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Comparison of Alternatives for Controlling Group Quarters Person Estimates in the American Community Survey

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Group Quarters Estimation Research for the American Community Survey

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Background

The American Community Survey (ACS) is a large continuous survey that replaces the Decennial Census long form sample. A sample for the ACS is selected in each of the 3,141 counties and county equivalents in the United States, including the District of Columbia, and each of the 78 *municipios* in Puerto Rico. Samples of housing unit (HU) addresses and group quarters (GQ) facilities are selected separately. The first full-implementation sample of HU addresses was selected for use in 2005. Each year the ACS samples about three million HU addresses in the United States and about 36,000 HU addresses in Puerto Rico. The first full-implementation sample of GQ facilities was selected for use in 2006 and approximately 2.5 percent of the people in GQ facilities will be included in the ACS annually.

Each sample HU address is assigned a month during which the address is eligible to receive a mail questionnaire; an interview may be completed during the assigned month or the following two months. All addresses mailed a questionnaire for which no response is received during the assigned month and which have an available telephone number are sent to the computer-assisted telephone interviewing (CATI) staff which attempts interviews during the following month. After the CATI month, a subsample of the cases with unmailable addresses and mailable addresses for which neither a completed questionnaire has been received nor a CATI interview completed, is selected for computer-assisted personal interviewing (CAPI) in the third month. Each GQ sample is assigned to a month and in most GQ facilities six weeks are allowed for collection of data by personal interview only.

Estimates are calculated annually for specified geographic areas and data is cumulated over three different time periods: one year for areas with population estimates of total population of at least 65,000, three years for areas having the same estimates of at least 20,000, and five years for all specified areas. The multi-step weighting procedure used for HUs (Asiala (2006)) is performed within *weighting areas* which are single counties or groups of small counties. HU selection weights are first adjusted for CAPI subsampling and non-response. They are then adjusted so that the weighted estimates of the number of persons by demographics (sex, age, race, and Hispanic origin) in HUs are equal to their population estimates. The population estimates are produced by the Census Bureau's Population Estimates Program (U.S. Census Bureau (2006b)). For single year estimates, the population estimates as of July 1 of the current year are used as controls; for the 3(5)-year estimates the averages of the population estimates across the 3(5) years are used as the controls.

Preceding full implementation in 2005, the ACS had been in a demonstration phase since 1996. During that period GQ weighting and estimation were carried out only once, for calendar year 1999 when there were 36 counties in sample. At that time GQ stratification and sampling were done separately for each county. (Sampling and data collection were also performed for these same counties in 2001, but weighting was not carried out.) For the full GQ implementation of the ACS starting in 2006, GQs are sorted by type within state and selected across the whole state.

The data products plan includes the calculation of the 2006 ACS estimates for institutional and noninstitutional GQ types at the national level and, if shown to be feasible, for states and large counties in future years. See U.S. Census Bureau (2006a) for a list of GQ types.

For the 1999 ACS the GQ person weighting was carried out at the county level, and estimates by demographics were controlled together with the persons in HUs to their population estimates of county totals. There was no other choice of geography because of the small number of counties in sample, and GQ persons could not be controlled alone because of the small GQ populations and resulting sample sizes in most counties. Now that every county in the nation is in sample, there is the possibility of weighting GQ persons by states or groups of counties in a state and controlling GQ person estimates, either by themselves or together with HU person estimates, for these geographies.

Objectives

This research compares several alternative methods for controlling GQ person estimates (by demographics or major GQ types) to population estimates by analyzing how closely selected GQ person estimates for states and counties match their "true" values under each method. These comparisons were derived from a simulation study using Census 2000 100% data and the results were used to inform the decision on how to incorporate GQ persons with HU persons in the ratio adjustment process used to control the 2005 ACS HU person estimates.

The focus of this research is the investigation of five options for controlling GQ person weights to population estimates:

- C1) no control for GQ person estimates;
- C2) control GQ person demographic estimates at the state level by themselves;
- C3) control GQ and HU person demographic estimates together for counties;
- C4) control GQ and HU person demographic estimates together at the state level;
- C5) control GQ person major type estimates at the state level.

GQ Distributions and Sampling

The distribution of GQ persons across areas differs substantially from that of HU persons. A high percentage of the GQ population is concentrated in large GQs that contain hundreds of people, and these large GQs are concentrated within a subset of all counties. In fact, two-thirds of all counties have no GQ population and about 70 percent of all GQ persons are in counties with population over 100,000. Thus many weighting areas (a larger county or group of smaller counties whose cases are weighted together) have very small GQ populations. Also, the people in different major GQ types have differing distributions of demographic characteristics.

GQ sampling is conducted at the state level, resulting in a larger variability in county GQ sample sizes and the major types of GQs selected from a county across years than if sampling were done by county. Counties with very small GQ populations may frequently not have any sample selected in a given year. However, this allows the overall and major type state sample sizes to be less variable across years.

As a result of these factors it does not make sense to attempt to control GQ persons by themselves at the county level or to base comparisons primarily on single year county estimates. Instead, 3- and 5-year estimates for states, large counties, and small counties are evaluated separately.

Data Used in the Study

Selection of States to Use in the Study

It was not practical to use all 50 states and the District of Columbia for this study due to the amount of computation and analysis that would be required. Instead, fourteen states were chosen based on their GQ populations: Arizona, California, Colorado, Florida, Hawaii, Louisiana, Mississippi, Nevada, New Jersey, New York, Pennsylvania, Rhode Island, Texas, and West Virginia.

Person Data Sources

Data for both GQ and HU persons were obtained through simulation of the ACS samples and use of 100% data from Census 2000 records. This was necessary to obtain GQ data because (1) there is little GQ data from the ACS itself and (2) the differences between the GQ sampling procedures for the Census 2000 long form and the 2006 ACS are too large to allow us to use GQ sample data from Census 2000.

The data files constructed for the simulations were derived from three sources.

a. Census 2000 100% data from all GQ persons, both those in the long form sample and those receiving the short form
b. Census 2000 100% data from the HU long form sample.
c. One thousand ACS samples of 2.5% of GQ persons previously simulated from the Census 2000 GQ universe by the ACS Design Branch (ACSDB) in the Decennial Statistical Studies Division.

Simulating the ACS 100% Data

The research data sets were simulated in two steps, one for GQ persons and one for HU persons, and then combined.

<u>GQ Sample</u>. 100 of the 1000 GQ samples simulated by the ACSDB were selected at random, each one of them representing a separate year of sample. The GQ in the universes used for selection of the original 1000 samples were sorted by state, type, county, tract, block, block suffix, state of the special place to which a GQ belongs, special place ID, and GQ ID. For each sample selected in a large GQ (>15 persons in Census 2000), a set of 10 persons was identified for inclusion in the ACS person sample. In small GQs (≤ 15 persons in Census 2000) all persons were included. The sample persons in each small GQ or selected set of 10 persons in each large GQ sample hit were assigned to a panel month using the 2005 ACS GQ sampling specifications. These sample persons were assigned Census 2000 100% data from persons in the selected GQs, with the exception of those persons in GQ type 501 (college dormitories/fraternities/sororities) assigned to the panel months June, July, and August. This excepted 501 sample represents

months of the year when we will assume students will not be in school and available for interviews.

HU Sample. For each county a systematic 15% sample of the Census 2000 long form sample HUs was selected. The data for the 100% variables from all persons in these HUs represent the same variables for a single year of the ACS HU sample.

The single HU sample was combined with each of the 100 GQ samples to represent 100 years of HU plus GQ sample for the ACS.

Seasonality in the GQ Population

During collection of GQ data for the ACS, certain GQ types will exhibit consistent patterns of varying numbers of people residing in them at different times of the year. These patterns are referred to as *seasonality*. Since during the course of this project we had no information on seasonality for specific GQs, other than those housing college students, the only GQ seasonality that was simulated was for type 501, college dormitories/fraternities/sororities. For the months June, July, and August this type is treated as having zero population, while for the other months each of these GQs has the population present at the time of Census 2000 – April 1, 2000. The effect this seasonality has on the GQ estimates is included in the study.

More About the Weighting Options

Some basic details about the options are presented here. First note that this study did not attempt to simulate nonresponse or the weighting steps prior to the application of controls. In actual implementation the selected procedure would be applied after nonresponse adjustment. All controls are calculated from Census 2000 to be consistent with the sources of the data.

1) C1 can be thought of as the weighted GQ sample estimate. It uses the basic GQ sampling weight of 40 as the person weight. C1 estimates are not controlled to any person controls. HU weighting is not needed to evaluate this option.

2) C2 weights the GQ population to GQ person demographic controls at the state level. The demographic cells and collapsing rules used for C2 are the same as those used for the 2003-2005 ACS weighting of the HU population, except that the cells are defined at the state level and only include the GQ population. Each GQ person has the weight 40 before the controls are applied. HU weighting is not needed to evaluate this option.

3) C3 weights the combined HU and GQ populations to total person demographic controls at the county level. The demographic cells and collapsing rules used for C3 are the same as those used for the 2003-2005 ACS weighting of the HU population, except that the cells include both the HU and GQ populations. Note that for most counties the C3 weighting will mainly be driven by the HU population, since the HU population is usually much larger than the GQ population. Each GQ person has the weight 40 before the controls are applied. Each person in a given HU has a weight of 1/(ACS HU sampling rate for its block) before the controls are applied, and these weights can be 53.33, 40.00, 26.67, or 13.33.

4) C4 weights the combined HU and GQ populations to total person demographic controls at the state level, rather than the county level that C3 uses. Everything else stated for C3 also holds for C4.

5) C5 weights the GQ population to the seven Census 2010 major GQ type controls at the state level. (The definitions for the major types are given at the end of this section.) No collapsing is performed as the controls are large except for three cases. Each GQ person has the weight 40 before the controls are applied. HU weighting is not needed to evaluate this option.

The two options we initially focus on in the comparisons are C2 and C3, as they are the most likely of C1 through C4 to be used for the initial implementation of the ACS GQ weighting. Since controls are currently applied for HU persons by weighting area, it is unlikely that there would be a change to state level controls used in C4 based solely on the results of this study without extensive discussions of the policy implications of such a change. Also, the ACS would not consider changing to C1 unless further research shows that using population estimates as controls for GQ persons introduces such biases that using no controls for GQ persons would be preferable. The recommended choice between C2 and C3 is then compared with C5 to reach a final recommendation.

Demographic Cells

Controlling by demographics for C1 through C4 uses 26 cells defined by combinations of age and gender for each of six race/Hispanic origin groups: Hispanic, and non-Hispanic American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, Black, and White. The thirteen age groups are 0-4, 5-14, 15-17, 18-19, 20-24, 25-29, 30-34, 35-44, 45-49, 50-54, 55-64, 65-74, and 75+.

Major GQ Types

The three-digit GQ types from Census 2000 are used in this study as the basis for the control cells in C5 and for comparison of the options. For the comparison of C1 through C4 the nine major types 1-9 are defined as they were in Census 2000, by the first digit of the three-digit type code, as 1=prisons/jails, 2= juvenile facilities, 3=nursing homes, 4=hospitals, 5=college housing, 6=military barracks/ships, 7=temporary shelters, 8=groups homes, and 9=other GQs. For the C5 weighting seven major types are used, where major types 7, 8, and 9 from Census 2000 have been combined into a single major type. With minor exceptions, these are the definitions of major GQ types planned for use with Census 2010. The revised seven major types are used for comparing C5 to the recommended choice between C2 and C3.

Evaluation Measures for Comparing the Control Options

The 1-year, 3-year period, and 5-year period estimates were evaluated for the five options. Option C1 was used more as a benchmark than as a competing option, to see how much the other options changed the estimates and their properties. As all data are selected from Census 2000 and the simulation treats the population as fixed across the 100 samples, Census 2000 100% counts are used as the population estimates for all years. Because the same HU sample and set of controls are used with each year of simulated data, the variability in the GQ estimates across years in options C3 and C4 results solely from the annual GQ samples. Thus they can be compared directly with the other options which have this property since they don't combine GQ and HU data.

An important factor that will be used in recommending between C5 and the best of C2 and C3 is that the population estimates for major GQ types are considered to be more reliable than those for GQ demographics. So for C2 or C3 to be recommended it must be demonstrably better than C5.

A set of marginal demographic characteristics for which it is desirable that the GQ estimates are close to their controls was selected for evaluation: female, male, Hispanic, non-Hispanic, white, black, and ages 0-17, 18-29, 30-54, and 55+. The corresponding abbreviations of fe, ml, hi, nh, wh, bk, a1, a2, a3, and a4 are used on the Boxplots in Appendices 2, 3, 5, and 6. The selection was based somewhat on demographic groupings that appear in the annually published tables of the ACS estimates and the demographic characteristics of the persons in different GQ types, as well as those for which we expect varying coverage rates. In addition, estimates of the GQ population for the major GQ types were evaluated. For each demographic characteristic and major GQ type, weighting alternative, and year, the deviation between the estimate and its control was calculated. The analyses are based on (1) how closely the state and county GQ estimates of demographics and major types approximate their Census 2000 counts, and (2) the variability of the estimates around their mean values. The percent mean absolute deviation (PMAD), the coefficient of variation (CV), and the percent root mean squared error (PRMSE) of each set of estimates are the measures used to compare the alternatives.

Percent Mean Absolute Deviation

For 1-year estimates let y_{ci} be the 'true' value (from Census 2000) for target cell or major type c in geographic area (state or county) i and $\hat{y}^{o1}_{sci}$ be its estimate for control option o and simulation (year) s. The mean absolute deviation (MAD) for a given cell is the mean across the 100 simulated years of $|\hat{y}^{o1}_{sci} - y_{ci}|$ and the PMAD is 100*MAD/y_{ci}. Similarly let $\hat{y}^{o3}_{sci}$ and $\hat{y}^{o5}_{sci}$ denote the 3-year and 5-year estimates for target cell or major type c in geographic area i and control option o, where s is now the latest year of data used in the estimate. Their MADs and PMADs are based on 98 and 96 estimates, respectively.

Percent Root Mean Squared Error

The MSE is defined like the MAD, the only difference being that the square of the individual deviations $(\hat{y}^{o1}_{sci} - y_{ci})^2$ are used rather than their absolute values. Thus larger deviations contribute more to the MSE than they do to the MAD. For the convenience of comparisons the MSE is converted to units similar to those for the PMADs and the CVs by using the percent root mean squared error defined as PRMSE = $100 * \sqrt{\text{MSE}} / y_{ci}$.

Coefficient of Variation

The CV measures the variability of an estimator relative to its mean value and is defined for a single year estimate as $100*\sqrt{\sum_{s=1}^{100}(\hat{y}_{sci}^{o1}-\overline{y}_{ci}^{o1})^2 / 99} \Big/ \overline{y}_{ci}^{o1}$, where $\overline{y}_{ci}^{o1}=\sum_{s=1}^{100}\hat{y}_{sci}^{o1} \Big/ 100$. For the 3-year (5-year) estimates the sum over s goes from 3(5) to 100, this sum is divided by 97 (95), and the divisor for the mean is 98 (96). The CV puts the standard deviations for estimators of different quantities on the same scale so that they can be compared.

Each of the statistics MAD, PMAD, CV, MSE, and PRMSE is a valid measure of the quality of an estimate. The CV differs from the others in that it is a measure of variability across years around the mean of the annual estimates, while the others measure the variability around the 'true' value in various ways. It is included as an important part of this study as it is a primary measure of the quality of the ACS estimates when comparing them with estimates from the Census 2000 long form.

The choice between use of MAD (PMAD) and MSE (PRMSE) in comparisons depends on the relative weight one wants to give to large vs. small deviations. When comparing control options for estimating a single quantity -- a demographic characteristic or a major type -- whether MAD (MSE) or PMAD (PRMSE) is used makes no difference as dividing by a constant doesn't change the comparison. When estimating different quantities, however, their MADs and MSEs tend to increase with the controls and it is more difficult to compare the measures. The analysis in this report will focus on the percentage measures as these put the measures for different quantities on the same scale.

Analysis – C1 through C4

Based on the method that determined the requirement for the HU population in an area to have a population of at least 65,000 for the ACS to produce annual estimates, we use a requirement of 55,000 GQ persons in this study. The basic reason for the smaller size requirement is that there is no computer assisted personal interview subsampling for GQs. Four of the states in the study – HI, NV, RI, WV – would not receive annual GQ estimates using this requirement for the GQ population. We also use 18,000 as the corresponding minimum GQ population required for a state or county to receive 3-year estimates, with all smaller counties eligible for only 5-year estimates. Due to these thresholds and the options being applied at both the state and county levels, we will summarize the results separately for (a) the 14 states using 3-year estimates, (b) the 46 'large' counties with GQ populations greater than 18,000 using 3-year estimates, and (c) the remaining 'small' counties with GQ populations less than 18,000 using 5-year estimates.

It seems obvious that C2 will, in general, produce GQ estimates of demographic characteristics that are closest to their state control totals. But during the control process for many states there will be collapsing of the original full set of adjustment cells, which will result in the GQ estimates not equaling their controls for any pre-specified set of cells. It is also clear for options C3 and C4 that, for the initial or collapsed sets of adjustment cells, the separate estimates for HUs or GQ will rarely equal their control totals. However, we do not know which of these three options will produce county-level estimates of GQ demographic characteristics closest to their control totals. Neither do we know what to expect for estimates of major GQ types, since they are not being controlled for in these options and it is unknown how the seasonality of major type 5 (consisting only of type 501) will affect them. The results of the comparisons of these four weighting options are summarized in the remainder of this section.

Demographics

The values for PMADs and PRMSEs in Table A1.1 confirm the supposition that C2 estimates of demographics by state are much closer to their true values than are those for the other options. This is because C2 controls to these values directly. In fact, all the deviations for 3-year estimates would be zero if there were no collapsing of cells. As an example of this, Table A1.1 shows that the PMADs for Hispanics and non-Hispanics are always zero in all states, and this is because there is no collapsing needed across those two categories. The CVs in Table A1.1 show that they are also consistently smaller for C2 than for the other options. Now we look further at the results to make sure that C2 does not distort demographic estimates for counties or major type estimates by county or state.

Appendix 2 gives Boxplots of the differences between the PMADs and CVs for C2 and C3 (C2 – C3) in the 46 large counties. They show that the distributions of the PMADs for demographics are much the same for C2 and C3, with the C2 PMADs usually being slightly smaller and their means always smaller for C2. The age 18-29, female, non-Hispanic, and white categories have mean values most in favor of C2. Most differences have a magnitude less than 5%, with those greater than 6% all in favor of C2. The distributions of the CVs are very similar, with C3 having smaller CVs slightly more often than C2. Most differences in CVs are less than 2.5%. The PRMSE comparisons are similar to those for the PMADs.

Boxplots for differences between C2 and C3 in small counties are given in Appendix 3. Variability of the PMAD can get very large when estimating small population totals, for either demographics or major types. As a consequence, to see more detail in the plots two Boxplots are used for each of these measures -- one for populations greater than 100 and one for populations less than or equal to 100. The results are mixed for PMADs, with no clear advantage to either C2 or C3, while C3 tends to have slightly lower CVs. The PRMSE comparisons are much like those for the PMADs.

Major Types

Looking at the PMADs for persons in the major GQ types across all 14 states in Table A1.2 shows that their distributions for C2 and C3 are about the same for five of the seven major types. For all states but Hawaii, C2 has a much smaller PMAD for major type 5 and C3 has a much smaller PMAD for major type 6. This is due to the seasonality in the major type 5 population and the similarity of its age distribution to that of the major type 6 population, as described in the following paragraphs.

We treat GQ type 501, college dormitories etc., as having no population in June-August. When adjusting the demographic combinations that contain a large proportion of the dorm population to the year-round-based controls with C2, they must be adjusted upward substantially. Persons between the ages of 18 and 24 in other GQ types will be affected by this adjustment in the same manner as college students in type 501. As a result, the persons in major GQ types other than type 5 will get larger upward adjustment factors rather than the small factors they would have gotten if they had been adjusted by themselves, tending to result in age 18-24 totals larger than their individual controls. Since major type 6 is the other main type with a large proportion of its population in the 18-24 age group, its total population estimate tends to be affected in this way. The resulting annual deviations are larger than the deviations before adjustment, either because the type 6 totals started below their controls and were adjusted to be above them but with larger deviations, or they started above the controls and were pulled further above.

When the HU and GQ populations are controlled together by county for C3, both the survey estimate and the control tend to be dominated by the HU population. This means that the adjustment ratio will usually be very close to what it would be for the HU population alone. There will be exceptions to this in some counties with smaller proportions of their total population in HUs. When summing the controlled estimates across counties to get the state estimates, the overall adjustment will, except possibly in rare instances, be dominated by the HU population. Consequently, the adjustment for the dorm population and persons in other GQ types with similar demographic characteristics will be much smaller for C3 than C2. So for C3 the seasonal dorm population will be adjusted slightly upward toward its true value but the annual deviations will remain quite large; the non-seasonal major type 6 population will be adjusted slightly toward or away from its true value, with the annual deviations remaining much smaller than those for the major type 5 population. The result is much larger PMADs for the major type 5 population than for the major type 6 population.

These relationships between the estimates for major types 5 and 6 are a result of inconsistency between the *current residence* rule used for the ACS data collection and the *usual residence* rule used for the population estimates applied as demographic weighting controls that ignore GQ type. The notable differences between estimates and controls resulting from this inconsistency are much more widespread for GQ estimates than they are for HU estimates due to the large proportion of the GQ population living in major type 5 and the prevalence of this major type throughout the country.

For state CVs the C3 values are usually slightly lower than the C2 values, with most differences between them less than 2.5%.

The distributions of the PMADs for type across the large counties (Appendix 2) are very similar, with neither C2 nor C3 being favored and most differences less than 10% in magnitude, except for types 5 and 6 which behave in a similar manner as they did for states. The distributions of the CVs are very similar to those for large county demographics, with C3 having smaller CVs slightly more often than C2. Most differences in CVs are less than 2.5%. The PRMSEs show relationships similar to those for the PMADs.

The results for small counties (Appendix 3) are much the same as they were for demographics. They are mixed for PMADs, while C3 tends to have somewhat lower CVs.

