intercept	0.1756	0.91423	0.04332	151.35089
		Automobile registrations	0.2008			
		State sales taxes	0.0337			
		Births (2-year averages)	0.2512			
		Deaths (2-year averages)	0.0970			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2391			

See footnotes at end of table.

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
Oregon	Resident	Y-Intercept	-0.0370	0.97781	0.02774	469.9995
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2264			
		Individual State income tax returns	0.4623			
		Voter registrations	0.3435			
Pennsylvania	Civilian	Y-Intercept	0.1629	0.63880	0.05863	37.13975
		Births (2-year averages)	0.3539			
		Deaths (2-year averages)	0.2664			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2294			
Puerto Rico[8]	Resident	Y-Intercept	-0.0206	0.96820	0.04719	730.62675
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.4996			
		Births (2-year averages)	0.4785			
		Motor vehicle registrations	0.0211			
Rhode Island[9]	Resident	Y-Intercept	0.2541	0.51122	0.19663	6.90311
		Births (2-year averages)	0.0861			
		Deaths (2-year averages)	-0.0956			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3830			
		Automobile registrations	0.4502			
		Covered employment	-0.0246			
South Carolina	Civilian	Y-Intercept	0.0542	0.93030	0.03465	136.81312
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.4565			
		Passenger car registrations	0.1969			
		Births (2-year averages)	0.1637			
		Deaths (2-year averages)	0.1250			
South Dakota	Resident	Y-Intercept	0.2101	0.86023	0.05942	75.08891
		Births (2-year averages)	0.2628			
		Deaths (2-year averages)	-0.0742			
		Automobile registrations	0.1378			
		School census in grades 1 through 12	0.3829			
		Gross retail sales	0.0806			

See footnotes at end of table.

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
Tennessee	Civilian	Y-Intercept	0.1194	0.86936	0.03868	201.84862
		Deaths (2-year averages)	0.0966			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.4916			
		Automobile registrations	0.3005			
Texas[10]	Civilian	Y-Intercept	0.6358	0.91763	0.04605	341.18637
		Births (3-year averages)	0.1689			
		Deaths (3-year averages)	0.0690			
		Metropolitan/nonmetropolitan status	0.0343			
		Percent change in county population, 1960-1970:				
		Percent change 1 -10.0%	-0.2464			
		-9.9% percent change 2 -0.1%	-0.1889			
		0.0% percent change 3 9.9%	-0.1465			
		10.0% percent change 4 19.9%	-0.0966			
		Total vehicle registrations	0.1869			
Utah	Resident	Y-Intercept	0.1422	0.90156	0.05633	76.31789
		Vital statistics—births plus deaths (3-year sums)	0.1938			
		Work force	0.1092			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.5449			
Vermont	Civilian	Y-Intercept	0.0930	0.98798	0.01376	131.50992
		Births (3-year sums)	0.0555			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3301			
		Marriages (2-year sums of brides and grooms)	0.5188			
Virginia[11]	Civilian	Y-Intercept	0.1342	0.94326	0.04643	609.57622
		Births (3-year sums)	0.2611			
		Total State income tax returns	0.1998			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.3876			

See footnotes at end of table.

State	Type of population estimate	Variable description	Beta coefficients (weights)	Proportion of variation explained by regression (R^2)	Standard error of the estimate (s_{yx})	F-calculated (due regression)
Washington . .	Resident	Y-Intercept	0.1550	0.82182	0.05775	53.80847
		Automobile registrations	0.3531			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.4410			
		Covered employment	0.0531			
West Virginia .	Resident	Y-Intercept	0.2722	0.79342	0.05081	48.00816
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.2527			
		Births (3-year averages)	0.2746			
		Deaths (3-year averages)	0.0832			
		Automobile and truck registrations	0.1178			
Wisconsin . . .	Resident	Y-Intercept	-0.1129	0.93671	0.02760	195.37338
		Births (2-year sums)	0.0841			
		Deaths (2-year sums)	0.0593			
		Bank deposits	0.0584			
		Truck registrations	0.0461			
		Passenger car registrations	0.8737			
Wyoming . . .	Civilian	Y-Intercept	0.1746	0.97561	0.05130	253.39870
		Sales tax	0.0561			
		Liquor sales tax	0.1371			
		Elementary school enrollment, grades 1 through 8, plus special and ungraded	0.6209			

[1]46 counties or groups of counties were used to develop the multiple regression equation. Estimates for all 58 counties, separately, are generated using this equation.

[2]17 counties and subgroups of counties (i.e., groups of cities and towns) were used to develop the multiple regression equation. Estimates are prepared for the 8 counties.

[3]In order to yield a significant regression equation, the 3 counties in Delaware were combined with 12 counties on Maryland's eastern shore to yield 15 observations. The Maryland counties included in the Delaware regression were Caivert, Caroline, Cecil, Charles, Dorchester, Kent, Queen Anne's, St. Mary's, Somerset, Talbot, Wicomico, and Worcester. Only the 3 counties in Delaware are estimated using this equation.

[4]The equation for Georgia was developed for 158 counties (Chattahoochee and Muscogee were combined). Estimates are prepared separately for all 159 counties.

[5]16 judicial districts or combinations of judicial districts were used to generate the multiple regression equation. The estimates are also developed for these 16 areas and are then summed to 4 county totals.

[6]50 cities, towns, and balances of counties were used to generate the multiple regression equation and develop estimates by this method. The estimates are then summed to 16 county totals.

[7]The multiple regression equation was developed for 112 counties and groups of counties (St. Louis County and St. Louis city combined; Clay, Jackson, and Platte counties combined). Estimates are prepared separately for all 115 counties.

[8]76 municipios were used to generate the multiple regression equation and develop the estimates.

[9]39 cities were used to generate the multiple regression equation and develop the estimates. The city estimates are subsequently summed to yield county estimates.

[10]Dummy variables for metropolitan/nonmetropolitan status in 1970 and rate of growth from 1960 to 1970 comprise a series of characteristics unique to each county which was designed to substantially improve the predictive quality of the regression equation and the resulting population estimates. Since the regression coefficients for the growth variables were derived from data for a 10-year period, they represented aggregate trends over the entire decade. To adjust for these decade trends during the 1970's, the corresponding coefficients for these variables were uniformly adjusted for the fractional portion of a decade covered between the last census and the estimate date. The coefficients shown here represent the entire 10-year period.

