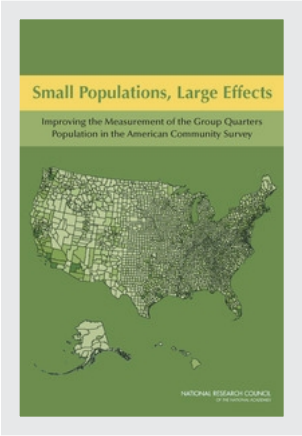

Small Populations, Large Effects: Improving the Measurement of the Group Quarters Population in the American Community Survey

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Small Populations, Large Effects

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Panel on Statistical Methods for Measuring the
Group Quarters Population in the American Community Survey

Paul R. Voss and Krisztina Marton, *Editors*

Committee on National Statistics

Division of Behavioral and Social Sciences and Education

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PANEL ON STATISTICAL METHODS FOR MEASURING THE GROUP QUARTERS POPULATION IN THE AMERICAN COMMUNITY SURVEY

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Acknowledgments

The Panel on Statistical Methods for Measuring the Group Quarters Population in the American Community Survey (ACS) of the Committee on National Statistics (CNSTAT) is pleased to submit this final report. The collection of data from the relatively small number of individuals living in group quarters (GQ) facilities has always been more challenging than collecting data from those living in housing units. However, since a group quarters sample was added to the ACS for the first time in 2006, there remain a number of sampling and statistical issues yet to be satisfactorily worked out. Examining these issues and making recommendations to the Census Bureau's ACS Office was the charge of our panel. The Census Bureau was conducting its own research on these issues in parallel with the panel's work, and as a result, the panel was receiving new updates and data to consider in its deliberations throughout the course of the study.

The ACS staff of the Census Bureau and the staff in the Population Estimates Program of the Census Bureau's Population Division were generous with their time throughout our work and responded to panel questions and requests for information with good humor and alacrity. Communication between the panel and the Census Bureau was greatly facilitated by lead technical liaison, Alfredo Navarro, who was a pleasure to work with. Philip Gbur served as contracting officer, and he was always accessible. Many Census Bureau staff members made informative presentations to the panel, including Mark Asiala, Michael Beaghen, Scott Boggess, Edward Castro, Annetta Smith Clark, Sandy Clark, Chandra Erdman, Steven Hefter, Todd Hughes, Susan Schechter, Amy Symens Smith, Sharon Stern, Victoria Velkoff, Lynn Weidman,

Daniel Weinberg, and David Whitford. These are all busy people, and their contributions to the work of the panel are greatly appreciated.

The panel also sought input on data collected about major segments of the GQ population from experts in other agencies in the federal statistical system. In particular, William Sabol from the Bureau of Justice Statistics presented a valuable overview of that agency's portfolio of data series on the correctional population. We also benefited from a discussion with Lauren Harris-Kojetin from the National Center for Health Statistics about data collections from health care facilities.

To assess the importance of GQ data from the ACS, the panel reached out to the data user community, and we are grateful to everyone who provided input. As part of this outreach effort, the panel sponsored a one-day data user meeting in Washington, DC, in December 2010. This well-attended meeting proved crucial in demonstrating the importance of these data for many users. We thank those individuals who gave their time to assist the panel at this meeting; the list of participants appears in Appendix A. The panel also engaged two teams of consultants to assist in understanding how data on GQ populations are used in the wide variety of program administration, eligibility determination, and funding at the federal, state and local levels of government. For helpful data gathering and insights in this regard, we express our appreciation to Cynthia M. Taeuber of CM Taueber & Associates, Rachel Blanchard Carpenter, survey specialist with the National Opinion Research Center, and Robert Scardamalia of RLS Demographics, Inc.

We also express our appreciation to Colm O'Muircheartaigh, at the National Opinion Research Center at the Univrersity of Chicago, for his special insights regarding surveying and data reporting on those who live in GQ facilities. We thank Joel Alvarez and Adam Attar from the New York City Department of City Planning and Melissa Stringfellow from the University of Maryland for their valuable assistance with analysis and visual presentation of the ACS and census data.

At our first meeting in March 2010, the panel formed two working groups on statistical issues and data user considerations to pursue specific tasks between meetings, and the work of the subgroups and of the panel as a whole proceeded with few disagreements, as well as a keen sense of remaining within the boundaries of our charge from the Census Bureau. As chair of the panel, I want to express my deep appreciation to each of the panelists for providing insightful input from their respective areas of expertise.

We could not have accomplished our mission without the steady guidance, keen attention to detail, and excellent writing talents of our study director, Krisztina Marton. In addition, we had the strong support of other CNSTAT staff. We extend our appreciation to Constance Citro, CNSTAT director, for her always deeply knowledgeable guidance when questions of procedure arose or when advice was requested. We thank CNSTAT senior program officer Michael Cohen for taking time to attend the panel's meetings and providing occasional

counsel. We are especially grateful to CNSTAT senior program officer Daniel Cork and associate program officer Esha Sinha for their input and help with data analysis. We thank Kirsten Sampson Snyder for her expert oversight of the report review process, Christine McShane for skilled technical editing of the draft report, and Agnes Gaskin for handling so capably the variety of logistical matters relating to our meetings.

This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the Report Review Committee of the National Research Council (NRC). The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report: Warren Brown, Cornell Institute for Social and Economic Research, Cornell University; Alicia Carriquiry, Department of Statistics, Iowa State University; John Czajka, Mathematica Policy Research, Inc.; Charlene Harrington, School of Nursing, University of California, San Francisco; Ken Hodges, Nielsen; David Hubble, Westat, Inc.; Colm O'Muircheartaigh, Harris School, University of Chicago; David Plane, School of Geography and Development, University of Arizona; and Bruce Spencer, Department of Statistics, Northwestern University.

Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse the conclusions or recommendations nor did they see the final draft of the report before its release. The review of this report was overseen by Richard Kulka, consultant, Statistical Survey and Social Research, and Charles Manski, Department of Economics, Northwestern University. Appointed by the NRC, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring panel and the institution.

Finally, we recognize the many federal agencies that support the Committee on National Statistics directly and through a grant from the National Science Foundation. Without their support and their commitment to improving the national statistical system, the committee work that is the basis of this report would not have been possible.

Paul R. Voss, *Chair*
Panel on Statistical Methods for Measuring
the Group Quarters Population
in the American Community Survey

Contents

Summary

The American Community Survey (ACS) was born of a desire to implement a continuous survey as a replacement for the "long-form" questionnaire that was used to enumerate a sample of the U.S. population as part of the 1960-2000 censuses. The goal for the ACS was twofold: (1) to produce continuously updated social and economic information on a more timely basis than the once-every-decade census and (2) to reduce the burden imposed on the constitutionally mandated complete census head count by the necessity to collect the long-form questions as well.

Like the census long form, the ACS collects detailed characteristics data from a sample of the total population, which consists of both persons residing in housing units and those living in group quarters (GQ). The Census Bureau defines a group quarters facility as "a place where people live or stay, in a group living arrangement, that is owned or managed by an entity or organization providing housing and/or services for the residents" (U.S. Census Bureau, 2008a). Group quarters are further defined as institutional (e.g., correctional facilities, nursing homes) and noninstitutional (e.g., military housing, college dormitories).

Although the ACS collects social and economic data on the characteristics of the GQ population, the GQ sample size is not large enough to produce accurate estimates of the characteristics of the GQ population for small geographic areas, and such estimates are not published. Given that less than 3 percent of the U.S. population resides in GQ facilities, a first reaction might be to downplay concern about this problem. A closer examination, however, reveals that the GQ estimates can play an important role in ACS estimates of totals and characteristics for the combined household and GQ population, especially in

geographic areas that are small in population size. In approximately 4.5 percent of places[1] in the nation, over 10 percent of the total population resides in group quarters, and 1.3 percent of places have over 25 percent of their population in group quarters. The lack of accurate data about the GQ population can adversely affect the ACS estimates produced for such places and, generally, for small geographic areas, especially because GQ residents tend to be systematically different from the household population in the communities where they live. Moreover, the fact that many geographic areas have none of their GQ facilities included in the ACS sample can substantially alter the characteristics of the total population year by year, even in small communities where GQ facilities represent only a small proportion of the total population.

The U.S. Census Bureau requested the Committee on National Statistics at the National Academy of Sciences/National Research Council to convene a panel to conduct an in-depth review of the statistical methodology for measuring the GQ population in the ACS. The panel was to consider user needs for ACS data on various components of the GQ population and, in light of user needs and considerations of operational feasibility and compatibility with the treatment of the household population in the ACS, recommend alternatives to the current sample design, weighting procedures, and other methodological features that can make the GQ data from the ACS more useful for users of small-area data.

THE PROBLEM

Difficulties associated with measuring the GQ population are not limited to the ACS. The accurate classification and enumeration of the GQ population has also been an ongoing concern for the decennial census (National Research Council, 2004). The operational challenges associated with collecting data from nonhousehold populations are similar in the ACS and the census. However, the fact that the ACS must rely on a sample of what is a small and very diverse population, combined with limited funding available for survey operations, makes the ACS GQ sampling, data collection, weighting, and estimation procedures more complex and the estimates more susceptible to problems stemming from these limitations. The concerns are magnified in small areas, particularly in terms of detrimental effects on the total population estimates produced for small areas. The reasons for this are among the main topics of this report.

One of the methodological features that adversely affect ACS estimates for a large number of small geographic areas is that GQ populations are sampled at the state level, without controlling for their distribution at substate levels of

[1]The Census Bureau defines a "place" as a concentration of population either legally bounded as an incorporated place, such as a city or town, or delineated for statistical purposes as a census-designated place.

geography. As a result, the ACS GQ sample is ill-suited, not only for estimating the characteristics of GQ residents for many substate areas but also for producing accurate estimates of the combined total housing and GQ population for these areas. Yet these adverse effects are masked because detailed characteristics data are not published separately for the GQ population. Moreover, due to the relatively small overall ACS sample size, a substantial number of counties and smaller geographic areas with actual existing GQ populations within their boundaries have no GQ residents represented in the sample. This is often the case even after the sample is cumulated over a 5-year period for the 5-year data release intended to provide data for geographic areas as small as census tracts and block groups. Because the GQ population is weighted only to state-level controls, there can be large effects on the ACS estimates of the total population, not only in those areas for which there is no sample but also in areas that do have sample cases. The reason is that the GQ sample in those areas is overweighted in order to account for the missing sample in other areas. Again, the effects are masked.

VALUE OF GQ DATA IN THE ACS

A fundamental question for the panel was whether there is a demonstrated and sufficiently compelling need for collecting data on residents of group quarters as part of the ACS. Although the panel was not charged with a formal cost-benefit analysis of continuing to include GQ data in the ACS, the panel's deliberations were conducted being mindful of the costs associated with the GQ data collection and of the need for realistic assumptions about ACS funding levels going forward. The panel communicated extensively with the data user community throughout its work and engaged consultants to examine the requirements for characteristics of the group quarters populations at the national, state, and local levels. In the end, the panel concluded that the GQ data in the ACS fulfill an important data user need and, indeed, appear to be required by statutes at the federal and state levels for administrating and funding a variety of programs based on the number and characteristics of the resident population. Data users, especially those with an interest in small geographic areas, depend on accurate data on the characteristics of the total population, which are based on combining the household and GQ data. Anything less does not do justice to the spirit in which the ACS was created to produce accurate and reliable estimates of the characteristics of the entire U.S. population, including in small geographic areas. At the same time, however, it is imperative to develop solutions to improve the quality of the GQ data as a component of the total population estimates. Currently, the quality of the GQ data compromises the ACS estimates of the characteristics of the total population to such an extent that, without significant improvements to the GQ data, the goals for the ACS would have to be reconsidered.

The panel recognizes the underlying challenge that large sample sizes are needed to provide accurate estimates of rare populations, such as residents of group quarters, at small levels of geography. From a methodological perspective, the most straightforward solution to address the shortcomings discussed would be to increase the sample size to the level necessary to enable the Census Bureau to produce high-quality estimates of the characteristics of GQ residents, including at small levels of geography. This could involve increasing the sample size for at least a subset of GQ types, particularly those that are most likely to change quickly. However, there are alternatives to a design-based solution (i.e., one that changes the sample size and design), such as modeling or imputing some of the GQ data, and these could also have the potential of improving the GQ estimates significantly at lower cost.

The Census Bureau already has conducted research on methodological issues for group quarters; in particular, it has investigated imputation methods for improving the ACS estimates of GQ residents and total population for small geographic areas, and plans to implement a new imputation method for the GQ data that it collects in 2012 and beyond. However, continued research is needed, not only to improve the chosen imputation procedure but also to investigate other promising methods for bolstering the GQ data in the ACS. The optimal method—considering both costs and data quality—could involve a combination of changes to the sample design, data collection procedures, and weighting and estimation strategies for group quarters.

Recommendation 3-1: Data on the characteristics of the total population fulfill an important need, particularly for small geographic areas. The Census Bureau should identify ways of improving the group quarters estimates from the American Community Survey as input to estimates of total population characteristics for small geographic areas.

OPTIMIZING GQ DATA IN THE ACS

The panel's recommendations for changes to the survey design, data collection procedures, and weighting and estimation strategies for the GQ component of the ACS are summarized below. The recent release of the 2010 census data represents a unique opportunity to evaluate different options because the decennial enumeration provides up-to-date basic demographic information on all group quarters for all levels of geography for purposes of comparison.

Sampling Frame Development and Maintenance

The American Community Survey sampling frame for both housing units and group quarters is based on the Master Address File (MAF), which is the Census Bureau's inventory of known living quarters. The quality of the list

is perhaps the single most important aspect of any list-based data collection approach, because it serves as the foundation on which all other elements of the survey depend, from sample selection to the development of controls used to produce the final estimates. In the case of the ACS, maintaining an up-to-date inventory of GQ facilities has proven to be a major challenge.

The designation of certain addresses as GQ facilities is inherently difficult. Even when that is accomplished, the MAF is most complete only immediately subsequent to each decennial census. The procedures that have been used to update the MAF between censuses are not complete with regard to additions, deletions, and modifications of addresses, so that errors creep into the MAF over a decade. The procedures for updating GQ addresses are particularly problematic. Although the Census Bureau's ACS Office supplements the MAF-based sampling frame for some types of group quarters with input from other sources, such as the Federal Bureau of Prisons and military liaisons, the updating process does not take full advantage of sources of information that are available within various Census Bureau units and from federal, state, and local partners.

To increase the accuracy and efficiency of the GQ address updating operations, the panel recommends the following:

Recommendation 4-1: The Census Bureau should give high priority to developing a detailed and systematic operational plan, with clear timelines and evaluation benchmarks, for a group quarters (GQ) address updating system. This should include a plan for greater information sharing and more efficient information flow between different Census Bureau divisions and programs to improve the inventory of group quarters in the Master Address File (MAF). The updating process for the MAF should include not only the additional information that is acquired by the American Community Survey Office on some types of group quarters but also information that is potentially available from other sources, including

1. the Census Bureau's Population Estimates Program (PEP), which obtains updated information on group quarters from state demographic offices, with varied success—PEP staff should follow up with every state to obtain information on changes to their GQ inventories, and the Census Bureau should develop procedures to ensure that the information is incorporated into the MAF updating process;
2. Census Bureau divisions that develop frames for sampling particular GQ types for other federal agencies; and
3. other federal agencies that may have information on particular types of group quarters.

In part because of the difficulties related to maintaining a current inventory of GQ facilities, the ACS sampling frame for group quarters contains a

relatively high percentage of cases that are either ineligible or eligible but unoccupied at the time of the data collection. This sampling frame is particularly inefficient in the case of some types of group quarters that change frequently and are sometimes difficult to distinguish from households—for example, a large house that is converted into a group home for people needing care. According to the current sample design and procedures, if a sampled unit is in the "wrong" sample (a GQ facility turns up in the housing unit sample or vice versa), an interview is not conducted. This design reduces the effective sample size for estimation and wastes data collection resources. To increase the efficiency of the sampling frame, the panel makes the following recommendations:

Recommendation 4-2: The Census Bureau should evaluate, by comparison with the 2010 census and other data sources, the reasons for the relatively high rates of ineligible and eligible but unoccupied group quarters (GQ) facilities in the American Community Survey sample and determine whether there are practical ways to reduce these rates for all or some GQ types. The evaluation should take into account the costs associated with determining that a facility is ineligible or unoccupied and how these costs would change if, for some GQ types, additional in-house research is performed before a case is sent to the field.

Recommendation 4-3: To increase effective sample size by more efficiently targeting resources, the Census Bureau should consider combining the American Community Survey (ACS) sampling frame for some types of group quarters (GQ) with the housing unit sampling frame and, in tandem, modifying its data collection procedures to enable field representatives to collect data from all cases—housing unit and group quarters—in the combined sample. Additional research will be needed to determine which GQ types are best suited for integration with the housing unit sample, but the GQ types that are especially difficult to update and that are most similar to housing units may be the best candidates. These group quarters could continue to be included in the GQ universe of the ACS for purposes of weighting and estimation.

Recommendation 4-4: For group quarters (GQ) types that are not integrated into the housing unit sampling frame, the Census Bureau should develop improved and expanded procedures that enable more efficient, real-time use of status updates received from field representatives. An operations plan needs to be constructed that allows new GQ facilities to be added to the Master Address File and changes in the status of existing addresses to be reported. The Census Bureau should also continue to pursue the development of procedures that will allow for more efficient updating of the hous-

ing unit sample with cases that have been converted from group quarters to housing units.

Sample Allocation and Selection

The current sample design is not optimized for substate geographies. Because the GQ sampling and estimation procedures are controlled at the state level, substate estimates may be highly variable. To address this serious problem, the Census Bureau needs to investigate possibilities for exercising more control over the allocation rates at the substate level. This may be possible, for example, by making adjustments to the sample design to pay more individualized attention to some small jurisdictions. The Census Bureau will need to determine an allocation that optimizes data quality and collection costs.

Recommendation 5-1: The Census Bureau should conduct a formal evaluation of sample redesign strategies that would make it possible to control the American Community Survey group quarters sample allocation at the substate level. The evaluation should focus on identifying options that can improve the precision of the estimates at the state and substate levels without substantially increasing the costs of the data collection.

The ACS GQ sample consists of a subsample of small group quarters, defined by the Census Bureau as facilities that are expected to have 15 or fewer residents based on the information available from the sampling frame, and a sample of large group quarters, defined as facilities with more than 15 residents. The ACS uses a probability proportional to size GQ sample design. The sample of small group quarters in a state is proportional to the number of small group quarters in the frame for that state. The sample of large group quarters is proportional to the expected number of residents in large group quarters in the state. There are concerns that not only is information about the existence of GQ facilities outdated on the Master Address File, but also information about the number of expected residents in a GQ facility becomes quickly dated, which adversely affects the efficiency of the sample.

Recommendation 5-2: The Census Bureau should monitor the accuracy of the measures of size used in the probability proportional to size group quarters (GQ) sample design in the American Community Survey and should assess the resources allocated for updating the GQ sampling frame in the context of how the measures-of-size information available from the sampling frame affects the effectiveness of the sample design.

Given that some GQ facilities can be very large relative to the size of the household population in a geographic area, the implications of redesigning the sample to capture more of them in the sample with certainty (as is done in surveys of other unequally distributed entities) should also be evaluated.

Recommendation 5-3: The Census Bureau should assess whether useful strategies could be learned from other surveys that incorporate a must-take stratum of large units in the sample design and evaluate these strategies for possible use in the sample design for group quarters in the American Community Survey.

The residents of large group quarters are subsampled in groups of 10. This means that although the ACS sample does not include a sufficiently large number of group quarters overall for accurate estimates for small geographic areas, some large GQ facilities can have multiple groups of 10 residents in the sample. This strategy is less costly in terms of data collection operations than including a larger number of group quarters in the sample with fewer residents in each, but it may be statistically inefficient because group quarters provide housing and services to people with similar needs and circumstances, and the intraclass correlations within group quarters are naturally high for many variables.

Recommendation 5-4: The Census Bureau should expand on the research it initiated to determine the optimal cluster size for subsampling residents in large group quarters (GQ) in the American Community Survey, estimating intraclass correlations for different variables, and factoring in facility-level and person-level costs using a variety of approaches. The analysis should address whether the same subsample size is efficient for each GQ type and whether the size of the subsample per facility should be reduced.

Weighting and Estimation

As is the case with the sample design, the current weighting and estimation procedures for GQ residents in the ACS are not optimized for small-area estimates. In addition, the inadequate updating of GQ information following the decennial census may adversely affect the PEP estimates, which are used as auxiliary data to adjust the sample estimates (in other words, as "controls") in the ACS at the state level by type of group quarters. The panel makes the following recommendations regarding the PEP controls:

Recommendation 6-1: The Census Bureau should conduct an evaluation of the 2010 American Community Survey estimates of the group quarters (GQ) population against the 2010 census counts at all levels of geography for which the Census Bureau's Population Estimates Program (PEP) prepares such estimates. This research should estimate bias and imprecision

by GQ type and seek to identify ways to improve the PEP estimates of group quarters.

Recommendation 6-2: Depending on the outcome of the evaluation discussed in Recommendation 6-1, the Census Bureau should evaluate the relative advantages and disadvantages of developing control totals for group quarters (GQ) residents in the American Community Survey by demographic characteristics (age, sex, race, ethnicity) at the state level, possibly in addition to the control totals that are currently implemented by GQ type. The Census Bureau should also evaluate the possibility of using population controls only for the GQ types for which reliable controls are available. Finally, the Census Bureau should evaluate whether data from outside sources that are currently used to provide updates for the sampling frame could also be used for controls.

The state-based sample design of the ACS is not an efficient vehicle for providing substate estimates of the GQ population, and the estimates can be especially error prone in small areas where the GQ population represents a large portion of the total population. Many small areas are missing group quarters in the sample entirely. Statistical alternatives for producing improved GQ estimates could include indirect estimates. A variety of options exist, including the strategy currently being researched by the Census Bureau, which would involve the use of data from in-sample GQ facilities to impute person records for group quarters that are not in sample. Other options are described in the report, and the panel encourages the Census Bureau to pursue research designed to evaluate whether statistical methods of this type can be developed to improve the estimates.

Recommendation 6-3: The Census Bureau should evaluate statistical methods, such as indirect estimation, for producing group quarters estimates for counties in which group quarters are known to exist based on the American Community Survey sampling frame but are not included in the sample.

The advantage of the imputation method in particular is that it emulates the ACS data capture approach and enables the "modeled data" to be folded directly into estimates not only of the total population counts but also of the population characteristics. As such, this is a promising approach that should be evaluated and then could be continuously improved, even after an initial approach is implemented in the ACS for data collected in 2012. The panel recommends some refinements and additional research related to this plan.

Recommendation 6-4: The Census Bureau's research on imputing group quarters (GQ) person records in the American Community Survey should further investigate the possibility of using a donor selection procedure

that deemphasizes geographic proximity in relation to matching by GQ type, trying out alternatives to the proposed sequence of collapsing the combinations of geography and GQ type. The possibility of using a cluster approach to donor selection should be reevaluated using clusters formed for this purpose based on GQ data from the 2010 census. The Census Bureau should also expand its simulation study of imputation methods to include a sufficiently large number of samples capable of revealing significant differences between the imputation-based and the design-based estimates.

In addition to a smaller-than-optimal sample size of GQ residents in the ACS, several questionnaire items exhibit very high item nonresponse rates for some group quarters (GQ) types. For example, income is missing at very high levels for residents of nursing homes, as well as "other institutional" and "other noninstitutional facilities." A strategy of omitting selected items for some GQ types could be preferable to including data that are so heavily underreported. One promising approach to accomplishing this goal is for the Census Bureau to abandon the tradition of using the same questionnaire for very disparate populations.

Recommendation 6-5: The Census Bureau should evaluate the possibility of customizing by group quarters (GQ) type the American Community Survey questionnaire for the GQ population with the goal of reducing item imputation rates, improving data quality, and reducing the burden on the GQ respondents who are required to answer questions that are not applicable to their circumstances. Changes to consider should include omitting or revising some of the questions on the GQ questionnaire for some types of group quarters.

LOOKING TO THE FUTURE

The process of improving estimates of the group quarters and total populations for small geographic areas in the American Community Survey will need to involve not only continued research and development by the Census Bureau but also regular feedback from data users. It is the panel's observation that data users are not yet familiar with the properties of the 5-year ACS estimates for small geographic areas and the limited information that can be provided specifically for GQ residents. If the strategies recommended by the panel and the Census Bureau's research in the near term do not lead to cost-effective ways of improving the ACS estimates for small areas to the satisfaction of data users, then the role of the ACS in providing information about the total population—including residents of group quarters—will need to be rethought.

1

Introduction

In the early 1990s, the Census Bureau proposed a program of continuous measurement as a possible alternative to the gathering of detailed social, economic, and housing data from a sample of the U.S. population as part of the decennial census. The idea was based on earlier visions of nonoverlapping monthly samples that could be cumulated over different time periods to provide data for geographic areas of different sizes or for different subsets of the population (Kish, 1981). When the Census Bureau began to actively pursue the possibility of implementing a continuous measurement approach, the goal was to make the same data that were collected on the census "long form" available on a more timely basis than what was possible through a decennial data collection, at the same time reducing the burden imposed on the census enumeration by the fielding of the long form.

Pilot testing of the new survey began a few years later, and the full-fledged American Community Survey (ACS) became a reality in 2005, with nationwide implementation at the household level. Group quarters (GQ) facilities have been included in the sample since 2006. The replacement of the long-form sample with the new, ongoing survey—and the consequent casting of the decennial census as "short-form only"—became a key part of the Census Bureau's strategy for the 2010 census.

The design of the ACS relies on monthly samples that are cumulated to produce sufficient data to enable the release of estimates for increasingly smaller geographic areas over multiyear rolling intervals. As such, the ACS data products are period estimates, as opposed to point-in-time estimates. In other words, they are based on aggregating and averaging data collected over a

period of time, instead of providing a snapshot as of a particular point in time, as the census long form did for the April 1 reference date, once every 10 years.

Table 1-1 shows the initial ACS sample sizes and number of completed interviews between 2006 and 2010 (U.S. Census Bureau, 2011a). These sample sizes cumulate to approximately 15.4 million cases (10.4 million completed interviews) over the 5-year period, including the GQ residents.

In an ideal version of the ACS design, data cumulated over 5 years would have comparable estimation reliability to that achieved by recent census long-form samples, even in small areas. Although long-form sample sizes have varied in recent censuses, the last time the long form was administered (as part of the 2000 census), the sample included approximately 18 million housing units, and the data collection resulted in 16.4 million completed questionnaires (National Research Council, 2007). During the first few years of the ACS, the survey was not funded at a level necessary for a comparable sample size, but beginning in June 2011 the target was increased to 3.54 million sampled addresses annually, which, if continued at that level, will bring the ACS housing unit sample size closer to the census 2000 level over 5-year intervals in the future (U.S. Census Bureau, 2011b).

Table 1-2 shows the ACS data release schedule from the survey's inception through 2013, along with the population thresholds required for each release. Beginning in 2006, the Census Bureau published annual 1-year estimates of characteristics of the U.S. population and housing units for all geographic entities with populations of at least 65,000. Since 2008, 3-year estimates for geographic entities with populations of at least 20,000 have also been reported. The end of 2010 marked a crucial milestone for the ACS, when the first set of estimates based on 5 years of continuous data collection were published for all statistical, legal, and administrative entities, including areas as small as census block groups.

TABLE 1-1 Initial ACS Sample Sizes and Completed Interviews, 2006-2010

	Housing Units		GQ Residents	
Year	Initial Addresses Selected	Final Interviews	Initial Sample Selected	Final Interviews
2010	2,899,676	1,917,799	197,045	144,948
2009	2,897,256	1,917,748	198,808	146,716
2008	2,894,711	1,931,955	186,862	145,974
2007	2,886,453	1,937,659	187,012	142,468
2006	2,885,384	1,968,362	189,641	145,311

NOTE: Only a subsample of the housing units that do not respond by either mail or telephone are included in the in-person follow-up, which is the final stage of the ACS nonresponse follow-up effort. More information about response rates is available on the Census Bureau website (http://www.census.gov/acs/www/methodology/response_rates_data/).
SOURCE: U.S. Census Bureau (2011a).

TABLE 1-2 ACS Data Release Schedule, 2006-2013

Data Product	Population Threshold	Year of Data Release							
		2006	2007	2008	2009	2010	2011	2012	2013
		Year(s) of data collection							
1-year estimates	65,000+	2005	2006	2007	2008	2009	2010	2011	2012
3-year estimates	20,000+			2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012
5-year estimates	All areas					2005-2009	2006-2010	2007-2011	2008-2012

NOTE: Group quarters have been included in the ACS sample since 2006.
SOURCE: U.S. Census Bureau (2011c).

The GQ data collection has always been more challenging than the housing unit data collection, even in the decennial census, and some of these challenges are the natural consequence of the more complex living arrangements associated with residence in GQ facilities. The replacement of the census long-form sample with the ACS promises data users major benefits, but it also presents new challenges. In terms of the benefits, the critical advantages of the ongoing, continuous ACS are the timeliness of the estimates and the increased frequency of data releases. The continuous ACS data collection also has some advantages in terms of data quality. Whereas the decennial census relies heavily on a vast temporary workforce that must be hired, trained, and deployed quickly, the continuous nature of the ACS can accommodate a staff of well-trained, permanent field representatives. This, in turn, may contribute to reducing various kinds of nonsampling errors, including item nonresponse rates and proxy responses compared with data from the census long-form approach.

However, the ACS has some offsetting disadvantages. Chief among these are the larger sampling errors associated with the estimates. Higher levels of estimate uncertainty are a consequence of the smaller overall sample size (compared, for example, with the 2000 census long-form sample), even cumulating over 5 years, and the fact that only a sample of nonresponding housing units is included in the follow-up stages of data collection. In addition, large numbers of GQ facilities included in the GQ sample are found to be ineligible or eligible but unoccupied during the data collection. Furthermore, the ACS uses control totals based on postcensal population estimates from the Population Estimates Program (PEP)—instead of the census itself—to reduce variation in the ACS estimates, which means that controls are not available for geographic areas as small as from the census, and that any errors associated with the population estimates will also affect the ACS estimates.

Although these comments refer to the ACS as a national survey and therefore apply primarily to the sample of housing units and estimates of the popu-

lation living in households, they apply to the GQ part of the ACS operation as well. However, several aspects of sampling GQ facilities and estimating the numbers and characteristics of individuals living in them are uniquely problematic to this segment of the population. This more narrow set of issues is the focus of this report.

ISSUES FOR THE PANEL

When the ACS entered full-scale production in 2005, it did so only for the household population. One year later, in 2006, the Census Bureau was also able to include what it refers to as group quarters—such places as correctional facilities for adults, student housing, nursing facilities, inpatient hospice facilities, and military barracks—primarily to more closely replicate the design and data products of the census long-form sample. The decision to include group quarters in the ACS enables the Census Bureau to provide a comprehensive benchmark on the total U.S. population (not just those living in households), but it also brings about additional challenges and data quality implications.

Box 1-1 provides the definition of group quarters used by the Census Bureau for purposes of the ACS and lists the major types of group quarters included in the survey (additional details are provided in Box 2-1).

The GQ population was 2.6 percent of the total U.S. population at the time of the 2010 census. Although this represents only a small fraction of the total population, its unique characteristics present major challenges for the ACS. In addition to the operational hurdles associated with collecting data from non-household populations, there are statistical challenges as well, partly because group quarters are unevenly distributed across the country and their residents are often systematically different from the household population in the communities in which they are located. Some jurisdictions have no group quarters at all, and others may have a large prison facility, military barracks, student housing, or a mix of different GQ types.

For national and state-level population estimates, this is not a particularly large concern. However, the goal of the ACS is to provide data for geographic areas as small as census tracts and block groups as well as for sparsely populated villages and towns across rural America. In such small areas, the accuracy and precision of population estimates will be affected by data limitations. These limitations necessarily affect estimates pertaining to the GQ populations. However, as a secondary consequence, errors in the GQ estimates can often profoundly affect the estimates and population characteristics of the total population as well. For a variety of reasons, which are described in detail in subsequent sections, the design of the ACS and the data collection, weighting, and estimation procedures pertaining to GQ residents are not optimized for small-area estimates. As a result, a thorough evaluation of the implications of these design issues for small-area estimates is essential.

BOX 1-1
ACS Definition and Major Types of Group Quarters

Definition

A group quarters is a place where people live or stay, in a group living arrangement, that is owned or managed by an entity or organization providing housing and/or services for the residents. This is not a typical household-type living arrangement. These services may include custodial or medical care as well as other types of assistance, and residency is commonly restricted to those receiving these services. People living in group quarters are usually not related to each other. Group quarters include such places as college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and workers' dormitories.

Major Types of Group Quarters

1. Correctional facilities for adults
2. Juvenile facilities
3. Nursing facilities and skilled nursing facilities
4. Other institutional facilities
5. College or university student housing
6. Military group quarters
7. Other noninstitutional facilities

SOURCE: U.S. Census Bureau (2008a).

As illustrated in Table 1-1, in any given year, the number of completed GQ interviews is less than 150,000 nationally. The annual sampling rate for the GQ population varies by state, but in most states it is approximately 2.5 percent of the expected number of GQ residents.

Currently, a stratified sample of group quarters is selected for each state, without controlling for the allocation of GQ populations at substate levels of geography, such as counties, municipalities, tracts, and block groups (unlike the 2000 census long-form sample, which was generally controlled to census counts at subcounty levels of geography). Consequently, while the household sample is suitable for producing estimates of characteristics of people residing in households for substate geographies, the measurement and estimation approaches developed for the GQ population are designed to be optimal only for estimates at the state level and higher levels of geography.

A serious challenge posed by the inclusion of group quarters in the ACS is "sampling zeroes"—small geographic areas that have no group quarters represented in the sample, even after a 5-year period of data collection, despite

the presence of GQ facilities in the sampling frame and nonzero GQ population counts revealed in the most recent decennial census for those areas. In substate areas, this can adversely affect the estimates of characteristics for the total population, and it can elevate estimated standard errors for characteristics of the total population. To the extent that group quarters are skipped over in the sample selection for some small jurisdictions or census tracts or block groups, the sampling weights of group quarters in other jurisdictions may be disproportionately increased.

Other challenges include the complexities and costs associated with maintaining an accurate and up-to-date inventory of GQ facilities, independent of the inventory of household addresses. This is especially difficult in the case of smaller group quarters, which open and close at rates faster than larger facilities, and group quarters in structures that may have been recently converted from housing units. This affects not only the efficiency of the GQ sampling frame but also the GQ estimates produced by the Census Bureau's PEP, which are used as controls in the ACS.

Based on the factors described above, the panel concludes that the main data quality concern is not necessarily the estimates of GQ characteristics, but rather the effects that the GQ sample has on the estimates of total population characteristics, especially in smaller areas. Although largely unanticipated by the panel early on, this conclusion solidified as it became evident over the course of the study that, for the GQ population, very limited data would be made available below the state level, even based on the 5-year data release. As part of the panel's research it also became clear that the presence of group quarters can play an important role in many smaller places, where the quality of the GQ estimates often means the difference between an accurate statistical portrait of the area and one that is substantially distorted.

PANEL CHARGE

The Census Bureau asked the Committee on National Statistics of the National Academies to convene a panel to evaluate the ACS methodology for measuring the GQ population, taking into consideration data user needs (for the exact wording of the panel's charge, see Box 1-2). The panel was asked to recommend alternatives to the current study design, with the primary goal of making the ACS data more useful for small-area data users. The panel was not asked to conduct a cost-benefit analysis of the inclusion of the GQ population in the ACS, although the panel conducted its deliberations being mindful of the costs associated with the GQ data collection, as well as of the costs of possible alternatives that would involve a major reconceptualization of the survey's design.

In response to this charge, the panel appointed by the National Research Council undertook a range of activities over the course of approximately 2

BOX 1-2
Statement of Task

An ad hoc panel will conduct an in-depth review of the statistical methodology for measuring the group quarters (GQ) population in the continuous American Community Survey (ACS). The panel will consider user needs for ACS data on the various components of the GQ population, including inmates of federal, state, and local correctional facilities, residents of nursing homes and other long-term health care facilities, college students living in campus housing, military personnel in barracks or on a ship in home port, and residents of noninstitutional group quarters, such as hospices, convents, monasteries, group homes, and migrant workers quarters. In light of user needs and considerations of operational feasibility and compatibility with the treatment of the household population in the ACS, the panel will recommend alternatives to the current sample design, weighting procedures, and other methodological features that can make the ACS GQ data more useful for small-area data users, particularly users of ACS 5-year period estimates for small governmental jurisdictions, census tracts, and block groups. The panel will issue an interim report at the end of the first year of the study with recommendations for near-term improvements in the sample design and weighting of group quarters in the ACS and a final report at the conclusion of a 24-month study with findings and recommendations for longer term improvements to the measurement of the GQ population.

years. The panel met with staff from the Census Bureau's American Community Survey Office on several occasions to learn about the design of the ACS, the GQ data collection methodology, the challenges experienced, and plans for the future. The panel also consulted with staff from other Census Bureau offices whose work has implications for the ACS. This included such units as the Decennial Census Division, the Population Estimates Program, and the Geography Division.

To evaluate data user needs, the panel held a workshop with users of the ACS data on December 13, 2010, in Washington, DC (for a list of participants, see Appendix A). The goal of the meeting was to gain a thorough understanding of how the GQ data are used and what the data user needs are and to discuss enhancement and alternatives to the current ACS design. In an effort to reach as many potential stakeholders as possible, panel members also discussed the study at several meetings and conferences attended by data users interested in census and ACS data. These included meetings of the Association of Public Data Users, the Council of Professional Associations on Federal Statistics, and the Population Association of America. The panel's efforts to better understand data user needs were also assisted by consultants engaged by the panel to review the role of GQ data in the distribution of federal funds as well as the use of GQ

data in programs primarily focused at the state and local levels. The panel also researched the availability of GQ data from sources other than the decennial census and the ACS.

Panel members discussed data collection strategies with other researchers, including staff from the Bureau of Justice Statistics and the National Center for Health Statistics.

OVERVIEW OF THE REPORT

At the request of the Census Bureau, the panel prepared an interim report, which focused on recommendations for near-term improvements in the sample design, weighting, and estimation of the GQ population (National Research Council, 2010). This final report incorporates the findings and recommendations from the interim report and discusses them in the broader context of long-term goals for the ACS, with special emphasis on data user needs.

Following this introduction, Chapter 2 describes the measurement of the GQ population in the ACS. Chapters 3 through 6 contain the panel's recommendations related to data user needs and to different aspects of the ACS GQ methodology. Chapter 3 discusses data user needs. Chapter 4 focuses on the challenges related to developing and maintaining a sampling frame of GQ facilities and makes recommendations for increasing the efficiency of the updating process and sample design. Chapter 5 describes the sample allocation and selection process and offers suggestions for refining these aspects of the survey design. Chapter 6 discusses possible improvements and alternatives to the weighting and estimation procedures.

2

The Group Quarters Population and the American Community Survey

WHAT ARE GROUP QUARTERS?

The Census Bureau classifies living quarters as either housing units or group quarters (GQ). Although living quarters are usually found in residential structures, they can also be found in structures not intended for residential use and in such places as tents, vans, and emergency and transitional shelters (U.S. Census Bureau, 2011d). Most people reside in housing units, which the Census Bureau defines as follows:

> A housing unit may be a house, an apartment, a mobile home, a group of rooms or a single room that is occupied (or, if vacant, intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live separately from any other individuals in the building and which have direct access from outside the building or through a common hall.

By this classification, people who do not live in housing units live in group quarters. The Census Bureau's definition of group quarters is as follows:

> A group quarters is a place where people live or stay, in a group living arrangement, that is owned or managed by an entity or organization providing housing and/or services for the residents. This is not a typical household-type living arrangement. These services may include custodial or medical care as well as other types of assistance, and residency is commonly restricted to those receiving these services. People living in group quarters are usually not related to each other. Group quarters include such places as college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and workers' dormitories.

At the time of the 2010 census, there were approximately 8 million people living in group quarters, representing 2.6 percent of the total U.S. population. This ratio has remained relatively constant over the past few decades.

Unlike most surveys that limit their target population to households (people who live in housing units) and sometimes noninstitutional group quarters, the goal of the American Community Survey (ACS) is to represent all U.S. residents. Samples of most types of group quarters have been included in the ACS since 2006, the second year of the survey's existence. For practical reasons and in some cases because of privacy concerns, the ACS does exclude a few of the less common GQ types (for example, domestic violence shelters, soup kitchens, regularly scheduled mobile food vans, targeted nonsheltered outdoor locations, commercial maritime vessels, natural disaster shelters, and dangerous encampments), but it remains the most comprehensive survey in the United States in terms of this target population, aside from the decennial census itself. It is also important to note that ACS estimates of the total population are controlled to the Population Estimates Program (PEP) estimates of the total GQ population, including residents of group quarters that are not included in the ACS (U.S. Census Bureau, 2009). Box 2-1 describes the group quarters that were included in the 2010 ACS.

Half of GQ residents live in *institutional* settings. Institutional facilities are group quarters that provide formally supervised custody or care to inmates or patients. Examples of institutional group quarters are correctional facilities and nursing homes. The remainder of the GQ population lives in *noninstitutional* settings, such as student housing and military quarters. Table 2-1 shows the GQ population by type of group quarters based on the 2010 census enumeration.

CHARACTERISTICS OF GROUP QUARTERS

Although the number of GQ residents is small relative to the total population, the GQ population is "lumpy" in several senses of the term. First, individual GQ facilities (e.g., student dormitories, correctional facilities, nursing homes) are unusually homogenous regarding basic demographic characteristics. Hypothetically, communities with identical total GQ populations may differ considerably depending on the types of facilities existing within their boundaries. Second, although some jurisdictions have very few GQ residents, the population of other jurisdictions may be dominated by a large GQ facility, such as a university or a federal or state prison. Third, the GQ population is systematically different from the household population in terms of basic demographic characteristics. Table 2-2 shows the characteristics of the GQ population by sex and age group. Table 2-3 summarizes the main characteristics that tend to differ between group quarters and the household population.

