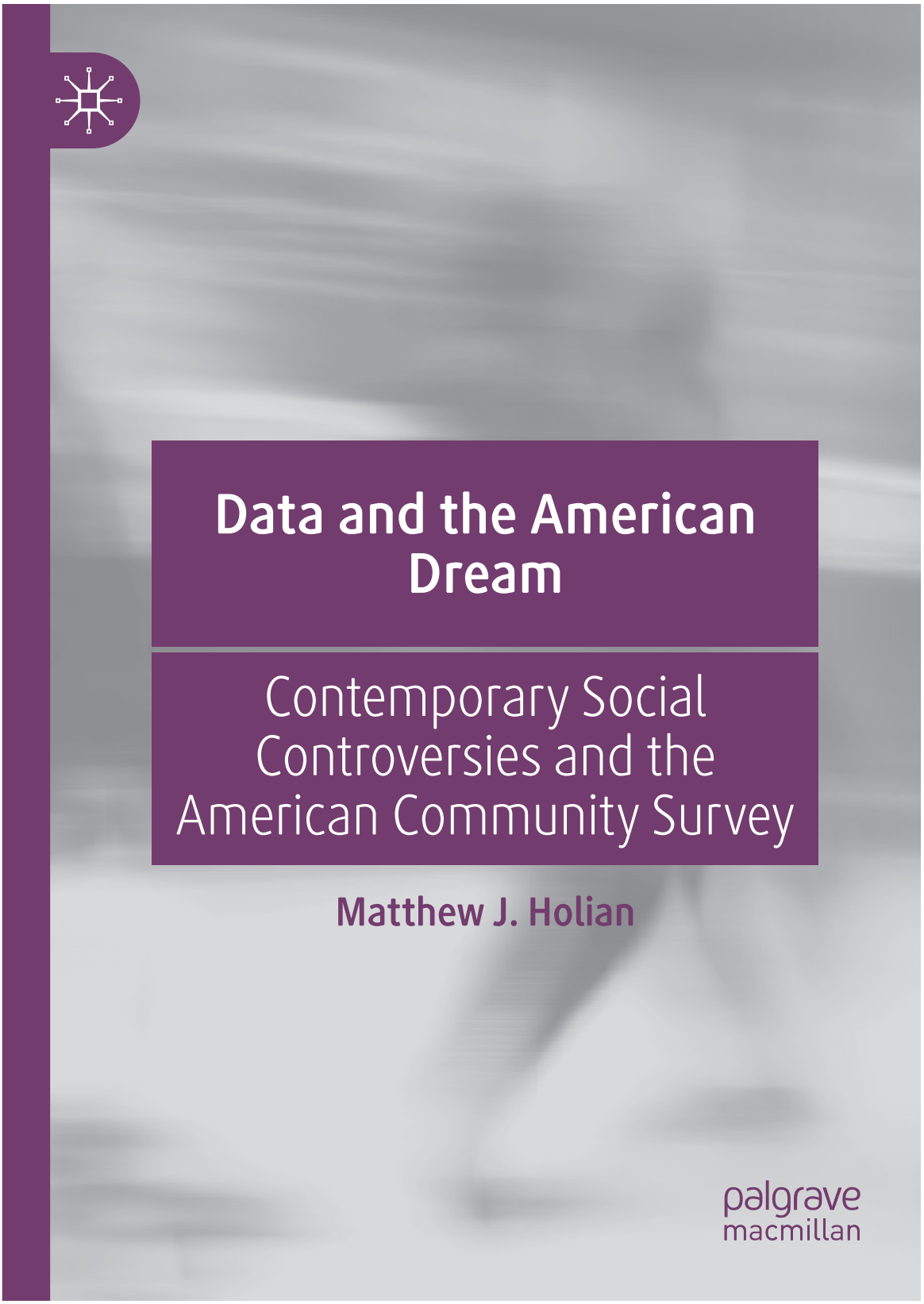
Data and the American Dream
Contemporary Social Controversies and the American Community Survey
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CHAPTER 1

Introduction: Stories, Data and Statistics

Each person in America and around the world has a story. Government agencies like the U.S. Census Bureau systematically collect these stories by conducting large-scale surveys, and archive millions per year as data that are publicly-available online. Secondary researchers then use these data on individuals and the households in which they live to calculate statistics. As an example, a researcher might use data to calculate that average household size was 2.44 in the US in 2015, although it is noticeably lower in one Manhattan neighborhood at 1.68 people per household.

Quite often, journalists and others use these statistics as evidence of real or perceived cause and effect relationships. For example, someone may use the statistics on household size and present them as evidence that living in an expensive, high-density area like Manhattan actually causes families to have fewer children. But there are other possible explanations, including that smaller families are more likely to move to Manhattan in the first place. This book describes how to calculate statistics using individual-level population data, and how (and how not) to use the statistics.

This book presents an accessible discussion of economic and social science research that share the theme of utilizing one data source: individual responses to the American Community Survey (ACS), the nation's largest household survey. The people represented in our data sets have real lives and aren't "just statistics" or even just data. But at the same time, the individual response data—also called *microdata*—is incredibly useful for understanding contemporary social life as we can look in the data set and

M. J. Holian, *Data and the American Dream*,
https://doi.org/10.1007/978-3-030-64262-4_1

find examples of, say, a Spanish-speaking single-mom with three daughters, and learn many details about their lives. This book presents evidence for concerned citizens on important social issues like climate change, health care, and immigration, while highlighting best practices in social science research for students and practitioners.

The stories in this book draw from many sources including the experience of my own family, families we have met living in San Francisco, and the lives of students I have met teaching for the last dozen years at San Jose State University. I grew up in a middle-class Ohio suburb and as a result many of my own experiences are typical, which makes them relevant in a book about American social life. I also happen to now have a unique vantage point from which to view the world's most dynamic economic region, as a professor at the oldest public university in California, which today is in the heart of Silicon Valley.