[11]The equation for Virginia was developed for 114 groupings of counties and independent cities because data were not available for all of the counties and independent cities. The groups used in the development of the multiple regression equation were Albemarle County and Charlottesville city; Alleghany County and Clifton Forge city; Bedford County and Bedford city; Carroll and Grayson Counties and Galax city; Chesterfield County and Richmond city; Fairfax County, Fairfax city, and Falls Church city; Greensville County and Emporia city; Halifax County and South Boston city; Henry County and Martinsville city; James City County, York County, and Williamsburg city; Prince George County and Hopewell city; Roanoke County, Roanoke city and Salem city; Rockingham County and Harrisonburg city; Southampton County and Franklin city; and Chesapeake city and Portsmouth city. Subsequent to 1970, Nansemond County consolidated with Suffolk city; Manasses town and Manasses Park town became independent cities and were separated from Prince William County; and Poquoson town became an independent city and was separated from York County. During the 1970's estimates were prepared separately for all counties and independent cities and were based on the most current geography, including annexations.

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Appendix D. Adjusted Test Results

Table D-1. Unweighted Average Absolute Percent Error of County Population Estimates Adjusted for the 1970 Undercount, by Method, for Regions, Divisions, and States: April 1, 1980

(Based on the 1970 census adjusted for illustrative estimates of undercount. For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	5.5	4.8	3.9	4.4	4.1	3.8	3.8
Region:								
Northeast	217	3.6	3.2	2.2	2.9	2.6	2.4	2.5
Midwest[1]	1,056	5.1	3.7	3.3	3.7	3.7	3.0	3.3
South	1,424	5.5	5.2	4.1	4.5	4.1	4.1	3.9
West	445	7.4	6.7	5.6	6.3	5.8	5.4	5.6
Northeast:								
New England	67	3.2	2.9	2.2	2.7	2.5	2.3	2.4
Middle Atlantic	150	3.7	3.3	2.3	3.1	2.7	2.5	2.6
Midwest:[1]								
East North Central	437	4.0	3.2	3.1	3.1	3.2	2.6	2.8
West North Central	619	5.8	4.0	3.5	4.2	4.0	3.2	3.6
South:								
South Atlantic	590	5.3	4.6	4.1	4.3	4.0	3.8	3.8
East South Central	364	4.1	4.5	3.6	3.6	3.3	3.6	3.3
West South Central	470	7.0	6.6	4.3	5.4	4.9	4.8	4.6
West:								
Mountain	279	7.7	7.3	5.3	6.7	5.6	5.3	5.6
Pacific	166	6.8	5.8	6.1	5.6	6.1	5.5	5.5
New England:								
Maine	16	3.5	2.7	2.1	2.7	2.6	1.8	2.3
New Hampshire	10	2.0	2.3	2.4	1.9	2.1	2.4	2.1
Vermont	14	5.0	2.4	2.4	3.1	3.1	2.2	2.5
Massachusetts	14	2.7	4.5	2.6	3.2	2.6	3.3	3.0
Rhode Island	5	2.9	2.7	1.4	2.8	2.0	2.0	2.3
Connecticut	8	2.3	2.6	1.6	1.7	1.5	1.9	1.5
Middle Atlantic:								
New York	62	3.5	2.4	2.0	2.4	2.4	1.8	2.1
New Jersey	21	2.4	3.8	1.8	2.3	1.5	2.5	1.8
Pennsylvania	67	4.3	3.9	2.6	3.9	3.4	3.1	3.3
East North Central:								
Ohio	88	3.4	2.6	3.0	2.3	2.9	2.1	2.2
Indiana	92	4.6	2.4	3.0	3.1	3.5	2.4	2.9
Illinois	102	4.0	3.4	2.9	3.4	3.1	2.9	3.0
Michigan	83	4.1	3.5	3.5	3.5	3.6	3.1	3.3
Wisconsin	72	3.8	4.3	3.0	3.1	2.8	2.6	2.4
West North Central:								
Minnesota	87	4.7	3.0	3.1	3.3	3.3	2.4	2.9
Iowa	99	3.6	2.7	2.3	2.4	2.4	2.0	2.0
Missouri	115	5.1	3.5	3.7	3.6	3.6	2.8	3.0
North Dakota	53	6.2	5.2	4.4	5.1	4.9	4.5	4.7
South Dakota	67	6.2	6.2	4.7	5.4	4.9	5.1	4.9
Nebraska	93	6.8	5.2	3.5	4.7	4.5	3.7	4.0
Kansas	105	8.2	3.8	3.6	5.5	5.1	3.4	4.5
South Atlantic:								
Delaware	3	4.4	2.7	2.2	2.4	3.0	2.5	2.1
Maryland	24	3.0	2.9	3.0	2.3	2.4	2.3	2.1
Virginia	136	6.1	5.0	5.9	4.7	5.0	4.8	4.4
West Virginia	55	4.2	4.0	3.8	3.6	3.6	3.7	3.5
North Carolina	100	3.7	4.5	3.0	3.6	3.1	3.5	3.2
South Carolina	46	4.0	3.6	3.0	3.6	3.2	3.1	3.2
Georgia	159	6.9	5.1	3.8	5.2	4.4	3.6	4.1
Florida	67	5.1	4.8	4.4	4.2	4.2	4.1	4.1
East South Central:								
Kentucky	120	3.9	3.6	3.5	3.1	2.9	3.2	2.8
Tennessee	95	3.8	4.4	2.8	3.3	2.9	3.1	2.9
Alabama	67	4.4	4.8	3.7	3.6	3.5	3.6	3.4
Mississippi	82	4.5	5.6	4.7	4.4	4.0	4.8	4.2
West South Central:								
Arkansas	75	5.7	6.5	4.0	5.3	4.3	4.8	4.5
Louisiana	64	4.4	4.4	3.9	4.2	3.9	3.9	3.9
Oklahoma	77	7.6	5.4	4.0	6.0	5.0	4.1	4.9
Texas	254	7.7	7.6	4.6	5.6	5.2	5.2	4.8
Mountain:								
Montana	57	8.5	7.5	5.7	7.5	6.0	5.4	6.0
Idaho	44	4.7	6.5	3.9	4.7	3.8	4.3	3.9
Wyoming	23	6.9	4.4	3.9	5.2	4.8	3.3	4.3
Colorado	63	8.9	6.3	5.9	7.0	6.5	5.1	5.7
New Mexico	32	10.6	12.4	6.5	10.9	7.6	8.9	9.1
Arizona	14	4.3	6.3	3.1	4.2	3.0	4.0	3.5
Utah	29	6.5	5.3	5.1	5.1	5.3	4.4	4.7
Nevada	17	8.7	10.2	6.2	7.6	6.1	7.9	6.7
Pacific:								
Washington	39	5.6	4.2	3.7	3.9	4.1	3.2	3.4
Oregon	36	6.1	3.0	3.0	3.6	4.2	2.2	3.1
California	58	4.7	4.3	4.4	4.1	4.2	4.1	4.0
Alaska	29	14.0	14.7	17.3	14.0	15.5	15.7	14.8
Hawaii	4	5.4	3.0	2.2	1.4	2.3	2.5	1.3

[1]Formerly North Central Region.

