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MEMORANDUM FOR   ACS Research and Evaluation Steering Committee

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Subject: Comparison of the American Community Survey Voluntary versus
                                   Mandatory Estimates

Attached is the American Community Survey Research and Evaluation Report for the
Comparison of the American Community Survey (ACS) Voluntary versus Mandatory Estimates.

In 2002 and 2003, the U.S. Census Bureau conducted research to determine whether the ACS
could be implemented as a voluntary survey, rather than a mandatory survey. A 2003 test was
designed to provide answers to key questions about the impact, if any, that a change to voluntary
collection methods would have on mail response, survey quality, and costs. The original study
focused on these three areas of interest. It does not assess if estimates produced from a voluntary
ACS would differ from estimates from a mandatory ACS. A re-examination of the data
collected in the 2003 test could help answer this new question.

If you have any questions about this report, please contact Alfredo Navarro (301)763-3600 or
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Attachment

cc:
ACS Research and Evaluation Team

Comparison of the American Community Survey Voluntary versus Mandatory Estimates

FINAL REPORT

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AMERICAN COMMUNITY SURVEY RESEARCH AND EVALUATION REPORT:
COMPARISON OF THE ACS VOLUNTARY VERSUS MANDATORY ESTIMATES

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Comparison of the ACS Voluntary versus Mandatory Estimates

I. INTRODUCTION

In 2002 and 2003, the U.S. Census Bureau at the request of Congress, conducted research to determine whether the American Community Survey (ACS) could be implemented as a voluntary survey, rather than a mandatory survey. Working closely with staff of the Technology, Information Policy, Intergovernmental Relations and Census Subcommittee and the House Government Reform Committee, a test was designed to provide answers to key questions about the impact, if any, that a change to voluntary collection methods would have on mail response, survey quality, and costs. While the test was not a randomized experiment, the Census Bureau did conclude that: [1]

- A dramatic decrease occurred in mail response when the survey was voluntary. The mail cooperation rate fell by over 20 percentage points and the final response rate after all three modes of data collection was about four percentage points lower. The reliability of estimates was adversely impacted by the reduction in the total number of completed interviews and a shift of a large number of interviews to the personal follow-up data collection mode.
- The estimated annual cost of implementing the ACS would increase by at least 38 percent if the survey was voluntary and the survey maintained the current reliability levels. (See Report # 3, Tables 13 and 14, pages 16-17.)
- Perhaps of greatest concern, the use of voluntary collection methods had a negative impact on traditionally low response areas that will compromise our ability to produce reliable data for these areas and for small population groups such as Blacks, Hispanics, Asians, and American Indians and Alaska Natives.

The original study does not assess if estimates produced from a voluntary ACS would differ from estimates from a mandatory ACS. A re-examination of the data that was collected in this test can help to answer this question.

II. RESEARCH QUESTIONS

1. *Do annualized estimates based on data collected using a voluntary collection method differ from those based on data collected using the current mandatory ACS? Is the answer different if estimates are based on initial selection weights versus modified final weights?*

2. *Are there differences in the characteristics of the population that responded in the ACS under voluntary versus mandatory collection methods?*

3. *What characteristics are most highly related to differences in response rates between the mandatory and voluntary collection methods?*

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[1] Two detailed reports on the design, analysis, and findings from this research can be found at
http://www.census.gov/acs/www/library//by_series/implementing_the_acs/ as Report #3 and Report #11.

4. *What would be the possible change in reliability of ACS estimates if the ACS becomes a voluntary survey and no additional funding is provided to counteract the likely lower response rate?*

III. BACKGROUND

A. ACS Data Collection Methods

The data for a single month of ACS sample cases are collected over a three-month period. The design of the ACS relies on three modes of data collection – mail, telephone follow-up, and personal visit follow-up. Significant cost variations exist among the three modes; personal visit follow-up is by far the most expensive mode of data collection.

The Census Bureau first attempts collecting ACS data using mail-out and mail-back techniques. To maximize mail response, several mailings are used, including an advance letter, initial questionnaire package, reminder card, and a targeted second to nonrespondents. Call centers provide telephone assistance to help households complete the forms they receive in the mail. Mail returned forms are data captured by keying and reviewed for completeness.[2] Telephone interviewers resolve incomplete forms in an edit follow-up operation.

ACS interviewers follow up on nonrespondents to the mail-out and mail-back collection through separate telephone and personal visit follow-up operations. For example, data collection for the March panel starts when we mail the survey questionnaires in late February. In April, interviewers conduct a telephone follow-up operation to collect data for nonresponding addresses for which a telephone number is available. At the end of April, a sample of about 1-in-3 of the addresses that do not respond by mail or telephone is selected for a personal visit follow-up operation in May. A 2-in-3 sample of addresses that could not be mailed (due to incomplete address information) is added to the personal visit follow-up workload. For more details about the ACS data collection methods refer to the ACS Design and Methodology Report.[3]

B. 2003 ACS Sample Design

The ACS sampled approximately 829,000 housing unit addresses in 2003 from the Master Address File (MAF). This was during the ACS's demonstration phase, when a nationwide representative sample was collected from 1,240 counties. The ACS used two distinct sampling methods in the 2003 sample, one for 36 "comparison" counties designed to mimic the then-current design for the full-sample ACS, and the other for the remainder of the country (non-comparison counties).

For the non-comparison counties, the first stage of sampling involved dividing the United States into primary sampling units (PSUs) —most of which comprised a metropolitan area, a large county, or a group of smaller counties. PSUs were contained within state boundaries. The PSUs were then grouped into strata on the basis of independent information, that is, information obtained from the decennial census or other sources.

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[2] In the 2003 ACS, data was captured by keying from paper. Currently data is captured by keying from image.
[3] The ACS Design and Methodology Report http://www.census.gov/acs/www/methodology/methodology_main/.

The strata were constructed so that they were as homogeneous as possible with respect to social and economic characteristics that were considered important by ACS data users. PSUs with a sufficiently large population were placed in their own stratum and selected with certainty. The remaining PSUs were grouped into strata and a pair of PSUs was selected from each non-certainty stratum. The probability of selection for each PSU in the stratum was proportional to its estimated 1996 population. In the second stage of sampling, a sample of housing units within the sample PSUs was drawn. Housing units were identified as the ultimate sampling units (USUs). The USUs sampled in the second stage consist of housing units which were systematically drawn from sorted lists of addresses of housing units from the MAF. In 2003, the selected PSUs contained 1,204 non-comparison counties. The housing unit sampling rate was based on a targeted annual national sample size of 829,000 housing units. The final sampling interval for most states in 2003 was determined to be roughly 189.

The 36 comparison counties were: Pima County, AZ; Jefferson County, AR; San Francisco County, CA; Tulare County, CA; Broward County, FL; Upson County, GA; Lake County, IL; Miami County, IN; Black Hawk County, IA; De Soto Parish, LA; Calvert County, MD; Hampden County, MA; Madison County, MI; Iron, Reynolds, and Washington Counties, MO; Flathead and Lake Counties, MT; Douglas County, NE; Otero County, NM; Bronx Borough, NY; Rockland County, NY; Franklin County, OH; Multnomah County, OR; Fulton County, PA; Schuylkill County, PA; Sevier County, TN; Fort Bend and Harris Counties, TX; Starr and Zapata Counties, TX; Petersburg City, VA; Yakima County, WA; Ohio County, WV; and Oneida and Vilas Counties, WI.[4]

The sampling rate within each comparison county was determined at the census block level, depending on the size of the governmental units and the tract that the block was contained within.

Type of Area	Fort Bend and Harris, TX	All Other Counties
Blocks in smallest governmental units (fewer than 200 HUs)	10%	10%
Blocks in smaller governmental units (200 than 800 HUs)	3%	7.5%
Blocks in small governmental units (between 800 and 1200 HUs)	1.5%	3.75%
Blocks in Large Tracts (more than 2000 HUs)	0.735%	1.837%
All other blocks (including ungeocoded records)	1%	2.5%

For 2003, all comparison test counties except Fort Bend and Harris had overall sampling rates of about 2.5 percent. The overall sampling rate in Fort Bend and Harris Counties was about 1 percent.

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[4] For more details, see the 2003 Accuracy Document at
http://www.census.gov/acs/www/data_documentation/documentation_main/

C. Design of the 2003 Voluntary Test

The 2003 voluntary test was conducted using the March and April sample panels, which contained about 140,000 sampled addresses. The sample for the ACS Voluntary Test was designed to study four experimental mail treatments–two mandatory and two voluntary. One voluntary collection method used a standard survey approach to explain the voluntary nature of the survey, the approach that the Census Bureau uses for its current surveys. A second voluntary collection method explained more directly that the survey was voluntary. Since the primary focus of this test was to evaluate the effect of voluntary collection methods on the ACS, we evenly distributed 75 percent of the combined 2003 March/April sample to the two voluntary mail collection methods and the remaining 25 percent between the two mandatory mail collection methods.

Unlike the mail portion, the test used only voluntary collection methods in the telephone and personal visit follow-up operations starting in April. We concluded that assigning both voluntary and mandatory collection methods to a sample of cases or a sample of interviewers introduced potential implementation risks to the study that the use of one method could avoid during the test period.

The test's sample design divided the universe into two strata, high response areas (HRA) and low response areas (LRA). We created these strata using tract-level long form mail return rates from Census 2000. Based on data from the 2001 ACS, people in the LRA stratum were younger, more likely to be Hispanic and non-White, and had more "other relative" and "non-relative" household members than people in the HRA stratum. The LRA stratum also had fewer people with college educations, more renters, more households who speak a language other than English at home, and more households with lower incomes compared with the HRA stratum. Within strata, experimental methods were designated in a systematic manner to ensure that we assigned 75 percent of the sample evenly to the two voluntary collection methods and 25 percent of the sample to the two mandatory collection methods.

For this analysis, the two voluntary mail collection methods in March and April are combined as the voluntary panel, and the two mandatory mail methods were omitted. This resulted in a loss of about 25 percent of the March and April 2003 samples.

IV. METHODOLOGY

In most of the analyses that follows, we use a set of weighted estimates produced from the data provided by respondents from the voluntary panels in March and April 2003 and another set of weighted estimates produced from the data provided by respondents from the mandatory panels in January, February, and May-December 2003. The mandatory estimates include sample cases from the November and December 2003 sample panels that responded in January and February, 2004. The weights for these estimates depend on the particular comparison being done. All use or start with the 2003 ACS initial selection weights (the ACS basic weight adjusted for Computer Assisted Personal Interviewing (CAPI) sub-sampling). To produce weighted collection method estimates that would approximate the estimates from a full year's worth of ACS data, the initial selection weights are

annualized. The initial weights of sample cases receiving the voluntary collection method are multiplied by 8 [= 12/2 (two months) x 4/3 (only ¾ of the sample panel was voluntary)] and the initial weights of sample cases receiving the mandatory collection method are multiplied by 1.2 [= 12/10 (ten months)].

A set of annualized final weights is also derived. These weights are adjusted to correct for nonresponse and noncoverage bias. Specifically, the annualized initial selection weights of voluntary and mandatory panel cases are put through a modified version of the 2003 weighting process separately by collection method. The following modifications to the 2003 methodology are warranted due to the small sample size of the voluntary panel.

1. The sample panel month is used instead of interview month in the weighting process. This is the best way to keep the collection method groups separate and reduce contamination during the weighting process.
2. The weighting process is controlled at the state level instead of the 2003 weighting areas due to the small number of expected person interviews in the voluntary panels.
3. A modification is made to the nonresponse adjustment to use state instead of county/tract to define the weighting cells
4. Both the mandatory and the voluntary collection method estimates are controlled to July 1, 2003 Population Estimates Program estimates.

Weighted estimates by collection method are tabulated for over 400 key ACS characteristics – specifically the estimates that are included in the ACS data profiles. These included totals of persons, households, and housing units, as well as ratios and percents. Additional percent estimates are calculated for many of the count estimates. More details about the characteristics examined are provided in the next section.

For each characteristic, the voluntary collection method estimate is compared to the mandatory estimate and the difference between the collection method estimates is examined in two ways. First, we assess the differences based on size alone. A characteristic is considered to have a "large difference" if either the absolute difference between collection method estimates is greater than 1 percent or the relative difference is greater than 10 percent. Changes of this size could have practical implications in the future if the ACS switches from a mandatory collection survey to a voluntary collection survey. It may also indicate symptomatic problems with a voluntary collection method. Secondly, we focus on characteristics with statistically significant differences regardless of size. All significant differences are determined at the 90 percent confidence level.[5] Characteristics with differences that are both "large" and statistically significant are of particular interest.

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[5] No adjustments were made for multiple comparisons.

The majority of the work is done at the national level. Due to the small number of interviews in the voluntary panels, only a few sets of sub-national estimates are produced. These collection method estimates are for the eight 2010 Census Integrated Communication segmentation groups and for the four largest states (California, Florida, New York, and Texas). [6]

Some additional information on the 2010 Census Integrated Communication eight segmentation groups is warranted here. All census tracts are assigned to segmentation groups based on social, economic, housing, and demographic characteristics and historical information about census participation. Appendix 1 provides some summary information about the characteristics of these eight segmentation groups. In this analysis, we refer to the segmentation groups as:
1. Average - Homeowners
2. Average - Renters
3. Economically Disadvantaged - Homeowners
4. Economically Disadvantaged - Renters
5. Ethnic Enclave - Homeowners
6. Ethnic Enclave - Renters
7. Single Unattached Mobiles
8. Advantaged - Homeowners

Group 1 (Average – Homeowners) and group 8 (Advantaged - Homeowners) combined contain about 60 percent of the total U.S. population. On the other hand, the two Economically Disadvantaged and the two Ethnic Enclave groups (groups 3 through 6) combined represent only about 15 percent of the total U.S. population. The remaining two groups, Average - Renter and Single Unattached Mobiles, make up the balance.

Unique aspects of each comparison are provided below as well as the methodology used to assess the impact of a voluntary ACS on the reliability of survey estimates.

A. Annualized Estimate Comparison Using Initial Selection Weights.

This set of comparisons answers, in part, research question 1. It compares weighted collection method estimates based on annualized initial weights described above. These estimates reflect the characteristics of the respondent population and housing included in a mandatory and voluntary ACS prior to any adjustments for nonresponse and noncoverage bias.

From the initial 2003 research we determined that there was a difference in the overall survey response rates between the mandatory and voluntary collection method panels. As a result, the collection method count estimates are different for many characteristics

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[6] For the 2010 Census eight tailored communication approaches were developed to encourage participation in the Census. A behavioral segmentation model was built based on indicators related to census mail-back behavior, media usage and attitudinal information. The model segments the U.S. population into relatively homogeneous groups that exhibited different response rates to the Census 2000. 2010 Census Integrated Communication Campaign Plan, US Census Bureau, August 2008, pages 33 – 43.

because no noninterview adjustments are applied to the weights used for this set of tabulations. So, this analysis focuses on weighted percent and ratio estimates.

B. Sample Completeness Ratio Comparison

This set of comparisons attempts to answer the second research question. It looks for significant differences in the demographic characteristics (age, race, sex etc.) of households interviewed by collection method. For this analysis, the collection method estimates are tabulated using annualized initial weights described above at the national level.

A derived product, which is called a sample completeness ratio, is calculated. The ratio is defined as an estimate divided by the associated official population estimate from the 2003 Population Estimates Program (PEP). The completeness ratios measure how representative the survey interviews are of the expected population prior to any adjustments for nonresponse and noncoverage bias. The ratios by collection method are calculated, compared, and statistically significant differences noted. Ratios are also calculated after mail, after phone, and after personal visit for each collection method.

Griffin and Raglin (2011) gives a complete description of the methodology and the results of this comparison.