BOX 2-1
2010 American Community Survey Group Quarters Definitions

1. Correctional Facilities for Adults

Correctional Residential Facilities
These are community-based facilities operated for correctional purposes. The facility residents may be allowed extensive contact with the community, such as for employment or attending school, but are obligated to occupy the premises at night. Examples are halfway houses, restitution centers, and prerelease, work release, and study centers.

Federal Detention Centers
Stand alone, generally multi-level, federally operated correctional facilities that provide "short-term" confinement or custody of adults pending adjudication or sentencing. These facilities may hold pretrial detainees, holdovers, sentenced offenders, and Immigration and Customs Enforcement (ICE) inmates, formerly called Immigration and Naturalization Service (INS) inmates. These facilities include Metropolitan Correctional Centers (MCCs), Metropolitan Detention Centers (MDCs), Federal Detention Centers (FDCs), Bureau of Indian Affairs Detention Centers, ICE Service Processing Centers, and ICE contract detention facilities.

Federal and State Prisons
Adult correctional facilities where people convicted of crimes serve their sentences. Common names include prison, penitentiary, correctional institution, federal or state correctional facility, and conservation camp. The prisons are classified by two types of control: (1) "federal" (operated by or for the Bureau of Prisons of the Department of Justice) and (2) "state." Residents who are forensic patients or criminally insane are classified on the basis of where they resided at the time of interview. Patients in hospitals (units, wings, or floors) operated by or for federal or state correctional authorities are interviewed in the prison population. Other forensic patients will be interviewed in psychiatric hospital units and floors for long-term non-acute patients. This category may include privately operated correctional facilities.

Local Jails and Other Municipal Confinement Facilities
Correctional facilities operated by or for counties, cities, and American Indian and Alaska Native tribal governments. These facilities hold adults detained pending adjudication and/or people committed after adjudication. This category also includes work farms and camps used to hold people awaiting trial or serving time on relatively short sentences. Residents who are forensic patients or criminally insane are classified on the basis of where they resided at the time of interview. Patients in hospitals (units, wings, or floors) operated by or for local correctional authorities are counted in the jail population. Other forensic patients will be interviewed in psychiatric hospital units and floors for long-term non-acute patients. This category may include privately operated correctional facilities.

continued

BOX 2-1 Continued

Military Disciplinary Barracks and Jails
Correctional facilities managed by the military to hold those awaiting trial or convicted of crimes.

2. Juvenile Facilities

Correctional Facilities Intended for Juveniles
Includes specialized facilities that provide strict confinement for its residents and detain juveniles awaiting adjudication, commitment or placement, and/or those being held for diagnosis or classification. Also included are correctional facilities where residents are permitted contact with the community, for purposes such as attending school or holding a job. Examples are residential training schools and farms, reception and diagnostic centers, group homes operated by or for correctional authorities, detention centers, and boot camps for juvenile delinquents.

Group Homes for Juveniles (non-correctional)
Includes community-based group living arrangements for youth in residential settings that are able to accommodate three or more clients of a service provider. The group home provides room and board and services, including behavioral, psychological, or social programs. Generally, clients are not related to the care giver or to each other. Examples are maternity homes for unwed mothers, orphanages, and homes for abused and neglected children in need of services. Group homes for juveniles do not include residential treatment centers for juveniles or group homes operated by or for correctional authorities.

Residential Treatment Centers for Juveniles (non-correctional)
Includes facilities that primarily serve youth that provide services on-site in a highly structured live-in environment for the treatment of drug/alcohol abuse, mental illness, and emotional/behavioral disorders. These facilities are staffed 24-hours a day. The focus of a residential treatment center is on the treatment program. Residential treatment centers for juveniles do not include facilities operated by or for correctional authorities.

3. Nursing Facilities/Skilled Nursing Facilities

Nursing Facilities/Skilled Nursing Facilities
Includes facilities licensed to provide medical care with 7 day, 24-hour coverage for people requiring long-term non-acute care. People in these facilities require nursing care, regardless of age. Either of these types of facilities may be referred to as nursing homes.

4. Other Institutional Facilities

Hospitals with Patients Who Have No Usual Home Elsewhere
Includes hospitals if they have any patients who have no exit or disposition plan, or who are known as “boarder patients” or “boarder babies.” All hospitals are eligible

BOX 2-1 Continued

for inclusion in this category except psychiatric hospitals, units, wings or floors operated by federal, state or local correctional authorities. Patients in hospitals operated by these correctional authorities will be interviewed in the prison or jail population. Psychiatric units and hospice units in hospitals are also excluded. Only patients with no usual home elsewhere are interviewed in this category.

Inpatient Hospice Facilities
Includes inpatient hospice facilities (both free-standing and units in hospitals) that provide palliative, comfort, and supportive care for the terminally ill patient and their families. All patients in these GQs are included in the ACS GQ sample.

Mental (Psychiatric) Hospitals and Psychiatric Units in Other Hospitals
Includes psychiatric hospitals, units and floors for long-term non-acute care patients. The primary function of the hospital, unit, or floor is to provide diagnostic and treatment services for long-term non-acute patients who have psychiatric-related illness.

Military Treatment Facilities with Assigned Patients
These facilities include military hospitals and medical centers with active duty patients assigned to the facility. Only these patients are interviewed in this category.

Residential Schools for People with Disabilities
Includes schools that provide the teaching of skills for daily living, education programs, and care for students with disabilities in a live-in environment**.** Examples are residential schools for the physically or developmentally disabled.

5. College/University Student Housing

College/University Student Housing
Includes residence halls and dormitories, which house college and university students in a group living arrangement. These facilities are owned, leased, or managed either by a college, university, or seminary, or by a private entity or organization. Fraternity and sorority housing recognized by the college or university are included as college student housing. Students attending the U.S. Naval Academy, the U.S. Military Academy (West Point), the U.S. Coast Guard Academy, and the U.S. Air Force Academy are interviewed in military group quarters.

6. Military Group Quarters

Military Quarters
These facilities include military personnel living in barracks (including “open” barrack transient quarters) and dormitories and military ships. Patients assigned to military treatment facilities and people being held in military disciplinary barracks and jails are not interviewed in this category. Patients in military treatment facilities with no usual home elsewhere are not interviewed in this category.

continued

BOX 2-1 Continued

7. Other Noninstitutional Facilities

Emergency and Transitional Shelters (with Sleeping Facilities) for People Experiencing Homelessness
Facilities where people experiencing homelessness stay overnight. These include (1) shelters that operate on a first-come, first-serve basis where people must leave in the morning and have no guaranteed bed for the next night; (2) shelters where people know that they have a bed for a specified period of time (even if they leave the building every day); and (3) shelters that provide temporary shelter during extremely cold weather (such as churches). This category does not include shelters that operate only in the event of a natural disaster. Examples are emergency and transitional shelters; missions; hotels and motels used to shelter people experiencing homelessness; shelters for children who are runaways, neglected or experiencing homelessness; and similar places known to have people experiencing homelessness.

Group Homes Intended for Adults
Group homes are community-based group living arrangements in residential settings that are able to accommodate three or more clients of a service provider. The group home provides room and board and services, including behavioral, psychological, or social programs. Generally, clients are not related to the care giver or to each other. Group homes do not include residential treatment centers or facilities operated by or for correctional authorities.

Residential Treatment Centers for Adults
Residential facilities that provide treatment on-site in a highly structured live-in environment for the treatment of drug/alcohol abuse, mental illness, and emotional/behavioral disorders. They are staffed 24 hours a day. The focus of a residential treatment center is on the treatment program. Residential treatment centers do not include facilities operated by or for correctional authorities.

Religious Group Quarters
These are living quarters owned or operated by religious organizations that are intended to house their members in a group living situation. This category includes such places as convents, monasteries, and abbeys. Living quarters for students living or staying in seminaries are classified as college student housing not religious group quarters.

Workers' Group Living Quarters and Job Corps Centers
Includes facilities such as dormitories, bunkhouses, and similar types of group living arrangements for agricultural and nonagricultural workers. This category also includes facilities that provide a full-time, year-round residential program offering a vocational training and employment program that helps young people 16- to-24 years old learn a trade, earn a high school diploma or GED and get help finding a job. Examples are group living quarters at migratory farm worker camps, construction workers' camps, Job Corps centers, and vocational training facilities, and energy enclaves in Alaska.

SOURCE: U.S. Census Bureau. Available: http://www.census.gov/acs/www/Downloads/data_documentation/GroupDefinitions/2010GQ_Definitions.pdf.

TABLE 2-1 GQ Population by Type of Group Quarters, 2010 Census

GQ Type	Number	Percentage
Correctional facilities for adults	2,263,602	28.3
Federal detention centers	68,577	0.9
Federal prisons	172,020	2.2
State prisons	1,248,167	15.6
Local jails and other municipal confinement facilities	682,043	8.5
Correctional residential facilities	91,006	1.1
Military disciplinary barracks and jails	1,789	0.0
Juvenile facilities	151,315	1.9
Group homes for juveniles (noncorrectional)	37,618	0.5
Residential treatment centers for juveniles (noncorrectional)	48,010	0.6
Correctional facilities intended for juveniles	65,687	0.8
Nursing facilities/skilled nursing facilities	1,502,264	18.8
Other institutional facilities	76,478	1.0
Mental hospitals and psychiatric units in other hospitals	42,035	0.5
Hospitals with patients who have no usual home elsewhere	16,902	0.2
Inpatient hospice facilities	7,751	0.1
Military treatment facilities with assigned patients	266	0.0
Residential schools for people with disabilities	9,524	0.1
Total Institutional Population	**3,993,659**	**50.0**
College/university student housing	2,521,090	31.6
Military group quarters	338,191	4.2
Military barracks and dormitories	288,718	3.6
Military ships	49,473	0.6
Other noninstitutional facilities	1,134,383	14.2
Emergency and transitional shelters for people experiencing homelessness	209,325	2.6
Group homes intended for adults	304,688	3.8
Residential treatment centers for adults	139,420	1.7
Maritime/merchant vessels	2,382	0.0
Workers' group living quarters and Job Corps centers	168,549	2.1
Other (noninstitutional)	310,019	3.9
Total Noninstitutional Population	**3,993,664**	**50.0**
Total GQ Population	**7,987,323**	**100.0**

SOURCE: U.S. Census Bureau 2010 Summary File 1 (PCT20). Available: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

DATA COLLECTIONS FROM GROUP QUARTERS

Because of the particular characteristics of the GQ population and their potentially large impact on the estimates in small areas, GQ data play a crucial role in the accuracy of the total population data from the ACS. The Census Bureau has been refining the ACS procedures used for collecting and producing GQ estimates over the years, building on decades of experience measuring these populations as part of the decennial census.

TABLE 2-2 GQ Population by Sex and Age, 2010 Census

	Number			Percentage		
Age	Male	Female	Total	Male	Female	Total
Under 20 years	910,270	877,497	1,787,767	18.7	28.0	22.4
20 to 34 years	1,965,139	850,832	2,815,971	40.4	27.2	35.3
35 to 64 years	1,529,210	396,669	1,925,879	31.5	12.7	24.1
65 years and over	453,591	1,004,115	1,457,706	9.3	32.1	18.3
Total GQ Population	4,858,210	3,129,113	7,987,323	100.0	100.0	100.0
Under 20 years	183,481	51,191	234,672	6.8	4.0	5.9
20 to 34 years	1,022,949	118,492	1,141,441	37.7	9.3	28.6
35 to 64 years	1,115,096	204,596	1,319,692	41.0	16.0	33.0
65 years and over	395,351	902,503	1,297,854	14.6	70.7	32.5
Total Institutional Population	2,716,877	1,276,782	3,993,659	100.0	100.0	100.0
Under 20 years	726,789	826,306	1,553,095	33.9	44.6	38.9
20 to 34 years	942,190	732,340	1,674,530	44.0	39.5	41.9
35 to 64 years	414,114	192,073	606,187	19.3	10.4	15.2
65 years and over	58,240	101,612	159,852	2.7	5.5	4.0
Noninstitutional Population	2,141,333	1,852,331	3,993,664	100.0	100.0	100.0

SOURCE: U.S. Census Bureau 2010 Summary File 1 (PCO2 and PCO7). Available: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

TABLE 2-3 Comparisons Between Group Quarters and the Household Population

Characteristic	Comparison
Sex	Correctional facilities are overwhelmingly male. Nursing homes are predominantly female.
Age	Student housing is almost exclusively for ages 18-24. Nursing homes are predominantly for ages 65 and over.
Race	Correctional facilities have a higher percentage of African Americans or blacks than the household population.
Hispanic origin	Correctional facilities have a higher percentage and nursing homes have a lower percentage of persons of Hispanic origin than the household population.
Marital status	Correctional facilities and college dorms have high never-married rates. Nursing homes have high widowed rates.
Disability status	Nursing homes have high rates of disabilities.
School enrollment	Residents of student housing are almost all enrolled in college.
Veteran status	Nursing homes have higher rates of veterans. Student housing has very few veterans.
Residence 1 year ago	GQ residents have a high rate of having lived somewhere else a year ago.
Employment status	Most persons living in college dorms are not in the labor force.
Income	GQ residents have lower income than the household population.

SOURCE: U.S. Census Bureau (2011e).

The concept of group quarters started to gradually emerge beginning with the 1830 census, with the term *group quarters* first appearing as part of the 1850 census (Ruggles and Brower, 2003). Prior to that, all individuals living together were enumerated as if they were part of a large family. The categorization of GQ facilities and the procedures used for the enumeration have generally been modified and updated with each census, but measuring this population remains extremely challenging, even in the decennial census. One reason is that it is difficult to develop standardized definitions for these types of complex living arrangements that are both operationally practical and consistent with the broad range of terminologies used by GQ facility managers and residents. Another reason is that many small GQ facilities are not easily distinguishable from traditional housing units. Third, the unique circumstances of many GQ residents means that some of the questions asked are not equally applicable to residents of all GQ types, which can result in the need to impute a large percentage of the responses to individual questions. This is especially true for the questions that were on the census long form and are now on the ACS. Although it is too early to assess the success of the enumeration of group quarters in the

2010 census, the 2000 census was criticized because some GQ residents were counted more than once, some were missed, and some were assigned to the wrong geographic location (U.S. Government Accountability Office, 2010).

The ACS faces the arguably more complex task of producing estimates of the total population based only on samples of this relatively small subset of the total population. The main steps in the current approach to the ACS GQ data collection are summarized in Box 2-2. Key aspects of the ACS survey design and GQ data collection are discussed in further detail in subsequent chapters.

The ACS was envisioned as a survey that would provide the same information about the U.S. population and entities in the geographic hierarchy as small as census block groups as did the census long-form questionnaire. Historically, the content of the census long form was determined by including only questions that met the following criteria (U.S. Census Bureau, 2009):

- They were mandated by federal law calling for the use of decennial census data for a particular federal program.
- They were required because a federal law or implementing regulation called for the use of specific data, and the decennial census was the historical or only source.
- They were required because of case law requirements imposed by the U.S. federal court system.
- They were necessary to meet Census Bureau operational needs.

In developing the content of the ACS, the Census Bureau was assisted by the Office of Management and Budget Interagency Committee for the ACS, which includes representatives from dozens of federal agencies; it is cochaired by the Office of Management and Budget and the Census Bureau. The committee continues to advise the Census Bureau as new data needs and the need for questionnaire revisions arise. This is a difficult task because of several important but often competing considerations: concerns about respondent burden, increasing data needs, and the consistency required to preserve the continuity of time series. Changes made to the ACS questionnaires over the years have been relatively small. Some new questions have been added to the ACS, including health insurance coverage, marital history, Veterans Administration service-connected disability rating, and field of college degree.

Box 2-3 summarizes the current content of the housing unit and the GQ questionnaires. Appendix B includes the full 2011 ACS housing unit questionnaire, and Appendix C includes the full 2011 ACS GQ questionnaire. The content of the GQ questionnaire is essentially the same as the housing unit questionnaire, except that the housing sections (physical and financial characteristics related to housing) are not asked of GQ residents. The only other question not asked of GQ residents is the "relationship to householder" question, which provides users with data on family structure in households.

BOX 2-2
Data Collection Steps for Group Quarters in the American Community Survey

Sample Development

The GQ sample is derived from data extracts from the Census Bureau's Master Address File (MAF) and information from other sources. The sample is divided into two strata: (1) GQ facilities with 15 or fewer expected residents and facilities with an unknown population count and (2) GQ facilities with more than 15 expected residents. In small group quarters, everyone is eligible to be interviewed. In large group quarters, the residents are divided into groups of 10 and a systematic sample of 1-in-40 groups of 10 is selected. The facilities and groups of 10 respondents are randomly assigned to data collection months throughout the year (with some exceptions, which are described below).

Facility-Level Data Collection Phase

The Census Bureau's National Processing Center mails an advance letter and brochure about the ACS to each sampled GQ facility prior to the beginning of the fieldwork. Field representatives contact sampled group quarters by phone to schedule an appointment for visiting the facility. During the visit to sampled facilities, field representatives administer the computer-assisted Group Quarters Facility Questionnaire to a contact person. The facility type, population size, and the sample of individuals to be interviewed are determined during this process.

Person-Level Data Collection Phase

Person-level interviews can be completed by:

- –in-person interview (computer-assisted personal interview) with the sample person (the method preferred by the Census Bureau);
- –telephone interview with the sample person;
- –in-person proxy interview with the GQ contact, relative, or guardian of the sample person;
- –leaving the questionnaire with the sample person to complete by self-response (the field representative must return to collect the completed questionnaire); or
- –leaving the questionnaire with the GQ contact, who agrees to give it to the sample person (the field representative must return to collect the completed questionnaire).

If a GQ contact is involved in distributing the questionnaires or providing responses, he or she must take an oath of nondisclosure, under Title 13 of the U.S. Code.

Special Procedures

In remote Alaska, the GQ data collection is conducted twice a year, from January through mid-April and from September through mid-January.

Data collection in federal prisons is completed during a 4-month period, from September through December. The Bureau of Prisons provides a list of inmates to the Census Bureau and conducts security clearances of field representatives who will be visiting these facilities.

Correctional and military facilities selected into the sample for more than one month of the year are visited only once a year, during a randomly selected month.

SOURCE: U.S. Census Bureau (2009).

BOX 2-3
Topics Covered in the 2011 ACS Questionnaires

HOUSING UNIT QUESTIONNAIRE	GROUP QUARTERS QUESTIONNAIRE
Demographic Characteristics	**Demographic Characteristics**
Age	Age
Sex	Sex
Hispanic origin	Hispanic origin
Race	Race
Relationship to householder	
Economic Characteristics	**Economic Characteristics**
Income	Income
Food stamps benefit	Food stamps benefit
Labor force status	Labor force status
Industry, occupation, and class of worker	Industry, occupation, and class of worker
Place of work and journey to work	Place of work and journey to work
Work status last year	Work status last year
Health insurance coverage	Health insurance coverage
Social Characteristics	**Social Characteristics**
Ancestry	Ancestry
Place of birth, citizenship, and year of entry to United States	Place of birth, citizenship, and year of entry to United States
Language spoken at home	Language spoken at home
Educational attainment and school enrollment	Educational attainment and school enrollment
Undergraduate field of degree	Undergraduate field of degree
Residence one year ago	Residence one year ago
Marital status and marital history	Marital status and marital history
Fertility	Fertility
Grandparents as caregivers	Grandparents as caregivers
Veteran status, period of military service, and Veterans Administration service-connected disability rating	Veteran status, period of military service, and Veterans Administration service-connected disability rating
Disability	Disability
Housing—Physical Characteristics	
Year structure built	
Units in structure	
Year moved into unit	
Rooms	
Bedrooms	
Kitchen facilities	
Plumbing facilities	

BOX 2-3 Continued

House heating fuel
Telephone service available
Vehicles available
Farm residence

Housing—Financial Characteristics
Tenure (owner/renter)
Housing value
Rent
Selected monthly owner costs

SOURCE: U.S. Census Bureau American Community Survey Questionnaire Archive. Available: http://www.census.gov/acs/www/methodology/questionnaire_archive/.

3

American Community Survey Data Products, Data Uses, and Data Needs

One of the main justifications for including a sample of the group quarters (GQ) population in the American Community Survey (ACS) is based on the original vision for the survey, which was that it would serve as a replacement for the census long-form sample. The long-form sample included both institutional and noninstitutional group quarters, and GQ facilities are currently included in the ACS to remain faithful to that goal. However, the cost of collecting data from a hard-to-reach population—such as the residents of group quarters—is higher per interview than the cost of housing unit interviews because of the more complex survey operations required (e.g., higher rates of face-to-face interaction with individual respondents and facility managers). Moreover, an inadequate GQ sample size jeopardizes not only the estimates for the GQ population but also the estimates for the total population in areas where a relatively large number of persons live in GQ facilities.

A fundamental question the panel had to consider was whether there is a demonstrated and sufficiently compelling need for collecting GQ data as part of the ACS. Other national surveys conducted by both government agencies and private research organizations typically exclude the institutional population and the active-duty military population and treat residents of civilian, noninstitutional group quarters as if they were part of the household population. These surveys are representative of the U.S. civilian, noninstitutional population. In addition, several other federal and private survey efforts focus specifically on segments of the GQ population (generally at a national level), raising the question of whether there is any redundancy of effort and overlap with the GQ data collection in the ACS.

To understand data user needs, and in particular the relevance of the GQ data to users of the American Community Survey, the panel sought input from researchers and stakeholders, attempting to identify data users who may have specific programmatic requirements for information about GQ residents. A workshop was held with a broad spectrum of users of the ACS data on December 13, 2010, in Washington, DC. The goal of the meeting was to gain a thorough understanding not only of what data users' needs are, but also of how the GQ data are used and to discuss enhancements and alternatives to the current ACS design and methodologies. In reviewing data user needs, the panel was also assisted by consultants who were asked to examine federal as well as state and local uses of the ACS GQ data, including uses for funding allocation and to meet programmatic needs.

This chapter discusses the input received from data users and draws on two papers commissioned by the panel:

1. "The American Community Survey: A Review of the Universe Requirements in Federal Legislation" by Cynthia M. Taeuber and Rachel Blanchard Carpenter, and
2. "The Importance of American Community Survey Data on the Group Quarters Population" by Robert Scardamalia.

ACS DATA PRODUCTS

As discussed, since 2006, the Census Bureau has been publishing annual 1-year ACS estimates for geographic entities with a population of at least 65,000. Three-year ACS estimates for geographic entities with populations of at least 20,000 have been published since 2008. The first release based on 5 years of data collection was published in 2010, with estimates for all statistical, legal, and administrative entities, including areas as small as census block groups. Data from 2005 include only the household population, whereas data beginning with 2006 include both households and group quarters. The 2010 release of 5-year period estimates was based on 1 year of data (2005) that did not include a GQ sample and 4 years of data (2006-2009) that included GQ samples (with the GQ data weighted to reflect a 5-year period estimate window). Beginning with the release of the 2006-2010 estimates in December 2011, all new ACS data products will be based on samples of both households and group quarters for every year included.

ACS data products are expected to evolve on the basis of data needs and feedback from researchers and other data users; Table 3-1 summarizes the current products. Not all releases include all of these products. For example, the 5-year release does not include comparison profiles, state ranking tables, or selected population profiles. Some of the derived data products, such as data and narrative profiles, subject profiles, and geographic comparison tables,

TABLE 3-1 Main American Community Survey Data Products

Data Product	Description
Data profiles	Provide broad social, economic, housing, and demographic profiles
Narrative profiles	Summarize the information in the data profiles using concise, nontechnical text and graphical displays
Selected population profiles	Provide broad social, economic, and housing profiles for a large number of race, ethnic, ancestry, and country/region of birth groups
Ranking tables	Provide state rankings of estimates across key variables
Subject tables	Provide detailed data on a particular topic
Detailed tables	Provide access to the most in-depth data available on all topics and geographic areas
Geographic comparison tables	Compare other types of geographic areas in addition to states (e.g., counties or congressional districts) for key variables
Thematic maps	Interactive, online maps that can be used to display the same estimates available in the geographic comparison tables
Summary files	Provide access to the detailed tables through a series of comma-delimited text files on the Census Bureau's FTP site
Public Use Microdata Sample files	Untabulated, anonymized records that contain information collected about individual people and housing units, as well as residents of GQs

SOURCE: Based on U.S. Census Bureau Data Product Descriptions. Available: http://www.census.gov/acs/www/data_documentation/product_descriptions/.

are produced only for a subset of the geographic summary levels in the 5-year release.

Selected data tables report a breakdown of the total population into those living in households (often accompanied by additional characteristics) and those living in group quarters (with limited detail). Box 3-1 summarizes the data products that highlight group quarters in the 1- and 3-year releases, and Box 3-2 summarizes the data products that highlight group quarters in the 5-year release.

To illustrate the available tables that include information on the GQ population, Appendix D contains the tables published for the state of Virginia based on the 2005-2009 ACS. Appendix E contains the tables published for the Virginia county of Goochland, which had a population of 16,863 based on the 2000 census. The example of Goochland and the impact of the GQ population on the quality of the estimates in this county are discussed further in later chapters.

BOX 3-1
ACS Tables That Highlight Group Quarters in the 1- and 3-Year Data Releases

Base Tables

B26001: total GQ population.

–Selected base tables with a single data line for the GQ population (e.g., B09016, household type by relationship).

Subject Tables

S2601A: characteristics of the GQ population (total population, total GQ population, institutional population, noninstitutional population) at the national, regional, and census division levels.

S2601B: characteristics of the GQ population by GQ type (total population, total GQ population, adult correctional facilities, nursing facilities, college/university housing) at the national level.

S2601C: characteristics of the GQ population in the United States (total population, total GQ population) for states that meet a population threshold.

SOURCE: Stern (2010).

BOX 3-2
ACS Tables That Highlight Group Quarters in the 5-Year Data Releases

Base Tables

B26001: total GQ population for all geographic areas.

–Selected base tables with a single data line for the GQ population (e.g., B09016, household type by relationship).

Subject Tables

S2601A: characteristics of the GQ population (total population, total GQ population, institutional population, noninstitutional population) at the national, regional, census division, and state levels.

S2601B: characteristics of the GQ population by GQ type (total population, total GQ population, adult correctional facilities, nursing facilities, college/university housing) at the national level.

SOURCE: Stern (2010).

For now, suffice it to say that relatively little information is released about the GQ population, even based on 5 years of cumulated data. For geographic entities below the state level, no characteristics data or population counts by GQ type are available. In connection with this, it is important to note that the data user workshop and the research conducted by the panel's consultants took place in the second half of 2010, before the first data release based on 5 years of ACS data. Although information about the Census Bureau's plans for the 5-year data products had been available prior to the release date, there was some confusion among data users about the level of detail that was going to be available for the GQ populations. Specifically, many users were not aware of the fact that the release of GQ data below the state level would be limited to counts.

DATA USES AND DATA NEEDS

The input from ACS users revealed that although some never use the GQ data (often excluding this population from the population totals before conducting analyses), most perform research that requires information about the characteristics of the total population, which by definition includes both households and group quarters. The allocation of federal program funds is often based on formulas that require information about the total population.

A recent study found that in fiscal year 2008, ACS data or data derived from the ACS were used by 184 federal domestic assistance programs to guide the geographic distribution of $416 billion in funds, representing 29 percent of all federal assistance (Reamer, 2010). Some of the data sets that are derived from the ACS include the Small Area Income and Poverty Estimates, area median income, and fair market rents. The ACS data on international migration feed into the Census Bureau's Population Estimates Program (PEP), and the journey-to-work data are used by the Bureau of Economic Analysis to determine per capita income and by the Office of Management and Budget to determine statistical area boundaries (Reamer, 2010). The Reamer study's summary of the main uses of the ACS is shown in Box 3-3.

The panel's consultants reviewed the federal programs discussed in the Reamer study to identify the programs that use ACS total population estimates in their allocation formulas (as opposed to data limited to the household population only). They found that 133 of the 184 federal programs discussed in the Reamer report use total population estimates from the ACS or based on the ACS in their allocation formulas or to establish eligibility for the distribution of $342 billion in funding.

Appendix F shows the 10 largest federal assistance programs that use estimates that are at least partially based on data from the ACS, along with brief descriptions of the allocation formulas. Although none of these programs requires estimates specific to the population living in group quarters, most are based on estimates of the total population, which by definition includes both

BOX 3-3
Uses of the ACS Data

Public Policy

- ACS data guide the equitable flow of hundreds of billions of dollars in federal domestic assistance across the nation.
- ACS data provide key benchmarks for federal enforcement of civil rights and antidiscrimination laws and court decisions.
- Federal agencies use ACS data to inform the design, implementation, and evaluation of programs and policies in every government realm, such as education, health, housing, transportation, small business development, human services, and environmental protection.
- State and local governments rely on ACS data to make on-the-ground investment decisions across all policy domains.

Economy

- Businesses of all types and sizes use ACS data to identify markets; select business locations; make investment decisions in plant, equipment, and new product development; determine goods and services to be offered; and assess labor markets.
- Nonprofit organizations, such as hospitals and community service organizations, rely on ACS data to better understand and serve the needs of their constituencies.
- ACS data are essential to efforts by state and local governments, chambers of commerce, and public-private partnerships to promote business attraction, expansions, and startups that lead to job creation and a larger tax base.

SOURCE: Reamer (2010).

households and group quarters. The most frequently used ACS-based data in the formulas include commuting data in the per capita income estimates to define metropolitan and nonmetropolitan status, migration estimates in the population estimates, demographic characteristics, and social characteristics, such as ability to speak English and disability status.

Most federal funding is distributed at the state level and then further allocated to substate areas by the states themselves. However, some assistance programs send funding directly to substate areas. Appendix G shows the 10 largest programs that involve funds distributed at the substate level. The data used by these programs include total population estimates, commuting data to define metropolitan areas, and income data.

ACS data are also widely used by state and local organizations, including government organizations. At the subnational level, there is also often a need for a better understanding of the GQ population beyond their role as an

integral part of the total population. Information about the GQ population is often necessary for an accurate picture of small governmental jurisdictions, whether this population is ultimately removed from the universe of interest for the analysis or kept in as part of the total population. Without the group quarters population, the ACS estimates would not reflect local characteristics accurately—data quality concerns about estimates that *do* include group quarters notwithstanding—and this was evident in the numbers released for some geographic areas based on the first year of the ACS (2005) that did not include group quarters. Although group quarters are now included in the ACS, researchers said that they do not trust these data for small areas because the margins of error are so large or because known GQ facilities are omitted entirely from estimates for small areas of interest.

The data user workshop and the research conducted by the panel's consultants revealed that at the state and local levels, some of the most frequent uses of the ACS data representing the total population include policy making, program development and administration, and research. Again, some data users are interested primarily in information about the total population for an area, and they are concerned about the effects of group quarters on the total population characteristics in particular. Many would be satisfied with estimates of the size of the GQ population that are accurate and reliable in small areas, especially if the numbers were available by GQ type, because this would provide clues as to how the presence of different GQ types may affect the total population estimates.

Others, particularly those interested in the population characteristics of smaller jurisdictions, would like to have characteristics data by GQ type, because information about characteristics often loses its meaning when data from different GQ types are combined. GQ types that tend to be large and represent a relatively large proportion of the population in small communities, such as correctional facilities, nursing and other institutional facilities, and student housing, are especially important to many data users. Student housing tends to be of particular interest to data users at the local and county levels. The correct assessment of the student population is of concern because students often divide their residence between their college community (whether they reside in dormitories or off-campus housing) and their parents' home.[1] Due to the nature of the year-round data collection and the residence rules in the ACS, this can lead to some degree of double counting of students.

Living arrangements for the elderly are of particular interest to researchers in various disciplines, because they are likely to become increasingly more

[1]An estimate is that among full-time enrollees of 4-year universities, about 40 percent live in on-campus housing, 42 percent in off-campus housing, and 18 percent with their parents. For 2-year colleges, only about 3 percent are estimated to live in on-campus facilities (National Research Council, 2006).

important as the U.S. population ages and people live longer. The Census Bureau's major GQ categories sometimes do not reflect the range of changes in living situations for this population. Some data users reported that they used various administrative data that provide information on the characteristics of residents in some GQ types; however, these data are usually limited to basic demographic characteristics.

Users who are interested in one or more GQ types would like additional details or better measures beyond what the ACS is currently able to provide. For example, migration is a recurring topic of interest, which data users thought should be captured more accurately. Another example of a specific need for better measurement is related to workers' group living quarters, which are within the scope of the ACS but are often missed because of their geographic remoteness and unusual nature, particularly in the case of farm worker housing.

Some of the discussions with data users centered around the difference between institutional and noninstitutional group quarters. Noninstitutional group quarters, such as college dormitories and military quarters, are of particular interest to many data users because they tend to be large, and they are comparable to the household population in the context of many applications of the data. Other data users were more concerned about the representation of smaller group quarters that change status frequently or resemble households so much that they are especially easy to miss as part of the GQ data collection. Data users tend to also have less confidence in the accuracy of the sampling frame in the case of these types of group quarters. Based on these considerations, some data users argued that including noninstitutional group quarters in the ACS should be a priority. However, others would prefer to see more emphasis placed on institutional group quarters, such as correctional facilities and nursing homes, precisely because they differ more from the general population, and excluding them from the total population is likely to affect the population characteristics more significantly.

Although many national surveys collect data on the civilian, noninstitutional population, they generally do not have sample sizes large enough for state-level, let alone for substate-level, analysis. Sources of information about specific GQ types include the periodic censuses of prisons and jails conducted by the Bureau of Justice Statistics, periodic surveys of nursing homes by the National Center for Health Statistics, and information collected by the National Center for Education Statistics on enrollment in colleges and universities. However, these are not potential substitutes for the ACS data, either, because they generally do not provide the same geographic detail as the ACS aims to do (acknowledging that the ACS in its current form does not provide characteristics information about the GQ population below the state level, either).

In some cases, states have extensive information about the populations in group quarters, which prompted a discussion about placing more of the burden of collecting data of particular interest for states at the local level. However, this

would represent a prohibitively high expense, without a clear source of funding, for many states. In addition, the lack of a centralized approach to the data collection would also mean that the data would be less consistent across states and therefore potentially less useful to many users. The Census Bureau would also find it more difficult to resume the collection of GQ data after a period of hiatus should funds for a larger sample become available in the future.

Data users indicated that GQ data from the ACS would be particularly useful in informing a variety of local planning decisions if they were available and reliable for small areas. Those who participated in the workshop organized by the panel also discussed data quality issues and were asked to consider the fact that, with the current sample size and design, the ACS is unable to produce detailed, high-quality characteristics data about the GQ population, particularly for small geographic areas. Although not all users were aware of the extent of the data quality and reporting limitations (discussed further in subsequent sections), they understood that compromises would have to be made in order to maintain the GQ data as part of the total population data. Some participants indicated that they were open to statistical solutions, such as modeling the data to provide information about group quarters not in the sample. One specific suggestion was to focus on obtaining accurate counts at the facility level and model the characteristics data for small areas, based on information collected at higher levels of aggregation (i.e., at the state level).

Especially as regards the GQ population, it is clear that the ACS cannot satisfy all the wishes described by data users who provided input to the panel. It is also important to note that, because of the short history of the ACS as well as the range and complexity of other census products, there was some confusion in the data user community about what data are available from the ACS and what products are based on the decennial census or the estimates produced by the PEP. This should become less of a problem as data users become familiar with the first 5-year release from the ACS, but at this stage it is apparent that many data users overestimate the reliability and detail of the ACS GQ data and hence their projected use of them.

CONCLUSIONS ON AMERICAN COMMUNITY SURVEY DATA USES AND DATA NEEDS

Discussions about the GQ population with data users revealed a lack of knowledge—even among experienced users—about what data products would be available for group quarters based on the ACS. The confusion was due not only to the timing of the first 5-year data product release but also to several other factors: (1) the decennial census produces detailed demographic characteristics of GQ residents by GQ type; (2) at higher levels of geography, the ACS is also able to produce detailed data for some groups quarters types (e.g., correctional facilities); and (3) some data users are able to access local admin-

istrative data on selected GQ facilities (e.g., nursing homes) through licensing systems. Once an understanding of the limitations associated with the GQ data develops among data users, concerns immediately follow about the potential effects on estimates of the total population characteristics in small areas—and the large impact of what was originally perceived by many to be a problem limited to a small population becomes apparent.

Given the limitations of the GQ data that can be published based on the ACS in its current form, the panel carefully considered whether continuing to collect GQ data as part of the ACS is necessary and justified. The review of data uses by the panel's consultants and discussions with members of the data user community was by no means a comprehensive or systematic evaluation of all uses or potential uses of the GQ data from the ACS. However, a clear priority emerged from these efforts, which helped inform the panel's recommendations throughout the report. Specifically, there is little doubt about the importance of incorporating the GQ population into the total population estimates for small areas. There are many data users whose primary interests are in one or more specific GQ types, and they would benefit from more data about the GQ population. However, given the very limited information that can be made available to data users about GQ residents because of the small sample sizes, a more realistic goal that addresses the most pressing need is to ensure that the GQ data are integrated into the estimates of the characteristics of the total population without adversely affecting those estimates, particularly in small areas.

Given that other large-scale national surveys sponsored by the federal government typically limit their study population to housing units and exclude group quarters, the panel initially considered whether it would be possible to envision a similar approach for the ACS. However, it became clear that the ACS fulfills a unique role and meets important needs that no other data collection does in the federal statistical system. The panel thinks that the spirit of the ACS as a program that aims to provide information about the U.S. population—not only those who reside in housing units—for all geographic areas deserves to be preserved. However, improvements to the survey's design are essential to accomplish the goals set forth for the ACS.

> **Recommendation 3-1:** Data on the characteristics of the total population fulfill an important need, particularly for small geographic areas. The Census Bureau should identify ways of improving the group quarters estimates from the American Community Survey as input to estimates of total population characteristics for small geographic areas.

The reality for the foreseeable future will be that data collection from GQ populations is more resource intensive than data collection from household populations. In subsequent sections of the report, the panel discusses strategies that could improve the quality of GQ estimates from the ACS for

small geographic areas. Some of the most cost-effective solutions are likely to involve such alternatives as modeling or imputing some of the GQ data.

The panel's expectation is that the Census Bureau will be able to improve the GQ estimates and the estimates of the total characteristics that combine the GQ and household populations for small areas. However, if the Census Bureau finds that the American Community Survey cannot satisfy these basic data user needs at an acceptable cost, then the goals of the survey should be reconsidered. Possible solutions could involve dropping some or all GQ types from the ACS and providing users with substitute information, such as from administrative records or from censuses or surveys of GQ types that are periodically fielded by other statistical agencies.

The use of administrative records could be a particularly promising avenue to explore because group quarters have a generally unexploited advantage. By definition, they are "owned or managed by an entity or organization providing housing and/or services for the residents," meaning that, in nearly every case, systematic records exist about the residents. An evaluation of the 2000 census enumeration of group quarters noted that more GQ questionnaires were completed by relying on administrative records than by any other method, and that administrative data were used particularly frequently in correctional institutions, nursing homes, hospitals, and group homes (U.S. Census Bureau, 2003). The analyses are not yet in, but one can anticipate that this situation continued, and possibly became even more widespread, in the 2010 census enumeration. Some of the GQ questionnaires in the ACS are also completed on the basis of administrative records rather than interviews, but the GQ data collection is still conceptualized as interviews with GQ residents.

An evaluation of the quality and scope of administrative records available from different types of GQ facilities could enable the Census Bureau to make greater use of administrative records for ACS data collection for portions of these populations. Indeed, it may be possible to reconceptualize the ACS as primarily a household survey with GQ data contributed largely from administrative records. Other sources could also be considered for the GQ data, including the periodic censuses of prisons and jails conducted by the Census Bureau for the Bureau of Justice Statistics.

One concern about the use of administrative records for ACS GQ data is that the administrative records typically do not contain data for the full range of attributes obtained from the ACS questionnaire. As an alternative to the concept described above, the ACS could be reenvisioned as a source of data on the characteristics of the noninstitutional population, supplemented with counts of the institutional population, which could be obtained from administrative records relatively consistently. This would be similar to the approach used by Statistics Canada, which relies primarily on administrative records to collect data about many institutional facilities (also known as collective dwellings in Canada) as part of its census of the population.

4

Sampling Frame Development and Maintenance

THE MASTER ADDRESS FILE

The sampling frame for the American Community Survey (ACS) is based on the Master Address File (MAF), which is the Census Bureau's inventory of known housing units, group quarters (GQ), transitory locations, and selected nonresidential units in the United States, along with associated information, such as address, location, and additional attributes. The Census Bureau developed the MAF in preparation for the 2000 census, with the intention of keeping it continuously updated during the years between censuses.

The quality of the list is perhaps the single most important aspect of any list-based data collection approach, because it serves as the foundation on which all other elements of the survey depend, from sample selection to the development of controls used to produce the final estimates. In the case of the ACS, maintaining an up-to-date inventory of GQ facilities has proven to be a major challenge.

Over the past decade, the primary sources of MAF updates have been regular "refreshes" from the U.S. Postal Service Delivery Sequence File, which is the Postal Service's inventory of mail delivery points. The Demographic Area Address Listing Files, a system that coordinates various operations related to the review and automated update of the geographic content of the database, is another main source of updates. Some updates are generated by clerical operations, such as the Master Address File Geocoding Office Resolutions, and some by field observations, such as the Community Address Updating System in primarily rural areas.

The Census Bureau's current Geographic Support System initiative focuses on improving address coverage to facilitate a transition from a complete to a targeted address canvassing operation in preparation for the 2020 census. As part of this initiative, the Census Bureau established an Address Coverage and Sources Working Group that focuses on three priority areas: (1) reviewing the current MAF update processes and recommending areas for improvement; (2) recommending methods and requirements for maintaining GQ addresses in the MAF; and (3) working closely with the Partnerships Working Group to recommend methods to improve MAF coverage using nontraditional address sources, such as partner-supplied or commercial address data (U.S. Census Bureau, 2011f).

The fact that GQ addresses will receive special attention as part of the Geographic Support System initiative is a promising development because, to date, procedures developed to maintain the MAF have been focused almost exclusively on keeping the inventory of housing units current. Strategies for updating the inventory of GQ facilities are less comprehensive, and the sources used for updates related to them are less than adequate. As a result, the relatively poor quality of GQ records is one of the shortcomings of the MAF.