Table D-2. Weighted Average Absolute Percent Error of County Population Estimates Adjusted for the 1970 Undercount, by Method, for Regions, Divisions, and States: April 1, 1980

(Based on the 1970 census adjusted for illustrative estimates of undercount. For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	3.3	3.4	2.4	2.8	2.4	2.6	2.4
Region:								
Northeast	217	3.0	3.1	1.8	2.6	2.2	2.2	2.2
Midwest[1]	1,056	3.2	2.6	2.2	2.6	2.4	2.1	2.2
South	1,424	3.8	4.4	2.9	3.3	2.9	3.3	2.9
West	445	2.8	3.2	2.5	2.2	2.1	2.6	2.2
Northeast:								
New England	67	2.3	2.2	1.8	2.0	2.0	1.8	1.9
Middle Atlantic	150	3.3	3.4	1.9	2.7	2.3	2.3	2.3
Midwest:[1]								
East North Central	437	2.8	2.3	1.8	2.3	2.1	1.8	2.0
West North Central	619	4.1	3.4	2.9	3.1	3.0	2.8	2.8
South:								
South Atlantic	590	3.7	3.6	3.1	3.2	3.0	3.0	2.9
East South Central	364	3.4	3.3	2.7	2.7	2.6	2.6	2.5
West South Central	470	4.1	6.3	2.8	4.0	2.8	4.1	3.3
West:								
Mountain	279	4.5	4.7	3.1	3.9	3.3	3.5	3.4
Pacific	166	2.2	2.6	2.2	1.6	1.6	2.3	1.7
New England:								
Maine	16	4.4	2.7	2.3	3.3	3.3	2.2	2.9
New Hampshire	10	2.0	1.9	1.8	1.8	1.8	1.8	1.8
Vermont	14	4.1	2.3	2.2	2.8	2.9	2.0	2.4
Massachusetts	14	1.9	2.4	1.6	2.0	1.8	1.9	1.8
Rhode Island	5	2.1	2.1	2.1	2.1	2.1	2.0	2.1
Connecticut	8	2.2	1.8	1.6	1.7	1.7	1.6	1.6
Middle Atlantic:								
New York	62	3.5	3.2	2.1	2.7	2.5	2.4	2.5
New Jersey	21	2.5	3.5	1.5	1.8	1.2	2.1	1.2
Pennsylvania	67	3.5	3.5	1.7	3.3	2.6	2.5	2.7
East North Central:								
Ohio	88	2.7	1.7	1.9	1.9	2.1	1.5	1.7
Indiana	92	3.2	2.3	2.2	2.5	2.5	2.1	2.3
Illinois	102	2.9	2.1	1.3	2.4	2.0	1.5	1.9
Michigan	83	2.4	2.4	1.9	2.1	2.0	1.9	1.9
Wisconsin	72	3.4	4.1	2.3	3.4	2.5	2.8	2.8
West North Central:								
Minnesota	87	3.6	2.3	2.4	2.5	2.7	2.0	2.2
Iowa	99	3.0	2.2	2.2	1.9	2.1	1.6	1.7
Missouri	115	4.3	4.6	3.3	4.0	3.4	3.6	3.5
North Dakota	53	4.2	4.0	3.4	3.8	3.5	3.4	3.5
South Dakota	67	4.5	4.9	3.8	3.8	3.7	3.7	3.6
Nebraska	93	4.5	4.5	3.0	3.8	3.3	3.4	3.3
Kansas	105	5.1	2.9	3.4	3.1	3.1	2.9	2.9
South Atlantic:								
Delaware	3	3.5	1.6	1.6	2.0	2.4	1.6	1.8
Maryland	24	1.6	2.9	2.2	2.0	1.6	2.2	1.8
Virginia	136	4.5	4.4	3.9	3.6	3.5	3.6	3.3
West Virginia	55	3.5	3.6	3.1	3.1	3.0	3.1	3.0
North Carolina	100	3.0	3.7	2.6	2.6	2.5	2.8	2.4
South Carolina	46	3.8	3.1	2.8	3.1	2.8	2.8	2.8
Georgia	159	6.1	3.9	2.6	4.7	3.8	2.7	3.6
Florida	67	3.4	3.5	3.8	3.0	3.3	3.3	3.1
East South Central:								
Kentucky	120	2.9	2.9	2.3	2.4	2.0	2.2	2.1
Tennessee	95	3.3	3.2	2.1	2.6	2.4	2.4	2.2
Alabama	67	3.6	3.1	2.7	2.7	2.8	2.4	2.5
Mississippi	82	3.9	4.6	4.1	3.6	3.3	4.1	3.4
West South Central:								
Arkansas	75	4.8	5.7	3.9	4.5	3.8	4.5	4.1
Louisiana	64	4.0	3.8	2.6	3.7	3.0	2.8	3.1
Oklahoma	77	5.3	4.0	4.1	3.7	3.2	3.9	3.2
Texas	254	3.8	7.6	2.5	4.0	2.5	4.5	3.2
Mountain:								
Montana	57	5.0	4.1	3.2	4.1	3.4	3.2	3.4
Idaho	44	3.5	5.0	2.6	3.9	2.7	3.3	3.2
Wyoming	23	4.8	3.5	2.9	3.6	3.1	2.3	2.9
Colorado	63	4.7	3.5	2.1	2.6	2.5	2.2	2.0
New Mexico	32	7.3	7.7	4.4	6.8	5.4	5.8	5.9
Arizona	14	3.0	4.9	3.2	3.6	2.9	3.9	3.4
Utah	29	4.2	4.6	3.6	3.8	3.8	3.5	3.7
Nevada	17	5.0	5.1	4.3	4.7	4.4	4.7	4.5
Pacific:								
Washington	39	2.4	3.2	1.7	2.2	1.8	2.1	1.9
Oregon	36	3.5	3.1	2.0	2.8	2.5	2.0	2.2
California	58	1.8	2.4	2.3	1.3	1.3	2.3	1.6
Alaska	29	9.7	8.0	8.8	8.6	9.1	8.2	8.4
Hawaii	4	4.0	1.4	1.5	2.0	2.5	1.4	1.7

[1]Formerly North Central Region.