C. Response Models

This exploratory analysis, using logit modeling technique, is done to answer research question 3. It is performed to determine which person and housing unit characteristics are most highly related to differential response between the two collection method groups. This work is done with the original initial weights for mandatory cases. For the voluntary cases, their initial weights are adjusted by only 4/3 to make up for the fact that only ¾ of March and April sample cases are used. This allows the focus to be the characteristics of the respondents and not on the total population.

A logit model is used for this by comparing the natural log of ratios of the odds of having received the mandatory or the voluntary collection method given being a respondent with a particular set of categorical and continuous characteristics. That is, the logit is the natural logarithm of the odds ratio:

P(mandatory respondent |characteristic set) / P(voluntary respondent |characteristic set).

Stepwise selection in the SAS Logistic procedure is used to determine the order in which the explanatory variables enter the model with the most highly related to differential response between collection methods entering first. The size of the estimated coefficient indicates the degree of reduction in response under the voluntary collection method. The larger (less negative or more positive) coefficients indicate more reduction in response.

Several sets of models are developed. Housing unit level models and person level models (both with and without demographics) are fitted for the nation and for each of the

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eight segmentation groups described above. Only the models without demographics are used in further analyses.

Once the model effects are analyzed, the model variables (respondent characteristics) related to each estimate being compared in this study for the two collection method groups are identified. Differences between estimates computed using annualized final weights are investigated to determine if there are any for which differences in the related respondent characteristics are carried through to significant differences in the estimates.

Ikeda, Tsay, and Weidman (2011) gives a complete description of the methodology of this comparison.

D. Annualized Estimate Comparison Using Modified Final Weights.

This set of comparisons is similar to the comparisons described in Section IV. A. This time the collection method estimates are calculated using annualized final weights. This analysis answers the second part of research question A. It looks for differences between collection method estimates, but this time for the total population rather than for the respondent population.

E. Impact on Reliability of a Voluntary ACS

A series of steps are taken to obtain an updated estimate of the general increase in the variances using a voluntary response option. This answers research question D. The calculation is similar to the one done for the earlier 2003 analysis, but incorporating corresponding information from the 2009 ACS, such as the small decline in the interview rates and the overall shift in collection mode distribution away from mail-out towards personal visit over the last few years. This time we focus only on the worst case scenario – a voluntary ACS with the current ACS annual budget. The steps include calculating the sample size under the cost constraint, determining the work load by mode, determining the expected number of interviews by mode, and with that determining the change in reliability of estimates. This one is unique among the five analyses presented here because it uses the 2009 weights processed through the nonresponse adjustment. For more details, see Appendix 2.

V. KEY ESTIMATES CONSIDERED

As mentioned in the methodology section, estimates by collection method for over 400 key ACS characteristics are tabulated using annualized weights. These items come from the standard ACS data profiles and include social, economic, housing, and demographic characteristics. Given that our comparison is aggregating and comparing data from different months of the year, we want to remove from consideration any of the 400 characteristics that might be influenced by seasonal differences within the year or any year to year trends. To help with this, estimates from the 2002 ACS and the 2004 ACS are formed using the same monthly breakdowns, March and April panels versus the rest of the year, and the appropriate annualized initial weights. Although there was only one collection method used in the 2002 ACS and the 2004 ACS, we refer to these month-based estimates as collection method estimates for consistency. By characteristics, these collection method estimates are compared

for the 2002 ACS and 2004 ACS. If the resulting differences meet criteria, they are flagged as large and/or statistically significant.   The next two sections describe how we use this information.

A. Number of Large Differences

In Table 1 we see the percent of characteristics with differences considered by our criteria as large for the 2002 ACS, the 2003 ACS, and the 2004 ACS respectively. At the national level, about 4.4 percent of the characteristics from the 2002 ACS and the 2004 ACS have absolute differences greater than 1 percent, whereas the 2003 ACS rate is twice that at 8.5 percent.[7] The same is true for the percent of characteristics with relative differences greater than 10 percent when the 2003 ACS is compared to the other two years at the national level.

Table 1. The Percent of ACS Profile Estimates with Absolute Difference > 1% or with Relative Difference>10% by Year and by Nation, State and Segmentation Group *

	Absolute Difference > 1.0%			Relative Difference > 10.0%		
	2002	2003	2004	2002	2003	2004
Nation	4.4%	8.5%	4.4%	6.2%	12.9%	5.9%
Segmentation Groups:						
Average - Homeowner	6.9%	10.3%	6.7%	12.6%	16.6%	11.9%
Average - Renter	13.6%	19.5%	9.7%	16.8%	26.0%	18.1%
Economically Disadvantaged - Homeowner	26.3%	26.0%	19.5%	34.3%	34.2%	29.3%
Economically Disadvantaged - Renter	36.9%	37.7%	36.0%	36.4%	47.0%	40.5%
Ethnic Enclave - Homeowner	32.1%	33.6%	31.4%	41.5%	33.9%	41.3%
Ethnic Enclave - Renter	36.3%	47.5%	36.4%	38.3%	52.1%	42.4%
Single Unattached Mobiles	20.3%	22.9%	17.4%	28.5%	34.0%	25.0%
Advantaged - Homeowner	7.9%	12.8%	6.9%	15.8%	24.3%	14.1%
States:						
California	14.9%	18.6%	15.4%	20.1%	27.2%	21.8%
Florida	17.1%	28.5%	20.5%	27.1%	35.0%	33.3%
New York	19.9%	23.2%	21.6%	23.0%	30.5%	26.6%
Texas	19.0%	29.4%	18.4%	28.1%	33.7%	25.0%

U.S. Census Bureau: 2002, 2003,and 2004 American Community Survey Special Tabulation
* The base of the percentages is the roughly 400 key characteristics.

At the segmentation group and state levels, the 2003 ACS also have higher numbers of large differences, but the results do not stand out so much. These results give us our first indication that there may be something more going on for 2003 than just seasonal effects or random noise.

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[7] Whether or not a difference is statistically significant was ignored at this point in the analysis.

B. Number and Patterns of Significant Differences

For each characteristic, the number of statistically significant differences between the collection method estimates across the 2002 ACS, the 2003 ACS, and the 2004 ACS are counted.[8] Of the roughly four hundred ACS characteristics, about 35 percent show statistically significant differences between collection method estimates in the 2003 ACS. For the 2002 ACS and the 2004 ACS, the comparable numbers of monthly differences are 22 percent and 13 percent, respectively. This result gives us our second indication that there may be something more going on for 2003 than just seasonal effects or random noise.

The pattern of these differences across the years is also of interest. That is, if a characteristic is significantly different in all three years then the pattern is Yes, Yes, and Yes. If the opposite is true then the pattern is No, No, and No. Characteristics with consistent patterns like those described above are of no interest to us and are removed from further consideration. Most characteristics with patterns showing statistically significant differences between estimates for two out of the three years are also removed. The exceptions to this rule are described below. In total, about 300 of the 400 key characteristics at the national level are removed and ignored in the annualized estimate comparisons described above in IV. A and IV. D. The remaining 112 key characteristics seem to indicate a possible voluntary collection method effect.

The 112 key characteristics with suspected voluntary collection method effects fall into five difference patterns. Table 2 gives a description of the five patterns of interest and the number of key characteristics falling into each pattern group. The majority of key characteristics fall into Pattern Y1 where the 2003 ACS difference is statistically significant while the differences for the other two years are not. Another interesting pattern is Pattern Y2 where the 2002 ACS and the 2004 ACS have a statistically significant difference, but the 2003 ACS does not. A small set of characteristics have difference patterns where there is a detectable shift in the direction of the significant difference. For example in Pattern Y3, the 2002 mandatory month-based estimate is significantly larger than the voluntary estimate, but the 2003 mandatory collection method estimate is significantly smaller than the voluntary estimate. In Appendix 3, the lines highlighted are the 112 key characteristics showing a possible treatment effect.

Table 2. Number of Key Characteristics Showing a Possible Voluntary Collection Method Effect by Difference Pattern at the National Level

Pattern	Difference Pattern Description	Significantly Different?			Number of Key Characteristics
		2002	2003	2004	
Y1	Only 2003 is different	No	Yes	No	92
Y2	Only 2003 is not different	Yes	No	Yes	6
Y3	2002 & 2003 are in different directions	Yes	Yes	No	6
Y4	2003 & 2004 are in different directions	No	Yes	Yes	7
Y5	2003 is in a different direction from 2002 & 2004	Yes	Yes	Yes	1
U.S. Census Bureau: 2002, 2003,and 2004 American Community Survey Special Tabulation					

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[8] The size of the difference was ignored in this examination.

The number of statistically significant differences is smaller at the segmentation group level. This is not surprising considering many of the groups are extremely small, i.e., containing 2 to 3 percent of the population. Only three out of the eight segmentation groups show statistically significant differences for 20 percent or more of the approximately 400 key characteristics examined. A similar three year comparison is done for this level, but there are no consistent significant difference patterns. Some of the more populated segmentation groups show results consistent with those at the national level so the same set of key characteristics is examined further at this level. See Section VI. Results.

Note that all of the approximate 400 key characteristics are eligible for consideration for the sample completeness ratios comparison and the logistic modeling analysis described in IV. B and IV. C, respectively.

VI. RESULTS

A. *Do annualized estimates based on data collected using a voluntary collection method differ from those based on data collected using the current mandatory ACS? Is the answer different if estimates are based on initial selection weights versus modified final weights?*

1. Comparison Using Estimates Based on Initial Weights

   a. National Level

   Of the over 400 key estimates studied, 112 have statistically significant differences that are not believed to be due to seasonal effects. About 15 percent of the 112 have an absolute difference greater than 1 percent and roughly 25 percent have a relative difference greater than 10 percent. Of those characteristic with results considered large (those meeting either of those criteria), several important statistically significant differences are noted. For a few important characteristic percentages, Table 3 gives the 2003 ACS mandatory and voluntary collection method estimates, indicates whether the difference between them is significant at the 90 percent confidence level, and provides the absolute difference (Abs Diff) and the relative difference (Rel Diff) between the two collection method estimates. These characteristics are discussed in more detail below. See Appendix 3 for complete details.

Table 3: Comparisons of the 2003 ACS Mandatory and Voluntary Percentage Estimates Using Initial Weights at the National Level

Topic	Characteristic	Mand	Vol	Sig Diff	Abs Diff	Rel Diff
Residence 1 year ago	Different house in US	14.5	12.9	Yes	1.6	11.2
Educational attainment	High school graduate or equivalent	29.8	31.2	Yes	1.4	4.7
Employment status	Unemployed in the Labor Force	4.9	4.7	Yes	0.2	4.1
Income	HH income $200,000 or more	2.5	2.0	Yes	0.5	16.9
	Family income $200,000 or more	3.2	2.6	Yes	0.6	17.1
Poverty	Families with related children < 5 years only	15.9	17.5	Yes	1.6	10.0
Housing occupancy	Vacant Units	10.8	12.4	Yes	1.6	14.8
Race Alone or In Combination	Some Other Race	5.2	4.4	Yes	0.8	15.3

U.S. Census Bureau: 2003 American Community Survey Special Tabulation

- Residence 1 year ago: Table 3 shows results for the percent of the population reporting living in a different house in the U.S. last year. However, all seven categories of residence 1 year ago show statistically significant differences with a shift from recent movers towards non-movers for the voluntary collection method. Most have a relative difference of 7 percent or higher. This suggests that the voluntary ACS estimate included a smaller proportion of movers.

- Educational attainment: The percent of the population that are a high school graduate or equivalent is shown in Table 3, but differences for the four categories representing those with some college or less are all statistically significantly of various magnitudes with the voluntary collection method estimates being higher. Therefore the voluntary ACS estimate includes a smaller proportion of respondents with higher levels of education.

- Employment status: The percent of the labor force that is unemployed is one of several categories in this topic that is significantly different. For this category, the voluntary collection method estimate includes a smaller proportion of the unemployed than the mandatory collection method estimate.

- Income: For both the household income and family income categories of $200,000 or more, the voluntary collection method estimate is significantly lower than the mandatory collection method estimate. All those with income between $75,000 and $199,000 show significantly higher voluntary collection method estimates. This suggests the voluntary ACS estimates includes a smaller proportion of respondents with high income.

- Poverty: Three out of the nineteen family and person poverty rate categories have statistically significant differences between the voluntary and mandatory collection

method estimates. All three categories show a voluntary collection method estimate that is higher than their respective mandatory collection method estimates. Of the nineteen categories in this topic, the category families with related children under 5 years only (presented in Table 3) have both the largest absolute difference and the largest relative difference. This suggests the voluntary ACS estimate includes a higher proportion of lower-income families.

- Housing occupancy: The percent of vacant housing units has a voluntary collection method estimate that is significantly larger than the mandatory collection method estimate. This is not surprising because there is more nonresponse among occupied housing units in the voluntary panels and the initial weights used to form the collection method estimates do not include an adjustment for nonresponse bias. It is expected that the difference would disappear once modified final weights are used to form the collection method estimates.

- Race alone or in combination: Four out of the six categories are significantly different with a significant shift in the distribution away from Asian and Hawaiian and Other Pacific Islander towards Black and White. For some other race, the voluntary collection method estimate is significantly smaller than the mandatory collection method estimate and is considered to be a large difference.

b. Segmentation Group Level

The same set of 112 key characteristics is examined closely at this level. Table 4 demonstrates how the size of the differences between the collection method estimates varies by segmentation group for the characteristic percent of the population, "residing in a different housing unit 1 year ago". There is one thing consistent across the groups, the voluntary collection method estimate for this characteristic is never significantly larger than the mandatory collection method estimate. This result is similar to what is seen at the national level.

Table 4: Comparison of the 2003 ACS Voluntary and Mandatory Percentage Estimates of Residing in a Different Residence 1 Year Ago Using Initial Weights By Segmentation Groups

Specific Characteristic	Segmentation Group	Mand	Vol	Sig Diff	Abs Diff	Rel Diff
Percent of Population Residing in a Different house in US 1 Year Ago	Average - Homeowner	13.5	12.3	Yes	1.2	8.9
	Average - Renter	19.8	16.9	Yes	2.9	14.6
	Economically Disadvantaged - Homeowner	17.5	17.4	No	0.1	0.6
	Economically Disadvantaged - Renter	18.5	15.7	Yes	2.8	15.1
	Ethnic Enclave - Homeowner	12.8	9.7	Yes	2.9	22.7
	Ethnic Enclave - Renter	13.8	12.5	No	1.3	9.4
	Single Unattached Mobiles	25.6	22.7	Yes	2.9	11.3
	Advantaged - Homeowner	10.4	9.1	Yes	1.3	12.5
U.S. Census Bureau: 2003 American Community Survey Special Tabulation						

Other characteristics showing similar results to those seen at the national level for the majority of segmentation groups include percent high school graduate or equivalent,

percent of households and families with income of $200,000 or more and the percent in the some other race category.

Characteristics showing different results for the segmentation group level include the percent of unemployed in the labor force and the multiple categories of poverty. For the characteristic percent of unemployed in the labor force, six out of eight segmentation groups do not show a statistically significant collection method difference, which includes the four groups characterized as having a higher than average unemployment rate. For the nineteen categories of poverty, very few segmentation groups show a statistically significant difference between collection method estimates except for Ethnic Enclave – Renters. For this group, twelve of the nineteen poverty categories show a statistically significant difference with the voluntary collection method estimates being significantly higher than the mandatory collection method estimates.

c. State Level

Limited analysis is done for the four largest states: California, Texas, New York and Florida. Again the focus is on the 112 key characteristics mentioned above in the national and segmentation comparison. For most characteristics, there are few consistent patterns of statistically significant differences between collection method estimates observed among these states. Household income of $200,000 or more is the one characteristic studied with a statistically significant difference for all four states. Three out of four states have statistically significant differences between collection method estimates for key characteristics such as residency 1 year ago and race alone or in combination. Only one state out of four show a statistically significant difference estimates for either high school graduate (or equivalent), or unemployed in the labor force, or families with related children under 5 only.