SAMPLING FRAME DEVELOPMENT FOR THE AMERICAN COMMUNITY SURVEY

The ACS Office receives the MAF data used to develop a sampling frame for the American Community Survey in the form of data extracts based on ACS-specific filtering rules developed to minimize both undercoverage and overcoverage in the survey. The filtering rules specify what types of addresses should be included in the extracts, which are delivered to the ACS Office twice a year. The main sampling operation occurs around August and September of the year preceding the sample year, and the MAF extract delivered for this is based on the records available as of July of that year. A second extract is drawn for the January and February supplemental sampling operation, and this is designed to update the sample with addresses that have been added to the MAF since the main extract was drawn.

The GQ sample is selected during the main sampling operation, occurring during the year preceding the sample year. Because the updating of the GQ addresses between censuses is operationally difficult and lags behind procedures for updating housing unit addresses, the inventory of group quarters in the MAF extract contains information primarily from the most recent census, including the identification of group quarters closed on Census Day, which is checked again during the ACS fieldwork.

The ACS Office creates its own sampling frame for the GQ population. The initial GQ sampling frame consisted only of the GQs that were listed in the MAF extracts. The current procedure used to create the next year's sam-

pling frame is to take the current year's sampling frame and apply updates from several different sources. Updates include the most recent MAF extracts. The Federal Bureau of Prisons provides a yearly listing to the ACS Office of all federally regulated prisons and detention centers. The ACS Office also uses its own Internet queries to update a variety of group quarters, such as state prisons and migrant worker camps. As feasible, it also relies on military liaisons to update the list of military GQ facilities.

Information about the group quarters selected into the sample is further updated with data obtained from field representatives, who complete a Group Quarters Facility Questionnaire during their initial visit to a facility. Problems encountered during field visits are researched by headquarters staff, and this research often provides new information about the status or location of a facility. The updates resulting from the fieldwork are used to update the ACS GQ universe for future samples.

Overall, the number of cases that are added to the GQ sampling frame, after the MAF extract is produced, is relatively small, but this can vary from year to year. For example, in 2007 there were 3,060 cases added to the sampling frame, approximately half of which were based on a file that provided updates on migrant worker camps (Hefter, 2010). In 2008, the number of updates was 339 (Hefter, 2010).

OPPORTUNITIES FOR INCREASED COLLABORATION TO IMPROVE THE GQ INVENTORY

The accuracy of the MAF and the sampling frame is a crucial element in the accuracy of the American Community Survey estimates; however, despite a variety of updating operations, the current procedures are still inadequate in terms of maintaining the sampling frame for the GQ population. Given that the MAF relies heavily on the decennial census, the problem is cyclical to some extent. The inventory of group quarters is most accurate following the decennial census and becomes less representative of reality later in the decade.

A major reason for the inefficiency in the address update operations seems to be the inadequate collaboration among the Census Bureau divisions to integrate address updates and corrections resulting from work related to individual programs carried out by the bureau. Although the MAF was envisioned as a resource not only for the decennial censuses but also for the Census Bureau's other major survey programs, to date, the integration of the MAF with programs beyond the census has been limited, despite the obvious potential benefits of integration. As a consequence, the ACS Office essentially has to maintain its own GQ sampling frame for the American Community Survey in an effort to make up for deficiencies in the MAF. Information flowing in the opposite direction—from the ACS to the MAF—is minimal at present, although plans are under way to develop mechanisms for updating the MAF based on some

of the updates performed by the ACS Office as part of its efforts to maintain the ACS GQ sampling frame.

As described, the Census Bureau has been working on researching and establishing procedures that will allow for more thorough, continuous updating of the MAF and TIGER (Topologically Integrated Geographic Encoding and Referencing), which is the Census Bureau's digital system that automates mapping and related geographic activities. This is the right time to consider a more integrated, agency-wide approach toward the MAF as a complete inventory of living quarters, both housing units and group quarters. Due to the large number and complexity of updating operations that have been developed over the years for the census, the ACS, the Census Bureau's Population Estimates Program (PEP), and other Census Bureau surveys, it may be tempting to focus on incremental improvements to further fine-tune the existing procedures. However, given the central role played by the MAF in so many of the Census Bureau's programs, it is imperative to conduct a top-to-bottom assessment of the MAF and articulate a vision that integrates the work of different Census Bureau divisions that have an interest in and benefit from the MAF.

Coordination and integration are especially important in the case of the GQ population because the resources available for updating and maintaining GQ addresses are more limited than the resources available for housing units. The status of at least some types of group quarters that tend to change frequently (for example, small group homes) can also be particularly difficult to track, which is another argument for greater coordination of efforts among the Census Bureau divisions.

Some units within the Census Bureau have long-standing partnerships with states and localities and rely on these for local information. However, these partnerships are often established on the basis of the needs of a specific program, without maximizing coordination with other Census Bureau units that may have similar needs. For example, the Federal-State Cooperative Program for Population Estimates involves states in assisting the PEP to produce subnational population estimates. The State Data Center Program is another partnership between the Census Bureau and the states, which facilitates the dissemination of data and other assistance to meet local needs. Many state partners currently provide information related to group quarters to the Census Bureau. Although this remains rather ad hoc, and while the information is often provided in a variety of nonuniform formats, the program has the potential for doing more to meet ACS needs if efforts were better coordinated and incentivized across the different Census Bureau units.

Working more closely with a large number of states and localities will present challenges. Establishing formal agreements with the approximately 39,000 functioning local governments, or even a subset of them, would be a major undertaking. Data availability varies greatly across local sources, and processing and standardizing these data may involve substantial resources. A perhaps more

practical alternative to consider would be heavier reliance on state demographic offices that maintain their own inventory of group quarters, some using them to generate their own estimates for state and local geographic areas. These offices could supply lists of facilities or estimates of the GQ populations as part of a formal program. These types of agreements may be particularly useful in large urban areas, where there are more GQ facilities with complex living arrangements (Goldenkoff, 2010).

ACS efforts to collect detailed information from GQ populations are not unique in the federal statistical system. Several national surveys, including the Current Population Survey (CPS) conducted by the Census Bureau for the Bureau of Labor Statistics, include residents of at least some noninstitutional group quarters in the sample, although it is important to note that the residence rules used by such surveys as the CPS often differ from the ACS residence rules.

Targeted surveys of specific GQ types exist as well. The National Center for Health Statistics (NCHS) conducts several surveys of some types of GQ facilities and their residents. Although resident-level data are collected and available from these surveys, NCHS typically collects resident data from facility managers and staff, rather than by directly interviewing residents. The National Survey of Residential Care Facilities is a new survey conducted for the first time in 2010 by NCHS. The survey collected data on 8,094 persons residing in 2,302 residential care facilities. NCHS developed the sampling frame for this survey by relying on lists of licensed residential care facilities. Every few years, NCHS also conducts a survey of nursing home residents. The most recent (2004) National Nursing Home Survey collected data on 1,174 facilities and 13,670 residents. The sampling frame for this survey was developed based on a service provider file from the Centers for Medicare & Medicaid Services and state licensing lists compiled by a private organization. Another NCHS survey, the National Home and Hospice Care Survey, involves home health and hospice care agencies. The last survey, conducted in 2007, included 1,036 facilities and 9,416 patients and hospice discharges. The sampling frame was developed based on service provider information from the Centers for Medicare & Medicaid Services, state licensing lists, and the National Hospice and Palliative Care Organization file of hospices.

The Bureau of Justice Statistics (BJS) regularly sponsors administrative censuses of correctional facilities of various types and administers surveys to their occupants, and the Office of Juvenile Justice and Delinquency Prevention does the same for facilities for juveniles. For example, the Census of Jails and the Census of Jail Inmates, conducted every 5 years, are focused on locally administered facilities and their residents. The Census of State and Federal Adult Correctional Facilities is conducted every 5 to 7 years, and so are the Survey of Inmates in Federal Correctional Facilities and a Survey of Inmates in State Correctional Facilities. The Annual Survey of Jails collects data from a nationally representative sample of jails and inmates. The sample development

and data collection for many of the BJS surveys are performed by the Census Bureau. BJS also has an administrative records program, which involves working with states to collect individual-level records of a cross-section of those in prisons, as well as prisoners admitted to and leaving prison. Although currently not all states are participating, BJS is working on expanding this program.

Other data collections involving group quarters include the National Center for Education Statistics surveys of students, including residents of college dorms, and regular surveys of military personnel conducted by the Defense Manpower Data Center in the U.S. Department of Defense. The data collected by these agencies, and possibly others, ought to complement the Census Bureau's efforts to maintain and update the sampling frames for certain types of group quarters, especially given that the Census Bureau often serves as the data collection contractor for other agencies sponsoring studies of these populations. Closer collaboration with the Census Bureau would also be beneficial to other agencies that have to invest significant resources in maintaining the sampling frames for their surveys.

Given that many group quarters operate as licensed establishments, often with a maximum number of beds approved, increased collaboration with the Census Bureau's economic statistics directorate and the possible use of the North American Industry Classification System (which classifies business establishments) could be another avenue for improving the GQ inventory. The panel is aware that efforts to explore these opportunities by the Census Bureau are already under way.

Recommendation 4-1: The Census Bureau should give high priority to developing a detailed and systematic operational plan, with clear timelines and evaluation benchmarks, for a group quarters (GQ) address updating system. This should include a plan for greater information sharing and more efficient information flow between different Census Bureau divisions and programs to improve the inventory of group quarters in the Master Address File (MAF). The updating process for the MAF should include not only the additional information that is acquired by the American Community Survey Office on some types of group quarters but also information that is potentially available from other sources, including:

1. the Census Bureau's Population Estimates Program (PEP), which obtains updated information on group quarters from state demographic offices, with varied success—PEP staff should follow up with every state to obtain information on changes to their GQ inventories, and the Census Bureau should develop procedures to ensure that the information is incorporated into the MAF updating process;
2. Census Bureau divisions that develop frames for sampling particular GQ types for other federal agencies; and

3. other federal agencies that may have information on particular types of group quarters.

SCOPE OF COVERAGE

Because of the difficulties associated with maintaining the sampling frame, the GQ sample contains a relatively high percentage of ineligible cases, which are identified only during the facility-level data collection phase. This includes cases that are determined to be housing units instead of group quarters and group quarters that no longer exist—for example, because the facility has been closed. As discussed, for a variety of reasons the ACS also classifies some GQ types (for example, domestic violence shelters, soup kitchens, regularly scheduled mobile food vans, targeted nonsheltered outdoor locations, crews of commercial maritime vessels, natural disaster shelters, and dangerous encampments) as permanently out of scope and excludes them from the sampling universe.

An additional challenge is introduced by a combination of the data collection methodology and the seasonal nature of some group quarters. Examples are college dormitories or military facilities, which are valid GQs but may have no residents during some of the data collection months in which they are included in the sample. As discussed later, most sampled GQ facilities are randomly assigned to an interview month throughout the course of the year, and some facilities—especially large ones—may be in the sample during more than one month.

Table 4-1 summarizes the distribution of the main GQ-level outcome codes for those included in the 2008 ACS sample based on an internal evaluation of the sampling frame conducted by the Census Bureau (Williams, 2010). A facility case is considered completed at the GQ level if a field representative collects basic information and a resident roster from the facility. Once the names of the residents are collected, the actual respondents can be sampled and approached for an interview.

Although inability to locate a sampled facility or refusal to participate do not seem to represent serious problems for the ACS GQ operation, eligible facilities that are unoccupied at the time of the survey and ineligible cases make up close to one-quarter of the sample. Tables 4-2 and 4-3, also based on the Census Bureau's internal research, show that the rates of cases that fall into one of these two categories differ considerably by GQ type and size. The Census Bureau stratifies facilities by size: the small stratum includes group quarters with 15 or fewer residents, as shown on the frame, and the large stratum includes those with more than 15 residents, as shown on the frame.

Table 4-2 shows that the GQ types with the highest rates of noninterviews (resulting from the facility being unoccupied at the time of the survey) are college housing, military facilities, "other institutional facilities," homeless shel-

TABLE 4-1 Distribution of GQ-Level Outcomes for Facilities Sampled in 2008

GQ-Level Outcomes	Number in Sample	Percentage (unweighted)
Completed	13,610	76.4
Refusals, unable to locate, and other nonresponse	37	0.1
Eligible but unoccupied at the time of survey	1,694	9.5
Ineligible	2,482	13.9
No longer exists	*928*	*5.2*
Converted to housing unit	*1,049*	*5.9*
Domestic violence shelter	*17*	*0.1*
Other out of scope	*488*	*2.7*

SOURCE: Williams (2010).

ters, and "other noninstitutional facilities." In the case of college dorms, one out of four of the large dorms sampled is not interviewed because the facility is unoccupied at the time of the survey. Table 4-3 illustrates that the sample includes many ineligible cases as well, especially among small group quarters. For example, approximately half of the small military facilities, homeless shelters, and nursing homes are found to be ineligible.

As discussed in Chapter 2, small and large group quarters are not sampled in the same way, which indicates that it is worthwhile to continue research on whether a cutpoint other than 15 or fewer for the expected number of residents would be more efficient for defining small facilities. A model relating an indicator of being in scope to the measure of size might be helpful in this regard.

The relatively high rates of ineligible and eligible but unoccupied cases raise concerns about overcoverage, in addition to the previously discussed undercoverage issues, such as those resulting from deficiencies in updating the GQ inventory. The Census Bureau uses population estimates obtained from the PEP (which we refer to as control totals throughout the report) as auxiliary estimates to adjust the ACS sample estimates. However, similar to the MAF, the population estimates are also less accurate for group quarters than for housing units, because the PEP procedures for group quarters are less thorough than those developed for housing units. The PEP controls tend to be more accurate immediately following a decennial census, and they experience a decline in quality toward the end of the decade.[1] As a result, the controls based on the PEP estimates are not always able to compensate for the problems discussed above and may in fact lead to biased estimates.

The significant effort spent in the field pursuing GQ facilities that do not lead to interviews warrants a closer look from a cost-benefit perspective. For

[1]For more information on how the 2010 PEP estimates compare with the census 2010 estimates for the total population, see http://www.census.gov/newsroom/releases/pdf/acs_2010_population_controls.pdf.

TABLE 4-2 Distribution of Eligible but Unoccupied Rates by GQ Size for Facilities Sampled in 2008

GQ Type	Number in Sample	Percentage of Sample	Number of Sample Cases		Percentage of Cases Unoccupied but Eligible	
			Large (>15)	Small (≤15)	Large (>15)	Small (≤15)
Correctional facilities for adults	3,482	19.4	3,373	109	1.1	5.5
Juvenile facilities	330	1.8	241	89	7.5	6.7
Nursing facilities/skilled nursing facilities	4,256	23.8	4,075	181	0.5	1.7
Other institutional facilities	474	2.6	348	126	9.5	22.2
College/university student housing	4,872	27.2	4,672	200	25.2	17.0
Military group quarters	790	4.4	697	93	16.9	15.1
Emergency and transitional shelters	557	3.1	390	167	4.1	13.8
Group homes intended for adults	2,279	12.7	955	1,324	1.9	2.6
Other noninstitutional facilities	872	4.9	356	516	14.3	11.8
Total	17,912	100.0	15,107	2,805	9.8	7.5

SOURCE: Based on tabulations provided by the Census Bureau, August 11, 2010.

TABLE 4-3 Distribution of Ineligible Rates by GQ Size for Facilities Sampled in 2008

GQ Type	Number in Sample	Percentage of Sample	Number of Sample Cases		Percentage of Cases Ineligible	
			Large (>15)	Small (≤15)	Large (>15)	Small (≤15)
Correctional facilities for adults	3,482	19.4	3,373	109	2.8	13.8
Juvenile facilities	330	1.8	241	89	14.5	22.5
Nursing facilities/skilled nursing facilities	4,256	23.8	4,075	181	10.3	48.6
Other institutional facilities	474	2.6	348	126	20.1	28.6
College/university student housing	4,872	27.2	4,672	200	5.1	30.5
Military group quarters	790	4.4	697	93	16.5	55.9
Emergency and transitional shelters	557	3.1	390	167	28.2	52.1
Group homes intended for adults	2,279	12.7	955	1,324	34.3	35.3
Other noninstitutional facilities	872	4.9	356	516	20.5	39.1
Total	17,912	100.0	15,107	2,805	8.3	36.6

SOURCE: Based on tabulations provided by the Census Bureau, August 11, 2010.

some GQ types, procedures may exist that could be implemented to improve the frame before sampling, or at least before cases are assigned to field representatives. This should be evaluated in the context of the relative costs of the additional research that would have to be conducted in-house compared with the costs associated with closing out the cases in the field. It is also important to consider how the two methods compare in terms of the quality of the information available to make a determination about a facility's status—in other words, whether one method or the other is less prone to error.

In some cases there is a significant lag between the time when information is received by the Census Bureau that can be used to update the MAF and the time the sample is generated (not to mention the time when the fieldwork is carried out). To reduce the percentages of group quarters that no longer exist or have been converted to housing units in the sample, this lag time should be examined to identify possible opportunities for increased efficiency.

One GQ facility type with relatively high rates of no residents is military facilities. When address updates are received by the Census Bureau, the challenge often becomes matching information from the different sources and identifying potential duplicates. More information about the quality of the updates received from such sources as the Defense Manpower Data Center in the U.S. Department of Defense is needed to assess whether replacing outdated lists of military facilities with updates from these sources, without spending additional resources on matching and reconciliation, may be justified. Naturally, increased reliance on alternative sources for updates would require that the updates are performed with adequate frequency.

Recommendation 4-2: The Census Bureau should evaluate, by comparison with the 2010 census and other data sources, the reasons for the relatively high rates of ineligible and eligible but unoccupied group quarters (GQ) facilities in the American Community Survey sample and determine whether there are practical ways to reduce these rates for all or some GQ types. The evaluation should take into account the costs associated with determining that a facility is ineligible or unoccupied and how these costs would change if, for some GQ types, additional in-house research is performed before a case is sent to the field.

SAMPLE REDESIGN OPTIONS

The label "group quarters" encompasses a wide variety of populations, ranging from inmates in maximum security prisons to people in small group homes in residential settings. In some sense, the main characteristic that GQ populations have in common is that they are not part of households (although some GQ facilities are more comparable to households than others). From a survey design perspective, the fact that group quarters are not households

makes all aspects of the data collection involving these special populations more resource intensive. Practical considerations—ranging from the updating of the sampling frame to interviewer training—typically lead survey designers to develop different procedures for nonhouseholds, and in the case of most surveys this usually means excluding them from the population universe. The ACS includes nearly all group quarters, but the sampling and data collection procedures are separate for households and nonhouseholds, for the same practical reasons.

The processes currently in place for updating the GQ inventory are more likely to identify and remove out-of-business or out-of-scope records from the ACS sampling frame than to locate and add new records, creating the impression that the GQ population is shrinking between updates from each decennial census. Some of the additions are found to be ineligible after they are added to the sampling frame to "update" it, and sometimes the reason is that the address is in fact a housing unit.

Anecdotal evidence suggests that it is not unusual for housing units to be converted to certain types of group quarters, such as group homes for adults, and then back to housing units over relatively short periods of time. Small group quarters are disproportionately more likely to be converted to housing units by the time a field representative visits the premises than larger facilities, and some GQ types, such as homeless shelters and juvenile detention centers, are also more susceptible to this type of change (Williams, 2010). In urban areas, additional challenges are posed by complex housing arrangements, such as apartment buildings of conventional housing mixed with small group quarters—for example, for populations with special needs.

Duplication between the two samples is also a concern, particularly in the case of some GQ types. An evaluation of the 2000 census found that duplication between the GQ and housing unit samples represents a problem for the enumeration conducted as part of the decennial census as well, especially in the case of small GQs that are often similar in appearance to households (U.S. Census Bureau, 2003). Some of this problem is likely to be carried over to the ACS sampling frames.

Based on current ACS field procedures, data collection for the two samples is also carried out independently. If, for example, a GQ facility has been converted to a housing unit or if a sampled housing unit turns out to be a GQ facility, the case is closed out and deleted from the sample as "not a group quarters facility" or "not a housing unit," respectively. A recently implemented change enables field representatives assigned to the housing unit sample to administer a brief questionnaire if they encounter a GQ facility, with the goal of determining the GQ type and size (maximum number of people who can stay at the facility at a particular time). This information enables the ACS Office to improve the GQ sampling frame for the next round of data collection, which will increase the efficiency of the updating operations and should also reduce

costs. Enabling field representatives to collect information about a housing unit that was included in the GQ sample has also been considered. However, cases that are encountered in the "wrong" sample are still closed out as ineligible in both samples, without respondent-level data being collected.

A state-of-the-art MAF, which would be a truly comprehensive and up-to-date inventory of all living quarters in the United States, would allow the Census Bureau to step back and consider what a survey of the U.S. population would look like if the difficulties associated with keeping the sampling frames current were not one of the primary considerations in the sample design. If an overarching sampling frame could be developed and maintained (perhaps treating group quarters as a stratum), then residence in a GQ facility could be treated similarly to any other population characteristic. The emphasis could be placed on the real differences associated with GQ type rather than on an either/or, household/nonhousehold designation.

INTEGRATING THE SAMPLE FOR SOME GQ FACILITIES WITH THE HOUSING UNIT SAMPLE

Although a major reconceptualization of the GQ classifications may not be feasible at this time, it is still important to consider the question of whether the sampling design—which relies on two separate samples, one for housing units and one for group quarters—is equally efficient for every GQ type. As discussed, the sampling frame performs particularly poorly for some GQ types, and keeping the list current will always be more challenging for some types of group quarters, which tend to go in and out of business or change profile frequently.

The panel thinks that strictly separating the entire GQ facility sample from the housing unit sample could be reconsidered. Feedback from data users about the importance of total population data underscores the benefits of continuing to include the group quarters in the ACS. However, some GQ types, or group quarters of a certain size, might sensibly be dropped from the GQ sample, and instead the data collection for these facilities could be performed as part of the housing unit data collection. This could be accomplished without affecting the population universe or modifying the specific GQ categories that are covered by the ACS. In other words, group quarters that are currently part of the ACS could continue to be included as group quarters. This approach would require a closer integration between the two data collections, including the development of procedures to enable field representatives to collect data from GQ residents in what are believed to be housing units (beyond what is currently collected to ascertain GQ type). However, once the integration is accomplished, the problem of GQ cases being deemed out of scope—at the cost of substantial fieldwork—because they are in the wrong sample should be reduced.

Considering that the current approach to maintaining the GQ sampling frame is inadequate and improving the quality of the sampling frame for some types of group quarters is likely to be particularly challenging and resource intensive, dropping some of the GQ types from the GQ sampling frame could present a cost-effective compromise. This alternative would reduce the need to keep the inventory up to date for the GQ types that are integrated with the housing unit sample.

Research will be needed to determine which group quarters are most suitable to be moved to the housing unit sample. Some factors to consider include GQ type, typical size, the extent to which the structure of the facility resembles a residential housing unit, and the number of ineligible cases encountered in the category. Within these categories, if there are large, stable subcategories, those could be kept in the original GQ sample frame. The recent change implemented that allows field representatives working the housing unit sample to collect basic information about group quarters encountered should be especially useful as part of this research. Another possible source of data to inform this research is the Group Quarters Validation process that is part of the decennial census operations; it should provide insight into what types of living quarters are especially difficult to classify.

The goal is to identify the categories of group quarters that are most difficult to keep up to date and are most likely to turn up in the housing unit sample. Generally, small noninstitutional group quarters are most likely to fit this category. Given that the size of a GQ facility is likely to change more frequently than the type, a design based on GQ type may be most practical. Specific possibilities could include moving "other noninstitutional facilities," "other institutional facilities," and "juvenile facilities" to the household sample.

One way to approach this question is to focus on the institutional versus noninstitutional aspect of the GQ facilities and on comparability with other national household surveys, such as the Current Population Survey. This would mean moving only noninstitutional group quarters to the housing unit sample. "Other noninstitutional facilities" may be an obvious category. The CPS limits its data collection from group quarters to the noninstitutional civilian population and, as such, it excludes most military housing. Not combining "military quarters" with the household population makes sense for the purposes of the ACS as well, because military quarters are more similar to institutional group quarters in terms of the operational considerations applicable to the data collection. A third category of noninstitutional group quarters that should be considered is "college/university student housing." The CPS collects data about college students at their parents' address as part of a household interview. Because the goals of the ACS are to provide small-area information that follows decennial census concepts as much as possible, the ACS follows decennial census rules and surveys residents of student housing where the facility is located (see Box 4-1). Options could be explored for treating residents of

BOX 4-1
Residence Rules for College Students

Since 1950, the decennial census has counted college students at their college location, whether in on-campus or off-campus housing. The Census Bureau's authority to make residence rule determinations in the case of college students and institutional populations was upheld by the U.S. Supreme Court in *Borough of Bethel Park v. Stans* (1971). The American Community Survey (ACS) follows census concepts except that it delimits the census "usual residence" rule to a 2-month (or more) window of time to accord with its continuous month-by-month data collection.

The ACS 2-month residence rule means that students who reside in on-campus facilities (or off-campus housing) may or may not be counted at that location depending on what time of year the facility (or off-campus housing) falls into the sample. Also, students may be double counted, not only because of misinterpretation of the rules by respondents, but also because, say, their parents' (or other) residence falls into the sample in the summer and their college residence falls into the sample at another time during the same year, although it is important to remember that the sample of GQ residents in the ACS is small overall. According to the ACS residence rules, it is appropriate to count them at both locations. The panel's charge did not include a revisiting of the census or ACS residence rules, which were the subject of a previous panel study (see National Research Council, 2006).

student housing as single-person households. In addition, in the case of large dormitories that may be closed in the summer, the efficiency of the data collection could be increased by determining the schedule of dormitories based on information that may be available online or via phone instead of through a visit by a field representative.

Regardless of which group quarters are moved to the housing unit sample, the ACS will still be based on two sampling frames after the redesign: (1) a sampling frame of housing units and "housing-unit like" group quarters (for simplicity's sake, referred to here as the housing unit frame) and (2) a sampling frame of mostly institutional group quarters (referred to as the GQ sampling frame). The procedures for the latter can remain the same as they are now. The housing unit sample should be stratified by whether a case is expected to be a GQ facility or not based on the information on the sampling frame. This will allow for a desired sampling rate to be set for GQ facilities. The actual status of a case as a housing unit or group quarters will be determined after the data are collected, based on the information in the questionnaire (subsampling procedures would likely have to be applied on the fly while the interviews are in progress).

It is important to note that the housing unit data collection procedures are

different from the GQ data collection procedures. Sampled housing units are first mailed a questionnaire, with a request to complete it and return it by mail. If a telephone number is available, nonresponding housing units receive a telephone follow-up. Finally, a subset of those who did not respond either by mail or telephone is followed up by an in-person visit from a field representative.

The data collection procedures would have to be adjusted to more closely integrate the operations for the two samples and to accommodate the group quarters included in the housing unit sample. The changes would have to be carefully considered to ensure that they do not have an adverse effect on the outcome of the housing unit data collection. The panel acknowledges that these changes are not trivial, but we think that, once implemented, the data collection process can be seamless. Some of the specific changes required are discussed below.

First, the mail data collection procedures would have to be modified to accommodate data collection from GQ residents. One option is to slightly modify the current housing unit questionnaire and accompanying instructions to enable their use for GQ residents as well. An alternative would be to use the information on the sampling frame about whether a unit is a group quarters or a housing unit (outdated as it may be) to customize the data collection for the initial mail contact with the sample members. In other words, living quarters that are expected to be housing units will receive the current housing unit questionnaire and those that are expected to be group quarters will be mailed the GQ questionnaire. This would reduce concerns that changes to the housing unit questionnaire to accommodate a small number of group quarters could increase the burden on household respondents and adversely affect housing unit response rates. In this case, the difference from the current procedures would be that the identification of sampling frames for the strata of group quarters that are moved to the housing unit sample will be based on the MAF extracts or ACS records from the previous data collection and on a more integrated, real-time updating system as part of the ongoing ACS data collection. No additional resources would be invested into keeping the sampling frames for these categories of group quarters up to date between data collections.

The procedures for housing units and the group quarters moved to the housing unit sample could be fully integrated for the follow-up stages, regardless of the approach chosen for the mail stage of the data collection. It is expected that the mail stage nonresponse will be higher among the group quarters included in the sample than among households because of the higher questionnaire burden associated with a larger number of residents. It may also be desirable to follow up with all the group quarters instead of just a subset, as it is done with the household cases. However, GQ facilities already require more resource-intensive follow-up than housing units, and the number of cases requiring follow-up based on the revised procedures should be lower. The costs

per interview for at least a subset of the group quarters that do respond by mail will also be lower.

For the telephone and in-person follow-ups, the current housing unit and GQ data collections will ideally be more closely integrated to allow interviewers to switch between housing unit and group quarters cases, completing interviews for both. This has implications ranging from interviewer training to the functionality of the software for both computer-assisted telephone and computer-assisted personal interviewing, but an integrated operation is a worthwhile investment. An alternative would be to instruct interviewers to refer GQ facilities encountered during the follow-up to the central office for interviewing at a later time. However, this would probably mean a more cumbersome and less cost-effective process.

The sample design changes essentially mean that the status of some of the living quarters would be determined based on the data collected, as opposed to a priori, as is done now. The group quarters that end up in the housing unit sample through this method would still be represented in estimates of the total population, but the sample sizes for some of the GQ types from the housing unit sample are likely to be too small to produce reliable results for these GQ populations separately. However, this is already the case with the current method as well, and it is typically a problem for very small populations in other surveys as well. Moreover, as discussed, a small number of GQ types are already excluded from the ACS data collection for a variety of reasons, and ACS estimates are controlled to be consistent with the PEP estimates for all group quarters (U.S. Census Bureau, 2009).

To produce state-level estimates (and possibly estimates for large metropolitan areas and congressional districts), data from the group quarters interviewed as part of the housing unit sample could be combined with all of the other group quarters, and weights could be applied by GQ type using the state-level GQ population controls. The Census Bureau could publish characteristics for the total population, the noninstitutional population, and the GQ population by type.

To produce estimates below the state level, data from the group quarters interviewed as part of the housing unit sample could be combined with the household sample for weighting and tabulation purposes, with the appropriate PEP controls at the county level. Depending on which group quarters are moved to the housing unit sample, the Census Bureau could publish total population numbers for three groups—noninstitutional group quarters, institutional group quarters, and housing units—and provide characteristics for the total noninstitutional population, which will make the ACS more comparable to other major household surveys. Alternatively, characteristics could continue to be provided for the combined total GQ and household populations, as is currently done.

With the redesigned sample, the ACS could retain the goal of covering

virtually the entire U.S. population, but without having to actively maintain a sampling frame for some of the group quarters that are particularly difficult to update. The new design and the closer integration between the procedures for the two samples could improve the coverage rate for both households and group quarters, because cases that are in the wrong sample based on the information on the sampling frame will no longer have to be removed as ineligible. Once the logistical details are worked out and a few years' worth of data collection are completed, the more integrated approach should start showing real benefits that could ultimately be the key to a better inventory of all GQ types, which is also necessary for the population controls for small geographic areas.

Recommendation 4-3: To increase effective sample size by more efficiently targeting resources, the Census Bureau should consider combining the American Community Survey (ACS) sampling frame for some types of group quarters (GQ) with the housing unit sampling frame and, in tandem, modifying its data collection procedures to enable field representatives to collect data from all cases—housing unit and group quarters—in the combined sample. Additional research will be needed to determine which GQ types are best suited for integration with the housing unit sample, but the GQ types that are especially difficult to update and that are most similar to housing units may be the best candidates. These group quarters could continue to be included in the ACS GQ universe for purposes of weighting and estimation.

Recommendation 4-4: For group quarters (GQ) types that are not integrated into the housing unit sampling frame, the Census Bureau should develop improved and expanded procedures that enable more efficient, real-time use of status updates received from field representatives. An operations plan needs to be constructed that allows new GQ facilities to be added to the Master Address File and changes in the status of existing addresses to be reported. The Census Bureau should also continue to pursue the development of procedures that will allow for more efficient updating of the housing unit sample with cases that have been converted from group quarters to housing units.

5

Sample Allocation and Selection

The goal of the American Community Survey (ACS) is to provide estimates of detailed characteristics of the total population of the United States at levels of geography as small as census block groups, replacing data that were previously obtained through the census long form. The current ACS sample design is optimized to produce substate-level estimates of characteristics of the household population. However, for the group quarters (GQ) population, the design accommodates only state-level estimates of the overall GQ population. The sample design is not adequate for substate GQ estimates, and this also affects the usability of the total population estimates for smaller geographic areas.

As discussed in Chapter 2, the GQ sample consists of two strata, small and large. The small stratum includes facilities with 15 or fewer residents, as shown on the frame, and ones for which the expected number of residents is unknown because the facility was closed on Census Day or because it was recently added to the sampling frame without information about the expected population count. The large stratum includes group quarters with expected populations of more than 15 residents.

The approach to sampling the small stratum is similar to the household sampling method (U.S. Census Bureau, 2009). First, each small facility is randomly assigned to one of five subframes, and sample is selected from each subframe once every 5 years. The facilities in a state are then sorted by small versus closed on Census Day, GQ type, and geographical order, and a systematic sample is selected. In most states, the overall facility sampling rate is approximately 1 in 40, or 2.5 percent in a given year. Some of the less populated states have higher target sampling rates to boost the precision of the state-level estimates.

For example, the target sampling rate is 7.11 percent for Wyoming and 4.95 percent for Vermont (see Table 5-1). All residents of the selected small facilities are eligible to be interviewed, unless the actual number of residents exceeds 15. In such instances, a subsample of 10 residents is selected when the field representative visits the facility (a process similar to that for the large facilities).

TABLE 5-1 GQ Facility Annual Sampling Rates and Sample Sizes by State, 2009

State	Facility Sampling Rate (percentage)	Facility Sample Size
Alabama	2.50	2,688
Alaska	5.53	1,033
Arizona	2.50	3,024
Arkansas	2.50	1,861
California	2.50	20,205
Colorado	2.50	2,591
Connecticut	2.50	2,805
Delaware	4.86	1,036
District of Columbia	3.08	1,019
Florida	2.50	9,649
Georgia	2.50	5,626
Hawaii	3.24	983
Idaho	3.48	945
Illinois	2.50	7,432
Indiana	2.50	4,439
Iowa	2.50	2,468
Kansas	2.50	2,002
Kentucky	2.50	3,049
Louisiana	2.50	3,400
Maine	3.14	1,159
Maryland	2.50	3,376
Massachusetts	2.50	5,494
Michigan	2.50	6,796
Minnesota	2.50	3,591
Mississippi	2.50	2,309
Missouri	2.50	4,093
Montana	4.38	1,100
Nebraska	2.50	1,334
Nevada	3.36	1,148
New Hampshire	3.17	1,176
New Jersey	2.50	5,184
New Mexico	3.06	1,033
New York	2.50	13,948
North Carolina	2.50	6,363
North Dakota	4.59	1,103
Ohio	2.50	7,678

TABLE 5-1 Continued

State	Facility Sampling Rate (percentage)	Facility Sample Size
Oklahoma	2.50	2,687
Oregon	2.50	2,193
Pennsylvania	2.50	11,073
Rhode Island	2.75	1,095
South Carolina	2.50	3,488
South Dakota	3.91	1,128
Tennessee	2.50	3,615
Texas	2.50	13,001
Utah	2.79	1,061
Vermont	4.95	1,054
Virginia	2.50	5,853
Washington	2.50	3,287
West Virginia	2.50	1,174
Wisconsin	2.50	3,958
Wyoming	7.11	1,001
Puerto Rico	2.50	960

SOURCE: Based on tabulations provided by the Census Bureau on July 30, 2010.

The sampling units for the large facilities are clusters of GQ residents, who are selected in groups of 10. This means that a large GQ facility is indirectly sampled with probability proportional to size (PPS) measured by its number of anticipated groups of 10 residents. Larger facilities can have several groups of 10 residents represented in the sample. Specifically, groups of residents of large group quarters are sorted by GQ type and geographical order and the groups of residents are then systematically sampled at a rate of approximately 1 in 40 (again, with some exceptions). This means that only group quarters with 40 or more groups of 10 residents are guaranteed to have at least 1 group of residents represented in a particular sample. As described above, the list of residents eligible to be interviewed is determined during the field representative's visit to the facility. During the visit, an algorithm with a random start is applied to the actual roster of residents. If multiple groups of 10 are selected, the groups are assigned to be interviewed during different months (with some exceptions, in the case of GQ types in which the data collection is concentrated in a shorter period of time for logistical reasons).

When the ACS sample design was first developed, the sampling rate for group quarters was 3 percent of addresses annually, translating into 15 percent over 5 years, but budget constraints resulted in lower sampling rates over the years. This means that a careful look at the sample design is warranted to identify possible opportunities for increased efficiency.

STATE-LEVEL ALLOCATION

As discussed above, the sample size of small group quarters in a state is proportional to the number of small group quarters on the frame for that state. The sample size of large group quarter residents is proportional to the expected number of residents in large group quarters in the state.

Because the GQ sample is not currently controlled at substate geographies, substate estimates of the combined household and GQ population may be highly variable, a problem that is discussed in more detail in the next section. To address this, the sample design could be modified to better manage (control) the sample allocation rates at the substate level and over time. For 3- and 5-year estimates, the sample could be required to have a minimum number of group quarters in each county over the course of the 5-year period. Some states have a large number of small counties, a situation that represents a challenge, but this change could improve the quality of the data available for small areas.

Another approach would be to individualize the sample further, depending on the characteristics of the small jurisdictions. For example, the lack of control over the allocation rates for smaller geographies may have a large effect on the estimates produced for a community that has 1,000 persons living in households and a correctional facility with 100 residents. According to counts from the 2000 census, places that have 10 percent or more of their population residing in group quarters represent less than 5 percent of all places in the United States. These may be the cases that would need individualized attention.

Additional control over the allocation to substate areas may be facilitated by switching from a PPS design for large group quarters to one in which strata are created on the basis of size and substate area and an equal probability sample is selected within strata. This would permit the allocation to substate areas to be better controlled over time. This type of design would also simplify variance estimation, which appears to be a problem with the current design (Keathley, Navarro, and Asiala, 2010). To determine whether any efficiency would be lost by such a design, the Census Bureau could undertake a study of the effectiveness of the current PPS methods. The expected population numbers in the frame are often incorrect, which reduces the efficiency of PPS sampling. Consequently, the loss in precision from moving from PPS to stratified, equal probability sampling within strata may not be serious.

Recommendation 5-1: The Census Bureau should conduct a formal evaluation of sample redesign strategies that would make it possible to control the American Community Survey group quarters sample allocation at the substate level. The evaluation should focus on identifying options that can improve the precision of the estimates at the state and substate levels, without substantially increasing the costs of the data collection.

As discussed, there are concerns that the sampling frame is outdated for many of the GQ types, and this includes the number of expected residents in a GQ facility—information that is used in the PPS sample selection. Table 5-2 shows the differences between the observed GQ population based on the 2008 data collection and the GQ population numbers expected from information on the sampling frame, by survey month. Discussions with the Census Bureau indicated that there are variations in the quality of the sampling frame by GQ type. Seasonality could also play a role in the discrepancies in the case of some GQ types. The Census Bureau has been researching the discrepancies between the expected and actual GQ sizes, and this research should continue to better understand the causes of the discrepancies, how they differ by GQ type, and how they affect the PPS sample design.

Recommendation 5-2: The Census Bureau should monitor the accuracy of the measures of size used in the probability proportional to size group quarters (GQ) sample design in the American Community Survey and should assess the resources allocated for updating the GQ sampling frame in the context of how the measures-of-size information available from the sampling frame affects the effectiveness of the sample design.

TABLE 5-2 Differences in 2008 Expected Population and Observed Population

Month	Sum of Expected Population	Sum of Observed Population	Difference in Sum of Expected and Observed Population	Percentage Difference in Sum of Expected and Observed Population
January	287,797	270,204	17,593	6.1
February	288,046	278,728	9,318	3.2
March	270,439	252,692	17,747	6.6
April	301,963	287,009	14,954	5.0
May	294,135	265,257	28,878	10.0
June	275,424	235,003	40,421	14.7
July	298,281	248,065	50,216	16.8
August	288,238	250,172	38,066	13.2
September	438,497	266,501	171,996	39.2
October	287,672	276,236	11,436	4.0
November	279,735	264,367	15,368	5.5
December	301,329	282,236	19,093	6.0
Total	3,611,556	3,176,470	435,086	12.0

SOURCE: U.S. Census Bureau (2010).

Given that some GQ facilities can be very large relative to the size of the household population in a geographic area, capturing them in the sample with certainty may be important. In some respects, data collection from GQ facilities resembles surveys of business populations, which often include a stratum of "must-take" units in the sample. For example, statistical strategies developed for business surveys—including methods to identify units to be in the sample with certainty—may be useful to consider for the ACS.

Clearly, if small-area estimates are important, then, in principle, a sampling design more suitable to address that need would be ideal. However, a must-take approach is often justified when, for example, local experts can identify (domain) estimates that are not reasonable, or there are reasonably foreseeable uses that the survey design either did not or could not account for.

Typically, the development of a must-take stratum is guided by data use considerations, including the data needs of subject-matter specialists who can provide input on whether specific locally significant units must be included in the sample. However, it will be important to carefully monitor the impact of the inclusion of the must-take units on the sample design to ensure that a high number of must-take cases does not excessively distort the design from a more optimal use of resources.

Recommendation 5-3: The Census Bureau should assess whether useful strategies could be learned from other surveys that incorporate a must-take stratum of large units in the sample design and evaluate these strategies for possible use in the sample design for group quarters in the American Community Survey.

SUBSAMPLING WITHIN LARGE GQ FACILITIES

The residents of large group quarters are subsampled in groups of 10, and some group quarters can have multiple groups of 10 in the sample. Given that group quarters provide housing and services to people with similar needs and circumstances, the intraclass correlations within group quarters are naturally high for many variables. Thus, while cost-effective, subsampling a large number of residents in a facility may be statistically inefficient. Reducing the number of persons subsampled in a facility and increasing the number of sample group quarters could improve the reliability of the estimates. This would also mean increased field costs if the number of sampled group quarters has to be increased to achieve the same level of precision of estimates. However, it is also possible that the subsample sizes could be reduced without a substantial loss in precision. If so, there may be no need to increase the number of sampled group quarters. The ideal balance between data quality considerations and cost would have to be evaluated to determine the optimal subsample size.