Summary

As a whole, the results suggest that C2 is preferred over C3 because of its notably smaller PMADs for state demographics and slightly smaller PMADs for large county demographics.

The remaining PMAD comparisons show little difference between C2 and C3. PRMSE comparisons give very similar results. The CVs do not show a noticeable favoritism for C3 that would make us doubt the preference for C2. For state demographics the CVs are consistently lower for C2 while for the other comparisons they favor C3 only slightly.

Analysis – C2 vs. C5

As stated previously, there is a preference for using controls by type rather than by demographics. Thus the comparison of C2 and C5 determines if there are results that strongly suggest a preference for C2 over C5, and if not, then C5 will be recommended for use.

Note that for C5 there are only 7 marginal totals being controlled to by type but for C2 there are 26 cells being controlled to for each race/Hispanic origin category. Consequently, for most states there will be cell collapsing required for C2 but no collapsing of marginals required for C5. So the state measures by type for C5 will usually be 0.0 and by demographics for C2 will be greater than 0.0, so we can't rely on comparing these measures to evaluate the two options. Rather, we would like to find an option that fits both the major type and demographic controls closely, with an emphasis on the major type controls. So this comparison focuses on (a) the size of the measures for major type when controlling by demographics versus (b) the size of the measures for demographics when controlling by major type.

The tables in Appendix 4 compare the state measures for options C2 and C5. As noted previously, most of the C5 measures for major type are 0. When comparing across the demographics and major type measures, C5 usually has smaller measures for demographics than C2 has for major types. So C5 would be the preferred option if we considered only state results.

Next we compare the measures for C2 and C5 at the county level. Appendix 5 contains Boxplots of the differences C5 – C2 of the three measures for demographics and major types in large counties. The same set of Boxplots for small counties are given in Appendix 6.

Demographics

For the large counties the means of the PMAD differences are close to 0, with most individual differences less than 4%. Results for the PRMSEs are very similar. CVs also have means near 0 with two differences greater than 10% in favor of C2. PMADSs and PRMSEs for small counties take a much larger range of values than for small counties but their mean values are close to 0. The distributions of both these measures are fairly symmetric about 0 and don't favor either option overall. The differences in CVs fall mostly between -10% and 10% and have means very close to 0.

Major Types

For large counties the mean differences of the PMADs are close to 0 but the three means farthest from 0 are due to smaller C5 PMADs. There are a few differences greater than 10%, most having smaller C5 values. PRMSE differences have distributions very similar to PMADs. The means of the CV differences are also close to 0. Most differences are less than 4% with a few differences greater than 9% favoring C5. Again PMADSs and PRMSEs for small counties take a much larger range of values than for large counties but their mean values are close to 0. However, there are several counties for which C2 has notably smaller PMADs for major type 5 and several other counties for which C5 has notably smaller PMADs for major type 6. The differences in CVs fall mostly between -8% and 8% and have symmetric distributions with means very close to 0.

Summary

As a result of C5 being preferred for states and there being little difference between the county-level distributions of the measures for C2 and C5, C5 is recommended as the option to use for the 2006 ACS GQ weighting.

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Selection of States to Use in GQ Weighting Research

In this study a GQ population of 55,000 was used as the threshold for producing single-year GQ estimates and a GQ population of 18,000 was used as the threshold for producing three-year GQ estimates. The 50 states and DC were separated into 4 groups by the size of their total GQ, Institutional GQ, and Non-institutional GQ populations from Census 2000. A small number of states from each group was selected for inclusion in the research.

Group definitions and states included in each.

1. Total GQ population < 55,000.
   States: AK, DE, DC, HI, ID, ME, MO, NE, NV, NH, NM, ND, RI, SD, UT, VT, WV, WY

The remaining three groups have total GQ population > 55,000.

2. Both Institutional and Non-institutional GQ population >55,000
   States: CA, FL, GA, IL, IN, MD, MA, MI, MN, MO, NJ, NY, NC, OH, PA, SC, TN TX, VA, WA, WI
3. Institutional population >55,000, Non-institutional population < 55,000.
   States: AL, AZ, CT, KY, LA, OK
4. Both Institutional and Non-institutional < 55,000.
   States: AR, CO, IA, KS, MS, OR

About four states from each of groups 1 and 2 and about two states from each of groups 3 and 4 were to be selected, based on the number of states in the groups. The existence of counties within a state meeting the single-year and three-year thresholds and the number of counties per state were used as selection criteria, as presented in Tables A1.1 and A1.2. Here are how the states were selected for each group.

1. DC, HI, and RI have one county satisfying threshold (13). Use HI and RI.
   From the remaining states select two with different numbers of counties. NV with 17 counties and WV with 55 counties were chosen.
2. CA has two counties satisfying some of thresholds (1)-(12).
   NY has nine counties satisfying threshold (13); FL and TX have six counties satisfying it.
   PA has four counties satisfying threshold (13) and two counties satisfying threshold (16).
   NJ is included since we were using it for testing software and some of the statistics were already available.
3. AZ has one county satisfying threshold (16).
   Select LA from the remainder as it is one of three states with its number of counties in the middle of the range.
4. Select CO and MS from among the three states with number of counties in the middle of the range.

Table A1.1. County Group Quarters Populations for Columns in Table A1.2

Total GQ Population	Institutional GQ Population	Non-institutional GQ Population	Column in Table A1.2
> 55,000			1
> 55,000	> 55,000		2
> 55,000		> 55,000	3
> 55,000	> 55,000	> 55,000	4
> 55,000	> 55,000	< 55,000	5
> 55,000	< 55,000	> 55,000	6
> 55,000	< 55,000	< 55,000	7
> 55,000	> 18,000		8
> 55,000		> 18,000	9
> 55,000	> 18,000	> 18,000	10
> 55,000	> 18,000	< 18,000	11
> 55,000	< 18,000	> 18,000	12
(18,000, 55,000)			13
(18,000, 55,000)	> 18,000		14
(18,000, 55,000)		> 18,000	15
(18,000, 55,000)	> 18,000	> 18,000	16
(18,000, 55,000)	> 18,000	< 18,000	17
(18,000, 55,000)	< 18,000	> 18,000	18
(18,000, 55,000)	< 18,000	< 18,000	19
< 18,000			20

Table A1.2. Number of Counties by State With Specified Group Quarters Populations – Census 2000

State	Counties	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
AL	67																				67
AK	25																				25
AZ	15													2	1	1	1			1	13
AR	75																				75
CA	57	2	1	2	1		1		2	2	2			10	4	1		4	1	5	45
CO	60																				60
CT	8													2						2	6
DE	3																				3
DC	1													1		1			1		
FL	67													6	1			1		5	61
GA	155													1		1			1		154
HI	4													1		1			1		3
ID	43																				43
IL	102	1						1	1	1	1			1						1	100
IN	92																				92
IA	99																				99
KS	105																				105
KY	120																				120
LA	64																				64
ME	16																				16
MD	24													1						1	23
MA	14													4		2			2	2	10
MI	83													2	1			1		1	81
MN	87													1						1	86
MS	82																				82
MO	115													1						1	114
MT	52																				52

State	**Counties**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
NE	81																				81
NV	17																				17
NH	10																				10
NJ	21													3						3	18
NM	32																				32
NY	62	1						1		1			1	9	1	1		1	1	7	52
NC	100													3		2			2	1	97
ND	50																				50
OH	88													3						3	85
OK	77																				77
OR	35																				35
PA	67													4	2	2	2			2	63
RI	5													1						1	4
SC	46													1		1			1		45
SD	61																				61
TN	95													2						2	93
TX	245													6	2	1		2	1	3	239
UT	28																				28
VT	13																				13
VA	130													1		1			1		129
WA	39													2		1			1	1	37
WV	55																				55
WI	72													1						1	71
WY	23																				23

Specifications for Constructing the Simulated Data Files

Subsampling Procedure for the SEDF HUs

Overview: Take a subsample of Census 2000 longform sample HUs that mimics an annual ACS HU sample. If Census 2000 used exactly the same sampling rate definitions as ACS and there was a completed data record for each sample HU, then we would only need to take a 15% sample of these HU to get the corresponding ACS sample size. Since there are missing HU data records due to nonresponse using the straight 15% won't give us enough sample.

The procedure given here increases the subsample rate to account for nonresponse so that we get a 2.5% sample. The HU weights are similarly adjusted so that they approximately add to their former totals. (The fact that these totals are approximate allows use of HU controls on them before controlling to demographic estimates.)

The starting point for subsampling is a SAS version of the Census 2000 SEDF. This file includes the following sample records: one for each vacant HU (RT=2), one record for each person in an occupied HU (RT=3), and one for each person in a GQ (RT = 5). All the available variables from Record Types 1 through 5 on the original SEDF associated with the given record are included on the file.

A. Create a HU level file to be used in the subsampling. The input is a SAS SEDF file.

I. Output a single record for each vacant HU record and each group of person records on the SEDF associated with an occupied HU.

   a. For each vacant HU record (RT = 2) calculate its census sampling rate, SRATE, as follows.
      If TEA=4 then SRATE = 0.5, regardless of BSAM or AASR
      Else, if AASR is non-blank, then SRATE = 1/ (2*AASR)
      Else SRATE = 1/(2*BSAM).
   Write a record that contains the variables RT, COUNTY, TRACT, BLOCK, POP100, HU1000, MAFID, HWT, TEA, BSAM, AASR, and SRATE.
   b. For each occupied HU record (RT = 3) with PNC = '1' repeat the procedure in (a.).
   c. Drop all GQ person records (RT = 5).

B. Calculate the subsampling rate

I. Sort the file from (A.) by COUNTY, BSAM, AASR, SRATE, TRACT, BLOCK, and MAFID.

II. For each BSAM, AASR and SRATE combination count the number of HUs = (H) and calculate their total HWT = (T).
   a. Calculate the ‘actual rate’(BSAM, AASR, SRATE) = (H)/(T).
      [The argument (BSAM, AASR, SRATE) indicates that actual rate is a function of these parameters. This format is used in the remainder of the specs)]
   b. Calculate the subsampling rate SSR(BSAM, AASR, SRATE) = .15*(SRATE)/(actual rate).

Note: To check that II.b is the correct rate note the number of units selected is equal to [.15(sample rate)*(T)/(H)]*(H) = .15*(SRATE)*(T).*

C. Calculate subsampling information for each HU record

I. Calculate its new HU weight, NHWT, to be used in the simulation as NHWT = HWT/SSR(BSAM, AASR, SRATE).

II. Compute its cumulative measure-of-size . Start with the first record in the county on the file. Let CMOS(1) = SSR(BSAM, AASR, SRATE) for record 1. For the second record on the file, let CMOS(2) = CMOS(1) + SSR(BSAM, AASR, SRATE) for record 2. In general, CMOS(m) = CMOS(m-1) + SSR(BSAM, AASR, SRATE) for record m. Let CMOS(N) be the cumulative measure of size assigned to the last record, the Nth, in the county.

III. Write record m to a file with SSR(BSAM, AASR, SRATE), NHWT, and CMOS(m) appended to it.

D. Generate a set of random numbers for each county.

I. Generate a random number in (0,1). This will be the random start (RS).

II. Compute the sequence of random numbers: RN(k) = RS + (k-1) through RN(n), where n is the largest integer such that RN(n) $\leq$ CMOS(N). (Stop creating random numbers when CMOS(N) for the county has been reached.) Write them to a file.

E. Carry out subsampling for all HUs by county using the files output from (C.) and (D.).

I. Compare each random number in sequence on the file from (D.) with CMOS for each HU record in order on the file from (C.). The *i*th sample record is the <u>first</u> record in the file from (C.) for which its CMOS $\geq$ RN(*i*). For each record selected:
   a. Assign the Order of Selection Code (ORD). Begin with '1' for the first selected sample record and increase ORD by 1 for each sample record thereafter.
   b. Write the record with ORD appended.

II. Sort the file by COUNTY, TRACT, BLOCK, and MAFID and drop ORD. This is the ‘final HU sample data’ file.

Construct the HU Person Sample Data File

Overview: All persons in sampled HUs are included in ACS. Here we extract their data from the SEDF. There are two input files. The SAS version of the SEDF and the 'final HU sample data' file.

A. For each HU included in the sample, construct a record for each person record in that HU on the SEDF.

I. Sort the SEDF by COUNTY, TRACT, BLOCK, MAFID, PSEQ, and PNC. Keep only records with RT = 3.

II. Merge the 'final HU sample data' file and the file from (I.) by MAFID. Keep all the variables from the former file and these variables from each record with RT=3 on the latter file: PSEQ, PNC, QREL, QSEX, QAGE, QDB, QSPANX, QRACE1, QRACE2, QRACE3, QRACEX.

III. Sort this file by COUNTY, TRACT, BLOCK, MAFID, and PNC. This is the 'final HU sample person data' file.

Construct the Small GQ Sample Person Data File

Overview: All persons in sampled small GQs are included in ACS. Here we extract variables for them from the Census 2000 100% data file, the HDF.

[There are two input files. The HDF and the file 'smallgq_sss' from the simulation of annual GQ sample by ACSDB. We sort this latter file for matching because the HDF has a hierarchical structure. After we have put all the person records on the output file we will re-sort them by HITNUM to get back to the original sample order.]

A. Modify 'smallgq_sss' in the following way.
Rename the variables FCNTY as COUNTY, FIPST as STATE, and BTRAT as TRACT.
Drop the variables ST, CENPOP, GQMOS, BLKS1, FSORD, N, J, RN, X, and HITMEAS.
Keep the records only for the STATE being investigated.
Call this the 'modified smallgq_sss_<st>' file. (<st> denotes the FIPS state number.)

B. For each GQ included in the 'modified smallgq_sss_<st>' file, construct a record for each person record in that GQ on the HDF.

I. Sort the 'modified smallgq_sss_<st>' file by COUNTY, TRACT, BLOCK, and MAFID.

II. For each GQ record (RT=4) on the HDF that matches by COUNTY, TRACT, BLOCK, (from corresponding RT=1) and MAFID to a record on the file from (I.), construct a record for each person record (RT=5) that belongs to the GQ record. Include on this record all variables from the 'modified smallgq_sss' file plus these variables from RT=5 of the HDF:

PSEQ, PNC, QREL, QSEX, QAGE, QDB, QSPANX, QRACE1, QRACE2, QRACE3, QRACEX. Add the Variable NGQWT with the value '40' to each person record.

III. After the file is completed sort it by HITNUM and PNC to get the 'final small GQ sample person <st> data' file.

Subsampling Procedure for Large GQs

<u>Overview</u>: For each sample hit in a large GQ 10 people in the GQ are selected for ACS. Here we give procedures to select these 10 people and compile the needed data about them from the Census 2000 100% data file, the HDF.

[There are two input files. The HDF and the file 'largegq_samp' from the simulation of annual GQ sample by ACSDB. We sort this latter file for matching because the HDF has a hierarchical structure. After we have put all the person records on the output file we will re-sort them by HITNUM to get back to the original sample order.

A. Modify 'largegq_samp_<st>' in the following way.
Rename the variables FCNTY as COUNTY, FIPST as STATE, and BTRAT as TRACT.
Drop the variables ST, CENPOP, BLKS1, GQFIRSTMEAS, GQLASTMEAS, CUMMEAS, TOTPOP, SAMPPOP, J, RN, X, WGQSW, and HITMEAS.
Keep the records only for the STATE being investigated.
Call this the 'modified largegq_samp_<st>' file.

B. For each GQ included in the 'modified largegq_samp_<st>' file, construct a record for each person record in that GQ on the HDF.

I. Sort the 'modified largegq_samp_<st>' file by COUNTY, TRACT, BLOCK, MAFID, and HITNUM. Calculate the number of hits, NHIT, for each GQ = its largest GQHITNUM. Write to a file the first record for each sampled GQ with the variable NHIT appended to it.

II. For each GQ record (RT=4) on the HDF that matches by COUNTY, TRACT, BLOCK, (from corresponding RT=1) and MAFID to a record on the file from (I.), construct a record for each person record (RT=5) that belongs to that GQ. Include on this record all variables from the 'modified largegq_samp_<st>' file plus these variables from RT=5 of the HDF: PSEQ, PNC, QREL, QSEX, QAGE, QDB, QSPANX, QRACE1, QRACE2, QRACE3, QRACEX.

If NHIT = 1 continue, otherwise go to D. (Large GQs with NHIT = 1 have a single hit. The rest of the procedure for them is similar to D.II of the SEDF subsampling procedure.)

III. For the mth person record in the GQ assign it cumulative measure-of-size PCMOS =10m/NP where NP = number of person records in the GQ from RT=4.

C. Select the person sample for each large GQ with NHIT = 1.

I. Generate a random number in (0,1). This will be the random start (RS).

II. Compute the sequence of random numbers: RN(k) = RS + (k-1) through RN(10).

III. Compare each random number in the sequence with PCMOS for each person in the GQ. The *i*th sample person is the <u>first</u> person in the file for which its PCMOS ≥ RN(*i*). For each person selected:
   i. Write the record to the ‘large GQ single hit person sample data_<st>’ file.

D. For GQ records on the HDF that match a record on the file from (I.) on COUNTY, TRACT, BLOCK, and MAFID with NHIT > 1 continue. (These are large GQs with multiple hits. This procedure is similar to that in (B.III) and (C.) The difference is that the person records for all hits are selected first and then assigned to individual hits.)

I. For the mth person record in the GQ assign it cumulative measure-of-size PCMOS = 10mNHIT/NP where NP = number of person records in the GQ from RT=4.

E. Select the person sample for each large GQ with NHIT > 1.

I. Generate a random number in (0,1). This will be the random start (RS).

II. Compute the sequence of random numbers: RN(k) = RS + (k-1) through RN(10*NHIT).

III. Compare each random number in the sequence with PCMOS for each person in the GQ. The *i*th person is the <u>first</u> person in the file for which its PCMOS ≥ RN(*i*).
   a. Assign the Order of Selection Code (ORD). Begin with '1' for the first selected person record and increase ORD by 1 for each selected person record thereafter.
   b. Write this record to a file with the variable ORD appended to it.

F. Assign persons within each GQ to HITNUMs

I. Sort the file from (E.) by COUNTY, TRACT, BLOCK, MAFID, and ORD.

II. Assign the records with ORD = 1, 1+NHIT, 1+2NHIT,…,1+9NHIT to the smallest HITNUM, records with ORD = 2, 2+ NHIT, 2+2NHIT,…,2+9NHIT to the next HITNUM, …, and records with ORD = NHIT, 2NHIT, 3NHIT,…,10NHIT to the largest HITNUM.

III. Write each selected person record to a ‘preliminary large GQ multiple hit person sample_<st> data’ file with ‘HITNUM’ appended to and ORD dropped from the record.

IV. Sort this file by TYPE, COUNTY, HITNUM, and, PNC. Output this as the ‘large GQ multiple hit person sample _<st> data’ file.

G. Combine the ‘large GQ single hit person sample_<st> data’ and ‘large GQ multiple hit person sample_<st> data’ files and sort by TYPE, COUNTY, HITNUM, and, PNC. Add the

Variable NGQWT with the value ‘40’ to each record. Write out this file as the ‘final large GQ person sample_<st> data’ file.

Assign the GQ Person Record Sample Date

Overview: So far we have identified all the persons in our GQ sample for 12 months of ACS data collection. Now we assign them to individual data collection months, which are used in weighting. (We didn’t assign the HU sample to months because the steps in the HU weighting we will need to perform do not involve months.)

A. The processing will need to monitor if a hit is the last hit for a particular GQ for the correct assignment of sample date. Here are GQ types which get special treatment.

List 1: GQ types for which the sample date of 09 will be assigned to all sample hits.

GQ type	GQ description
101	Federal detention centers
102	Federal prisons

List 2: GQ types for which the same sample date will be assigned to all sample hits within a GQ.

GQ type	GQ description
104	Local Jails
105	Half-way houses
106	Military disciplinary barracks
107	Other types of correctional institutions
601-603	Military barracks

B. Concatenate the ‘final large GQ person sample_<st> data’ file to the end of the ‘final small GQ person sample_<st> data’ file.

C. Generate a random number RN in (0,1] and multiply it by 12. Define the first value of the index I as the smallest integer greater than or equal to RN.

D. Assign the sample date, SMPDT , to the person records within a GQ using the following procedure.

I. If the GQ type is 101 or 102, then assign sample date SMPDT = ‘09’ to all person records with all HITNUMs in the GQ.

II. If the GQ type is in List 1, assign SMPDT corresponding to I in the Sample Data Order Array to all person records selected in the GQ, regardless of HITNUM.

Sample Date Order Array

I	SMPDT
1	03
2	07
3	11
4	02
5	06
6	10
7	01
8	05
9	09
10	04
11	08
12	12

III. If the GQ type is not in either list, assign the SMPDT that corresponds to I to the person records with the same HITNUM as the current person record.

IV. Increment I by 1 if the sample date has been assigned to the last person in the highest HITNUM in a GQ with a type on List 2 <u>or</u> to the last person in any HITNUM for a GQ type not on either list. If I is now 13, reset it to 1.

<u>Note</u>: This will allow hits within the same GQID in GQ types not in either list to occur in different months. Any GQID with a GQ type in the given list, should have the same SMPDT for all hits within that GQID. I will not be incremented if the GQ is type 101 or 102 since they occur in a fixed month.

V. Repeat this process until SMPDT is assigned to the person records for all sample GQs in the state.

D. Sort the concatenated file with SMPDT added by SMPDT, TYPE, COUNTY, MAFID, and PNC. If GQ type is 501 and SMPDT is 06, 07, or 08, change SMPDT to 00. Output this as the ‘final GQ person sample_<st> data’ file.

Determining the Group Quarters Population With a Coefficient of Variation Equivalent to the One for 65,000 Housing Unit Persons

The GQ sample is separate from the HU sample. The question of interest is "How many GQ persons must there be in a given geography to get GQ variances equivalent to those for a HU population of 65,000 if there overall sampling rates are the same?"

If the variance approximation formula (2.4) from Alexander (1993) is the same for the two populations, then the required GQ population is the same 65,000. But there is no CATI or CAP1 subsampling for GQs, so the variance approximation formula differs and for a given geography is $(1- r_g f_g)P_g Q_g / f_g N_g r_g$, where $f_g = f$ = sampling fraction (.025) for GQs and HUs, $P_g = (1- Q_g)$ is the proportion of GQ person having the characteristic, N_g is the GQ population, and r_g = response rate for GQs.