2. Comparison Using Estimates Based on Modified Final Weights

a. National Level

Only 74 of the 112 key characteristics of interest continued to show a voluntary collection method effect after modified final weights are applied that adjust for nonresponse and noncoverage bias. The percent of characteristics with large differences between collection method estimates is about the same compared with what is shown earlier in Table 1 for the 2003 ACS. Table 5 gives percentage estimates by collection method for the same topics and characteristics seen in Table 3. In general there is little change in the relationship between the collection method estimates for most of the characteristics presented here when compared to those using only the initial selection weights. See the three last columns on the far right in Appendix 3 for more details.

Table 5: Comparison of the 2003 ACS Mandatory and Voluntary Percentage Estimates Using Modified Final Weights at the National Level

Topic	Characteristics	Mand	Vol	Sig Diff	Abs Diff	Rel Diff
Residence 1 year ago	Different house in US	14.9	13.4	Yes	1.5	10.1
Educational Attainment	High School Graduate or equivalency	29.7	30.9	Yes	1.2	4.0
Employment Status	Unemployed in the labor force	5.0	4.8	Yes	0.2	3.8
Income	HH income $200,000 or more	2.4	2.1	Yes	0.3	15.0
	Family income $200,000 or more	3.1	2.6	Yes	0.5	15.0
Poverty	Families with related kids < 5 years only	16.4	17.5	No	1.1	6.4
Housing occupancy	Vacant Units	10.2	11.3	Yes	1.1	10.6
Race alone or in combination	Some Other Race	5.4	4.5	Yes	0.9	16.4

U.S. Census Bureau: 2003 American Community Survey Special Tabulation

There are a few characteristics in Table 5 that are impacted by the change of weights. For example, while several of the poverty estimates are significantly different across collection methods using the initial weights, no poverty estimates are significantly different when calculated with the modified final weights. For employment status, eleven out of the twelve characteristics have statistically significant differences after the final weighting compared with only five out of twelve based on the initial weights.

One interesting result seen in Table 5 is the voluntary collection method estimate for the percent of vacant housing units is still significantly larger than the mandatory collection method estimate. The modified weighting process does not remove the statistically significant difference between the collection method estimates. The result seems beyond sampling variability, but we suspect that this could be an artifact of the modified weighting methodology.

b. Segmentation Group Level

Using final weights, the percent of the roughly 400 key characteristics showing large differences and the percent of the 400 showing a statistically significant difference between mandatory and voluntary collection estimates is comparable with what is seen with the initial weights. The Ethnic Enclave – Renters segmentation group has one of the highest percent of key characteristics with large differences – 48 percent with an absolute difference greater than 1 percentage point, and 52 percent with a percent difference of 10 percent or more. These are comparable with what is seen with the initial weights. Table 6 gives the percentage estimates by collection method for the same characteristic in Table 4. In general there is little noticeable change in the relationship between the collection method estimates for most of the segmentation groups compared to those using the initial selection weights.

Table 6: Comparison of the 2003 Voluntary and Mandatory Percentage Estimates of Residence 1 Year Ago Using Modified Final Weights By Segmentation Groups

Specific Characteristic	Segmentation Groups	Mand	Vol	Sig Diff	Abs Diff	Rel Diff
Percent of the Population Residing in a different house in US 1 year ago	Average – Homeowner	13.9	12.6	Yes	1.3	9.6
	Average – Renter	20.3	17.4	Yes	2.9	14.5
	Economically Disadvantaged – Homeowner	17.8	18.1	No	0.3	1.6
	Economically Disadvantaged – Renter	18.4	16.3	No	2.1	11.7
	Ethnic Enclave – Homeowner	13.0	9.9	Yes	3.1	23.7
	Ethnic Enclave – Renter	14.1	12.9	No	1.2	8.5
	Single Unattached Mobiles	26.1	23.0	Yes	3.1	12.1
	Advantaged – Homeowner	10.7	9.5	Yes	1.2	10.9

U.S. Census Bureau: 2003 American Community Survey Special Tabulation

Other characteristics showing similar results to those seen using initial weights include percent unemployed, the many categories of poverty, and the percent in the some other race category for the race alone and in combination topic group.

c. State Level

Again a limited analysis is done for the four largest states: California, Texas, New York and Florida. The patterns observed using the initial selection weights and discussed above are seen again using modified final weights.

In general there is little change in results when collection method estimates are calculated using modified final weights instead of initial selection weights.

B. *Are there differences in the characteristics of the population that responded in the ACS under voluntary versus mandatory collection methods?*

Another ACS voluntary versus mandatory research project done by Deborah Griffin and David Raglin of the Census Bureau answers this research question. Using a measure called the sample completeness ratio, they find results that are similar to those seen in the other research. They find that the voluntary collection method do not have a significant impact on the level of response for traditionally hard-to-interview populations. They do, however, find evidence of a possible differential loss in the White and Asian population representation in a voluntary survey. For more detail, see Griffin and Raglin (2011).

C. *What characteristics are most highly related to differences in response rates between the mandatory and voluntary collection methods?*

This is a summary of the results from another ACS voluntary versus mandatory research project done by Michael Ikeda, Julie Tsay, and Lynn Weidman of the Census Bureau. Their report gives a complete description of the results of this analysis. For more detail, see Ikeda, Tsay, and Weidman (2011).

Beginning with the national level models, Table 7 shows the first ten explanatory variables to enter the model in order.

Table 7. The First Ten Characteristics By Model at National Level

Step	Housing Unit Model		Person Model	
	Without Demographics	With Demographics	Without Demographics	With Demographics
1	# of Bedrooms	Sex of HHer	Non-mover	Non-mover
2	Retirement Inc	Race of HHer	Education Attained	Race of HHer
3	Social Security Inc	# of Bedrooms	Private Transport to Work	HHer Hispanic
4	HHld Language Other	HHer Hispanic	HHld Poverty Status	Education Attained
5	Presences of Own Children	Age of HHer	HHld Language Other	Age of HHer
6	HHld Income	Retirement Inc	Citizenship	Private Transport to Work
7	# of Vehicles	# of Vehicles	Marital Status	HHld Language Other
8	Persons per room	HHld Language Other	On Layoff	Citizenship
9	Large Multi-unit	Social Security Inc	Owner Occupied HU	Marital Status
10	Family HHld	Persons per room	Family HHld	HHld Poverty Status

U.S. Census Bureau: 2003 American Community Survey Special Tabulation

For the housing unit model without demographics, the estimated effects are quite small. The most important thing to note in the housing unit model with demographics is the non-demographic explanatory variables enter the model in much the same order. For the person model without demographics, the first variable showing up is non-mover in the last year with the smallest estimated coefficient of any of the first 10 characteristics. This indicates there is a larger drop in response for movers than for non-movers in a voluntary ACS. Similar to the two housing unit models, the seven top non-demographic person variables show up in the person model with demographics, but not necessarily in the same order.

Models for the eight segmentation groups show quite a bit of consistency with the variables selected in the national housing unit models. There are a few variables seen in some of the segmentation group that are not seen in national model but there doesn't appear to be any consistent pattern.

When differences between annualized final estimates are investigated to determine if there are any for which differences in the related respondent characteristics are carried through to significant differences in the estimates, there are a few that show up at the national level. In all of these cases, the estimated characteristic is the same as or very closely related to a respondent characteristic -- family type, residence one year ago, educational attainment, and language other than English spoken at home. This is evidence that their differential response affects the corresponding final estimates. For more details, see Ikeda, Tsay, and Weidman (2011).

D. *What would be the possible change in reliability of ACS estimates if the ACS becomes a voluntary survey and no additional funding is provided to counteract likely lower response rate.*

Under the assumptions of a voluntary ACS and no additional funding, it is demonstrated that the sample size of the ACS would need to drop to cover the cost of larger telephone and personal-visit workloads. This is primarily due to the expected decrease in the mail response rates. Based on the calculation presented in Appendix 2, the ACS sample size would go from the current 2.89 million addresses with a mandatory collection method to 2.4 million with a voluntary collection method. As a result of this reduction in sample size and the shift in the mode distribution of interviews, the expected increase in the variance estimates is approximately 45.1 percent. See Appendix 2 for further details.

VII. FINAL OBSERVATIONS

- Only a small number of key characteristics repeatedly show a statistically significant collection method effect of a voluntary survey at the national, state, and segmentation group levels.

- For those key characteristics that show a statistically significant collection method effect using the initial selection weights, the modified weighting adjustments do not, in general, bring the voluntary and mandatory estimates closer together. The characteristics showing statistically significant collection method effects before adjustments for nonresponse and noncoverage also show statistically significant effects after these adjustments.

- There is no clear evidence of a collection method effect by race and other demographics at the national and state level. The few characteristics highlighted in the results section are those that appear to show the largest effect. These noted effects do not appear to be correlated in any way with the traditionally hard to interview populations such as ethnic or economically disadvantaged groups. Any potential effect of a voluntary survey appears to be more likely for the White or Asian populations.

- Results that we observe for educational attainment and income may be related. The voluntary collection method estimates for high school graduate or less are higher than the similar mandatory collection method estimates. The voluntary collection method estimates of household or family income of 200,000 or more are lower than the comparable mandatory collection method estimate. This may suggest that going to a voluntary collection method obtains a smaller proportion of respondents with higher levels of education and with high income.

- In summary for most analyses, the conclusions drawn from using estimates produced from a voluntary ACS would not be substantively different from those drawn from using estimates produced from a mandatory ACS. The more pronounced effects of a shift from a mandatory to a voluntary collection method might be the change in costs and reliability.

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Appendix:

1. Segmentation Group Summary

2. Impact on the American Community Survey of Using Voluntary Data Collection Methods.

3. 2002, 2003, and 2004 ACS Month-based Estimate Comparisons Using Initial and Final Weights

Segmentation Group Summary

Average – homeowners
- 35 percent of all occupied housing units in the U.S.
- Second highest Census mail response
- Large percent rural
- Skews homeowners
- Skews older

Average – renters
- 15 percent of all occupied housing units in the U.S.
- Average Census mail response
- Skews renter, densely populated
- Urban
- Skews younger

Economically Disadvantaged - homeowners
- 6 percent of all occupied housing units in the U.S.
- Largely urban, higher percent poverty, public assistance, unemployment, less than high school education
- Skews older, homeowner
- 36 percent with children under 18

Economically Disadvantaged - renters
- 3 percent of all occupied housing units in the U.S.
- Lowest census mail response
- Skews renters in urban multi-units
- Highest poverty, public assistance, unemployment
- 1/3 speak language other than English at home
- 35 percent with children under 18

Ethnic Enclave - homeowners
- 3 percent of all occupied housing units in the U.S.
- Above average crowding, poverty, public assistance, unemployment, low education
- Less urban and densely populated, skews homeowner, stable and married households
- 50 percent with children under 18
- 43 percent foreign-born, 58 percent speak Spanish at home

Ethnic Enclave - renters
- 2 percent of all occupied housing units in the U.S.
- 62 percent foreign-born, 54 percent speak Spanish, 20 percent speak another language other than English at home
- Higher poverty, unemployment, public assistance
- Skewed renters in urban, crowded multi-units – most densely populated
- 44 percent with children under 18

Single, Unattached, Mobiles
- 7 percent of all occupied housing units in the U.S.
- Higher education
- Highly mobile single renters in urban multi-units, densely populated
- Racial and ethnic diversity
- Skews younger and single

Advantaged homeowners
- 28 percent of all occupied housing units in the U.S.
- Highest Census mail response
- Stable, married homeowners
- Least densely populated
- Higher education
- 39 percent with children under 18

Source: U.S. Census Bureau. (2008). 2010 Census Integrated Communications Campaign Plan

Impact on the American Community Survey of Using Voluntary Data Collection Methods

By Donald Keathley, Steven Hefter, Michael Starsinic, and Mark Asiala

Background

A study in 2003 (Census Bureau 2003) indicates that changing the ACS to a voluntary response survey would, for a given sample size, lower the reliability of its estimates. This is due, primarily, to a lower mail response rate, which causes the Computer Assisted Personal Interview (CAPI) sample to increase, thereby increasing sampling weight variation. It is also due, to a lesser degree, to a lower overall response rate.

The Computer Assisted Telephone Interview (CATI) workload increases as well. We use information from the two Census Bureau reports, along with information from the 2009 ACS, to estimate what the decrease in reliability of the estimates would be if the ACS became a voluntary response survey and no additional funding was provided to complete data collection. This research uses the current level of sub-sampling of nonrespondents for a fixed sample size of 2.9 million.

This document details the following:

- The calculation of the annual ACS U.S. housing unit address sample required to maintain the current overall data collection budget under voluntary data collection methods;
- The projection of the expected workloads by data collection mode given the new sample size and using voluntary data collection methods;
- The projection of the expected number of interviews by mode using the new projected workloads and the voluntary data collection assumption; and,
- The calculations showing the expected change in the reliability of the ACS estimates due to the new smaller sample size and the change in the mode distribution of interviews.

This new annual sample size will be smaller than the current ACS. The decrease is primarily driven by an expected decrease in the mail response rates leading to larger CATI and CAPI workloads. Without a corresponding increase in costs to absorb the expected increase in the CATI and CAPI workloads, the overall sample size must be reduced. Note that maintaining the current ACS sample size under voluntary data collection methods would, necessarily, increase the overall cost of the survey. In addition to the additional variance introduced by shifting the mode distribution of interviews from mail to CATI and CAPI, we also expect the reliability of the ACS estimates to be negatively affected by an overall increase in the weights of the interviewed cases due to the smaller annual sample size.

Summary of Methodology and Results

The following outlines the steps taken to obtain an estimate of the increase in the estimated variances using a voluntary response option with an approximate sample size of 2,404,000 housing unit addresses (alternate design).

The result shows an increase in the variance estimates of approximately 45.1%.

Methodology

1. Calculate Total U.S. Sample Size - Maintaining the Current Budget for a Voluntary ACS

Using the approximate cost figues below provided by ACSO (e-mail from T. Hughes 2/18/11)

	(A)	(B)	(B /A)
	2009 Workloads	FY 11 Budget	Cost per Case
US Initial	2,897,256		
US Mail	2,757,357	$37,940,000	$13.760
US CATI	1,076,411	$19,960,000	$18.543
US CAPI	557,022	$79,988,000	$143.599
Total		$137,888,000	

The 2009 number of cases in the workload by mode (Census, 2009), we calculate the sample size required to maintain current costs accounting for a mode distribution change as follows:

Set up the following equation to determine the new sample size under voluntary methods:

(proportion of sample in mail x sample x mail unit cost) +
(proportion of sample in CATI x sample x CATI unit cost) +
(proportion of sample in CAPI x sample x CAPI unit cost) = total survey cost

$0.952n(\$13.760) + 0.427n(\$18.543) + 0.253n(\$143.599) = \$137,888,000$

where

n   = total annual sample size

0.952 $\cong$ observed proportion of sample in mail from 2009 (2,757,357/2,897,256)
        Note: No change in the mailable rate is expected in moving from mandatory to voluntary.

0.427 $\cong$ proportional change in the CATI workload moving from mandatory to voluntary (Census 2003, Table 13) $\times$ observed proportion of sample in CATI workload from 2009 (Census Bureau, 2011a)
        $= (1,206,000/1,050,000) \times (1,076,411/2,897,256)$

0.253 ≅ proportional change in the CAPI workload moving from mandatory to voluntary (Census 2003, Table 13) × observed proportion of sample in CAPI workload from 2009 (Census Bureau, 2011a)
= (632,000/480,000) × (557,022/2,897,256)

Note: These calculations account for the change due to moving from mandatory to voluntary data collection methods as well as the current (2009) response rates.