A recent Census Bureau project calculated the optimal subsample size

for residents of GQ facilities to be around four after averaging the results of calculations based on two different sets of assumptions about travel costs (Sommers and Hefter, 2010). The question can be approached in a variety of ways, particularly in terms of calculating cost savings. This is one reason why pursuing this research further is important. Future research could also take into consideration possible differences among the intraclass correlations that characterize different GQ types, given that the correlations are presumably not equally high among all of them.

Recommendation 5-4: The Census Bureau should expand on the research it initiated to determine the optimal cluster size for subsampling residents in large group quarters (GQ) in the American Community Survey, estimating intraclass correlations for different variables, and factoring in facility-level and person-level costs using a variety of approaches. The analysis should address whether the same subsample size is efficient for each GQ type and whether the size of the subsample per facility should be reduced.

6

Weighting and Estimation

As is the case with the sample design, the current weighting and estimation procedures used in the American Community Survey (ACS) are not optimized to produce reliable small-area estimates for group quarters (GQ) residents, nor, as a result, are they adequate to produce reliable estimates of characteristics of the total population. Acknowledging these limitations, the Census Bureau is continuing to evaluate options for revising the weighting procedures. The methodology is expected to evolve based on decisions made about revising other aspects of the survey design, particularly the imputation plans discussed later in this chapter.

WEIGHTING PROCEDURES

The ACS estimates are based on a raking ratio estimation procedure that results in two sets of weights: a weight assigned to each sample person record and a weight assigned to each sample housing unit record. Estimates of person characteristics are based on summing the person weights in the geographic area of interest. Estimates of family, household, and housing unit characteristics are based on summing the housing unit weights.

Current Weighting Procedures

The Census Bureau uses a design-based weighting procedure, conducted in two steps: the first step involves assigning weights to persons in group quarters; the second step involves assigning weights to both housing units and to persons within housing units. The GQ person weighting is conducted before the house-

hold person weighting because the weighting for household persons makes use of the GQ person weights. The household and GQ weights are combined to produce estimates of the total population.

The first step applies a trimmed base weight that reflects the initial sampling probability and the within-GQ subsampling probability. The second step is a noninterview adjustment across group quarters, defined within state, by county and by major GQ type. If the sample is small or if the adjustment is large, the cells are collapsed to state by major GQ type. The third step applies a coverage adjustment, controlling the weighted number of GQ persons at the state level by major GQ type, using the GQ population estimates from the Population Estimates Program (PEP).

On the basis of the current estimation procedures, only the total population (households and group quarters) is guaranteed to be controlled at the county (or groups of less populous counties) level. When some small geographic areas with GQ populations do not have group quarters represented in the sample, group quarters in other areas may be overrepresented. Thus, for some small areas, the 5-year estimates do not reflect local reality.

Alternative Approach Under Consideration

The Census Bureau is researching the possibility of introducing a new imputation and weighting approach, with the primary goal of achieving representation at the county level of all major GQ types present in that county for the 1-, 3-, and 5-year data. A secondary goal is to achieve representation at the tract level by major GQ type for the 5-year data. Keeping in mind the ongoing imputation research, the new method will make no distinction between sampled and imputed GQ person records, and it is developed to be sufficiently flexible to accommodate different possible outcomes of that research (Asiala, 2011).

The alternative GQ weighting methodology is based on the steps described below (Asiala, 2011). This approach is discussed in further detail later in this chapter.

1. Defining separate base weights for persons in large and small group quarters.
2. Applying tract- and county-level constraints based on the modeled populations on the frame and applying state by major GQ type-level controls based on independent population estimates.

PEP CONTROLS AND ALTERNATIVES

The population controls used in the ACS weighting process are based on estimates produced by the Census Bureau's Population Estimates Program. The PEP publishes total population estimates annually, based on a methodol-

ogy that essentially updates data from the most recent census with changes from births, deaths, and migration, as well as additional refinements based on Medicare enrollment data and estimates of the GQ population. After each new decennial census, the population estimates are rebenchmarked to reflect the new counts. For example, the 2010 ACS 1-year data, which are controlled to population estimates that reflect the 2010 census results, are not strictly speaking comparable to 2009 ACS 1-year data (or ACS 1-year data from previous years), which are controlled to population estimates derived as updates of the 2000 census (U.S. Census Bureau, 2011g).

To estimate changes in GQ populations, the Census Bureau starts with GQ population counts by facility type for each subcounty area from the previous decennial census and updates them with a time series of individual GQ records from the Group Quarters Report (GQR). The GQR is an annual estimate of GQ populations prepared by Federal-State Cooperative for Population Estimates program units (U.S. Census Bureau, 2008b). A time series of the GQ population is derived in two steps. First, facility-level GQ populations from the GQR are summed to the subcounty level by facility type for each estimate date in the time series. Second, a year-to-year change is calculated by the aggregated GQR time series of these populations.

As the decade progresses, the census counts become increasingly outdated and the updates, such as the GQR data collected from states, cannot always be relied on, which affects the overall quality of the GQ population estimates. For some GQ types, the population estimates are basically the decennial census counts kept constant. At the national and state levels, the Census Bureau urges caution when comparing the GQ population numbers based on the 2010 ACS and the 2010 census, and it advises data users not to compare the GQ data from these two sources at the substate level (U.S. Census Bureau, 2011h).

To better understand the magnitude of the differences among the GQ estimates from different sources, the panel compared the GQ counts from several ACS data releases (2005-2009 5-year, 2007-2009 3-year, and 2009 1-year) to expected counts interpolated from the 2000 and 2010 census data. Although the interpolated counts are themselves subject to error, they provide a reasonable comparison to ACS estimates as long as the change in population between 2000 and 2010 is fairly smooth. Table 6-1 shows the mean absolute percent errors (MAPE) and mean algebraic percent errors (MALPE) for the comparisons between the state-level ACS period estimates and the GQ count interpolated for the year in the middle of the time period, based on the 2000 and 2010 census counts (treating the interpolated number as the "gold standard").[1]

[1]The MAPE is calculated as the average across all states of the absolute difference between the ACS estimate and the interpolated estimate, divided by the interpolated estimate and multiplied by 100. The MALPE is calculated similarly, except the sign of the difference (positive or negative) is considered in the calculation.

TABLE 6-1 MAPE and MALPE of State-Level ACS Estimates of Group Quarters Compared with Expected GQ Counts

	ACS 0509/ Expected 2007	ACS 0709/ Expected 2008	ACS 09/ Expected 2009
MAPE	5.5	6.0	6.2
MALPE	2.5	2.2	1.7

NOTES: Expected counts are interpolated based on the 2000 and 2010 census counts. ACS = American Community Survey, GQ = group quarters, MALPE = mean algebraic percent error, MAPE = mean absolute percent error.
SOURCE: Calculated by the panel based on 2000 census data and the 2010 census Advance Group Quarters Summary File.

Appendix H shows plots of the relative errors computed as the difference between the ACS estimates and the expected estimates of the GQ population, divided by the expected estimates of the GQ population in U.S. states. The graphs show that, in the case of the biggest states, the ACS estimates from all three data releases examined are uniformly higher than the expected estimates.

Table 6-2 shows the mean absolute percent error and mean algebraic percent error for counties by region and for counties with populations under 20,000. As anticipated, the MAPE errors at the county level are higher than at the state level, and they are highest for the counties with the smallest number of residents (under 20,000). Table 6-3 shows the county-level errors using medians instead of means.

TABLE 6-2 MAPE and MALPE of County-Level ACS Estimates of Group Quarters Compared with Expected GQ Counts

Region		ACS 0509/ Expected 2007	ACS 0709/ Expected 2008	ACS 09/ Expected 2009
Northeast	MAPE	22.3	20.8	23.4
	MALPE	5.2	7.4	9.9
Midwest	MAPE	56.8	28.1	26.4
	MALPE	17.1	13.1	7.8
West	MAPE	64.8	27.2	26.0
	MALPE	8.0	6.0	4.1
South	MAPE	55.9	39.1	30.4
	MALPE	14.9	19.3	9.4
Counties with population under 20,000	MAPE	86.2	118.0	—
	MALPE	20.0	56.3	—

NOTES: Expected counts are interpolated based on the 2000 and 2010 census counts. ACS = American Community Survey, GQ = group quarters, MALPE = mean algebraic percent error, MAPE = mean absolute percent error.
SOURCE: Calculated by the panel based on 2000 census data and the 2010 census Advance Group Quarters Summary File.

TABLE 6-3 MAPE and MALPE of County-Level ACS Estimates of Group Quarters Compared with Expected GQ Counts

Region		ACS 0509/ Expected 2007	ACS 0709/ Expected 2008	ACS 09/ Expected 2009
Northeast	MAPE	12.7	15.4	15.8
	MALPE	3.2	6.1	3.3
Midwest	MAPE	33.6	18.8	17.7
	MALPE	2.7	3.7	1.1
West	MAPE	34.7	17.4	16.6
	MALPE	–9.8	–1.7	–5.4
South	MAPE	33.5	24.5	24.1
	MALPE	0.3	7.0	0.5
Counties with population under 20,000	MAPE	68.5	67.9	—
	MALPE	–10.1	31.3	—

NOTES: Expected counts are interpolated based on the 2000 and 2010 census counts. ACS = American Community Survey, GQ = group quarters, MALPE = mean algebraic percent error, MAPE = mean absolute percent error.
SOURCE: Calculated by the panel based on 2000 census data and the 2010 census Advance Group Quarters Summary File.

In most cases, the MAPE statistics are larger for the 5-year estimates than for the 1- and 3-year estimates, possibly because that data release includes smaller counties that may have estimates that are disproportionately unreliable. Table 6-4 shows that the MAPEs and MALPEs are reduced when the means are

TABLE 6-4 Weighted MAPE and MALPE of County-Level ACS Estimates of Group Quarters Compared with Expected GQ Counts

Region		ACS 0509/ Expected 2007	ACS 0709/ Expected 2008	ACS 09/ Expected 2009
Northeast	MAPE	14.5	15.7	18.2
	MALPE	5.6	6.3	6.9
Midwest	MAPE	22.5	19.4	20.9
	MALPE	7.5	8.4	5.4
West	MAPE	17.7	15.8	18.6
	MALPE	3.1	2.8	2.2
South	MAPE	27.4	25.1	26.6
	MALPE	7.8	8.7	6.3
Counties with population under 20,000	MAPE	76.9	119.1	—
	MALPE	20.6	57.9	—

NOTES: GQ counts are weighted by the 2010 total population size. Expected counts are interpolated based on the 2000 and 2010 census counts. ACS = American Community Survey, GQ = group quarters, MALPE = mean algebraic percent error, MAPE = mean absolute percent error.
SOURCE: Calculated by the panel based on 2000 census data and the 2010 census Advance Group Quarters Summary File.

weighted by the total population counts from the 2010 census. Yet it is troubling to see estimate errors of this magnitude. Part of the apparent error may be due to the simplistic manner by which the expected estimate was derived. But Table 6-3 reveals that for the counties selected for examination, more than half had ACS GQ estimates that deviated from the expected GQ estimate by more than 30 percent (for all but the Northeast) in 2005-2009 and close to 20 percent for 2007-2009. The story for small counties is much worse, with MAPEs for half the counties exceeding 65 percent error. For small counties, the population weighted MAPE for 2007-2009 suggests that well over half of the selected counties had errors in ACS GQ estimates that exceed 100 percent.

Appendix I shows plots of the relative errors computed as the difference between the 2005-2009 ACS estimate and the expected estimates of the GQ population, divided by the expected estimates of the GQ population in selected counties by region. The upper and lower limits for the error bars were computed as plus or minus the margin of error of the ACS divided by the expected estimate, where the margin of error here is twice the standard error of the ACS.

The ACS estimates tend to be higher than the expected values in the largest states in the Northeast and the Midwest. Appendix J shows similar relative error plots for selected counties with populations under 20,000. For these counties, the ACS estimates do not appear to be consistently higher or lower than the expected values.

The tables and graphs illustrate large overall differences between the GQ estimates from the ACS and the expected GQ population counts based on interpolated census numbers. The impact of these differences, however, varies greatly among counties, depending on local circumstances, which needs to be explored further. The panel anticipates that greater clarity regarding these difference explorations will result from the Census Bureau's research comparing ACS estimates for 2010 against the 2010 census counts. The comparisons conducted by the panel could be used as a template for a more thorough analysis by the Census Bureau to determine the impact of these differences, particularly for small areas, because in small areas inaccurate GQ estimates can have an especially large impact on the accuracy of the data for the total population. Issues specific to small areas are discussed in further detail later in this chapter.

Following the release of counts from the decennial census, the Census Bureau typically conducts a formal evaluation of errors (bias and precision) in its population estimates for various levels of geography. These tests generally treat the census counts as the gold standard against which the population estimates are evaluated. The Census Bureau awarded eight contracts to external researchers to evaluate the 2010 round of population estimates against the 2010 census and to assess alternative population estimation methodologies. The purpose of this work is to evaluate the current PEP method by comparing the population estimates of the total resident population and the household population at the national, state, and county levels with the census counts.

However, despite uncertainty surrounding the quality of the GQ estimates prepared by the PEP, the proposed evaluation research regrettably is focused only on the total population (household and GQ populations combined) and on the household population compared with total 2010 census counts. The Census Bureau plans to consider the GQ estimates separately at a later time, but this could be a missed opportunity to better understand the challenges surrounding the GQ population estimates in relation to the total population estimates and to inform the deliberations about the role of the GQ population in the ACS. The panel urges that an evaluation of the GQ estimates should be conducted along with the evaluation of other aspects of the Population Estimates Program.

> **Recommendation 6-1:** The Census Bureau should conduct an evaluation of the 2010 American Community Survey estimates of the group quarters (GQ) population against the 2010 census counts at all levels of geography for which the Census Bureau's Population Estimates Program (PEP) prepares such estimates. This research should estimate bias and imprecision by GQ type and seek to identify ways to improve the PEP estimates of group quarters.

Population controls for GQ estimates need to be considered in the context of their effect on error evaluations, given that inaccurate population controls are more likely to introduce error than to reduce it. Although there are arguments for considering county, or even subcounty controls, this is unrealistic at the moment, because GQ types often are collapsed as a result of small sample size or large adjustments. An alternative would be to control for demographic characteristics (age, sex, race, and Hispanic origin) and to drop controls for GQ type. This approach would reduce the likelihood that demographic characteristics for small areas are distorted because an age-clustered GQ, such as a nursing home or dormitory, happens to be included in the sample for the area.

Arguably, the use of outdated or inadequate controls may be worse than the use of no controls at all. As another alternative to the current approach, the use of population controls could be limited to those GQ types for which the controls are most reliable. If the updates received from outside sources about some GQ types are better than the PEP controls, it should be possible to use these population estimates instead. For example, the records of the Defense Manpower Data Center in the U.S. Department of Defense or the Federal Bureau of Prisons may supply better data than the current approach of updating the census counts for military and correctional facilities. In addition, many GQ facilities also maintain basic administrative records about their residents. If these facility-level records include sufficient information to produce population counts by demographic cross-classifications, they could also be used as controls.

As discussed, state and other local resources are underutilized as sources of data. State governments often have comprehensive lists of group quarters

that are more current than any other source, and they often produce their own estimates as well (often based on a simple telephone call to facility administrators). Considering the limitations and costs of the current procedures, it should be worth exploring the possibility of obtaining state-generated estimates of GQ populations and assessing how these compare to the bureau's own estimates, as recommended in Chapter 4.

Recommendation 6-2: Depending on the outcome of the evaluation discussed in Recommendation 6-1, the Census Bureau should evaluate the relative advantages and disadvantages of developing control totals for group quarters (GQ) residents in the American Community Survey by demographic characteristics (age, sex, race, ethnicity) at the state level, possibly in addition to the control totals that are currently implemented by GQ type. The Census Bureau should also evaluate the possibility of using population controls only for the GQ types for which reliable controls are available. Finally, the Census Bureau should evaluate whether data from outside sources that are currently used to provide updates for the sampling frame could also be used for controls.

ESTIMATES OF THE GQ POPULATION IN SMALL AREAS

The decennial census, because of its role of providing complete counts of the population down to the census block level, mostly succeeds in completely enumerating the GQ population everywhere and is able to support counts by GQ type for all entities in the census geographic hierarchy. In contrast, the state-based sample design of the ACS is not an adequate vehicle for providing small-area estimates of the GQ population.

The ACS substate samples are highly variable, particularly by GQ type, and there are large fluctuations over time in the characteristics associated with residence in group quarters. In some cases, this variation results in counties with known GQ facilities within their administrative boundaries having no group quarters represented in the sample. Table 6-5 shows the number of counties with specific GQ types on the sampling frame and whether the GQ type is actually represented in the 2006-2009 ACS sample.

At lower geographic levels this is an even more common occurrence, with approximately half of the census tracts that have group quarters according to the sampling frame ending up with none selected in the sample after 4 years (Asiala, 2010). Table 6-6 shows the breakdown of census tracts with and without group quarters in the sample, and Table 6-7 illustrates the differences in the availability of county-level samples among major GQ types.

As illustrated in Table 6-2, the MAPEs and MALPEs associated with the differences between the GQ estimates from the ACS and the census counts are especially large for counties with populations under 20,000. The ACS estimates

TABLE 6-5 GQ Sample in Counties with Group Quarters on the ACS Sampling Frame by Major Type of Group Quarters, 2006-2009

Major GQ Type	Percentage of Counties with GQ Sample in the ACS	Percentage of Counties Without GQ Sample in the ACS	Total Number of Counties with GQ Type on Frame
Correctional facilities for adults	65.3	34.7	2,745
Juvenile facilities	55.8	44.2	1,182
Nursing facilities/skilled nursing facilities	88.0	12.0	2,955
Other institutional facilities	41.4	58.6	1,332
College/university student housing	85.5	14.5	1,155
Military group quarters	54.5	45.5	396
Other noninstitutional facilities	66.9	33.1	2,823
Total	65.3	34.7	12,588

SOURCE: U.S. Census Bureau (2011e).

TABLE 6-6 GQ Sample in Census Tracts with Group Quarters on the ACS Sampling Frame, 2006-2009

Type of Census Tract	Percentage of Tracts	Number of Tracts
Census tracts with GQ sample	49.8	21,596
Census tracts without GQ sample	50.2	21,771
Total census tracts with group quarters	100.0	43,367

SOURCE: U.S. Census Bureau (2011e).

TABLE 6-7 GQ Sample in Census Tracts with Group Quarters on the ACS Sampling Frame by Major Type of Group Quarters, 2006-2009

Major GQ Type	Percentage of Tracts with ACS Sample	Percentage of Tracts Without ACS Sample	Total Number of Tracts with GQ Type on Frame
Correctional facilities for adults	57.7	42.3	4,994
Juvenile facilities	40.2	59.8	2,818
Nursing facilities/skilled nursing facilities	59.4	40.6	16,583
Other institutional facilities	27.1	72.9	3,633
College/university student housing	72.5	27.5	3,351
Military group quarters	49.8	50.2	576
Other noninstitutional facilities	28.7	71.3	34,971
Total	47.9	52.1	66,926

SOURCE: U.S. Census Bureau (2011e).

of the GQ population, and of total population characteristics, can be especially error prone not only if a county with GQ residents does not have any group quarters represented in the sample but also if the county has group quarters in the sample, in which case these may be weighted up to match state-level population controls. The controls will bring the data in line with the PEP estimates at the state level, but they can seriously skew the estimated distributions at the county and lower levels of geography.

For example, during the time period between the 2000 and 2010 censuses, the small county of Goochland, Virginia, was home to two large state correctional institutions: the Virginia Correctional Center for Women and the James River Correctional Center, both with a capacity of approximately 500 residents (Virginia Department of Corrections, 2011). While the 2000 and 2010 census numbers show little change in the number of GQ residents in the county and a slight drop in the proportion of GQ residents relative to the total population, the 2005-2009 5-year ACS estimates of the GQ population show a percentage increase in excess of 400 percent and a large margin of error associated with the GQ estimate (see Table 6-8). This also affects the estimates for the demographic characteristics of the total population in the county. For example, based on the census 2010 numbers, 19.2 percent of the county's total population is black, whereas the 5-year ACS estimates show the black population to be 30 percent. The source of the problem seems to be the disproportional weighting up of the prisons in Goochland County to account for the lack of sample cases of prisons in other areas in the state.

As another example, the ACS data for Elmore County, Alabama, seems to suggest that the poverty rate in the county dropped from 14 to 10.4 percent between 2006 and 2007. However, a closer examination of the role of the group quarters in the sample reveals that the apparent change is largely explained by the fact that in 2006 the ACS estimate of the GQ population for the county was 1,976, and 90 percent of the GQ residents were in poverty. In 2007, no group quarters were included in the sample, so the 10.4 percent poverty rate for that year is essentially the household poverty rate, which is not very different from the 11.8 percent household poverty rate in 2006 (Asiala, 2010).

TABLE 6-8 Census and 5-Year ACS Estimates of the GQ Population in Goochland County, Virginia

Source	Total Population	Number in Group Quarters	Percentage in Group Quarters
Census 2010	21,717	1,405	6.5
ACS 2005-2009	20,429	5,707*	27.9
Census 2000	16,863	1,388	8.2

*90 percent margin of error of +/– 1,638.

SOURCE: U.S. Census Bureau. Available: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

It would be unfair and incorrect to judge an estimation system by selecting nonrandomly two counties with glaring errors and highlighting those as if they were typical examples. They are not. However, they do illustrate some of the potential difficulties facing the Census Bureau in this regard, and they serve as a reminder that there are communities like Goochland and Elmore counties in which estimates with large discrepancies may be data users' first exposure to local data from the American Community Survey. Problems such as these draw attention to the immense difficulties of estimating, on the basis of a sample survey, a sparse and irregularly distributed population (such as those residing in group quarters) for small geographic units. This is a fundamental tension arising from the conflicting goals of providing relatively current and frequent estimates for what are often very small units of geography based on a sample survey. The challenges lead to sample-based estimates that have, for the statistician, very large standard errors and, for the unsophisticated data user, numbers that often simply make no sense.

Acknowledging that the Census Bureau has made the decision not to apply release restrictions for the 5-year estimates based on data quality, the panel thinks that it is important to ensure that the published numbers, and the metadata behind those numbers, resonate with reality from the perspective of small geographic areas and users of such data. The importance of improving the sampling frame and identifying solutions that can improve the sampling design cannot be overstated. In addition, statistical solutions that can be particularly cost-effective in improving the estimation procedures should be evaluated. One such option to consider is the use of some type of indirect estimate. There are a variety of estimators in this class, ranging from simple to complex. Which type would be both feasible and an improvement over the current method is a subject for study. The Census Bureau for many years has employed a variation of this general approach as part of its Small Area Income and Poverty Estimates (SAIPE) Program. It produces annual small-area income and poverty estimates for school districts, counties, and states using a model-based approach that relies on combining survey data with population estimates and administrative records (National Research Council, 2000).

An option would be to use a composite of a small-area model estimate and direct estimate. If the geographic entity has group quarters but the sample has none, then the direct estimate would receive a weight of zero, and the model-based estimate would apply. Otherwise, a combination estimate could be used that weights the direct estimate and the model-based estimate based on the variance of each.

Sources of GQ data that could be used in a model include (but are likely not to be limited to) counts of residents and group quarters for small areas as shown on the frame, the previous census counts of GQ population by small area, data provided by state or local agencies regarding GQ populations, and possibly the PEP subcounty estimates of the GQ population. Another option would be to investigate the use of administrative records maintained by GQ

facilities for this purpose, even if these records are found not to be comprehensive enough to replace interviews with residents.

The best estimate to use may depend on how old the latest census counts are at any particular point. The census counts might be used exclusively in the years immediately following the decennial census, but a few years later information obtained from administrative records or the PEP numbers (assuming that these can be improved for group quarters) might be more reliable. An additional issue to consider is how the unreliability of the GQ sampling frame may affect synthetic small-area estimates. An example is a similar effort, the Local Area Unemployment Statistics (LAUS) Program of the Bureau of Labor Statistics, which uses state-level estimates from the Current Population Survey (CPS) as input to create model-based estimates. This program found that the direct CPS estimates of unemployment for lower levels of geography are not reliable enough to publish (Pfeffermann and Tiller, 2006).

If a model-based small-area estimate were used for the total GQ population, for example, for a county, an additional dilemma arises. A decision would have to be made about whether acceptably accurate small-area estimates could be made for the GQ totals in demographic groups in the small area. If this is not possible, it may be reasonable to simply report a small-area estimate for the total GQ population without breakdown by characteristics, and breakdowns by characteristics for that area would be reserved for the household population only. One advantage of model-based estimates is that there would be fewer confidentiality concerns associated with the small-area data.

Recommendation 6-3: The Census Bureau should evaluate statistical methods, such as indirect estimation, for producing group quarters estimates for counties in which group quarters are known to exist based on the American Community Survey sampling frame but are not included in the sample.

CENSUS BUREAU IMPUTATION PLANS TO IMPROVE THE GQ ESTIMATES

In parallel with the panel's work on this study, the Census Bureau has been conducting its own internal research to identify ways of improving the ACS estimates for substate geographies. Its research is focused on the possibility of using data from in-sample GQ facilities to impute person records for group quarters that are not in sample but are either on the ACS sampling frame or known to exist based on information from the 2010 census (Erdman and Nagaraja, 2010). The advantage of an imputation method over other model-based alternatives of producing estimates for the GQ population would be that imputation emulates the ACS data capture approach and enables the "modeled data" to be folded directly into estimates not only of the total population counts but also of the population characteristics. Given that at the time when this report was pre-

pared, the Census Bureau was considering the implementation of the imputation approach, we discuss this approach in a little more detail in this section.

The Census Bureau considered two methods for selecting group quarters for hot-deck imputation of person records and two methods for selecting donors. The two approaches are described below, followed by the panel's comments on the proposals.

Selecting Group Quarters for Imputation

The first option for selecting group quarters for imputation is designed to improve representation for each major GQ type by county (before tract), based on the following steps:

- For each year and for each large group quarters not in sample, 2.5 percent of the population (expected based on the sampling frame) is imputed.
- For each year and for each combination of county and major GQ type on the sampling frame but not in that year's sample (or among the imputed), one small group quarters is selected at random, with probability equal to the reciprocal of the number of small group quarters of the same major GQ type in the county.
- For each small group quarters selected, person records equal to 20 percent of the population (expected based on the sampling frame) are imputed.
- Each combination of tract and major GQ type on any year's sampling frame, but not in any year's sample (or among any year's imputed records), is selected.
- For each combination of tract and major GQ type above, for each year that the combination exists on the sampling frame, one small group quarters is selected at random, with probability equal to the reciprocal of the number of small group quarters of the same major GQ type in the tract.
- For each small group quarters selected, person records equal to 20 percent of the expected population are imputed.

The second GQ selection option is designed to improve the representation of each major GQ type by tract (before county). To accomplish this, the steps described above are repeated, imputing for tracts before imputing for counties, as follows:

- For each year and for each large group quarters not in sample, 2.5 percent of the expected population is imputed.

- For each year and for each combination of tract and major GQ type on the sampling frame but not in that year's sample (or among the imputes), one small group quarters is selected at random, with probability equal to the reciprocal of the number of small group quarters of the same major GQ type in the tract.
- For each small group quarters selected, person records equal to 20 percent of the expected population are imputed.
- Each combination of county and major GQ type on any year's sampling frame, but not in any year's sample (or among any year's imputed records), is selected.
- For each combination of county and major GQ type above, for each year that the combination exists on the sampling frame, one small group quarters is selected at random, with probability equal to the reciprocal of the number of small group quarters of the same major GQ type in the county.
- For each small group quarters selected, person records equal to 20 percent of the expected population are imputed.

Selecting Donors for Imputation

The Census Bureau also considered two options for selecting GQ residents with completed interviews who could serve as donors for the imputation. One option is to choose from within specific GQ type (when the donor-to-recipient ratio is reasonable) and give preference to donors from facilities that are geographically close. The donor pool is set to the first combination of geography and GQ type in which there is at least one donor per five imputed records, from the list of combinations below:

- County and specific type
- County and major type
- State and specific type
- State and major type
- Division and specific type
- Division and major type
- Region and specific type
- Region and major type
- Specific type without restriction
- Major type without restriction

Another option for donor selection is to apply a K-means clustering algorithm that selects donors from tracts that are demographically similar. The Census Bureau identified eight demographic clusters of tracts as part of the marketing campaign for the 2010 census, taking into consideration tract characteristics, such as vacancy rates, housing unit type, family structure, poverty

rate, employment rate, and others (Bates and Mulry, 2008). The clusters are as follows:

- All around average I (homeowner skewed)
- All around average II (renter skewed)
- Economically disadvantaged I (homeowner skewed)
- Economically disadvantaged II (renter skewed)
- Ethnic enclave I (homeowner skewed)
- Ethnic enclave II (renter skewed)
- Single/unattached/mobiles
- Advantaged homeowners

Using the clusters above was another option considered to guide the donor selection process. The procedure involves grouping group quarters selected for imputation by cluster and type. If there is at least 1 donor per 5 imputations needed, donors are selected at random from within cluster and specific type. If this approach does not yield at least 1 donor per 5 imputations needed, the subtypes of clusters (i.e., I and II) are collapsed.

Evaluation of the Imputation Methodology

The Census Bureau compared the imputation methods proposed and the current design-based ACS method using a GQ population simulated based on census 2000 data, using estimates of age, sex, race, and Hispanic origin for comparison (Erdman and Nagaraja, 2010). From this population, 25 independent ACS samples were generated, and each of the imputation procedures was tested on the simulated samples. The results of the two methods for selecting facilities for imputation were comparable. For donor selection, the expanding geographic search performed better than the cluster approach. The results of the imputation methods were systematically biased even at the state level, but the variances of the imputed estimates were smaller than variances of the estimates from the design-based method. Regardless of the method used, close to half of the augmented data consisted of imputed records, and in the case of some major GQ types, well over half of the records were imputed.

Table 6-9 shows that the number of imputed persons is around half overall, but it is particularly high for some group quarter types, such as "other long-term care" facilities.

Overall, 86 percent of imputations come from the same specific GQ type as the recipient, and 69 percent come from within the same county, although the results for geography vary greatly by type (see Table 6-10).

Based on the simulation study using census 2000 data, several changes were made to the imputation methodology:

TABLE 6-9 Survey Respondent and Imputed Record Counts by Major GQ Type for 5-Year Estimates

Major GQ Type	Number of Respondents (a)	Number of Imputed Persons (b)	Percentage of Imputed Persons (b/(a+b))	Number of Respondents Who Are Donors
Correctional facilities for adults	236,946	132,931	35.9	87,242
Juvenile facilities	17,139	23,031	57.3	10,787
Nursing facilities/skilled nursing facilities	185,109	155,511	45.7	101,381
Other institutional facilities	7,331	28,582	79.6	6,883
College/university student housing	173,121	167,865	49.2	102,532
Military group quarters	25,416	30,325	54.4	16,530
Other noninstitutional facilities	84,322	177,700	67.8	67,879
Total	729,384	715,945	49.5	393,234

SOURCE: U.S. Census Bureau (2011i).

- Taking account of sex when selecting donors for GQ facilities that have been preidentified as single-sex facilities.
- Adjusting the expected GQ populations based on an algorithm that applies observed population changes to the unobserved group quarters.
- Restricting imputation for GQs with seasonal residence patterns.
- Limiting the number of times a person can be used as a donor in a tract.

A second evaluation was conducted using the expanding search method emphasizing county coverage, based on ACS data from 2006 through 2010, so that the effects of the imputation could be evaluated on the full range of estimates produced by the ACS. Examining the impact of the imputation on state-level estimates revealed that the imputation-based estimates were relatively consistent with the design-based estimates. Smaller states, especially Delaware, Idaho, Maine, and Wyoming, tended to have more of the estimates flagged as different. Larger differences were observed for "other long-term care" and "other noninstitutional" categories, which were also the GQ types with the higher imputation rates.

Limitations of the Imputation Method

The imputation methods are largely dependent on the quality of the sampling frame. In other words, reliable information is necessary about the GQ facilities that are not in sample, including their type and number of

TABLE 6-10 Donor Sources for Imputed Records (in percentage)

Major GQ Type (and number of imputed records)	Donor in Same Specific Type	Donor in Same Tract	Donor in Same County (not tract)	Donor in Same State (not county)	Donor Outside of State	Total Proportion of Donors
Correctional facilities for adults	FALSE	3.9	9.3	0.9	0.0	14.2
(132,931)	TRUE	40.5	15.5	25.4	4.5	85.8
Juvenile facilities	FALSE	1.7	13.8	17.7	1.9	35.1
(23,031)	TRUE	5.9	11.5	44.9	2.4	64.9
Nursing facilities/skilled nursing facilities	FALSE	—	—	—	—	—
(155,511)	TRUE	7.2	75.4	17.1	0.3	100.0
Other institutional facilities	FALSE	1.0	9.4	27.9	6.9	45.1
(28,582)	TRUE	4.6	6.2	32.8	11.3	54.9
College/university student housing	FALSE	—	—	—	—	—
(167,875)	TRUE	37.1	46.2	13.4	3.2	100.0
Military group quarters	FALSE	3.3	3.5	3.1	0.3	10.3
(30,325)	TRUE	40.9	18.8	15.6	14.5	89.7
Other noninstitutional facilities	FALSE	0.4	22.5	8.7	0.2	31.8
(177,700)	TRUE	1.2	33.3	30.0	3.7	68.2
All GQ Types	FALSE	1.1	8.3	4.1	0.4	13.9
(715,945)	TRUE	20.2	39.8	22.4	3.7	86.1

NOTE: Nursing homes and college dormitories only have one specific type (see Box 1-1).
SOURCE: U.S. Census Bureau (2011i).

residents. Otherwise, the shortcomings described in earlier sections related to the GQ frame could result in scenarios in which data are imputed into facilities that no longer exist. The panel thinks that improvements to the GQ sampling frame are essential to ensure the success of the imputation approach.

The success of the item imputation plans also depends on the quality of the donors. Some of the data associated with the donor cases are also imputed due to item nonresponse, which, in essence, translates into "double imputation." The item imputation rates in the GQ data are higher than in the household data and are particularly high for the income questions (see Table 6-11). Item imputation rates also vary by state (see Table 6-12). To the extent of the panel's knowledge, the effects of the double imputation on the data have not yet been evaluated.

Panel Observations on the Imputation Plans

The Census Bureau's plans to impute nonsample GQ person records are in line with the panel's view that GQ estimates can be produced based on alternatives to a design-based weighting approach. The proposed method allows for the creation of a microdata file with all characteristics included that could also serve as the basis for a Public Use Microdata Sample (PUMS) file and would be valuable to data users. By contrast, small-area estimation would involve constructing separate estimates for group quarters, which would then be combined with the household estimates to obtain total population estimates. Moreover, person-level imputation would not need to be performed for the GQ types that are moved to the housing unit sample (see Recommendation 4-7), which also has the advantage of reducing the volume of records imputed.

We discuss below some refinements to the Census Bureau plans presented to the panel. We also make recommendations for additional research that could inform the direction of this work in the future.

There are several alternatives that could be explored to evaluate methods for identifying donors. One concern is that donors are pulled from multiple group quarters in order to impute for a recipient GQ. This does not reflect the natural intraclass correlation that occurs within a GQ facility, but it could nevertheless produce unbiased estimates of descriptive statistics. The variance of the imputation procedure could, in fact, be lower this way. If more complex statistics—having to do with the relationships of variables among persons in the same group quarters—were of interest, then the imputation method could be biased. Another issue is that the imputation model assumes that all GQ cases, in each cell, have the same mean or are, in some sense, exchangeable. This may not account for other important covariates.

In the case of the donor selection procedure that prioritizes donor pools based on geographic proximity, it is not clear that the sequence of combinations

TABLE 6-11 Item Imputation Rates (in percentage) for Selected Characteristics by GQ Type, 2005-2009 American Community Survey

Major GQ Type	Sex	Age	Race	Hispanic Origin	One or More Income Source	Marital Status	Citizenship	Speaks Another Language at Home	Mobility Status	Veteran Status
Total GQ population	0.2	1.1	2.5	3.1	37.9	5.0	5.7	10.7	7.7	10.2
Correctional facilities for adults	0.2	0.5	1.5	2.3	27.0	6.6	3.4	11.7	8.1	9.1
Juvenile facilities	0.3	3.2	2.0	2.8	25.4	3.0	5.4	10.0	7.8	7.7
Nursing facilities/skilled nursing facilities	0.2	1.2	0.7	1.6	63.4	3.3	6.0	9.5	5.6	13.1
Other institutional facilities	0.3	11.4	1.6	4.2	44.2	6.6	11.0	14.5	10.1	15.1
College/university student housing	0.1	0.8	5.4	5.4	28.8	5.8	7.6	12.4	9.2	10.5
Military group quarters	0.0	0.3	2.4	2.1	16.7	2.0	4.3	6.9	6.3	2.1
Other noninstitutional facilities	0.2	1.3	1.4	2.1	43.1	4.3	5.5	8.3	7.3	9.5
2005 household population	0.2	0.8	1.6	1.5	18.0	5.4	1.6	1.7	2.1	2.1

NOTE: The 2005 American Community Survey did not include group quarters.
SOURCE: Beaghen (2011).

TABLE 6-12 Item Imputation Rates (in percentage) for Selected Characteristics of the GQ Population by State, 2005-2009 American Community Survey

State	Sex	Age	Race	Hispanic Origin	One or More Income Source	Marital Status	Citizenship	Speaks Another Language at Home	Mobility Status	Veteran Status
Alabama	0.2	0.7	0.8	2.7	28.7	4.6	3.4	6.0	5.8	7.5
Alaska	0.2	0.5	1.2	0.8	11.1	2.7	3.3	3.7	3.4	3.6
Arizona	0.1	0.5	3.1	3.3	30.0	7.4	6.0	9.0	7.2	9.8
Arkansas	0.0	1.0	2.3	1.2	38.4	2.3	4.6	6.4	5.4	7.9
California	0.2	1.0	3.6	2.8	36.6	7.5	8.3	12.3	7.8	12.8
Colorado	0.0	0.4	2.0	2.3	44.1	3.7	4.2	22.1	17.9	23.4
Connecticut	0.1	0.6	4.2	4.1	48.1	4.8	8.9	13.3	10.3	9.0
Delaware	0.0	0.3	1.5	3.0	37.6	2.0	11.0	15.6	14.9	8.7
District of Columbia	0.1	2.6	3.5	3.9	48.2	10.0	12.8	20.3	20.7	27.8
Florida	0.3	1.0	2.0	3.7	32.9	5.6	7.3	11.3	9.1	12.0
Georgia	0.3	0.4	1.0	1.4	22.1	1.9	2.0	4.1	2.8	4.1
Hawaii	0.1	1.0	1.4	1.9	29.8	1.1	1.8	4.6	2.8	7.6
Idaho	0.1	0.6	0.3	0.5	18.5	0.3	1.1	5.1	1.6	3.1
Illinois	0.2	1.5	2.7	3.4	41.4	3.4	4.5	9.9	5.2	10.3
Indiana	0.3	1.4	1.0	1.7	44.4	5.7	7.6	14.0	11.6	15.7
Iowa	0.1	0.8	3.3	3.9	49.7	5.6	6.5	9.8	7.0	10.7
Kansas	0.2	0.5	3.8	4.2	45.2	4.5	5.0	10.0	7.3	10.1
Kentucky	0.1	0.6	1.3	1.7	34.5	2.4	3.8	6.8	5.2	7.9
Louisiana	0.1	1.6	0.5	2.4	34.5	3.1	2.2	6.7	6.8	8.2
Maine	0.0	0.3	4.9	6.4	41.3	11.9	13.3	19.2	13.0	18.1
Maryland	0.3	0.6	2.7	3.1	36.0	4.3	8.4	14.7	12.7	16.3
Massachusetts	0.1	0.9	4.2	4.7	50.8	9.3	13.6	19.8	12.4	16.9
Michigan	0.1	0.6	1.1	1.5	33.9	2.8	2.7	4.5	3.5	6.3
Minnesota	0.1	0.6	2.1	2.8	52.6	2.8	4.6	7.4	5.1	8.4
Mississippi	0.2	0.5	0.4	1.1	28.4	2.0	2.8	5.9	4.6	6.7

Missouri	0.1	1.5	0.4	0.9	38.0	1.8	1.1	3.3	1.8	4.6
Montana	0.0	0.4	0.4	0.6	40.6	2.3	1.4	3.6	2.9	3.7
Nebraska	0.0	0.9	1.2	0.9	45.7	2.0	1.6	3.4	1.3	4.7
Nevada	0.2	0.5	1.3	0.6	23.4	1.7	1.5	3.1	1.7	2.3
New Hampshire	0.1	1.2	2.3	3.9	42.7	3.7	3.4	7.1	3.8	8.6
New Jersey	0.3	0.9	2.0	3.7	50.4	3.6	6.8	17.4	13.6	16.0
New Mexico	0.0	2.6	2.2	2.5	35.6	2.9	4.4	13.2	7.4	9.8
New York	0.3	2.5	6.1	6.7	42.8	7.6	9.4	15.4	10.0	12.8
North Carolina	0.1	0.8	1.4	2.1	34.7	4.1	3.5	7.8	5.7	9.0
North Dakota	0.0	0.1	0.6	0.3	41.7	0.8	1.7	3.2	2.3	3.6
Ohio	0.0	0.5	0.9	1.5	38.3	2.1	2.9	5.1	2.4	6.9
Oklahoma	0.1	1.1	2.9	3.5	36.2	3.8	2.5	7.0	5.0	7.3
Oregon	0.4	3.7	0.6	1.2	26.4	2.0	2.3	3.3	2.9	5.5
Pennsylvania	0.2	1.3	4.0	4.9	46.7	12.3	6.5	19.0	17.8	11.4
Rhode Island	0.0	0.3	5.9	9.9	37.0	10.5	11.9	13.3	12.3	14.1
South Carolina	0.1	0.2	1.1	3.0	31.2	2.4	4.8	7.8	6.9	10.0
South Dakota	0.0	1.4	0.7	0.7	34.7	0.7	0.9	2.2	2.0	2.3
Tennessee	0.0	1.0	1.3	1.9	36.3	4.0	5.2	9.8	9.0	11.3
Texas	0.2	1.2	1.3	2.0	29.2	3.0	3.7	5.8	4.9	6.8
Utah	0.1	1.7	1.2	1.2	27.1	1.5	5.1	8.6	6.9	4.1
Vermont	0.1	0.1	5.8	7.1	37.6	6.2	6.7	12.2	9.7	13.5
Virginia	0.2	0.7	2.1	2.7	44.0	4.5	4.9	19.8	5.5	8.3
Washington	0.1	1.2	1.3	2.1	33.8	5.7	6.2	8.2	6.4	9.4
West Virginia	0.0	1.0	3.0	4.5	44.8	4.6	4.8	11.1	9.6	13.2
Wisconsin	0.2	0.4	3.7	3.6	38.8	4.9	4.8	8.4	6.3	9.5
Wyoming	0.0	2.5	3.1	3.1	43.2	3.7	3.5	9.9	8.2	8.0
Puerto Rico	0.1	0.3	0.7	0.8	27.5	1.4	0.4	0.6	0.8	1.9

SOURCE: Beaghen (2011).

of geography and GQ type proposed is the best or only option. For example, a sequence of combinations of geography and GQ type that collapses geographic areas before GQ type could be considered, as follows:

- County and specific type
- State and specific type
- County and major type
- State and major type

A classification algorithm may be useful in exploring this further using 2010 census data or frame data. For example, a regression tree could be used within either a specific or a major GQ type to model the number of persons in a facility with a specific characteristic. In the case of such characteristics as disability, the predictors could be dummy variables for tracts, dummy variables for county, number of persons in different age ranges, number of persons by educational attainment, and so on. The predictors selected would have to be variables that are available on the sampling frame of group quarters or could be tabulated by group quarters based on the census. The hierarchy created by the tree could be used in deciding which variables are the most effective predictors of disability (or other analytic variables). The results would then guide the order of collapsing of group quarters.