This introductory chapter describes the plan of the book, important background information on the ACS, and illustrates key statistical techniques, and is followed by five chapters with topical themes: homes, migration, work, family, transportation. A typical topics chapter presents a detailed case of one study that uses the ACS, and all chapters draw from other studies that use the ACS, other scholarly sources, the news media, and popular culture. A concluding chapter shows how credible causal estimates can be used to make decisions by introducing a framework called Cost–Benefit Analysis (CBA). Appendix A is an important part of this book. It describes software, data and online resources, and parts will be of interest to both student and professional audiences.

Every 10 years since 1790, the U.S. government has taken a Census. Along with enumerating the population, the U.S. Census Bureau has in recent years taken advantage of the opportunity of counting everyone to ask a subset of Americans questions about their lives, including the occupation of workers in the household, their age, race, and so on. The decennial Census asked these detailed question to about 5% of the population during census years, the so-called "long-form" sample. The data available from the U.S. Census Bureau is one of the oldest and richest anywhere, and anyone with a computer and Internet connection can download data on millions of Americans.

While it is sometimes possible to obtain these data directly from the Census Bureau's webpage, I discuss in Appendix A why it is easiest to download Census microdata from a third-party, rather than from the Census Bureau directly, and in particular to download the data from an organization at the

University of Minnesota that goes by the acronym IPUMS, which stands for, Integrated Public Use Microdata Series. IPUMS distributes Census data going back to 1850 with a user-friendly web page (though the records from 1890 are unavailable as they were lost in a 1921 fire in the Commerce Department Building where the paper records of the time were stored).

The 2000 decennial Census was the last one to incorporate a long-form survey. Since then, the American Community Survey has replaced the decennial Census long form for the purposes of asking respondents about their lives. The Census Bureau still enumerates the population every ten years through a decennial Census, but since 2010 the decennial Census no longer contains a long-form. The beauty of the ACS is that it was modeled on the long-form but samples 1% of households every year, not 5% every decade. The questions on the ACS are still very similar to those that were asked on the 2000 long form, but the questionnaire has evolved some. For example, the ACS now asks college degree holders what they majored in, and all persons their health insurance status. This book focuses on studies of the contemporary period that have used ACS data from years 2004 to 2017, but the methods these studies use are highly applicable to older Census data as well.

To get an idea of what the ACS looks like, consider the information presented in Fig. 1.1. This is a snapshot of the survey form a respondent to the ACS may see. Respondents don't always see these questions, for example, in cases where the survey was conducted through an in-person interview with a Census worker, but this is the form someone completing the survey by mail would see. I include this image so that a reader can imagine they themselves are filling out this survey. The ACS is a long survey and the full survey questionnaire (which is reproduced in Appendix B) is about 15 pages, but seeing the questions just as respondents see them can help a reader imagine how their own stories and experiences can be turned into data. For example, what's your age, gender, and highest level of educational attainment? Some questions are more sensitive: What was your total income from all sources last year? Are you a citizen of the USA?

It may seem surprising that every year, the Census Bureau is able to conduct these surveys with millions of Americans. The ACS aims to survey 1% of the population each year. Given the U.S. population is currently 327 million, this means about 3.27 million people are surveyed every year. Take a moment to reread that line. The ACS is truly a massive survey effort. What is especially remarkable is the very high response rate, which is reliably

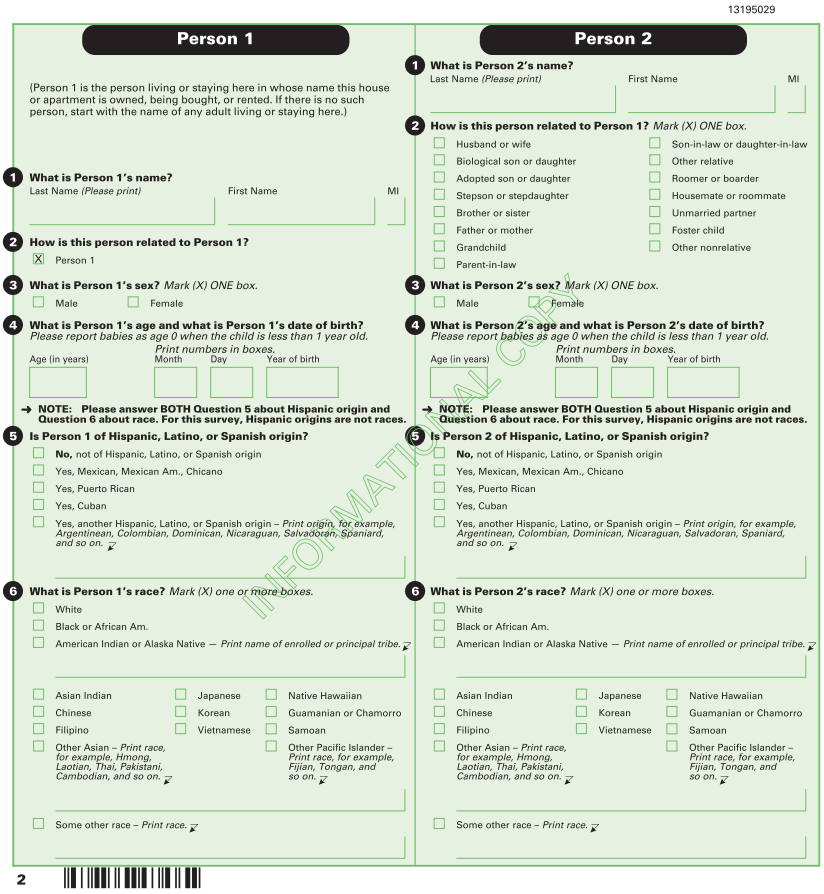


Fig. 1.1 The first page of the ACS survey form

more than 90% each year. While many survey organizations are content with much lower response rates, the Census Bureau is able to achieve such high rates, in part because respondents are legally obligated to complete the survey (though I have found no evidence someone has ever been prosecuted for failing to complete the ACS questionnaire). Of course whether everyone is giving completely truthful information is another question, which I address later in this chapter, and not all respondents answer all questions;