Let $n_g = f_g N_g$ be the GQ sample size in a geography. Then setting the variance approximations for HUs and GQs equal gives us the relationship $\frac{N_g}{N} = \frac{(1-r_g f_g)P_g Q_g}{r_g PQ}\frac{r^2}{d'}$, where P is the proportion in HUs having the characteristic, r^2 and d' are as defined in Alexander (1993) and are functions of the CATI and CAPI HU subsampling rates.

Then assuming the same proportion of persons in GQs and HUs have a given characteristic, i.e. $P_g = P$, we get $\frac{N_g}{N} = \frac{(1-r_g f_g)}{r_g}\frac{r^2}{d'}$. So N_g/N is a function of r_g, f_t = CATI subsampling rate, f_{pd} = CAPI subsampling rate for mailable addresses, and f_{pu} = CAPI subsampling rate for unmailable addresses. The approximate ratio of population sizes falls in (.61, 1.00) for r_g ranging from .9 to .6 and three different sets of subsampling factors: (a) optimal factors and (b) optimal factors with no CATI subsampling derived in Tersine and Starsinic (2003), and (c) the factors of f_{pd} = .33, and f_{pu} = .67 with no CATI subsampling, in use by ACS when this project started. These ratios of population sizes give N_g between 40,000 to 65,000. Based on these results a GQ population size requirement of 55,000 is used in this study.

Evaluation Measures for States – 3-year Estimates

Table A4.1. Measures for Demographic Characteristics

Arizona

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	72720	3.68	0.24	0.92	1.51	4.13	0.30	1.18	1.77	1.96	0.22	1.18	1.17
Female	37130	7.78	0.46	7.41	7.87	8.76	0.59	7.96	8.35	4.36	0.43	3.13	3.02
Hispanic	24550	4.71	0.00	1.86	2.64	5.64	0.00	2.30	3.13	4.36	0.00	2.07	2.12
Non-Hispanic	85300	5.44	0.00	2.97	3.89	5.68	0.00	3.13	4.01	1.73	0.00	1.02	1.00
White	75805	5.35	0.27	4.04	4.46	5.53	0.32	4.11	4.53	1.48	0.32	0.74	0.83
Black	10224	4.48	0.70	3.91	1.87	5.81	0.84	4.47	2.28	4.35	0.82	2.40	2.25
age 0-17	6020	11.85	0.53	6.79	6.88	14.60	0.66	8.48	8.63	14.32	0.64	7.56	7.73
age 18-29	41593	11.12	0.13	6.26	7.44	11.29	0.18	6.39	7.52	2.15	0.18	1.35	1.21
age 30-54	36350	3.21	0.11	1.87	1.80	4.21	0.13	2.31	2.24	3.68	0.13	1.87	2.17
age 55+	25887	2.43	0.11	1.79	1.57	2.96	0.16	2.20	1.99	2.85	0.13	1.57	1.58

California

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	528567	2.85	0.01	0.47	0.29	2.92	0.01	0.56	0.37	0.62	0.01	0.38	0.35
Female	291187	6.59	0.02	5.27	6.48	6.65	0.02	5.30	6.50	0.99	0.02	0.59	0.58
Hispanic	192560	2.54	0.00	1.37	1.50	2.83	0.00	1.54	1.66	1.59	0.00	0.86	0.91
Non-Hispanic	627194	4.74	0.00	1.71	2.69	4.76	0.00	1.73	2.70	0.49	0.00	0.29	0.25
White	495036	4.43	0.18	2.67	3.45	4.50	0.23	2.71	3.48	0.86	0.23	0.47	0.45
Black	133748	1.79	0.16	3.85	3.75	2.14	0.21	3.92	3.82	1.43	0.19	0.73	0.68
age 0-17	46188	5.32	0.00	3.82	4.66	6.76	0.00	4.58	5.40	5.45	0.00	3.12	3.12
age 18-29	307768	9.72	0.00	4.61	6.05	9.77	0.01	4.63	6.07	1.07	0.01	0.47	0.51
age 30-54	265090	0.88	0.00	2.10	1.97	1.14	0.01	2.21	2.06	1.08	0.01	0.65	0.60
age 55+	200708	1.24	0.00	1.51	2.03	1.54	0.00	1.71	2.18	1.39	0.00	0.84	0.81

Colorado

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	65453	4.90	0.13	0.86	2.11	5.20	0.17	1.02	2.29	1.84	0.15	0.96	0.92
Female	37502	9.09	0.23	7.01	9.10	9.60	0.29	7.16	9.20	3.38	0.26	1.56	1.50
Hispanic	16451	4.09	0.00	3.35	2.02	5.06	0.00	4.00	2.34	4.21	0.00	2.52	2.31
Non-Hispanic	86504	7.08	0.00	3.88	5.60	7.18	0.00	3.95	5.63	1.32	0.00	0.75	0.67
White	82461	7.09	0.28	4.79	5.89	7.23	0.34	4.88	5.96	1.57	0.34	0.97	0.90
Black	11194	4.24	0.69	5.23	2.48	5.23	0.84	5.95	3.02	5.14	0.84	2.75	2.61
age 0-17	4709	13.41	0.53	7.51	8.24	16.61	0.66	9.35	10.20	16.27	0.66	9.07	9.76
age 18-29	46440	12.62	0.11	6.65	8.94	12.71	0.16	6.73	8.98	1.74	0.15	1.11	0.95
age 30-54	26748	3.29	0.20	3.44	1.76	4.66	0.25	3.88	2.27	4.22	0.21	2.09	2.26
age 55+	25058	3.16	0.23	2.81	3.05	3.53	0.28	3.29	3.44	3.41	0.18	1.77	1.69

Florida

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	241149	2.76	0.02	1.46	0.57	2.94	0.03	1.59	0.71	1.08	0.02	0.61	0.57
Female	147796	5.06	0.03	4.59	5.21	5.20	0.04	4.65	5.25	1.28	0.04	0.74	0.73
Hispanic	49771	2.82	0.00	3.24	1.52	3.55	0.00	3.62	1.90	2.82	0.00	1.61	1.80
Non-Hispanic	339174	3.83	0.00	1.43	2.48	3.86	0.00	1.47	2.50	0.50	0.00	0.31	0.27
White	260296	3.90	0.14	2.15	3.10	3.99	0.17	2.20	3.14	0.89	0.14	0.50	0.52
Black	110192	2.63	0.15	2.12	0.86	3.05	0.18	2.30	1.04	1.97	0.18	0.89	1.02
age 0-17	16959	4.82	0.20	3.34	4.01	6.24	0.26	4.07	4.75	6.11	0.26	3.80	3.44
age 18-29	129782	10.40	0.04	4.31	5.97	10.46	0.05	4.36	6.01	1.30	0.05	0.65	0.66
age 30-54	116156	1.38	0.04	3.53	1.55	1.74	0.05	3.65	1.80	1.74	0.05	0.87	0.92
age 55+	126048	1.00	0.03	1.21	1.74	1.24	0.03	1.37	1.86	1.21	0.03	0.68	0.65

Hawaii

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	24401	3.98	0.39	5.27	4.56	4.76	0.47	5.86	5.26	4.74	0.43	2.52	2.57
Female	11381	8.06	0.84	4.92	4.82	10.29	1.01	6.21	6.16	8.36	0.93	4.82	4.78
Hispanic	3079	10.67	0.00	5.54	5.19	12.84	0.00	6.98	6.55	12.83	0.00	6.56	6.55
Non-Hispanic	32703	2.98	0.00	2.74	2.07	3.73	0.00	3.10	2.48	2.79	0.00	1.44	1.42
White	16380	3.50	0.61	5.80	4.83	4.44	0.74	6.14	5.21	4.16	0.72	1.91	1.87
Black	3088	9.62	2.60	5.77	4.64	11.44	3.09	6.82	5.69	10.56	2.75	4.36	4.64
age 0-17	1339	27.03	2.72	15.80	15.55	32.64	4.71	19.36	19.23	34.36	4.23	18.67	18.82
age 18-29	19006	5.22	0.26	3.33	2.59	5.71	0.35	3.66	2.90	2.44	0.35	1.55	1.47
age 30-54	8389	7.48	0.49	5.33	5.30	9.33	0.61	6.60	6.65	9.23	0.52	4.97	5.07
age 55+	7048	5.28	0.37	2.66	2.97	6.79	0.44	3.30	3.60	6.57	0.44	3.27	3.52

Louisiana

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	84940	2.90	0.13	1.60	0.95	3.35	0.21	1.85	1.21	1.82	0.19	0.94	1.01
Female	51025	7.74	0.21	6.33	7.55	8.21	0.34	6.57	7.74	2.99	0.32	1.87	1.82
Hispanic	3774	11.13	0.00	5.65	5.33	13.45	0.00	7.18	6.72	11.15	0.00	6.21	5.67
Non-Hispanic	132191	4.56	0.00	1.52	3.24	4.60	0.00	1.68	3.26	0.62	0.00	0.73	0.31
White	65657	4.61	0.18	2.96	4.23	4.99	0.22	3.16	4.35	2.00	0.22	1.13	1.05
Black	67323	4.49	0.14	1.00	2.10	4.83	0.18	1.29	2.28	1.85	0.17	1.29	0.95
age 0-17	5595	14.73	0.63	8.27	7.30	17.89	0.80	10.13	9.20	17.84	0.79	8.87	9.23
age 18-29	53614	12.04	0.14	4.50	7.43	12.17	0.18	4.60	7.49	2.01	0.17	1.00	1.04
age 30-54	39424	1.88	0.15	2.38	1.41	2.37	0.19	2.70	1.76	2.36	0.18	1.26	1.37
age 55+	37332	2.57	0.10	1.88	2.38	3.13	0.12	2.63	2.95	3.07	0.12	2.01	1.86

Mississippi

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	55610	6.42	0.17	1.78	2.41	7.09	0.22	2.09	2.88	3.24	0.16	1.77	1.64
Female	39804	9.43	0.24	4.34	7.07	10.15	0.31	4.72	7.37	4.16	0.23	1.95	2.22
Hispanic	2533	10.24	0.00	28.58	16.90	13.01	0.00	29.41	18.49	12.58	0.00	5.39	6.42
Non-Hispanic	92881	7.74	0.00	1.99	4.93	7.77	0.00	2.17	4.94	0.78	0.00	0.89	0.33
White	49401	8.53	0.22	3.09	5.51	8.77	0.28	3.35	5.60	2.24	0.22	1.35	1.04
Black	43700	6.91	0.17	1.29	4.17	7.29	0.20	1.72	4.34	2.49	0.20	1.60	1.25
age 0-17	3834	13.74	1.48	8.97	8.82	16.10	1.92	10.81	10.66	16.10	1.34	9.50	9.45
age 18-29	47688	14.92	0.16	5.41	9.63	14.99	0.20	5.55	9.66	1.66	0.20	1.31	0.75
age 30-54	19671	3.85	0.32	7.37	3.32	5.26	0.43	7.91	4.06	5.27	0.36	2.75	2.59
age 55+	24221	3.61	0.13	1.86	1.40	4.36	0.20	2.25	1.82	4.34	0.20	1.98	1.79

Nevada

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	24014	9.19	0.70	5.20	6.97	9.44	0.91	5.35	7.07	2.38	0.64	1.32	1.25
Female	9661	17.30	1.74	18.72	19.68	18.66	2.26	19.12	20.05	8.45	1.62	4.77	4.76
Hispanic	4455	11.51	0.00	5.30	6.86	12.84	0.00	6.83	8.73	12.55	0.00	6.28	7.19
Non-Hispanic	29220	12.57	0.00	9.99	11.40	12.78	0.00	10.11	11.47	2.63	0.00	1.68	1.47
White	23978	13.23	0.72	11.77	13.05	13.31	0.85	11.80	13.08	1.61	0.50	0.93	0.97
Black	6453	7.89	0.77	2.86	3.24	8.76	0.99	3.54	3.89	6.65	0.89	3.46	3.49
age 0-17	1944	30.64	3.38	28.57	30.50	32.73	3.70	29.59	31.38	17.85	1.64	10.78	10.59
age 18-29	10391	8.97	1.94	4.37	5.82	9.99	2.07	5.05	6.37	4.84	0.70	2.64	2.75
age 30-54	13417	7.12	0.65	3.51	5.62	7.82	0.74	4.13	5.95	3.67	0.38	2.72	2.07
age 55+	7923	17.85	0.73	20.49	20.49	18.36	0.87	20.61	20.61	5.21	0.59	2.89	2.79

New Jersey

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	110292	4.30	0.11	0.69	1.55	4.64	0.14	0.89	1.74	1.81	0.09	0.82	0.90
Female	84529	7.92	0.14	4.48	6.70	8.14	0.18	4.58	6.78	2.04	0.12	1.00	1.09
Hispanic	19815	5.53	0.00	2.53	2.51	6.90	0.00	3.13	3.13	5.75	0.00	3.08	3.04
Non-Hispanic	175006	6.06	0.00	2.00	4.09	6.11	0.00	2.03	4.11	0.74	0.00	0.36	0.41
White	122388	6.74	0.23	3.64	5.40	6.82	0.29	3.68	5.43	1.14	0.21	0.57	0.64
Black	56377	2.83	0.32	3.02	0.85	3.21	0.38	3.18	1.02	1.71	0.31	0.97	0.84
age 0-17	6187	12.59	0.66	8.30	8.60	15.19	0.83	10.47	10.72	15.29	0.63	9.38	9.38
age 18-29	71003	15.24	0.07	6.97	11.15	15.29	0.10	6.99	11.17	1.42	0.09	0.63	0.75
age 30-54	51576	2.47	0.07	3.87	3.04	3.01	0.09	4.19	3.37	3.01	0.09	1.69	1.61
age 55+	66055	2.13	0.03	1.17	1.29	2.52	0.04	1.48	1.69	2.50	0.03	1.48	1.49

New York

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	323248	6.48	0.02	1.52	3.50	6.54	0.02	1.63	3.54	0.94	0.02	0.59	0.56
Female	257213	9.03	0.02	6.47	8.37	9.10	0.03	6.49	8.39	1.21	0.03	0.61	0.67
Hispanic	72341	3.48	0.00	1.21	0.87	4.09	0.00	1.41	1.18	2.22	0.00	1.05	1.17
Non-Hispanic	508120	8.20	0.00	4.37	6.45	8.21	0.00	4.38	6.45	0.41	0.00	0.29	0.24
White	367099	9.25	0.19	6.20	7.73	9.28	0.23	6.21	7.74	0.91	0.15	0.47	0.47
Black	148243	2.89	0.25	1.49	0.85	3.29	0.32	1.70	1.05	1.65	0.25	0.82	0.92
age 0-17	31133	4.49	0.06	2.80	2.90	5.77	0.08	3.58	3.75	5.75	0.08	3.58	3.26
age 18-29	241483	17.52	0.02	9.17	12.93	17.53	0.03	9.18	12.94	0.74	0.02	0.42	0.36
age 30-54	141374	1.63	0.03	2.30	1.69	2.02	0.04	2.54	1.95	1.90	0.03	1.07	1.03
age 55+	166471	0.89	0.02	1.60	2.00	1.08	0.02	1.70	2.08	1.03	0.02	0.59	0.61

Pennsylvania

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	219229	7.91	0.03	2.97	4.43	8.03	0.03	3.07	4.49	1.47	0.03	0.83	0.77
Female	214072	9.51	0.03	6.51	7.55	9.58	0.03	6.54	7.58	1.29	0.03	0.62	0.65
Hispanic	18507	7.26	0.00	5.71	2.11	8.12	0.00	5.99	2.61	4.52	0.00	1.72	2.30
Non-Hispanic	414794	8.78	0.00	5.18	6.18	8.79	0.00	5.19	6.19	0.41	0.00	0.30	0.26
White	334531	9.48	0.12	6.58	7.42	9.51	0.15	6.60	7.44	0.95	0.15	0.57	0.56
Black	79043	3.89	0.26	2.42	0.85	4.42	0.35	2.64	1.05	2.19	0.27	1.03	1.04
age 0-17	16500	8.61	0.16	4.81	6.54	10.47	0.22	5.81	8.10	9.77	0.21	5.74	6.30
age 18-29	185833	19.80	0.03	11.90	13.86	19.81	0.04	11.91	13.86	0.87	0.04	0.47	0.43
age 30-54	79932	1.72	0.07	2.65	1.48	2.10	0.09	2.81	1.73	2.01	0.08	0.92	0.98
age 55+	151036	0.89	0.01	0.43	0.43	1.04	0.02	0.52	0.51	1.01	0.02	0.50	0.45

Rhode Island

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	18726	13.84	0.57	7.27	10.24	14.69	0.74	7.79	10.59	5.74	0.74	3.03	3.02
Female	20090	13.05	0.53	8.09	8.87	13.85	0.69	8.54	9.24	5.32	0.68	2.97	2.84
Hispanic	2396	11.16	0.00	5.28	7.20	14.87	0.00	6.51	8.67	12.42	0.00	5.93	6.03
Non-Hispanic	36420	13.67	0.00	8.36	9.72	13.72	0.00	8.38	9.74	1.29	0.00	0.64	0.71
White	32250	13.40	0.25	8.49	10.21	13.53	0.30	8.56	10.26	2.15	0.30	1.20	1.19
Black	3452	10.79	3.09	3.09	3.32	12.87	3.81	3.88	4.37	9.57	2.53	3.88	4.35
age 0-17	864	25.24	4.35	14.19	13.38	31.73	5.27	18.00	17.27	32.03	4.85	18.22	17.48
age 18-29	22801	22.09	0.18	13.33	16.24	22.13	0.23	13.36	16.26	1.69	0.21	1.07	1.04
age 30-54	4487	6.92	1.15	4.61	4.50	9.15	1.46	5.67	5.54	8.81	1.45	5.65	5.22
age 55+	10664	2.27	0.36	1.36	1.36	2.81	0.52	1.70	1.67	2.81	0.51	1.35	1.26

Texas

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	370702	1.42	0.02	2.30	1.42	1.63	0.02	2.36	1.51	0.99	0.02	0.51	0.51
Female	190407	5.82	0.03	4.37	5.61	6.04	0.04	4.49	5.68	1.69	0.04	1.06	0.94
Hispanic	122958	2.52	0.00	1.95	1.11	3.11	0.00	2.26	1.42	2.58	0.00	1.27	1.42
Non-Hispanic	438151	3.14	0.00	0.52	1.20	3.21	0.00	0.72	1.27	0.72	0.00	0.55	0.43
White	368493	3.54	0.16	2.07	2.28	3.62	0.20	2.12	2.32	0.78	0.18	0.49	0.43
Black	141330	1.50	0.12	4.58	2.60	1.98	0.15	4.66	2.75	1.82	0.12	0.84	0.88
age 0-17	22281	6.47	0.18	3.81	4.59	8.06	0.21	4.61	5.60	7.90	0.13	4.49	4.90
age 18-29	231508	6.96	0.03	1.58	2.56	7.01	0.03	1.67	2.59	0.87	0.02	0.54	0.45
age 30-54	173470	0.90	0.02	3.00	1.81	1.13	0.03	3.11	1.90	1.03	0.03	0.81	0.57
age 55+	133850	1.05	0.01	1.16	1.51	1.33	0.01	1.37	1.62	1.33	0.01	0.76	0.63

West Virginia

Characteristic	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
Male	23041	7.75	0.67	3.90	4.59	8.47	0.83	4.42	5.01	3.81	0.54	2.18	2.10
Female	20106	10.34	0.76	10.14	10.41	11.06	0.95	10.31	10.61	4.37	0.62	2.11	2.28
Hispanic	668	18.01	0.00	8.85	10.72	24.16	0.00	10.54	13.25	24.68	0.00	9.21	13.07
Non-Hispanic	42479	9.03	0.00	6.98	7.35	9.16	0.00	7.08	7.40	1.67	0.00	1.29	0.96
White	36090	8.77	0.14	7.61	7.04	9.00	0.18	7.74	7.11	2.22	0.17	1.51	1.13
Black	6252	7.76	0.51	3.00	7.37	9.54	0.63	3.95	7.96	6.94	0.62	3.93	3.25
age 0-17	1771	35.22	1.28	21.59	22.08	42.45	1.75	25.47	26.10	39.41	1.62	21.42	22.66
age 18-29	19057	20.51	0.39	17.01	17.00	20.72	0.46	17.11	17.04	3.64	0.27	2.20	1.48
age 30-54	8518	7.78	0.66	5.60	3.73	9.30	0.79	6.86	4.49	9.34	0.44	4.87	4.47
age 55+	13801	5.14	0.26	2.23	2.95	7.03	0.32	4.29	3.57	7.03	0.25	3.93	3.53

Table A4.2. Measures for Major GQ Types

Arizona

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	45783	0.42	3.33	4.86	2.94	0.46	3.52	4.88	2.95	0.26	1.10	0.46	0.16
2	1955	5.63	6.43	3.93	3.39	7.44	8.32	4.98	4.50	7.47	7.49	4.90	4.20
3	13607	1.94	1.74	2.09	2.03	2.32	2.08	2.50	2.35	2.31	2.08	1.66	1.27
4	2423	10.20	6.37	7.26	6.87	12.21	7.77	8.88	8.38	12.13	7.68	8.74	8.32
5	17340	26.74	9.26	21.36	23.46	26.80	9.55	21.39	23.49	2.51	2.58	1.58	1.55
6	5256	2.07	13.19	1.33	3.91	3.37	13.45	1.67	4.26	3.38	2.33	1.47	1.67
7	5526	7.31	3.59	4.55	4.81	8.56	4.14	5.33	5.61	7.52	3.95	4.51	4.63
8	8058	5.00	2.34	4.22	3.89	6.27	3.11	5.04	4.67	5.47	2.89	3.54	3.51
9	9902	6.29	5.01	6.75	7.18	7.29	5.66	7.08	7.55	4.68	3.03	2.31	2.54

