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The Nature of the Bias When Studying Only Linkable Person Records: Evidence from the American Community Survey

by

Brittany Bond
U.S. Department of Commerce

J. David Brown
Center for Economic Studies, U.S. Census Bureau
j.david.brown@census.gov

Adela Luque
Center for Administrative Records Research & Applications, U.S. Census Bureau
adela.luque@census.gov

Amy O'Hara
Center for Administrative Records Research & Applications, U.S. Census Bureau
amy.b.ohara@census.gov

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Abstract

Record linkage across survey and administrative records sources can greatly enrich data and improve their quality. The linkage can reduce respondent burden and nonresponse follow-up costs. This is particularly important in an era of declining survey response rates and tight budgets. Record linkage also creates statistical bias, however. The U.S. Census Bureau links person records through its Person Identification Validation System (PVS), assigning each record a Protected Identification Key (PIK). It is not possible to reliably assign a PIK to every record, either due to insufficient identifying information or because the information does not uniquely match any of the administrative records used in the person validation process. Non-random ability to assign a PIK can potentially inject bias into statistics using linked data. This paper studies the nature of this bias using the 2009 and 2010 American Community Survey (ACS). The ACS is well-suited for this analysis, as it contains a rich set of person characteristics that can describe the bias. We estimate probit models for whether a record is assigned a PIK. The results suggest that young children, minorities, residents of group quarters, immigrants, recent movers, low-income individuals, and non-employed individuals are less likely to receive a PIK using 2009 ACS. Changes to the PVS process in 2010 significantly addressed the young children deficit, attenuated the other biases, and increased the validated records share from 88.1 to 92.6 percent (person-weighted).

1. Introduction

Integrating survey data with other sources, including censuses and administrative records, can increase data quality and unlock powerful new insights unattainable from analyzing a single survey data set in isolation. Leveraging data from censuses and administrative records in conjunction with surveys can also reduce respondent burden and operational costs.[1] The process of linking data from different sources requires common identifiers unique to each record. In assigning these identifiers, the protection of privacy and maintenance of each record's confidential information is essential to the viability of producing such linkages. The Census Bureau uses the Person Identification Validation System (PVS) to assign each record a Protected Identification Key (PIK) through an independent designation process. This process enhances data confidentiality, protects individuals' privacy, and enables record linkage to other data sources similarly validated.

The inability of the validation system to assign every survey record a PIK can, however, introduce statistical bias into analyses using only linkable individuals. Higher match rates and lower biases in linked data produce information that better reflects the original collected input.[2] Knowing how validation rates are associated with certain socioeconomic, demographic and housing profiles can help researchers better understand the nature of the statistical bias, interpret results more accurately, and adjust/reweight the linked set accordingly.[3]

Previous research has explored biases from the PVS process as well as the impact of such biases on aggregated analysis. Meyer and Goerge (2011) find statistically significant differences in PIK rates by household size, age, education, race and ethnicity, and citizenship in 2001 ACS data. Using 2009 ACS data, Mulrow et al. (2011) found substantial geographic heterogeneity in PIK assignment rates.[4] The NORC researchers also identified differences in PIK rates by factors such as reported income, employment status, race/ethnic identity, and citizenship.

This paper investigates the nature of this bias by estimating the probability of PIK assignment for all person records ACS collected in 2009 and 2010. Because PVS tested some changes between these two years, the analysis also sheds light on how the bias may have been altered by those changes. We find that PVS is less likely to validate mobile persons, those with less education and income, poor English ability, non-employed, non-citizens, non-participants in government programs, and minorities. Differences are found in validation rates across socioeconomic demographic groups in the 2009 data. Changes tested in the 2010 PVS increased overall validation rates by 4.5 percentage points and reduced differences across groups. Section 2 describes the PVS process, the data and methodology are discussed in section 3, section 4 displays and discusses results, and section 5 concludes.

[1] See Office of Management and Budget Memoranda M-14-06, "Guidance for Providing and Using Administrative Data for Statistical Purposes": https://www.ncsbn.org/NCLEX_Abbreviations_Country_Codes.pdf.
[2] See Mulrow, et al. (2011).
[3] For examples of how such biases affect research results from errors and how to correct for probability of having a PIK, see Meyer and Goerge (2011).
[4] Mulrow, et al. (2011).

2. Record Linkage

Person Identification Validation System

PIKs are assigned by the Census Bureau's Person Identification Validation System (PVS).[5] PIKs are anonymous person identifiers that are as unique as a Social Security Number (SSN). PIKs are assigned to facilitate linking across files while protecting individuals' privacy.

The PVS probabilistically matches data from an incoming file (e.g., survey or census data) to reference files containing data from the Social Security Administration (SSA) enhanced with address data obtained from federal administrative record files. Reference files contain all variants of a person's name, date of birth, and sex, as well as current and recent addresses.
The standard PVS methodology consists of an initial edit procedure to clean and standardize the linking fields (name, date of birth, sex, and address), followed by a cascading matching process involving several modules (described below): Verification, GeoSearch, NameSearch, ZIP3 adjacency, Household composition and DOBSearch. Records failing each module proceed to the next module.

Because it is infeasible to compare all records from a given input file to all records in the reference file, comparisons are restricted to records that agree on certain characteristics, a process called blocking. That is, the data are split into blocks based on exact matches of certain fields (or parts of a field). Then probabilistic matching is performed within each block. A typical blocking strategy gives rise to a series of 'passes' within each module. It starts with a restrictive pass where the records have to agree on a very constrained set of characteristics (e.g., address including apartment number), then broadens the blocking universe (e.g., street or 5-digit ZIP) for subsequent passes.

PVS Modules

Verification Module. If the input file has SSNs, the verification module checks for an exact SSN match to the reference file and verifies that the name and date of birth elements sufficiently agree. If they do, the SSN is considered *verified* and PVS assigns the corresponding PIK to the (person) record.

GeoSearch. Records not assigned a PIK in the verification module are sent to the GeoSearch module. This module blocks on various levels of address information and attempts to find matches, typically based on name, date of birth, and gender.

ZIP3 Adjacency Module.[6] Rather than searching only within a particular ZIP3 area like in GeoSearch, the ZIP3 Adjacency Module expands the ZIP blocking to neighboring areas with different ZIP3 values. Within these blocks, the module searches for matches based on name, date of birth, gender, and various address fields.

[5]See Wagner and Layne (2013).
[6]This module is being tested with the 2010 ACS file used here. It is not a normal part of the PVS production process.

Name Search Module. This module uses name and date of birth fields in the search process,including all possible combinations of alternate name and dates of birth for a given SSN. *DOB Search Module.* In this module, the reference file is blocked based on month and day of birth prior to matching attempts. This module looks through the reference file for the records that fail the previous modules, using name, gender, and date of birth data.

Household Composition Search Module. When an incoming record fails to find a match in the reference files through the preceding modules, it proceeds to the Household Composition module. This module requires at least one person in the household of the unmatched person to have received a PIK. It then creates a universe of unmatched records with historical name, date of birth, gender, and address data where the PIKed household members were observed in the past. The module attempts to find a match based on name and date of birth information.

Differences between ACS 2009 and 2010 in this Study

The production processing for the 2009 ACS included the GeoSearch, and NameSearch modules.[7] A revised method was tested for the 2010 ACS, incorporating the Household Composition, DOBSearch and test ZIP3 adjacency modules. Records with Individual Taxpayers Identification Numbers (ITINs)[8] were part of the reference file in 2010 but not 2009.

These changes were incorporated to determine whether more records would obtain a high-quality PIK. The changes may also alter the nature of the bias – as certain populations are likely to be affected more than others.