Table D-3. Percent of Counties With Positive Percent Errors of Estimates Adjusted for the 1970 Undercount, by Method, for Regions, Divisions, and States: April 1, 1980

(Based on the 1970 census adjusted for illustrative estimates of undercount. For meaning of symbols, see text)

Region, division, and State	Number of counties	Single method			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	50.7	52.4	47.6	53.2	50.1	51.0	52.2
Region:								
Northeast	217	32.3	37.8	36.9	33.6	34.1	38.2	35.9
Midwest[1]	1,056	50.6	49.3	46.9	50.9	49.6	48.1	49.8
South	1,424	48.7	52.5	44.2	52.6	47.5	48.7	50.4
West	445	66.5	66.7	65.4	69.7	67.2	71.7	71.9
Northeast:								
New England	67	41.8	37.3	43.3	41.8	43.3	41.8	41.8
Middle Atlantic	150	28.0	38.0	34.0	30.0	30.0	36.7	33.3
Midwest:[1]								
East North Central	437	35.5	31.6	37.3	33.9	33.6	32.7	32.7
West North Central	619	61.2	61.9	53.6	63.0	60.9	59.0	61.9
South:								
South Atlantic	590	41.7	53.7	40.3	46.9	41.2	48.0	46.8
East South Central	364	46.4	58.0	43.1	53.3	43.4	51.4	50.0
West South Central	470	59.1	46.6	49.8	59.1	58.5	47.4	55.1
West:								
Mountain	279	66.3	69.5	60.6	70.6	64.5	72.8	71.7
Pacific	166	66.9	62.0	73.5	68.1	71.7	69.9	72.3
New England:								
Maine	16	37.5	31.3	31.3	37.5	37.5	25.0	31.3
New Hampshire	10	20.0	20.0	20.0	20.0	30.0	20.0	20.0
Vermont	14	28.6	21.4	35.7	21.4	35.7	28.6	28.6
Massachusetts	14	71.4	57.1	57.1	71.4	64.3	64.3	71.4
Rhode Island	5	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Connecticut	8	62.5	75.0	100.0	75.0	62.5	100.0	75.0
Middle Atlantic:								
New York	62	32.3	58.1	50.0	43.5	38.7	56.5	46.8
New Jersey	21	47.6	52.4	38.1	47.6	38.1	57.1	52.4
Pennsylvania	67	17.9	14.9	17.9	11.9	19.4	11.9	14.9
East North Central:								
Ohio	88	28.4	40.9	33.0	35.2	27.3	35.2	33.0
Indiana	92	32.6	28.3	23.9	32.6	28.3	25.0	28.3
Illinois	102	26.5	16.7	18.6	17.6	18.6	14.7	15.7
Michigan	83	47.0	45.8	45.8	44.6	45.8	42.2	43.4
Wisconsin	72	47.2	29.2	76.4	44.4	55.6	54.2	50.0
West North Central:								
Minnesota	87	67.8	57.5	46.0	65.5	64.4	56.3	62.1
Iowa	99	52.5	60.6	38.4	61.6	46.5	47.5	51.5
Missouri	115	51.3	51.3	46.1	47.0	50.4	45.2	50.4
North Dakota	53	66.0	83.0	71.7	79.2	69.8	83.0	77.4
South Dakota	67	61.2	71.6	64.2	65.7	59.7	71.6	68.7
Nebraska	93	61.3	44.1	62.4	57.0	65.6	54.8	57.0
Kansas	105	72.4	77.1	59.0	75.2	75.2	70.5	76.2
South Atlantic:								
Delaware	3	33.3	(Z)	(Z)	33.3	33.3	(Z)	33.3
Maryland	24	37.5	70.8	37.5	37.5	33.3	50.0	41.7
Virginia	136	44.1	56.6	44.1	53.7	45.6	54.4	54.4
West Virginia	55	38.2	30.9	23.6	29.1	34.5	21.8	29.1
North Carolina	100	42.0	56.0	49.0	49.0	46.0	54.0	49.0
South Carolina	46	43.5	41.3	37.0	43.5	39.1	39.1	43.5
Georgia	159	44.7	63.5	39.6	55.3	43.4	57.2	52.2
Florida	67	32.8	44.8	40.3	31.3	29.9	32.8	34.3
East South Central:								
Kentucky	120	46.7	53.3	37.5	47.5	36.7	40.0	40.8
Tennessee	95	35.8	60.0	43.2	49.5	38.9	60.0	49.5
Alabama	67	43.3	67.2	46.3	56.7	44.8	56.7	50.7
Mississippi	82	61.0	54.9	48.8	63.4	57.3	53.7	63.4
West South Central:								
Arkansas	75	40.0	45.3	36.0	44.0	37.3	41.3	40.0
Louisiana	64	57.8	70.3	76.6	67.2	70.3	76.6	71.9
Oklahoma	77	59.7	66.2	44.2	67.5	59.7	59.7	62.3
Texas	254	65.0	35.0	48.8	59.1	61.4	38.2	53.1
Mountain:								
Montana	57	70.2	86.0	64.9	77.2	68.4	82.5	78.9
Idaho	44	56.8	56.8	50.0	65.9	50.0	61.4	68.2
Wyoming	23	69.6	78.3	73.9	78.3	73.9	78.3	73.9
Colorado	63	69.8	65.1	71.4	71.4	66.7	77.8	71.4
New Mexico	32	78.1	81.2	78.1	84.4	87.5	87.5	87.5
Arizona	14	57.1	57.1	28.6	50.0	50.0	50.0	57.1
Utah	29	55.2	55.2	37.9	55.2	51.7	55.2	58.6
Nevada	17	64.7	64.7	47.1	64.7	58.8	64.7	58.8
Pacific:								
Washington	39	61.5	38.5	56.4	51.3	56.4	46.2	51.3
Oregon	36	75.0	38.9	63.9	66.7	72.2	55.6	69.4
California	58	62.1	74.1	86.2	74.1	79.3	84.5	84.5
Alaska	29	79.3	93.1	82.8	86.2	79.3	86.2	82.8
Hawaii	4	25.0	100.0	75.0	25.0	50.0	100.0	50.0

[1]Formerly North Central Region.