California

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	248516	0.14	1.60	3.53	3.35	0.20	1.68	3.54	3.35	0.20	0.50	0.25	0.12
2	17900	2.51	7.48	4.37	3.72	3.18	7.94	4.55	3.91	2.21	2.46	1.21	1.16
3	120724	3.35	4.10	2.57	2.08	3.42	4.17	2.59	2.11	0.66	0.72	0.35	0.34
4	26516	1.26	2.17	2.56	1.64	1.40	2.29	2.69	1.81	1.33	0.70	0.81	0.76
5	126715	24.88	10.23	20.04	22.23	24.88	10.24	20.04	22.23	0.47	0.56	0.35	0.27
6	58810	1.21	9.05	5.80	5.40	1.38	9.09	5.81	5.42	0.69	0.76	0.38	0.40
7	50271	2.26	0.71	0.69	0.90	2.53	0.90	0.94	1.01	1.55	0.85	0.80	0.82
8	71447	2.29	1.47	1.23	1.11	2.63	1.82	1.57	1.32	2.46	1.21	1.21	1.31
9	98855	6.44	4.34	5.58	6.38	6.51	4.38	5.62	6.41	1.05	0.58	0.72	0.66

Colorado

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	30136	0.82	2.34	4.09	2.88	1.02	2.68	4.22	2.92	1.00	1.28	1.00	0.46
2	2446	8.73	8.07	6.17	5.34	11.13	10.38	7.36	6.45	11.25	9.30	7.41	6.47
3	18495	1.25	1.46	3.25	2.71	1.76	1.74	3.38	2.81	1.63	1.74	0.96	0.78
4	1664	7.18	5.77	6.78	5.92	9.54	7.14	7.79	6.71	8.97	7.17	5.76	5.71
5	23631	25.85	7.93	16.77	22.13	25.88	7.97	16.79	22.14	1.57	0.88	1.17	0.79
6	8512	1.65	11.42	2.12	3.62	1.99	11.72	2.56	3.89	1.98	2.36	1.55	1.37
7	4117	7.17	3.77	3.23	5.23	9.05	4.72	4.09	6.26	6.95	3.99	3.94	3.99
8	4173	6.31	5.12	3.92	3.86	8.60	6.28	5.11	4.93	8.41	4.94	4.52	4.69
9	9781	4.21	2.17	2.83	2.54	4.74	2.64	3.61	3.09	4.62	2.43	3.01	2.74

Florida

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	139148	0.23	2.17	5.19	2.97	0.27	2.23	5.20	2.98	0.23	0.52	0.35	0.14
2	7330	8.26	5.03	8.07	9.53	9.11	5.78	8.46	9.79	4.20	3.43	2.77	2.50
3	88828	1.25	1.44	0.43	0.40	1.45	1.58	0.52	0.50	0.76	0.63	0.49	0.44
4	13044	1.57	1.29	1.37	0.89	1.92	1.50	1.78	1.12	1.89	1.07	1.29	1.13
5	54085	25.16	10.30	20.66	21.60	25.16	10.34	20.66	21.61	0.72	0.98	0.49	0.40
6	13457	1.58	11.01	5.78	3.97	2.06	11.09	5.96	4.15	2.00	1.23	1.37	1.18
7	13401	3.09	1.65	1.07	2.14	3.63	2.03	1.38	2.37	1.97	1.53	1.27	1.04
8	19093	2.69	3.95	3.13	2.46	3.57	4.22	3.45	2.81	3.01	1.53	1.52	1.49
9	40559	2.62	1.47	1.23	2.41	3.17	1.81	1.61	2.71	2.13	1.20	1.42	1.30

Hawaii

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	3233	5.84	3.33	7.24	6.26	7.77	4.14	8.09	7.23	7.71	3.79	4.00	4.11
2	216	96.07	59.34	64.73	64.82	96.29	71.01	73.00	73.02	167.27	101.38	107.22	107.32
3	2949	7.40	5.84	5.19	5.16	8.86	7.21	6.36	6.35	8.93	7.23	6.18	6.08
4	1292	22.69	21.22	23.10	22.40	30.21	23.72	25.20	24.72	16.66	8.79	8.22	8.58
5	4716	23.05	13.45	16.40	17.25	23.37	13.91	16.66	17.49	5.04	4.11	3.53	3.53
6	13992	2.18	3.06	7.78	7.79	2.57	3.39	7.96	7.96	2.57	1.42	1.56	1.52
7	1684	10.27	7.41	8.99	7.41	14.25	10.13	11.67	9.49	14.30	9.09	9.70	8.78
8	4305	10.90	4.05	6.22	6.19	12.76	4.74	7.36	7.42	11.77	3.57	5.71	5.87
9	3395	7.33	5.16	4.69	5.46	8.88	5.94	5.72	6.40	6.19	3.47	4.03	4.13

Louisiana

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	49854	0.75	2.88	5.44	3.78	1.01	3.08	5.53	3.81	0.98	1.05	0.96	0.48
2	2781	8.59	8.02	7.69	4.84	9.87	9.62	9.17	6.21	9.97	9.71	7.47	6.25
3	31521	1.23	1.70	1.39	1.83	1.39	2.27	1.81	1.95	0.84	2.13	1.25	0.67
4	5846	4.73	2.39	3.46	3.31	5.71	3.12	4.16	3.95	5.47	3.13	3.63	3.02
5	26959	23.33	7.38	15.65	19.98	23.34	7.51	15.67	19.99	1.03	1.55	0.80	0.67
6	3877	3.87	9.42	6.86	3.65	4.12	10.05	7.15	4.35	4.09	3.21	1.92	2.62
7	3059	9.28	5.32	5.90	6.48	12.01	6.99	7.42	7.99	10.68	6.44	6.27	6.09
8	6382	4.55	3.27	2.83	2.62	5.53	4.00	3.35	3.19	5.55	3.54	3.19	3.03
9	5686	7.01	3.14	4.46	4.19	8.23	3.81	5.37	5.00	7.84	3.74	4.71	3.56

Mississippi

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	25778	1.04	4.68	8.26	4.44	1.46	5.05	8.32	4.50	1.40	1.82	0.93	0.70
2	1530	21.33	16.60	20.05	20.16	26.75	19.50	22.19	22.26	22.63	13.21	11.95	12.02
3	18382	1.40	1.44	2.57	0.70	1.62	1.75	2.81	0.84	1.43	1.72	1.45	0.56
4	5136	6.81	6.48	6.06	4.72	8.21	7.82	7.13	5.66	7.60	4.57	5.01	4.29
5	29238	25.25	8.88	15.03	20.22	25.26	8.94	15.08	20.23	1.14	1.12	1.35	0.72
6	5722	1.88	17.62	7.26	8.10	2.53	17.77	7.48	8.28	2.35	2.00	1.69	1.61
7	1084	20.71	13.44	15.46	16.21	25.19	15.93	17.70	18.29	22.87	12.01	13.36	11.75
8	4180	8.86	7.41	8.68	5.57	10.27	9.07	10.24	7.19	9.71	6.05	5.38	5.48
9	4364	5.62	4.36	4.54	5.15	8.39	5.27	5.46	6.07	8.45	4.50	4.25	4.81

Nevada

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	15940	1.68	5.22	3.56	0.87	1.85	5.39	3.73	1.04	1.12	1.26	1.08	0.58
2	949	19.14	12.54	15.16	19.17	22.35	16.18	16.56	20.13	14.35	11.45	7.90	7.62
3	4895	4.53	16.34	8.32	8.37	5.91	16.80	8.57	8.62	4.00	3.36	2.24	2.28
4	389	48.44	42.92	45.70	45.85	68.54	49.85	53.39	53.57	94.54	53.25	53.13	52.93
5	2498	21.73	3.56	21.01	19.93	24.44	4.49	21.76	20.75	14.36	4.52	7.20	7.26
6	1312	12.37	15.50	10.27	7.21	13.77	17.46	12.81	8.52	13.82	6.99	7.69	7.27
7	3273	9.09	4.44	7.72	8.17	10.93	5.83	8.52	8.86	6.71	5.34	3.96	3.77
8	1436	56.80	50.48	56.81	56.79	58.46	51.37	57.29	57.30	32.23	19.38	17.21	17.72
9	2983	47.18	37.98	48.13	47.51	47.29	38.13	48.17	47.54	6.12	5.61	4.03	3.31

New Jersey

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	47941	0.55	2.89	6.35	4.44	0.67	3.04	6.36	4.46	0.67	0.90	0.43	0.37
2	2610	13.02	7.50	12.41	14.58	15.54	8.91	13.57	15.53	9.88	6.65	6.29	6.30
3	51493	1.82	2.10	2.19	1.58	1.92	2.36	2.22	1.62	0.62	1.10	0.40	0.34
4	8125	1.63	2.74	3.55	1.54	2.00	3.17	3.77	1.85	1.88	1.70	1.23	1.11
5	45222	24.68	6.60	16.12	20.96	24.69	6.65	16.13	20.96	0.95	0.88	0.72	0.55
6	3291	6.28	13.01	5.57	4.10	7.91	14.04	6.60	4.93	7.86	4.71	4.99	4.42
7	8707	4.65	2.92	2.97	2.61	5.62	3.55	3.68	3.30	5.41	3.33	3.56	3.31
8	12252	4.97	5.91	4.09	3.89	6.15	6.96	5.01	4.85	5.55	3.64	3.45	3.46
9	15180	7.12	5.05	5.83	6.38	7.98	5.47	6.29	6.79	4.56	2.22	2.52	2.48

New York

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	108088	0.25	2.62	5.25	4.02	0.28	2.71	5.27	4.02	0.26	0.65	0.47	0.15
2	8126	6.71	9.02	12.37	6.65	8.45	10.10	13.13	7.52	5.75	4.23	3.98	3.61
3	123852	0.42	0.54	1.18	1.46	0.45	0.69	1.22	1.48	0.43	0.53	0.34	0.26
4	22196	2.90	4.72	4.08	2.94	3.25	4.91	4.27	3.16	2.22	1.29	1.22	1.17
5	174111	24.59	4.89	15.98	20.30	24.59	4.90	15.98	20.30	0.33	0.41	0.28	0.17
6	8598	2.60	19.79	8.72	6.07	2.92	19.90	8.81	6.25	2.82	1.79	1.17	1.41
7	41450	1.14	3.21	1.29	0.72	1.35	3.34	1.43	0.84	1.24	0.90	0.60	0.63
8	50909	1.26	3.13	1.68	1.15	1.63	3.28	2.03	1.47	1.63	0.96	1.17	1.03
9	43131	5.89	2.95	4.56	5.80	6.14	3.20	4.71	5.88	1.87	1.30	1.22	1.05

Pennsylvania

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	76553	0.64	3.99	5.85	4.04	0.71	4.05	5.86	4.06	0.71	0.67	0.38	0.37
2	6987	5.99	4.23	2.57	3.28	6.69	5.17	3.15	4.10	5.35	3.59	3.17	2.97
3	114113	0.35	0.50	0.24	0.27	0.47	0.64	0.30	0.30	0.37	0.62	0.29	0.27
4	16137	3.22	3.88	4.09	2.57	4.01	4.37	4.49	3.05	3.72	2.00	1.80	2.19
5	147542	25.13	3.36	17.32	19.36	25.13	3.39	17.32	19.36	0.43	0.44	0.29	0.27
6	758	15.38	13.22	9.67	9.69	21.47	15.03	11.14	11.16	21.99	10.39	10.98	10.86
7	8664	3.99	3.43	2.46	2.24	4.55	4.14	2.93	2.65	4.41	3.83	2.90	2.62
8	27446	2.63	3.17	2.28	1.76	3.36	3.52	2.64	2.11	3.37	1.64	1.73	1.73
9	35101	3.37	1.26	1.97	2.16	3.81	1.53	2.41	2.55	3.05	1.45	1.88	1.71

Rhode Island

Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	3576	0.23	6.61	5.44	4.32	4.06	7.86	5.82	4.73	4.07	4.46	2.51	2.40
2	429	39.19	25.99	23.45	22.54	49.56	31.07	28.97	28.19	48.20	26.68	28.53	27.46
3	9222	1.07	1.05	1.00	0.94	2.06	1.29	1.19	1.11	1.98	1.26	1.08	0.95
4	574	33.33	13.69	14.63	14.97	33.72	18.24	19.15	19.00	34.75	18.19	19.32	19.31
5	20551	24.97	2.38	16.26	19.21	24.99	2.48	16.29	19.23	1.47	0.71	1.18	1.03
6	870	25.05	16.24	15.42	13.52	31.82	20.23	19.41	17.31	33.52	17.87	17.91	17.57
7	1074	24.87	13.84	12.40	12.82	26.39	17.59	15.74	15.89	27.23	17.14	15.90	16.18
8	1626	18.30	10.21	10.33	9.89	22.83	13.08	12.57	12.00	22.54	11.92	12.05	11.68
9	894	20.58	11.89	11.99	12.45	24.87	14.89	14.97	15.81	23.54	13.88	13.81	13.98

Texas

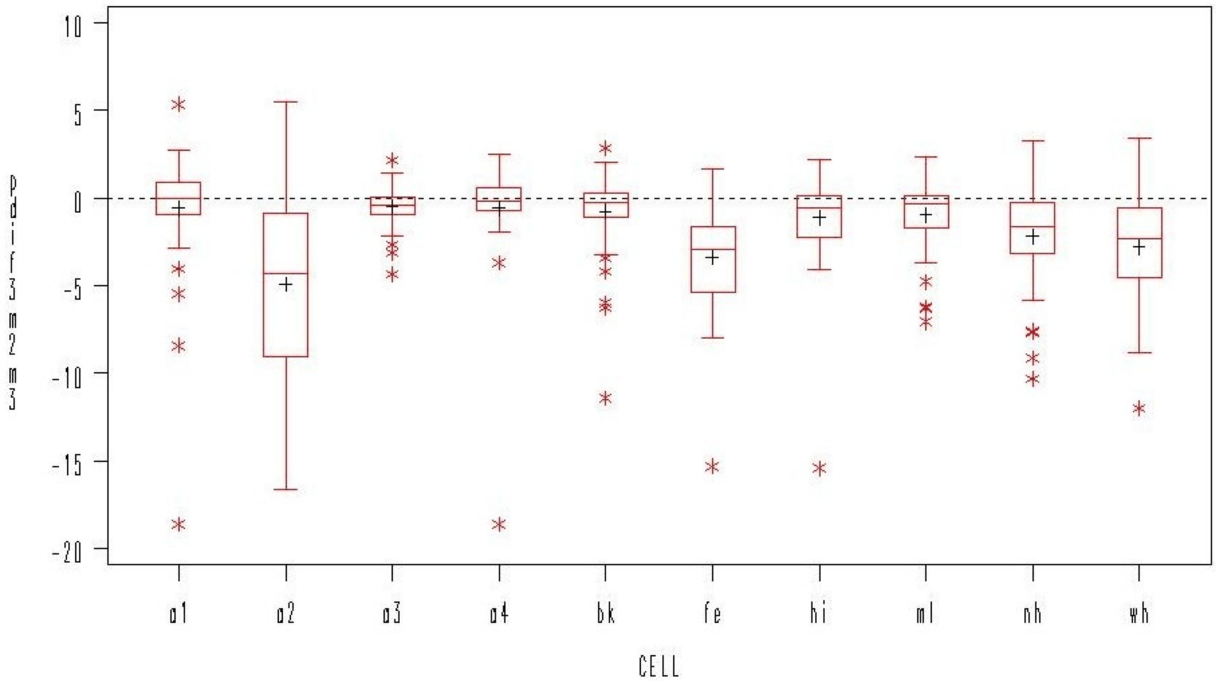
Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	244363	0.23	0.61	4.62	2.93	0.29	0.70	4.63	2.93	0.22	0.33	0.33	0.10
2	8909	6.77	8.87	10.08	6.89	7.47	9.84	10.57	7.13	3.11	3.94	2.91	1.70
3	105052	0.66	0.77	0.77	0.85	0.76	0.95	0.97	0.88	0.47	0.71	0.68	0.25
4	16380	2.55	2.03	3.35	1.46	2.96	2.37	3.70	1.76	2.88	1.81	1.79	1.60
5	92246	25.24	13.60	17.34	21.92	25.24	13.62	17.34	21.92	0.56	0.84	0.58	0.33
6	34056	23.86	32.17	16.94	29.54	23.89	32.19	16.97	29.55	0.94	0.74	0.89	0.53
7	13014	9.76	8.39	7.93	8.84	10.44	8.96	8.24	9.10	4.12	3.47	2.47	2.39
8	24163	3.61	3.39	3.91	2.93	4.47	3.88	4.52	3.53	4.02	2.40	3.07	2.58
9	22926	7.71	5.45	5.64	7.41	8.55	5.76	5.97	7.68	4.04	2.00	2.08	2.21

West Virginia

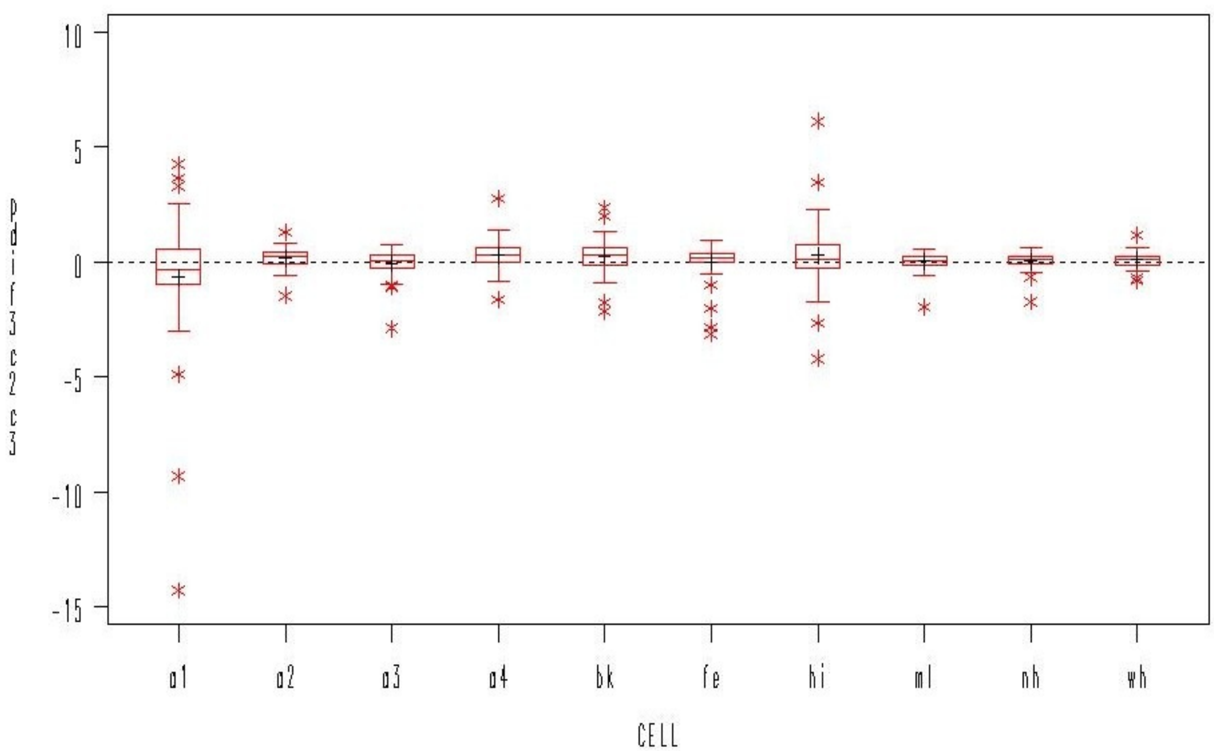
Major Type	Census 2000	3-year estimate PMADs				3-year estimate PRMSEs				3-year estimate CVs			
		C1	C2	C3	C4	C1	C2	C3	C4	C1	C2	C3	C4
1	108088	0.25	2.62	5.25	4.02	0.28	2.71	5.27	4.02	0.26	0.65	0.47	0.15
2	8126	6.71	9.02	12.37	6.65	8.45	10.10	13.13	7.52	5.75	4.23	3.98	3.61
3	123852	0.42	0.54	1.18	1.46	0.45	0.69	1.22	1.48	0.43	0.53	0.34	0.26
4	22196	2.90	4.72	4.08	2.94	3.25	4.91	4.27	3.16	2.22	1.29	1.22	1.17
5	174111	24.59	4.89	15.98	20.30	24.59	4.90	15.98	20.30	0.33	0.41	0.28	0.17
6	8598	2.60	19.79	8.72	6.07	2.92	19.90	8.81	6.25	2.82	1.79	1.17	1.41
7	41450	1.14	3.21	1.29	0.72	1.35	3.34	1.43	0.84	1.24	0.90	0.60	0.63
8	50909	1.26	3.13	1.68	1.15	1.63	3.28	2.03	1.47	1.63	0.96	1.17	1.03
9	43131	5.89	2.95	4.56	5.80	6.14	3.20	4.71	5.88	1.87	1.30	1.22	1.05