Another option to consider for the imputation would be to identify GQ facilities rather than GQ residents to serve as donors. In this case, a block of persons from the donor group quarters would be assigned to the recipient group quarters. This would more closely reflect the population structure that exists within a GQ facility, although it would probably increase variances of some descriptive statistics because of the imputation of correlated observations.

In the case of the cluster approach to donor selection, the initial clusters formed for census marketing purposes and based on household data were not ideally suited to evaluate this method of donor selection. This approach should be evaluated based on clusters formed for this purpose, from 2010 census GQ data.

The Census Bureau's test of the proposed imputation procedures using 25 simulated samples generated based on census data (Erdman and Nagaraja, 2010) should be repeated on a larger scale. It is possible that a test performed on a larger number of samples will be able to reveal more differences between the imputation-based and the design-based estimates.

Recommendation 6-4: The Census Bureau's research on imputing group quarters (GQ) person records in the American Community Survey should further investigate the possibility of using a donor selection procedure that deemphasizes geographic proximity in relation to matching by GQ type, trying out alternatives to the proposed sequence of collapsing the combinations of geography and GQ type. The possibility of using a cluster

approach to donor selection should be reevaluated using clusters formed for this purpose based on GQ data from the 2010 census. The Census Bureau should also expand its simulation study of imputation methods to include a sufficiently large number of samples capable of revealing significant differences between the imputation-based and the design-based estimates.

Finally, the concerns related to the double imputation, resulting from the fact that many of the donor cases themselves have imputed data, raises a broader question about whether the GQ questionnaires could be revised to better reflect the ways group quarters differ from households. The questionnaire currently used to collect data from the residents of group quarters is very similar to the data collection instrument used for the housing unit sample, except that the questions about the physical and financial characteristics of the household are not asked of GQ residents. The GQ questionnaire has not been customized further, in part because it is operationally more efficient to maintain as much overlap between the two forms as possible. However, the Census Bureau currently imputes 38 percent of one or more sources of income for the GQ population, compared with an 18 percent imputation rate for this question for the household population (Asiala, 2011). Another item with much higher imputation rates among GQ residents is the question about the language spoken at home (10.7 percent for GQs compared with 1.7 percent for households), presumably because the concept of "at home" is not as straightforward for people who may be living in a GQ facility for the long term or permanently, as it is for those who live in households.

The high item imputation rates in the case of some of the questions asked of GQ residents warrant a closer look at whether the questionnaire in its current form is appropriate for the GQ population, particularly the institutional population. The Census Bureau should conduct an assessment of the reasons for the high item imputation rates and the need for revisions to the questionnaire, possibly conducting cognitive interviews with GQ residents living in different GQ types, and an analysis of the impacts of the revisions on both data quality and ability to meet data user needs. Customizing the questionnaire would reduce the burden on GQ respondents, which is likely to have a positive impact not only on the questions that have high imputation rates but also on other questions, which may be affected by cognitive shortcuts taken by respondents as a result of the less than optimal questionnaire design. Dropping or revising the questions with high item imputation rates will also greatly reduce double imputation, if the individual record level–approach is implemented for group quarters.

Recommendation 6-5: The Census Bureau should evaluate the possibility of customizing by group quarter (GQ) type the American Community Survey questionnaire for the GQ population with the goal of reducing item

imputation rates, improving data quality, and reducing the burden on the GQ respondents who are required to answer questions that are not applicable to their circumstances. Changes to consider should include omitting or revising some of the questions on the GQ questionnaire for some types of group quarters.

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Appendix A

Participants in the Panel's Meeting with Data Users December 13, 2010

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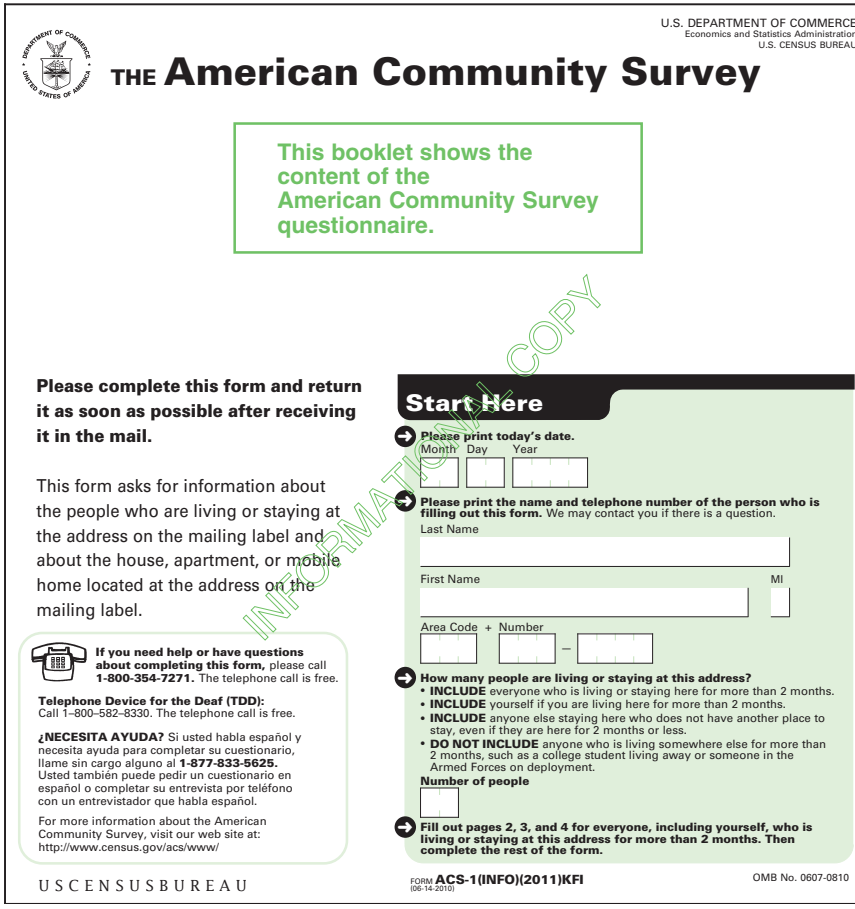
Patty Becker, APB Associates
Jacqueline Byers, National Association of Counties
Stephen Cohen, National Science Foundation
Kenneth Darga, Michigan Department of Technology, Management and Budget
John Drabek, U.S. Department of Health and Human Services
Alexandra Enders, University of Montana Rural Institute
Linda Gage, California Department of Finance
Ken Hodges, Nielsen Claritas
Eddie Hunsinger, Colorado State Demography Office
Ilene Jacobs, California Rural Legal Assistance
Elaine Murakami, U.S. Department of Transportation
David Plane, University of Arizona
Risa Proehl, Portland State University Population Research Center
Vera Prosper, New York State Office for the Aging
Kristen Rohanna, San Diego Association of Governments
William Schooling, Arizona Department of Commerce
Yi Zhao, Washington State Office of Financial Management

Appendix B

2011 American Community Survey: Housing Unit Questionnaire



U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

THE American Community Survey

This booklet shows the content of the American Community Survey questionnaire.

Please complete this form and return it as soon as possible after receiving it in the mail.

This form asks for information about the people who are living or staying at the address on the mailing label and about the house, apartment, or mobile home located at the address on the mailing label.

If you need help or have questions about completing this form, please call **1-800-354-7271.** The telephone call is free.

Telephone Device for the Deaf (TDD): Call 1–800–582–8330. The telephone call is free.

¿NECESITA AYUDA? Si usted habla español y necesita ayuda para completar su cuestionario, llame sin cargo alguno al **1-877-833-5625.** Usted también puede pedir un cuestionario en español o completar su entrevista por teléfono con un entrevistador que habla español.

For more information about the American Community Survey, visit our web site at: http://www.census.gov/acs/www/

U S C E N S U S B U R E A U

Start Here

Please print today's date.
Month Day Year

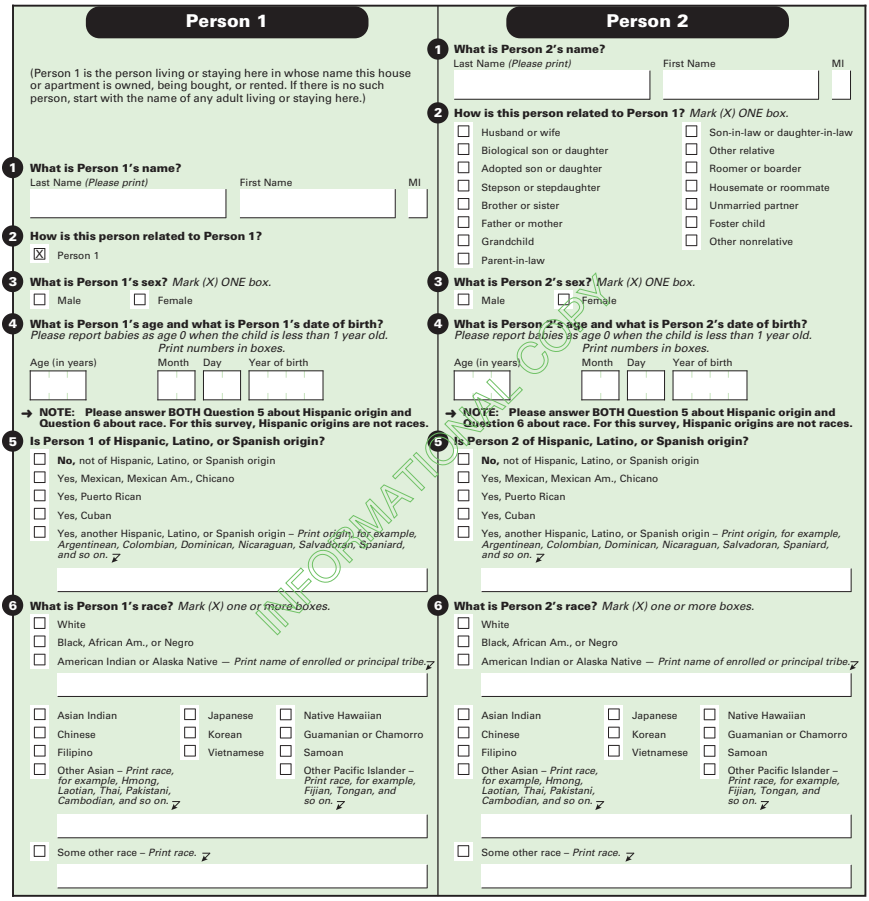
Please print the name and telephone number of the person who is filling out this form. We may contact you if there is a question.
Last Name
First Name MI
Area Code + Number –

How many people are living or staying at this address?
- **INCLUDE** everyone who is living or staying here for more than 2 months.
- **INCLUDE** yourself if you are living here for more than 2 months.
- **INCLUDE** anyone else staying here who does not have another place to stay, even if they are here for 2 months or less.
- **DO NOT INCLUDE** anyone who is living somewhere else for more than 2 months, such as a college student living away or someone in the Armed Forces on deployment.

Number of people

Fill out pages 2, 3, and 4 for everyone, including yourself, who is living or staying at this address for more than 2 months. Then complete the rest of the form.

FORM **ACS-1(INFO)(2011)KFI** (06-14-2010) OMB No. 0607-0810



Person 1

(Person 1 is the person living or staying here in whose name this house or apartment is owned, being bought, or rented. If there is no such person, start with the name of any adult living or staying here.)

1 **What is Person 1's name?**
Last Name *(Please print)* First Name MI

2 **How is this person related to Person 1?**
☒ Person 1

3 **What is Person 1's sex?** *Mark (X) ONE box.*
☐ Male ☐ Female

4 **What is Person 1's age and what is Person 1's date of birth?**
Please report babies as age 0 when the child is less than 1 year old.
Print numbers in boxes.
Age (in years) Month Day Year of birth

→ **NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this survey, Hispanic origins are not races.**

5 **Is Person 1 of Hispanic, Latino, or Spanish origin?**
☐ **No,** not of Hispanic, Latino, or Spanish origin
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, another Hispanic, Latino, or Spanish origin – *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.*

6 **What is Person 1's race?** *Mark (X) one or more boxes.*
☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*
☐ Asian Indian ☐ Japanese ☐ Native Hawaiian
☐ Chinese ☐ Korean ☐ Guamanian or Chamorro
☐ Filipino ☐ Vietnamese ☐ Samoan
☐ Other Asian – *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*
☐ Other Pacific Islander – *Print race, for example, Fijian, Tongan, and so on.*
☐ Some other race – *Print race.*

Person 2

1 **What is Person 2's name?**
Last Name *(Please print)* First Name MI

2 **How is this person related to Person 1?** *Mark (X) ONE box.*
☐ Husband or wife
☐ Biological son or daughter
☐ Adopted son or daughter
☐ Stepson or stepdaughter
☐ Brother or sister
☐ Father or mother
☐ Grandchild
☐ Parent-in-law
☐ Son-in-law or daughter-in-law
☐ Other relative
☐ Roomer or boarder
☐ Housemate or roommate
☐ Unmarried partner
☐ Foster child
☐ Other nonrelative

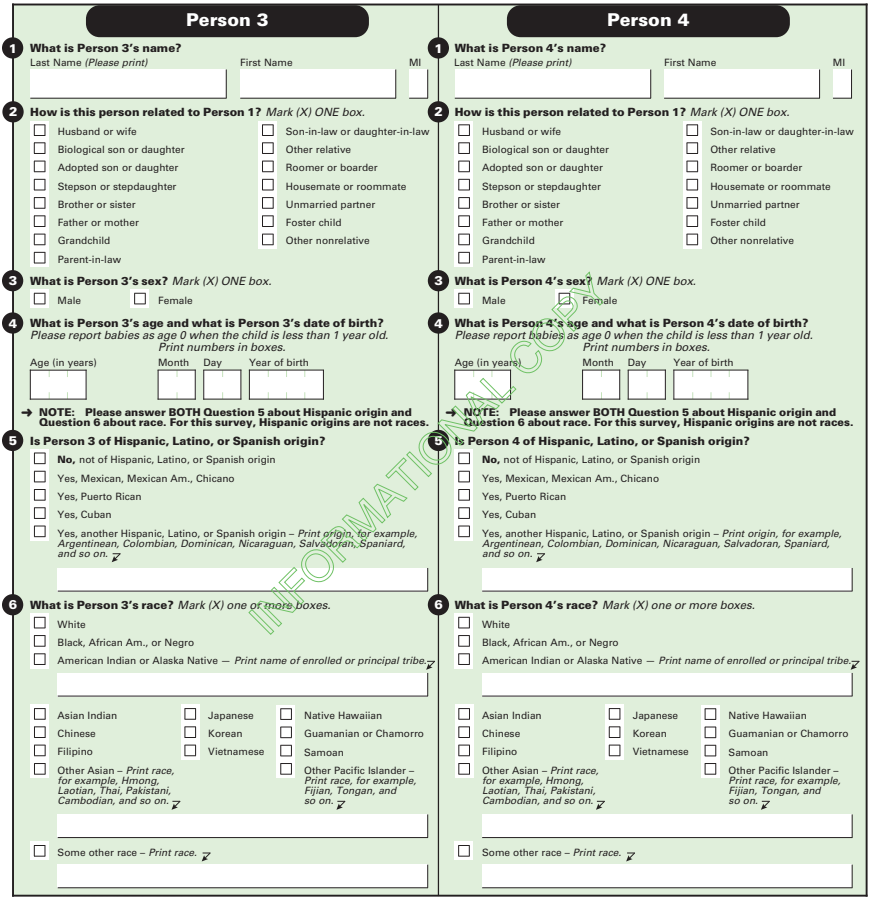
3 **What is Person 2's sex?** *Mark (X) ONE box.*
☐ Male ☐ Female

4 **What is Person 2's age and what is Person 2's date of birth?**
Please report babies as age 0 when the child is less than 1 year old.
Print numbers in boxes.
Age (in years) Month Day Year of birth

→ **NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this survey, Hispanic origins are not races.**

5 **Is Person 2 of Hispanic, Latino, or Spanish origin?**
☐ **No,** not of Hispanic, Latino, or Spanish origin
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, another Hispanic, Latino, or Spanish origin – *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.*

6 **What is Person 2's race?** *Mark (X) one or more boxes.*
☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*
☐ Asian Indian ☐ Japanese ☐ Native Hawaiian
☐ Chinese ☐ Korean ☐ Guamanian or Chamorro
☐ Filipino ☐ Vietnamese ☐ Samoan
☐ Other Asian – *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*
☐ Other Pacific Islander – *Print race, for example, Fijian, Tongan, and so on.*
☐ Some other race – *Print race.*



Person 3

1 What is Person 3's name?
Last Name *(Please print)* | First Name | MI

2 How is this person related to Person 1? *Mark (X) ONE box.*
- ☐ Husband or wife
- ☐ Biological son or daughter
- ☐ Adopted son or daughter
- ☐ Stepson or stepdaughter
- ☐ Brother or sister
- ☐ Father or mother
- ☐ Grandchild
- ☐ Parent-in-law
- ☐ Son-in-law or daughter-in-law
- ☐ Other relative
- ☐ Roomer or boarder
- ☐ Housemate or roommate
- ☐ Unmarried partner
- ☐ Foster child
- ☐ Other nonrelative

3 What is Person 3's sex? *Mark (X) ONE box.*
☐ Male ☐ Female

4 What is Person 3's age and what is Person 3's date of birth?
Please report babies as age 0 when the child is less than 1 year old. Print numbers in boxes.
Age (in years) | Month | Day | Year of birth

→ **NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this survey, Hispanic origins are not races.**

5 Is Person 3 of Hispanic, Latino, or Spanish origin?
- ☐ **No,** not of Hispanic, Latino, or Spanish origin
- ☐ Yes, Mexican, Mexican Am., Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, another Hispanic, Latino, or Spanish origin – *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.*

6 What is Person 3's race? *Mark (X) one or more boxes.*
- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*
- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Other Asian – *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander – *Print race, for example, Fijian, Tongan, and so on.*
- ☐ Some other race – *Print race.*

Person 4

1 What is Person 4's name?
Last Name *(Please print)* | First Name | MI

2 How is this person related to Person 1? *Mark (X) ONE box.*
- ☐ Husband or wife
- ☐ Biological son or daughter
- ☐ Adopted son or daughter
- ☐ Stepson or stepdaughter
- ☐ Brother or sister
- ☐ Father or mother
- ☐ Grandchild
- ☐ Parent-in-law
- ☐ Son-in-law or daughter-in-law
- ☐ Other relative
- ☐ Roomer or boarder
- ☐ Housemate or roommate
- ☐ Unmarried partner
- ☐ Foster child
- ☐ Other nonrelative

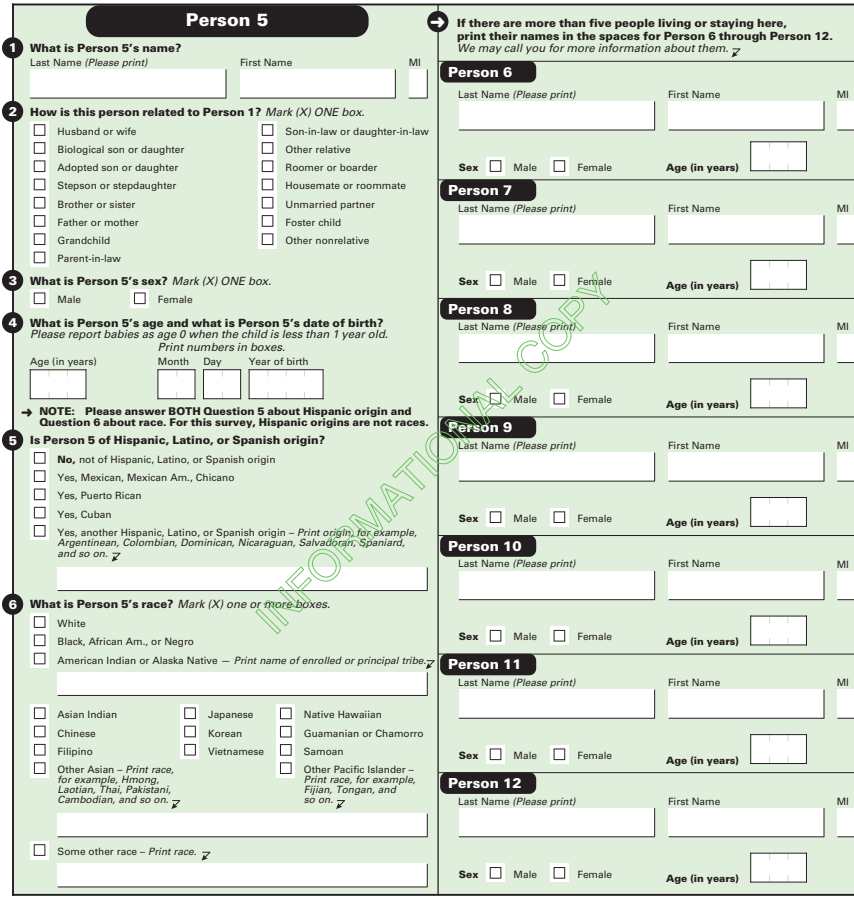
3 What is Person 4's sex? *Mark (X) ONE box.*
☐ Male ☐ Female

4 What is Person 4's age and what is Person 4's date of birth?
Please report babies as age 0 when the child is less than 1 year old. Print numbers in boxes.
Age (in years) | Month | Day | Year of birth

→ **NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this survey, Hispanic origins are not races.**

5 Is Person 4 of Hispanic, Latino, or Spanish origin?
- ☐ **No,** not of Hispanic, Latino, or Spanish origin
- ☐ Yes, Mexican, Mexican Am., Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, another Hispanic, Latino, or Spanish origin – *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.*

6 What is Person 4's race? *Mark (X) one or more boxes.*
- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*
- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Other Asian – *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander – *Print race, for example, Fijian, Tongan, and so on.*
- ☐ Some other race – *Print race.*



Person 5

1 What is Person 5's name?

Last Name *(Please print)* | First Name | MI

2 How is this person related to Person 1? *Mark (X) ONE box.*

- ☐ Husband or wife
- ☐ Biological son or daughter
- ☐ Adopted son or daughter
- ☐ Stepson or stepdaughter
- ☐ Brother or sister
- ☐ Father or mother
- ☐ Grandchild
- ☐ Parent-in-law
- ☐ Son-in-law or daughter-in-law
- ☐ Other relative
- ☐ Roomer or boarder
- ☐ Housemate or roommate
- ☐ Unmarried partner
- ☐ Foster child
- ☐ Other nonrelative

3 What is Person 5's sex? *Mark (X) ONE box.*

☐ Male ☐ Female

4 What is Person 5's age and what is Person 5's date of birth?
Please report babies as age 0 when the child is less than 1 year old. Print numbers in boxes.

Age (in years) | Month | Day | Year of birth

→ **NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this survey, Hispanic origins are not races.**

5 Is Person 5 of Hispanic, Latino, or Spanish origin?

- ☐ **No,** not of Hispanic, Latino, or Spanish origin
- ☐ Yes, Mexican, Mexican Am., Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, another Hispanic, Latino, or Spanish origin – *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.*

6 What is Person 5's race? *Mark (X) one or more boxes.*

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*
- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Other Asian – *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander – *Print race, for example, Fijian, Tongan, and so on.*
- ☐ Some other race – *Print race.*

→ **If there are more than five people living or staying here, print their names in the spaces for Person 6 through Person 12.** *We may call you for more information about them.*

Person 6

Last Name *(Please print)* | First Name | MI

Sex ☐ Male ☐ Female **Age (in years)**

Person 7

Last Name *(Please print)* | First Name | MI

Sex ☐ Male ☐ Female **Age (in years)**

Person 8

Last Name *(Please print)* | First Name | MI

Sex ☐ Male ☐ Female **Age (in years)**

Person 9

Last Name *(Please print)* | First Name | MI

Sex ☐ Male ☐ Female **Age (in years)**

Person 10

Last Name *(Please print)* | First Name | MI

Sex ☐ Male ☐ Female **Age (in years)**

Person 11

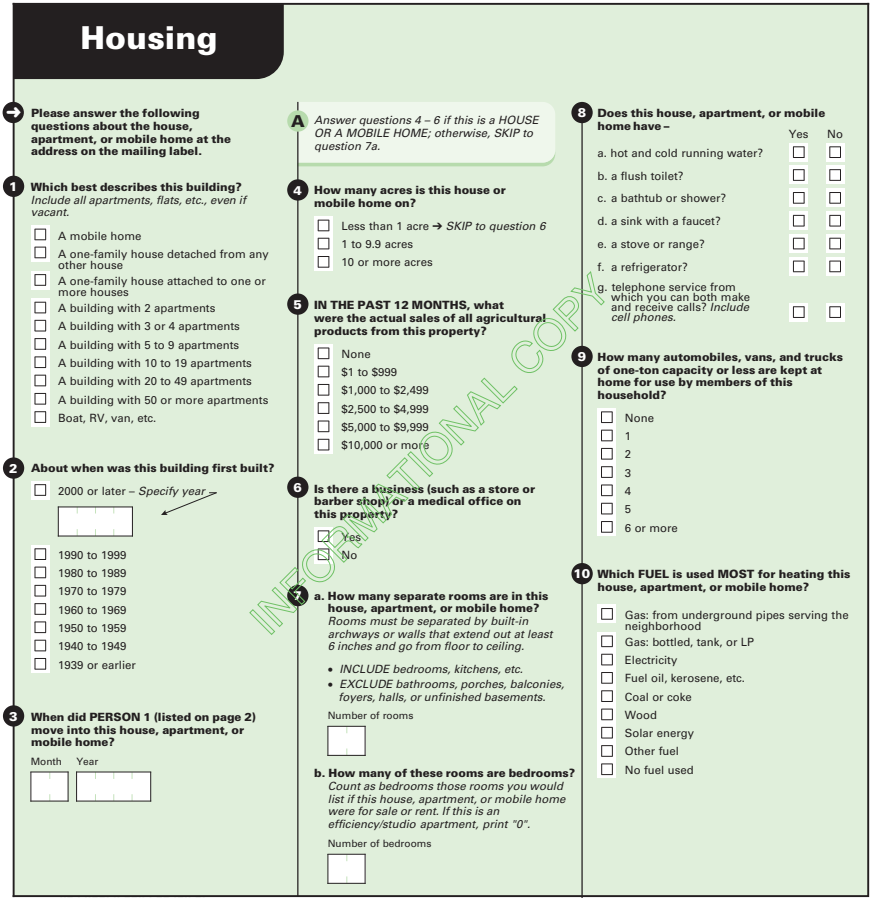
Last Name *(Please print)* | First Name | MI

Sex ☐ Male ☐ Female **Age (in years)**

Person 12

Last Name *(Please print)* | First Name | MI

Sex ☐ Male ☐ Female **Age (in years)**



Housing

Please answer the following questions about the house, apartment, or mobile home at the address on the mailing label.

1 Which best describes this building?
Include all apartments, flats, etc., even if vacant.

- ☐ A mobile home
- ☐ A one-family house detached from any other house
- ☐ A one-family house attached to one or more houses
- ☐ A building with 2 apartments
- ☐ A building with 3 or 4 apartments
- ☐ A building with 5 to 9 apartments
- ☐ A building with 10 to 19 apartments
- ☐ A building with 20 to 49 apartments
- ☐ A building with 50 or more apartments
- ☐ Boat, RV, van, etc.

2 About when was this building first built?

- ☐ 2000 or later – *Specify year* ____
- ☐ 1990 to 1999
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1960 to 1969
- ☐ 1950 to 1959
- ☐ 1940 to 1949
- ☐ 1939 or earlier

3 When did PERSON 1 (listed on page 2) move into this house, apartment, or mobile home?

Month ____ Year ____

A *Answer questions 4 – 6 if this is a HOUSE OR A MOBILE HOME; otherwise, SKIP to question 7a.*

4 How many acres is this house or mobile home on?

- ☐ Less than 1 acre → *SKIP to question 6*
- ☐ 1 to 9.9 acres
- ☐ 10 or more acres

5 IN THE PAST 12 MONTHS, what were the actual sales of all agricultural products from this property?

- ☐ None
- ☐ $1 to $999
- ☐ $1,000 to $2,499
- ☐ $2,500 to $4,999
- ☐ $5,000 to $9,999
- ☐ $10,000 or more

6 Is there a business (such as a store or barber shop) or a medical office on this property?

- ☐ Yes
- ☐ No

7 a. How many separate rooms are in this house, apartment, or mobile home?
Rooms must be separated by built-in archways or walls that extend out at least 6 inches and go from floor to ceiling.

- *INCLUDE bedrooms, kitchens, etc.*
- *EXCLUDE bathrooms, porches, balconies, foyers, halls, or unfinished basements.*

Number of rooms ____

b. How many of these rooms are bedrooms?
Count as bedrooms those rooms you would list if this house, apartment, or mobile home were for sale or rent. If this is an efficiency/studio apartment, print "0".

Number of bedrooms ____

8 Does this house, apartment, or mobile home have –

	Yes	No
a. hot and cold running water?	☐	☐
b. a flush toilet?	☐	☐
c. a bathtub or shower?	☐	☐
d. a sink with a faucet?	☐	☐
e. a stove or range?	☐	☐
f. a refrigerator?	☐	☐
g. telephone service from which you can both make and receive calls? *Include cell phones.*	☐	☐

9 How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of this household?

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6 or more

10 Which FUEL is used MOST for heating this house, apartment, or mobile home?

- ☐ Gas: from underground pipes serving the neighborhood
- ☐ Gas: bottled, tank, or LP
- ☐ Electricity
- ☐ Fuel oil, kerosene, etc.
- ☐ Coal or coke
- ☐ Wood
- ☐ Solar energy
- ☐ Other fuel
- ☐ No fuel used

Housing (continued)

11 a. LAST MONTH, what was the cost of electricity for this house, apartment, or mobile home?

Last month's cost – *Dollars*

$ .00

OR

☐ Included in rent or condominium fee
☐ No charge or electricity not used

b. LAST MONTH, what was the cost of gas for this house, apartment, or mobile home?

Last month's cost – *Dollars*

$ .00

OR

☐ Included in rent or condominium fee
☐ Included in electricity payment entered above
☐ No charge or gas not used

c. IN THE PAST 12 MONTHS, what was the cost of water and sewer for this house, apartment, or mobile home? *If you have lived here less than 12 months, estimate the cost.*

Past 12 months' cost – *Dollars*

$ .00

OR

☐ Included in rent or condominium fee
☐ No charge

d. IN THE PAST 12 MONTHS, what was the cost of oil, coal, kerosene, wood, etc., for this house, apartment, or mobile home? *If you have lived here less than 12 months, estimate the cost.*

Past 12 months' cost – *Dollars*

$ .00

OR

☐ Included in rent or condominium fee
☐ No charge or these fuels not used

12 IN THE PAST 12 MONTHS, did anyone in this household receive Food Stamps or a Food Stamp benefit card? *Include government benefits from the Supplemental Nutrition Assistance Program (SNAP). Do NOT include WIC or the National School Lunch Program.*

☐ Yes
☐ No

13 Is this house, apartment, or mobile home part of a condominium?

☐ Yes → **What is the monthly condominium fee?** *For renters, answer only if you pay the condominium fee in addition to your rent; otherwise, mark the "None" box.*

Monthly amount – *Dollars*

$ .00

OR

☐ None

☐ No

14 Is this house, apartment, or mobile home – *Mark (X) ONE box.*

☐ Owned by you or someone in this household with a mortgage or loan? *Include home equity loans.*
☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
☐ Rented?
☐ Occupied without payment of rent? → *SKIP to* **C**

B *Answer questions 15a and b if this house, apartment, or mobile home is RENTED. Otherwise, SKIP to question 16.*

15 a. What is the monthly rent for this house, apartment, or mobile home?

Monthly amount – *Dollars*

$ .00

b. Does the monthly rent include any meals?

☐ Yes
☐ No

C *Answer questions 16 – 20 if you or someone else in this household OWNS or IS BUYING this house, apartment, or mobile home. Otherwise, SKIP to* **E** *on the next page.*

16 About how much do you think this house and lot, apartment, or mobile home (and lot, if owned) would sell for if it were for sale?

Amount – *Dollars*

$ .00

17 What are the annual real estate taxes on THIS property?

Annual amount – *Dollars*

$ .00

OR

☐ None

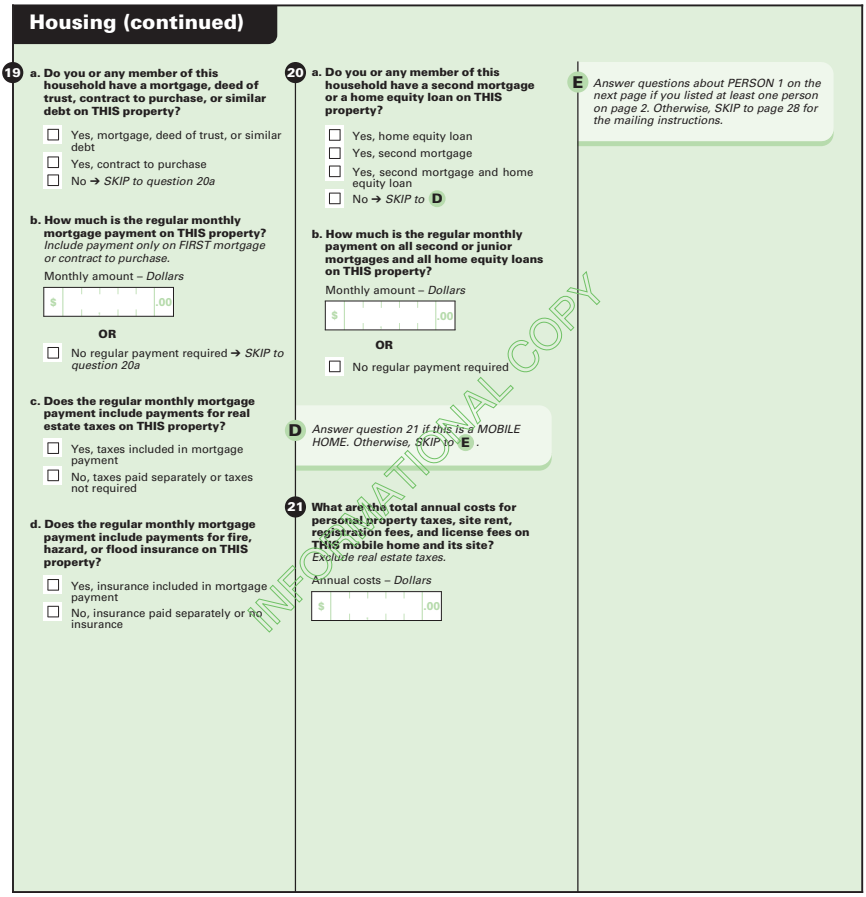
18 What is the annual payment for fire, hazard, and flood insurance on THIS property?

Annual amount – *Dollars*

$ .00

OR

☐ None



Housing (continued)

19 **a. Do you or any member of this household have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?**

- ☐ Yes, mortgage, deed of trust, or similar debt
- ☐ Yes, contract to purchase
- ☐ No → *SKIP to question 20a*

b. How much is the regular monthly mortgage payment on THIS property? *Include payment only on FIRST mortgage or contract to purchase.*

Monthly amount – *Dollars*

$ .00

OR

- ☐ No regular payment required → *SKIP to question 20a*

c. Does the regular monthly mortgage payment include payments for real estate taxes on THIS property?

- ☐ Yes, taxes included in mortgage payment
- ☐ No, taxes paid separately or taxes not required

d. Does the regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?

- ☐ Yes, insurance included in mortgage payment
- ☐ No, insurance paid separately or no insurance

20 **a. Do you or any member of this household have a second mortgage or a home equity loan on THIS property?**

- ☐ Yes, home equity loan
- ☐ Yes, second mortgage
- ☐ Yes, second mortgage and home equity loan
- ☐ No → *SKIP to* **D**

b. How much is the regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?

Monthly amount – *Dollars*

$ .00

OR

- ☐ No regular payment required

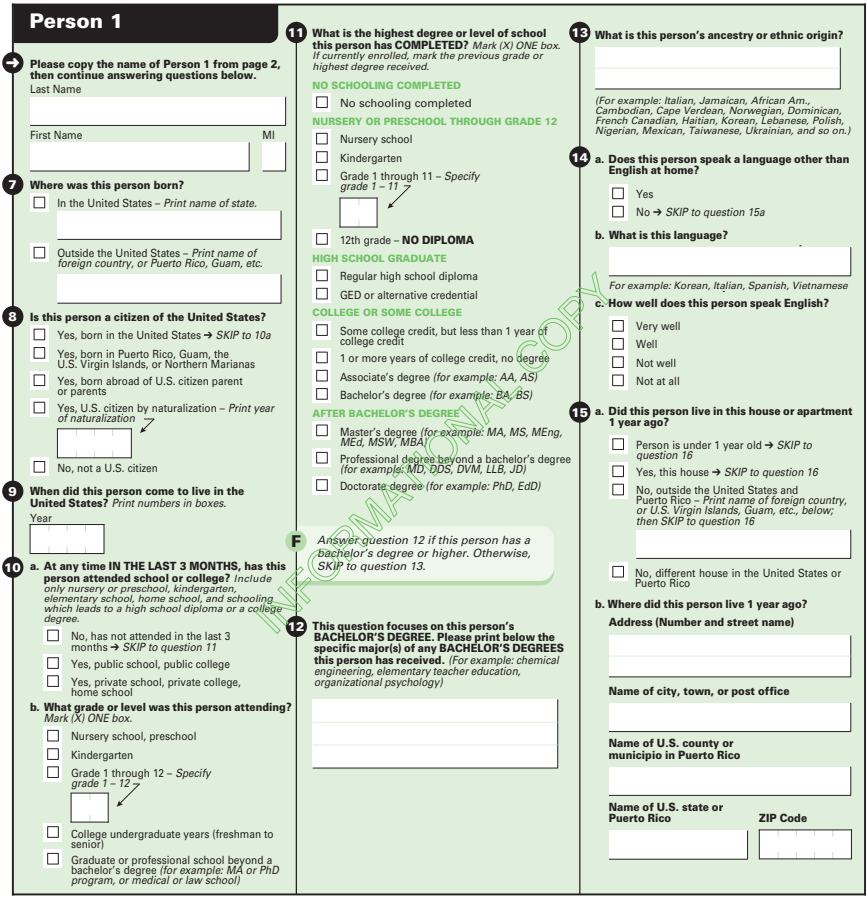
D *Answer question 21 if this is a MOBILE HOME. Otherwise, SKIP to* **E**.

21 **What are the total annual costs for personal property taxes, site rent, registration fees, and license fees on THIS mobile home and its site?** *Exclude real estate taxes.*

Annual costs – *Dollars*

$ .00

E *Answer questions about PERSON 1 on the next page if you listed at least one person on page 2. Otherwise, SKIP to page 28 for the mailing instructions.*



Person 1

Please copy the name of Person 1 from page 2, then continue answering questions below.