3. Data & Methodology

Data

Person and housing unit data from the 2009 and 2010 American Community Survey (ACS) are used for this analysis. The ACS is an ongoing representative survey of the U.S. population, collecting and providing socioeconomic, demographic, and housing data for large as well as small geographic areas in the U.S.[9] The ACS is well-suited for the analysis at hand, as it enables us to describe the nature of PIK assignment bias in detail. Our two analytical datasets consist of 2009 and 2010 ACS person records that have undergone the PVS process. Those successfully

[7] Since the ACS does not contain SSNs, ACS' validation process does not include the Verification Module.

[8] An ITIN is a tax processing number only available for certain nonresident and resident aliens, their spouses, and dependents who cannot get a Social Security Number.

[9] The estimates approximate the actual population values and represent the entire household population. Sampling error is the difference between an estimate based on a sample and the corresponding value that would be obtained if the estimate were based on the entire population (as from a census). All comparative statements in this report have undergone statistical testing, and comparisons are significant at the 90 percent level unless otherwise noted. In addition to sampling error, nonsampling errors may be introduced during any of the operations used to collect and process survey data such as editing, reviewing, or keying data from questionnaires. For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, see the 2011 ACS Accuracy of the Data document located at www.census.gov/acs/www/Downloads/data_documentation/Accuracy/ACS_Accuracy_of_Data_2011.pdf.

validated have been assigned PIKs. The study includes persons living in housing units as well as group quarters[10] in the fifty states and the District of Columbia.[11]

Model Specification and Estimation

We employ a probit model to examine the potential bias associated with non-randomness in PIK assignment (or person record validation). The goal is to explore how commonly-used characteristics are associated with the probability of receiving a PIK, and also examine which associations are robust to controlling for other factors – many of which are likely to be highly correlated (e.g., race and ethnicity with income and immigration).

The dependent variable equals one if a person record receives a PIK, and zero otherwise. The model covariates consist of a series of dummy variables (see Table 1),[12] which include:

i) Demographic characteristics: age, sex, race and Hispanic origin
ii) Socio-economic characteristics: marital status, level of education, employment status, income, poverty status, public program participation, health insurance status, citizenship status, English proficiency, military status, mobility status, and household type
iii) Housing and address-related characteristics.[13]

Income is defined as the log of total personal income during the twelve months prior to the ACS interview.[14] Poverty status equals one if the individual's income is below the federal poverty line (FPL), and zero otherwise. Employment status[15] includes dummy variables indicating whether the individual was non-employed (control group), employed by a private firm,[16] employed by the government, self-employed, or worked for his or her family without pay.

Participation in public programs is captured by two sets of indicator variables: whether the person received any public assistance or welfare program income, and whether the individual received social security or railroad retirement income (income from neither source is the control group). Health insurance status consists of three categories: the person is currently uninsured (control group), insured by private health insurance, or insured through a public health insurance program.

[10]A group quarter 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". Group quarters include such places as college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and workers' dormitories. For further information on group quarters, see http://www.census.gov/acs/www/Downloads/data_documentation/GroupDefinitions/2011GQ_Definitions.pdf.

[11]Puerto Rico is not included in the analysis.

[12] The control group for each of the categorical variables is indicated in Table 2.

[13]All demographic and socio-economic characteristics except family household are person-level, while housing and address-related characteristics and the family household variable are housing-unit level.

[14]Income includes wages and earnings as well as income from sources including dividends, interest, and public assistance programs.

[15]Employment status refers to a person's employment the week prior to the ACS interview. If the person had no job the week prior to the interview, then employment status refers to his/her most recent job if he/she worked in the last 5 years. Children less than 16 years of age are classified as not employed.

[16]This includes for-profit and not-for-profit firms.

Citizenship status is divided into three groups: non-U.S. citizens, native-born U.S. citizens (control group), and naturalized U.S. citizens. We also include two dummies indicating his/her English proficiency and whether English is the language the person speaks at home.

Military status consists of four categories that indicate whether the person is presently on active duty, is not on active duty but is presently in training, was on active duty in the past but not presently, or none of these (control group)[17].

Mobility status is captured by two categorical variables. The person-level ACS one-year migration question asks whether each individual lived at the address one year ago. Migrants are then asked whether they moved from within the U.S. or from abroad. Migrants are compared to non-movers within the past year. Another variable is created using a housing unit-level question capturing the month and year that the reference person (Person 1) moved into the house, apartment, or mobile home. Seven categories are created by subtracting the household move-in date (month-year) from the interview (month-year), differentiating recently formed households from more established households (move-in dates two or more years ago).

Family type is a household-level variable that equals one if the individual resides in a family household, and zero otherwise.

Finally, housing and address characteristics include housing unit tenure status, living quarters type, the year the housing unit was built, and urban/rural status of the housing unit.[18] Housing tenure status is captured by a dummy variable that equals one if the housing unit is being rented or occupied without payment, and zero otherwise. Living quarters type consists of a set of dummy variables indicating whether the unit is a group quarters, a detached one-family house, an attached one-family house, an apartment building with different numbers of units, a mobile home (control group) or other type of living quarters (including boat/RV/van, etc.). The urban/rural dummy variable indicates whether the address is in a Metropolitan Statistical Area (MSA).

Using weighted data, we estimate separate probit regressions for 2009 and 2010. To account for the survey design of the ACS, we use replicate weights in estimating the standard errors and statistical significance of our model.[19] We have chosen to focus on the 2009 and 2010 ACS survey years because, as explained above, PVS modifications were tested in 2010. While the emphasis of this paper is to assess PIK assignment bias, it is also of interest to explore whether changes in PVS have altered the nature of the bias and by what magnitude.

[17]Children under 17 are included in this category.

[18]Note that housing tenure status, the year the housing unit was built, and urban/rural status are relevant only for housing units. Group quarters residents are placed in the base category for these variables.

[19]In particular, the successive difference replication (SDR) method is used. See chapter 12 of U.S. Census Bureau (2009).

4. Results

Previous research suggests a person record fails validation when the record has insufficient identifying information, the person is not in the government reference files (e.g., a newborn baby, a recent immigrant, or a low-income, unemployed person not paying taxes), the person is in the reference files but the identifying information differs between the survey and the reference files (e.g., the person uses different versions of their last name, as is common with Latin names), or the address information differs between the reference files and the survey (e.g., due to a recent move or because the address is stated differently (which may be common in small multi-unit structures or in rural areas).[20] Table 1 reports validation rates by person and housing unit characteristics. Table 2 shows results from testing the statistical significance of validation rate differences between each category and its base group. In addition, results from testing the statistical significance of the changes in validation rates from 2009 to 2010 are shown in Table 3. We also report probit regression results in Table 4, displaying how the associations differ between the 2009 and 2010 ACS when using different PVS methods. Results from testing the statistical significance of the changes in probit marginal effects from 2009 to 2010 are shown in Table 5.[21] The findings discussed below are all statistically significant at the 10 percent level of significance unless noted otherwise.

The percentage of person records that are successfully validated, separately by characteristics, are displayed in Table 1. For both 2009 and 2010, characteristics observed with lower validation rates may be associated with language barriers, trust in government, or privacy preferences. These include groups such as Hispanic, some other race, non-U.S. citizen, poor spoken English, and other language than English spoken at home. Validation rates for all these groups are found to be lower compared to their base categories (see Table 2). For instance, 74.37 percent of Hispanics received a PIK in the 2009 ACS while 90.63 percent of Non-Hispanics obtained one. PVS is most robust when persons provide complete, accurate name and date of birth data to the ACS. For some race and ethnic groups, names are difficult to parse and match. For example, Hispanic respondents may provide first, middle, and both maternal and paternal last names.