Table 1.1 ACS Raw Person Data, 2015, PUMA 068511

SERIAL	*AGE*	*CITIZEN*	*RELATED*	*EDUCD*	*SEX*	*INCTOT*	*UHRSWORK*	*OCC1990*
67205	57	0	101	71	1	72000	40	217
67205	56	0	201	101	2	21000	28	156
67359	52	0	101	81	1	130000	56	417
67359	51	0	201	65	2	60000	40	337
67383	61	3	101	40	1	19000	30	276
67481	40	0	101	101	1	60000	40	103
67481	7	0	301	14	1	9999999	0	999
67481	27	0	1115	101	2	48000	40	379
68781	39	3	101	116	1	115300	40	55
68781	39	3	201	101	2	0	0	999
68781	3	0	301	2	2	9999999	0	999
68781	2	0	301	1	1	9999999	0	999

Notes Data is 2015 ACS microdata for twelve individuals in PUMA 11 in Santa Clara County, California. The Data section of the file `script1.R` on the book's webpage produces a table with these data in it

Appendix A contains a discussion of this issue, which the Census Bureau refers to as "item nonresponse."

After the Census completes a survey, it is digitized. Table 1.1 presents data from twelve people surveyed in one California neighborhood in 2015. There is nothing special about the neighborhood I chose to take these data from, except that it happens to be near my university in San Jose. After completing a fifteen-page survey, there are many things we know about the households who were surveyed, and the questions are turned into dozens of variables. Table 1.1 shows data on just nine variables. A *variable* is a column of data, and the variable name is at the top of the column.

Each row of this table contains information on one of the twelve people. These twelve people live in five separate households, which we know because each household is given a unique identifying value of the variable SERIAL, which stands for "serial number." In this book, I always write variable names in all capital letters, and I have also retained IPUMS variable names, even in cases like with SERIAL where a name like "HOUSEHOLD ID" would have been more descriptive. Table A.4 in the Appendix describes the coding for all of the variables in Table 1.1. At this point, a reader could just read my descriptions of the variables in the text that follows, though later I'll discuss why it would be better to cross-reference the data in Table 1.1 with the *codebook* details in Table A.4.

Consider the first two rows. Both individuals live in the same household 67205, are aged 57 and 56, respectively, and both are U.S. citizens. We

know this last fact about their citizenship because according to the codebook, when the value of the variable CITIZEN equals 0 it signifies the individual was born in the USA and is thus a citizen.

The SEX variable tells us the first individual in Table 1.1 is male, because it takes on a value of 1, and the second is female because it's 2. We know from the relationship variable RELATED they are married; a value of RELATED equal to 101 indicates this is the "reference person." This is the person the Census Bureau interviewed; the reference person is sometimes referred to as the "head of household" but in modern times this designation has less meaning. We see at the top of Fig. 1.1 that the reference person is also referred to as Person 1 and, "…is the person living or staying here in whose name this house or apartment is owned, being bought, or rented." A value of RELATED equal to 201 indicates this person is the spouse of the reference person. They both work; she works 28 hours per week on average and he works a 40-hour week (these are the values of UHRSWORK, which stands for "usual hours work"). His occupation is coded as 217, and when the variable OCC1990 takes this value it indicates the occupation is "Drafters." She works in occupation 156, "Primary school teachers." She is more highly educated; a value of EDUCD equal to 71 indicates he has one year of college but no degree, and her value of this variable is 101 which indicates she has a bachelor's degree.

Next let's consider the last four individuals in Table 1.1. They are all in household 68781 (a household we meet again in Chapter 5, Question 2). This is a household with two parents and two children. Both are 39 years of age and they have two children aged two and three, a boy and a girl. So far this looks like a prototypical American household, however, closer inspection reveals the parents are not citizens; we know this because the value of the variable CITIZEN equals 3, which indicates someone is not a citizen of the USA. The mom of this household does not work (we know this because there is zero value of UHRSWORK). The husband has a doctoral degree and his occupation is 055 (Electrical engineer). This person has the highest level of both education and income among the twelve individuals in Table 1.1.

Although not indicated in Table 1.1, the ACS also reports the place of birth for all respondents. It turns out the parents in household 68781 were born in Korea. The children were born here but are growing up with parents who cannot vote in U.S. elections. As they get older they will be strongly influenced by the community around them. Their interactions in schools, churches, and markets will strongly shape their national

self-identification. Thanks to the ACS, we know a lot about this family, but of course quantitative measures like the variables in the ACS can only tell us so much.

This book is not a memoir, but I have read some memoirs while writing it. A memoir can be thought of as a source of qualitative information, which contrasts with the quantitative nature of the ACS data. In his memoir, *Fresh Off the Boat*, which was later adapted into a popular television show of the same name, chef and restauranteur Eddie Huang describes growing up in a Taiwanese immigrant family in Orlando, Florida in the 1980s, developing tastes for both hip-hop and other elements of American culture, and the culture of his ancestors, especially food. Unlike Huang and his brothers, who were born in Taiwan, the kids in household 68781 are native-born Americans of Korean immigrant parents. There are other important differences between these two households. But it is possible some of the experiences Eddie Huang shares with his readers may be similar to experiences the kids in 68781 will have.

For example, one of Huang's stories relates to his embarrassment in bringing Taiwanese food to lunch at his largely white U.S. elementary school, and another to how unprepared he was for the texture when he finally tried typical American kids cuisine like macaroni and cheese and tuna fish sandwiches. Given they live in Silicon Valley, the kids in household 68781 will likely attend more diverse schools than did Huang, but these kids will be introduced to many types of American food outside the household, as were Huang and his brothers. The cultures from which Americans descend infuse with American culture as well, and today Eddie Huang owns a restaurant serving Taiwanese food in the trendy East Village neighborhood of New York City.