Solve for n.

n ≅ 2,404,411

2. Determine the expected workloads by mode for an annual sample of approximately 2,404,411 and voluntary data collection methods

Expected mail workload = 0.952 × 2,404,411 ≅ 2,288,999
Expected CATI workload = 0.427 × 2,404,411 ≅ 1,027,176
Expected CAPI workload = 0.253 × 2,404,411 ≅   608,607

3. Determine the expected number of interviews by mode under the new annual sample size and voluntary data collection methods

Using the 2009 mode level workloads (Census Bureau, 2011b) and the distribribution of interviews by mode in the final 2009 estimation universe (Census Bureau, 2009c),

2009 mail workload   ≅ 2,757,357
2009 CATI workload   ≅ 1,076,411
2009 CAPI workload   ≅   557,022

2009 mail interviews   ≅ 1,253,740
2009 CATI interviews   ≅   226,301
2009 CAPI interviews   ≅   437,707

Note that we use the actual number of interviews from 2009 (estimation universe) since it is the final number of interviews that are used to generate the estimates and the variance estimates.

Calculate the 2009 observed completion rates by mode.

In general, the completion rate for each data collection mode is defined as:

Number of 2009 interviews / 2009 workload.

Therefore:

2009 mail completion rate =	1,253740 / 2,757,357 ≅ 0.455
2009 CATI completion rate =	226,301 / 1,076,411 ≅ 0.210
2009 CAPI completion rate =	437,707 / 557,022 ≅ 0.786

Calculate the relative change in the completion rates by mode (Census 2003, Appendix 5 – Tables A, B, and C) moving from mandatory to voluntary data collection methods.

In general, the relative percent change in the completion rates for each data collection mode can be given as:

(completion rate mandatory – completion rate voluntary) / completion rate mandatory

Therefore we have:

Relative change in mail completion rate   = (51.7 – 32.7) / 51.7 ≅ 0.368
Relative change in CATI completion rate = (25.8 – 27.9) / 25.8 ≅ -0.081
Relative change in CAPI completion rate = (86.3 – 82.1) / 86.3 ≅ 0.049

Using these relative percent changes we adjust the 2009 observed completion rates by mode. We then apply the adjusted rates to the new projected workloads to come up with new projected interview counts by mode, under the new annual sample size and voluntary data collection procedures:

Projected mail interviews   =(1 – 0.368)   × 0.455 × 2,288,999 ≅ 658,225
Projected CATI interviews   =(1 – (-0.081)) × 0.210 × 1,027,176 ≅ 233,179
Projected CAPI interviews   =(1 – 0.049)   × 0.786 ×   608,607 ≅ 454,925

4. Determine the Change in Reliability

Using the noninterview adjusted weights (WMBF) from the 2009 ACS, we have the following sums of squared weights by mode:

Mail	≅	3,721,369,280
CATI	≅	615,272,191
CAPI	≅	8,282,116,733
Total	≅	12,618,758,204

Using these sums and the ratio of the expected number of interviews under voluntary methods and the smaller sample size to the 2009 number of interviews by mode, we calculate an adjusted sum of squared weights for each mode as follows:

To account for the increase in the weights of the sampled cases due to the smaller sample size, we calculate the following ratio:

(2009 sample size / new sample size)^2 = (2,897,256 / 2,404,411)^2 ≅ 1.452

The adjusted sum of squared weights = sum of squared weights × (expected number of interviews / 2009 interviews) × (2009 sample size / new sample size)^2

Mail   = 3,721,369,280 × (658,225/ 1,253,740) × 1.45 ≅   2,832,941,859
CATI   =   615,272,000 × (233,000/ 226,301)   × 1.45 ≅   919,259,763
CAPI   = 8,282,116,733 × (454,925/ 437,707)   × 1.45 ≅ 12,481,467,818
Total ≅ 16,233,669,440

Next we apply an adjustment to account for noninterviews and undercoverage to the sums of squared weights from 2009 and under the alternate design. See Appendix 1 Attachment A for the calculation of these factors.

For the 2009 ACS, the approximate adjustment factor is 1.011. Under the alternate design the approximate factor is 1.074. This yields the following sums of squared weights:

2009 ACS =   12,618,758,204 × 1.011^2 ≅ 12,896,204,893
Alternate design =   16,233,669,440 × 1.074^2 ≅ 18,709,563,511

Therefore, the expected change in the estimated variance due to the smaller sample size and moving from mandatory to voluntary data collection methods is calculated as:

(18,709,563,511/ 12,896,204,893) = 1.451 ≅ **45.1% increase in variance**.

Note that this expected change in the variances accounts for the decrease in sample size, the shift in the mode distribution of interviews, and increased overall nonresponse.

Attachment A

Review of 2003 Voluntary Test Variance Calculations as it Relates to the Present Work

This is to document the research into the methods used for the variance impact calculation used for the 2003 Voluntary Test (Report 3, 2003) and how it relates to the current work to update those impact assessments.

Methodology Used for 2003 Report

From the draft ACS Voluntary Test Variance and Cost Model dated 07/09/2003, the following data are used as inputs

Table A. 2003 ACS: Details for Variance Calculation Changes Due to a Voluntary ACS

Row	Category	Mandatory		Voluntary	
		Parameter	Num HUs	Parameter	Num HUs
1	Universe Num HUs		120,000,000		120,000,000
18	Total interviews	72.5%	2,174,879	59.9%	1,797,061
19	Interviews at TE	40	1,760,434	40	1,279,095
20	Interviews at TE *1.5	60	70,221	60	68,980
21	Interviews at TE * 3.0	120	344,225	120	448,986
22	Est #Hus & avg TE	53.3	115,937,566	60.8	109,180,934
23	Total adjusted SSq		8,598,661,166		10,582,463,863
23a	Total unadjusted SSq		8,026,330,000		8,760,278,400
23b	NI and Coverage Factor Squared		1.0713067		1.2080054
24	Diff from Mandatory				1,983,802,698
25	Pct Diff in Var from Mand				23.1%
26	Pct Diff in SE from Mand				10.9%

This particular table provides significantly more insight into how the variance calculation is made than the final published report. To document the calculated rows above, we have:
22) Estimated Number of Housing Units (HU) and Average Take Every (TE).
     a) Estimated number of HUs = weighted estimate of housing units using the unbiased weights only (sum product of lines 19-21).
     b) Average TE = Estimated number of housing units (line 22) divided by the Total interviews (line 18).
23) Total adjusted sum of squares of weights.
     a) This total is equal to the sum product of the TE times the number of interviews per strata (lines 19-21).
     b) Noninterview (NI) and noncoverage adjustment factor squared is equal to (Universe Number of housing units divided by Estimated Number of housing units) squared (i.e., (line 1 divided by line 22) squared).
     This factor performs a combined noninterview and noncoverage bias adjustment and is done for both the mandatory and voluntary designs.
24) Difference from mandatory current design.
     This value is simply the difference between the sums of squares from the voluntary and the mandatory designs (line 23, voluntary, minus line 23, mandatory).

Attachment A

25) Percent difference in variance from mandatory current design.
This value is simply the percent difference in the adjusted sum of squares (line 24 divided by line 23, mandatory)

26) Percent difference in standard error (SE) from mandatory current design.
This value is simply the square root of the percent change in the variances (square root of line 24)

Implications for the Current Work

On the attached table, the methodology that was used for the 2003 work is extended to the current work by Donald Keathley and Steven Hefter. The principle addition is incorporating a combined nonresponse and noncoverage bias adjustment to the sum of squares for both the mandatory and voluntary totals. Since, unlike the 2003 work, we are using the sum of squared weights after the mode bias factor rather than the weights after the CAPI sub-sampling factor the adjustment to the mandatory totals represents simply the coverage adjustment to the weighted universe total (obtained by summing the 2009 final housing unit weights for all interviewed housing units). For the voluntary sum of squares, however, it also captures the relative change in nonresponse using voluntary methods as compared to mandatory methods. In addition, the use of an average squared weight results in a more accurate estimate of the sum of squares than simply using the average weight as was done for the 2003 work.

This nonresponse-noncoverage adjustment would have a linear impact on the average weights and a squared impact on the average squared weights. Thus the adjusted sum of squares is calculated by multiplying the square of the adjustment factor by the unadjusted sum of squares. In the table given, both treatments receive the adjustment but the relationship could be normalized to obtain one factor to apply to the voluntary method only that would capture just the relative change in nonresponse. This factor would be equal to (1.07355297 / 1.01093365) = 1.061942068 and the factor modifying the sum of squares would be approximately 1.127720956. The result is that the impact on the variances moves from 28.6 percent when the factor is not applied to 45.1% with the nonresponse-noncoverage adjustment.

Calculation of Impact of Voluntary Collection Methods on Variances Assuming the 2009 ACS Mandatory Design

	Mandatory						Voluntary					
	Avg Wgt	Interviews	Weighted	Avg Sq Wgt	Adjusted SSq	Original SSq	Avg Wgt	Interviews	Weighted	Avg Sq Wgt	Adjusted SSq	Original SSq
Universe			129,949,960						129,949,960			
Sample		2,897,256						2,404,411				
Total Interviews		1,917,860	128,544,499					1,917,860	121,046,621			
Mail	51.1447	1,253,740	64,122,156	2,968.2145	3,721,369,247	3,721,369,280	61.5863742	658,225	40,537,691	4,303.9110	2,832,941,834	2,832,941,859
CATI	48.1658	226,301	10,899,969	2,718.8222	615,272,183	615,272,191	57.9993036	233,179	13,524,220	3,942.2922	919,259,751	919,259,763
CAPI	122.279	437,707	53,522,374	18,921.5999	8,282,116,727	8,282,116,733	147.243414	454,925	66,984,710	27,436.3199	12,481,467,810	12,481,467,818
Unadjusted SSq					12,618,758,157	12,618,758,204					16,233,669,395	16,233,669,440
Nonint/Cov Adj					1.01093365	1					1.07355297	1
Adjusted SSq for NI/Cov					12,896,204,893	12,618,758,204					18,709,563,511	16,233,669,440
Diff SSq V-M											5,813,358,618	3,614,911,236
Pct Diff Variance											45.1%	28.6%
Pct Diff SE											20.4%	13.4%

Notes:

Weighted Universe is the 2009 ACS National HU estimate

All estimates of sample sizes and interviews by mode come from Don/Steve's work

All estimates of weighted interviews assumes the average weight by mode

All estimates of Revised SSq assumes a fixed average squared weight

The estimated ratio of the sample size is sqrt(1.45) to be consistent with Don/Steve's work

Voluntary Avg Wgt = sqrt(1.45)*Mandatory Avg Wgt

Voluntary Avg Squared Wgt = 1.45*Mandatory Avg Squared Wgt

Average weights are based on WMBF for stateside only

Nonint/Cov Adjustment = (Weighted Universe / Weighted Interviews), for mandatory primarily is noncoverage adjustment, voluntary also adjusts for differential noninterview rate

Adj SSq for NI/Cov = Unadj SSq * (Noninterview and Coverage Adjustment)^2

Comparison of the ACS Voluntary versus Mandatory Estimates Report

2002, 2003, and 2004 ACS Month-based Estimates Comparison Using Initial and Final Weights

			2002 Initial			2003 Initial			2004 Initial			2003 Final		
NATIONAL PROFILE CHARACTERISTICS		Cat	Mand	Vol	Sig?	Mand	Vol	Sig?	Mand	Vol	Sig?	Mand	Vol	Sig?
DP02	0	**Social Characteristics in the United States**													
DP02	1	**HOUSEHOLDS BY TYPE**													
DP02	1	**Total households**													
DP02	2	Family households (families)	N8	67.69	67.18	Yes	67.34	67.83	No	67.21	67.58	Yes	67.02	67.52	Yes
DP02	3	With own children under 18 years	N6	31.78	32.01	No	31.48	31.83	No	31.33	31.54	No	31.97	32.38	Yes
DP02	4	Married-couple family	N6	51.00	50.64	No	50.83	51.02	No	50.41	50.52	No	50.07	50.42	No
DP02	5	With own children under 18 years	N6	22.28	22.49	No	22.11	22.33	No	21.87	22.02	No	22.19	22.52	No
DP02	6	Male householder, no wife present, family	N6	4.27	4.33	No	4.15	4.22	No	4.22	4.44	Yes	4.36	4.40	No
DP02	7	With own children under 18 years	N6	2.02	2.10	No	1.96	2.03	No	2.02	2.11	No	2.09	2.15	No
DP02	8	Female householder, no husband present, family	N6	12.42	12.21	No	12.36	12.58	No	12.57	12.61	No	12.59	12.70	No
DP02	9	With own children under 18 years	N6	7.49	7.42	No	7.40	7.47	No	7.43	7.42	No	7.68	7.71	No
DP02	10	Nonfamily households	N8	32.31	32.82	Yes	32.66	32.17	No	32.79	32.42	Yes	32.98	32.48	Yes
DP02	11	Householder living alone	N6	26.54	27.05	Yes	26.92	26.53	No	26.91	26.64	No	27.03	26.59	Yes
DP02	12	65 years and over	N9	9.33	9.63	Yes	9.48	9.86	Yes	9.33	9.31	No	9.10	9.19	No
DP02	12														
DP02	13	Households with one or more people under 18 years	Y1	35.24	35.48	No	34.70	35.22	Yes	34.72	34.96	No	35.19	35.77	Yes
DP02	14	Households with one or more people 65 years and over	Y1	23.53	23.49	No	23.87	24.64	Yes	23.45	23.66	No	22.94	23.10	No
DP02	14														
DP02	15	Average household size	Y1	2.53	2.53	No	2.51	2.53	Yes	2.52	2.53	No	2.61	2.64	Yes
DP02	16	Average family size	N6	3.08	3.10	Yes	3.07	3.08	No	3.08	3.09	No	3.19	3.22	Yes
DP02	16														
DP02	17	**RELATIONSHIP**													
DP02	17	**Population in households**													
DP02	18	Householder	Y1	39.55	39.57	No	39.77	39.48	Yes	39.64	39.49	No	39.62	39.40	Yes
DP02	19	Spouse	N6	20.17	20.04	Yes	20.21	20.14	No	19.98	19.95	No	19.87	19.91	No
DP02	20	Child	N6	29.66	29.80	No	29.66	29.81	No	29.87	29.95	No	29.87	29.86	No
DP02	21	Other relatives	N10	5.81	5.89	No	5.61	5.84	Yes	5.67	5.86	Yes	5.73	5.90	No
DP02	22	Nonrelatives	N6	4.81	4.69	No	4.75	4.73	No	4.84	4.75	No	4.91	4.92	No
DP02	23	Unmarried partner	Y1	1.90	1.90	No	1.98	1.88	Yes	2.05	2.05	No	2.05	1.99	No
DP02	23														
DP02	24	**MARITAL STATUS**													
DP02	24	**Males 15 years and over**													
DP02	25	Never married	N6	29.43	29.41	No	29.61	29.41	No	29.97	30.11	No	30.67	30.51	No
DP02	26	Now married, except separated	N6	57.38	57.24	No	57.18	57.55	No	56.79	56.70	No	56.29	56.55	No
DP02	27	Separated	Y1	1.75	1.77	No	1.69	1.49	Yes	1.68	1.67	No	1.74	1.54	Yes
DP02	28	Widowed	N6	2.56	2.60	No	2.59	2.68	No	2.58	2.51	No	2.44	2.49	No
DP02	29	Divorced	N6	8.88	8.98	No	8.93	8.87	No	8.98	9.01	No	8.87	8.92	No
DP02	29														