Rates may also be low because records for the survey persons are missing from the PVS reference file or appear in the reference file at an old address, preventing a match and PIK assignment. This likely affects populations such as those in poverty, no schooling completed (pre-school-age children), secondary school completed, and the mover variables (see Table 1). By contrast, populations such as the insured, those who own (vs. rent) a home, and those with age 45 or above have higher validation rates. Higher validation rates are also associated with public assistance recipients, those in the military, and persons who are employed (Table 1).
Other fields associated with lower rates include housing variables such as living in a group quarters, [22] and living in a small or medium multi-unit building.[23] Meanwhile, those owning

[20] See Mulrow, et al. (2011), and Rastogi and O'Hara (2012).

[21] Due to computational constraints, the results presented in Table 5 are based on a 10 percent random sample of the pooled 2009 and 2010 ACS.

[22] A group quarter 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". Group quarters include such places as college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and workers' dormitories.

(versus renting) a home have higher validation rates (see Table 1). It is unclear, though, whether these location variables are associated with data collection issues or underrepresentation in the reference file.

Changes to PVS resulted in higher validation rates in the 2010 ACS: the weighted rate is 4.5 percentage points higher than the 2009 rate, and the rates are higher for every category (see Tables 1 and 3). Categories with some of the largest rate gains include age 0-2, non-U.S. citizens, the uninsured, movers, no schooling completed, and small multi-unit building residents (Table 1). These are likely due to the inclusion of the DOB Search and Household Composition modules as well as the inclusion of ITINs in the 2010 PVS.

Most of these associations observed in the raw validation rates survive after controlling for relevant factors in the probit models. Regression results are shown in Table 4, where the statistical significance of the marginal effect of a given variable on the probability of obtaining a PIK is noted. As mentioned earlier, results from testing the statistical significance of the change in marginal effects from 2009 to 2010 are shown in Table 5.

The results in Table 4 indicate that the bias for Hispanic is sharply reduced as indicated by the lower marginal effect and the statistically significant change from 2009 to 2010. In particular, in the 2009 ACS, Hispanics had a probability of getting a PIK that was 3.66 percentage points lower than that of non-Hispanics – while in the 2010 ACS, that figure was 1.12 percentage points. Similarly, results for African American and American Indian and Alaska Native more closely resemble the White base category after the 2010 PVS changes (as indicated by marginal effects closer to zero). Regarding age effects, overall, the association between age and validation is weaker in 2010. Note, though, that the decrease in marginal effects between 2009 and 2010 is only significant for the older populations (35 years or older).

The results on the citizenship variables also indicated large bias reductions in 2010 for both non-U.S. citizen and foreign-born U.S. citizens (using U.S. citizens as the base category), due to the inclusion of ITIN data in the reference file in 2010. The bias in the language spoken at home variable also diminishes in 2010.

In 2009, veterans are less likely to get a PIK relative to those that have never been in the military; the negative effect disappears in 2010. The effects of income, poverty status, and health insurance coverage have diminished with the 2010 changes. It is unclear whether these changes resulted from the Household Composition or DOB Search modules introduced in 2010; they are probably unrelated to the Zipcode Adjacency module or ITIN modifications.
Results from the person-level one-year migration question, asking if each person lived in the unit one year earlier, indicate a bias reduction for movers from abroad likely due to inclusion of ITIN data. In 2010, the marginal effect of domestic movers within the past twelve months is positive, indicating that this group has a higher probability of getting a PIK than non-movers - meanwhile the category has a negative association with getting a PIK in 2009. Regression results for housing structure type also indicate bias reductions for the 2010 processing changes except for

[23] Small or medium multi-unit buildings are those with 2 to 49 units or apartments.

group quarters, where the decrease in the marginal effect is not statistically significant. Without further analysis, it is unclear which of the PVS changes are responsible for these changes.

These probit results have followed expectations and correspond to findings in the descriptive statistics with one main exception: the marginal effects on the urban area variable change from positive to negative between 2009 and 2010. It is unclear which PVS modification could have caused the change. Overall, the results indicate that changes to the PVS process have decreased bias, as reflected by smaller differences in raw rates and smaller marginal effects in the 2010 regression.

5. Conclusion

The analysis shows large differences in validation rates by person and housing unit characteristics in the 2009 ACS. Researchers linking ACS data should be aware that the characteristics of persons who can be linked to external data sources vary considerably from the full set of ACS persons. Researchers may wish to alter the survey weights accordingly when conducting analysis. Changes tested in the PVS process for the 2010 ACS validation not only increase the overall validation rate, but also more importantly attenuate the bias by characteristics. This illustrates the importance of record linkage research for improving the quality of studies employing linked data.

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Table 1. PVS Validation Rates in 2009 and 2010, Overall & by Category				
Variable	2009		2010	
	PVS Rate	N. Obs.	PVS Rate	N. Obs.
Female	88.42	2,300,493	92.90	2,290,419
Male	87.71	2,182,946	92.24	2,180,309
Age 0-2	76.03	156,090	91.98	152,791
Age 3-5	86.31	162,013	92.23	162,084
Age 6-9	86.48	222,858	92.03	219,996
Age 10-14	87.00	291,179	92.32	287,758
Age 15-18	87.63	252,757	92.30	246,453
Age 19-24	83.98	319,205	89.99	321,205
Age 25-34	84.10	511,922	90.93	519,180
Age 35-44	87.52	574,165	92.11	560,761
Age 45-54	91.11	685,641	93.46	675,848
Age 55-64	92.82	592,939	94.23	603,703
Age 65-74	93.77	379,039	94.48	383,274
Age 75 and older	93.56	335,631	94.83	337,675
Hispanic	74.37	543,571	87.13	559,903
Non-Hispanic	90.63	3,939,868	93.64	3,910,825
White	89.82	3,594,421	93.45	3,563,293
African-American	85.79	452,040	91.40	463,635
American Indian and Alaska Native	84.01	59,349	91.03	61,211
Asian	85.11	199,265	90.81	209,467
Native Hawaiian and Other Pacific Islander	83.31	8,695	90.09	10,098
Some Other Race	71.66	169,669	84.88	163,024
Non-U.S. Citizen	56.71	236,752	78.20	243,574
Foreign-Born U.S. Citizen	89.09	277,561	92.82	283,729
U.S. Citizen	90.56	3,969,126	93.77	3,943,425
Poor Spoken English	58.29	147,100	76.98	150,269
Not Poorly Spoken English	89.43	4,336,339	93.29	4,320,459
Other Language than English Spoken in Home	76.73	696,900	87.45	715,103
No Other Language than English Spoken in Home	90.66	3,786,539	93.79	3,755,625
Active Military	91.81	15,848	95.06	14,070
Military Training	95.01	46,447	95.99	44,826
Veteran	93.95	369,588	95.07	358,690
No Military Participation	88.43	3,095,697	92.39	3,109,610
Missing Military Status	84.83	955,859	92.18	943,532
Income>Median	91.10	2,232,445	93.76	2,235,369
Income<Median	85.28	2,250,994	91.47	2,235,359
In Poverty	79.08	526,965	88.50	570,920
Not In Poverty	89.53	3,956,474	93.29	3,899,808