Table D-4. Percent of Counties With Absolute Percent Errors of Estimates of 5 Percent or More Adjusted for the 1970 Undercount, by Method, for Regions, Divisions, and States: April 1, 1980

(Based on the 1970 census adjusted for illustrative estimates of undercount. For meaning of symbols, see text)

Region, division and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	40.1	34.2	25.4	30.0	27.0	24.5	25.1
Region:								
Northeast	217	24.4	18.0	7.8	13.4	11.5	7.4	8.8
Midwest[1]	1,056	37.8	24.1	21.4	24.6	23.7	17.4	19.9
South	1,424	41.9	40.2	27.7	32.7	29.5	29.1	28.3
West	445	47.9	47.0	36.0	42.2	34.4	35.3	35.3
Northeast:								
New England	67	20.9	17.9	10.4	13.4	10.4	6.0	9.0
Middle Atlantic	150	26.0	18.0	6.7	13.3	12.0	8.0	8.7
Midwest:[1]								
East North Central	437	30.7	19.0	19.2	18.5	19.0	12.8	13.3
West North Central	619	42.8	27.8	22.9	28.9	27.0	20.7	24.6
South:								
South Atlantic	590	41.2	33.4	25.9	30.5	29.7	26.6	25.4
East South Central	364	31.0	36.0	25.0	25.3	20.9	24.5	24.7
West South Central	470	51.1	52.1	31.9	41.3	36.0	35.7	34.7
West:								
Mountain	279	51.3	53.4	36.2	47.3	33.0	39.1	37.3
Pacific	166	42.2	36.1	35.5	33.7	36.7	28.9	31.9
New England:								
Maine	16	18.8	12.5	12.5	12.5	6.3	6.3	12.5
New Hampshire	10	10.0	10.0	10.0	(Z)	(Z)	(Z)	(Z)
Vermont	14	42.9	14.3	7.1	21.4	14.3	(Z)	7.1
Massachusetts	14	21.4	28.6	21.4	21.4	28.6	21.4	21.4
Rhode Island	5	20.0	40.0	(Z)	20.0	(Z)	(Z)	(Z)
Connecticut	8	(Z)	12.5	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	62	22.6	6.5	3.2	11.3	16.1	3.2	4.8
New Jersey	21	9.5	28.6	4.8	4.8	(Z)	9.5	(Z)
Pennsylvania	67	34.3	25.4	10.4	17.9	11.9	11.9	14.9
East North Central:								
Ohio	88	23.9	10.2	14.8	8.0	14.8	4.5	4.5
Indiana	92	40.2	10.9	16.3	17.4	22.8	10.9	17.4
Illinois	102	32.4	24.5	18.6	25.5	18.6	19.6	14.7
Michigan	83	28.9	20.5	25.3	24.1	24.1	18.1	20.5
Wisconsin	72	26.4	30.6	22.2	16.7	13.9	9.7	8.3
West North Central:								
Minnesota	87	35.6	13.8	18.4	23.0	19.5	10.3	20.7
Iowa	99	26.3	12.1	5.1	10.1	10.1	6.1	8.1
Missouri	115	36.5	21.7	28.7	24.3	25.2	13.9	20.0
North Dakota	53	50.9	43.4	30.2	41.5	37.7	41.5	39.6
South Dakota	67	46.3	44.8	32.8	37.3	31.3	35.8	35.8
Nebraska	93	46.2	44.1	23.7	26.9	29.0	24.7	20.4
Kansas	105	61.9	27.6	26.7	46.7	40.9	26.7	37.1
South Atlantic:								
Delaware	3	33.3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	24	16.7	20.8	12.5	4.2	4.2	8.3	4.2
Virginia	136	42.6	33.1	35.3	33.8	36.0	33.1	29.4
West Virginia	55	38.2	30.9	32.7	27.3	25.5	27.3	21.8
North Carolina	100	28.0	37.0	14.0	29.0	20.0	30.0	28.0
South Carolina	46	30.4	19.6	15.2	19.6	17.4	15.2	15.2
Georgia	159	54.7	34.6	26.4	36.5	37.1	23.3	26.4
Florida	67	44.8	43.3	31.3	32.8	35.8	31.3	29.9
East South Central:								
Kentucky	120	28.3	25.8	27.5	19.2	15.0	21.7	17.5
Tennessee	95	25.3	34.7	17.9	23.2	13.7	18.9	16.8
Alabama	67	37.3	35.8	22.4	26.9	25.4	20.9	26.9
Mississippi	82	36.6	52.4	31.7	35.4	34.1	37.8	42.7
West South Central:								
Arkansas	75	53.3	57.3	29.3	48.0	37.3	37.3	37.3
Louisiana	64	34.4	31.3	28.1	28.1	25.0	26.6	26.6
Oklahoma	77	51.9	44.2	31.2	44.2	35.1	29.9	32.5
Texas	254	54.3	58.3	33.9	41.7	38.6	39.4	36.6
Mountain:								
Montana	57	61.4	59.6	36.8	56.1	35.1	33.3	36.8
Idaho	44	43.2	50.0	22.7	40.9	15.9	25.0	27.3
Wyoming	23	43.5	30.4	39.1	34.8	26.1	30.4	26.1
Colorado	63	54.0	47.6	34.9	44.4	36.5	41.3	34.9
New Mexico	32	71.9	81.3	53.1	78.1	56.3	81.3	78.1
Arizona	14	21.4	42.9	21.4	28.6	14.3	28.6	28.6
Utah	29	31.0	44.8	37.9	31.0	27.6	24.1	20.7
Nevada	17	58.8	64.7	47.1	47.1	47.1	52.9	47.1
Pacific:								
Washington	39	41.0	35.9	25.6	25.6	30.8	12.8	20.5
Oregon	36	38.9	11.1	13.9	22.2	25.0	5.6	13.9
California	58	25.9	32.8	31.0	24.1	27.6	31.0	25.9
Alaska	29	79.3	75.9	86.2	82.8	82.8	79.3	86.2
Hawaii	4	50.0	25.0	25.0	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Table D-5. Percent of Counties With Absolute Percent Errors of Estimates of 10 Percent or More Adjusted for the 1970 Undercount, by Method, for Regions, Divisions, and States: April 1, 1980