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP02	30	**Females 15 years and over**													
DP02	31	Never married	N6	24.13	24.29	No	24.21	23.98	No	24.83	24.73	No	25.00	24.66	Yes
DP02	32	Now married, except separated	N6	51.93	51.86	No	51.89	51.80	No	51.40	51.61	No	51.37	51.54	No
DP02	33	Separated	N6	2.62	2.73	No	2.52	2.51	No	2.54	2.58	No	2.59	2.58	No
DP02	34	Widowed	Y1	9.98	10.02	No	10.02	10.48	Yes	9.72	9.77	No	9.70	9.95	Yes
DP02	35	Divorced	N6	11.34	11.10	Yes	11.36	11.23	No	11.51	11.30	No	11.34	11.27	No
DP02	35														
DP02	36	**FERTILITY**													
DP02	36	**Number of women 15 to 50 years old who had a birth in the past 12 months**													
DP02	37	Unmarried women (widowed, divorced, and never married	N6	28.19	29.64	No	28.33	30.19	No	29.05	29.87	No	29.05	30.43	No
DP02	38	Per 1,000 unmarried women	N6	33.52	37.23	Yes	32.18	33.03	No	33.27	35.07	No	33.18	33.77	No
DP02	39	Per 1,000 women 15 to 50 years old	N6	55.23	58.00	Yes	53.02	50.87	No	54.22	55.28	No	53.88	51.96	No
DP02	40	Per 1,000 women 15 to 19 years old	N6	29.78	36.02	Yes	29.85	34.00	No	30.41	28.98	No	30.36	34.55	No
DP02	41	Per 1,000 women 20 to 34 years old	Y1	107.22	109.38	No	102.50	95.54	Yes	103.18	105.55	No	102.12	95.93	Yes
DP02	42	Per 1,000 women 35 to 50 years old	N6	21.12	22.99	No	20.22	20.59	No	21.68	22.34	No	20.31	20.51	No
DP02	42														
DP02	43	**GRANDPARENTS**													
DP02	43	**Number of grandparents living with own grandchildren under 18 years**													
DP02	44	Responsible for grandchildren	Y1	42.88	41.49	No	41.86	45.44	Yes	41.89	42.10	No	41.83	45.34	Yes
DP02	45	Years responsible for grandchildren														
DP02	45	Less than 1 year	N6	9.50	9.40	No	9.20	9.14	No	9.42	9.10	No	9.25	9.15	No
DP02	46	1 or 2 years	N6	10.22	9.99	No	9.52	10.28	No	9.48	9.36	No	9.55	10.22	No
DP02	47	3 or 4 years	N6	6.92	6.67	No	6.97	6.68	No	6.84	6.49	No	6.95	6.57	No
DP02	48	5 or more years	Y1	16.23	15.43	No	16.18	19.34	Yes	16.15	17.14	No	16.08	19.39	Yes
DP02	48														
DP02	49	**Number of grandparents responsible for own grandchildren under 18 years**													
DP02	50	Who are female	Y1	61.93	62.76	No	63.29	65.58	Yes	63.41	62.76	No	63.08	65.53	Yes
DP02	51	Who are married	N6	71.75	72.47	No	71.51	69.39	No	71.91	70.88	No	71.36	69.88	No
DP02	51														
DP02	52	**SCHOOL ENROLLMENT**													
DP02	52	**Population 3 years and over enrolled in school**													
DP02	53	Nursery school, preschool	N6	5.96	6.26	Yes	5.98	6.12	No	5.95	5.98	No	6.11	6.21	No
DP02	54	Kindergarten	N6	5.44	5.56	No	5.36	5.26	No	5.38	5.67	Yes	5.29	5.18	No
DP02	55	Elementary school (grades 1-8)	N7	44.70	45.29	Yes	43.98	44.93	Yes	43.95	44.79	Yes	43.28	44.10	Yes
DP02	56	High school (grades 9-12)	N6	22.09	21.69	No	22.28	22.50	No	22.10	21.78	No	22.03	22.02	No
DP02	57	College or graduate school	N7	21.80	21.20	Yes	22.40	21.19	Yes	22.62	21.77	Yes	23.28	22.50	Yes
DP02	57														
DP02	58	**EDUCATIONAL ATTAINMENT**													
DP02	58	**Population 25 years and over**													
DP02	59	Less than 9th grade	Y1	6.61	6.77	No	6.40	6.65	Yes	6.27	6.29	No	6.48	6.61	No
DP02	60	9th to 12th grade, no diploma	Y1	10.56	10.79	No	9.93	9.56	Yes	9.72	9.92	No	9.99	9.51	Yes
DP02	61	High school graduate (includes equivalency)	Y1	29.97	29.98	No	29.79	31.17	Yes	29.83	29.99	No	29.65	30.93	Yes
DP02	62	Some college, no degree	Y1	20.27	20.31	No	20.26	19.50	Yes	20.19	20.19	No	20.32	19.56	Yes

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP02	63	Associate's degree	N6	6.73	6.80	No	7.02	7.01	No	7.12	7.06	No	7.02	7.03	No
DP02	64	Bachelor's degree	N6	16.47	16.24	No	16.90	16.60	No	17.11	16.84	Yes	16.93	16.80	No
DP02	65	Graduate or professional degree	N6	9.38	9.11	Yes	9.69	9.51	No	9.76	9.72	No	9.62	9.57	No
DP02	65														
DP02	66	Percent high school graduate or higher	N6	82.83	82.43	Yes	83.66	83.79	No	84.02	83.80	No	83.54	83.88	Yes
DP02	67	Percent bachelor's degree or higher	N9	25.85	25.35	Yes	26.60	26.11	Yes	26.87	26.56	No	26.55	26.36	No
DP02	67														
DP02	68	**VETERAN STATUS**													
DP02	68	**Civilian population 18 years and over**													
DP02	69	Civilian veterans	N6	12.04	12.11	No	11.76	11.75	No	11.40	11.48	No	11.42	11.41	No
DP02	69														
DP02	70	**DISABILITY STATUS OF THE CIVILIAN NONINSTITUTIONALIZED POPULATION**													
DP02	70	**Total Civilian Noninstitutionalized Population**													
DP02	71	With a disability	N6	14.95	14.67	Yes	13.48	13.63	No	13.57	13.43	No	13.20	13.29	No
DP02	71														
DP02	72	**Under 18 years**													
DP02	73	With a disability	N6	4.96	4.68	Yes	4.62	4.65	No	4.72	4.64	No	4.57	4.61	No
DP02	73														
DP02	74	**18 to 64 years**													
DP02	75	With a disability	Y3	13.67	13.30	Yes	11.76	11.79	No	12.04	11.80	Yes	11.62	11.62	No
DP02	75														
DP02	76	**65 years and over**													
DP02	77	With a disability	N6	42.26	42.74	No	39.79	40.28	No	39.68	39.87	No	39.93	40.57	No
DP02	77														
DP02	78	**RESIDENCE 1 YEAR AGO**													
DP02	78	**Population 1 year and over**													
DP02	79	Same house	N10	84.83	84.80	No	84.93	86.61	Yes	84.15	84.55	Yes	84.51	86.16	Yes
DP02	80	Different house in the U.S.	Y1	14.58	14.59	No	14.53	12.93	Yes	15.00	14.85	No	14.94	13.36	Yes
DP02	81	Same county	Y1	9.42	9.45	No	9.39	8.23	Yes	9.69	9.64	No	9.67	8.51	Yes
DP02	82	Different county	Y1	5.16	5.14	No	5.14	4.70	Yes	5.32	5.21	No	5.27	4.86	Yes
DP02	83	Same state	Y1	2.91	2.81	No	2.90	2.69	Yes	2.99	2.92	No	2.98	2.79	Yes
DP02	84	Different state	Y1	2.25	2.34	No	2.24	2.01	Yes	2.33	2.29	No	2.29	2.07	Yes
DP02	85	Abroad	Y1	0.59	0.62	No	0.54	0.46	Yes	0.62	0.60	No	0.55	0.48	Yes
DP02	85														
DP02	86	**PLACE OF BIRTH**													
DP02	86	**Total population**													
DP02	87	Native	N6	88.63	88.43	No	88.44	88.52	No	88.21	88.24	No	88.05	88.03	No
DP02	88	Born in United States	N6	87.41	87.17	No	87.24	87.41	No	86.79	87.04	No	86.83	86.87	No
DP02	89	State of residence	Y1	59.99	60.01	No	59.70	60.29	Yes	59.42	59.68	No	59.50	59.76	No
DP02	90	Different state	N6	27.42	27.16	No	27.54	27.12	No	27.37	27.35	No	27.32	27.11	No
DP02	91	Born in Puerto Rico, U.S. Island areas, or born abroad to	N10	1.22	1.26	No	1.20	1.11	Yes	1.43	1.20	Yes	1.22	1.16	No
DP02	92	Foreign born	N6	11.37	11.57	No	11.56	11.48	No	11.79	11.76	No	11.95	11.97	No
DP02	92														

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP02	93	**U.S. CITIZENSHIP STATUS**													
DP02	93	**Foreign-born population**													
DP02	94	Naturalized U.S. citizen	N6	41.37	39.94	Yes	41.88	41.90	No	41.75	42.20	No	41.21	41.61	No
DP02	95	Not a U.S. citizen	N6	58.63	60.06	Yes	58.12	58.10	No	58.25	57.80	No	58.79	58.39	No
DP02	95														
DP02	96	**YEAR OF ENTRY**													
DP02	96	**Population born outside the United States**													
DP02	96														
DP02	97	**Native**													
DP02	98	Entered 2000 or later	Y1	6.27	5.83	No	8.64	6.22	Yes	9.69	11.46	No	8.48	6.13	Yes
DP02	99	Entered before 2000	Y1	93.73	94.17	No	91.36	93.78	Yes	90.31	88.54	No	91.52	93.87	Yes
DP02	99														
DP02	100	**Foreign born**													
DP02	101	Entered 2000 or later	N6	11.96	11.37	No	15.69	14.73	No	19.16	18.37	No	15.74	14.70	No
DP02	102	Entered before 2000	N6	88.04	88.63	No	84.31	85.27	No	80.84	81.63	No	84.26	85.30	No
DP02	102														
DP02	103	**WORLD REGION OF BIRTH OF FOREIGN BORN**													
DP02	103	**Foreign-born population, excluding population born at sea**													
DP02	104	Europe	N6	15.71	14.33	Yes	15.13	14.89	No	14.93	14.77	No	14.28	14.08	No
DP02	105	Asia	Y1	26.55	26.87	No	27.37	25.79	Yes	26.61	27.30	No	27.02	26.66	No
DP02	106	Africa	N6	2.88	3.19	No	3.13	2.89	No	3.29	3.18	No	3.18	3.02	No
DP02	107	Oceania	N6	0.62	0.56	No	0.61	0.47	No	0.60	0.57	No	0.56	0.51	No
DP02	108	Latin America	Y1	51.65	52.64	No	51.12	53.18	Yes	52.04	51.63	No	52.45	53.11	No
DP02	109	Northern America	N6	2.59	2.42	No	2.64	2.78	No	2.54	2.54	No	2.51	2.62	No
DP02	109														
DP02	110	**LANGUAGE SPOKEN AT HOME**													
DP02	110	**Population 5 years and over**													
DP02	111	English only	N6	82.26	81.91	No	81.99	82.43	No	81.43	81.55	No	81.44	81.85	Yes
DP02	112	Language other than English	N6	17.74	18.09	No	18.01	17.57	No	18.57	18.45	No	18.56	18.15	Yes
DP02	113	Speak English less than "very well"	N6	7.79	7.92	No	8.12	7.88	No	8.37	8.24	No	8.44	8.19	Yes
DP02	114	Spanish	N6	10.73	11.08	No	10.86	10.94	No	11.47	11.21	No	11.35	11.22	No
DP02	115	Speak English less than "very well"	N6	5.03	5.17	No	5.24	5.21	No	5.54	5.38	No	5.52	5.38	No
DP02	116	Other Indo-European languages	N6	3.70	3.59	No	3.68	3.51	No	3.67	3.70	No	3.67	3.53	No
DP02	117	Speak English less than "very well"	N6	1.23	1.19	No	1.28	1.20	No	1.27	1.25	No	1.27	1.20	No
DP02	118	Asian and Pacific Islander languages	Y1	2.65	2.73	No	2.78	2.55	Yes	2.73	2.82	No	2.84	2.78	No
DP02	119	Speak English less than "very well"	Y1	1.32	1.34	No	1.40	1.29	Yes	1.35	1.40	No	1.43	1.41	No
DP02	120	Other languages	N6	0.66	0.68	No	0.68	0.58	No	0.70	0.72	No	0.71	0.62	No
DP02	121	Speak English less than "very well"	N6	0.21	0.22	No	0.21	0.19	No	0.21	0.21	No	0.21	0.20	No
DP02	121														
DP02	122	**ANCESTRY**													
DP02	122	**Total population**													
DP02	123	American	Y1	7.13	7.16	No	7.04	6.72	Yes	7.01	7.07	No	6.96	6.67	No
DP02	124	Arab	N6	0.44	0.47	No	0.46	0.41	No	0.47	0.46	No	0.45	0.42	No

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP02	125	Czech	Y1	0.50	0.53 No		0.53	0.46 Yes		0.51	0.51 No		0.51	0.45 Yes	
DP02	126	Danish	N6	0.53	0.55 No		0.53	0.49 No		0.52	0.48 No		0.52	0.48 No	
DP02	127	Dutch	N6	1.88	1.86 No		1.83	1.76 No		1.82	1.78 No		1.78	1.73 No	
DP02	128	English	Y1	10.35	10.14 No		10.31	9.98 Yes		10.05	10.01 No		10.06	9.77 Yes	
DP02	129	French (except Basque)	N6	3.54	3.53 No		3.48	3.46 No		3.38	3.37 No		3.40	3.41 No	
DP02	130	French Canadian	N9	0.81	0.73 Yes		0.80	0.66 Yes		0.78	0.78 No		0.78	0.66 Yes	
DP02	131	German	N6	17.59	17.14 Yes		17.30	17.18 No		17.17	17.04 No		16.88	16.90 No	
DP02	132	Greek	N6	0.45	0.41 No		0.45	0.40 No		0.47	0.47 No		0.44	0.39 No	
DP02	133	Hungarian	N6	0.57	0.55 No		0.56	0.51 No		0.54	0.56 No		0.54	0.50 No	
DP02	134	Irish	N6	12.38	12.32 No		12.24	12.11 No		12.23	12.45 No		11.98	11.94 No	
DP02	135	Italian	Y1	5.99	5.99 No		6.09	5.72 Yes		6.01	5.93 No		5.96	5.61 Yes	
DP02	136	Lithuanian	N6	0.26	0.23 Yes		0.27	0.25 No		0.26	0.24 No		0.26	0.24 No	
DP02	137	Norwegian	N6	1.67	1.69 No		1.62	1.51 No		1.64	1.63 No		1.58	1.48 No	
DP02	138	Polish	Y1	3.36	3.32 No		3.44	3.12 Yes		3.36	3.38 No		3.34	3.07 Yes	
DP02	139	Portuguese	N6	0.50	0.50 No		0.48	0.46 No		0.49	0.48 No		0.47	0.45 No	
DP02	140	Russian	Y1	1.08	1.07 No		1.08	0.99 Yes		1.08	1.10 No		1.06	0.98 Yes	
DP02	141	Scotch-Irish	Y1	1.90	1.85 No		1.87	1.65 Yes		1.88	1.87 No		1.82	1.63 Yes	
DP02	142	Scottish	N6	2.05	2.00 No		2.09	2.15 No		2.03	2.04 No		2.05	2.10 No	
DP02	143	Slovak	Y1	0.30	0.31 No		0.30	0.26 Yes		0.30	0.27 No		0.29	0.24 Yes	
DP02	144	Subsaharan African	N6	0.57	0.59 No		0.62	0.61 No		0.72	0.66 No		0.66	0.66 No	
DP02	145	Swedish	N6	1.58	1.63 No		1.54	1.48 No		1.55	1.48 No		1.50	1.44 No	
DP02	146	Swiss	N6	0.37	0.40 No		0.36	0.33 No		0.37	0.38 No		0.35	0.32 No	
DP02	147	Ukrainian	N6	0.33	0.28 Yes		0.31	0.31 No		0.32	0.35 No		0.30	0.31 No	
DP02	148	Welsh	N6	0.66	0.70 No		0.68	0.67 No		0.69	0.67 No		0.67	0.65 No	
DP02	149	West Indian (excluding Hispanic origin groups)	N6	0.67	0.63 No		0.70	0.67 No		0.71	0.73 No		0.76	0.69 No	
DP03	0	**Selected Economic Characteristics**													
DP03	1	**Selected Economic Characteristics**													
DP03	1	**EMPLOYMENT STATUS**													
DP03	1	**Population 16 years and over**													
DP03	2	In labor force	N6	65.54	65.90 No		65.16	65.29 No		65.22	65.20 No		65.90	66.34 Yes	
DP03	3	Civilian labor force	N6	65.23	65.59 No		64.87	65.05 No		64.92	64.87 No		65.60	66.09 Yes	
DP03	4	Employed	N9	60.42	60.91 Yes		60.01	60.39 Yes		60.35	60.22 No		60.58	61.26 Yes	
DP03	5	Unemployed	Y1	4.81	4.69 No		4.86	4.66 Yes		4.57	4.65 No		5.02	4.83 Yes	
DP03	6	Armed Forces	Y1	0.31	0.31 No		0.29	0.24 Yes		0.30	0.33 No		0.31	0.26 Yes	
DP03	7	Not in labor force	N6	34.46	34.10 No		34.84	34.71 No		34.78	34.80 No		34.10	33.66 Yes	
DP03	7														
DP03	8	**Civilian labor force**													
DP03	9	Percent Unemployed	N9	7.38	7.14 Yes		7.49	7.16 Yes		7.03	7.16 No		7.65	7.31 Yes	
DP03	9														
DP03	10	**Females 16 years and over**													
DP03	11	In labor force	N6	58.86	59.19 No		58.49	58.66 No		58.58	58.54 No		58.93	59.52 Yes	
DP03	12	Civilian labor force	N6	58.78	59.13 No		58.41	58.60 No		58.49	58.46 No		58.85	59.45 Yes	
DP03	13	Employed	N6	54.42	54.97 Yes		54.01	54.49 No		54.27	54.19 No		54.33	55.21 Yes	