Table 1. PVS Validation Rates in 2009 and 2010, Overall & by Category				
Variable	2009		2010	
	PVS Rate	N. Obs.	PVS Rate	N. Obs.
Public Assistance Recipient	87.44	50,347	92.78	55,433
Not Public Assistance Recipient	88.08	4,433,092	92.57	4,415,295
Social Security Recipient	93.99	801,451	94.98	806,444
Not Social Security Recipient	87.05	3,681,988	92.15	3,664,284
Private Health Insurance	90.94	2,552,785	93.87	2,470,279
Public Health Insurance	85.79	743,802	92.27	801,657
Both Private and Public Health Insurance	94.25	620,323	95.37	611,063
Uninsured	75.83	566,529	86.53	587,729
Private Employment	88.79	1,945,418	92.81	1,915,555
Government Employment	93.02	416,783	94.90	420,591
Self-Employed	89.26	282,457	92.61	274,595
Family Employment	86.33	7,903	90.81	7,291
Not Employed (including missing)	86.07	1,830,878	91.83	1,852,696
No Schooling Completed	79.37	298,168	91.11	298,133
Nursery School	89.12	67,470	93.69	66,444
Kindergarten	86.34	58,745	92.30	58,394
Primary School	84.84	248,801	90.83	245,807
Secondary School	81.86	355,613	89.54	348,520
Incomplete High School	85.53	464,838	91.42	461,018
High School Diploma	88.10	881,922	91.92	880,098
GED	90.93	140,340	94.04	139,303
Some College, <1 year	92.67	257,360	94.98	255,805
Some College, 1+ year	89.77	545,523	92.76	543,887
Associate Degree	91.78	254,506	94.23	255,928
Bachelor's Degree	92.19	575,029	94.20	579,107
Master's Degree	93.76	234,684	95.45	237,052
Professional Degree	94.05	63,068	95.74	62,554
Doctorate Degree	93.71	37,372	95.42	38,678
Own Home, with Mortgage	91.81	2,324,622	94.33	2,254,429
Own Home, No Mortgage	91.97	917,022	94.18	926,961
Rent Home (incl. no cash rent)	80.73	1,241,795	89.34	1,289,338
Non-Family Household	87.04	826,303	90.61	834,980
Living with Family	88.30	3,657,136	93.01	3,635,748
Never Married	85.02	1,826,455	91.18	1,839,833
Married	90.70	1,965,323	93.97	1,929,050
Widowed	91.55	251,742	93.42	250,829
Divorced	90.87	374,091	93.44	383,306
Separated	85.09	65,828	91.08	67,710
Rural	89.38	986,913	93.66	996,697
Urban	87.82	3,496,526	92.36	3,474,031
Mover from Abroad in 12 Months	50.31	19,824	72.14	20,770

Table 1. PVS Validation Rates in 2009 and 2010, Overall & by Category				
Variable	2009		2010	
	PVS Rate	N. Obs.	PVS Rate	N. Obs.
Before Interview Month (IM)				
Domestic Mover in 12 Months Before IM	81.77	556,266	90.97	557,480
Non-Mover in 12 Months Before IM	89.92	3,857,558	93.00	3,844,302
Moving Status Missing	56.21	49,791	91.86	48,176
Moved in IM	75.25	23,525	87.27	23,926
Moved 1-3 Months Before IM	75.92	135,840	88.86	138,366
Moved 4-6 Months Before IM	79.80	118,252	90.33	120,430
Moved 7-9 Months Before IM	83.16	109,164	91.28	105,145
Moved 10-12 Months Before IM	84.27	103,910	91.31	96,775
Moved 13-24 Months Before IM	87.21	291,019	93.01	272,270
Moved 2 or More Years Before IM, including missing	89.58	3,701,729	92.97	3,713,816
Group Quarters	83.41	146,716	89.16	144,948
Mobile Home	84.87	252,925	91.77	256,114
Detached One-Family House	90.54	3,187,858	93.71	3,153,874
Attached One-Family House	87.94	226,672	92.56	229,063
Building with 2 Apartments	81.77	120,471	89.39	122,066
Building with 3-4 Apartments	79.86	125,883	88.74	129,498
Building with 5-9 Apartments	80.44	121,489	89.42	124,016
Building with 10-19 Apartments	79.22	103,754	88.55	104,507
Building with 20-49 Apartments	80.94	81,854	89.29	85,737
Building with 50+ Apartments	86.05	113,359	91.59	118,416
Other (Boat/RV/Van, etc.)	84.23	2,458	86.52	2,489
Built in 1999 or Later	87.38	627,989	91.90	620,547
Built in 1995-1998	87.53	246,016	92.03	239,941
Built in 1990-1994	88.79	490,645	92.87	488,054
Built in 1980-1989	87.79	469,333	92.54	471,804
Built in 1970-1979	87.37	670,511	92.46	664,948
Built in 1960-1969	87.77	557,618	92.67	556,493
Built in 1950-1959	89.32	629,980	93.16	622,926
Built in 1940-1949	89.43	378,897	93.25	365,910
Built in 1939 or Earlier	89.10	83,208	92.94	90,522
Building year, missing	86.55	329,242	91.75	349,583
Total	88.07	4,483,439	92.57	4,470,728

Source: 2009 and 2010 ACS files. These are weighted by person weights.

Table 2. Tests of Differences in Mean PVS Rates Across Categories Within Year				
Variable	Difference vs. Base Category in 2009	Standard Error	Difference vs. Base Category in 2010	Standard Error
Female	(base)		(base)	
Male	-0.0071*	0.0004	-0.0066*	0.0003
Age 0-2	-0.0807*	0.0015	0.0105*	0.0011
Age 3-5	0.0221*	0.0013	0.0130*	0.0010
Age 6-9	0.0238*	0.0012	0.0110*	0.0009
Age 10-14	0.0290*	0.0011	0.0139*	0.0009
Age 15-18	0.0352*	0.0011	0.0137*	0.0009
Age 19-24	-0.0012	0.0011	-0.0094*	0.0009
Age 25-34	(base)		(base)	
Age 35-44	0.0342*	0.0009	0.0118*	0.0007
Age 45-54	0.0701*	0.0009	0.0253*	0.0007
Age 55-64	0.0872*	0.0008	0.0330*	0.0007
Age 65-74	0.0967*	0.0009	0.0355*	0.0007
Age 75 and older	0.0946*	0.0009	0.0390*	0.0008
Hispanic	-0.1626*	0.0008	-0.0650*	0.0006
Non-Hispanic	(base)		(base)	
White	(base)		(base)	
African-American	-0.0402*	0.0007	-0.0205*	0.0006
American Indian and Alaska Native	-0.0581*	0.0021	-0.0242*	0.0016
Asian	-0.0471*	0.0011	-0.0264*	0.0009
Native Hawaiian and Other Pacific Islander	-0.0651*	0.0053	-0.0336*	0.0039
Some Other Race	-0.1816*	0.0014	-0.0857*	0.0011
Non-U.S. Citizen	-0.3385*	0.0013	-0.1557*	0.0011
Foreign-Born U.S. Citizen	-0.0147*	0.0008	-0.0095*	0.0007
U.S. Citizen	(base)		(base)	
Poor Spoken English	-0.3114*	0.0016	-0.1630*	0.0014
Not Poorly Spoken English	(base)		(base)	
Other Language than English Spoken in Home	-0.1393*	0.0007	-0.0635*	0.0005
Not Other Language than English Spoken in Home	(base)		(base)	
Active Military	0.0338*	0.0031	0.0266*	0.0028
Military Training	0.0658*	0.0014	0.0360*	0.0013
Veteran	0.0552*	0.0006	0.0268*	0.0005
No Military Participation	(base)		(base)	
Missing Military Status	-0.0360*	0.0005	-0.0022*	0.0004
Income>Median	0.0531*	0.0005	0.0272*	0.0004