With a memoir like *Fresh off the Boat*, a reader learns intimate details about a family compared to the ACS where we have dozens of variables, but from a snapshot in time only. With a memoir, we know details about the extended family, where they have lived and what they have done throughout their lives. We cannot hope to gather this much detail from a 15-page survey that we expect millions of households to complete. Thus in this book I'll draw from diverse sources for the stories that will give life or at least help us imagine what the households in our data may really be like.

When interpreting raw data like those in Table 1.1, best practice calls for carefully consulting the codebook. This is a document that gives the meaning of every possible value of each variable. It's therefore worth repeating that a codebook for all variables discussed in this book appears in Table A.4

in the Appendix. Sometimes the value of a variable seems self-explanatory and you do not need to consult the codebook to determine its meaning; for example, when AGE equals 57 it seems obvious this means the individual is 57 years old. And in this case it is true. But what about when SEX equals 2? You might reason that because female comes before male in alphabetical order, 1 would represent a female and 2 a male, but if you consult the ACS codebook you'll find it is the opposite.

The RELATED variable can at times leave us guessing as to the real connections between people in a household. For example in household 67481, there is a father who lives with his seven-year old son, and a 27-year-old female. Her value of RELATED is 1115 and this indicates she is a "Housemate or roommate." You can see this is the eleventh option in the relationship question shown in Fig. 1.1. We can only imagine the real story about this 27-year-old lady who lives with these guys. Perhaps she rents a room from the family and interacts very little with them, or perhaps she is in a romantic relationship with the father and has a parental relationship with the boy. There is an option on the Census form to indicate someone is an unmarried partner, but this is not the information the father provided to the Census interviewer.

There are only 12 individuals and nine variables reported in Table 1.1, but the full ACS sample, starting from 2000 and, as of this writing, until 2018, includes data on almost 50 million individuals. From the 15-page survey form, the Census produces and distributes over 129 person variables. In addition, we know things about the households themselves, and the Census produces over 102 household variables.[1] Some examples of things we know about each household are illustrated in Table 1.2.

Table 1.2 tells us the total household income from all sources of all members of the household (HHINCOME) and the number of rooms in the home (ROOMS). For rented homes we know the monthly rent (RENT), and for owned homes the estimated current market value (VALUEH). Table 1.2 also indicates how many vehicles (VEHICLES) are available to members of the household. Take the first two households (67205 and

[1] IPUMS also constructs its own variables, such as those describing family interrelationship. I have written a blog post that contains a link to all the person and household variables the Census produced in 2015, for PUMA 068511. The variable names and coding values that appear in this book reflect IPUMS conventions, but it can be illustrative to see how the same data looks when it is distributed by Census.gov. http://mattholian.blogspot.com/2019/09/downloading-census-micro-data-ipums-or.html.

Table 1.2 ACS Raw Household Data, 2015, PUMA 068511

SERIAL	*HHINCOME*	*ROOMS*	*RENT*	*VALUEH*	*VEHICLES*
67205	93000	6	0	500000	3
67359	190000	7	0	800000	3
67383	19000	4	1200	9999999	1
67481	108000	5	2200	9999999	2
68781	115300	5	2400	9999999	2

Notes Data is 2015 ACS microdata for five households in PUMA 11 in Santa Clara County, California. The Data section of the file `script1.R` on the book's webpage produces a table with these data in it

67359). Both of these households own their homes. The ACS asks homeowners to estimate the value of their home if it were for sale today. San Jose is in one of the most expensive real estate markets in the country, and in 2015, these two households estimated their home's value as $500,000 and $800,000, respectively. Each of these households also happens to have three cars. The other three households are renters and reported rent ranges from $1200 to $2400. Note that these three households have a value of 9999999 for VALUEH; this means they are renters, not that their homes are worth just shy of $10 million. This example highlights another reason why reading the codebook is important. Finally, what about income? Table 1.1 indicated the wage income of each individual, but Table 1.2 presents the sum of all income earned by all people in the household. Thus Table 1.2 reports a household income of $93,000 for household 67205, which is just the sum of $72,000 and $21,000 reported in Table 1.1 for the two individuals who live in household 67205. Some of the other households earn income from other sources beyond wages (such as investment earnings).

Like the "person" variables in Table 1.1, the "household" variables shown in Table 1.2 are only a small subset of those available in the full sample. Clearly, the ACS data tells us a lot about the people and households it surveys. The information may not be complete, as in cases when investment income is mistakenly not reported, and it is likely that some people are hesitant to provide truthful information to the Census Bureau about somethings, as in the case of illicitly earned income. And perhaps a respondent is uncertain how to answer some questions (Is my lady friend who just moved in a partner or a roommate?) It may be hard to estimate what your home would sell for today if you haven't been following real estate market trends. Despite these limitations, the data provides a wealth of information about Americans.

The individuals and households in Tables 1.1 and 1.2 all live in the same geographic area. To protect the confidentiality of respondents, the Census Bureau does not share detailed information on the household's location with the public. Instead, they report the Public Use Microdata Area or PUMA in which the household lives. PUMAs are designed to contain about 100,000 people. So in a dense city like San Francisco PUMAs will be relatively small geographic areas, around the size of a zip code, but in rural areas a PUMA may be larger than a county.

Figure 1.2 shows a map of the USA that is divided into 2351 PUMAs.[2] Figure 1.3 shows detail of the San Francisco Bay Area. The PUMAs in the part of San Francisco where I live are somewhat smaller in land area than the PUMAs near where I work in downtown San Jose. This is a result of the fact that San Francisco has higher population density, and PUMAs are designed to hold about 100,000 people. In New York City there is a seven square mile area that contains more people than in the entire state of Wyoming.

Table 1.3 presents some statistics that I calculated with the microdata.[3] The file `script1.R` on the book's webpage carries out the calculations using ACS data from 2015. These statistics highlight some dramatic differences across seven illustrative PUMAs. In New York City, in one small section of Manhattan, the large majority (86.5%) of adults aged 25 and over hold bachelor's degrees. In the eastern portion of the city of Cleveland, Ohio (which is in central Cuyahoga county) this figure is only 15.4%.