Evaluation Measures for Large (GQ≥18,000) Counties--3-Year Estimates

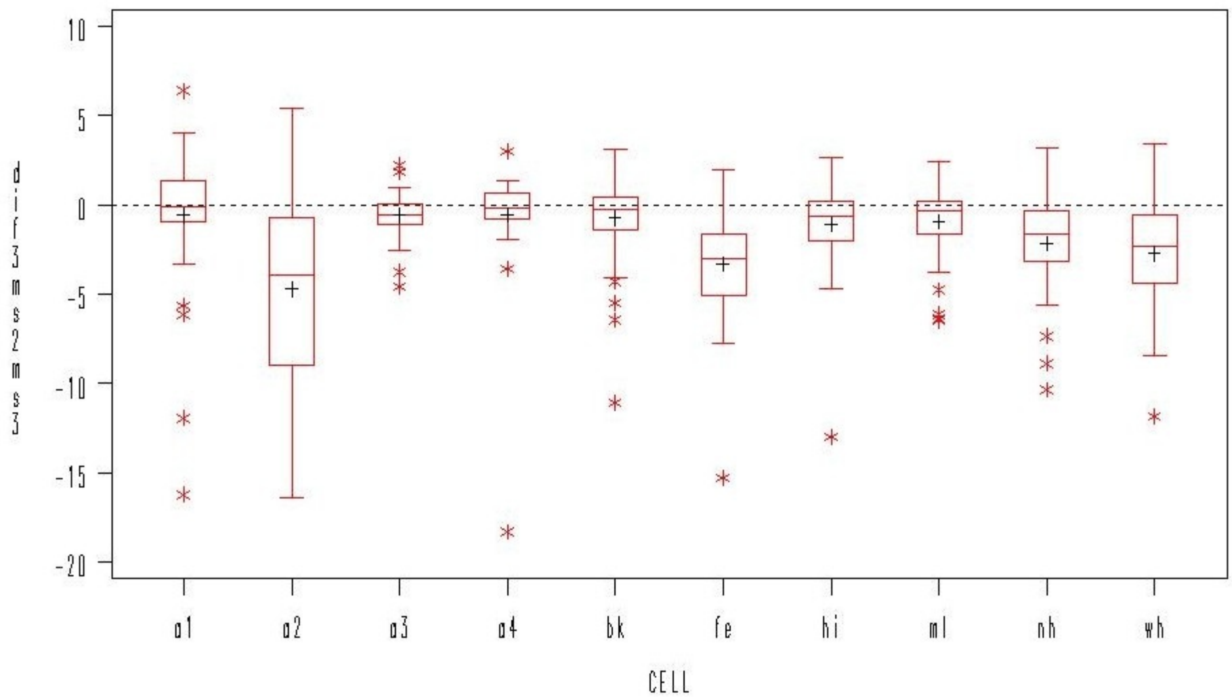
Plot A5.1: C2 - C3 PMAD for Demographic Characteristics



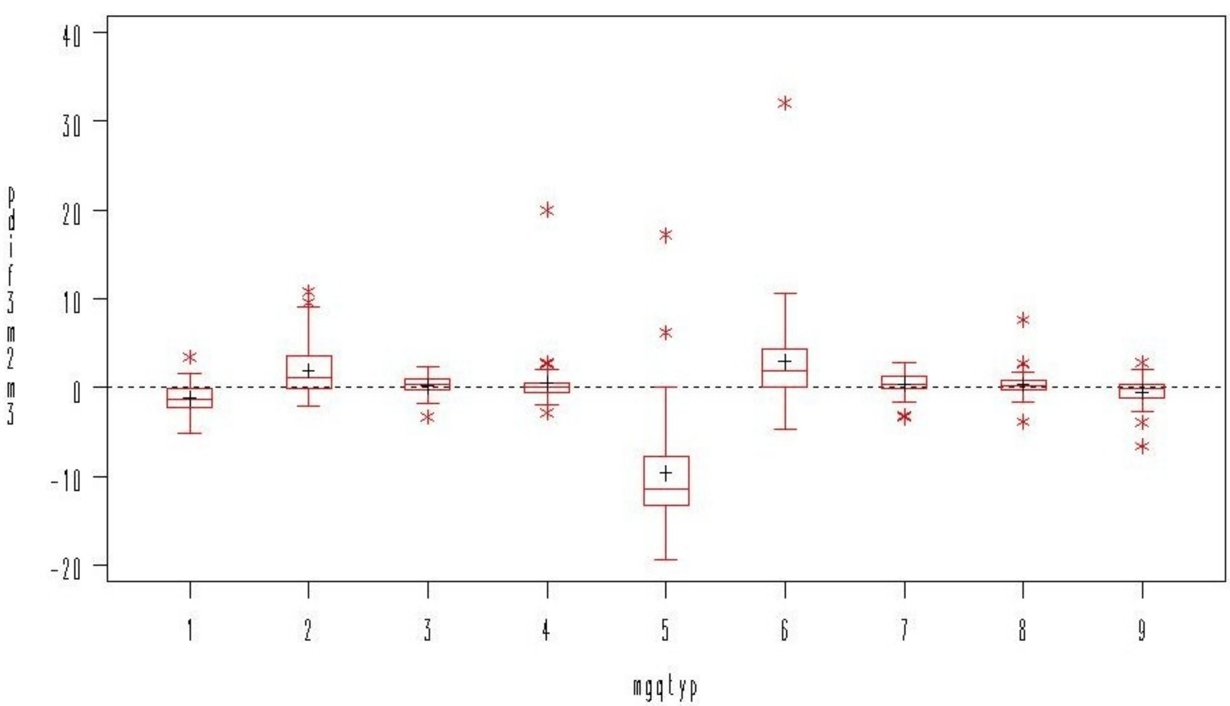
Plot A5.2: C2 - C3 CV for Demographic Characteristics



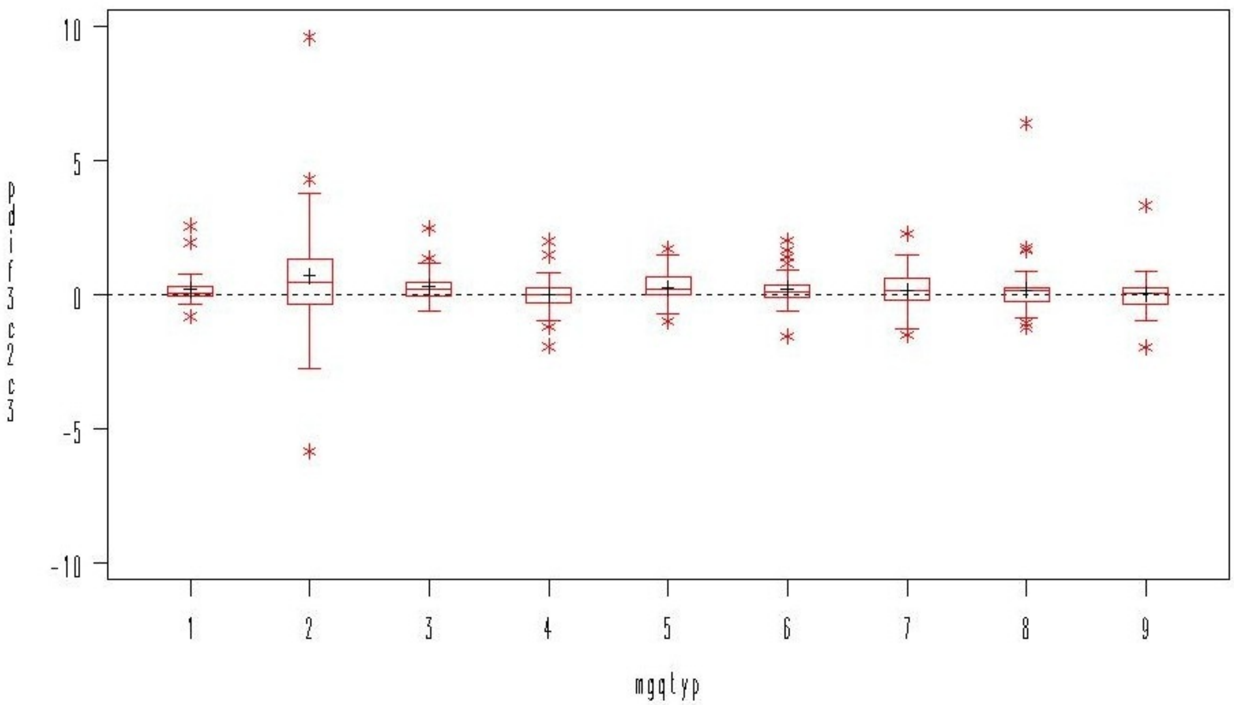
Plot A5.3: C2 - C3 PRMSE for Demographic Characteristics



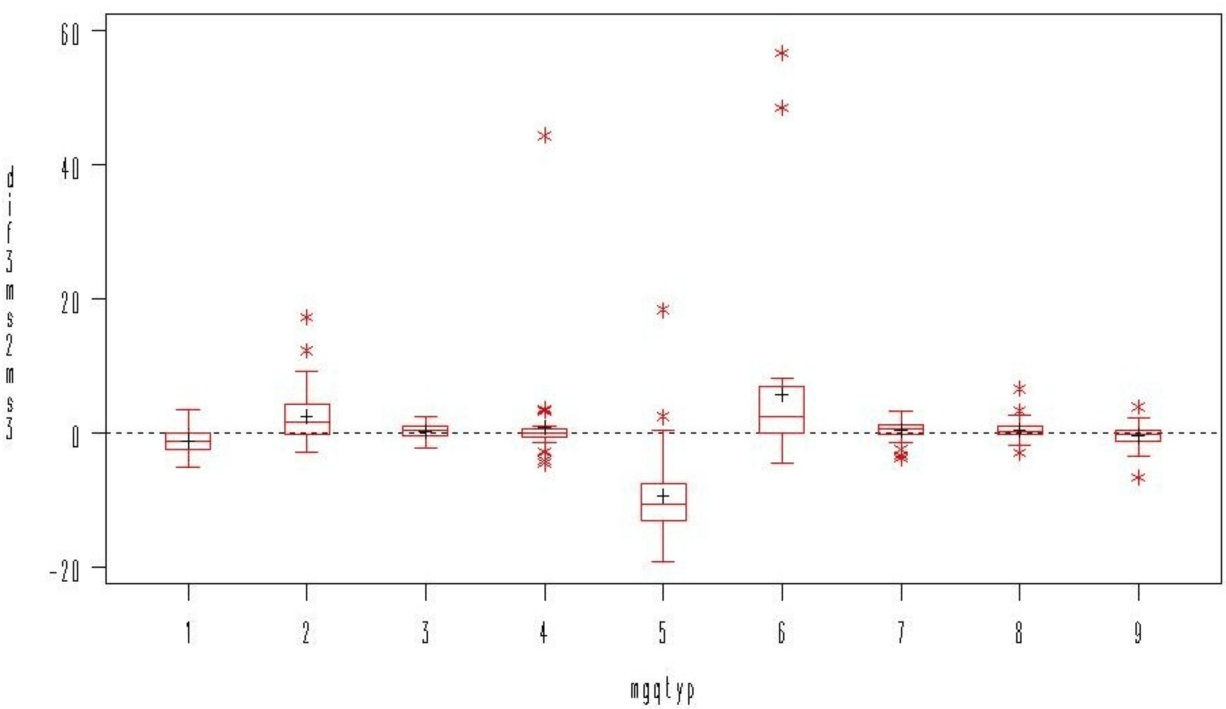
Plot A5.4: C2 - C3 PMAD for Major GQ Types



Plot A5.5: C2 - C3 CV for Major GQ Types



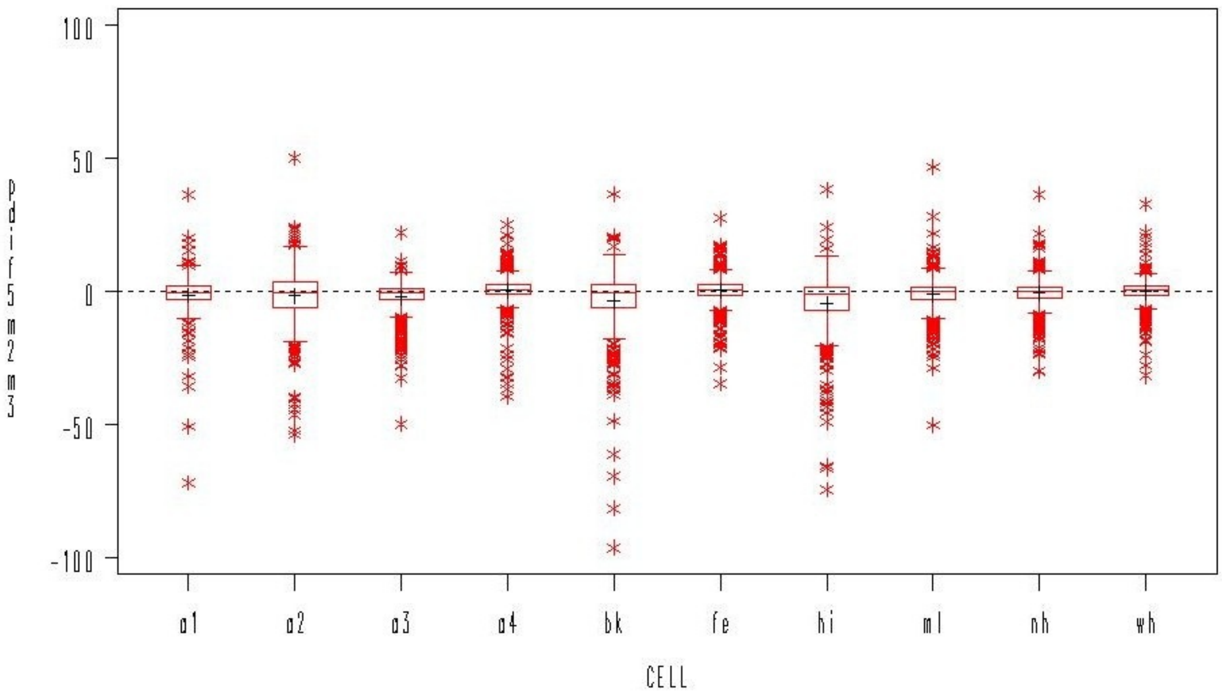
Plot A5.6: C2 - C3 PRMSE for Major GQ Types



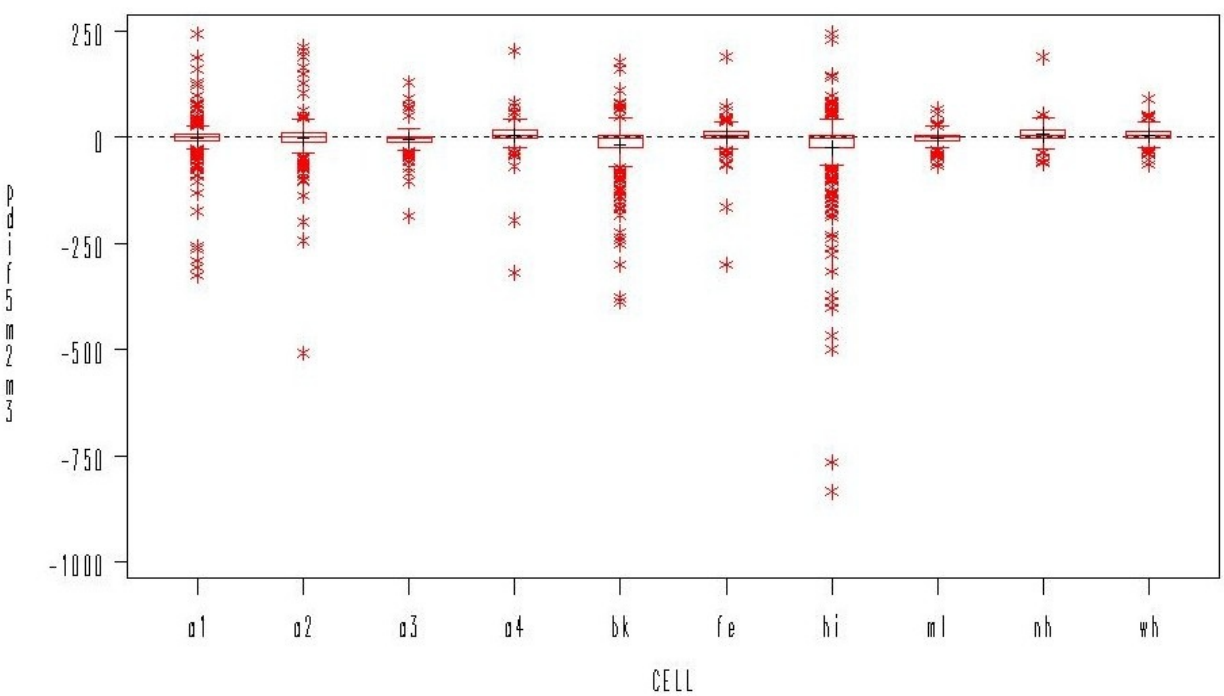
Appendix 6

Evaluation Measures for Small (GQ<18000) Counties--5-Year Estimates

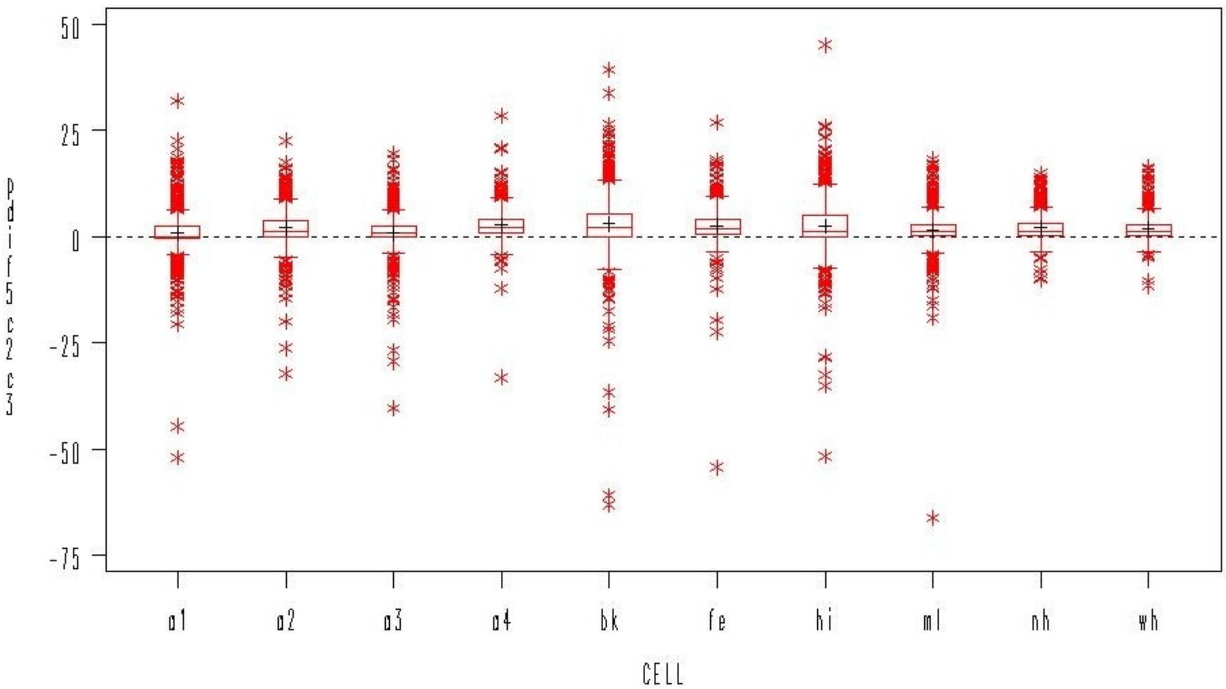
Plot A6.1: C2 - C3 PMAD for Demographic Characteristics (Census>100)



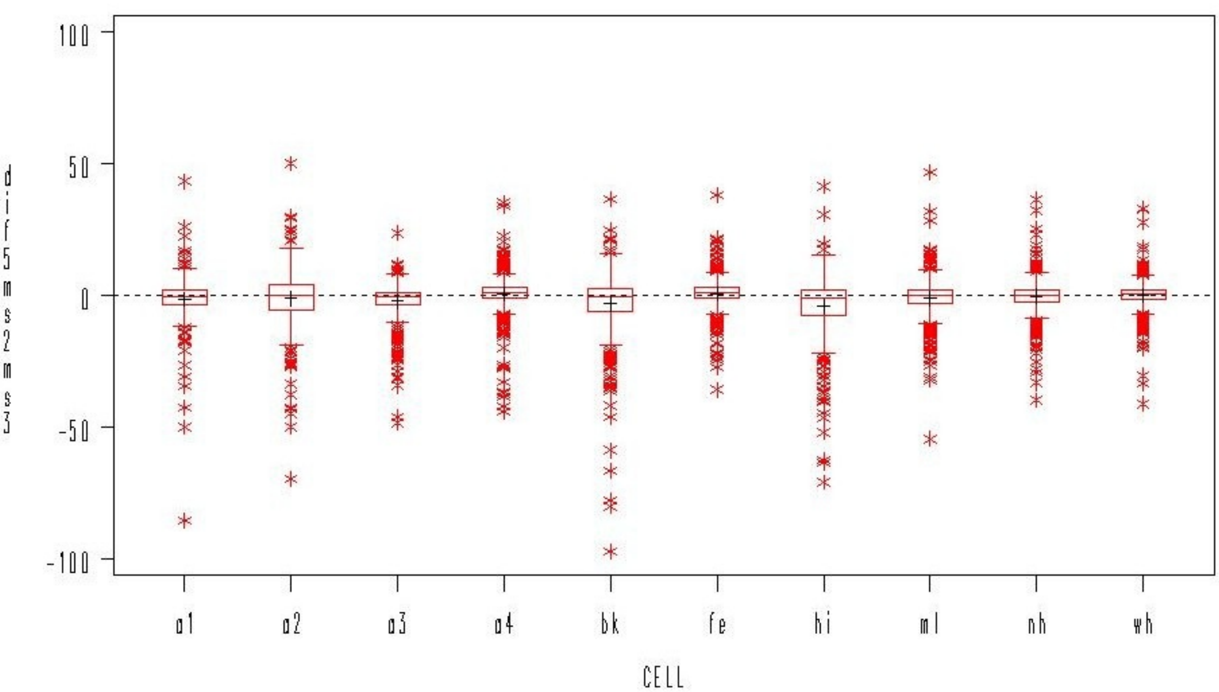
Plot A6.2: C2 - C3 PMAD for Demographic Characteristics (Census≤100)