Last Name

First Name MI

7 Where was this person born?

- ☐ In the United States – *Print name of state.*
- ☐ Outside the United States – *Print name of foreign country, or Puerto Rico, Guam, etc.*

8 Is this person a citizen of the United States?

- ☐ Yes, born in the United States → *SKIP to 10a*
- ☐ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
- ☐ Yes, born abroad of U.S. citizen parent or parents
- ☐ Yes, U.S. citizen by naturalization – *Print year of naturalization*
- ☐ No, not a U.S. citizen

9 When did this person come to live in the United States? *Print numbers in boxes.*

Year

10 a. At any time IN THE LAST 3 MONTHS, has this person attended school or college? *Include only nursery or preschool, kindergarten, elementary school, home school, and schooling which leads to a high school diploma or a college degree.*

- ☐ No, has not attended in the last 3 months → *SKIP to question 11*
- ☐ Yes, public school, public college
- ☐ Yes, private school, private college, home school

b. What grade or level was this person attending? *Mark (X) ONE box.*

- ☐ Nursery school, preschool
- ☐ Kindergarten
- ☐ Grade 1 through 12 – *Specify grade 1 – 12*
- ☐ College undergraduate years (freshman to senior)
- ☐ Graduate or professional school beyond a bachelor's degree *(for example: MA or PhD program, or medical or law school)*

11 What is the highest degree or level of school this person has COMPLETED? *Mark (X) ONE box. If currently enrolled, mark the previous grade or highest degree received.*

NO SCHOOLING COMPLETED

- ☐ No schooling completed

NURSERY OR PRESCHOOL THROUGH GRADE 12

- ☐ Nursery school
- ☐ Kindergarten
- ☐ Grade 1 through 11 – *Specify grade 1 – 11*
- ☐ 12th grade – **NO DIPLOMA**

HIGH SCHOOL GRADUATE

- ☐ Regular high school diploma
- ☐ GED or alternative credential

COLLEGE OR SOME COLLEGE

- ☐ Some college credit, but less than 1 year of college credit
- ☐ 1 or more years of college credit, no degree
- ☐ Associate's degree *(for example: AA, AS)*
- ☐ Bachelor's degree *(for example: BA, BS)*

AFTER BACHELOR'S DEGREE

- ☐ Master's degree *(for example: MA, MS, MEng, MEd, MSW, MBA)*
- ☐ Professional degree beyond a bachelor's degree *(for example: MD, DDS, DVM, LLB, JD)*
- ☐ Doctorate degree *(for example: PhD, EdD)*

F *Answer question 12 if this person has a bachelor's degree or higher. Otherwise, SKIP to question 13.*

12 This question focuses on this person's BACHELOR'S DEGREE. Please print below the specific major(s) of any BACHELOR'S DEGREES this person has received. *(For example: chemical engineering, elementary teacher education, organizational psychology)*

13 What is this person's ancestry or ethnic origin?

(For example: Italian, Jamaican, African Am., Cambodian, Cape Verdean, Norwegian, Dominican, French Canadian, Haitian, Korean, Lebanese, Polish, Nigerian, Mexican, Taiwanese, Ukrainian, and so on.)

14 a. Does this person speak a language other than English at home?

- ☐ Yes
- ☐ No → *SKIP to question 15a*

b. What is this language?

For example: Korean, Italian, Spanish, Vietnamese

c. How well does this person speak English?

- ☐ Very well
- ☐ Well
- ☐ Not well
- ☐ Not at all

15 a. Did this person live in this house or apartment 1 year ago?

- ☐ Person is under 1 year old → *SKIP to question 16*
- ☐ Yes, this house → *SKIP to question 16*
- ☐ No, outside the United States and Puerto Rico – *Print name of foreign country, or U.S. Virgin Islands, Guam, etc., below; then SKIP to question 16*
- ☐ No, different house in the United States or Puerto Rico

b. Where did this person live 1 year ago?

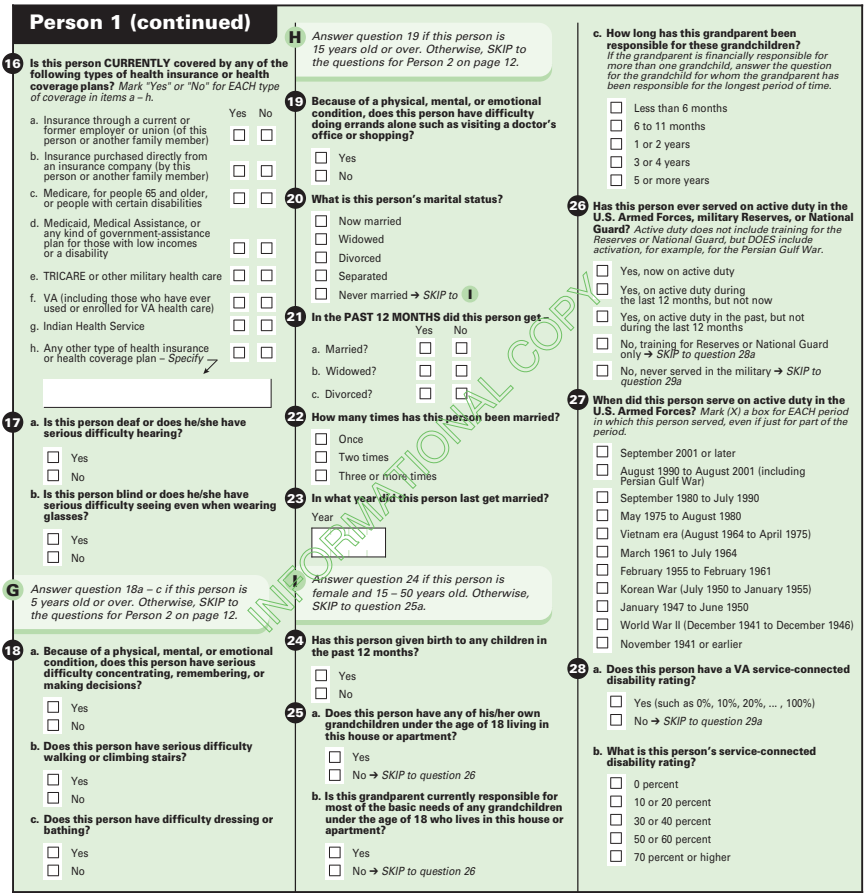
Address (Number and street name)

Name of city, town, or post office

Name of U.S. county or municipio in Puerto Rico

Name of U.S. state or Puerto Rico

ZIP Code



Person 1 (continued)

16 **Is this person CURRENTLY covered by any of the following types of health insurance or health coverage plans?** *Mark "Yes" or "No" for EACH type of coverage in items a – h.*

	Yes	No
a. Insurance through a current or former employer or union (of this person or another family member)	☐	☐
b. Insurance purchased directly from an insurance company (by this person or another family member)	☐	☐
c. Medicare, for people 65 and older, or people with certain disabilities	☐	☐
d. Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability	☐	☐
e. TRICARE or other military health care	☐	☐
f. VA (including those who have ever used or enrolled for VA health care)	☐	☐
g. Indian Health Service	☐	☐
h. Any other type of health insurance or health coverage plan – *Specify*	☐	☐

17 **a. Is this person deaf or does he/she have serious difficulty hearing?**

☐ Yes
☐ No

b. Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?

☐ Yes
☐ No

G *Answer question 18a – c if this person is 5 years old or over. Otherwise, SKIP to the questions for Person 2 on page 12.*

18 **a. Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?**

☐ Yes
☐ No

b. Does this person have serious difficulty walking or climbing stairs?

☐ Yes
☐ No

c. Does this person have difficulty dressing or bathing?

☐ Yes
☐ No

H *Answer question 19 if this person is 15 years old or over. Otherwise, SKIP to the questions for Person 2 on page 12.*

19 **Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?**

☐ Yes
☐ No

20 **What is this person's marital status?**

☐ Now married
☐ Widowed
☐ Divorced
☐ Separated
☐ Never married → *SKIP to* **I**

21 **In the PAST 12 MONTHS did this person get –**

	Yes	No
a. Married?	☐	☐
b. Widowed?	☐	☐
c. Divorced?	☐	☐

22 **How many times has this person been married?**

☐ Once
☐ Two times
☐ Three or more times

23 **In what year did this person last get married?**

Year

F *Answer question 24 if this person is female and 15 – 50 years old. Otherwise, SKIP to question 25a.*

24 **Has this person given birth to any children in the past 12 months?**

☐ Yes
☐ No

25 **a. Does this person have any of his/her own grandchildren under the age of 18 living in this house or apartment?**

☐ Yes
☐ No → *SKIP to question 26*

b. Is this grandparent currently responsible for most of the basic needs of any grandchildren under the age of 18 who lives in this house or apartment?

☐ Yes
☐ No → *SKIP to question 26*

c. How long has this grandparent been responsible for these grandchildren? *If the grandparent is financially responsible for more than one grandchild, answer the question for the grandchild for whom the grandparent has been responsible for the longest period of time.*

☐ Less than 6 months
☐ 6 to 11 months
☐ 1 or 2 years
☐ 3 or 4 years
☐ 5 or more years

26 **Has this person ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard?** *Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.*

☐ Yes, now on active duty
☐ Yes, on active duty during the last 12 months, but not now
☐ Yes, on active duty in the past, but not during the last 12 months
☐ No, training for Reserves or National Guard only → *SKIP to question 28a*
☐ No, never served in the military → *SKIP to question 29a*

27 **When did this person serve on active duty in the U.S. Armed Forces?** *Mark (X) a box for EACH period in which this person served, even if just for part of the period.*

☐ September 2001 or later
☐ August 1990 to August 2001 (including Persian Gulf War)
☐ September 1980 to July 1990
☐ May 1975 to August 1980
☐ Vietnam era (August 1964 to April 1975)
☐ March 1961 to July 1964
☐ February 1955 to February 1961
☐ Korean War (July 1950 to January 1955)
☐ January 1947 to June 1950
☐ World War II (December 1941 to December 1946)
☐ November 1941 or earlier

28 **a. Does this person have a VA service-connected disability rating?**

☐ Yes (such as 0%, 10%, 20%, ... , 100%)
☐ No → *SKIP to question 29a*

b. What is this person's service-connected disability rating?

☐ 0 percent
☐ 10 or 20 percent
☐ 30 or 40 percent
☐ 50 or 60 percent
☐ 70 percent or higher

Person 1 (continued)

29 a. LAST WEEK, did this person work for pay at a job (or business)?

- ☐ Yes → *SKIP to question 30*
- ☐ No – Did not work (or retired)

b. LAST WEEK, did this person do ANY work for pay, even for as little as one hour?

- ☐ Yes
- ☐ No → *SKIP to question 35a*

30 At what location did this person work LAST WEEK? *If this person worked at more than one location, print where he or she worked most last week.*

a. Address (Number and street name)

If the exact address is not known, give a description of the location such as the building name or the nearest street or intersection.

b. Name of city, town, or post office

c. Is the work location inside the limits of that city or town?

- ☐ Yes
- ☐ No, outside the city/town limits

d. Name of county

e. Name of U.S. state or foreign country

f. ZIP Code

31 How did this person usually get to work LAST WEEK? *If this person usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.*

- ☐ Car, truck, or van
- ☐ Bus or trolley bus
- ☐ Streetcar or trolley car
- ☐ Subway or elevated
- ☐ Railroad
- ☐ Ferryboat
- ☐ Taxicab
- ☐ Motorcycle
- ☐ Bicycle
- ☐ Walked
- ☐ Worked at home → *SKIP to question 39a*
- ☐ Other method

J *Answer question 32 if you marked "Car, truck, or van" in question 31. Otherwise, SKIP to question 33.*

32 How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

Person(s)

33 What time did this person usually leave home to go to work LAST WEEK?

Hour : Minute

- ☐ a.m.
- ☐ p.m.

34 How many minutes did it usually take this person to get from home to work LAST WEEK?

Minutes

K *Answer questions 35 – 38 if this person did NOT work last week. Otherwise, SKIP to question 39a.*

35 a. LAST WEEK, was this person on layoff from a job?

- ☐ Yes → *SKIP to question 35c*
- ☐ No

b. LAST WEEK, was this person TEMPORARILY absent from a job or business?

- ☐ Yes, on vacation, temporary illness, maternity leave, other family/personal reasons, bad weather, etc. → *SKIP to question 38*
- ☐ No → *SKIP to question 36*

c. Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?

- ☐ Yes → *SKIP to question 37*
- ☐ No

36 During the LAST 4 WEEKS, has this person been ACTIVELY looking for work?

- ☐ Yes
- ☐ No → *SKIP to question 38*

37 LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?

- ☐ Yes, could have gone to work
- ☐ No, because of own temporary illness
- ☐ No, because of all other reasons (in school, etc.)

38 When did this person last work, even for a few days?

- ☐ Within the past 12 months
- ☐ 1 to 5 years ago → *SKIP to* **L**
- ☐ Over 5 years ago or never worked → *SKIP to question 47*

39 a. During the PAST 12 MONTHS (52 weeks), did this person work 50 or more weeks? Count paid time off as work.

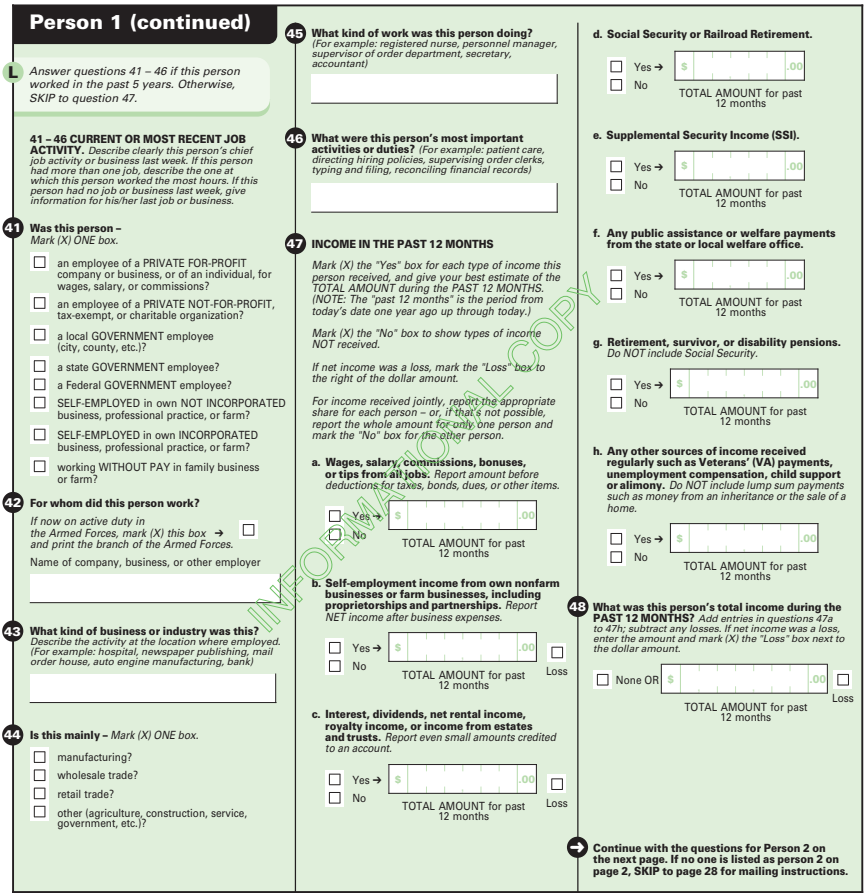
- ☐ Yes → *SKIP to question 40*
- ☐ No

b. How many weeks DID this person work, even for a few hours, including paid vacation, paid sick leave, and military service?

- ☐ 50 to 52 weeks
- ☐ 48 to 49 weeks
- ☐ 40 to 47 weeks
- ☐ 27 to 39 weeks
- ☐ 14 to 26 weeks
- ☐ 13 weeks or less

40 During the PAST 12 MONTHS, in the WEEKS WORKED, how many hours did this person usually work each WEEK?

Usual hours worked each WEEK



Person 1 (continued)

L *Answer questions 41 – 46 if this person worked in the past 5 years. Otherwise, SKIP to question 47.*

41 – 46 CURRENT OR MOST RECENT JOB ACTIVITY. *Describe clearly this person's chief job activity or business last week. If this person had more than one job, describe the one at which this person worked the most hours. If this person had no job or business last week, give information for his/her last job or business.*

41 Was this person – *Mark (X) ONE box.*

- ☐ an employee of a PRIVATE FOR-PROFIT company or business, or of an individual, for wages, salary, or commissions?
- ☐ an employee of a PRIVATE NOT-FOR-PROFIT, tax-exempt, or charitable organization?
- ☐ a local GOVERNMENT employee (city, county, etc.)?
- ☐ a state GOVERNMENT employee?
- ☐ a Federal GOVERNMENT employee?
- ☐ SELF-EMPLOYED in own NOT INCORPORATED business, professional practice, or farm?
- ☐ SELF-EMPLOYED in own INCORPORATED business, professional practice, or farm?
- ☐ working WITHOUT PAY in family business or farm?

42 For whom did this person work?

If now on active duty in the Armed Forces, mark (X) this box → ☐ *and print the branch of the Armed Forces.*

Name of company, business, or other employer

43 What kind of business or industry was this? *Describe the activity at the location where employed. (For example: hospital, newspaper publishing, mail order house, auto engine manufacturing, bank)*

44 Is this mainly – *Mark (X) ONE box.*

- ☐ manufacturing?
- ☐ wholesale trade?
- ☐ retail trade?
- ☐ other (agriculture, construction, service, government, etc.)?

45 What kind of work was this person doing? *(For example: registered nurse, personnel manager, supervisor of order department, secretary, accountant)*

46 What were this person's most important activities or duties? *(For example: patient care, directing hiring policies, supervising order clerks, typing and filing, reconciling financial records)*

47 INCOME IN THE PAST 12 MONTHS

Mark (X) the "Yes" box for each type of income this person received, and give your best estimate of the TOTAL AMOUNT during the PAST 12 MONTHS. (NOTE: The "past 12 months" is the period from today's date one year ago up through today.)

Mark (X) the "No" box to show types of income NOT received.

If net income was a loss, mark the "Loss" box to the right of the dollar amount.

For income received jointly, report the appropriate share for each person – or, if that's not possible, report the whole amount for only one person and mark the "No" box for the other person.

a. Wages, salary, commissions, bonuses, or tips from all jobs. *Report amount before deductions for taxes, bonds, dues, or other items.*

☐ Yes → $ .00
☐ No
TOTAL AMOUNT for past 12 months

b. Self-employment income from own nonfarm businesses or farm businesses, including proprietorships and partnerships. *Report NET income after business expenses.*

☐ Yes → $ .00 ☐ Loss
☐ No
TOTAL AMOUNT for past 12 months

c. Interest, dividends, net rental income, royalty income, or income from estates and trusts. *Report even small amounts credited to an account.*

☐ Yes → $ .00 ☐ Loss
☐ No
TOTAL AMOUNT for past 12 months

d. Social Security or Railroad Retirement.

☐ Yes → $ .00
☐ No
TOTAL AMOUNT for past 12 months

e. Supplemental Security Income (SSI).

☐ Yes → $ .00
☐ No
TOTAL AMOUNT for past 12 months

f. Any public assistance or welfare payments from the state or local welfare office.

☐ Yes → $ .00
☐ No
TOTAL AMOUNT for past 12 months

g. Retirement, survivor, or disability pensions. *Do NOT include Social Security.*

☐ Yes → $ .00
☐ No
TOTAL AMOUNT for past 12 months

h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support or alimony. *Do NOT include lump sum payments such as money from an inheritance or the sale of a home.*

☐ Yes → $ .00
☐ No
TOTAL AMOUNT for past 12 months

48 What was this person's total income during the PAST 12 MONTHS? *Add entries in questions 47a to 47h; subtract any losses. If net income was a loss, enter the amount and mark (X) the "Loss" box next to the dollar amount.*

☐ None OR $ .00 ☐ Loss
TOTAL AMOUNT for past 12 months

→ **Continue with the questions for Person 2 on the next page. If no one is listed as person 2 on page 2, SKIP to page 28 for mailing instructions.**

Person 2

The balance of the questionnaire has questions for Person 2, Person 3, Person 4, and Person 5. The questions are the same as the questions for Person 1.

Mailing Instructions

Please make sure you have...

- listed all names and answered the questions on pages 2, 3, and 4
- answered all Housing questions
- answered all Person questions for each person.

Then...

- put the completed questionnaire into the postage-paid return envelope. If the envelope has been misplaced, please mail the questionnaire to:
  U.S. Census Bureau
  P.O. Box 5240
  Jeffersonville, IN 47199-5240
- make sure the barcode above your address shows in the window of the return envelope.

Thank you for participating in the American Community Survey.

For Census Bureau Use

POP EDIT PHONE JIC1 JIC2

EDIT CLERK TELEPHONE CLERK JIC3 JIC4

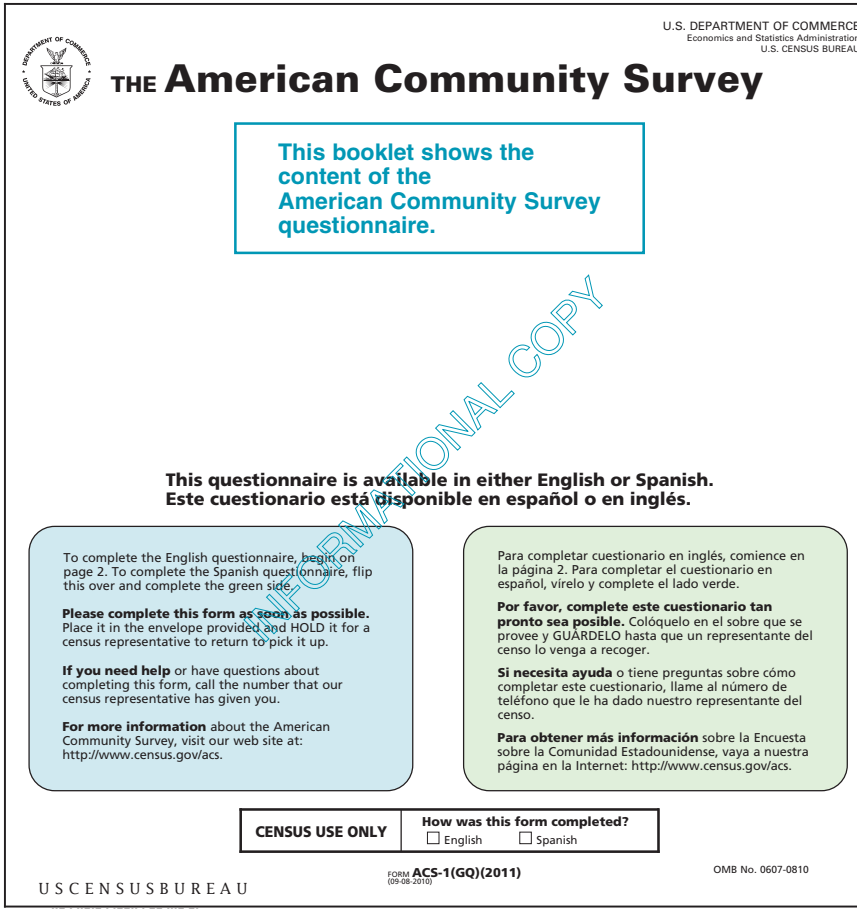
The Census Bureau estimates that, for the average household, this form will take 38 minutes to complete, including the time for reviewing the instructions and answers. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Paperwork Project 0607-0810, U.S. Census Bureau, 4600 Silver Hill Road, AMSD – 3K138, Washington, D.C. 20233. You may e-mail comments to Paperwork@census.gov; use "Paperwork Project 0607-0810" as the subject. Please DO NOT RETURN your questionnaire to this address. Use the enclosed preaddressed envelope to return your completed questionnaire.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget. This 8-digit number appears in the bottom right on the front cover of this form.

Form ACS-1(INFO)(2011)KFI (06-14-2010)

Appendix C

2011 American Community Survey: Group Quarters Questionnaire



U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

THE American Community Survey

This booklet shows the content of the American Community Survey questionnaire.

This questionnaire is available in either English or Spanish.
Este cuestionario está disponible en español o en inglés.

To complete the English questionnaire, begin on page 2. To complete the Spanish questionnaire, flip this over and complete the green side.

Please complete this form as soon as possible. Place it in the envelope provided and HOLD it for a census representative to return to pick it up.

If you need help or have questions about completing this form, call the number that our census representative has given you.

For more information about the American Community Survey, visit our web site at: http://www.census.gov/acs.

Para completar cuestionario en inglés, comience en la página 2. Para completar el cuestionario en español, vírelo y complete el lado verde.

Por favor, complete este cuestionario tan pronto sea posible. Colóquelo en el sobre que se provee y GUÁRDELO hasta que un representante del censo lo venga a recoger.

Si necesita ayuda o tiene preguntas sobre cómo completar este cuestionario, llame al número de teléfono que le ha dado nuestro representante del censo.

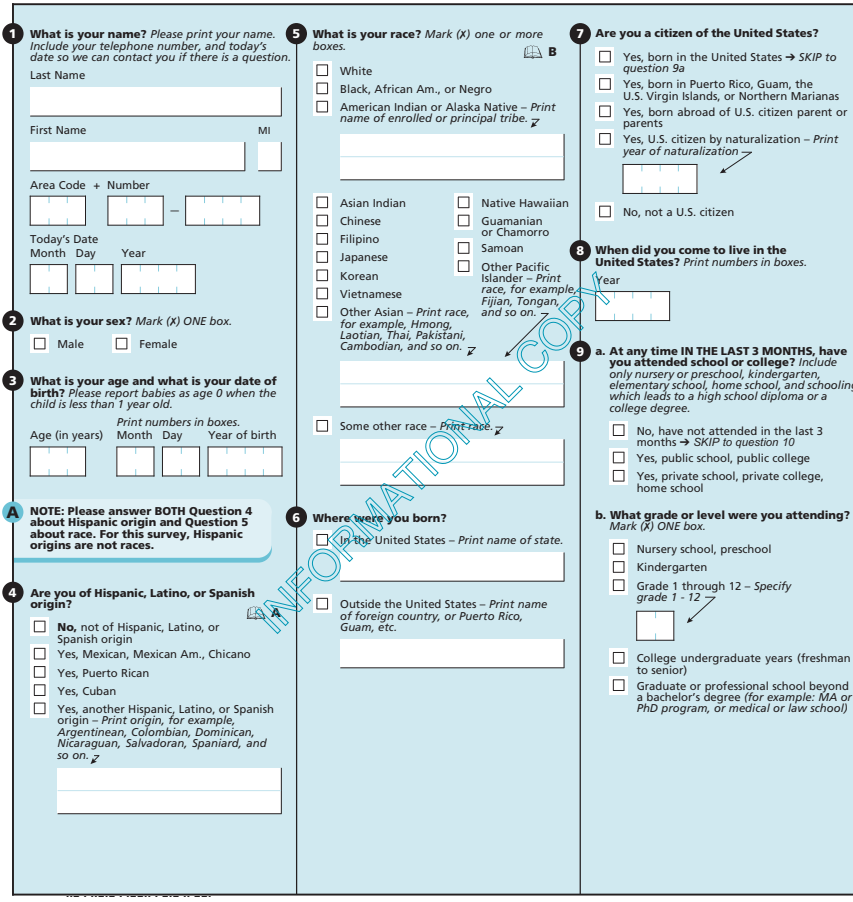
Para obtener más información sobre la Encuesta sobre la Comunidad Estadounidense, vaya a nuestra página en la Internet: http://www.census.gov/acs.

CENSUS USE ONLY	How was this form completed? ☐ English ☐ Spanish

USCENSUSBUREAU

FORM ACS-1(GQ)(2011) (09-08-2010)

OMB No. 0607-0810



1 **What is your name?** *Please print your name. Include your telephone number, and today's date so we can contact you if there is a question.*

Last Name

First Name MI

Area Code + Number

Today's Date
Month Day Year

2 **What is your sex?** *Mark (X) ONE box.*

☐ Male ☐ Female

3 **What is your age and what is your date of birth?** *Please report babies as age 0 when the child is less than 1 year old.*

Print numbers in boxes.
Age (in years) Month Day Year of birth

A **NOTE: Please answer BOTH Question 4 about Hispanic origin and Question 5 about race. For this survey, Hispanic origins are not races.**

4 **Are you of Hispanic, Latino, or Spanish origin?** A

☐ **No,** not of Hispanic, Latino, or Spanish origin
☐ Yes, Mexican, Mexican Am., Chicano
☐ Yes, Puerto Rican
☐ Yes, Cuban
☐ Yes, another Hispanic, Latino, or Spanish origin – *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.*

5 **What is your race?** *Mark (X) one or more boxes.* B

☐ White
☐ Black, African Am., or Negro
☐ American Indian or Alaska Native – *Print name of enrolled or principal tribe.*

☐ Asian Indian
☐ Chinese
☐ Filipino
☐ Japanese
☐ Korean
☐ Vietnamese
☐ Other Asian – *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*

☐ Native Hawaiian
☐ Guamanian or Chamorro
☐ Samoan
☐ Other Pacific Islander – *Print race, for example, Fijian, Tongan, and so on.*

☐ Some other race – *Print race.*

6 **Where were you born?**

☐ In the United States – *Print name of state.*

☐ Outside the United States – *Print name of foreign country, or Puerto Rico, Guam, etc.*

7 **Are you a citizen of the United States?**

☐ Yes, born in the United States → *SKIP to question 9a*
☐ Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
☐ Yes, born abroad of U.S. citizen parent or parents
☐ Yes, U.S. citizen by naturalization – *Print year of naturalization*
☐ No, not a U.S. citizen

8 **When did you come to live in the United States?** *Print numbers in boxes.*

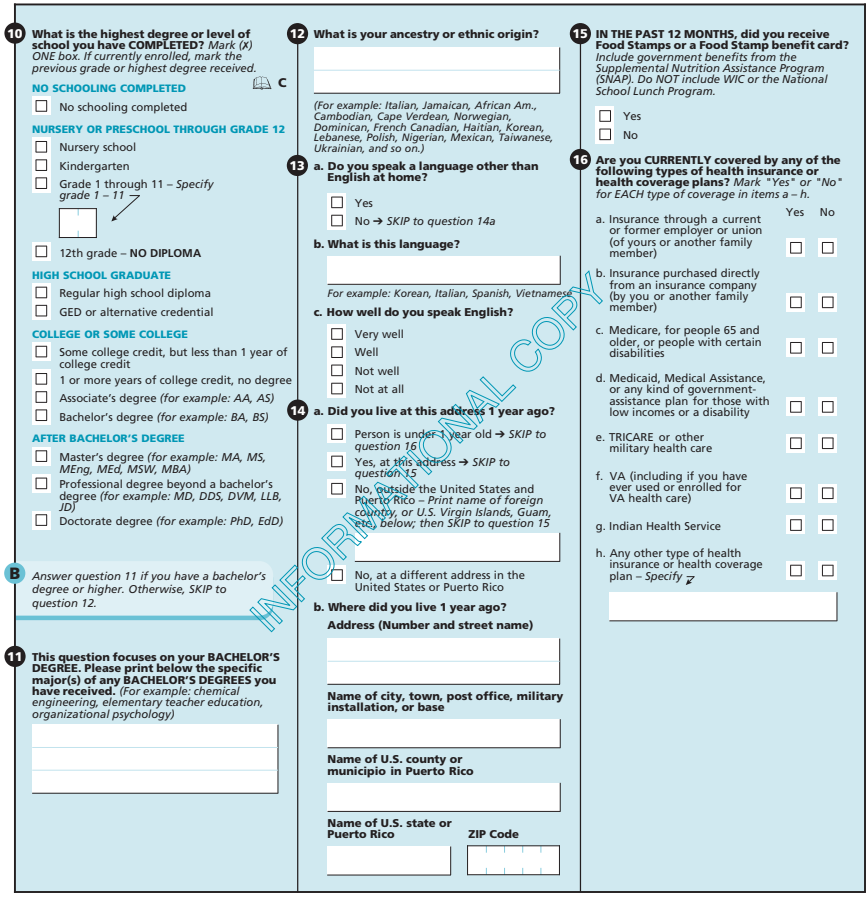
Year

9 **a. At any time IN THE LAST 3 MONTHS, have you attended school or college?** *Include only nursery or preschool, kindergarten, elementary school, home school, and schooling which leads to a high school diploma or a college degree.*

☐ No, have not attended in the last 3 months → *SKIP to question 10*
☐ Yes, public school, public college
☐ Yes, private school, private college, home school

b. What grade or level were you attending? *Mark (X) ONE box.*

☐ Nursery school, preschool
☐ Kindergarten
☐ Grade 1 through 12 – *Specify grade 1 - 12*
☐ College undergraduate years (freshman to senior)
☐ Graduate or professional school beyond a bachelor's degree *(for example: MA or PhD program, or medical or law school)*



10 **What is the highest degree or level of school you have COMPLETED?** *Mark (X) ONE box. If currently enrolled, mark the previous grade or highest degree received.*

C

NO SCHOOLING COMPLETED

- ☐ No schooling completed

NURSERY OR PRESCHOOL THROUGH GRADE 12

- ☐ Nursery school
- ☐ Kindergarten
- ☐ Grade 1 through 11 – *Specify grade 1 – 11*
- ☐ 12th grade – **NO DIPLOMA**

HIGH SCHOOL GRADUATE

- ☐ Regular high school diploma
- ☐ GED or alternative credential

COLLEGE OR SOME COLLEGE

- ☐ Some college credit, but less than 1 year of college credit
- ☐ 1 or more years of college credit, no degree
- ☐ Associate's degree *(for example: AA, AS)*
- ☐ Bachelor's degree *(for example: BA, BS)*

AFTER BACHELOR'S DEGREE

- ☐ Master's degree *(for example: MA, MS, MEng, MEd, MSW, MBA)*
- ☐ Professional degree beyond a bachelor's degree *(for example: MD, DDS, DVM, LLB, JD)*
- ☐ Doctorate degree *(for example: PhD, EdD)*

B *Answer question 11 if you have a bachelor's degree or higher. Otherwise, SKIP to question 12.*

11 **This question focuses on your BACHELOR'S DEGREE. Please print below the specific major(s) of any BACHELOR'S DEGREES you have received.** *(For example: chemical engineering, elementary teacher education, organizational psychology)*

12 **What is your ancestry or ethnic origin?**

(For example: Italian, Jamaican, African Am., Cambodian, Cape Verdean, Norwegian, Dominican, French Canadian, Haitian, Korean, Lebanese, Polish, Nigerian, Mexican, Taiwanese, Ukrainian, and so on.)

13 **a. Do you speak a language other than English at home?**

- ☐ Yes
- ☐ No → *SKIP to question 14a*

b. What is this language?

For example: Korean, Italian, Spanish, Vietnamese

c. How well do you speak English?

- ☐ Very well
- ☐ Well
- ☐ Not well
- ☐ Not at all

14 **a. Did you live at this address 1 year ago?**

- ☐ Person is under 1 year old → *SKIP to question 16*
- ☐ Yes, at this address → *SKIP to question 15*
- ☐ No, outside the United States and Puerto Rico – *Print name of foreign country, or U.S. Virgin Islands, Guam, etc, below; then SKIP to question 15*
- ☐ No, at a different address in the United States or Puerto Rico

b. Where did you live 1 year ago?

Address (Number and street name)

Name of city, town, post office, military installation, or base

Name of U.S. county or municipio in Puerto Rico

Name of U.S. state or Puerto Rico

ZIP Code

15 **IN THE PAST 12 MONTHS, did you receive Food Stamps or a Food Stamp benefit card?** *Include government benefits from the Supplemental Nutrition Assistance Program (SNAP). Do NOT include WIC or the National School Lunch Program.*

- ☐ Yes
- ☐ No

16 **Are you CURRENTLY covered by any of the following types of health insurance or health coverage plans?** *Mark "Yes" or "No" for EACH type of coverage in items a – h.*

	Yes	No
a. Insurance through a current or former employer or union (of yours or another family member)	☐	☐
b. Insurance purchased directly from an insurance company (by you or another family member)	☐	☐
c. Medicare, for people 65 and older, or people with certain disabilities	☐	☐
d. Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability	☐	☐
e. TRICARE or other military health care	☐	☐
f. VA (including if you have ever used or enrolled for VA health care)	☐	☐
g. Indian Health Service	☐	☐
h. Any other type of health insurance or health coverage plan – *Specify*	☐	☐

17 a. Are you deaf or do you have serious difficulty hearing?

- ☐ Yes
- ☐ No

b. Are you blind or do you have serious difficulty seeing even when wearing glasses?

- ☐ Yes
- ☐ No

C *Answer question 18a – c if you are 5 years old or over. Otherwise, SKIP to* **I** *on page 7 for further instructions; do not answer any more questions.*

18 a. Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?

- ☐ Yes
- ☐ No

b. Do you have serious difficulty walking or climbing stairs?

- ☐ Yes
- ☐ No

c. Do you have difficulty dressing or bathing?

- ☐ Yes
- ☐ No

D *Answer question 19 if you are 15 years old or over. Otherwise, SKIP to* **I** *on page 7 for further instructions; do not answer any more questions.*

19 Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?

- ☐ Yes
- ☐ No

20 What is your marital status?

- ☐ Now married
- ☐ Widowed
- ☐ Divorced
- ☐ Separated
- ☐ Never married → *SKIP to* **E**

21 In the PAST 12 MONTHS did you get –

	Yes	No
a. Married?	☐	☐
b. Widowed?	☐	☐
c. Divorced?	☐	☐

22 How many times have you been married?

- ☐ Once
- ☐ Two times
- ☐ Three or more times

23 In what year did you last get married?

Year

E *Answer question 24 if you are female and 15 – 50 years old. Otherwise, SKIP to question 25a.*

24 Have you given birth to any children in the past 12 months?

- ☐ Yes
- ☐ No

25 a. Do you have any of your own grandchildren under the age of 18 living in this place?

- ☐ Yes
- ☐ No → *SKIP to question 26*

b. Are you currently responsible for most of the basic needs of any grandchildren under the age of 18 who lives in this place?

- ☐ Yes
- ☐ No → *SKIP to question 26*

c. How long have you been responsible for these grandchildren? *If you are financially responsible for more than one grandchild, answer the question for the grandchild for whom you have been responsible for the longest period of time.*

- ☐ Less than 6 months
- ☐ 6 to 11 months
- ☐ 1 or 2 years
- ☐ 3 or 4 years
- ☐ 5 or more years

26 Have you ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? *Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.*

- ☐ Yes, now on active duty
- ☐ Yes, on active duty during the last 12 months, but not now
- ☐ Yes, on active duty in the past, but not during the last 12 months
- ☐ No, training for Reserves or National Guard only → *SKIP to question 28a*
- ☐ No, never served in the military → *SKIP to question 29a*

27 When did you serve on active duty in the U.S. Armed Forces? *Mark (X) a box for EACH period in which you served, even if just for part of the period.* **D**

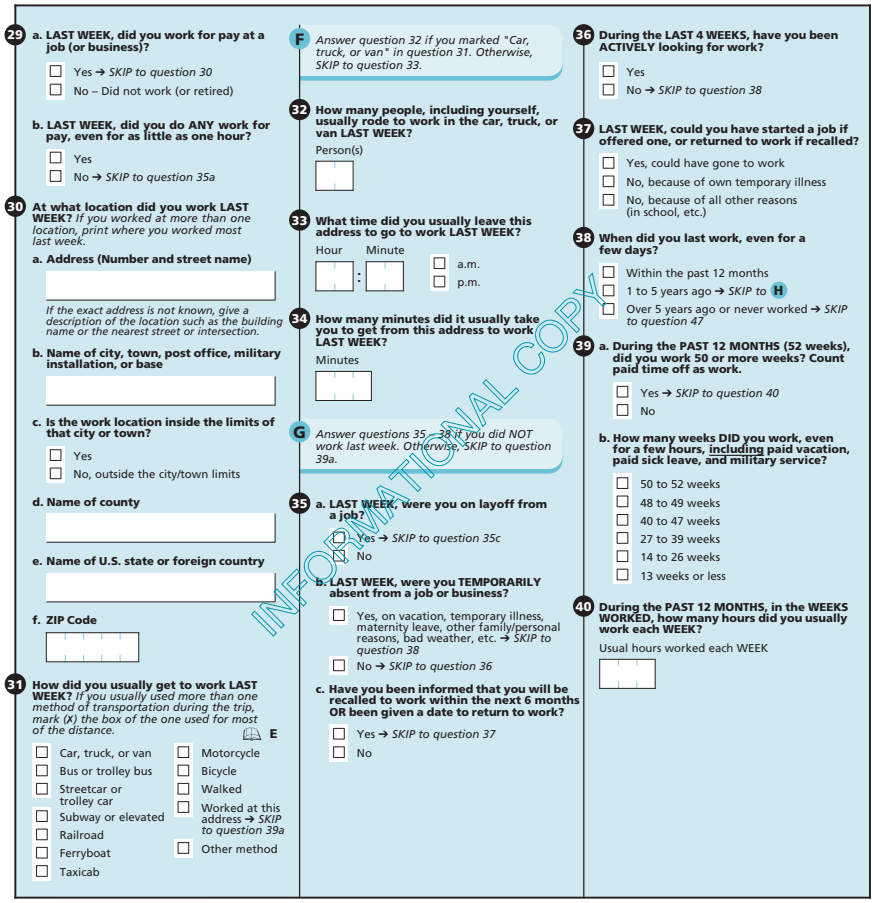
- ☐ September 2001 or later
- ☐ August 1990 to August 2001 (including Persian Gulf War)
- ☐ September 1980 to July 1990
- ☐ May 1975 to August 1980
- ☐ Vietnam era (August 1964 to April 1975)
- ☐ March 1961 to July 1964
- ☐ February 1955 to February 1961
- ☐ Korean War (July 1950 to January 1955)
- ☐ January 1947 to June 1950
- ☐ World War II (December 1941 to December 1946)
- ☐ November 1941 or earlier

28 a. Do you have a VA service-connected disability rating?

- ☐ Yes (such as 0%, 10%, 20%, ... , 100%)
- ☐ No → *SKIP to question 29a*

b. What is your service-connected disability rating?

- ☐ 0 percent
- ☐ 10 or 20 percent
- ☐ 30 or 40 percent
- ☐ 50 or 60 percent
- ☐ 70 percent or higher



29 a. LAST WEEK, did you work for pay at a job (or business)?
- ☐ Yes → *SKIP to question 30*
- ☐ No – Did not work (or retired)

b. LAST WEEK, did you do ANY work for pay, even for as little as one hour?
- ☐ Yes
- ☐ No → *SKIP to question 35a*

30 At what location did you work LAST WEEK? *If you worked at more than one location, print where you worked most last week.*

a. Address (Number and street name)

If the exact address is not known, give a description of the location such as the building name or the nearest street or intersection.

b. Name of city, town, post office, military installation, or base

c. Is the work location inside the limits of that city or town?
- ☐ Yes
- ☐ No, outside the city/town limits

d. Name of county

e. Name of U.S. state or foreign country

f. ZIP Code

31 How did you usually get to work LAST WEEK? *If you usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.* E
- ☐ Car, truck, or van
- ☐ Bus or trolley bus
- ☐ Streetcar or trolley car
- ☐ Subway or elevated
- ☐ Railroad
- ☐ Ferryboat
- ☐ Taxicab
- ☐ Motorcycle
- ☐ Bicycle
- ☐ Walked
- ☐ Worked at this address → *SKIP to question 39a*
- ☐ Other method

F *Answer question 32 if you marked "Car, truck, or van" in question 31. Otherwise, SKIP to question 33.*

32 How many people, including yourself, usually rode to work in the car, truck, or van LAST WEEK?

Person(s)

33 What time did you usually leave this address to go to work LAST WEEK?

Hour : Minute
- ☐ a.m.
- ☐ p.m.