The Manhattan neighborhood also stands out as having few children; only 6.3% of the people are under 18 years old, while this fraction is 20% or higher in some of the more suburban areas. It may be that living in a

[2] These maps were created using an open-source software program called QGIS. This book is in part a guide to R software, but R is not the only "open-source" software I used in writing this book. In Appendix A, I discuss a third software program called LaTeX which I used for word processing. Here, I wanted to provide some guidance on cartography. Making maps with computer software is part of a field called Geographic Information Systems (GIS). An excellent commercial version of GIS software is ArcGIS, but the free, open-source QGIS program is also easy to use. You can download the software and find training manuals at: www.qgis.org. More resources are at www.qgistutorials.com. Once you have GIS software, you need input files known as "shapefiles" or map "layers." Download these here: https://usa.ipums.org/usa/volii/tgeotools.shtml.

[3] It is possible to download some of these statistics from data.census.gov. While this is a good place to find commonly used statistics like average income, you won't find specialized statistics, like average lawyer earnings by college major. To find these a user has to calculate them themselves with the public microdata as I have done here.

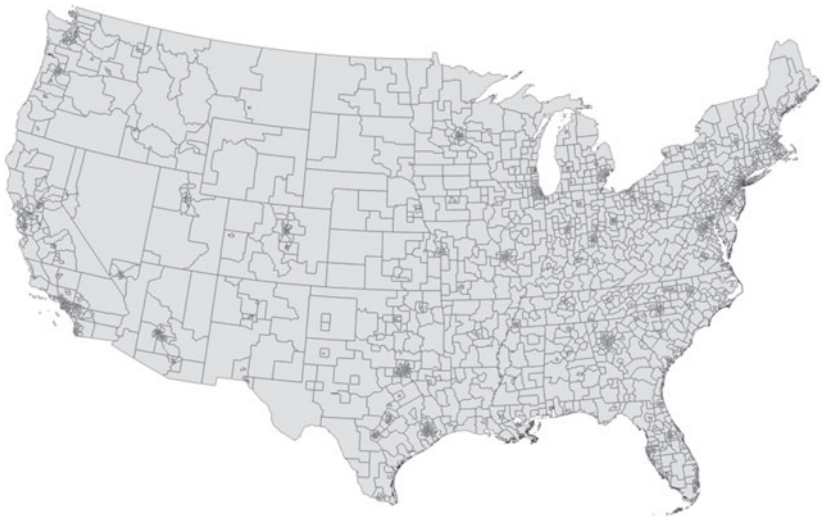


Fig. 1.2 Map of USA showing 2378 Public-Use Microdata Areas

high-density area like Manhattan causes families to have fewer children. It could also be that people with smaller families are more likely to live in these areas. This is a question of "selection versus treatment" that is a reoccurring theme in this book.

The final column in Table 1.3 does not actually contain a statistic (a number calculated with data) but rather a measure of the land area of each PUMA in square miles. In fact, this land area measure is not part of the ACS data. Of course, the ACS won't always contain all the measures we need, and sometimes we have to merge data from other sources on to the ACS. I discuss merged data in more detail in Appendix A. You can see in Table 1.3 that the PUMAs in New York City and, to a lesser extent the one in San Francisco, are much smaller than the other PUMAs, especially those in Ohio. Figure 1.4 shows New York City, highlighting two neighborhoods: PUMA 3603808 (Murray Hill) which includes the East Village neighborhood where Eddie Huang's restaurant is located, and Greenwich Village, the neighborhood where twentieth-century urbanist Jane Jacobs lived. She wrote passionately about the vibrant street life in her neighborhood in the 1950s when the so-called "urban renewal" policies were trying to remake cities better suited to automobile travel. Jacobs saw

Fig. 1.3 Map of San Francisco Bay Area, showing Public Use Microdata Areas, and indicating author's home and work locations

urban renewal as killing the urban vibrancy she loved, and indeed many U.S. cities went through a period of decline in the second half of the twentieth century. A section of Chapter 3 on migration describes research using the ACS that is related to the contemporary "back to the cities" movement.

This book is about how researchers use the ACS microdata, conveniently distributed by IPUMS, to calculate their own statistics. Many of the statistics we will see in the pages that follow will be averages or percentages like those in Table 1.3. It is also common to talk about differences between two

Table 1.3 Statistics for seven select PUMAs calculated using ACS microdata from 2015

Geography	*PUMA ID*	% *married*	%. *under 18*	% *college*	% *black*	% *white*	*Land area (sq. miles)*
NYC-Manhattan (Murray Hill)	3603808	40.4	6.3	86.5	1.7	77.9	1.6
San Francisco (North and West)	0607501	43.6	12.2	66.3	5.6	57.5	9.6
San Jose City (South Central)	0608511	68.0	24.9	47.4	4.0	58.2	12.8
Cuyahoga County, Ohio (West)	3900901	63.8	22.1	42.8	1.3	94.4	45.9
Cleveland, Ohio (East)	3900908	29.4	20.0	15.4	83.7	12.0	30.9
New Orleans City (Central)	2202401	30.8	16.7	38.0	56.8	39.4	16.6
District of Columbia (Central)	1100105	32.6	6.6	81.7	18.8	67.2	9.8

Notes All statistics were calculated with 2015 ACS microdata. The file `script1.R` on the book's webpage documents the analysis that produces these statistics. Persons in group quarters are excluded from the calculations. The statistic % married is the percent of adults age 25 and older that are married; % under 18 is the percent of persons under age 18; % college is the percent of adults age 25 and older with a bachelor's degree or higher; % black and % white are the percent of persons reporting race as black and white, respectively. Land area is the area in square miles of the PUMA, obtained from the Census Bureau's Gazetteer Files

averages. An average is a statistic, and the difference between two averages is also statistic. Most of the statistics reported in this book are nothing more than averages, and differences of averages of one sort or another.