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP03	13														
DP03	14	**Own children under 6 years**													
DP03	15	All parents in family in labor force	N6	60.30	60.97	No	59.44	59.52	No	59.33	59.68	No	59.49	59.99	No
DP03	15														
DP03	16	**Own children 6 to 17 years**													
DP03	17	All parents in family in labor force	N10	69.24	69.70	No	68.36	69.48	Yes	67.99	69.20	Yes	68.41	69.73	Yes
DP03	17														
DP03	18	**COMMUTING TO WORK**													
DP03	18	**Workers 16 years and over**													
DP03	19	Car, truck, or van -- drove alone	N6	77.86	77.64	No	77.88	78.07	No	77.86	77.92	No	77.57	77.77	No
DP03	20	Car, truck, or van -- carpooled	Y1	10.29	10.42	No	10.25	9.85	Yes	9.99	9.98	No	10.38	9.95	Yes
DP03	21	Public transportation (excluding taxicab)	N6	4.73	4.59	No	4.51	4.45	No	4.38	4.51	No	4.71	4.68	No
DP03	22	Walked	N6	2.38	2.43	No	2.31	2.43	No	2.36	2.42	No	2.34	2.46	No
DP03	23	Other means	N6	1.31	1.39	No	1.37	1.45	No	1.46	1.37	No	1.39	1.47	No
DP03	24	Worked at home	N6	3.43	3.53	No	3.69	3.75	No	3.95	3.80	No	3.61	3.66	No
DP03	24														
DP03	25	Mean travel time to work (minutes)	N10	24.28	24.18	No	24.31	23.77	Yes	24.66	24.43	Yes	24.40	23.86	Yes
DP03	25														
DP03	26	**OCCUPATION**													
DP03	26	**Civilian employed population 16 years and over**													
DP03	27	Management, professional, and related occupations	N6	34.01	33.79	No	34.46	34.27	No	34.19	34.47	No	34.11	34.13	No
DP03	28	Service occupations	N6	15.70	15.87	No	16.10	16.22	No	16.20	16.02	No	16.26	16.35	No
DP03	29	Sales and office occupations	Y1	26.60	26.55	No	26.49	25.91	Yes	26.28	26.41	No	26.35	25.80	Yes
DP03	30	Farming, fishing, and forestry occupations	N6	0.68	0.63	No	0.66	0.74	No	0.64	0.67	No	0.68	0.74	No
DP03	31	Construction, extraction, maintenance, and repair occupati	Y1	9.32	9.24	No	9.32	9.74	Yes	9.70	9.53	No	9.49	9.86	Yes
DP03	32	Production, transportation, and material moving occupatio	N6	13.69	13.91	No	12.97	13.11	No	12.99	12.90	No	13.11	13.13	No
DP03	32														
DP03	33	**INDUSTRY**													
DP03	33	**Civilian employed population 16 years and over**													
DP03	34	Agriculture, forestry, fishing and hunting, and mining	N6	1.83	1.86	No	1.76	1.79	No	1.73	1.88	Yes	1.75	1.75	No
DP03	35	Construction	N6	6.90	6.95	No	7.10	7.36	No	7.47	7.27	No	7.21	7.43	No
DP03	36	Manufacturing	N6	12.86	13.20	Yes	12.23	12.46	No	12.10	11.91	No	12.20	12.44	No
DP03	37	Wholesale trade	Y1	3.63	3.64	No	3.74	3.53	Yes	3.72	3.86	No	3.74	3.53	Yes
DP03	38	Retail trade	N6	11.68	11.45	No	11.59	11.38	No	11.70	11.76	No	11.61	11.41	No
DP03	39	Transportation and warehousing, and utilities	N6	5.17	5.16	No	5.01	5.06	No	4.94	5.02	No	5.04	5.06	No
DP03	40	Information	N6	2.75	2.79	No	2.63	2.61	No	2.53	2.54	No	2.64	2.66	No
DP03	41	Finance and insurance, and real estate and rental and leasi	N6	7.08	6.81	Yes	7.21	7.15	No	7.16	7.16	No	7.18	7.15	No
DP03	42	Professional, scientific, and management, and administrati	Y1	9.51	9.30	No	9.71	9.23	Yes	9.73	9.67	No	9.75	9.32	Yes
DP03	43	Educational services, and health care and social assistance	N6	20.73	21.04	No	20.80	20.91	No	20.55	20.65	No	20.56	20.70	No
DP03	44	Arts, entertainment, and recreation, and accommodation a	N6	8.15	8.04	No	8.33	8.23	No	8.58	8.51	No	8.45	8.32	No
DP03	45	Other services, except public administration	Y1	4.79	4.81	No	4.91	5.17	Yes	4.86	4.83	No	4.89	5.14	Yes
DP03	46	Public administration	N6	4.91	4.94	No	4.97	5.12	No	4.93	4.93	No	4.97	5.10	No
DP03	46														

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP03	47	**CLASS OF WORKER**													
DP03	47	**Civilian employed population 16 years and over**													
DP03	48	Private wage and salary workers	N9	77.40	77.00	Yes	77.37	76.83	Yes	77.59	77.39	No	77.60	77.10	Yes
DP03	49	Government workers	Y1	15.23	15.52	No	15.12	15.80	Yes	14.88	14.98	No	15.02	15.67	Yes
DP03	50	Self-employed in own not incorporated business workers	N6	7.08	7.21	No	7.20	7.12	No	7.24	7.33	No	7.09	6.98	No
DP03	51	Unpaid family workers	Y1	0.29	0.26	No	0.31	0.25	Yes	0.29	0.30	No	0.30	0.25	Yes
DP03	51														
DP03	52	**INCOME AND BENEFITS (IN 2008 INFLATION-ADJUSTED DOLLARS)**													
DP03	52	**Total households**													
DP03	53	Less than $10,000	N6	9.02	8.95	No	8.92	8.91	No	8.93	8.61	Yes	9.10	8.99	No
DP03	54	$10,000 to $14,999	N6	6.48	6.58	No	6.40	6.64	No	6.34	6.35	No	6.41	6.51	No
DP03	55	$15,000 to $24,999	N6	12.82	12.65	No	12.59	12.74	No	12.34	12.22	No	12.63	12.67	No
DP03	56	$25,000 to $34,999	Y1	12.26	12.13	No	12.19	11.82	Yes	11.82	11.85	No	12.26	11.86	Yes
DP03	57	$35,000 to $49,999	N6	15.97	15.93	No	15.67	15.50	No	15.38	15.49	No	15.72	15.61	No
DP03	58	$50,000 to $74,999	N6	19.23	19.38	No	19.10	18.92	No	18.96	19.01	No	19.07	18.92	No
DP03	59	$75,000 to $99,999	N10	10.67	10.89	No	10.88	11.31	Yes	11.08	11.31	Yes	10.79	11.28	Yes
DP03	60	$100,000 to $149,999	N6	8.73	8.49	Yes	9.08	9.32	No	9.53	9.47	No	8.96	9.29	Yes
DP03	61	$150,000 to $199,999	N6	2.54	2.62	No	2.70	2.79	No	2.88	2.98	No	2.66	2.81	No
DP03	62	$200,000 or more	Y1	2.27	2.37	No	2.46	2.05	Yes	2.76	2.69	No	2.42	2.05	Yes
DP03	64	Mean household income (dollars)	Y4	57,232	57,841	Yes	58,549	57,548	Yes	60,321	60,780	No	58,118	57,553	Yes
DP03	64														
DP03	65	With earnings	N6	79.90	79.90	No	79.52	79.19	No	79.64	79.74	No	80.09	80.20	No
DP03	66	Mean earnings (dollars)	N6	58,509	59,218	Yes	59,931	59,735	No	61,724	62,089	No	59,429	59,534	No
DP03	67	With Social Security	Y1	27.04	26.70	No	27.44	28.16	Yes	27.16	27.09	No	26.47	26.66	No
DP03	68	Mean Social Security income (dollars)	N6	12,367	12,327	No	12,734	12,635	No	13,072	13,110	No	12,670	12,570	No
DP03	69	With retirement income	N9	17.23	16.85	Yes	17.66	17.18	Yes	17.46	17.57	No	17.01	16.36	Yes
DP03	70	Mean retirement income (dollars)	Y1	16,434	16,395	No	17,149	16,581	Yes	17,772	17,931	No	17,102	16,591	Yes
DP03	70														
DP03	71	With Supplemental Security Income	N6	3.85	3.58	Yes	3.82	3.80	No	3.81	3.84	No	3.82	3.73	No
DP03	72	Mean Supplemental Security Income (dollars)	Y1	6,592	6,577	No	6,774	6,525	Yes	6,922	6,994	No	6,763	6,523	Yes
DP03	73	With cash public assistance income	N6	2.36	2.44	No	2.42	2.38	No	2.42	2.49	No	2.50	2.46	No
DP03	74	Mean cash public assistance income (dollars)	N6	2,963	3,139	No	3,110	3,071	No	3,108	3,168	No	3,108	3,133	No
DP03	75	With Food Stamp/SNAP benefits in the past 12 months	N9	6.29	6.07	Yes	6.59	6.27	Yes	7.24	7.13	No	6.80	6.40	Yes
DP03	75														
DP03	76	**Families**													
DP03	77	Less than $10,000	N6	5.41	5.33	No	5.25	5.22	No	5.43	5.29	No	5.47	5.37	No
DP03	78	$10,000 to $14,999	N6	4.24	4.40	No	4.08	4.26	No	3.97	3.98	No	4.16	4.29	No
DP03	79	$15,000 to $24,999	N6	10.55	10.38	No	10.24	10.58	No	9.99	10.10	No	10.35	10.53	No
DP03	80	$25,000 to $34,999	N6	11.44	11.17	Yes	11.35	11.18	No	10.89	10.85	No	11.43	11.18	No
DP03	81	$35,000 to $49,999	N6	16.24	16.19	No	15.99	15.86	No	15.57	15.49	No	15.98	15.88	No
DP03	82	$50,000 to $74,999	N6	21.82	22.08	No	21.61	21.21	No	21.23	21.35	No	21.52	21.11	No
DP03	83	$75,000 to $99,999	N6	13.10	13.31	No	13.37	13.71	No	13.55	13.76	No	13.26	13.68	Yes
DP03	84	$100,000 to $149,999	Y4	11.05	10.76	Yes	11.51	11.86	Yes	12.12	11.92	No	11.35	11.81	Yes

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP03	85	$150,000 to $199,999	N6	3.25	3.35 No		3.44	3.50 No		3.71	3.81 No		3.39	3.50 No	
DP03	86	$200,000 or more	Y1	2.90	3.03 No		3.16	2.62 Yes		3.55	3.45 No		3.10	2.64 Yes	
DP03	88	Mean family income (dollars)	Y4	66,066	66,753 Yes		67,731	66,256 Yes		70,065	70,264 No		67,148	66,177 Yes	
DP03	88														
DP03	89	Per capita income (dollars)	Y4	22,635	22,889 Yes		23,283	22,720 Yes		23,910	24,005 No		23,144	22,821 Yes	
DP03	89														
DP03	90	**Nonfamily households**													
DP03	92	Mean nonfamily income (dollars)	N6	36,334	37,216 Yes		37,242	36,813 No		37,982	38,622 No		37,347	37,213 No	
DP03	92														
DP03	103	**PERCENTAGE OF FAMILIES AND PEOPLE WHOSE INCOME IN THE PAST 12 MONTHS IS BELOW THE POVERTY LEVEL**													
DP03	103	All families	N6	9.52	9.55 No		9.45	9.60 No		10.03	9.79 No		9.80	9.86 No	
DP03	104	With related children under 18 years	N6	14.64	14.48 No		14.50	14.74 No		15.43	15.05 No		14.92	15.00 No	
DP03	105	With related children under 5 years only	Y1	15.72	15.36 No		15.90	17.47 Yes		16.41	16.92 No		16.43	17.48 No	
DP03	106	Married couple families	N6	4.74	4.66 No		4.71	4.90 No		5.04	4.83 No		4.81	4.98 No	
DP03	107	With related children under 18 years	N6	6.46	6.36 No		6.40	6.73 No		6.96	6.52 No		6.52	6.82 No	
DP03	108	With related children under 5 years only	N6	6.10	6.28 No		6.13	6.45 No		6.36	6.33 No		6.27	6.51 No	
DP03	109	Families with female householder, no husband present	N6	28.00	28.46 No		27.77	27.37 No		28.92	29.02 No		28.48	27.97 No	
DP03	110	With related children under 18 years	N6	36.20	36.45 No		35.94	35.77 No		37.39	37.61 No		36.51	36.14 No	
DP03	111	With related children under 5 years only	Y1	44.09	43.57 No		46.03	50.42 Yes		45.34	45.92 No		46.69	49.90 No	
DP03	111														
DP03	112	All people	N6	12.54	12.42 No		12.55	12.70 No		13.22	12.86 Yes		12.85	12.83 No	
DP03	113	Under 18 years	N6	17.75	17.72 No		17.54	17.82 No		18.66	18.01 No		17.88	17.78 No	
DP03	114	Related children under 18 years	N6	17.35	17.33 No		17.18	17.43 No		18.27	17.69 No		17.52	17.41 No	
DP03	115	Related children under 5 years	Y5	20.10	20.35 No		20.29	21.54 Yes		21.17	20.08 Yes		20.76	21.48 No	
DP03	116	Related children 5 to 17 years	N6	16.37	16.21 No		16.07	15.97 No		17.24	16.85 No		16.30	15.89 No	
DP03	117	18 years and over	N6	10.72	10.56 No		10.84	10.93 No		11.33	11.06 Yes		11.13	11.15 No	
DP03	118	18 to 64 years	Y3	10.97	10.66 Yes		11.10	11.10 No		11.71	11.41 Yes		11.39	11.32 No	
DP03	119	65 years and over	N6	9.51	10.05 Yes		9.61	10.15 No		9.47	9.35 No		9.79	10.25 No	
DP03	120	People in families	N6	10.56	10.58 No		10.48	10.74 No		11.19	10.94 No		10.78	10.84 No	
DP03	121	Unrelated individuals 15 years and over	Y3	22.04	21.19 Yes		22.35	22.23 No		22.78	22.09 Yes		22.54	22.34 No	
DP04	0	**Selected Housing Characteristics**													
DP04	1	**Selected Housing Characteristics**													
DP04	1	**HOUSING OCCUPANCY**													
DP04	1	**Total housing units**													
DP04	2	Occupied housing units	Y1	89.24	88.99 No		89.25	87.55 Yes		88.67	88.60 No		89.78	88.69 Yes	
DP04	3	Vacant housing units	Y1	10.76	11.01 No		10.75	12.45 Yes		11.33	11.40 No		10.22	11.31 Yes	
DP04	3														
DP04	4	Homeowner vacancy rate	N6	1.77	1.74 No		1.74	1.93 No		1.64	1.81 No		1.68	1.76 No	
DP04	5	Rental vacancy rate	Y1	8.01	7.95 No		8.65	10.13 Yes		9.11	9.30 No		7.90	8.80 Yes	
DP04	5														
DP04	6	**UNITS IN STRUCTURE**													
DP04	6	**Total housing units**													
DP04	7	1-unit, detached	N6	61.21	60.64 Yes		61.42	61.57 No		61.47	61.57 No		60.56	60.75 No	