Table 2. Tests of Differences in Mean PVS Rates Across Categories Within Year				
Variable	Difference vs. Base Category in 2009	Standard Error	Difference vs. Base Category in 2010	Standard Error
Income<Median	(base)		(base)	
In Poverty	-0.1065*	0.0008	-0.0492*	0.0006
Not In Poverty	(base)		(base)	
Missing Poverty	-0.0673*	0.0013	-0.0438*	0.0011
Public Assistance Recipient	-0.0155*	0.0021	0.0011	0.0015
Not Public Assistance Recipient	(base)		(base)	
Missing Public Assistance	-0.0452*	0.0006	-0.0051*	0.0004
Social Security Recipient	0.0614*	0.0005	0.0283*	0.0004
Not Social Security Recipient	(base)		(base)	
Missing Social Security	-0.0337*	0.0006	0.00007	0.0005
Private Health Insurance	0.1511*	0.0008	0.0734*	0.0006
Public Health Insurance	0.0996*	0.0009	0.0574*	0.0007
Both Private and Public Health Insurance	0.1842*	0.0009	0.0884*	0.0007
Uninsured	(base)		(base)	
Private Employment	0.0272*	0.0005	0.0098*	0.0004
Government Employment	0.0695*	0.0007	0.0307*	0.0005
Self-Employed	0.0319*	0.0009	0.0079*	0.0008
Family Employment	0.0026	0.0057	-0.0102*	0.0049
Not Employed (including missing)	(base)		(base)	
No Schooling Completed	-0.0491*	0.0014	-0.0174*	0.0011
Nursery School	0.0103*	0.0017	0.0177*	0.0013
Kindergarten	-0.0176*	0.0019	0.0037*	0.0015
Primary School	-0.0326*	0.0011	-0.0109*	0.0009
Secondary School	-0.0623*	0.0010	-0.0239*	0.0008
Incomplete High School	-0.0257*	0.0009	-0.0050*	0.0007
High School Diploma	(base)		(base)	
GED	0.0283*	0.0012	0.0212*	0.0010
Some College, <1 year	0.0458*	0.0009	0.0306*	0.0007
Some College, 1+ year	0.0168*	0.0008	0.0083*	0.0006
Associate Degree	0.0368*	0.0009	0.0231*	0.0008
Bachelor's Degree	0.0409*	0.0007	0.0228*	0.0006
Master's Degree	0.0566*	0.0009	0.0353*	0.0007
Professional Degree	0.0595*	0.0014	0.0382*	0.0012
Doctorate Degree	0.0561*	0.0018	0.0350*	0.0015
Missing Education	-0.0716*	0.0019	0.0180*	0.0014
Own Home, with Mortgage	0.1107*	0.0005	0.0499*	0.0004
Own Home, No Mortgage	0.1124*	0.0006	0.0485*	0.0005
Rent Home (incl. no cash rent)	(base)		(base)	
Living with Family	0.0126*	0.0006	0.0240*	0.0005

Table 2. Tests of Differences in Mean PVS Rates Across Categories Within Year				
Variable	Difference vs. Base Category in 2009	Standard Error	Difference vs. Base Category in 2010	Standard Error
Non-Family Household	(base)		(base)	
Never Married	(base)		(base)	
Married	0.0568*	0.0005	0.0279*	0.0004
Widowed	0.0653*	0.0009	0.0224*	0.0007
Divorced	0.0585*	0.0008	0.0226*	0.0006
Separated	0.0007	0.0019	-0.0009	0.0015
Rural	(base)		(base)	
Urban	-0.0157*	0.0005	-0.0131*	0.0004
Mover from Abroad in 12 Months Before Interview Month (IM)	-0.3961*	0.0044	-0.2086*	0.0039
Domestic Mover in 12 Months Before IM	-0.0815*	0.0007	-0.0202*	0.0005
Non-Mover in 12 Months Before IM	(base)		(base)	
Moving Status Missing	-0.3371*	0.0028	-0.0113*	0.0016
Moved in IM	-0.1433*	0.0037	-0.0570*	0.0029
Moved 1-3 Months Before IM	-0.1366*	0.0015	-0.0411*	0.0011
Moved 4-6 Months Before IM	-0.0977*	0.0016	-0.0264*	0.0012
Moved 7-9 Months Before IM	-0.0642*	0.0015	-0.0169*	0.0012
Moved 10-12 Months Before IM	-0.0530*	0.0016	-0.0166*	0.0012
Moved 13-24 Months Before IM	-0.0236*	0.0009	0.0004	0.0007
Moved 2 or More Years Before IM, including missing	(base)		(base)	
Group Quarters	-0.0146*	0.0016	-0.0261*	0.0013
Mobile Home	(base)		(base)	
Detached One-Family House	0.0568*	0.0010	0.0193*	0.0008
Attached One-Family House	0.0307*	0.0014	0.0079*	0.0011
Building with 2 Apartments	-0.0310*	0.0018	-0.0238*	0.0014
Building with 3-4 Apartments	-0.0501*	0.0018	-0.0304*	0.0014
Building with 5-9 Apartments	-0.0443*	0.0018	-0.0236*	0.0014
Building with 10-19 Apartments	-0.0565*	0.0019	-0.0322*	0.0015
Building with 20-49 Apartments	-0.0393*	0.0020	-0.0248*	0.0016
Building with 50+ Apartments	0.0118*	0.0017	-0.0019	0.0013
Other (Boat/RV/Van, etc.)	-0.0064	0.0093	-0.0525*	0.0090
Built in 1999 or Later	(base)		(base)	
Built in 1995-1998	0.0016	0.0011	0.0013	0.0009
Built in 1990-1994	0.0141*	0.0009	0.0097*	0.0007
Built in 1980-1989	0.0041*	0.0009	0.0065*	0.0007
Built in 1970-1979	-0.00009	0.0008	0.0056*	0.0007
Built in 1960-1969	0.0040*	0.0009	0.0077*	0.0007

Table 2. Tests of Differences in Mean PVS Rates Across Categories Within Year				
Variable	Difference vs. Base Category in 2009	Standard Error	Difference vs. Base Category in 2010	Standard Error
Built in 1950-1959	0.0194*	0.0008	0.0126*	0.0007
Built in 1940-1949	0.0206*	0.0009	0.0135*	0.0008
Built in 1939 or Earlier	0.0172*	0.0016	0.0104*	0.0013
Building year, missing	-0.0082*	0.0010	-0.0015*	0.0008
N. of observations	4,483,439		4,470,728	

Source: 2009 and 2010 ACS files. These are calculated using person weights. * denotes statistical significance at the 10 percent level.

Table 3. Tests of Differences in Descriptive Statistics Across Years		
Variable	2010-2009 Difference	Standard Error
Female	0.0448*	0.0004
Male	0.0453*	0.0004
Age 0-2	0.1595*	0.0017
Age 3-5	0.0592*	0.0014
Age 6-9	0.0555*	0.0012
Age 10-14	0.0532*	0.0011
Age 15-18	0.0467*	0.0011
Age 19-24	0.0601*	0.0011
Age 25-34	0.0683*	0.0009
Age 35-44	0.0459*	0.0008
Age 45-54	0.0235*	0.0006
Age 55-64	0.0140*	0.0006
Age 65-74	0.0071*	0.0008
Age 75 and older	0.0127*	0.0008
Hispanic	0.1277*	0.0009
Non-Hispanic	0.0301*	0.0003
White	0.0363*	0.0003
African-American	0.0561*	0.0009
American Indian and Alaska Native	0.0702*	0.0026
Asian	0.0570*	0.0013
Native Hawaiian and Other Pacific Islander	0.0678*	0.0066
Some Other Race	0.1322*	0.0017
Non-U.S. Citizen	0.2149*	0.0016
Foreign-Born U.S. Citizen	0.0373*	0.0010
U.S. Citizen	0.0321*	0.0003
Poor Spoken English	0.1870*	0.0021
Not Poorly Spoken English	0.0386*	0.0003
Other Language than English Spoken in Home	0.1072*	0.0008
Not Other Language than English Spoken in Home	0.0313*	0.0003
Active Military	0.0324*	0.0041
Military Training	0.0098*	0.0019
Veteran	0.0112*	0.0008
No Military Participation	0.0396*	0.0003
Missing Military Status	0.0735*	0.0006
Income>Median	0.0273*	0.0004
Income<Median	0.0526*	0.0005
In Poverty	0.0942*	0.0009
Not In Poverty	0.0369*	0.0003