Let's turn now to the first of many scholarly studies we will encounter in this book which uses the ACS data to calculate statistics. In an article titled, "Is economics a good major for future lawyers? Evidence from earnings data," the economist John Winters reported average lawyer earnings by college major, for the 25 most popular majors. This article was published in *The Journal of Economic Education*, a scholarly journal which is distinguished from popular press magazines, in addition to the nature of the material, by the fact that the articles go through a blind peer-review process. This study reveals that lawyers who were economics majors do quite well, with average annual earnings of $182,359. This is a key statistic from the Winters (2016) study that is replicated in the R and Stata files associated with this chapter. Among the 25 most popular majors, only electrical engineering majors do better, with average annual earnings of $219,383. The difference between these two averages (which are means not medians) is $37,024. (219,383–182,359=37,024). Therefore $37,024 is an example of a *difference in means*.

Fig. 1.4 Map of New York City Area, showing Public Use Microdata Areas, and indicating Greenwich Village and Murray Hill locations

How should we interpret these means? They are best thought of as descriptive statistics, measures of what the world looks like, not explanations for why or how it is. But do these figures suggest an economics student could really make $37,024 more if they switched to electrical engineering? In other words, does studying engineering cause you to earn more, all else equal? This figure reflects what empirical economists call both *selection bias* and a *treatment effect*. Selection bias results when students who major in electrical engineering in college are likely to earn more later in life for reasons apart from the curriculum they studied. Perhaps they're smarter, or more willing to sacrifice leisure for higher income. The effect of the curriculum itself on earnings, which is what a student considering switching

majors wants to know, is the treatment effect.[4] At this point, most students can't change who they are, but they do have to decide what to major in.

The use of the terms selection and treatment is based on an analogy to *randomized experiments*. In these types of studies, treatment is administered by the experimenter randomly, for example, by the flip of a coin. In this lawyer earnings example, there is no experimenter randomly assigning students into economics or electrical engineering majors. We could imagine some process whereby universities do have the ability to assign students to majors, but, most of the time this sort of experiment would be prevented by the ethnical consideration that, in a free society individuals should be able to select their college major themselves. It is often still helpful to consider what a hypothetical *ideal experiment* would look like, as this forces us to define the causal effect we are estimating.

A good way to understand why a difference in means estimated with the ACS microdata is often not a good estimate of a treatment effect is to recognize that data from the ACS are an example of *observational data*, not *experimental data*. Experimental data is produced through conducting a formal experiment with random assignment of subjects into control and treatment groups. This contrasts with survey data, which is produced through questionnaires by randomly sampling households in a population. Observational data is data produced in non-experimental settings, for example, by looking around (observing) and recording what we see. There is no experimental manipulation, only recording facts as they are seen or reported. The Census Bureau asks respondents to answer questions, but in principle some of the questions could be answered by the interviewer just by observing, such as how many average size rooms are in a house, how many cars are visible, and so on.

With observational data, a difference in means like our figure of $37,024 will usually be a mix of both selection and treatment effects. At this point we can't say much about the future earnings a student can expect by switching to electrical engineering from an economics major. One thing we can say

[4] Angrist and Pischke (2014, p. 10) discuss selection bias in the context of an equation, which I adopt as a definition of the term: Selection Bias = (Difference in Means) − (Average Causal Effect). Here, selection bias is the entire gap between what we observe ($37,024, the difference in means) and the true impact of the treatment, which generally is unknown, but could be measured in an ideal randomized experiment. There's a lot of jargon in econometrics, some of it unfortunate, and some of it necessary to discuss nuanced concepts. Take, for example, the treatment effect. The effect of the economics curriculum likely varies across people. The average of the individual effects is known as the *average causal effect*.

is that this figure of $37,024 is a description of the population of working lawyers. It is best thought of as a *descriptive statistic*, rather than a causal effect (i.e., the treatment effect in an ideal experiment that randomly assigns college students to an electrical engineering versus economics major). In the ACS data, people are not assigned to majors and instead select what they major in, based on their own innate preferences and abilities. If, hypothetically, people were randomly assigned to majors, then differences in average earnings could be interpreted as causal effects, but here they cannot.

A theme of this book is understanding when observational data can and cannot be used to estimate causal effects. The example above illustrates when statistics cannot be interpreted as a causal effect. Below, I introduce two techniques that do allow us to estimate causal effects with observational data. But before continuing I want to clarify an important point: The average earning estimates of $182,359 and $219,383 are valuable measures of reality. Just because they are descriptive statistics and not treatment effects or causal effects does not mean they are not valuable contributions to the body of knowledge. There seems to be some prejudice in economics and other social sciences against descriptive research. Political scientist Justin Grimmer (2015) has argued that, "Political scientists prioritize causal inference…often pejoratively dismissing measurement…as 'mere description' …." He points to research by Gerring (2012) that showed 80% of articles published in *American Political Science Review* focus on causal inference. In light of this, the important point I want to make is that even though much of this book focuses on econometric techniques for causal inference, it certainly does not aim to dismiss the importance of descriptive research. This lawyer earnings case study, the PUMA-level statistics presented in Table 1.3, and many other descriptive statistics to be discussed in chapters that follow highlight the valuable role the ACS plays in measuring social quantities.

Often, as in the case of policy evaluation and CBA, we do need precise estimates of causal effects as well as accurate descriptive measures of social quantities. Luckily we have techniques to estimate causal effects with observational data. One is called *regression control*, and we could reanalyze the lawyer earnings example if we had data on factors that jointly determine a person's choice of major and their earnings. Intelligence is one such factor, and test scores are a possible but controversial measure of intelligence. The second technique encompasses several types of research designs, which share a common search for *natural experiments*. Natural experiments are settings where social or political processes end up assigning treatment in

a way that is as if it were randomly assigned by an experimenter in a true experiment. When we find a natural experiment, we don't need data on control variables, and sometimes a difference in means that we estimate with observational data can be interpreted as a causal effect.