(Based on the 1970 census adjusted for illustrative estimates of undercount. For meaning of symbols, see text)

Region, division, and State	Number of counties	Single estimate			Average of estimates			
		Component Method II	Ratio-Correlation method	Administrative Records method	Component Method II and Ratio-Correlation method	Component Method II and Administrative Records method	Ratio-Correlation and Administrative Records method	Component Method II, Ratio-Correlation, and Administrative Records method
United States	3,142	14.9	10.7	6.4	9.3	7.7	6.2	6.6
Region:								
Northeast	217	3.7	2.3	0.5	1.4	0.9	1.4	0.9
Midwest[1]	1,056	12.8	4.5	3.9	6.4	6.3	2.5	4.4
South	1,424	15.2	13.3	7.4	8.9	7.0	7.3	6.1
West	445	24.3	21.1	12.4	21.1	16.9	13.9	16.0
Northeast:								
New England	67	3.0	3.0	1.5	1.5	(Z)	1.5	(Z)
Middle Atlantic	150	4.0	2.0	(Z)	1.3	1.3	1.3	1.3
Midwest:[1]								
East North Central	437	6.9	1.8	2.3	1.8	2.3	1.1	1.4
West North Central	619	17.0	6.5	5.0	9.7	9.0	3.4	6.5
South:								
South Atlantic	590	13.7	9.5	6.3	7.1	5.9	5.9	6.1
East South Central	364	5.8	9.6	6.3	3.6	3.3	4.7	2.2
West South Central	470	24.5	20.9	9.6	15.3	11.1	11.1	9.1
West:								
Mountain	279	26.2	24.4	11.5	23.3	16.5	14.0	15.8
Pacific	166	21.1	15.7	13.9	17.5	17.5	13.9	16.3
New England:								
Maine	16	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Hampshire	10	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Vermont	14	7.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Massachusetts	14	7.1	14.3	7.1	7.1	(Z)	7.1	(Z)
Rhode Island	5	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Connecticut	8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Middle Atlantic:								
New York	62	4.8	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
New Jersey	21	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Pennsylvania	67	4.5	4.5	(Z)	3.0	3.0	3.0	3.0
East North Central:								
Ohio	88	3.4	1.1	2.3	1.1	2.3	2.3	1.1
Indiana	92	9.8	(Z)	2.2	1.1	3.3	(Z)	1.1
Illinois	102	6.9	(Z)	1.0	1.0	(Z)	(Z)	(Z)
Michigan	83	8.4	4.8	3.6	3.6	3.6	2.4	2.4
Wisconsin	72	5.6	4.2	2.8	2.8	2.8	1.4	2.8
West North Central:								
Minnesota	87	10.3	1.1	4.6	1.1	6.9	1.1	1.1
Iowa	99	5.1	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Missouri	115	13.9	6.1	3.5	4.3	6.1	2.6	3.5
North Dakota	53	18.9	13.2	9.4	20.8	17.0	3.8	18.9
South Dakota	67	17.9	17.9	16.4	16.4	14.9	14.9	13.4
Nebraska	93	18.3	8.6	5.4	11.8	10.8	3.2	7.5
Kansas	105	34.3	4.8	1.9	20.0	13.3	1.9	8.6
South Atlantic:								
Delaware	3	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Maryland	24	4.2	(Z)	(Z)	4.2	4.2	(Z)	4.2
Virginia	136	17.6	11.8	14.7	10.3	10.3	12.5	11.8
West Virginia	55	5.5	5.5	3.6	1.8	1.8	3.6	1.8
North Carolina	100	3.0	9.0	(Z)	3.0	(Z)	2.0	1.0
South Carolina	46	8.7	8.7	2.2	8.7	2.2	(Z)	2.2
Georgia	159	23.3	11.3	5.7	10.1	9.4	6.9	8.2
Florida	67	13.4	9.0	7.5	4.5	4.5	4.5	4.5
East South Central:								
Kentucky	120	5.0	5.0	5.0	0.8	3.3	1.7	(Z)
Tennessee	95	6.3	7.4	1.1	4.2	3.2	2.1	3.2
Alabama	67	3.0	14.9	6.0	7.5	1.5	4.5	3.0
Mississippi	82	8.5	14.6	14.6	3.7	4.9	12.2	3.7
West South Central:								
Arkansas	75	16.0	22.7	8.0	13.3	2.7	10.7	8.0
Louisiana	64	12.5	9.4	3.1	9.4	6.3	3.1	4.7
Oklahoma	77	28.6	14.3	7.8	18.2	10.4	6.5	10.4
Texas	254	28.7	25.2	12.2	16.5	15.0	14.6	10.2
Mountain:								
Montana	57	33.3	24.6	10.5	26.3	14.0	7.0	10.5
Idaho	44	11.4	20.5	6.8	9.1	6.8	6.8	4.5
Wyoming	23	21.7	8.7	(Z)	26.1	17.4	4.3	13.0
Colorado	63	27.0	17.5	14.3	22.2	19.0	12.7	19.0
New Mexico	32	50.0	62.5	25.0	50.0	31.3	40.6	40.6
Arizona	14	7.1	21.4	(Z)	14.3	(Z)	7.1	(Z)
Utah	29	24.1	6.9	10.3	17.2	20.7	10.3	17.2
Nevada	17	17.6	41.2	17.6	17.6	17.6	35.3	17.6
Pacific:								
Washington	39	20.5	5.1	2.6	10.3	7.7	5.1	7.7
Oregon	36	16.7	2.8	(Z)	8.3	11.1	(Z)	5.6
California	58	12.1	6.9	6.9	8.6	10.3	3.4	6.9
Alaska	29	48.3	65.5	62.1	58.6	55.2	65.5	62.1
Hawaii	4	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

[1]Formerly North Central Region.