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP04	8	1-unit, attached	Y1	5.49	5.42 No		5.53	5.34 Yes		5.61	5.63 No		5.55	5.40 No
DP04	9	2 units	N6	4.45	4.53 No		4.10	4.06 No		4.09	4.17 No		4.19	4.14 No
DP04	10	3 or 4 units	N6	4.64	4.65 No		4.63	4.72 No		4.57	4.69 No		4.78	4.87 No
DP04	11	5 to 9 units	N6	4.86	5.08 Yes		4.89	4.81 No		4.90	4.92 No		5.09	4.96 No
DP04	12	10 to 19 units	N6	4.35	4.43 No		4.46	4.64 No		4.51	4.39 No		4.65	4.87 Yes
DP04	13	20 or more units	N6	7.51	7.65 No		7.73	7.63 No		7.72	7.57 No		8.00	7.87 No
DP04	14	Mobile home	N6	7.41	7.54 No		7.16	7.16 No		7.04	6.98 No		7.10	7.07 No
DP04	15	Boat, RV, van, etc.	N6	0.07	0.05 Yes		0.08	0.07 No		0.08	0.08 No		0.08	0.07 No
DP04	15														
DP04	16	**YEAR STRUCTURE BUILT**													
DP04	16	**Total housing units**													
DP04	18	Built 1995 or later	Y5	11.87	11.86 No		13.50	13.06 Yes		13.63	14.34 Yes		13.61	13.21 Yes
DP04	19	Built 1990 to 1994	N6	7.19	7.19 No		7.22	7.30 No		7.94	6.96 Yes		7.23	7.38 No
DP04	20	Built 1980 to 1989	Y1	15.28	15.30 No		14.80	14.43 Yes		14.98	14.87 No		14.83	14.45 Yes
DP04	21	Built 1970 to 1979	N6	17.75	17.82 No		17.48	17.41 No		17.46	17.54 No		17.48	17.43 No
DP04	22	Built 1960 to 1969	N6	12.62	12.52 No		12.48	12.46 No		12.40	12.29 No		12.45	12.45 No
DP04	23	Built 1950 to 1959	N6	12.57	12.51 No		12.41	12.57 No		12.13	12.17 No		12.37	12.49 No
DP04	24	Built 1940 to 1949	N9	6.79	7.06 Yes		6.67	7.12 Yes		6.49	6.56 No		6.67	7.08 Yes
DP04	25	Built 1939 or earlier	N6	15.93	15.74 No		15.44	15.64 No		14.96	15.26 No		15.36	15.52 No
DP04	25														
DP04	26	**ROOMS**													
DP04	26	**Total housing units**													
DP04	27	1 room	N6	1.52	1.56 No		1.54	1.44 No		0.96	1.00 No		1.60	1.51 No
DP04	28	2 rooms	Y1	3.60	3.59 No		3.57	3.22 Yes		3.16	3.19 No		3.69	3.34 Yes
DP04	29	3 rooms	Y4	9.51	9.87 Yes		9.68	9.11 Yes		9.26	9.34 No		9.96	9.38 Yes
DP04	30	4 rooms	Y1	17.41	17.59 No		17.16	17.66 Yes		17.68	17.77 No		17.39	17.79 Yes
DP04	31	5 rooms	Y1	21.88	21.76 No		21.57	21.94 Yes		21.93	21.63 No		21.52	21.86 No
DP04	32	6 rooms	Y1	18.89	18.89 No		18.81	19.56 Yes		18.98	18.81 No		18.60	19.32 Yes
DP04	33	7 rooms	N6	12.08	11.95 No		12.10	11.96 No		12.31	12.35 No		11.92	11.81 No
DP04	34	8 rooms	N6	7.76	7.67 No		7.84	7.68 No		7.88	7.98 No		7.71	7.63 No
DP04	35	9 rooms or more	N9	7.37	7.12 Yes		7.73	7.43 Yes		7.84	7.92 No		7.60	7.36 Yes
DP04	36														
DP04	37	**BEDROOMS**													
DP04	37	**Total housing units**													
DP04	38	No bedroom	N6	1.92	1.91 No		1.92	1.83 No		1.25	1.31 No		2.00	1.93 No
DP04	39	1 bedroom	Y4	12.33	12.84 Yes		12.39	12.02 Yes		11.86	12.02 No		12.75	12.35 Yes
DP04	40	2 bedrooms	Y1	28.62	28.58 No		28.16	28.64 Yes		28.38	28.28 No		28.31	28.68 No
DP04	41	3 bedrooms	N6	39.38	39.34 No		39.36	39.73 No		39.91	39.75 No		39.00	39.41 Yes
DP04	42	4 bedrooms	N6	14.45	14.13 Yes		14.65	14.40 No		15.00	15.00 No		14.46	14.28 No
DP04	43	5 or more bedrooms	N6	3.30	3.20 No		3.52	3.38 No		3.60	3.64 No		3.48	3.36 No
DP04	43														
DP04	44	**HOUSING TENURE**													
DP04	44	**Occupied housing units**													

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP04	45	Owner-occupied	N6	67.18	67.04	No	67.75	68.13	No	67.73	67.72	No	66.39	66.67	No
DP04	46	Renter-occupied	N6	32.82	32.96	No	32.25	31.87	No	32.27	32.28	No	33.61	33.33	No
DP04	46														
DP04	47	Average household size of owner-occupied unit	N6	2.63	2.63	No	2.61	2.62	No	2.62	2.63	No	2.72	2.75	Yes
DP04	48	Average household size of renter-occupied unit	Y1	2.33	2.32	No	2.31	2.34	Yes	2.33	2.33	No	2.39	2.42	Yes
DP04	48														
DP04	49	**YEAR HOUSEHOLDER MOVED INTO UNIT**													
DP04	49	**Occupied housing units**													
DP04	51	Moved in 2000 or later	N7	30.07	28.18	Yes	37.21	34.74	Yes	43.57	42.14	Yes	38.29	36.04	Yes
DP04	52	Moved in 1990 to 1999	N7	38.97	40.67	Yes	33.70	35.11	Yes	29.40	30.52	Yes	33.59	35.04	Yes
DP04	53	Moved in 1980 to 1989	N10	13.77	13.82	No	12.77	13.12	Yes	12.04	12.34	Yes	12.47	12.80	Yes
DP04	54	Moved in 1970 to 1979	N9	8.78	9.07	Yes	8.37	8.71	Yes	7.80	7.83	No	8.07	8.37	Yes
DP04	55	Moved in 1969 or earlier	Y1	8.40	8.27	No	7.96	8.31	Yes	7.19	7.17	No	7.58	7.73	No
DP04	55														
DP04	56	**VEHICLES AVAILABLE**													
DP04	56	**Occupied housing units**													
DP04	57	No vehicles available	N6	8.95	9.23	Yes	8.89	8.87	No	8.67	8.64	No	9.15	8.98	No
DP04	58	1 vehicle available	N6	33.47	33.40	No	33.14	32.82	No	33.20	33.04	No	33.40	33.07	No
DP04	59	2 vehicles available	N6	38.36	38.53	No	38.56	38.74	No	38.47	38.64	No	38.32	38.54	No
DP04	60	3 or more vehicles available	N6	19.22	18.84	Yes	19.41	19.57	No	19.66	19.68	No	19.13	19.41	No
DP04	60														
DP04	61	**HOUSE HEATING FUEL**													
DP04	61	**Occupied housing units**													
DP04	62	Utility gas	N6	50.50	50.04	No	50.99	50.86	No	50.88	50.97	No	50.83	50.70	No
DP04	63	Bottled, tank, or LP gas	N6	6.49	6.56	No	6.22	6.09	No	6.10	6.31	No	6.11	5.94	No
DP04	64	Electricity	N6	30.84	30.85	No	30.99	31.14	No	31.46	31.35	No	31.33	31.57	No
DP04	65	Fuel oil, kerosene, etc.	N6	8.92	9.15	No	8.70	8.79	No	8.39	8.44	No	8.62	8.70	No
DP04	66	Coal or coke	N6	0.16	0.19	No	0.15	0.17	No	0.15	0.14	No	0.14	0.16	No
DP04	67	Wood	N6	1.79	1.85	No	1.72	1.77	No	1.65	1.55	No	1.69	1.73	No
DP04	68	Solar energy	N6	0.03	0.03	No	0.03	0.03	No	0.03	0.03	No	0.03	0.03	No
DP04	69	Other fuel	N6	0.40	0.36	No	0.39	0.39	No	0.38	0.40	No	0.39	0.38	No
DP04	70	No fuel used	N8	0.87	0.98	Yes	0.82	0.78	No	0.97	0.81	Yes	0.85	0.79	No
DP04	70														
DP04	71	**SELECTED CHARACTERISTICS**													
DP04	71	**Occupied housing units**													
DP04	72	Lacking complete plumbing facilities	N6	0.48	0.45	No	0.42	0.41	No	0.44	0.39	No	0.42	0.42	No
DP04	73	Lacking complete kitchen facilities	N6	0.58	0.53	No	0.52	0.55	No	0.53	0.51	No	0.53	0.56	No
DP04	74	No telephone service available	N6	3.37	3.24	No	3.71	3.66	No	4.43	4.12	Yes	3.90	3.81	No
DP04	74														
DP04	75	**OCCUPANTS PER ROOM**													
DP04	75	**Occupied housing units**													
DP04	76	1.00 or less	N6	96.19	96.13	No	96.31	96.46	No	96.94	96.85	No	96.18	96.34	No
DP04	77	1.01 to 1.50	N6	2.54	2.65	No	2.51	2.57	No	2.31	2.43	No	2.59	2.63	No

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP04	78	1.51 or more	Y1	1.27	1.22 No		1.17	0.97 Yes		0.75	0.73 No		1.23	1.03 Yes	
DP04	78														
DP04	79	**VALUE**													
DP04	79	**Owner-occupied units**													
DP04	80	Less than $50,000	N6	12.06	12.18 No		10.83	10.93 No		9.98	10.19 No		10.86	10.81 No	
DP04	81	$50,000 to $99,999	Y3	24.97	25.55 Yes		22.60	22.70 No		20.14	20.93 Yes		22.56	22.45 No	
DP04	82	$100,000 to $149,999	N9	20.91	21.40 Yes		20.03	20.57 Yes		18.78	18.80 No		20.04	20.65 Yes	
DP04	83	$150,000 to $199,999	N6	14.33	14.30 No		14.31	14.31 No		14.09	14.39 No		14.33	14.43 No	
DP04	84	$200,000 to $299,999	N6	13.10	13.11 No		14.22	14.15 No		14.71	14.50 No		14.26	14.22 No	
DP04	85	$300,000 to $499,999	Y3	9.85	9.10 Yes		11.94	11.62 No		13.74	13.31 Yes		11.92	11.71 No	
DP04	86	$500,000 to $999,999	N7	3.92	3.55 Yes		5.02	4.77 Yes		7.10	6.43 Yes		4.99	4.78 No	
DP04	87	$1,000,000 or more	Y1	0.86	0.81 No		1.06	0.95 Yes		1.46	1.44 No		1.05	0.95 No	
DP04	88														
DP04	89	**MORTGAGE STATUS**													
DP04	89	**Owner-occupied units**													
DP04	90	Housing units with a mortgage	Y1	65.99	65.93 No		66.53	65.93 Yes		67.16	67.05 No		67.10	66.92 No	
DP04	91	Housing units without a mortgage	Y1	34.01	34.07 No		33.47	34.07 Yes		32.84	32.95 No		32.90	33.08 No	
DP04	91														
DP04	92	**SELECTED MONTHLY OWNER COSTS (SMOC)**													
DP04	92	**Housing units with a mortgage**													
DP04	93	Less than $300	N6	0.67	0.64 No		0.62	0.59 No		0.57	0.36 Yes		0.62	0.59 No	
DP04	94	$300 to $499	Y3	4.97	4.70 Yes		4.53	4.60 No		4.00	3.62 Yes		4.50	4.52 No	
DP04	95	$500 to $699	N8	11.24	11.73 Yes		10.67	10.70 No		9.73	9.42 Yes		10.65	10.57 No	
DP04	96	$700 to $999	N6	23.00	23.00 No		22.29	22.41 No		21.22	20.93 No		22.32	22.34 No	
DP04	97	$1,000 to $1,499	N10	30.38	30.55 No		30.14	31.00 Yes		29.93	31.12 Yes		30.19	31.12 Yes	
DP04	98	$1,500 to $1,999	N6	15.62	15.46 No		16.01	15.63 No		16.78	16.86 No		16.04	15.70 No	
DP04	99	$2,000 or more	Y1	14.12	13.91 No		15.73	15.06 Yes		17.76	17.68 No		15.69	15.16 Yes	
DP04	100														
DP04	101	**Housing units without a mortgage**													
DP04	102	Less than $100	N10	2.53	2.46 No		2.24	1.87 Yes		2.17	1.79 Yes		2.27	1.92 Yes	
DP04	103	$100 to $199	N7	17.41	15.95 Yes		15.27	13.93 Yes		13.51	11.77 Yes		15.37	14.01 Yes	
DP04	104	$200 to $299	N7	28.20	27.47 Yes		26.42	25.29 Yes		24.47	22.29 Yes		26.41	25.24 Yes	
DP04	105	$300 to $399	N6	21.38	22.44 Yes		21.74	21.91 No		21.76	21.81 No		21.69	21.82 No	
DP04	106	$400 or more	N7	30.49	31.67 Yes		34.33	37.01 Yes		38.10	42.34 Yes		34.25	37.02 Yes	
DP04	107														
DP04	108	**SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)**													
DP04	108	**Housing units with a mortgage (excluding units where SMOCAPI cannot be computed)**													
DP04	109	Less than 20.0 percent	Y5	39.92	40.44 No		39.00	39.74 Yes		38.12	37.09 Yes		38.89	39.78 Yes	
DP04	110	20.0 to 24.9 percent	Y1	17.02	17.25 No		17.01	16.42 Yes		16.79	17.08 No		17.04	16.47 Yes	
DP04	111	25.0 to 29.9 percent	Y5	12.23	12.19 No		12.43	11.96 Yes		12.44	12.85 Yes		12.46	11.97 Yes	
DP04	112	30.0 to 34.9 percent	N6	8.29	8.03 No		8.23	8.06 No		8.35	8.56 No		8.24	8.12 No	
DP04	113	35.0 percent or more	N6	22.55	22.10 No		23.34	23.83 No		24.30	24.42 No		23.38	23.66 No	
DP04	113														