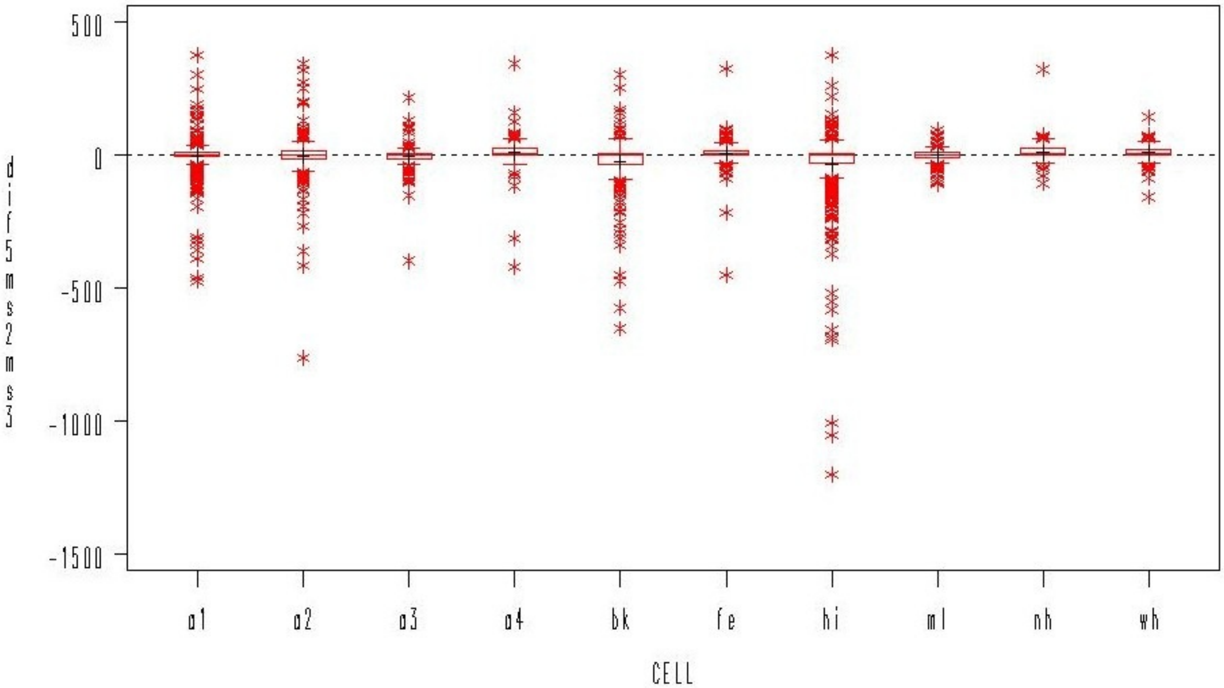
Plot A6.3: C2 -C3 CV for Demographic Characteristics



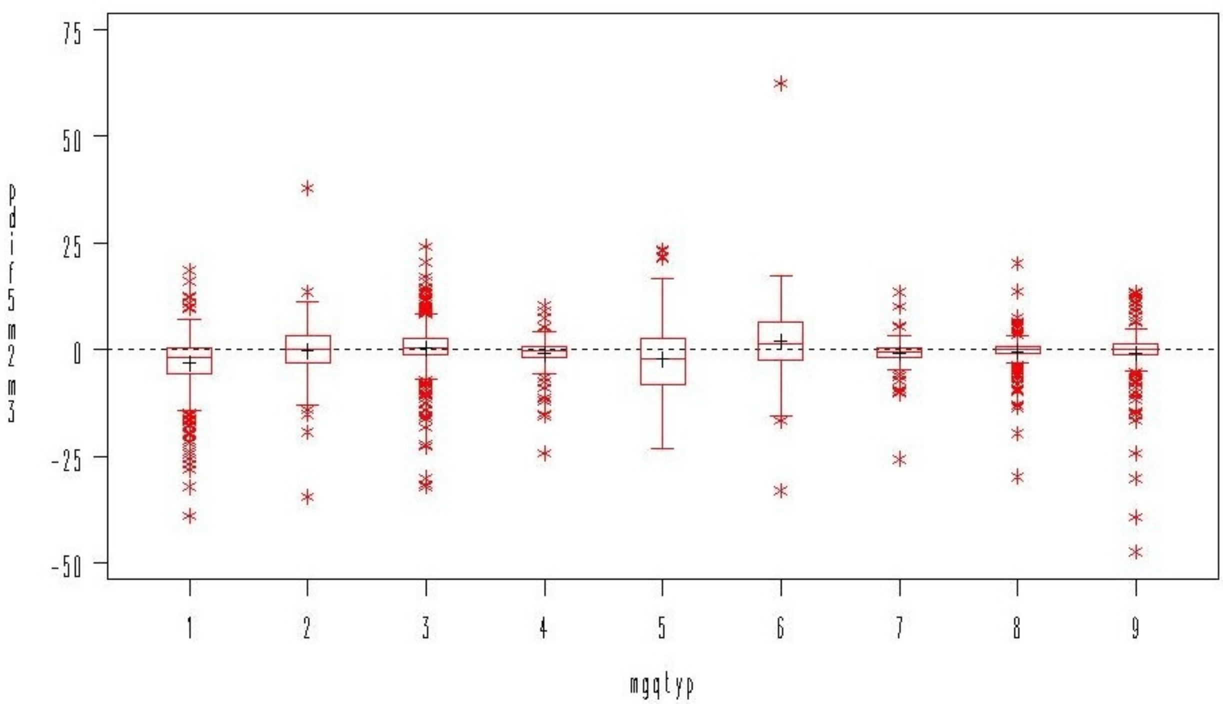
Plot A6.4: C2 - C3 PRMSE for Demographic Characteristics (Census>100)



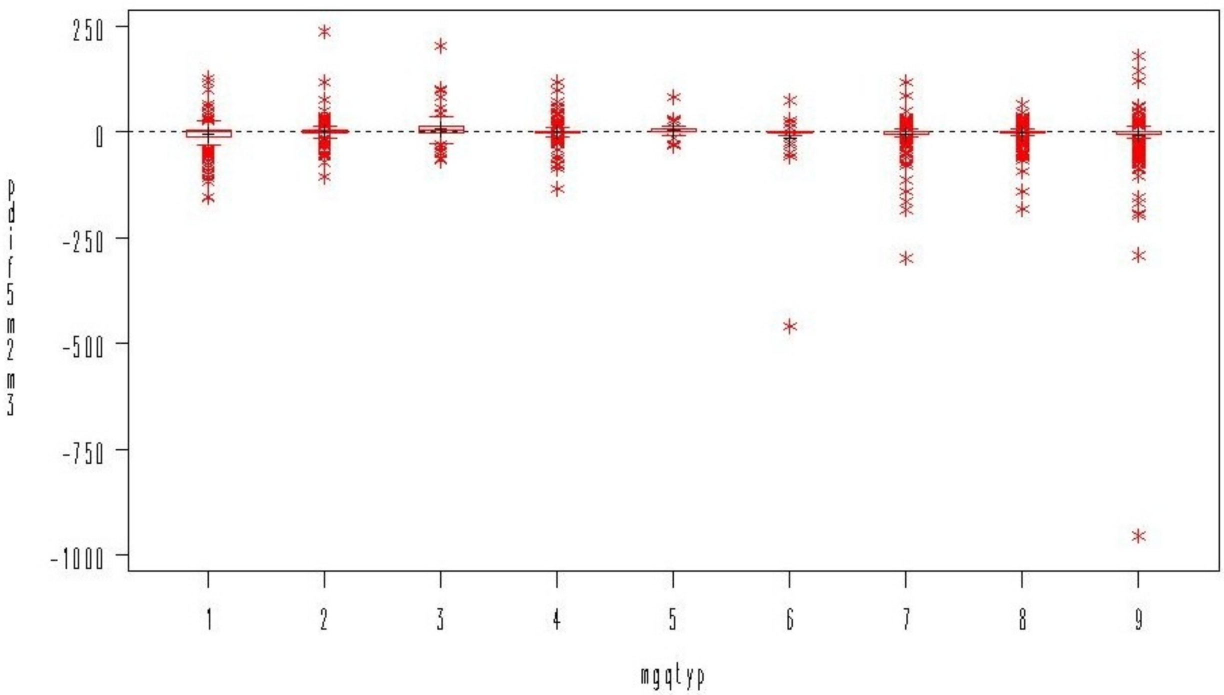
Plot A6.5: C2 - C3 PRMSE for Demographic Characteristics (Census≤100)



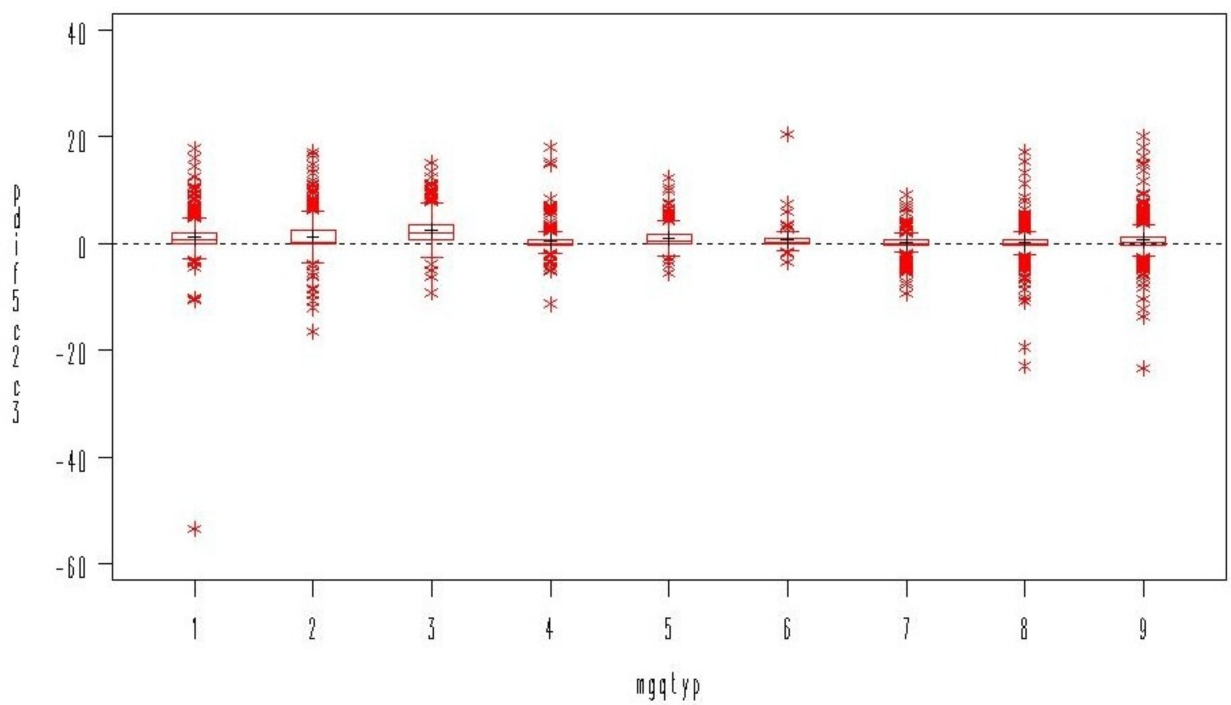
Plot A6.6: C2 - C3 PMAD for Major GQ Types (Census>100)



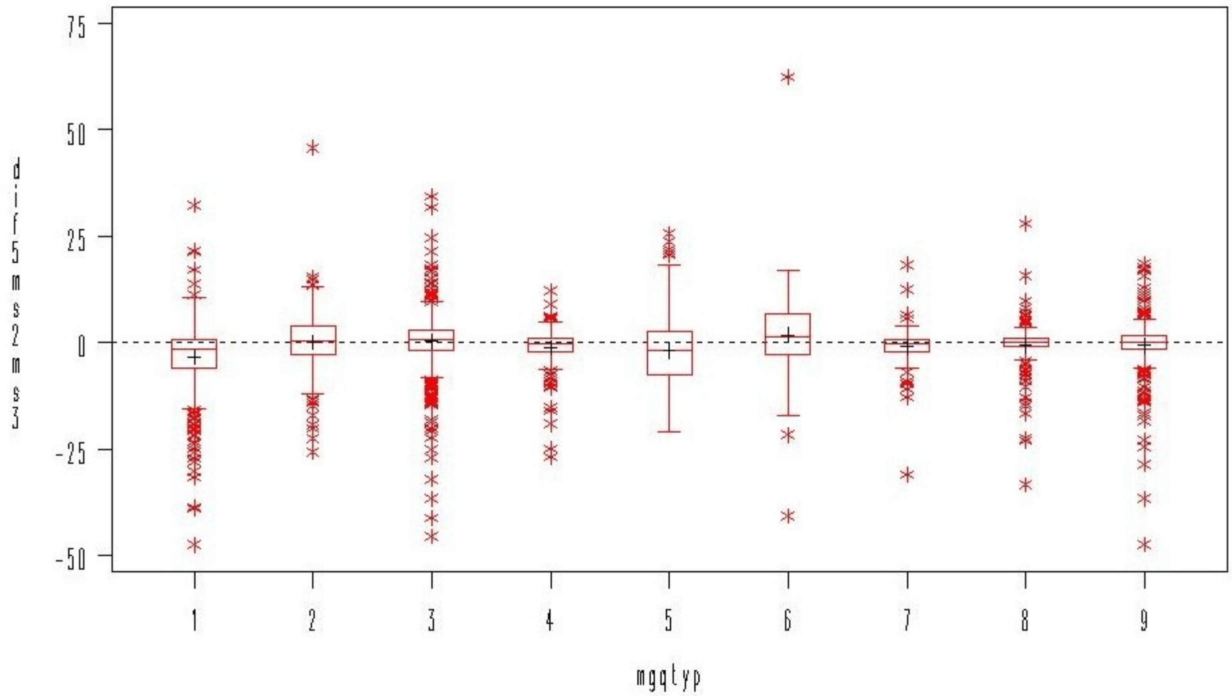
Plot A6.7: C2 - C3 PMAD for Major GQ Types (Census≤100)



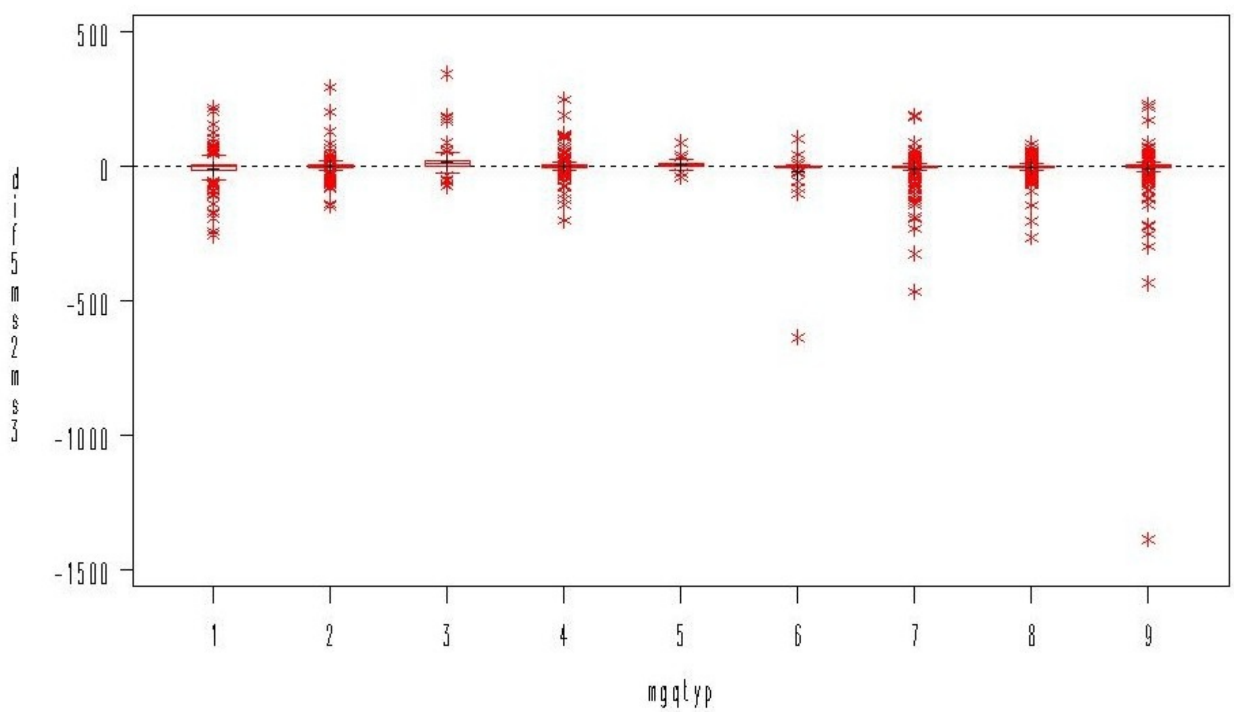
Plot A6. 8: C2 - C3 CV for Major GQ Types



Plot A6.9: C2 - C3 PRMSE for Major GQ Types (Census>100)



Plot A6.10: C2 - C3 PRMSE for Major GQ Types (Census≤100)



C2 and C5: Evaluation Measures for States -- 3-year Estimates

Arizona

Characteristic	Census 2000	3-year estimates PMADs C2	PMADs C5	PRMSEs C2	PRMSEs C5	CVs C2	CVs C5
Male	72720	0.24	1.08	0.30	1.31	0.22	1.32
Female	37130	0.46	2.12	0.59	2.57	0.43	2.58
Hispanic	24550	0.00	2.09	0.00	2.50	0.00	1.94
Non-Hispanic	85300	0.00	0.60	0.00	0.72	0.00	0.55
White	75805	0.27	0.81	0.32	1.00	0.32	0.87
Black	10224	0.70	2.48	0.84	3.12	0.82	2.54
age 0-17	6020	0.53	5.45	0.66	6.94	0.64	6.98
age 18-29	41593	0.13	1.02	0.18	1.35	0.18	1.32
age 30-54	36350	0.11	1.87	0.13	2.30	0.13	1.95
age 55+	25887	0.11	2.81	0.16	3.32	0.13	2.07

Major Type	Census 2000	3-year estimates PMADs C2	PMADs C5	PRMSEs C2	PRMSEs C5	CVs C2	CVs C5
1	45783	3.33	0.00	3.52	0.00	1.10	0.00
2	1955	6.43	0.00	8.36	0.00	7.49	0.00
3	13607	1.74	0.00	2.09	0.00	2.08	0.00
4	2423	6.37	0.00	7.80	0.00	7.68	0.00
5	17340	9.26	0.00	9.55	0.00	2.58	0.00
6	5256	13.19	0.00	13.45	0.00	2.33	0.00
7	5526	4.87	0.00	5.33	0.00	2.34	0.00

California

Characteristic	Census 2000	3-year estimates PMADs C2	PMADs C5	PRMSEs C2	PRMSEs C5	CVs C2	CVs C5
Male	528567	0.01	0.35	0.01	0.41	0.01	0.33
Female	291187	0.02	0.63	0.02	0.74	0.02	0.60
Hispanic	192560	0.00	0.70	0.00	0.94	0.00	0.84
Non-Hispanic	627194	0.00	0.22	0.00	0.29	0.00	0.26
White	495036	0.18	0.34	0.23	0.44	0.23	0.40
Black	133748	0.16	0.63	0.21	0.80	0.19	0.79
age 0-17	46188	0.00	3.03	0.00	3.66	0.00	2.92
age 18-29	307768	0.00	0.40	0.01	0.49	0.01	0.45
age 30-54	265090	0.00	1.15	0.01	1.30	0.01	0.68
age 55+	200708	0.00	1.25	0.00	1.41	0.00	0.72

Major Type	Census 2000	3-year estimates PMADs C2	PMADs C5	PRMSEs C2	PRMSEs C5	CVs C2	CVs C5
1	248516	1.60	0.00	1.68	0.00	0.50	0.00
2	17900	7.48	0.00	7.93	0.00	2.46	0.00
3	120724	4.10	0.00	4.17	0.00	0.72	0.00
4	26516	2.17	0.00	2.29	0.00	0.70	0.00
5	126715	10.23	0.00	10.24	0.00	0.56	0.00
6	58810	9.05	0.00	9.09	0.00	0.76	0.00
7	220573	2.07	0.00	2.13	0.00	0.54	0.00

Colorado

Characteristic	Census 2000	3-year estimates PMADs C2	PMADs C5	PRMSEs C2	PRMSEs C5	CVs C2	CVs C5
Male	65453	0.13	0.66	0.17	0.84	0.15	0.82
Female	37502	0.23	1.15	0.29	1.46	0.26	1.43
Hispanic	16451	0.00	1.96	0.00	2.31	0.00	2.32
Non-Hispanic	86504	0.00	0.37	0.00	0.44	0.00	0.44
White	82461	0.28	0.62	0.34	0.73	0.34	0.71
Black	11194	0.69	2.72	0.84	3.22	0.84	3.11
age 0-17	4709	0.53	8.11	0.66	9.78	0.66	9.20
age 18-29	46440	0.11	0.83	0.16	1.02	0.15	0.91
age 30-54	26748	0.20	2.03	0.25	2.52	0.21	2.21
age 55+	25058	0.23	1.57	0.28	1.92	0.18	1.93

Major Type	Census 2000	3-year estimates PMADs C2	PMADs C5	PRMSEs C2	PRMSEs C5	CVs C2	CVs C5
1	30136	2.34	0.00	2.68	0.00	1.28	0.00
2	2446	8.07	0.00	10.38	0.00	9.30	0.00
3	18495	1.46	0.00	1.74	0.00	1.74	0.00
4	1664	5.77	0.00	7.14	0.00	7.17	0.00
5	23631	7.93	0.00	7.97	0.00	0.88	0.00
6	8512	11.42	0.00	11.72	0.00	2.36	0.00
7	4117	2.23	0.00	2.79	0.00	2.47	0.00

Florida

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	241149	0.02	0.42	0.03	0.52	0.02	0.51
Female	147796	0.03	0.69	0.04	0.85	0.04	0.84
Hispanic	49771	0.00	1.38	0.00	1.76	0.00	1.75
Non-Hispanic	339174	0.00	0.20	0.00	0.26	0.00	0.26
White	260296	0.14	0.38	0.17	0.44	0.14	0.44
Black	110192	0.15	0.95	0.18	1.16	0.18	1.09
age 0-17	16959	0.20	3.96	0.26	4.92	0.26	3.59
age 18-29	129782	0.04	0.44	0.05	0.54	0.05	0.55
age 30-54	116156	0.04	0.65	0.05	0.82	0.05	0.74
age 55+	126048	0.03	0.82	0.03	1.00	0.03	0.70

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	139148	2.17	0.00	2.23	0.00	0.52	0.00
2	7330	5.03	0.00	5.78	0.00	3.43	0.00
3	88828	1.44	0.00	1.58	0.00	0.63	0.00
4	13044	1.29	0.00	1.50	0.00	1.07	0.00
5	54085	10.30	0.00	10.34	0.00	0.98	0.00
6	13457	11.01	0.00	11.09	0.00	1.23	0.00
7	13401	0.95	0.00	1.22	0.00	1.20	0.00