As a hypothetical example of a natural experiment, imagine a university where the two most popular majors are electrical engineering and economics, and the number of students who wish to major in them was greater than the number of spaces available. So the university creates a wait list and assigns students on the wait list into majors based on a lottery. In this case, the treatment—whether a student is an economics or electrical engineering major, is as good as randomly assigned, and a comparison of earnings by these majors five years post-graduation can be interpreted as an average causal effect of the major itself on earnings. This would be an example of a natural experiment if university administrators at the time didn't intend to randomly assign major to study the causal effect of curriculum on earnings.[5]

Like a lot of econometrics jargon, the term natural experiment doesn't always clearly convey its meaning. After all, there's not much natural about the idea of college administrators assigning students to majors through a lottery. What makes the example a natural experiment is that the treatment was assigned randomly by some process other than a true experiment.

Sometimes with natural experiments, the process *is* natural, as with weather shocks. As another example of a natural experiment where the term natural makes more sense, the gender of a child can be said to be determined by nature. If child gender is as good as randomly assigned, even when it's not actually randomly assigned by an experimenter, we can use basic statistics such as a difference in means to provide a compelling estimate of a causal effect. We'll see an example of this at the end of this chapter.

[5] If their intention behind randomly assigning students to major was to study the effect of major on income, we would call it an actual experiment (or a randomized experiment, or maybe a field experiment) but not a natural experiment. See Dunning (2012) for further discussion of natural experiments. Bleemer and Mehta (2021) use a grade point average policy at UC Santa Cruz, in a technique called *regression discontinuity*, to study the causal effect of the economics curriculum on earnings.

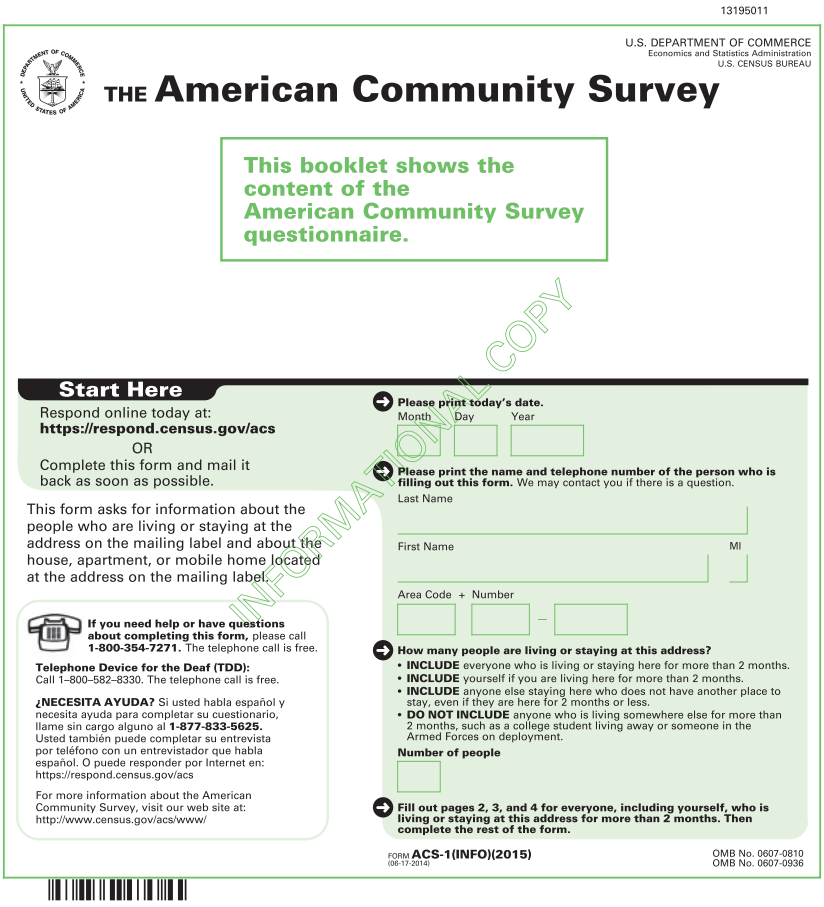
Table A.1 Variables in master data file for this book

Variable	*Description*
AGE	Age
BEDROOMS	Number of bedrooms
BPL	Birthplace
BUILTYR2	Age of structure, decade
CITIZEN	Citizenship status
CLASSWKR	Class of worker
COSTELEC	Annual electricity cost
COSTGAS	Annual gas cost
COUNTYFIP	County FIPS code
CPI99	CPI-U adjustment factor to 1999 dollars
DEGFIELD	Field of degree
EDUC	Educational attainment
EMPSTAT	Employment status
FUELHEAT	Home heating fuel
HHINCOME	Total household income
HHTYPE	Household Type
HISPAN	Hispanic origin
INCBUS00	Business and farm income, in 2000 dollars
INCEARN	Total personal earned income
LABFORCE	Labor force status
MARST	Marital status
MOVEDIN	When occupant moved into residence
NCHILD	Number of own children in the household
NUMPREC	Number of person records following
OCC1990	Occupation, 1990 basis
OWNERSHP	Ownership of dwelling
PUMA	Public Use Microdata Area
QBPL	Data quality flag for Bpl, Nativity
QINCWAGE	Data quality flag for incwage, inctot, incearn
RACE	Race
RELATE	Relationship to household head
RENT	Monthly rent
ROOMS	Number of rooms
SEI	Duncan Socioeconomic Index
SEX	Sex
STATEFIP	State FIPS code
UHRSWORK	Usual hours worked per week
UNITSSTR	Type of housing structure
VALUEH	Value of owner-occupied housing
VEHICLES	Vehicles available
WKSWORK2	Weeks worked last year, intervalled
YRIMMIG	Year of immigration