Appendix E. Current FSCPE Participants and Methods Used in the 1980's

C = Component Method II; R = Ratio-Correlation method; A = Administrative Records method. State-produced methods: DLAC = Drivers' License Address Change Composite Migration Estimating Method; HSG = Housing Unit Method; Inc. Tax. An asterisk (*) denotes key contact person.

State	Agency and contact	Methods in use in the 1980's
Alabama	Office of State Planning and Federal Programs State Capitol Building Montgomery, AL 36130 Mr. Gilford C. Gilder Alabama State Data Center Center for Business and Economic Research The University of Alabama P.O. Box AK University, AL 35486 *Dr. James C. Raymondo	R-A
Alaska	Research and Analysis Section Department of Labor P.O. 1149 Juneau, AK 99802 Dr. Gregory Williams, State Demographer *Ms. Jo Van Patten, FSCPE Coordinator	C-R
Arizona	Arizona Department of Economic Security Population Statistics Unit P.O. Box 6123-045Z Phoenix, AZ 85005 *Ms. Linda Strock *Mr. David H. Lillie	C-R-A
Arkansas	Research and Public Services University of Arkansas at Little Rock Room 508 B, Library Building 33rd and University Streets Little Rock, AR 72204 *Dr. Forrest H. Pollard Ms. Mary McGehee	A
California	Population Research Unit State Department of Finance 1025 P Street Sacramento, CA 95814 Ms. Linda Gage, Chief *Ms. Elizabeth Hoag	R-A-DLAC
Colorado	Department of Local Affairs Colorado Division of Local Government Room 520, 1313 Sherman Street Denver, CO 80203 Dr. Reid T. Reynolds, State Demographer *Dr. Y. Richard Lin, Estimates Demographer (FSCPE Estimates) Dr. Earl Hughes, Systems Analyst *Dr. Irene Kalenova, Researcher (Demographic Information)	R-A
Connecticut	Division of Health Statistics State Department of Health Services 150 Washington Street Hartford, CT 06106 Dr. Merton S. Honeyman *Dr. Christine Pattee	C-R-A
Delaware	Delaware Development Office 3rd Floor, Townsend Building P.O. Box 1401 Dover, DE 19901 *Mr. Douglas Clendaniel	C-R-A
District of Columbia	Data User Services Division Room 452, 420 Seventh St. NW. Washington, DC 20004 *Mr. Gangu Ahuja	

C = Component Method II; R = Ratio-Correlation method; A = Administrative Records method. State-produced methods: DLAC = Drivers' License Address Change Composite Migration Estimating Method; HSG = Housing Unit Method; Inc. Tax. An asterisk (*) denotes key contact person.

State	Agency and contact	Methods in use in the 1980's
Florida	Bureau of Economic and Business Research 221 Matherly Hall University of Florida Gainesville, FL 32611 Dr. Stanley K. Smith *Ms. Faith Sincich	R-A-HSG
Georgia	Governor's Office of Planning and Budget 270 Washington Street, SW. Atlanta, GA 30334 Mr. Thomas M. Wagner *Mr. Jeff Browning	R-A
Hawaii	Department of Planning and Economic Development P.O. Box 2359 Honolulu, HI 96804 *Mr. Robert C. Schmitt, State Statistician State Department of Health P.O. Box 3378 Honolulu, HI 96801 *Mr. Shigeo Tengan	R-A
Idaho	Division of Financial Management Executive Office of the Governor Room 122, Statehouse Boise, ID 83720 *Mr. Mike Ferguson, Chief Economist Mr. Tom Fullerton, Economist	C-A
Illinois	Division of Health Information and Evaluation Illinois Department of Public Health 525 West Jefferson Street Springfield, IL 62761 Dr. Merwyn Nelson *Mr. Mark Flotow, State Demographer	R-A
Indiana	Division of Public Health Statistics Indiana State Board of Health 1330 West Michigan Street Indianapolis, IN 46206 *Dr. Robert A. Calhoun, Director Ms. Susie Dorrell, Statistician	R-A[1]
Iowa	Office of the State Demographer Iowa Office for Planning and Programming 523 E. 12th Street Des Moines, IA 50319 *Mr. James R. Taylor, State Demographer	R-A
Kansas	Division of the Budget Room 152 E, Statehouse Topeka, KS 66602 *Mr. Dana Ferrell	R-A
Kentucky	Population Research Unit Urban Studies Center University of Louisville Gardencourt Campus Louisville, KY 40292 *Dr. Michael Price	C-R-A
Louisiana	Research Division College of Administration and Business Louisiana Tech University Box 10318, Tech Station Ruston, LA 71272 Dr. James Robert Michael *Ms. Barbara H. Denton	R-A
Maine	Division of Data and Research Department of Human Services Statehouse Augusta, ME 04333 *Mr. Dale E. Welch	R-A

[1]R for <50K; R-A for >50K.

C = Component Method II; R = Ratio-Correlation method; A = Administrative Records method. State-produced methods: DLAC = Drivers' License Address Change Composite Migration Estimating Method; HSG = Housing Unit Method; Inc. Tax. An asterisk (*) denotes key contact person.

State	Agency and contact	Methods in use in the 1980's
Maryland	Maryland Center for Health Statistics Department of Health and Mental Hygiene 201 West Preston Street Baltimore, MD 21201 Dr. Frances Jean Warthen *Ms. Rose Marie Martin	R-A-Inc. Tax
Massachusetts	Center for Massachusetts Data Division of Community Services Executive Office of Communities and Development Room 904, 100 Cambridge Street Boston, MA 02202 Mr. Charles J. McSweeney, Coordinator	C-R-A
	Massachusetts Institute for Social and Economic Research (MISER) University of Massachusetts 117 Draper Hall Amherst, MA 01003 *Ms. Patricia Madson	
Michigan	Office of Revenue and Tax Analysis Michigan Department of Management and Budget Lewis Cass Building P.O. Box 30026 Lansing, MI 48909 Dr. Robert J. Cline, Director *Dr. Ching-li Wang	R-A
Minnesota	Department of Energy, Planning and Development 101 Capitol Square Building 550 Cedar Street St. Paul, MN 55101 *Dr. R. Thomas Gillaspy, State Demographer Mr. Don Feeney, Local Estimates Mr. James Hibbs	R-A
Mississippi	Mississippi Research and Development Center 3825 Ridgewood Road Jackson, MS 39211 Dr. Jim W. Merideth, Director *Dr. Edward L. Ranck, Assistant Director and State Economist *Dr. Philip W. Pepper	C-R
Missouri	Office of Administration Divison of Budget and Planning Box 809 Jefferson City, MO 65102 *Mr. Ryan Burson Mr. Tony Moulton	R-A[2]
Montana	Bureau of Business and Economic Research University of Montana Missoula, MT 59812 Ms. Maxine C. Johnson, Director *Ms. Susan Selig Wallwork, Research Associate	R-A
Nebraska	Nebraska Natural Resources Commission P.O. Box 94876 Lincoln, NE 68509 Mr. Dayle Williamson, Executive Secretary *Mr. Mahendra K. Bansal	R-A
Nevada	Bureau of Business and Economic Research College of Business Administration University of Nevada-Reno Reno, NV 89557 Dr. James L. Walker, Director *Dr. John L. Dobra	C-A[3]