Hawaii

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	24401	0.39	1.63	0.47	2.10	0.43	1.97
Female	11381	0.84	3.89	1.01	4.98	0.93	4.50
Hispanic	3079	0.00	5.48	0.00	6.82	0.00	6.55
Non-Hispanic	32703	0.00	0.52	0.00	0.65	0.00	0.65
White	16380	0.61	1.89	0.74	2.30	0.72	2.30
Black	3088	2.60	6.97	3.09	8.06	2.75	6.42
age 0-17	1339	2.72	14.15	4.71	17.91	4.23	18.01
age 18-29	19006	0.26	1.08	0.35	1.38	0.35	1.28
age 30-54	8389	0.49	3.30	0.61	4.16	0.52	3.70
age 55+	7048	0.37	3.80	0.44	4.66	0.44	4.63

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	3233	3.33	0.00	4.14	0.00	3.79	0.00
2	216	59.34	45.92	71.01	67.76	101.38	92.62
3	2949	5.84	0.00	7.21	0.00	7.23	0.00
4	1292	21.22	0.00	23.72	0.00	8.79	0.00
5	4716	13.45	0.00	13.91	0.00	4.11	0.00
6	13992	3.06	0.00	3.39	0.00	1.42	0.00
7	1684	3.27	0.00	4.17	0.00	3.86	0.00

Louisiana

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	84940	0.13	1.04	0.21	1.32	0.19	1.22
Female	51025	0.21	1.73	0.34	2.20	0.32	2.06
Hispanic	3774	0.00	6.13	0.00	7.56	0.00	6.31
Non-Hispanic	132191	0.00	0.18	0.00	0.22	0.00	0.17
White	65657	0.18	0.93	0.22	1.17	0.22	0.99
Black	67323	0.14	0.93	0.18	1.15	0.17	1.01
age 0-17	5595	0.63	8.10	0.80	10.15	0.79	9.77
age 18-29	53614	0.14	0.98	0.18	1.24	0.17	1.10
age 30-54	39424	0.15	1.22	0.19	1.52	0.18	1.47
age 55+	37332	0.10	1.82	0.12	2.27	0.12	2.28

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	49854	2.88	0.00	3.08	0.00	1.05	0.00
2	2781	8.02	0.00	9.62	0.00	9.71	0.00
3	31521	1.70	0.00	2.27	0.00	2.13	0.00
4	5846	2.39	0.00	3.12	0.00	3.13	0.00
5	26959	7.38	0.00	7.51	0.00	1.55	0.00
6	3877	9.42	0.00	10.05	0.00	3.21	0.00
7	3059	1.94	0.00	2.32	0.00	1.77	0.00

Mississippi

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	55610	0.17	1.53	0.22	1.91	0.16	1.89
Female	39804	0.24	2.14	0.31	2.67	0.23	2.62
Hispanic	2533	0.00	6.35	0.00	7.57	0.00	7.44
Non-Hispanic	92881	0.00	0.17	0.00	0.21	0.00	0.20
White	49401	0.22	1.21	0.28	1.47	0.22	1.07
Black	43700	0.17	1.43	0.20	1.75	0.20	1.49
age 0-17	3834	1.48	7.05	1.92	9.76	1.34	9.20
age 18-29	47688	0.16	0.66	0.20	0.79	0.20	0.79
age 30-54	19671	0.32	2.32	0.43	2.81	0.36	2.83
age 55+	24221	0.13	1.41	0.20	1.73	0.20	1.69

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	25778	4.68	0.00	5.05	0.00	1.82	0.00
2	1530	16.60	0.00	19.50	0.00	13.21	0.00
3	18382	1.44	0.00	1.75	0.00	1.72	0.00
4	5136	6.48	0.00	7.82	0.00	4.57	0.00
5	29238	8.88	0.00	8.94	0.00	1.12	0.00
6	5722	17.62	0.00	17.77	0.00	2.00	0.00
7	1084	4.19	0.00	4.90	0.00	3.19	0.00

Nevada

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	24014	0.70	1.78	0.91	2.19	0.64	1.69
Female	9661	1.74	4.31	2.26	5.33	1.62	4.00
Hispanic	4455	0.00	10.04	0.00	11.88	0.00	7.28
Non-Hispanic	29220	0.00	1.59	0.00	1.87	0.00	1.20
White	23978	0.72	1.92	0.85	2.21	0.50	1.19
Black	6453	0.77	4.11	0.99	5.35	0.89	3.84
age 0-17	1944	3.38	11.06	3.70	13.41	1.64	10.19
age 18-29	10391	1.94	2.51	2.07	2.97	0.70	1.99
age 30-54	13417	0.65	3.29	0.74	3.91	0.38	2.39
age 55+	7923	0.73	5.95	0.87	6.67	0.59	3.22

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	15940	5.22	0.00	5.39	0.00	1.26	0.00
2	949	12.54	0.00	16.18	0.00	11.45	0.00
3	4895	16.34	0.00	16.80	0.00	3.36	0.00
4	389	42.92	7.14	49.85	26.73	53.25	27.88
5	2498	3.56	0.00	4.49	0.00	4.52	0.00
6	1312	15.50	0.00	17.46	0.00	6.99	0.00
7	3273	32.55	0.00	32.56	0.00	1.42	0.00

New Jersey

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	110292	0.11	0.97	0.14	1.24	0.09	0.86
Female	84529	0.14	1.27	0.18	1.61	0.12	1.15
Hispanic	19815	0.00	2.58	0.00	3.17	0.00	3.06
Non-Hispanic	175006	0.00	0.29	0.00	0.36	0.00	0.35
White	122388	0.23	0.65	0.29	0.78	0.21	0.63
Black	56377	0.32	1.09	0.38	1.30	0.31	1.00
age 0-17	6187	0.66	6.98	0.83	8.49	0.63	7.77
age 18-29	71003	0.07	0.65	0.10	0.79	0.09	0.80
age 30-54	51576	0.07	1.85	0.09	2.23	0.09	1.88
age 55+	66055	0.03	1.43	0.04	1.83	0.03	1.36

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	47941	2.89	0.00	3.04	0.00	0.90	0.00
2	2610	7.50	0.00	8.91	0.00	6.65	0.00
3	51493	2.10	0.00	2.36	0.00	1.10	0.00
4	8125	2.74	0.00	3.17	0.00	1.70	0.00
5	45222	6.60	0.00	6.65	0.00	0.88	0.00
6	3291	13.01	0.00	14.04	0.00	4.71	0.00
7	8707	1.46	0.00	1.82	0.00	1.52	0.00

New York

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	323248	0.02	0.44	0.02	0.57	0.02	0.57
Female	257213	0.02	0.56	0.03	0.72	0.03	0.72
Hispanic	72341	0.00	1.00	0.00	1.26	0.00	1.21
Non-Hispanic	508120	0.00	0.14	0.00	0.18	0.00	0.17
White	367099	0.19	0.40	0.23	0.51	0.15	0.51
Black	148243	0.25	0.79	0.32	1.02	0.25	1.01
age 0-17	31133	0.06	2.33	0.08	3.05	0.08	3.02
age 18-29	241483	0.02	0.38	0.03	0.45	0.02	0.35
age 30-54	141374	0.03	0.93	0.04	1.16	0.03	1.09
age 55+	166471	0.02	0.52	0.02	0.62	0.02	0.62

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	108088	2.62	0.00	2.71	0.00	0.65	0.00
2	8126	9.02	0.00	10.10	0.00	4.23	0.00
3	123852	0.54	0.00	0.69	0.00	0.53	0.00
4	22196	4.72	0.00	4.91	0.00	1.29	0.00
5	174111	4.89	0.00	4.90	0.00	0.41	0.00
6	8598	19.79	0.00	19.90	0.00	1.79	0.00
7	41450	3.21	0.00	3.34	0.00	0.90	0.00
8	50909	3.13	0.00	3.28	0.00	0.96	0.00
9	43131	0.59	0.00	0.69	0.00	0.54	0.00

Pennsylvania

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	219229	0.03	0.56	0.03	0.72	0.03	0.73
Female	214072	0.03	0.58	0.03	0.74	0.03	0.74
Hispanic	18507	0.00	2.13	0.00	2.61	0.00	2.52
Non-Hispanic	414794	0.00	0.09	0.00	0.12	0.00	0.11
White	334531	0.12	0.36	0.15	0.45	0.15	0.45
Black	79043	0.26	1.11	0.35	1.38	0.27	1.34
age 0-17	16500	0.16	4.57	0.22	5.52	0.21	5.25
age 18-29	185833	0.03	0.31	0.04	0.38	0.04	0.38
age 30-54	79932	0.07	0.71	0.09	0.89	0.08	0.90
age 55+	151036	0.01	0.52	0.02	0.67	0.02	0.59

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	76553	3.99	0.00	4.05	0.00	0.67	0.00
2	6987	4.23	0.00	5.17	0.00	3.59	0.00
3	114113	0.50	0.00	0.64	0.00	0.62	0.00
4	16137	3.88	0.00	4.37	0.00	2.00	0.00
5	147542	3.36	0.00	3.39	0.00	0.44	0.00
6	758	13.22	0.00	15.03	0.00	10.39	0.00
7	8664	0.83	0.00	0.98	0.00	0.98	0.00

Rhode Island

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	18726	0.57	2.54	0.74	3.19	0.74	3.06
Female	20090	0.53	2.37	0.69	2.98	0.68	2.79
Hispanic	2396	0.00	5.37	0.00	6.69	0.00	6.72
Non-Hispanic	36420	0.00	0.35	0.00	0.44	0.00	0.44
White	32250	0.25	0.79	0.30	0.98	0.30	0.98
Black	3452	3.09	4.19	3.81	5.33	2.53	5.28
age 0-17	864	4.35	15.69	5.27	19.26	4.85	19.56
age 18-29	22801	0.18	0.71	0.23	0.92	0.21	0.83
age 30-54	4487	1.15	4.50	1.46	5.84	1.45	5.36
age 55+	10664	0.36	1.12	0.52	1.36	0.51	1.31

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	3576	6.61	0.00	7.86	0.00	4.46	0.00
2	429	25.99	0.00	31.07	0.00	26.68	0.00
3	9222	1.05	0.00	1.29	0.00	1.26	0.00
4	574	13.69	0.00	18.24	0.00	18.19	0.00
5	20551	2.38	0.00	2.48	0.00	0.71	0.00
6	870	16.24	0.00	20.23	0.00	17.87	0.00
7	1074	5.23	0.00	6.43	0.00	5.99	0.00

Texas

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	370702	0.02	0.49	0.02	0.59	0.02	0.59
Female	190407	0.03	0.95	0.04	1.15	0.04	1.14
Hispanic	122958	0.00	1.14	0.00	1.46	0.00	1.47
Non-Hispanic	438151	0.00	0.32	0.00	0.41	0.00	0.41
White	368493	0.16	0.36	0.20	0.44	0.18	0.42
Black	141330	0.12	0.95	0.15	1.14	0.12	1.10
age 0-17	22281	0.18	4.42	0.21	5.35	0.13	5.00
age 18-29	231508	0.03	0.41	0.03	0.49	0.02	0.44
age 30-54	173470	0.02	0.65	0.03	0.80	0.03	0.59
age 55+	133850	0.01	0.51	0.01	0.67	0.01	0.67

Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	244363	0.61	0.00	0.70	0.00	0.33	0.00
2	8909	8.87	0.00	9.84	0.00	3.94	0.00
3	105052	0.77	0.00	0.95	0.00	0.71	0.00
4	16380	2.03	0.00	2.37	0.00	1.81	0.00
5	92246	13.60	0.00	13.62	0.00	0.84	0.00
6	34056	32.17	0.00	32.19	0.00	0.74	0.00
7	13014	2.59	0.00	2.87	0.00	1.33	0.00

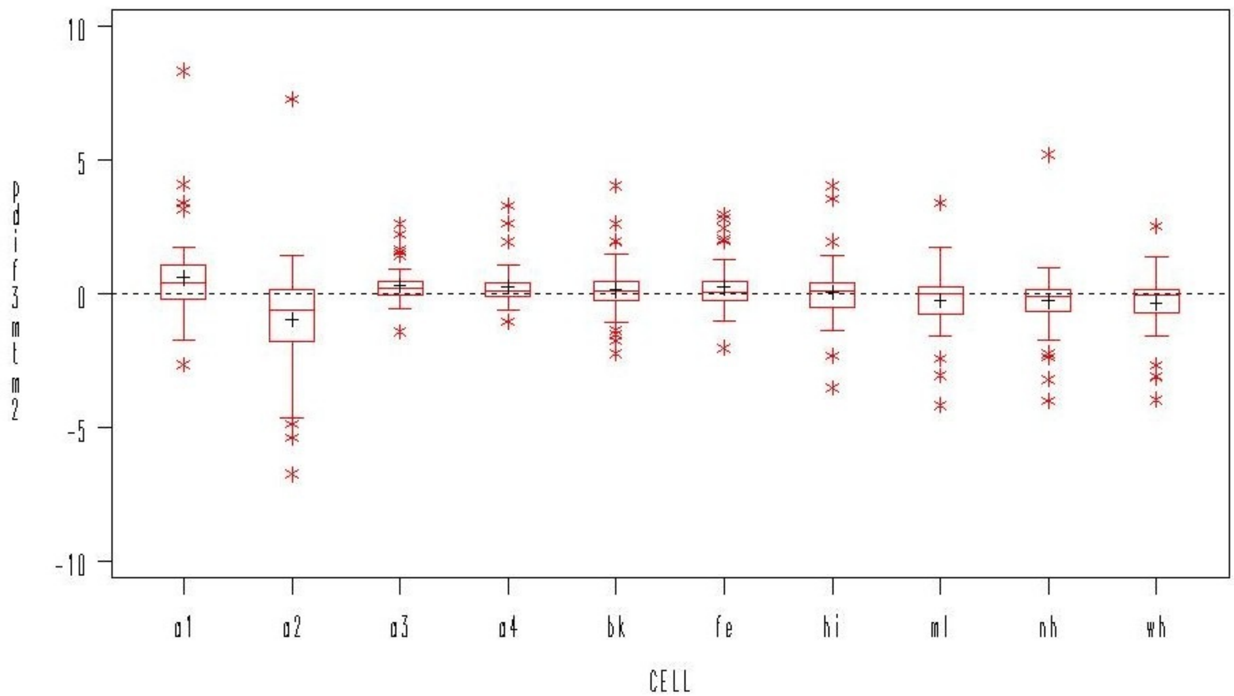
West Virginia

Characteristic	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
Male	23041	0.67	1.85	0.83	2.25	0.54	2.12
Female	20106	0.76	2.20	0.95	2.69	0.62	2.54
Hispanic	668	0.00	10.71	0.00	13.52	0.00	12.27
Non-Hispanic	42479	0.00	0.21	0.00	0.26	0.00	0.22
White	36090	0.14	0.81	0.18	0.99	0.17	0.78
Black	6252	0.51	3.47	0.63	4.35	0.62	4.10
age 0-17	1771	1.28	14.41	1.75	17.56	1.62	16.97
age 18-29	19057	0.39	1.23	0.46	1.55	0.27	1.33
age 30-54	8518	0.66	3.64	0.79	4.38	0.44	4.41
age 55+	13801	0.26	2.13	0.32	2.81	0.25	2.70

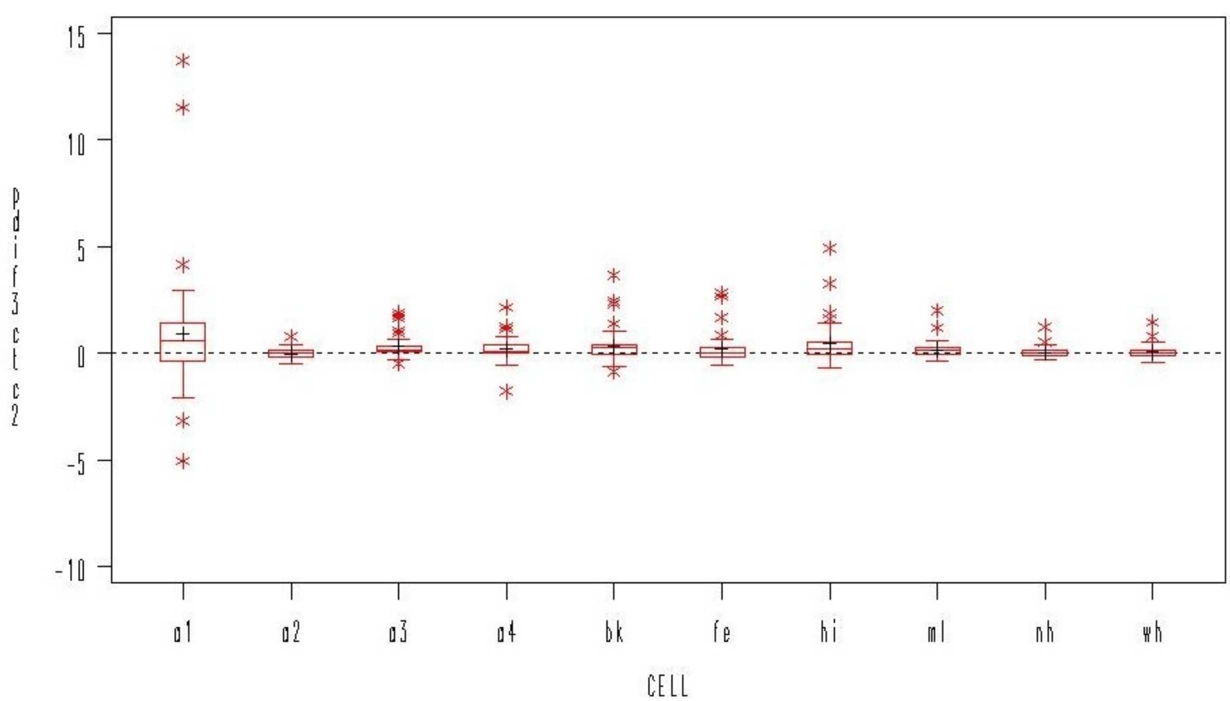
Major Type	Census 2000	3-year estimates					
		PMADs		PRMSEs		CVs	
		C2	C5	C2	C5	C2	C5
1	10505	5.26	0.00	5.93	0.00	2.62	0.00
2	558	17.95	0.00	23.25	0.00	20.91	0.00
3	11601	1.93	0.00	2.53	0.00	2.37	0.00
4	1345	12.73	0.00	15.44	0.00	10.78	0.00
5	14300	4.20	0.00	4.42	0.00	1.42	0.00
6	59	75.76	45.92	86.55	67.76	116.26	92.62
7	975	5.73	0.00	6.97	0.00	6.57	0.00

Evaluation Measures for Large (GQ$\geq$18,000) Counties--3-Year Estimates, C5 vs. C2

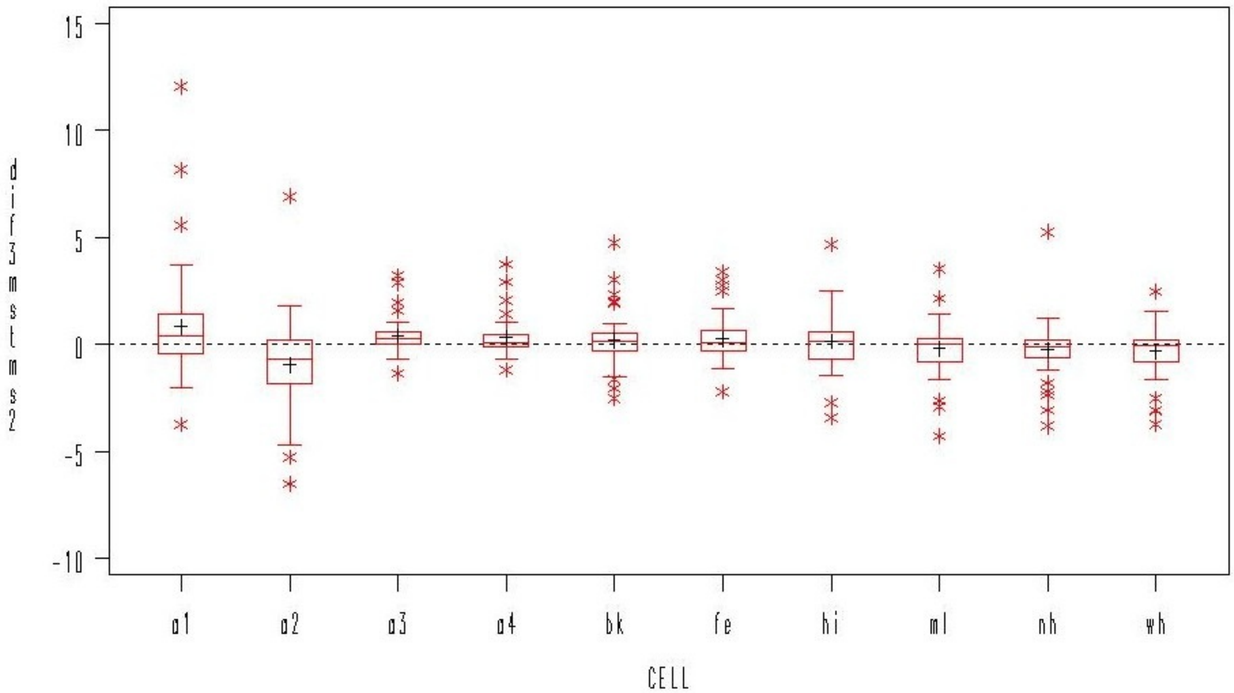
Plot A8.1: C5 - C2 PMAD for Demographic Characteristics