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP04	114	Not computed													
DP04	114														
DP04	115	**Housing unit without a mortgage (excluding units where SMOCAPI cannot be computed)**													
DP04	116	Less than 10.0 percent	N7	44.36	43.59	Yes	42.75	40.74	Yes	41.25	38.93	Yes	42.91	41.24	Yes
DP04	117	10.0 to 14.9 percent	N6	19.95	19.67	No	20.06	19.43	No	20.06	20.67	Yes	20.03	19.45	No
DP04	118	15.0 to 19.9 percent	N6	11.36	11.60	No	11.94	11.70	No	11.93	12.18	No	11.90	11.59	No
DP04	119	20.0 to 24.9 percent	N6	7.14	6.99	No	7.39	7.64	No	7.44	7.55	No	7.36	7.48	No
DP04	120	25.0 to 29.9 percent	N10	4.42	4.59	No	4.46	5.20	Yes	4.84	5.32	Yes	4.43	5.14	Yes
DP04	121	30.0 to 34.9 percent	N7	2.95	3.40	Yes	3.14	3.55	Yes	3.38	3.74	Yes	3.12	3.44	No
DP04	122	35.0 percent or more	N10	9.80	10.15	No	10.27	11.74	Yes	11.10	11.61	Yes	10.25	11.66	Yes
DP04	122														
DP04	123	Not computed													
DP04	123														
DP04	124	**GROSS RENT**													
DP04	124	**Occupied units paying rent**													
DP04	125	Less than $200	N6	4.17	4.43	No	4.03	4.24	No	3.89	3.96	No	4.00	4.12	No
DP04	126	$200 to $299	N6	4.67	4.62	No	4.35	4.66	No	4.02	4.18	No	4.28	4.47	No
DP04	127	$300 to $499	N6	18.65	19.70	Yes	17.38	17.14	No	15.91	15.89	No	17.27	16.96	No
DP04	128	$500 to $749	Y1	34.24	34.42	No	32.53	33.58	Yes	32.37	32.53	No	32.71	33.78	Yes
DP04	129	$750 to $999	N9	21.16	20.41	Yes	22.35	21.28	Yes	22.80	23.02	No	22.51	21.53	Yes
DP04	130	$1,000 to $1,499	N6	12.48	12.43	No	14.19	14.03	No	15.18	14.83	No	14.15	14.18	No
DP04	131	$1,500 or more	N6	4.63	3.99	Yes	5.17	5.07	No	5.84	5.59	No	5.08	4.96	No
DP04	132														
DP04	133	No rent paid													
DP04	133														
DP04	134	**GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI)**													
DP04	134	**Occupied units paying rent (excluding units where GRAPI cannot be computed)**													
DP04	135	Less than 15.0 percent	N6	15.62	16.35	Yes	14.48	14.94	No	13.71	14.22	No	14.43	14.97	No
DP04	136	15.0 to 19.9 percent	N6	14.26	14.53	No	13.53	14.01	No	12.92	13.07	No	13.54	14.09	No
DP04	137	20.0 to 24.9 percent	N6	13.45	13.57	No	13.44	13.34	No	13.05	13.05	No	13.46	13.42	No
DP04	138	25.0 to 29.9 percent	N6	11.53	11.93	No	11.73	11.63	No	11.94	11.74	No	11.69	11.57	No
DP04	139	30.0 to 34.9 percent	N6	8.66	8.42	No	8.73	8.52	No	8.73	8.80	No	8.72	8.46	No
DP04	140	35.0 percent or more	N6	36.49	35.20	Yes	38.09	37.56	No	39.64	39.12	No	38.15	37.50	No
DP04	140														
DP04	141	Not computed													
DP05	0	**ACS Demographic and Housing Estimates**													
DP05	1	**ACS Demographic and Housing Estimates**													
DP05	1	**SEX AND AGE**													
DP05	1	**Total population**													
DP05	2	Male	N6	48.29	48.32	No	48.38	48.27	No	48.35	48.40	No	48.94	48.90	No
DP05	3	Female	N6	51.71	51.68	No	51.62	51.73	No	51.65	51.60	No	51.06	51.10	No
DP05	3														
DP05	4	Under 5 years	N6	6.78	7.05	Yes	6.73	6.77	No	6.80	6.75	No	6.97	6.96	No

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP05	5	5 to 9 years	N6	7.21	7.38	Yes	7.09	7.09	No	7.17	7.25	No	6.99	6.92	No
DP05	6	10 to 14 years	N6	7.72	7.50	Yes	7.58	7.70	No	7.65	7.80	No	7.46	7.52	No
DP05	7	15 to 19 years	N6	6.81	6.83	No	6.79	6.85	No	6.82	6.81	No	6.71	6.68	No
DP05	8	20 to 24 years	N6	6.15	6.15	No	6.20	6.05	No	6.33	6.22	No	6.76	6.74	No
DP05	9	25 to 34 years	N6	13.24	13.43	No	13.05	13.09	No	12.88	13.07	No	13.74	13.73	No
DP05	10	35 to 44 years	N6	15.52	15.68	No	15.12	15.14	No	14.93	14.91	No	15.37	15.45	Yes
DP05	11	45 to 54 years	N6	14.47	14.23	Yes	14.58	14.38	No	14.61	14.44	No	14.25	14.24	No
DP05	12	55 to 59 years	N6	5.45	5.31	Yes	5.71	5.59	No	5.84	5.76	No	5.49	5.49	No
DP05	13	60 to 64 years	N6	4.22	4.08	Yes	4.46	4.37	No	4.54	4.51	No	4.28	4.28	No
DP05	14	65 to 74 years	Y1	6.65	6.63	No	6.76	6.94	Yes	6.61	6.65	No	6.37	6.36	No
DP05	15	75 to 84 years	N6	4.51	4.46	No	4.61	4.61	No	4.48	4.55	No	4.37	4.31	Yes
DP05	16	85 years and over	Y1	1.27	1.25	No	1.32	1.41	Yes	1.33	1.28	No	1.25	1.30	No
DP05	16														
DP05	17														
DP05	18	18 years and over	N6	73.87	73.71	No	74.24	73.99	No	73.99	73.85	No	74.30	74.31	No
DP05	19	21 years and over	N6	70.28	70.11	No	70.59	70.39	No	70.33	70.20	No	70.55	70.57	No
DP05	20	62 years and over	N6	14.83	14.69	No	15.16	15.41	No	14.94	15.01	No	14.37	14.36	No
DP05	21	65 years and over	Y1	12.43	12.34	No	12.69	12.96	Yes	12.42	12.48	No	11.99	11.97	No
DP05	21														
DP05	22	**18 years and over**													
DP05	23	Male	N6	47.42	47.34	No	47.43	47.27	No	47.40	47.56	No	48.18	48.12	Yes
DP05	24	Female	N6	52.58	52.66	No	52.57	52.73	No	52.60	52.44	No	51.82	51.88	Yes
DP05	24														
DP05	25	**65 years and over**													
DP05	26	Male	Y5	42.54	42.35	No	42.70	41.99	Yes	42.65	43.24	Yes	42.43	42.34	No
DP05	27	Female	Y5	57.46	57.65	No	57.30	58.01	Yes	57.35	56.76	Yes	57.57	57.66	No
DP05	27														
DP05	28	**RACE**													
DP05	28	**Total population**													
DP05	29	One race													
DP05	30	Two or more races													
DP05	30														
DP05	31	One race	N6	97.73	97.68	No	98.17	98.22	No	98.09	98.16	No	98.14	98.21	No
DP05	32	White	N6	76.75	76.16	Yes	77.14	77.60	No	76.39	76.56	No	76.01	76.83	Yes
DP05	33	Black or African American	Y1	11.50	11.62	No	11.29	11.83	Yes	11.53	11.50	No	12.11	12.23	Yes
DP05	34	American Indian and Alaska Native	N6	0.72	0.79	No	0.80	0.80	No	0.81	0.77	No	0.79	0.75	No
DP05	35	Cherokee tribal grouping	N6	0.11	0.09	Yes	0.14	0.15	No	0.13	0.11	No	0.12	0.13	No
DP05	36	Chippewa tribal grouping	N6	0.03	0.04	No	0.03	0.03	No	0.04	0.03	No	0.03	0.02	No
DP05	37	Navajo tribal grouping	N6	0.05	0.05	No	0.07	0.06	No	0.08	0.09	No	0.09	0.07	No
DP05	38	Sioux tribal grouping	N6	0.03	0.03	No	0.03	0.03	No	0.03	0.02	No	0.03	0.03	No
DP05	39	Asian	Y1	3.83	4.00	No	4.06	3.84	Yes	4.13	4.13	No	4.14	4.16	No
DP05	40	Asian Indian	N6	0.70	0.68	No	0.77	0.70	No	0.78	0.79	No	0.79	0.76	No
DP05	41	Chinese	Y1	0.91	0.89	No	0.94	0.84	Yes	0.95	1.01	No	0.96	0.91	No

	L#		Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
DP05	42	Filipino	Y1	0.69	0.66 No		0.74	0.59 Yes		0.75	0.75 No		0.74	0.63 Yes	
DP05	43	Japanese	N6	0.27	0.29 No		0.29	0.32 No		0.28	0.28 No		0.29	0.34 Yes	
DP05	44	Korean	N6	0.37	0.42 No		0.41	0.38 No		0.42	0.43 No		0.42	0.43 No	
DP05	45	Vietnamese	N6	0.39	0.39 No		0.45	0.48 No		0.44	0.45 No		0.45	0.53 Yes	
DP05	46	Other Asian	N8	0.51	0.67 Yes		0.46	0.52 No		0.52	0.43 Yes		0.48	0.57 Yes	
DP05	47	Native Hawaiian and Other Pacific Islander	N6	0.13	0.14 No		0.14	0.12 No		0.13	0.18 Yes		0.14	0.14 No	
DP05	48	Native Hawaiian	Y5	0.05	0.05 No		0.05	0.03 Yes		0.04	0.08 Yes		0.05	0.04 Yes	
DP05	49	Guamanian or Chamorro	N6	0.02	0.03 No		0.02	0.04 No		0.02	0.02 No		0.02	0.04 Yes	
DP05	50	Samoan	N6	0.03	0.01 No		0.03	0.02 No		0.02	0.03 No		0.02	0.02 No	
DP05	51	Other Pacific Islander	N6	0.04	0.05 No		0.04	0.03 No		0.05	0.05 No		0.04	0.04 No	
DP05	52	Some other race	Y1	4.80	4.97 No		4.74	4.03 Yes		5.10	5.01 No		4.95	4.10 Yes	
DP05	53	Two or more races	N6	2.27	2.32 No		1.83	1.78 No		1.91	1.84 No		1.86	1.79 No	
DP05	54	White and Black or African American	N6	0.37	0.38 No		0.37	0.35 No		0.40	0.37 No		0.39	0.38 No	
DP05	55	White and American Indian and Alaska Native	Y1	0.60	0.63 No		0.47	0.53 Yes		0.53	0.55 No		0.44	0.46 No	
DP05	56	White and Asian	N6	0.32	0.32 No		0.29	0.30 No		0.31	0.28 No		0.30	0.32 No	
DP05	57	Black or African American and American Indian and Al	Y1	0.09	0.09 No		0.07	0.04 Yes		0.07	0.07 No		0.07	0.04 Yes	
DP05	57														
DP05	58	*Race alone or in combination with one or more other races*													
DP05	58	**Total population**													
DP05	59	White	N6	78.68	78.12 Yes		78.70	79.20 No		78.05	78.18 No		77.59	78.43 Yes	
DP05	60	Black or African American	Y1	12.17	12.30 No		11.90	12.38 Yes		12.16	12.08 No		12.76	12.83 No	
DP05	61	American Indian and Alaska Native	N6	1.54	1.61 No		1.42	1.47 No		1.50	1.47 No		1.39	1.36 No	
DP05	62	Asian	Y1	4.37	4.54 No		4.51	4.25 Yes		4.59	4.57 No		4.61	4.61 No	
DP05	63	Native Hawaiian and Other Pacific Islander	Y2	0.27	0.32 Yes		0.27	0.19 Yes		0.24	0.30 Yes		0.27	0.22 Yes	
DP05	64	Some other race	Y1	5.42	5.59 No		5.16	4.42 Yes		5.49	5.38 No		5.38	4.49 Yes	
DP05	64														
DP05	65	**HISPANIC OR LATINO AND RACE**													
DP05	65	**Total population**													
DP05	66	Hispanic or Latino (of any race)	N6	13.07	13.37 No		13.30	13.64 No		14.11	13.91 No		13.85	13.85 No	
DP05	67	Mexican	Y1	8.37	8.48 No		8.52	9.26 Yes		8.94	8.89 No		8.86	9.16 Yes	
DP05	68	Puerto Rican	N10	1.22	1.32 No		1.27	1.15 Yes		1.53	1.38 Yes		1.32	1.27 No	
DP05	69	Cuban	N6	0.47	0.50 No		0.48	0.43 No		0.50	0.50 No		0.49	0.46 No	
DP05	70	Other Hispanic or Latino	Y1	3.02	3.07 No		3.02	2.79 Yes		3.14	3.15 No		3.18	2.96 Yes	
DP05	71	Not Hispanic or Latino	N6	86.93	86.63 No		86.70	86.36 No		85.89	86.09 No		86.15	86.15 No	
DP05	72	White alone	N6	69.27	68.59 Yes		69.23	68.73 No		68.05	68.39 No		67.78	67.82 Yes	
DP05	73	Black or African American alone	Y1	11.28	11.41 No		11.09	11.60 Yes		11.31	11.26 No		11.90	11.99 Yes	
DP05	74	American Indian and Alaska Native alone	N6	0.63	0.65 No		0.70	0.68 No		0.71	0.67 No		0.68	0.62 Yes	
DP05	75	Asian alone	Y1	3.80	3.96 No		4.02	3.80 Yes		4.08	4.08 No		4.10	4.12 No	
DP05	76	Native Hawaiian and Other Pacific Islander alone	Y1	0.11	0.12 No		0.13	0.10 Yes		0.12	0.16 No		0.13	0.12 No	
DP05	77	Some other race alone	Y1	0.23	0.24 No		0.21	0.16 Yes		0.21	0.20 No		0.22	0.16 Yes	
DP05	78	Two or more races	N6	1.61	1.65 No		1.33	1.31 No		1.42	1.33 No		1.34	1.32 No	
DP05	79	Two races including Some other race	N10	0.12	0.12 No		0.07	0.05 Yes		0.07	0.05 Yes		0.07	0.05 Yes	
DP05	80	Two races excluding Some other race, and Three or m	N6	1.49	1.53 No		1.26	1.26 No		1.35	1.28 No		1.27	1.27 No	

			Cat	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Initial Mand	Initial Vol	Initial Sig?	Final Mand	Final Vol	Final Sig?
L#															

Source: U S Census Bureau Americian Community Survey 2002, 2003, and 2004 Special Tabulations