34 How many minutes did it usually take you to get from this address to work LAST WEEK?

Minutes

G *Answer questions 35 – 38 if you did NOT work last week. Otherwise, SKIP to question 39a.*

35 a. LAST WEEK, were you on layoff from a job?
- ☐ Yes → *SKIP to question 35c*
- ☐ No

b. LAST WEEK, were you TEMPORARILY absent from a job or business?
- ☐ Yes, on vacation, temporary illness, maternity leave, other family/personal reasons, bad weather, etc. → *SKIP to question 38*
- ☐ No → *SKIP to question 36*

c. Have you been informed that you will be recalled to work within the next 6 months OR been given a date to return to work?
- ☐ Yes → *SKIP to question 37*
- ☐ No

36 During the LAST 4 WEEKS, have you been ACTIVELY looking for work?
- ☐ Yes
- ☐ No → *SKIP to question 38*

37 LAST WEEK, could you have started a job if offered one, or returned to work if recalled?
- ☐ Yes, could have gone to work
- ☐ No, because of own temporary illness
- ☐ No, because of all other reasons (in school, etc.)

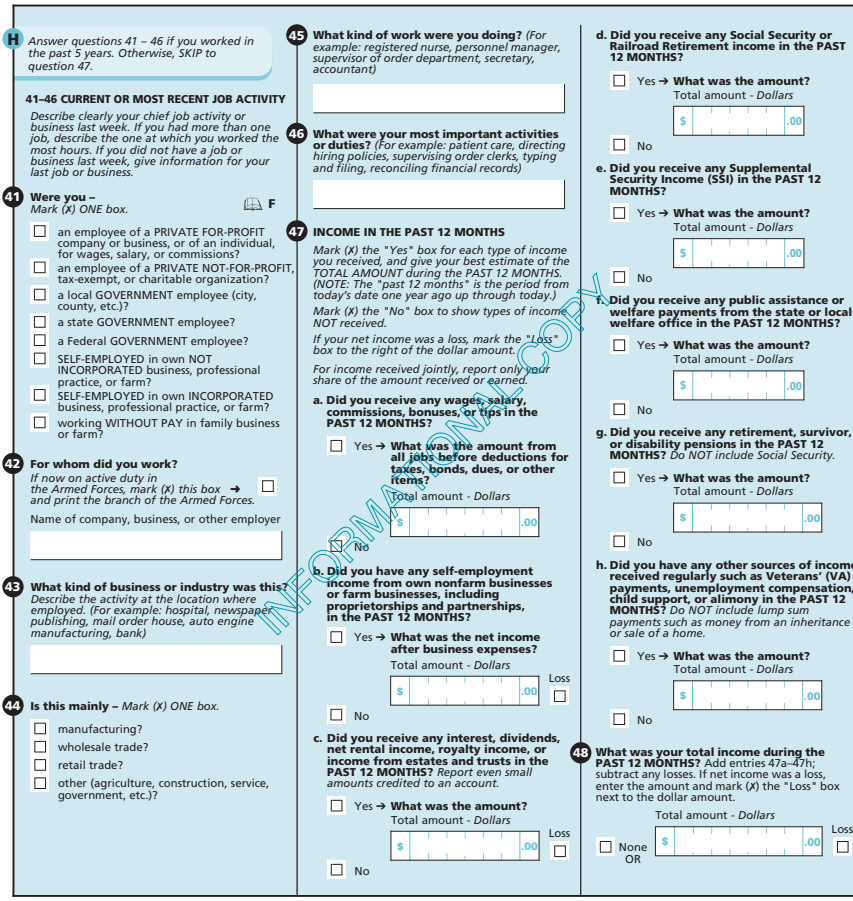
38 When did you last work, even for a few days?
- ☐ Within the past 12 months
- ☐ 1 to 5 years ago → *SKIP to* H
- ☐ Over 5 years ago or never worked → *SKIP to question 47*

39 a. During the PAST 12 MONTHS (52 weeks), did you work 50 or more weeks? Count paid time off as work.
- ☐ Yes → *SKIP to question 40*
- ☐ No

b. How many weeks DID you work, even for a few hours, including paid vacation, paid sick leave, and military service?
- ☐ 50 to 52 weeks
- ☐ 48 to 49 weeks
- ☐ 40 to 47 weeks
- ☐ 27 to 39 weeks
- ☐ 14 to 26 weeks
- ☐ 13 weeks or less

40 During the PAST 12 MONTHS, in the WEEKS WORKED, how many hours did you usually work each WEEK?

Usual hours worked each WEEK



H *Answer questions 41 – 46 if you worked in the past 5 years. Otherwise, SKIP to question 47.*

41–46 CURRENT OR MOST RECENT JOB ACTIVITY

Describe clearly your chief job activity or business last week. If you had more than one job, describe the one at which you worked the most hours. If you did not have a job or business last week, give information for your last job or business.

41 **Were you –** *Mark (X) ONE box.* F

- ☐ an employee of a PRIVATE FOR-PROFIT company or business, or of an individual, for wages, salary, or commissions?
- ☐ an employee of a PRIVATE NOT-FOR-PROFIT, tax-exempt, or charitable organization?
- ☐ a local GOVERNMENT employee (city, county, etc.)?
- ☐ a state GOVERNMENT employee?
- ☐ a Federal GOVERNMENT employee?
- ☐ SELF-EMPLOYED in own NOT INCORPORATED business, professional practice, or farm?
- ☐ SELF-EMPLOYED in own INCORPORATED business, professional practice, or farm?
- ☐ working WITHOUT PAY in family business or farm?

42 **For whom did you work?**

If now on active duty in the Armed Forces, mark (X) this box ➔ ☐ *and print the branch of the Armed Forces.*

Name of company, business, or other employer

43 **What kind of business or industry was this?** *Describe the activity at the location where employed. (For example: hospital, newspaper publishing, mail order house, auto engine manufacturing, bank)*

44 **Is this mainly –** *Mark (X) ONE box.*

- ☐ manufacturing?
- ☐ wholesale trade?
- ☐ retail trade?
- ☐ other (agriculture, construction, service, government, etc.)?

45 **What kind of work were you doing?** *(For example: registered nurse, personnel manager, supervisor of order department, secretary, accountant)*

46 **What were your most important activities or duties?** *(For example: patient care, directing hiring policies, supervising order clerks, typing and filing, reconciling financial records)*

47 **INCOME IN THE PAST 12 MONTHS**

Mark (X) the "Yes" box for each type of income you received, and give your best estimate of the TOTAL AMOUNT during the PAST 12 MONTHS. (NOTE: The "past 12 months" is the period from today's date one year ago up through today.)

Mark (X) the "No" box to show types of income NOT received.

If your net income was a loss, mark the "Loss" box to the right of the dollar amount.

For income received jointly, report only your share of the amount received or earned.

a. Did you receive any wages, salary, commissions, bonuses, or tips in the PAST 12 MONTHS?

☐ Yes ➔ **What was the amount from all jobs before deductions for taxes, bonds, dues, or other items?**
Total amount - *Dollars* $ .00

☐ No

b. Did you have any self-employment income from own nonfarm businesses or farm businesses, including proprietorships and partnerships, in the PAST 12 MONTHS?

☐ Yes ➔ **What was the net income after business expenses?**
Total amount - *Dollars* $ .00 Loss ☐

☐ No

c. Did you receive any interest, dividends, net rental income, royalty income, or income from estates and trusts in the PAST 12 MONTHS? *Report even small amounts credited to an account.*

☐ Yes ➔ **What was the amount?**
Total amount - *Dollars* $ .00 Loss ☐

☐ No

d. Did you receive any Social Security or Railroad Retirement income in the PAST 12 MONTHS?

☐ Yes ➔ **What was the amount?**
Total amount - *Dollars* $ .00

☐ No

e. Did you receive any Supplemental Security Income (SSI) in the PAST 12 MONTHS?

☐ Yes ➔ **What was the amount?**
Total amount - *Dollars* $ .00

☐ No

f. Did you receive any public assistance or welfare payments from the state or local welfare office in the PAST 12 MONTHS?

☐ Yes ➔ **What was the amount?**
Total amount - *Dollars* $ .00

☐ No

g. Did you receive any retirement, survivor, or disability pensions in the PAST 12 MONTHS? *Do NOT include Social Security.*

☐ Yes ➔ **What was the amount?**
Total amount - *Dollars* $ .00

☐ No

h. Did you have any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony in the PAST 12 MONTHS? *Do NOT include lump sum payments such as money from an inheritance or sale of a home.*

☐ Yes ➔ **What was the amount?**
Total amount - *Dollars* $ .00

☐ No

48 **What was your total income during the PAST 12 MONTHS?** Add entries 47a–47h; subtract any losses. If net income was a loss, enter the amount and mark (X) the "Loss" box next to the dollar amount.

Total amount - *Dollars* $ .00 Loss ☐

☐ None OR

Thank you very much for your participation.

Place the questionnaire in the envelope and HOLD for your Census Bureau Representative to pick up.

The Census Bureau estimates that this form will take about 25 minutes to complete, including the time for reviewing the instructions and answers. Send comments regarding this burden estimate, including suggestions for reducing this burden, to: Paperwork Reduction Project 0607-0810, U.S. Census Bureau, 4600 Silver Hill Road, AMSD-3K138, Washington, DC 20233. You may email comments to Paperwork@census.gov; use "Paperwork Project 0607-0810" as the subject.

Respondents are not required to respond to any information collection unless it displays a valid approval number from the Office of Management and Budget. This 8-digit number appears in the bottom right on the front cover of this form.

Appendix D

2005-2009 American Community Survey 5-Year Estimates Data Tables That Highlight the Group Quarters Population in Virginia

B26001: Group Quarters Population in Virginia

	Estimate	Margin of Error
Total	251,365	*****

B09001: Population Under 18 Years of Age in Virginia

	Estimate	Margin of Error
Total	1,831,470	+/–1,131
In households	1,825,930	+/–1,518
Under 3 years	309,657	+/–2,952
3 and 4 years	211,419	+/–2,810
5 years	98,457	+/–2,324
6 to 8 years	294,749	+/–3,337
9 to 11 years	295,298	+/–3,201
12 to 14 years	306,584	+/–3,053
15 to 17 years	309,766	+/–1,016
In group quarters	5,540	+/–927

NOTE: An ***** entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
SOURCE: U.S. Census Bureau. Available: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

B09016: Household Type (including living alone) by Relationship in Virginia

	Estimate	Margin of Error
Total	7,721,730	*****
In households	7,470,365	*****
In family households	6,234,990	+/–10,159
Householder	1,967,020	+/–8,603
Male	1,165,765	+/–9,416
Female	801,255	+/–5,205
Spouse	1,497,397	+/–10,474
Child	2,194,666	+/–8,133
Grandchild	137,854	+/–3,605
Brother or sister	77,810	+/–3,500
Parent	76,511	+/–3,051
Other relatives	145,889	+/–4,912
Nonrelatives	137,843	+/–3,592
Roomer or boarder	16,224	+/–1,369
Housemate or roommate	23,893	+/–1,496
Unmarried partner	53,507	+/–1,823
Foster child	4,529	+/–634
Other nonrelatives	39,690	+/–1,887
In nonfamily households	1,235,375	+/–10,159
Householder	969,614	+/–5,352
Male	439,455	+/–4,329
Living alone	339,966	+/–3,958
Not living alone	99,489	+/–2,551
Female	530,159	+/–4,294
Living alone	454,289	+/–4,088
Not living alone	75,870	+/–2,214
Nonrelatives	265,761	+/–7,354
Roomer or boarder	27,978	+/–2,498
Housemate or roommate	121,589	+/–5,044
Unmarried partner	85,067	+/–2,130
Foster child	772	+/–238
Other nonrelatives	30,355	+/–1,989
In group quarters	251,365	*****

B09017: Relationship by Household Type (including living alone) for the Population 65 Years and Over in Virginia

	Estimate	Margin of Error
Total	907,858	+/–893
In households	869,554	+/–1,906
In family households	599,007	+/–3,799
Householder	302,380	+/–2,281
Male	213,289	+/–1,929
Female	89,091	+/–1,700
Spouse	215,765	+/–1,891
Parent	46,754	+/–1,950
Other relatives	31,078	+/–1,376
Nonrelatives	3,030	+/–353
In nonfamily households	270,547	+/–3,415
Householder	261,228	+/–3,517
Male	72,097	+/–1,487
Living alone	66,868	+/–1,468
Not living alone	5,229	+/–439
Female	189,131	+/–2,750
Living alone	183,801	+/–2,725
Not living alone	5,330	+/–438
Nonrelatives	9,319	+/–715
In group quarters	38,304	+/–1,518

S2601A: Characteristics of the Group Quarters Population in the United States, Virginia

Subject	Total Population		Total Group Quarters Population		Institutionalized Group Quarters Population		Noninstitutionalized Group Quarters Population	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total Population	7,721,730	*****	251,365	*****	110,925	+/–632	140,440	+/–632
Sex and Age								
Male	49.1%	+/–0.1	62.3%	+/–1.1	67.0%	+/–1.2	58.6%	+/–1.6
Female	50.9%	+/–0.1	37.7%	+/–1.1	33.0%	+/–1.2	41.4%	+/–1.6
Under 15 years	19.7%	+/–0.1	0.8%	+/–0.2	1.2%	+/–0.4	0.4%	+/–0.3
15 to 17 years	4.1%	+/–0.1	1.4%	+/–0.2	2.0%	+/–0.5	1.0%	+/–0.2
18 to 24 years	10.3%	+/–0.1	48.7%	+/–0.9	11.2%	+/–0.9	78.2%	+/–1.4
25 to 34 years	13.5%	+/–0.1	13.2%	+/–0.8	19.6%	+/–1.0	8.2%	+/–1.1
35 to 44 years	14.8%	+/–0.1	9.7%	+/–0.5	17.1%	+/–0.9	3.9%	+/–0.6
45 to 54 years	14.8%	+/–0.1	7.3%	+/–0.5	11.9%	+/–0.8	3.8%	+/–0.6
55 to 64 years	11.1%	+/–0.1	3.6%	+/–0.3	5.8%	+/–0.7	1.9%	+/–0.4
65 to 74 years	6.4%	+/–0.1	2.9%	+/–0.3	5.5%	+/–0.6	0.9%	+/–0.2
75 to 84 years	3.9%	+/–0.1	5.3%	+/–0.4	11.0%	+/–0.7	0.7%	+/–0.3
85 years and over	1.5%	+/–0.1	7.1%	+/–0.5	14.7%	+/–0.8	1.1%	+/–0.5
Under 18 years	1,831,470	+/–1,131	5,540	+/–927	3,590	+/–738	1,950	+/–447
Male	51.1%	+/–0.1	61.1%	+/–6.2	75.3%	+/–7.8	34.8%	+/–7.2
Female	48.9%	+/–0.1	38.9%	+/–6.2	24.7%	+/–7.8	65.2%	+/–7.2
65 years and over	907,858	+/–893	38,304	+/–1,518	34,595	+/–905	3,709	+/–1,097
Male	42.0%	+/–0.1	28.6%	+/–1.5	27.6%	+/–1.5	37.7%	+/–8.1
Female	58.0%	+/–0.1	71.4%	+/–1.5	72.4%	+/–1.5	62.3%	+/–8.1
Median age (years)	36.7	+/–0.1	24.6	+/–0.4	44.3	+/–0.7	20.3	+/–0.1
Race and Hispanic Origin or Latino Origin								
One race	7,562,029	+/–4,542	246,435	+/–658	109,828	+/–647	136,607	+/–841
White	72.2%	+/–0.1	63.8%	+/–1.2	53.4%	+/–1.5	72.1%	+/–1.7
Black or African American	20.0%	+/–0.1	31.7%	+/–1.1	44.1%	+/–1.4	21.7%	+/–1.5

continued

S2601A: Continued

Subject	Total Population		Total Group Quarters Population		Institutionalized Group Quarters Population		Noninstitutionalized Group Quarters Population	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
American Indian and Alaska Native	0.3%	+/–0.1	0.4%	+/–0.1	0.3%	+/–0.1	0.4%	+/–0.1
Asian	4.9%	+/–0.1	2.4%	+/–0.3	0.6%	+/–0.2	3.9%	+/–0.5
Native Hawaiian and Other Pacific Islander	0.1%	+/–0.1	0.1%	+/–0.1	0.1%	+/–0.1	0.2%	+/–0.2
Some other race	2.5%	+/–0.1	1.6%	+/–0.3	1.5%	+/–0.2	1.7%	+/–0.5
Two or more races	159,701	+/–4,542	4,930	+/–658	1,097	+/–209	3,833	+/–670
Hispanic or Latino (of any race)	6.7%	+/–0.1	5.3%	+/–0.6	3.3%	+/–0.4	6.8%	+/–1.0
Not Hispanic or Latino	93.3%	+/–0.1	94.7%	+/–0.6	96.7%	+/–0.4	93.2%	+/–1.0
White alone, not Hispanic or Latino	67.0%	+/–0.1	59.7%	+/–1.3	51.5%	+/–1.5	66.1%	+/–2.0
Marital Status								
Population 15 years and over	6,203,670	+/–1,170	249,469	+/–580	109,566	+/–789	139,903	+/–767
Now married, except separated	51.8%	+/–0.3	10.9%	+/–0.6	15.7%	+/–0.9	7.1%	+/–0.9
Widowed	5.9%	+/–0.1	9.5%	+/–0.5	19.8%	+/–0.8	1.5%	+/–0.6
Divorced	9.5%	+/–0.1	6.8%	+/–0.5	11.7%	+/–0.9	3.0%	+/–0.6
Separated	2.6%	+/–0.1	2.8%	+/–0.4	4.5%	+/–0.5	1.4%	+/–0.5
Never married	30.2%	+/–0.2	70.0%	+/–0.9	48.3%	+/–1.3	87.0%	+/–1.3
School Enrollment								
Population 3 years and over enrolled in school	2,033,368	+/–7,036	92,202	+/–2,734	5,811	+/–949	86,391	+/–2,428
Nursery school through 12th grade	70.9%	+/–0.2	6.1%	+/–0.8	74.2%	+/–9.1	1.6%	+/–0.5
College or graduate school	29.1%	+/–0.2	93.9%	+/–0.8	25.8%	+/–9.1	98.4%	+/–0.5
Educational Attainment								
Population 25 years and over	5,092,358	+/–1,855	123,516	+/–2,250	94,892	+/–1,157	28,624	+/–1,892
High school graduate or higher	85.8%	+/–0.1	60.8%	+/–1.6	57.7%	+/–1.6	71.2%	+/–3.5
Bachelor's degree or higher	33.4%	+/–0.2	10.1%	+/–1.4	8.0%	+/–1.0	16.7%	+/–4.5

Veteran Status								
Civilian population 18 years and over	5,764,663	+/–2,777	208,547	+/–1,420	107,335	+/–988	101,212	+/–929
Civilian veteran	13.0%	+/–0.1	8.5%	+/–0.7	12.1%	+/–1.1	4.6%	+/–0.9
Disability Status								
Total population	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
With a disability	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Population under 18 years	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
With a disability	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Population 18 to 64 years	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
With a disability	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
No disability	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Population 65 years and over	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
With a disability	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Residence 1 Year Ago								
Population 1 year and over	7,619,716	+/–2,195	251,343	+/–25	110,914	+/–632	140,429	+/–643
Same address	83.3%	+/–0.2	47.9%	+/–1.6	59.3%	+/–1.9	38.9%	+/–2.5
Different address in the U.S.	15.9%	+/–0.2	50.1%	+/–1.4	40.3%	+/–1.9	57.8%	+/–2.1
Same county	6.9%	+/–0.1	9.2%	+/–0.6	12.0%	+/–1.0	7.0%	+/–0.7
Different county	9.1%	+/–0.1	40.9%	+/–1.4	28.4%	+/–1.6	50.7%	+/–2.1
Same state	5.3%	+/–0.1	23.8%	+/–1.0	23.7%	+/–1.4	23.9%	+/–1.3
Different state	3.7%	+/–0.1	17.0%	+/–1.0	4.7%	+/–0.7	26.8%	+/–1.9
Abroad	0.8%	+/–0.1	2.0%	+/–0.8	0.4%	+/–0.1	3.3%	+/–1.5
Place of Birth, Citizenship Status, and Year of Entry								
Total population	7,721,730	*****	251,365	*****	110,925	+/–632	140,440	+/–632
Native	6,941,095	+/–6,929	236,137	+/–2,236	106,575	+/–729	129,562	+/–2,339
Male	49.1%	+/–0.1	61.8%	+/–1.2	66.8%	+/–1.2	57.6%	+/–1.7
Female	50.9%	+/–0.1	38.2%	+/–1.2	33.2%	+/–1.2	42.4%	+/–1.7
Foreign born	780,635	+/–6,929	15,228	+/–2,236	4,350	+/–548	10,878	+/–2,207
Male	49.6%	+/–0.3	71.0%	+/–4.9	72.0%	+/–5.4	70.6%	+/–6.2
Female	50.4%	+/–0.3	29.0%	+/–4.9	28.0%	+/–5.4	29.4%	+/–6.2
Naturalized U.S. citizen	341,649	+/–4,673	4,892	+/–769	1,437	+/–292	3,455	+/–772

continued

S2601A: Continued

Subject	Total Population		Total Group Quarters Population		Institutionalized Group Quarters Population		Noninstitutionalized Group Quarters Population	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Male	46.3%	+/–0.5	59.0%	+/–6.7	40.2%	+/–8.8	66.8%	+/–7.8
Female	53.7%	+/–0.5	41.0%	+/–6.7	59.8%	+/–8.8	33.2%	+/–7.8
Not a U.S. citizen	438,986	+/–6,779	10,336	+/–2,111	2,913	+/–470	7,423	+/–2,011
Male	52.2%	+/–0.5	76.7%	+/–5.7	87.6%	+/–5.3	72.3%	+/–8.4
Female	47.8%	+/–0.5	23.3%	+/–5.7	12.4%	+/–5.3	27.7%	+/–8.4
Entered 2000 or later	33.4%	+/–0.6	47.3%	+/–7.8	30.3%	+/–5.0	54.1%	+/–9.6
Entered 1990 to 1999	30.1%	+/–0.5	29.8%	+/–4.7	23.7%	+/–3.6	32.2%	+/–7.0
Entered before 1990	36.5%	+/–0.5	22.9%	+/–5.4	45.9%	+/–5.9	13.7%	+/–6.2
Language Spoken at Home and Ability to Speak English								
Population 5 years and over	7,200,451	+/–924	251,162	+/–164	110,904	+/–632	140,258	+/–680
English only	86.8%	+/–0.1	91.1%	+/–1.0	94.3%	+/–0.6	88.6%	+/–1.7
Language other than English	13.2%	+/–0.1	8.9%	+/–1.0	5.7%	+/–0.6	11.4%	+/–1.7
Speak English less than “very well”	5.4%	+/–0.1	3.0%	+/–0.8	2.3%	+/–0.3	3.5%	+/–1.4
Employment Status								
Population 16 years and over	6,097,997	+/–2,034	248,765	+/–705	(X)	(X)	139,903	+/–767
In labor force	67.4%	+/–0.1	28.7%	+/–1.0	(X)	(X)	51.0%	+/–1.8
Civilian labor force	65.4%	+/–0.1	13.7%	+/–1.0	(X)	(X)	24.3%	+/–1.9
Employed	61.8%	+/–0.1	11.2%	+/–1.0	(X)	(X)	20.0%	+/–1.7
Unemployed	3.6%	+/–0.1	2.4%	+/–0.3	(X)	(X)	4.3%	+/–0.5
Percent of civilian labor force	5.4%	+/–0.1	17.8%	+/–2.0	(X)	(X)	17.8%	+/–2.0
Armed Forces	2.1%	+/–0.1	15.0%	+/–0.5	(X)	(X)	26.7%	+/–0.7
Not in labor force	32.6%	+/–0.1	71.3%	+/–1.0	(X)	(X)	49.0%	+/–1.8

Occupation								
Civilian employed population 16 years and over	3,768,930	+/–7,527	27,960	+/–2,413	(X)	(X)	27,960	+/–2,413
Management, professional, and related occupations	40.5%	+/–0.2	21.0%	+/–2.9	(X)	(X)	21.0%	+/–2.9
Service occupations	15.3%	+/–0.2	28.9%	+/–3.0	(X)	(X)	28.9%	+/–3.0
Sales and office occupations	24.0%	+/–0.1	30.4%	+/–3.5	(X)	(X)	30.4%	+/–3.5
Farming, fishing, and forestry occupations	0.5%	+/–0.1	8.4%	+/–6.4	(X)	(X)	8.4%	+/–6.4
Construction, extraction, maintenance, and repair occupations	9.5%	+/–0.1	4.9%	+/–1.3	(X)	(X)	4.9%	+/–1.3
Production, transportation, and material moving occupations	10.3%	+/–0.1	6.4%	+/–1.6	(X)	(X)	6.4%	+/–1.6
Income and Benefits in the Past 12 Months (in 2009 inflation-adjusted dollars)								
Individuals	7,721,730	*****	251,365	*****	110,925	+/–632	140,440	+/–632
Per capita income (dollars)	31,606	+/–124	10,647	+/–427	11,745	+/–494	9,780	+/–586
With earnings								
Male	2,326,228	+/–5,004	103,664	+/–3,062	33,817	+/–1,769	69,847	+/–2,534
Female	2,089,092	+/–5,459	49,945	+/–2,492	5,616	+/–991	44,329	+/–2,194
Mean earnings (dollars)								
Male	54,667	+/–262	15,297	+/–690	18,204	+/–898	13,890	+/–874
Female	35,303	+/–165	6,119	+/–384	9,590	+/–1,815	5,680	+/–389
Median earnings (dollars)								
Male	39,054	+/–213	10,739	+/–547	11,010	+/–579	10,486	+/–951
Female	26,582	+/–142	3,058	+/–190	5,504	+/–1,832	2,860	+/–210
With Food Stamp/SNAP benefits	(X)	(X)	5,250	+/–877	2,805	+/–434	2,445	+/–763
Poverty Rates for People for Whom Poverty Status Is Determined								
All people	10.1%	+/–0.1	61.2%	+/–6.9	(X)	(X)	61.2%	+/–6.9
18 years and over	9.1%	+/–0.1	61.2%	+/–6.9	(X)	(X)	61.2%	+/–6.9
18 to 64 years	9.1%	+/–0.1	66.4%	+/–7.8	(X)	(X)	66.4%	+/–7.8
65 years and over	8.9%	+/–0.2	38.1%	+/–8.6	(X)	(X)	38.1%	+/–8.6

Appendix E

2005-2009 American Community Survey 5-Year Estimates Data Tables That Highlight the Group Quarters Population in Goochland County, Virginia

B26001: Group Quarters Population in Goochland County, Virginia

	Estimate	Margin of Error
Total	5,707	+/–1,638

B09001: Population Under 18 Years of Age in Goochland County, Virginia

	Estimate	Margin of Error
Total	4,034	+/–39
In households	3,808	+/–326
Under 3 years	560	+/–72
3 and 4 years	430	+/–73
5 years	175	+/–59
6 to 8 years	733	+/–125
9 to 11 years	517	+/–93
12 to 14 years	717	+/–130
15 to 17 years	676	+/–218
In group quarters	226	+/–363

B09016: Household Type (including living alone) by Relationship in Goochland County, Virginia

	Estimate	Margin of Error
Total	20,429	*****
In households	14,722	+/–1,638
In family households	13,154	+/–1,443
Householder	4,688	+/–812
Male	3,101	+/–725
Female	1,587	+/–522
Spouse	4,139	+/–642
Child	3,945	+/–402
Grandchild	282	+/–97
Brother or sister	19	+/–38
Parent	12	+/–39
Other relatives	18	+/–59
Nonrelatives	51	+/–46
Roomer or boarder	0	+/–127
Housemate or roommate	1	+/–3
Unmarried partner	43	+/–46
Foster child	5	+/–9
Other nonrelatives	2	+/–7
In nonfamily households	1,568	+/–332
Householder	1,364	+/–269
Male	366	+/–148
Living alone	281	+/–128
Not living alone	85	+/–52
Female	998	+/–208
Living alone	782	+/–143
Not living alone	216	+/–171
Nonrelatives	204	+/–99
Roomer or boarder	0	+/–127
Housemate or roommate	4	+/–13
Unmarried partner	159	+/–75
Foster child	0	+/–127
Other nonrelatives	41	+/–46
In group quarters	5,707	+/–1,638

NOTE: An ***** entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
SOURCE: U.S. Census Bureau. Available: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

B09017: Relationship by Household Type (including living alone) for the Population 65 Years and Over in Goochland County, Virginia

	Estimate	Margin of Error
Total	2,635	+/–61
In households	2,602	+/–79
In family households	1,970	+/–141
Householder	1,049	+/–113
Male	823	+/–103
Female	226	+/–80
Spouse	901	+/–119
Parent	11	+/–36
Other relatives	8	+/–26
Nonrelatives	1	+/–3
In nonfamily households	632	+/–132
Householder	623	+/–129
Male	93	+/–53
Living alone	93	+/–53
Not living alone	0	+/–127
Female	530	+/–107
Living alone	498	+/–109
Not living alone	32	+/–51
Nonrelatives	9	+/–14
In group quarters	33	+/–56

Appendix F

The 10 Largest Federal Assistance Programs That Relied on ACS Total Population Estimates, Fiscal Year 2008

CFDA Number and Program Name	Department	Fiscal Year 2008 Expenditures	Data Set	Type of Assistance and Recipient
93.778 Medical Assistance Program	HHS	$261,143,624,624	Per capita income	Formula grants to states
84.027 Special Education Grants to States	ED	$10,786,318,120	SF-3/ACS	Formula grants to states
84.010 Title I Grants to Local Educational Agencies	ED	$7,513,986,185	SAIPE	Formula grants to state educational agencies (local educational agencies are subgrantees)
10.410 Very Low to Moderate Income Housing Loans	USDA	$7,268,193,451	MSAs	Direct loans and guaranteed/ insured loans to very low- to moderate-income families
20.500 Federal Transit—Capital Investment Grants (Fixed Guideway Modernization Bus and Bus Facilities New Starts)	DOT	$4,667,272,525	Population Estimates Program estimates	Formula and project grants to states and local governments

continued

CFDA Number and Program Name	Department	Fiscal Year 2008 Expenditures	Data Set	Type of Assistance and Recipient
93.658 Foster Care—Title IV-E	HHS	$4,335,529,844	Per capita income	Formula and project grants to states
84.367 Improving Teacher Quality State Grants	ED	$2,798,832,364	Population Estimates Program estimates	Formula grants to states
14.218 Community Development Block Grants/Entitlement Grants	HUD	$2,570,735,980	Population Estimates Program estimates, MSAs, area median income, and SF-3/ACS	Formula grants to states, metropolitan cities, and counties
10.558 Child and Adult Care Food Program	USDA	$2,367,591,204	SF-3/ACS and SAIPE	Formula grants to states or institutions
10.760 Water and Waste Disposal Systems for Rural Communities	USDA	$2,317,463,815	Population Estimates Program estimates, MSAs, SF-3/ACS, and area median income	Formula grants to counties and local governments

NOTES: DOT = U.S. Department of Transportation, ED = U.S. Department of Education, HHS = U.S. Department of Health and Human Services, HUD = U.S. Department of Housing and Urban Development, MSA = metropolitan statistical area, SAIPE = Small Area Income and Poverty Estimates Program, SF-3/ACS = Census 2000 Summary File 3/American Community Survey, USDA = U.S. Department of Agriculture.
SOURCE: Taeuber and Carpenter (unpublished).

Appendix G

The 10 Largest Federal Assistance Programs with Funds Sent Directly to Substate Areas Based on ACS Total Population Estimates, Fiscal Year 2008

CFDA Number and Program Name	Department	Fiscal Year 2008 Expenditures	Data Set	Recipient
10.410 Very Low-to-Moderate Income Housing Loans	USDA	$7,268,193,451	Population Estimates Program estimates, MSAs, area median income, and SF-3/ACS	Individuals
20.500 Federal Transit—Capital Investment Grants (Fixed Guideway Modernization Bus and Bus Facilities New Starts)	DOT	$4,667,272,525	Population Estimates Program estimates	State and local public agencies
14.218 Community Development Block Grants/Entitlement Grants	HUD	$2,570,735,980	Population Estimates Program estimates, MSAs, area median income, and SF-3/ACS	Cities and counties

continued

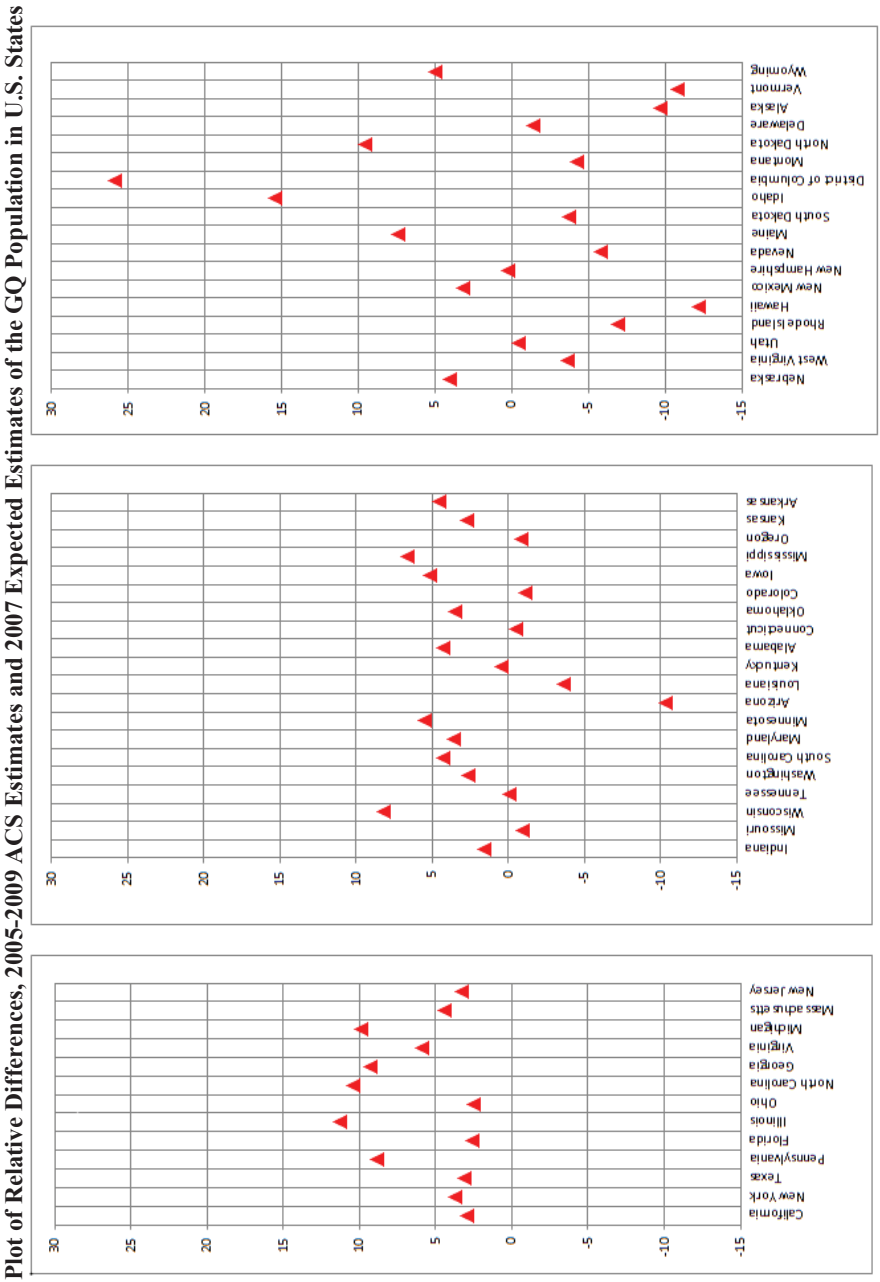
CFDA Number and Program Name	Department	Fiscal Year 2008 Expenditures	Data Set	Recipient
10.558 Child and Adult Care Food Program	USDA	$2,367,591,204	SF-3/ACS and SAIPE	States or approved institutions
10.760 Water and Waste Disposal Systems for Rural Communities	USDA	$2,317,463,815	Population Estimates Program estimates, MSAs, SF-3/ACS, and area median income	Counties and local governments
14.872 Public Housing Capital Fund	HUD	$2,277,009,757	Area median income and MSAs	Public housing agencies
10.850 Rural Electrification Loans and Loan Guarantees	USDA	$2,255,350,000	Population Estimates Program estimates	Rural electric cooperatives
14.228 Community Development Block Grants/State's Program	HUD	$1,981,935,290	Population Estimates Program estimates, MSAs, area median income, and SF-3/ACS	Counties and cities
14.239 HOME Investment Partnerships Program	HUD	$1,560,899,281	Per capita income	States and local governments
10.768 Business and Industry Loans	USDA	$1,547,724,817	Population Estimates Program estimates	Individuals or rural organizations

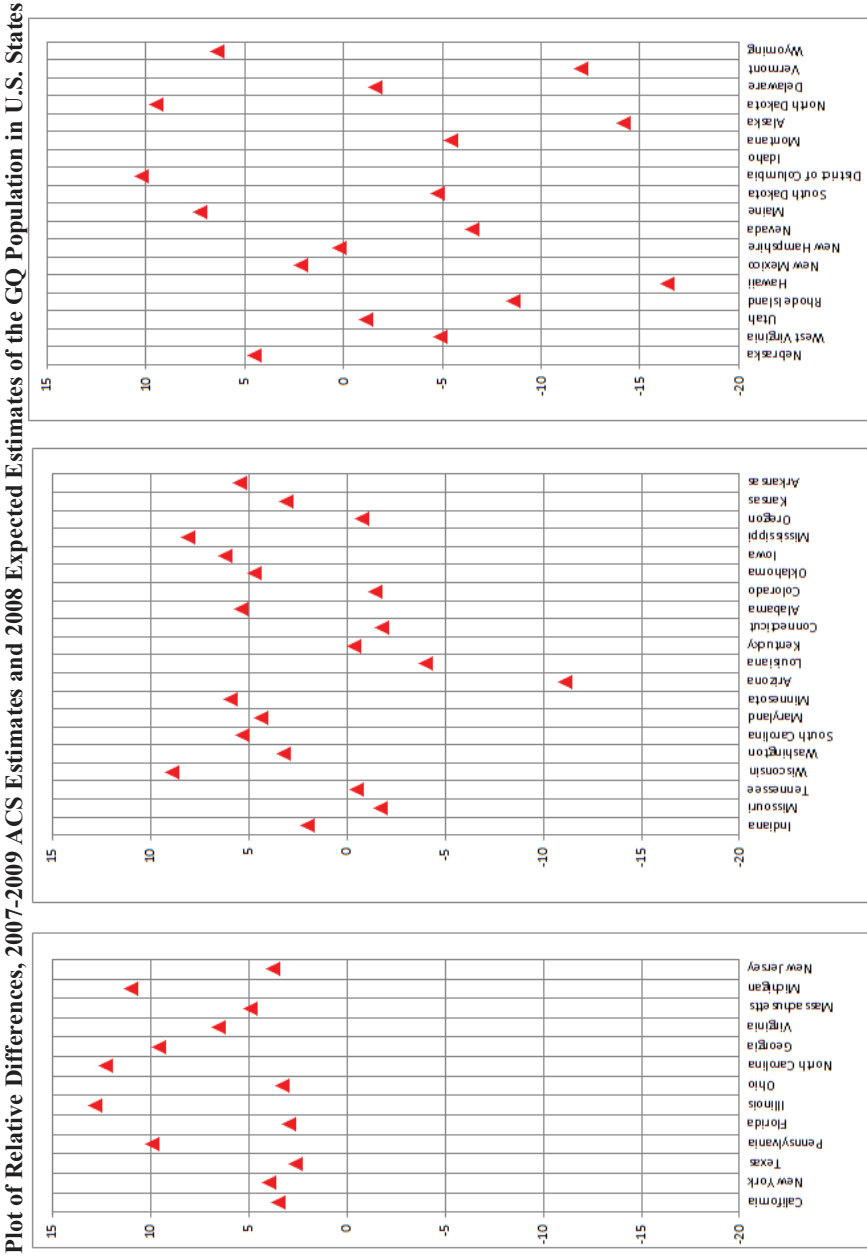
NOTES: DOT = U.S. Department of Transportation, HUD = U.S. Department of Housing and Urban Development, MSA = metropolitan statistical area, SAIPE = Small Area Income and Poverty Estimates Program, SF-3/ACS = Census 2000 Summary File 3/American Community Survey, USDA = U.S. Department of Agriculture.
SOURCE: Taeuber and Carpenter (unpublished).