[2]R-A for counties <100K; A only for >100K until 1982. Beginning 1983, R-A for all counties.
[3]A only for counties < 5K; C-A for counties > 5K.

C = Component Method II; R = Ratio-Correlation method; A = Administrative Records method. State-produced methods: DLAC = Drivers' License Address Change Composite Migration Estimating Method; HSG = Housing Unit Method; Inc. Tax. An asterisk (*) denotes key contact person.

State	Agency and contact	Methods in use in the 1980's
New Hampshire	New Hampshire Office of State Planning 2½ Beacon Street Concord, NH 03301 *Mr. Thomas J. Duffy Mr. James F. McLaughlin	C-R-A
New Jersey	Office of Demographic and Economic Analysis Department of Labor CN 388 Trenton, NJ 08625-0056 Ms. Shirley A. Goetz, Assistant Director *Mr. Alfred Toizer	C-R-A[4]
New Mexico	Bureau of Business and Economic Research University of New Mexico Albuquerque, NM 87131 Dr. M. Brian McDonald *Ms. Lynn Wombold	C-R-A[4]
New York	New York State Department of Commerce 99 Washington Avenue Albany, NY 12245 Mr. Michael J. Batutis, Jr. *Mr. Robert Scardamalia	R-A
North Carolina	Office of State Budget and Management 116 West Jones Street Raleigh, NC 27611 *Mr. William Tillman, Acting State Demographer Ms. Sharon Rains	R-A
North Dakota	North Dakota State Census Data Center North Dakota State University of Agriculture and Applied Science Fargo, ND 58105 *Mr. Richard W. Rathge	R-A
Ohio	Office of Research—Ohio Data Users Center Department of Development P.O. Box 1001 Columbus, OH 43216 *Mr. Jack E. Brown, Jr.	R-A
Oklahoma	Research and Planning Oklahoma Employment Security Commission 310 Will Rogers Building Oklahoma City, OK 73105 Mr. W. J. Bowman *Mr. Roger A. Jacks	R-A
Oregon	Center for Population Research and Census Portland State University P.O. Box 751 Portland, OR 97207 Dr. Edward A. Schafer *Mr. Michael Knight	R-A
Pennsylvania	State Data Center Institute of State and Regional Affairs Penn State University Capitol Campus Middletown, PA 17057 *Mr. Robert W. Surridge, Director	R-A
Puerto Rico	Puerto Rico Planning Board Minillas Government Center P.O. Box 41119 San Juan, PR 00940-9985 Ms. Edme R. Doble *Mrs. Carmine Laquerre	C-R
Rhode Island	Rhode Island Statewide Planning Program Room 203, 265 Melrose Street Providence, RI 02907 Mr. Daniel Varin, Chief *Mr. Chester Symanski	R-A
South Carolina	Office of Demographic Statistics Division of Research and Statistical Services Room 337, Rembert C. Dennis Building 1000 Assembly Street Columbia, SC 29201 Mr. Bobby M. Bowers, Chief, Demographic Statistics *Mr. Michael V. Macfarlane State Demographer	R-A

[4]C-A for counties <5K; R-A for counties 5K-10K; A only for counties >10K.

C = Component Method II; R = Ratio-Correlation method; A = Administrative Records method. State-produced methods: DLAC = Drivers' License Address Change Composite Migration Estimating Method; HSG = Housing Unit Method; Inc. Tax. An asterisk (*) denotes key contact person.

State	Agency and contact	Methods in use in the 1980's
South Dakota	Center for Health Statistics State Department of Health Foss Office Building Pierre, SD 57501 *Mr. William D. Johnson	R-A
Tennessee	Tennessee State Planning Office Suite 1800, James K. Polk Building 505 Deaderick Street Nashville, TN 37219 *Mr. Charles Brown	C-A
Texas	Texas Data Management Program Texas ACIR P.O. Box 13206, Capitol Station Austin, TX 78711 *Ms. Susan Szaniszlo	C-A
Utah	State Planning Coordinator's Office Room 124, State Capitol Building Salt Lake City, UT 84114 *Mr. Brad Barber	R-A
Vermont	Division of Public Health Statistics Vermont Department of Health P.O. Box 70 Burlington, VT 05402 *Mr. Walter Cooley, Population Statistician	R-A
Virginia	Tayloe Murphy Institute 4th Floor, Dynamics Building 2015 Ivy Road Charlottesville, VA 22903 *Dr. Julie Martin Dr. Michael Spar	C-R-A[5]
Washington	Policy Analysis and Forecasting Office of Financial Management Insurance Building, AQ44 Olympia, WA 98504 *Ms. Theresa J. Lowe	R-A
West Virginia	Governor's Office of Economic and Community Development Community Development Division State Capitol Complex Charleston, WV 25305 Mr. Thomas Holder Mr. Thomas H. Pendelton Office of Research and Development West Virginia University 404 Knapp Hall Morgantown, WV 26505 *Dr. Will Smith	C-R-A
Wisconsin	Section of Demographic and Special Analysis Bureau of Health Statistics Division of Health Wisconsin Department of Health and Social Service P.O. Box 309 Madison, WI 53701 *Mr. Henry Krebs Ms. Margaret Schmale	R-A
Wyoming	Institute for Policy Research University of Wyoming P.O. Box 3925, University Station Laramie, WY 82071 *Mr. G. Fred Doll	R-A

[5]C-R for counties with independent cities and cities in counties; R-A for counties without cities and cities not in counties.

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