Table 3. Tests of Differences in Descriptive Statistics Across Years		
Variable	2010-2009 Difference	Standard Error
Public Assistance Recipient	0.0534*	0.0025
Not Public Assistance Recipient	0.0368*	0.0003
Social Security Recipient	0.0438*	0.0004
Not Social Security Recipient	0.0430*	0.0004
Private Health Insurance	0.0293*	0.0003
Public Health Insurance	0.0648*	0.0007
Both Private and Public Health Insurance	0.0112*	0.0005
Uninsured	0.1070*	0.0010
Private Employment	0.0402*	0.0004
Government Employment	0.0188*	0.0007
Self-Employed	0.0335*	0.0011
Family Employment	0.0447*	0.0075
Not Employed (including missing)	0.0575*	0.0004
No Schooling Completed	0.1174*	0.0012
Nursery School	0.0457*	0.0020
Kindergarten	0.0595*	0.0024
Primary School	0.0599*	0.0012
Secondary School	0.0767*	0.0011
Incomplete High School	0.0589*	0.0009
High School Diploma	0.0382*	0.0007
GED	0.0311*	0.0014
Some College, <1 year	0.0231*	0.0010
Some College, 1+ year	0.0298*	0.0008
Associate Degree	0.0245*	0.0010
Bachelor's Degree	0.0201*	0.0007
Master's Degree	0.0169*	0.0009
Professional Degree	0.0169*	0.0017
Doctorate Degree	0.0171*	0.0023
Own Home, with Mortgage	0.0252*	0.0003
Own Home, No Mortgage	0.0221*	0.0005
Rent Home (incl. no cash rent)	0.0861*	0.0006
Living with Family	0.0471*	0.0003
Non-Family Household	0.0357*	0.0007
Never Married	0.0616*	0.0005
Married	0.0327*	0.0004
Widowed	0.0187*	0.0010
Divorced	0.0257*	0.0009
Separated	0.0599*	0.0024
Rural	0.0428*	0.0006
Urban	0.0454*	0.0003
Mover from Abroad in 12 Months	0.2183*	0.0059

Table 3. Tests of Differences in Descriptive Statistics Across Years		
Variable	2010-2009 Difference	Standard Error
Before Interview Month (IM)		
Domestic Mover in 12 Months Before IM	0.0920*	0.0009
Non-Mover in 12 Months Before IM	0.0307*	0.0003
Moving Status Missing	0.3565*	0.0032
Moved in IM	0.1203*	0.0047
Moved 1-3 Months Before IM	0.1295*	0.0018
Moved 4-6 Months Before IM	0.1053*	0.0019
Moved 7-9 Months Before IM	0.0812*	0.0019
Moved 10-12 Months Before IM	0.0704*	0.0020
Moved 13-24 Months Before IM	0.0580*	0.0011
Moved 2 or More Years Before IM, including missing	0.0339*	0.0003
Group Quarters	0.0575*	0.0016
Mobile Home	0.0690*	0.0013
Detached One-Family House	0.0316*	0.0004
Attached One-Family House	0.0462*	0.0012
Building with 2 Apartments	0.0762*	0.0018
Building with 3-4 Apartments	0.0887*	0.0018
Building with 5-9 Apartments	0.0897*	0.0019
Building with 10-19 Apartments	0.0933*	0.0021
Building with 20-49 Apartments	0.0836*	0.0023
Building with 50+ Apartments	0.0554*	0.0017
Other (Boat/RV/Van, etc.)	0.0230*	0.0128
Built in 1999 or Later	0.0452*	0.0008
Built in 1995-1998	0.0449*	0.0012
Built in 1990-1994	0.0408*	0.0008
Built in 1980-1989	0.0476*	0.0009
Built in 1970-1979	0.0509*	0.0007
Built in 1960-1969	0.0490*	0.0008
Built in 1950-1959	0.0384*	0.0007
Built in 1940-1949	0.0382*	0.0009
Built in 1939 or Earlier	0.0384*	0.0019
Building year, missing	0.0519*	0.0010
Total (person weighted)	0.0450*	0.0003

Source: 2009 and 2010 ACS files. These are calculated using person weights. The tests are for statistically significant differences relative to zero change. * denotes statistical significance at the 10 percent level.

Table 4. Probit Regression Results				
Variable				
	2009		2010	
	Marginal Effect	Delta-Method Std. Error	Marginal Effect	Delta-Method Std. Error
Female	(base)		(base)	
Male	-0.0008*	0.0005	-0.0046*	0.0003
Age 0-2	-0.0421*	0.0080	-0.0249*	0.0082
Age 3-5	-0.0413*	0.0082	-0.0271*	0.0083
Age 6-9	-0.0358*	0.0085	-0.0222*	0.0081
Age 10-14	-0.0236*	0.0084	-0.0178*	0.0081
Age 15-18	0.0191*	0.0014	0.0110*	0.0013
Age 19-24	0.0010	0.0010	-0.0009	0.0010
Age 25-34	(base)		(base)	
Age 35-44	0.0098*	0.0007	-0.0005	0.0007
Age 45-54	0.0237*	0.0009	0.0037*	0.0007
Age 55-64	0.0325*	0.0010	0.0065*	0.0009
Age 65-74	0.0326*	0.0016	-0.0018*	0.0011
Age 75 and Older	0.0409*	0.0018	0.0122*	0.0013
Hispanic	-0.0366*	0.0009	-0.0112*	0.0008
Non-Hispanic	(base)		(base)	
White	(base)		(base)	
African-American	-0.0273*	0.0009	-0.0132*	0.0008
American Indian and Alaska	-0.0284*	0.0017	-0.0140*	0.0018
Asian	0.0063*	0.0016	-0.0001	0.0012
Native Hawaiian and Other Pacific	-0.0326*	0.0052	-0.0209*	0.0054
Some Other Race	-0.0118*	0.0011	-0.0126*	0.0011
Non-U.S. Citizen	-0.1340*	0.0011	-0.0597*	0.0008
Foreign-Born U.S. Citizen	-0.0166*	0.0010	-0.0062*	0.0008
U.S. Citizen	(base)		(base)	
Poor Spoken English	-0.0469*	0.0011	-0.0352*	0.0009
Not Poorly Spoken English	(base)		(base)	
Other Language than English Spoken in Home	-0.0054*	0.0010	0.0009	0.0009
No Other Language than English Spoken in Home	(base)		(base)	
Active military	0.0290*	0.0039	0.0272*	0.0034
Military training	0.0262*	0.0020	0.0180*	0.0017
Veteran	-0.0030*	0.0009	0.0001	0.0008
No Military Participation	(base)		(base)	
Military status, missing	0.0032*	0.0013	0.0049*	0.0013