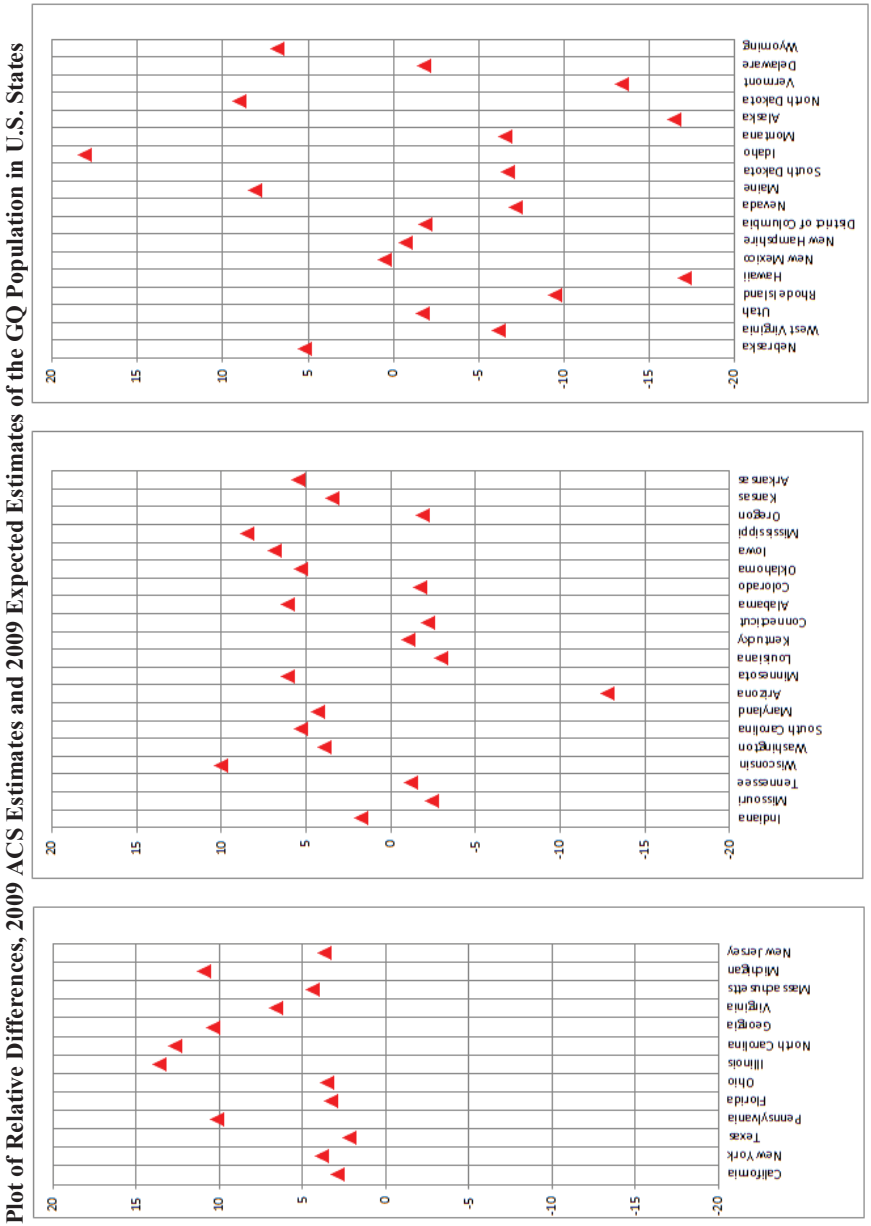
Appendix H

Plots of Relative Differences, ACS Estimates from 2005-2009, 2007-2009, and 2009 with Expected Estimates of the Group Quarters Population in U.S. States

NOTE: Relative differences are defined as 100*(ACS–Interpolated estimate)/Interpolated estimate).
SOURCE: Plots generated by the panel based on data available from U.S. Census Bureau. Available: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.





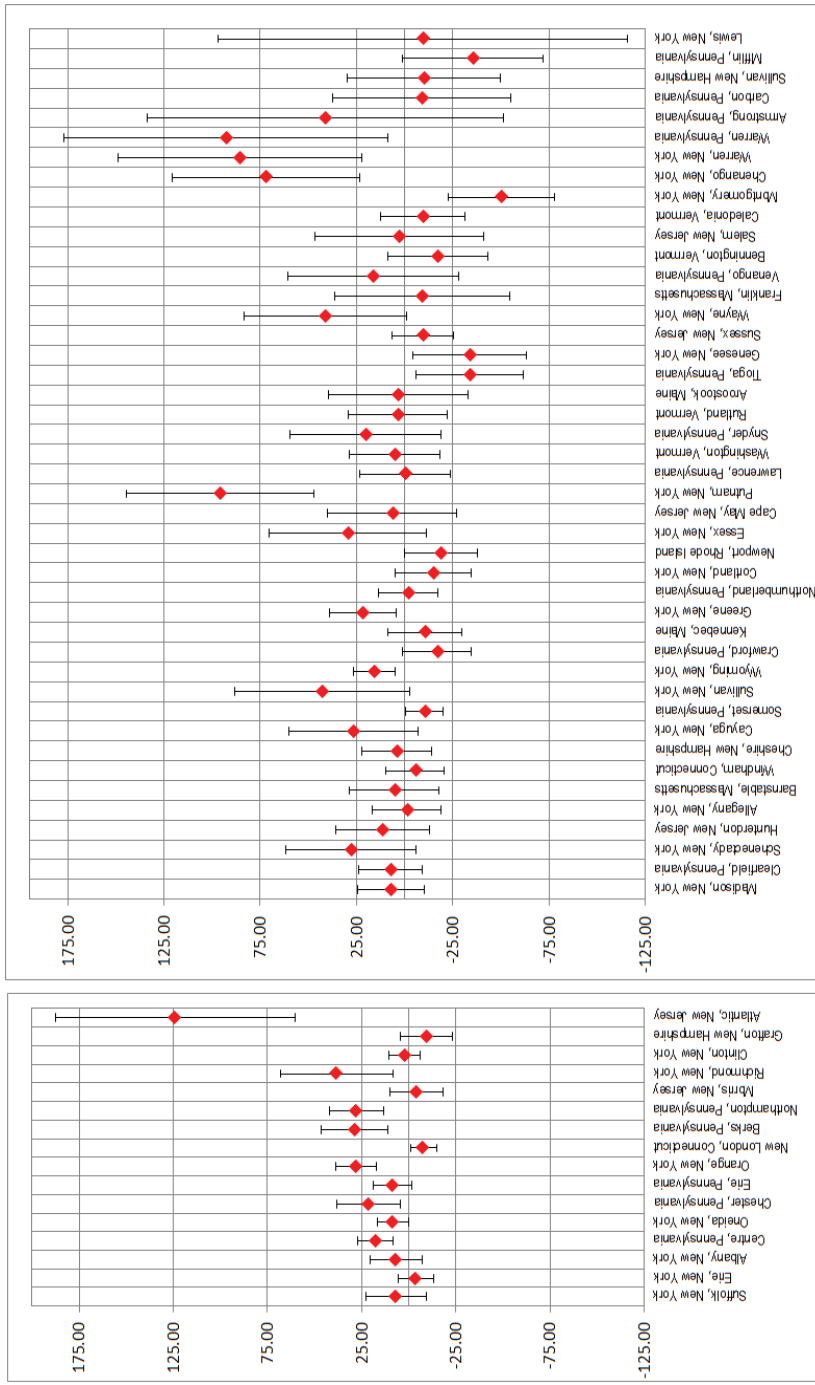


Appendix I

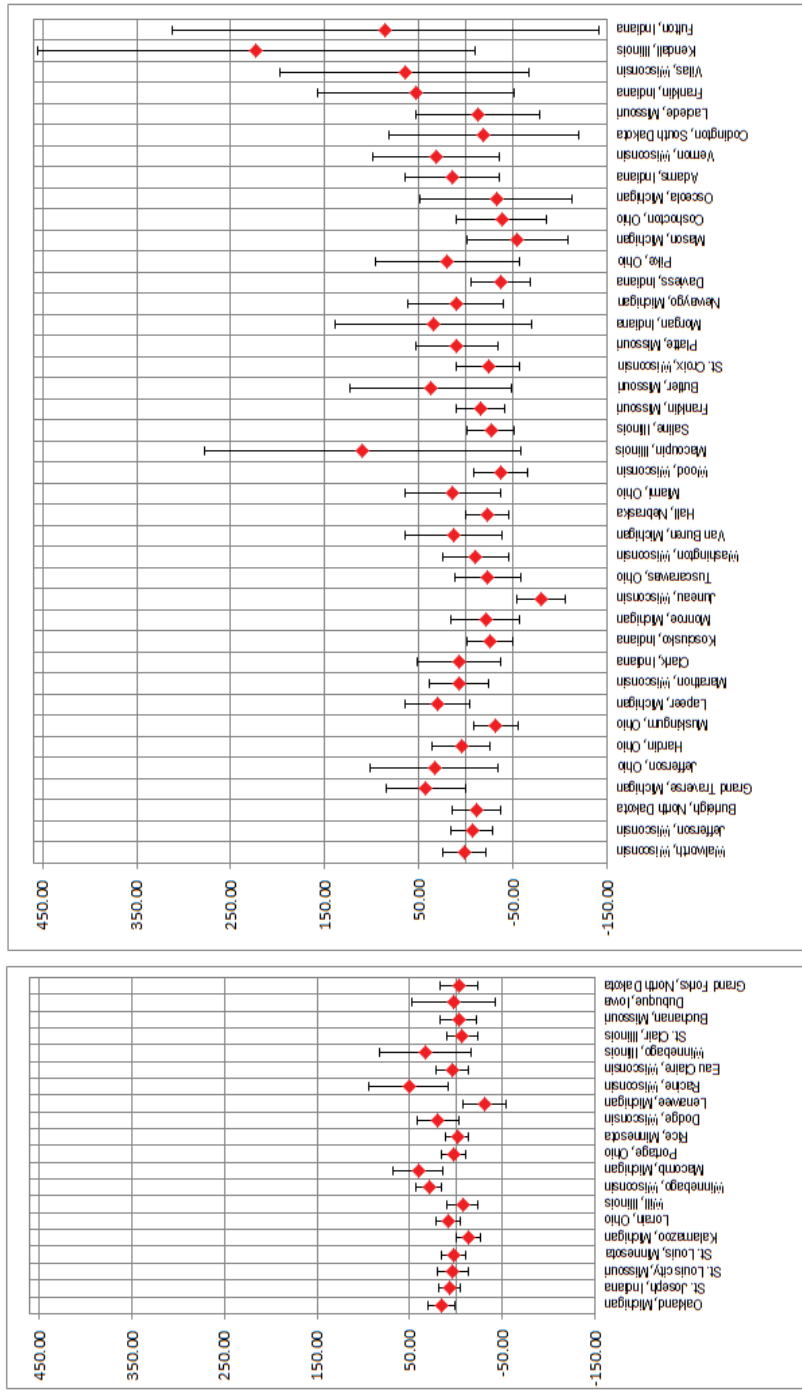
Plots of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Counties by Region

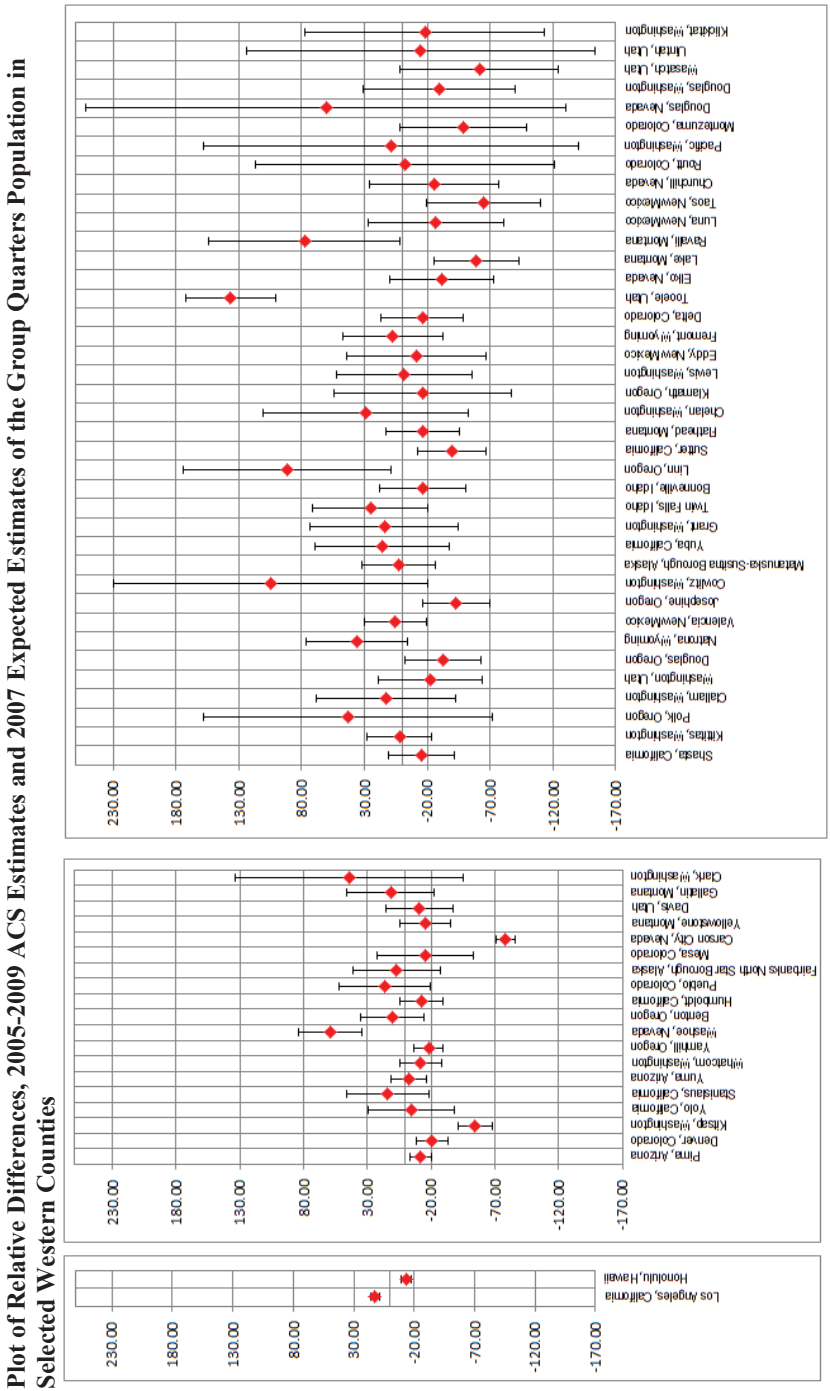
NOTE: Relative differences are defined as 100*(ACS–Interpolated estimate/Interpolated estimate).
SOURCE: Plots generated by the panel based on data available from U.S. Census Bureau. Available: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

Plot of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Northeast Counties



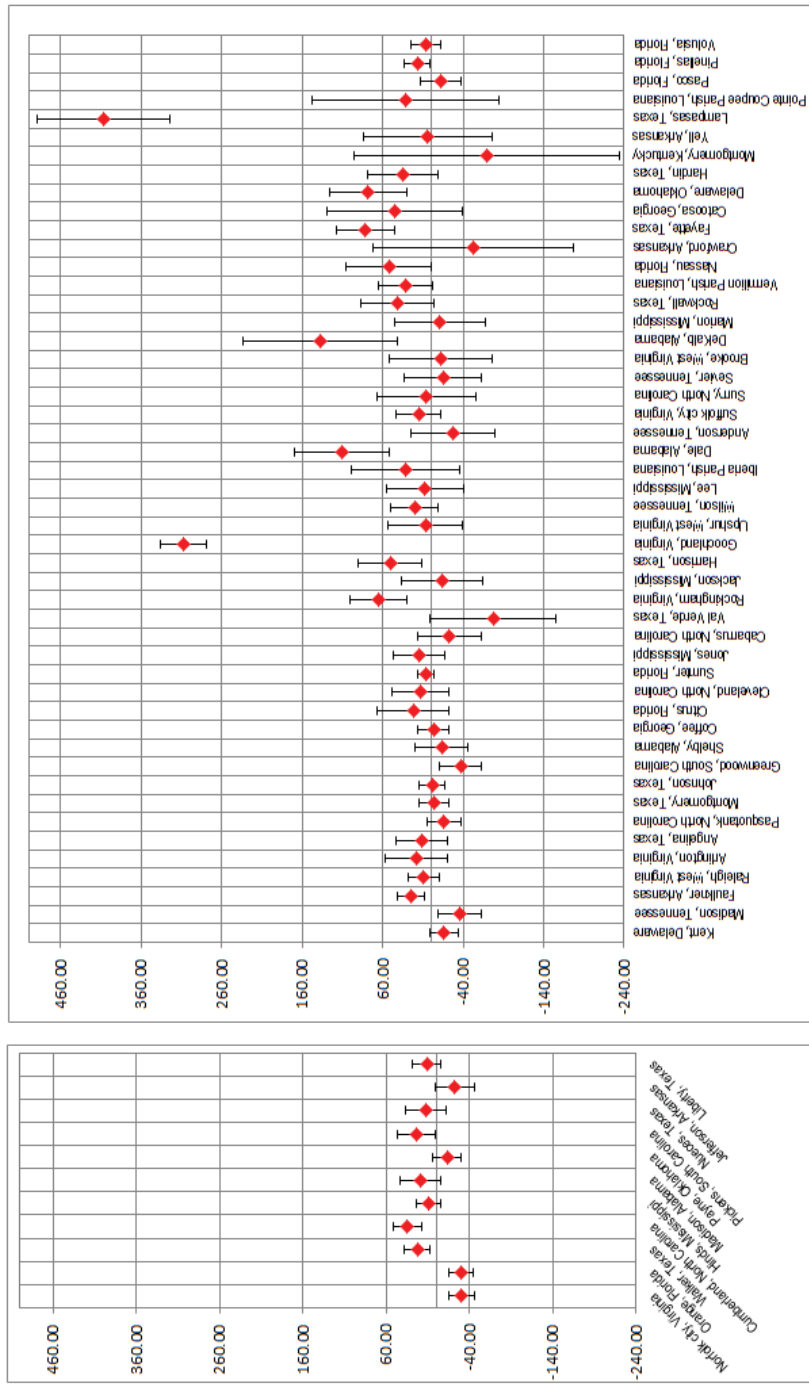
Plot of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Midwest Counties





Plot of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Western Counties

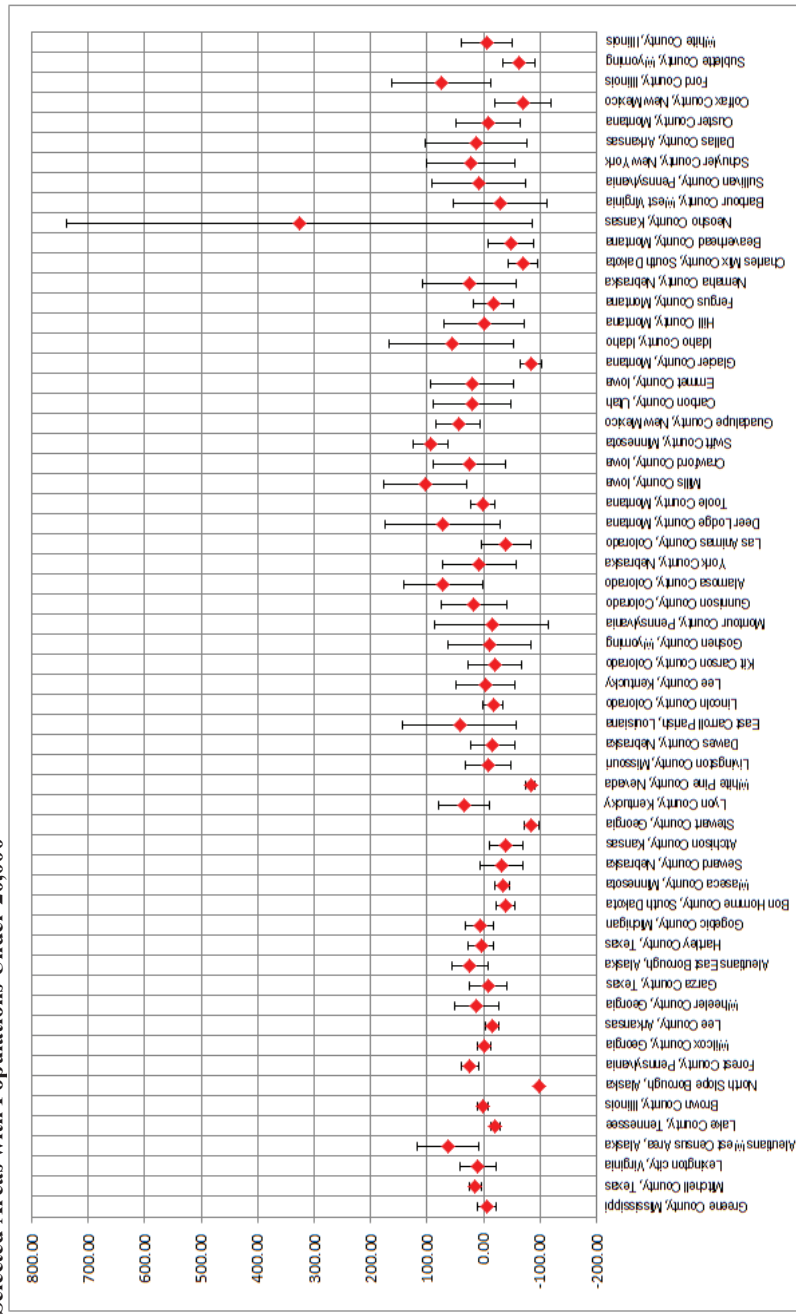
Plot of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Southern Counties



Appendix J

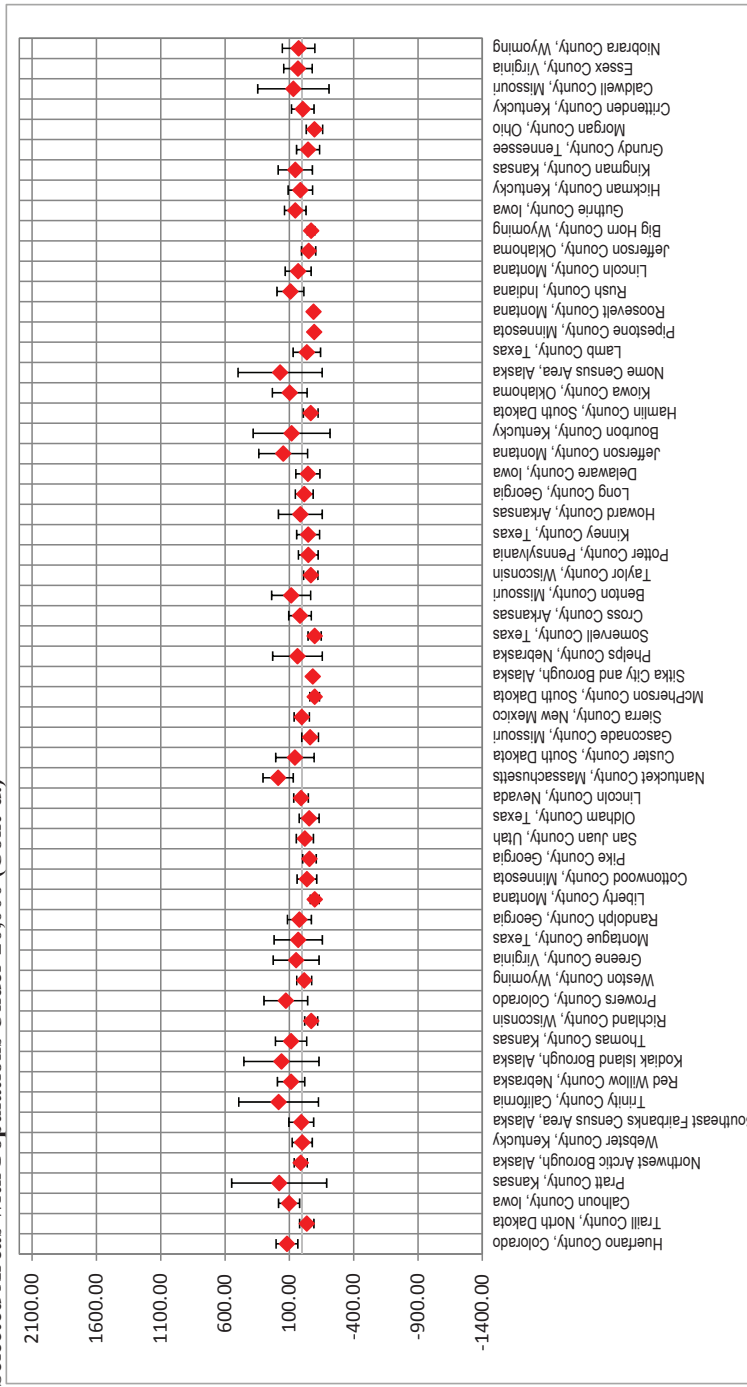
Plots of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Areas with Populations Under 20,000

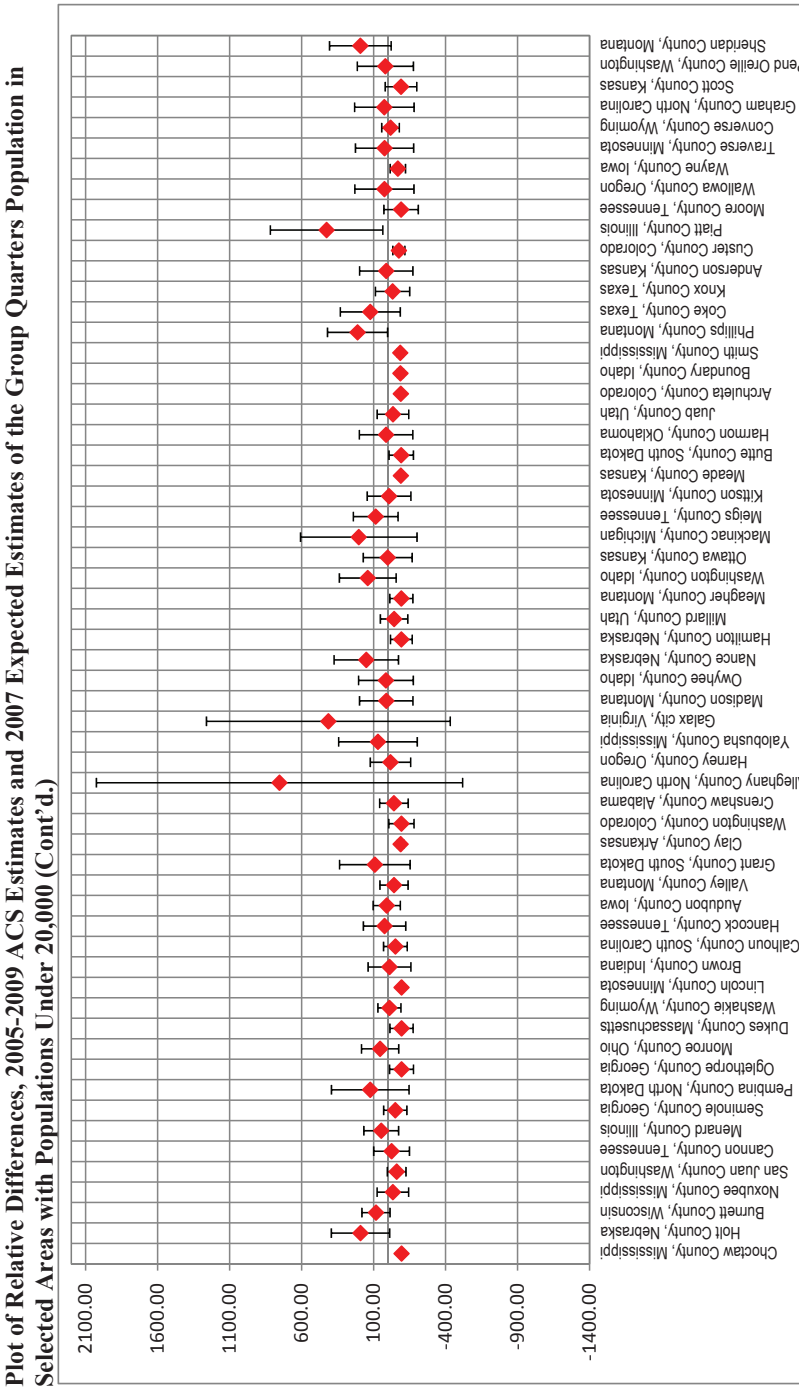
NOTE: Relative differences are defined as 100*(ACS–Interpolated estimate/Interpolated estimate).
SOURCE: Plots generated by the panel based on data available from U.S. Census Bureau. Available: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.



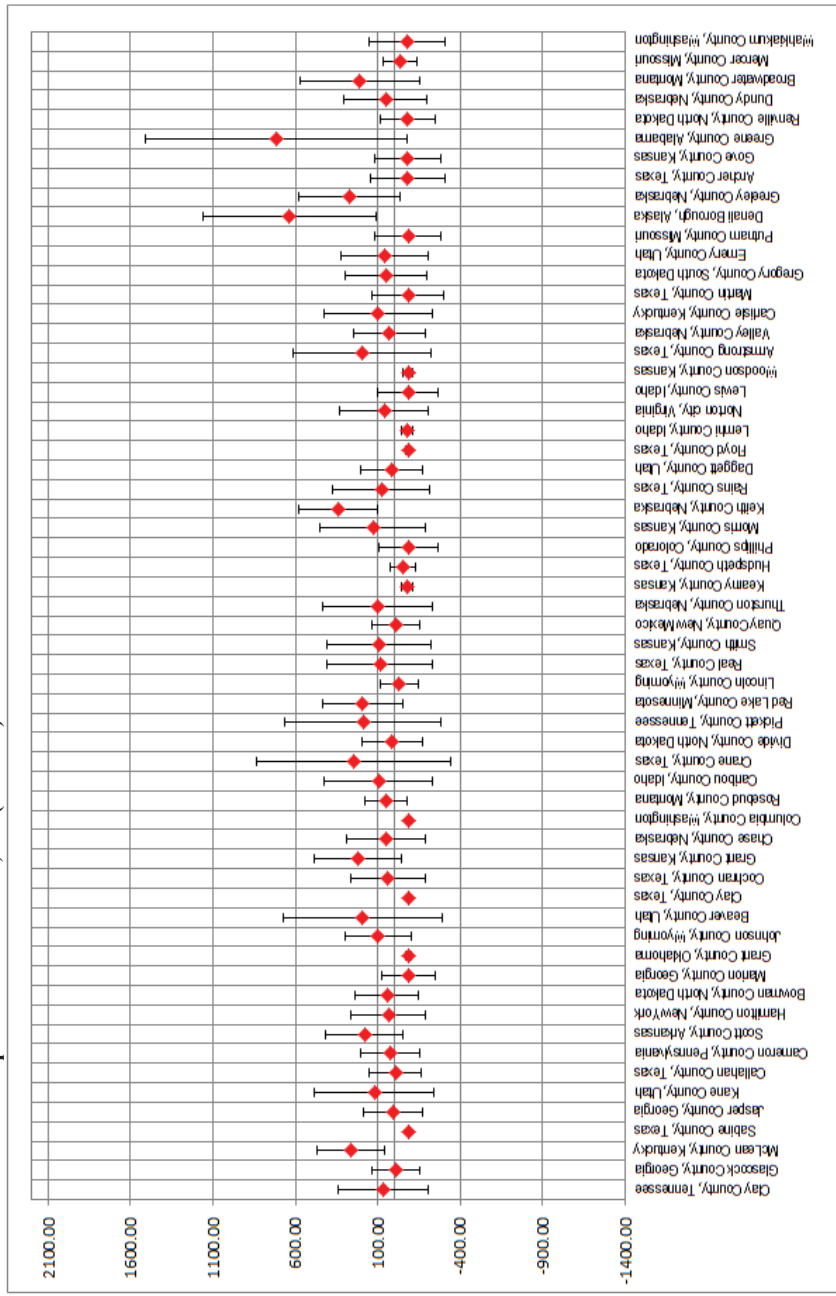
Plot of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Areas with Populations Under 20,000

Plot of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Areas with Populations Under 20,000 (Cont'd.)

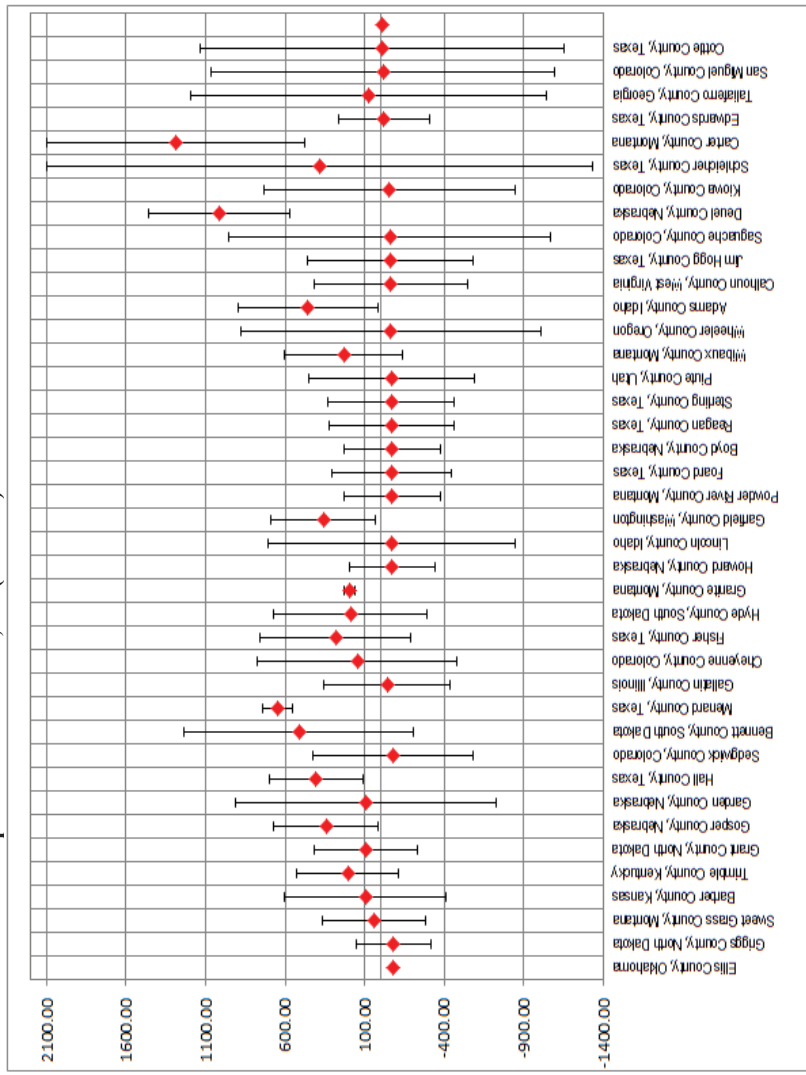




Plot of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Areas with Populations Under 20,000 (Cont'd.)



Plot of Relative Differences, 2005-2009 ACS Estimates and 2007 Expected Estimates of the Group Quarters Population in Selected Areas with Populations Under 20,000 (Cont'd.)



Appendix K

Biographical Sketches of Panel Members and Staff

PAUL R. VOSS (*Chair*) is fellow and interim director at the Carolina Population Center and senior spatial analyst at the Odum Institute for Research in Social Science at the University of North Carolina, Chapel Hill. He is also emeritus professor of rural sociology at the University of Wisconsin and was director of the University of Wisconsin Applied Population Laboratory. His research interests are in applied demography, including small-area demographic models of population estimation and projection, as well as human migration, environmental demography, and spatial statistics. He has written extensively on the use and applicability of census and American Community Survey data in small communities. He served on the U.S. Department of Commerce's Decennial Census Advisory Committee as representative of the Population Association of America as well as the U.S. Census Bureau's advisory committee of professional associations. At the National Research Council, he chaired the Committee on National Statistics Panel on Residence Rules in the Decennial Census and also served on the Panel on Estimates of Poverty for Small Geographic Areas. He has an M.A. and a Ph.D. in sociology (demography) from the University of Michigan.

WILLIAM A.V. CLARK is professor of statistics and geography at the University of California, Los Angeles. His research is focused on demographic change and the nature of the spatial outcomes of population migration flows. He is currently investigating the interaction of class, race, and geography in metropolitan areas. He has published numerous research articles and books. He served on the editorial board of a number of journals, including *Popula-*

tion, *Space and Place*, the *Journal of Urban Affairs*, *Population and Environment*, and *Urban Geography*. He is a member of the National Academy of Sciences and has served on a number of National Research Council committees, and he is currently on the Transportation Research Board Executive Committee and the Geographical Sciences Committee. He has a Ph.D. in geography from the University of Illinois.

SUSAN COPELLA is director of the Pennsylvania State Data Center at Pennsylvania State University. She is chair of the Federal State Cooperative Program for Population Projections, state representative to the Federal State Cooperative Program for Population Estimates, and member of its group quarters subcommittee. Her experience includes working with the U.S. Census Bureau to review population estimates and to coordinate the Local Update of Census Addresses, the Participants Statistical Areas Program, and the 2010 Count Review Program, including a review of housing units and group quarters. Prior to joining the State Data Center, she worked in a number of urban and regional planning agencies. She has a B.A. in urban studies and geography from the University of Pittsburgh.

DAVID DOLSON is director of the Social Survey Methods Division at Statistics Canada, where he is responsible for all statistical and survey methods in support of the Census of Population, including the program of postcensal surveys, the Geography Division, and the demographic statistics program. He also oversees the Statistical Consultation Group, the Questionnaire Design Resource Centre, and the Data Analysis Resource Centre. He directs the development, testing, evaluation, and implementation of statistical and survey methods, using a variety of data collection modes, including supplementing questionnaire data with information obtained from administrative records. He consulted with the U.S. Census Bureau staff on the Reverse Record Check methodology for census coverage measurement and participated in expert workshops on the U.S. census coverage measurement program and coverage improvement options for the 2020 U.S. census. He has a master of mathematics degree in statistics from the University of Waterloo.

RALPH FOLSOM is chief scientist at RTI International, with expertise in complex sample design and analysis, small-area estimation, missing data imputation, and survey weight adjustment. Working on the National Survey on Drug Use and Health (NSDUH), which is based on a sample of individuals living both in households and in group quarters, he initiated innovative weight adjustment methods based on his logistic response propensity and exponential poststratification models. He has also introduced model-based imputations for missing frequency of use and income data items, and he has been an influential collaborator in the development of the NSDUH Predictive Mean Neighbor-

hoods imputation methodology. For the last decade and a half, he has led RTI's work in small-area estimation research, including the NSDUH team that develops annual small-area estimates for drug use, dependency, and treatment or treatment need for states and biannual estimates for substate areas. He has an M.S. in statistics from Iowa State University and a Ph.D. in biostatistics from the University of North Carolina.

RACHEL HARTER is a senior research statistician at RTI International (formerly a senior fellow and vice president at the National Opinion Research Center [NORC] at the University of Chicago). She evaluated alternative substate estimators of employment for Illinois and managed the development of a production small-area estimation system using the Current Employment Statistics survey and related programs of the Bureau of Labor Statistics. She managed the planning stages for NORC's national sampling frame of addresses for in-person surveys. She recently worked on the Survey of Doctorate Recipients for the National Science Foundation and the Residential Energy Consumption Survey for the U.S. Energy Information Administration. Her current projects focus on address-based sampling and telephone sampling. She is council of sections representative for the Survey Research Methods Section of the American Statistical Association and former program chair for the Survey Research Methods Section of the American Statistical Association. She has an M.S. and a Ph.D. in statistics from Iowa State University.

STEVEN HEERINGA is a research scientist in the University of Michigan Survey Methodology Program, director of the Statistical and Research Design Group in the Survey Research Center (SRC), and director of the Summer Institute in Survey Research Techniques at the Institute for Social Research. He is on the faculty of the Michigan Program in Survey Methodology and the Joint Program in Survey Methodology and is an adjunct associate professor in the Department of Biostatistics at the University of Michigan. He has over 25 years of statistical sampling experience, directing the development of the SRC national sample design, as well as sample designs for SRC's major longitudinal and cross-sectional survey programs. He has contributed as a consulting statistician to a number of international research projects and ongoing data collections and has published on sample design methods and procedures, such as weighting, variance estimation, and the imputation of missing data. He is a fellow of the American Statistical Association and has an M.S. in statistics and a Ph.D. in biostatistics from the University of Michigan.

KRISZTINA MARTON (*Study Director*) is senior program officer with the Committee on National Statistics. She is currently serving as study director for the Panel on Redesigning the Commercial Buildings and Residential Energy Consumption Surveys of the U.S. Energy Information Administration and the

Workshop on the Future of Federal Household Surveys. Previously, she was a survey researcher at Mathematica Policy Research (MPR), where she conducted methodological research and oversaw data collections for the National Science Foundation, the U.S. Department of Health and Human Services, the Agency for Healthcare Research and Quality, the Robert Wood Johnson Foundation, and other clients. Prior to joining MPR, she was a survey director in the Ohio State University Center for Survey Research. She has a Ph.D. in communication, with an interdisciplinary specialization in survey research, from Ohio State University.

JOSEPH SALVO is director of the Population Division at the New York City Department of City Planning. His background includes a year at the U.S. Census Bureau. He has broad expertise in the application of small-area data for policies and programs, and uses of census data to address the concerns of local government. A past president of the Association of Public Data Users, he has served on various advisory committees to the Census Bureau. He has experience with the Census Bureau's Master Address File and TIGER geographic database, and he has been involved in the evaluation of the American Community Survey since its inception. At the National Research Council, he served on the Panel on the Functionality and Usability of Data from the American Community Survey and the Panel on Research on Future Census Methods, and he chaired the Local Update of Census Addresses working group. He has an M.A. and a Ph.D. in sociology from Fordham University, is a fellow of the American Statistical Association, and is a recipient of the Sloan Public Service Award from the Fund for the City of New York.

RICHARD VALLIANT is a research professor at the Joint Program for Survey Methodology at the University of Maryland, and Survey Research Center, University of Michigan. He was formerly an associate director at Westat and a mathematical statistician with the Bureau of Labor Statistics. His 30 years of applied experience includes survey sampling, estimation theory, and statistical computing for establishment and household surveys. At the National Research Council, he served on the Panel to Review Research and Development Statistics at the National Science Foundation. He is a fellow of the American Statistical Association, a former member of the Census Advisory Council, and an elected member of the International Statistical Institute. He has served as associate editor of the *Journal of the American Statistical Association—Theory and Methods*, the *Journal of the American Statistical Association—Applications and Case Studies*, the *Journal of Official Statistics*, and *Survey Methodology*. He has an M.S. in statistics from Cornell University and a Ph.D. in biostatistics from Johns Hopkins University.

COMMITTEE ON NATIONAL STATISTICS

The Committee on National Statistics (CNSTAT) was established in 1972 at the National Academies to improve the statistical methods and information on which public policy decisions are based. The committee carries out studies, workshops, and other activities to foster better measures and fuller understanding of the economy, the environment, public health, crime, education, immigration, poverty, welfare, and other public policy issues. It also evaluates ongoing statistical programs and tracks the statistical policy and coordinating activities of the federal government, serving a unique role at the intersection of statistics and public policy. The committee's work is supported by a consortium of federal agencies through a National Science Foundation grant.