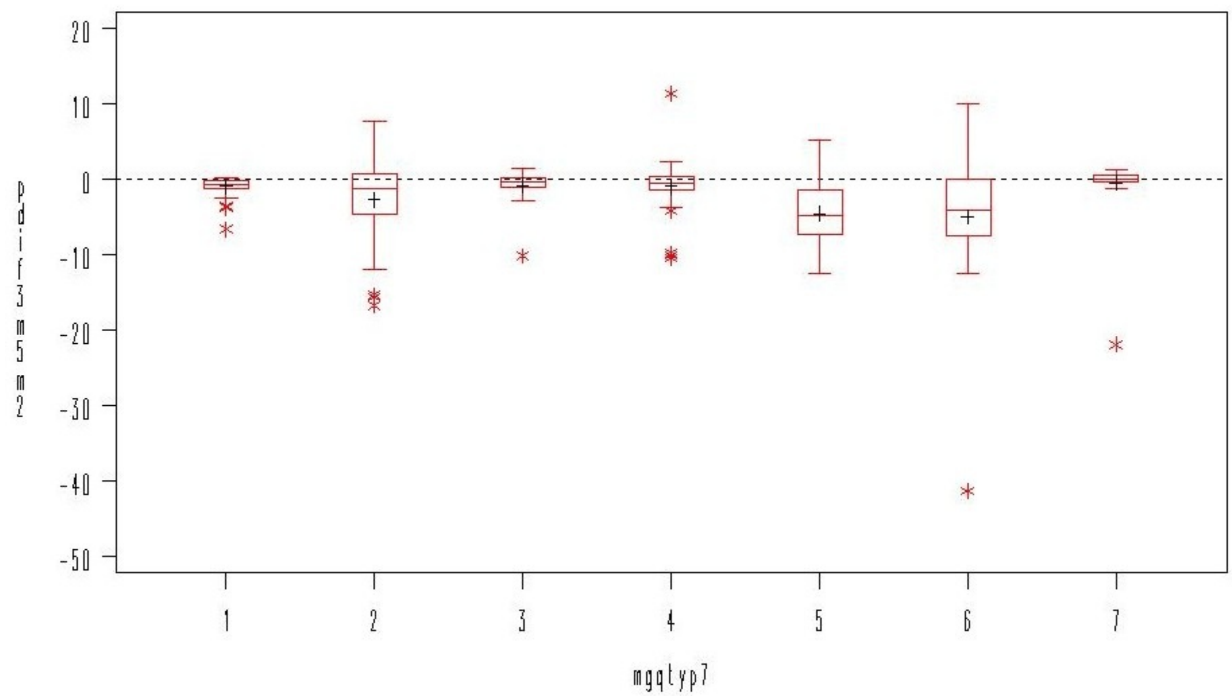
Plot A8.2: C5 - C2 CV for Demographic Characteristics



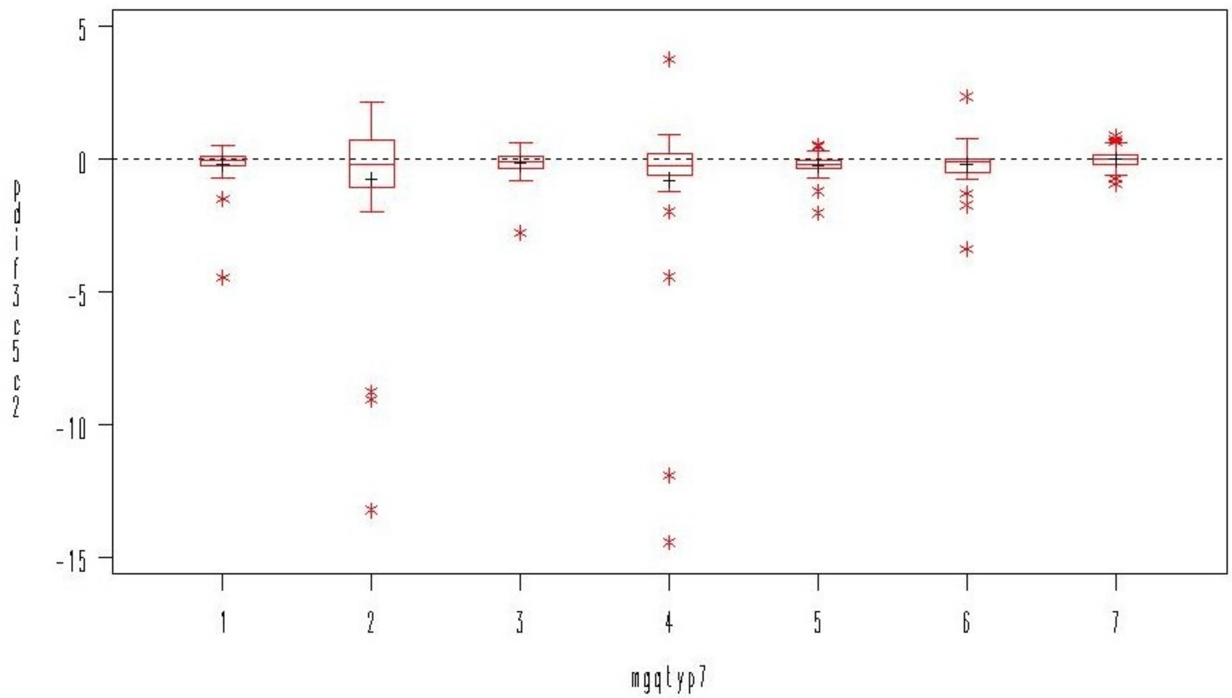
Plot A8.3: C5 - C2 PRMSE for Demographic Characteristics



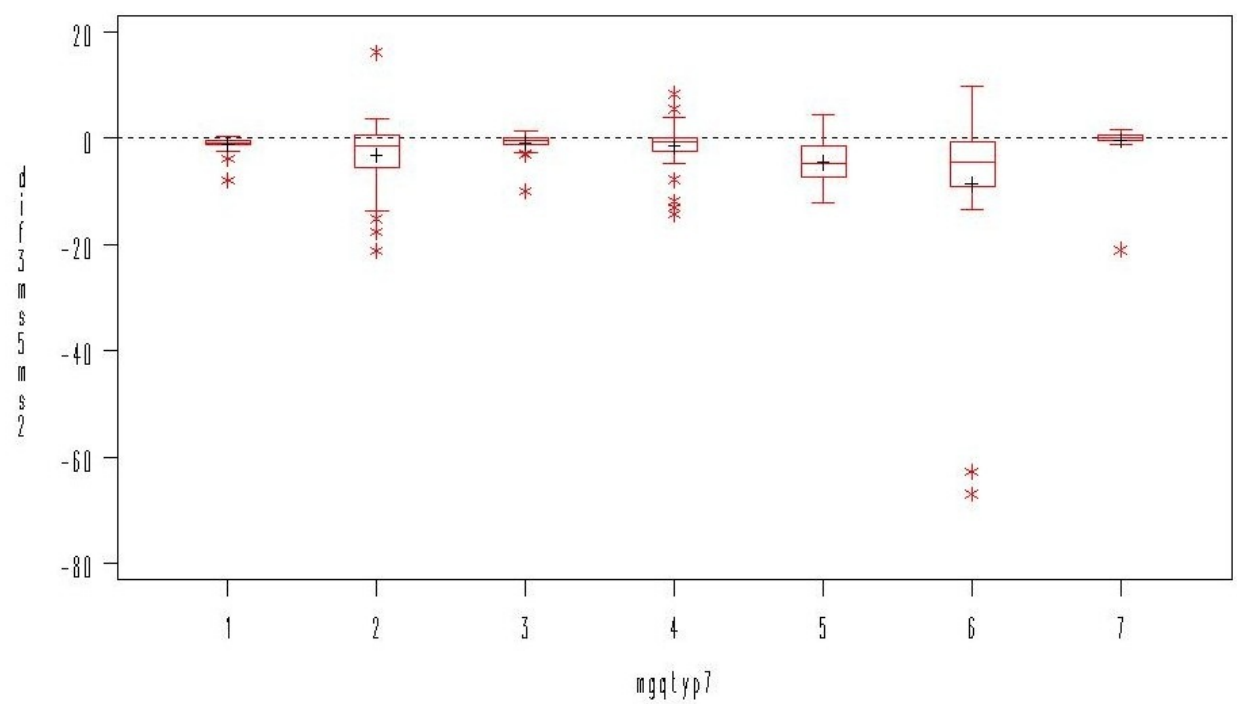
Plot A8.4: C5 - C2 PMAD for Major GQ Types (7 Types)



Plot A8.5: C5 - C2 CV for Major GQ Types (7 Types)

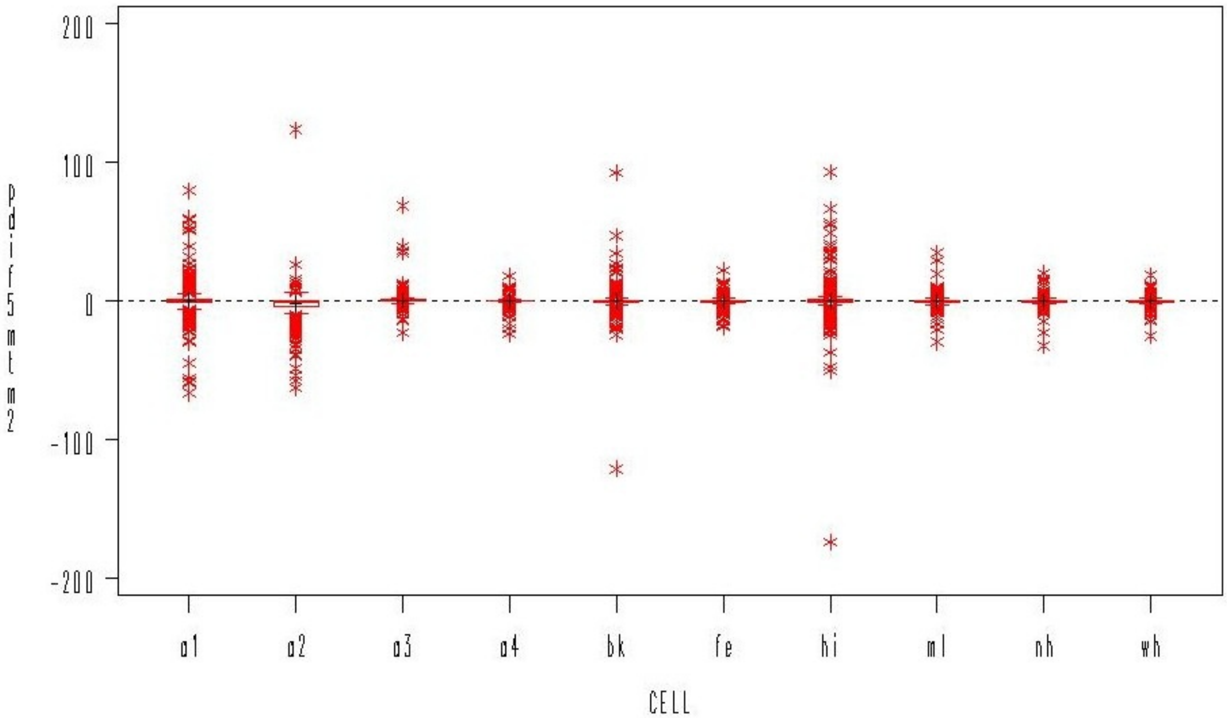


Plot A8.6: C5 - C2 PRMSE for Major GQ Types (7 Types)

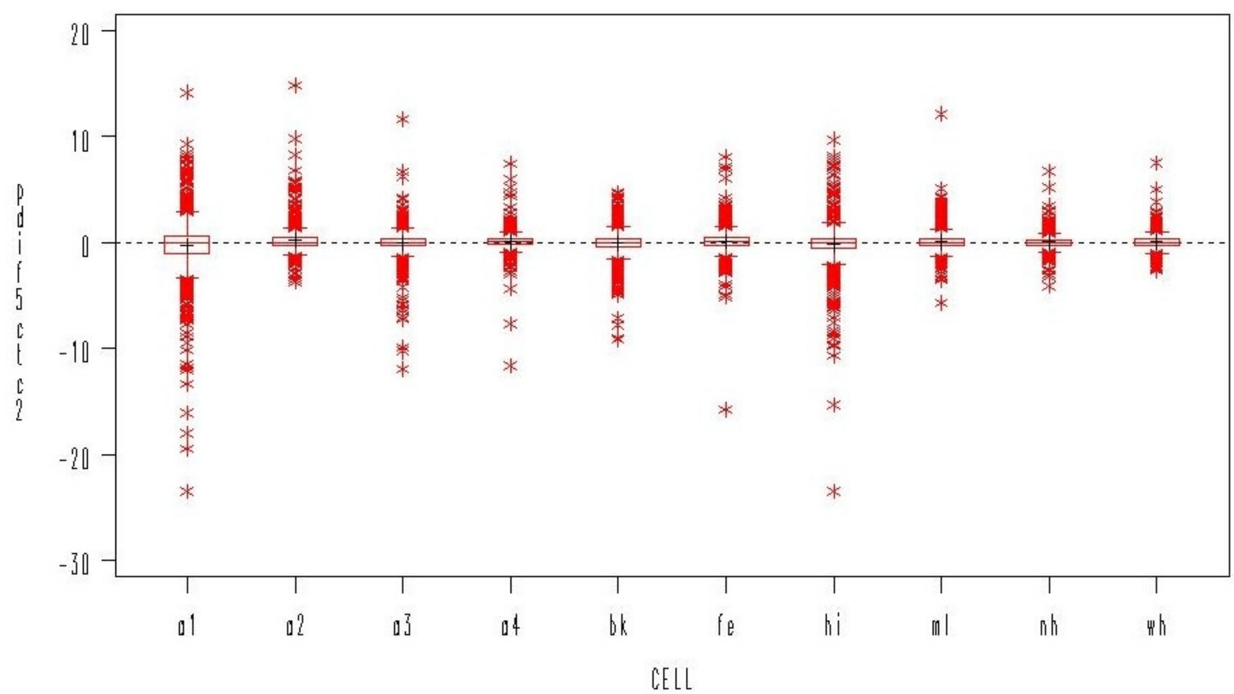


Evaluation Measures for Small (GQ<18000) Counties--5-Year Estimates, C5 vs. C2

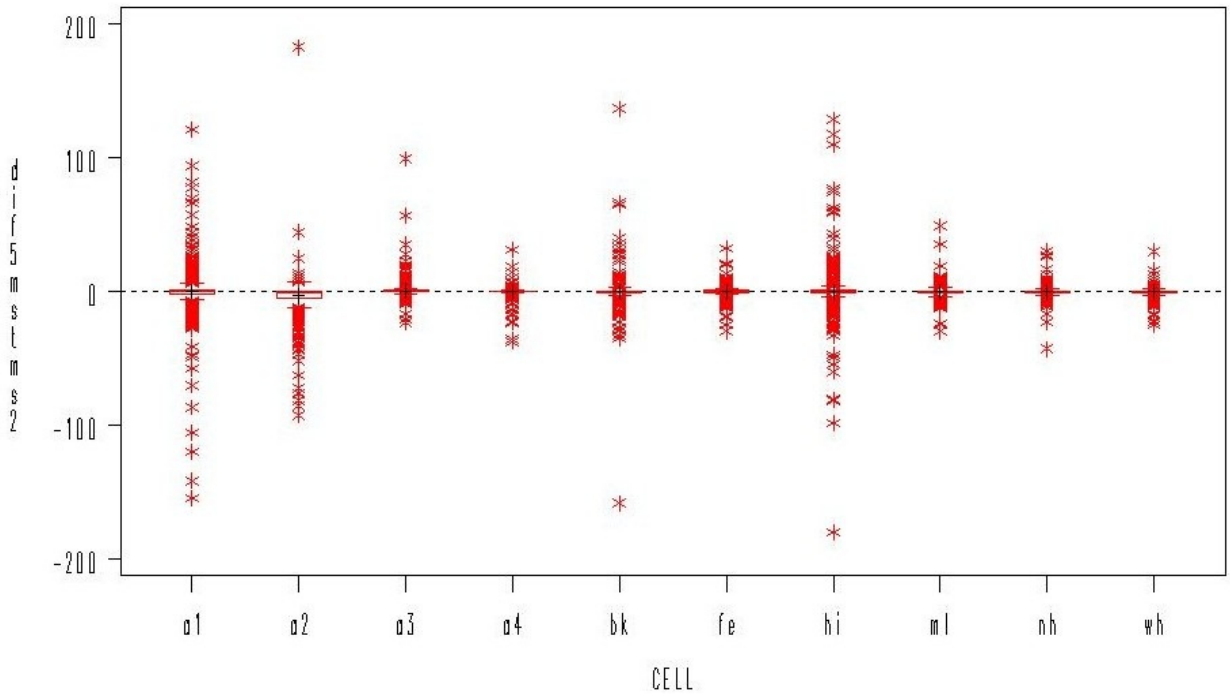
Plot A9.1: C5 - C2 PMAD for Demographic Characteristics



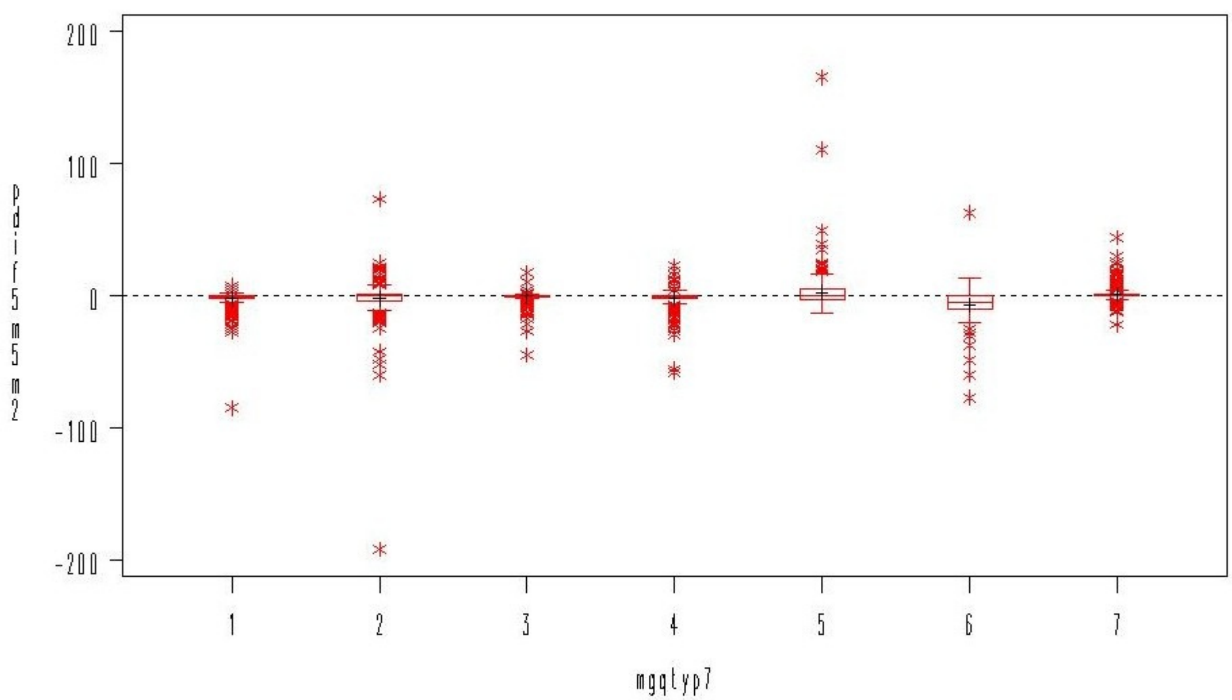
Plot A9.2: C5 -C2 CV for Demographic Characteristics



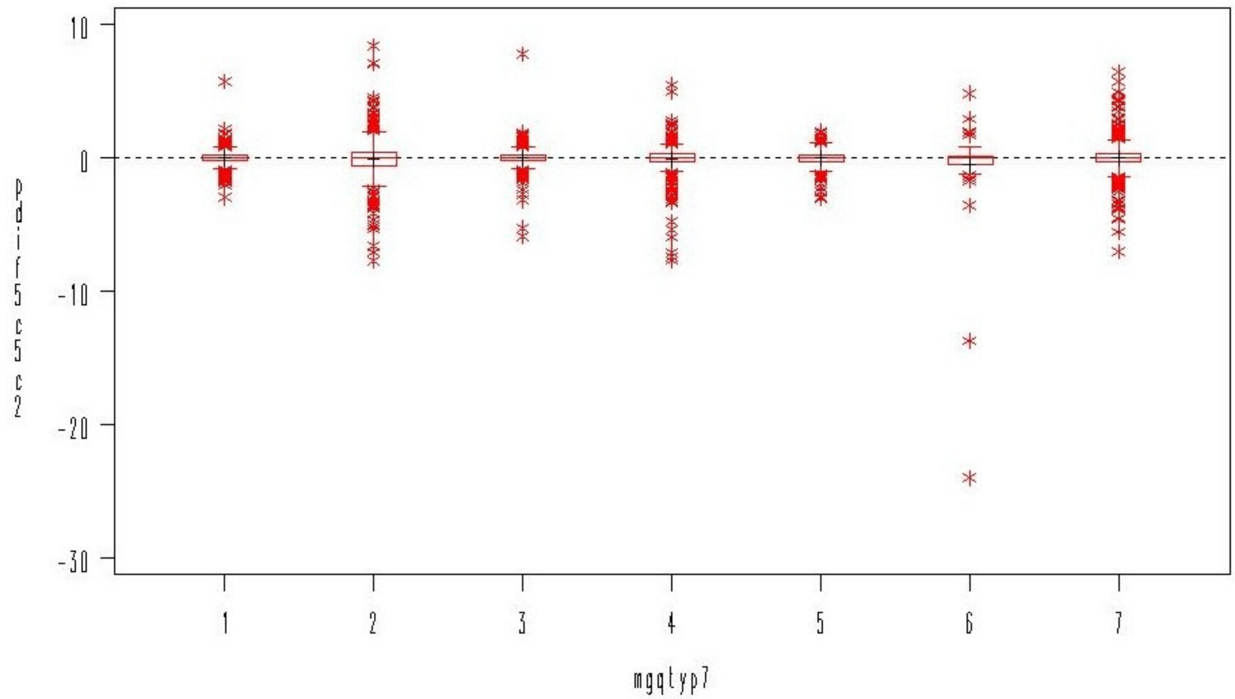
Plot A9.3: C5 - C2 PRMSE for Demographic Characteristics



Plot A9.4: C5 - C2 PMAD for Major GQ Types (7 Types)



Plot A9.5: C5 - C2 CV for Major GQ Types (7 Types)



Plot A9.6: C5 - C2 PRMSE for Major GQ Types (7 Types)