Table 4. Probit Regression Results				
Variable				
	2009		2010	
	Marginal Effect	Delta-Method Std. Error	Marginal Effect	Delta-Method Std. Error
Log Income	0.0020*	0.0001	0.0009*	0.0001
Income, missing	0.0513*	0.0079	0.0398*	0.0078
In Poverty	-0.0175*	0.0008	-0.0110*	0.0007
Not In Poverty	(base)		(base)	
Poverty status, missing	-0.0102*	0.0039	-0.0138*	0.0037
Public Assistance Recipient	0.0131*	0.0019	0.0129*	0.0016
Not Public Assistance Recipient	(base)		(base)	
Social Security Recipient	0.0153*	0.0010	0.0112*	0.0009
Private Health Insurance	0.0383*	0.0006	0.0188*	0.0006
Public Health Insurance	0.0422*	0.0008	0.0277*	0.0008
Both Private and Public Health	0.0498*	0.0012	0.0316*	0.0012
Uninsured	(base)		(base)	
Private Employment	0.0285*	0.0007	0.0220*	0.0006
Government Employment	0.0309*	0.0010	0.0236*	0.0009
Self-Employed	0.0143*	0.0010	0.0124*	0.0010
Family Employment	0.0011	0.0050	-0.0007	0.0046
Not Employed (including missing)	(base)		(base)	
No Schooling Completed	0.0061*	0.0017	0.0021	0.0017
Nursery School	0.0264*	0.0023	0.0177*	0.0017
Kindergarten	0.0086*	0.0020	0.0036*	0.0018
Primary School	0.0072*	0.0015	-0.0021*	0.0011
Secondary School	-0.0019*	0.0012	-0.0008	0.0009
Incomplete High School	0.0108*	0.0008	0.0111*	0.0007
High School Diploma	(base)		(base)	
GED	0.0320*	0.0013	0.0218*	0.0012
Some College, <1 year	0.0371*	0.0011	0.0261*	0.0008
Some College, 1+	0.0111*	0.0007	0.0059*	0.0006
Associate Degree	0.0168*	0.0013	0.0118*	0.0008
Bachelor's Degree	0.0201*	0.0008	0.0222*	0.0011
Master's Degree	0.0296*	0.0014	0.0271*	0.0018
Professional Degree	0.0332*	0.0022	0.0243*	0.0022
Doctorate Degree	0.0356*	0.0026	0.0263*	0.0007
Non-Family Household	(base)		(base)	
Living with Family	0.0255*	0.0009	0.0263*	0.0007
Rented Housing Unit	-0.0373*	0.0008	-0.0210*	0.0007
Own Home	(base)		(base)	
Never Married	(base)		(base)	

Table 4. Probit Regression Results				
Variable				
	2009		2010	
	Marginal Effect	Delta-Method Std. Error	Marginal Effect	Delta-Method Std. Error
Married	0.0006	0.0008	0.0093*	0.0006
Widowed	-0.0018	0.0012	0.0086*	0.0010
Divorced	0.0098*	0.0010	0.0143*	0.0007
Separated	0.0082*	0.0016	0.0113*	0.0015
Rural	(base)		(base)	
Urban Area	0.0083*	0.0007	-0.0033*	0.0006
Mover From Abroad in 12 Months before Interview Month (IM)	-0.1071*	0.0023	-0.0561*	0.0022
Domestic Mover in 12 Months before IM	-0.0256*	0.0011	0.0034*	0.0010
Non-Mover in 12 Months Before	(base)		(base)	
Moving status, missing	-0.1681*	0.0018	-0.0027*	0.0014
Moved in IM	-0.0390*	0.0025	-0.0204*	0.0027
Moved 1-3 Months Before IM	-0.0287*	0.0015	-0.0084*	0.0012
Moved 4-6 Months Before IM	-0.0057*	0.0015	0.0022	0.0018
Moved 7-9 Months Before IM	0.0122*	0.0016	0.0073*	0.0018
Moved 10-12 Months Before IM	0.0086*	0.0018	0.0078*	0.0016
Moved 13-24 Months Before IM	0.0114*	0.0012	0.0187*	0.0010
Moved 2 or More Years Before IM, including missing	(base)		(base)	
Lives in Group Quarters	0.0303*	0.0049	0.0263*	0.0046
Mobile Home	(base)		(base)	
Detached One-Family House	0.0207*	0.0010	0.0040*	0.0011
Attached One-Family House	0.0281*	0.0017	0.0088*	0.0015
Building with 2 Apartments	0.0131*	0.0020	0.0012	0.0018
Building with 3-4 Apartments	0.0182*	0.0015	0.0035*	0.0016
Building with 5-9 Apartments	0.0246*	0.0017	0.0087*	0.0016
Building with 10-19 Apartments	0.0221*	0.0019	0.0053*	0.0016
Building with 20-49 Apartments	0.0292*	0.0017	0.0112*	0.0017
Building with 50+ Apartments	0.0451*	0.0020	0.0206*	0.0019
Other (Boat/RV/Van, etc.)	-0.0136*	0.0075	-0.0355*	0.0077
Built in 1999 or Later	(base)		(base)	
Built in 1995-1998	0.0058*	0.0014	0.0024*	0.0013
Built in 1990-1994	0.0094*	0.0011	0.0065*	0.0011
Built in 1980-1989	0.0031*	0.0013	0.0049*	0.0012
Built in 1970-1979	0.0020*	0.0011	0.0032*	0.0008
Built in 1960-1969	0.0010	0.0011	0.0038*	0.0009

Table 4. Probit Regression Results				
Variable				
	2009		2010	
	Marginal Effect	Delta-Method Std. Error	Marginal Effect	Delta-Method Std. Error
Built in 1950-1959	0.0056*	0.0012	0.0031*	0.0010
Built in 1940-1949	0.0072*	0.0014	0.0035*	0.0012
Built in 1939 or Earlier	0.0103*	0.0023	0.0005	0.0021
Year Built, missing	0.0086*	0.0015	0.0019	0.0013
N. of observations	4,483,439		4,470,728	

Source: 2009 and 2010 ACS files. The regression is estimated using replicate weights. * denotes statistical significance at the 10 percent level.

Table 5. Probit Regression Results with Differences between 2009 and 2010				
Variable	Marginal Effect on Variable	Delta-Method Std. Error	Marginal Effect on Variable* 2010 Dummy	Delta-Method Std. Error
Female	(base)		(base)	
Male	-0.0007*	0.0004	-0.0045*	0.0006
Age 0-2	-0.0372*	0.0073	0.0087	0.0110
Age 3-5	-0.0365*	0.0073	0.0054	0.0109
Age 6-9	-0.0316*	0.0072	0.0062	0.0109
Age 10-14	-0.0209*	0.0072	0.0005	0.0108
Age 15-18	0.0169*	0.0012	-0.0043	0.0018
Age 19-24	0.0009	0.0008	-0.0019	0.0012
Age 25-34	(base)		(base)	
Age 35-44	0.0087*	0.0007	-0.0093*	0.0010
Age 45-54	0.0209*	0.0007	-0.0167*	0.0011
Age 55-64	0.0288*	0.0008	-0.0214*	0.0012
Age 65-74	0.0288*	0.0013	-0.0309*	0.0018
Age 75 and older	0.0361*	0.0014	-0.0222*	0.0020
Hispanic	-0.0324*	0.0006	0.0195*	0.0009
Non-Hispanic	(base)		(base)	
White	(base)		(base)	
African-American	-0.0241*	0.0006	0.0090*	0.0020
American Indian and Alaska Native	-0.0251*	0.0014	0.0091*	0.0020
Asian	0.0055*	0.0009	-0.0056*	0.0013
Native Hawaiian and Other Pacific Islander	-0.0288*	0.0034	0.0048	0.0049
Some Other Race	-0.0104*	0.0008	-0.0040*	0.0012
Non-U.S. Citizen	-0.1184*	0.0007	0.0499*	0.0011
Foreign-Born U.S. Citizen	-0.0147*	0.0008	0.0075*	0.0012
U.S. Citizen	(base)		(base)	
Poor Spoken English	-0.0414*	0.0009	0.0010	0.0013
Not Poorly Spoken English	(base)		(base)	
Other Language than English Spoken in Home	-0.0048*	0.0007	0.0059*	0.0010
Not Other Language than English Spoken in Home	(base)		(base)	
Active Military	0.0256*	0.0034	0.0055	0.0055
Military Training	0.0232*	0.0021	-0.0025	0.0031
Veteran	-0.0027*	0.0008	0.0028*	0.0012
No Military Participation	(base)		(base)	
Missing Military Status	0.0028*	0.0014	0.0028	0.0021
Log Income	0.0017*	0.0001	-0.0007*	0.0001

Table 5. Probit Regression Results with Differences between 2009 and 2010				
Variable	Marginal Effect on Variable	Delta-Method Std. Error	Marginal Effect on Variable* 2010 Dummy	Delta-Method Std. Error
Missing Income	0.0453*	0.0070	0.0003	0.0105
In Poverty	-0.0155*	0.0005	0.0028*	0.0008
Not In Poverty	(base)		(base)	
Missing Poverty	-0.0090*	0.0022	-0.0068*	0.0033
Public Assistance Recipient	0.0116*	0.0016	0.0031	0.0024
Not Public Assistance Recipient	(base)		(base)	
Social Security Recipient	0.0135*	0.0009	-0.0007	0.0013
Not Social Security Recipient	(base)		(base)	
Private Health Insurance	0.0339*	0.0005	-0.0123*	0.0008
Public Health Insurance	0.0373*	0.0006	-0.0056*	0.0009
Both Private and Public Health Insurance	0.0440*	0.0009	-0.0078*	0.0014
Uninsured	(base)		(base)	
Private Employment	0.0252*	0.0007	0.00007	0.0010
Government Employment	0.0273*	0.0009	-0.0003	0.0014
Self-Employed	0.0127*	0.0010	0.0015	0.0014
Family Employment	0.0010	0.0043	-0.0017	0.0063
Not Employed (including missing)	(base)		(base)	
No Schooling Completed	0.0054*	0.0014	-0.0030	0.0021
Nursery School	0.0234*	0.0020	-0.0031	0.0030
Kindergarten	0.0076*	0.0019	-0.0034	0.0028
Primary School	0.0064*	0.0013	-0.0087*	0.0019
Secondary School	-0.0017*	0.0009	0.0008	0.0014
Incomplete High School	0.0095*	0.0007	0.0033*	0.0011
High School Diploma	(base)		(base)	
GED	0.0283*	0.0012	-0.0033*	0.0017
Some College, <1 year	0.0328*	0.0009	-0.0028*	0.0014
Some College, 1+ year	0.0098*	0.0007	-0.0031*	0.0010
Associate Degree	0.0148*	0.0009	-0.0013	0.0013
Bachelor's Degree	0.0178*	0.0007	-0.0042*	0.0010
Master's Degree	0.0261*	0.0010	-0.0006	0.0015
Professional Degree	0.0293*	0.0018	0.0018	0.0027
Doctorate Degree	0.0314*	0.0023	-0.0036	0.0034
Own Home	(base)		(base)	
Rent Home (incl. no cash rent)	-0.0330*	0.0005	0.0090*	0.0008
Living with Family	0.0226*	0.0007	0.0076*	0.0010
Non-Family Household	(base)		(base)	
Never Married	(base)		(base)	
Married	0.0005	0.0007	0.0101*	0.0010

Table 5. Probit Regression Results with Differences between 2009 and 2010				
Variable	Marginal Effect on Variable	Delta-Method Std. Error	Marginal Effect on Variable* 2010 Dummy	Delta-Method Std. Error
Widowed	-0.0016	0.0011	0.0115*	0.0016
Divorced	0.0086*	0.0008	0.0077*	0.0012
Separated	0.0073*	0.0014	0.0057*	0.0021
Rural	(base)		(base)	
Urban	0.0073*	0.0005	-0.0111*	0.0007
Mover from Abroad in 12 Months Before Interview Month (IM)	-0.0947*	0.0018	0.0304*	0.0026
Domestic Mover in 12 Months Before IM	-0.0227*	0.0007	0.0266*	0.0011
Non-Mover in 12 Months Before IM	(base)		(base)	
Moving Status Missing	-0.1486*	0.0014	0.1455*	0.0025
Moved in IM	-0.0344*	0.0020	0.0110*	0.0030
Moved 1-3 Months Before IM	-0.0254*	0.0010	0.0158*	0.0016
Moved 4-6 Months Before IM	-0.0051*	0.0011	0.0077*	0.0017
Moved 7-9 Months Before IM	0.0108*	0.0012	-0.0025	0.0018
Moved 10-12 Months Before IM	0.0076*	0.0011	0.0013	0.0017
Moved 13-24 Months Before IM	0.0100*	0.0007	0.0115*	0.0011
Moved 2 or More Years Before IM, including missing	(base)		(base)	
Group Quarters	0.0268*	0.0026	0.0034	0.0038
Mobile Home	(base)		(base)	
Detached One-Family House	0.0183*	0.0008	-0.0137*	0.0012
Attached One-Family House	0.0248*	0.0010	-0.0148*	0.0016
Building with 2 Apartments	0.0116*	0.0012	-0.0101*	0.0018
Building with 3-4 Apartments	0.0161*	0.0011	-0.0121*	0.0017
Building with 5-9 Apartments	0.0217*	0.0012	-0.0118*	0.0018
Building with 10-19 Apartments	0.0196*	0.0012	-0.0135*	0.0018
Building with 20-49 Apartments	0.0258*	0.0013	-0.0129*	0.0020
Building with 50+ Apartments	0.0399*	0.0013	-0.0162*	0.0019
Other (Boat/RV/Van, etc.)	-0.0121*	0.0063	-0.0287*	0.0090
Built in 1999 or Later	(base)		(base)	
Built in 1995-1998	0.0051*	0.0009	-0.0024*	0.0013
Built in 1990-1994	0.0083*	0.0007	-0.0009	0.0010
Built in 1980-1989	0.0027*	0.0007	0.0029*	0.0011
Built in 1970-1979	0.0018*	0.0007	0.0019*	0.0010
Built in 1960-1969	0.0009	0.0007	0.0035*	0.0010
Built in 1950-1959	0.0050*	0.0007	-0.0014	0.0010
Built in 1940-1949	0.0063*	0.0008	-0.0024*	0.0012

Table 5. Probit Regression Results with Differences between 2009 and 2010				
Variable	Marginal Effect on Variable	Delta-Method Std. Error	Marginal Effect on Variable* 2010 Dummy	Delta-Method Std. Error
Built in 1939 or Earlier	0.0091*	0.0014	-0.0086*	0.0020
Building year, missing	0.0076*	0.0010	-0.0054*	0.0015
2010 Year Dummy	0.0480*	0.0021		
N. of observations	896,464			

Source: 2009 and 2010 ACS files. The regression, weighted by person weights, is run on the full sample of 8,954,167 observations, and the marginal effects are calculated on a 10% random sample of these observations. * denotes statistical significance at the 10 percent level.

Source and Accuracy

The data presented in this report are based on the ACS samples interviewed in 2009 and 2010. The estimates in this report based on this sample approximate the actual values and represent the entire household population. Sampling error is the difference between an estimate based on a sample and the corresponding value that would be obtained if the estimate were based on the entire population (as from a census). Measures of the sampling errors are provided in the form of standard error for key estimates included in this report. All comparative statements in this report have undergone statistical testing, and comparisons are significant at least at the 90 percent level unless otherwise noted. In addition to sampling error, nonsampling error may be introduced during any of the operations used to collect and process survey data such as editing, reviewing, or keying data from questionnaires. For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, please see the 2010 ACS Accuracy of the Data document located at <www.census.gov/acs /www/Downloads/data _documentation/Accuracy/ACS _Accuracy_of_Data_2010.pdf>.