Table A.4 Codebook values for selected person and household variables

Variable	*Codebook values and interpretation*
CBSERIAL	Census Bureau household identification number
AGE	0 Less than 1 year; 1 One year; ... 135 years
CITIZEN	0 N/A; 1 Born abroad of American parents; 2 Naturalized citizen; 3 Not a citizen; 4 Not a citizen, but has received first papers; 5 Foreign-born, citizenship status not reported
RELATED	101 Head/Householder; 201 Spouse; 301 Child; 302 Adopted Child; 303 Stepchild; 401 Child-in-law; 501 Parent; 601 Parent-in-Law; 701 Sibling; 801 Sibling-in-Law; 901 Grandchild; 1001 Other Relatives; 1114 Unmarried Partner; 1115 Housemate/Roomate; 1241 Roomers/boarders/lodgers; 1242 Foster children; 1260 Other non-relatives; 1270 Group quarters member; 1301 Institutional inmates
EDUCD	1 N/A; 2 No schooling completed; 11 Nursery school, preschool; 12 Kindergarten; 14 Grade 1; 15 Grade 2; 16 Grade 3; 17 Grade 4; 22 Grade 5; 23 Grade 6; 25 Grade 7; 26 Grade 8; 30 Grade 9; 40 Grade 10; 50 Grade 11; 61 12th grade, no diploma; 63 Regular high school diploma; 64 GED or credential; 65 Some college, but less than 1 year; 71 1 or more years of college credit, no degree; 81 Associate's degree; 101 bachelor's degree; 114 master's degree; 115 Professional degree beyond a bachelor's degree; 116 Doctoral degree
SEX	1 Male, 2 Female
INCTOT	0000001 = $1 or break even, 9999999 = N/A, −$19,998 Bottom code, No Topcode.
UHRSWORK	0 N/A, 1-98 1-98 hours, 99 Top code
OCC1990	055 Electrical engineer; 103 Physical therapists; 156 Primary school teachers; 178 Lawyers; 217 Drafters; 276 Cashiers; 337 Bookkeepers, accounting clerks; 379 General office clerks; 417 Fire fighting, prevention, and inspection; 229 Computer software developers; 999 Unknown
HHINCOME	9999999 = N/A, −$19,998 Bottom code, No Topcode.
HHTYPE	0 N/A; 1 Married-couple family household; 2 Male householder, no wife present; ... 7 Female householder, not living alone; 9 HHTYPE could not be determined.
ROOMS	00 N/A, 1 one room, 2 2, ... 30 30 rooms
RENT	0000 = N/A, 0001 = No cash rent, top codes by state
VALUEH	9999999 = Missing, top code by state
VEHICLES	0 N/A, 1 1 available, 2 2, ..., 9 no vehicles available

Notes Select values only shown for HHTYPE and OCC1990
CBSERIAL values are not unique; they are reassigned every survey wave
Values indicating N/A are interpreted differently depending on the variable
As two examples: N/A for CITIZEN indicates a person was born in USA (see question wording in Fig. B.8 in Appendix B). For VALUEH a value of N/A indicates both that the person lives in group quarters, and that the home is rented



13195011

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.

Start Here

Respond online today at:
https://respond.census.gov/acs
OR
Complete this form and mail it back as soon as possible.

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 completar su entrevista por teléfono con un entrevistador que habla español. O puede responder por Internet en: https://respond.census.gov/acs

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

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

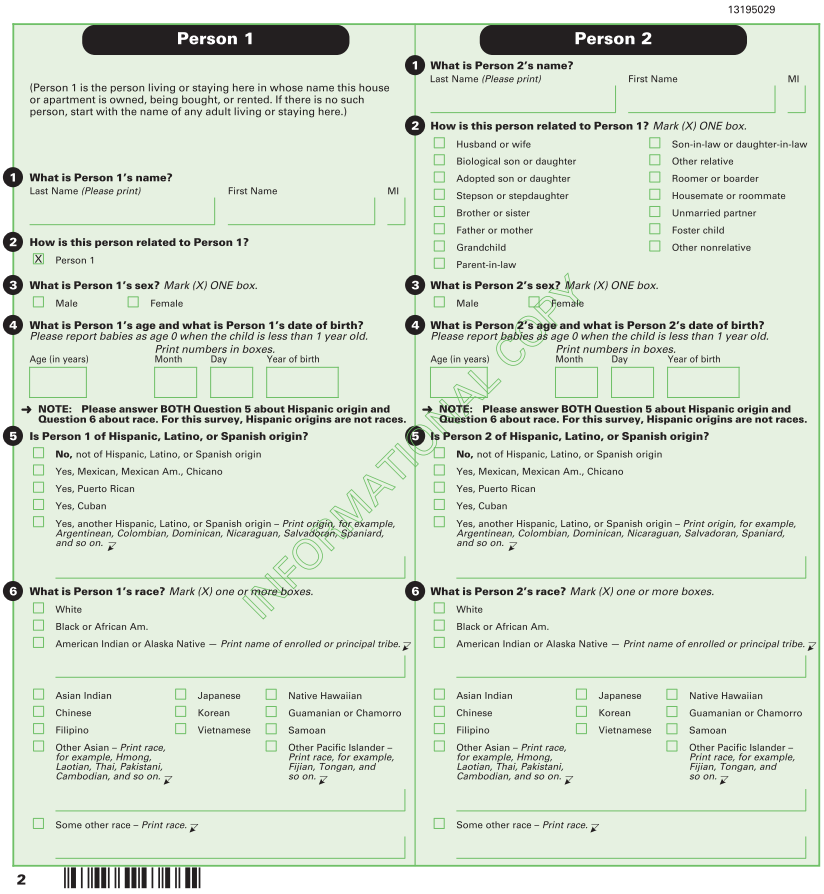
How many people are living or staying at this address?
- **INCLUDE** everyone who is living or staying here for more than 2 months.
- **INCLUDE** yourself if you are living here for more than 2 months.
- **INCLUDE** anyone else staying here who does not have another place to stay, even if they are here 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 (06-17-2014) **ACS-1(INFO)(2015)**
OMB No. 0607-0810
OMB No. 0607-0936

Fig. B.1 Page 1 of the ACS questionnaire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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?**
[X] 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 or African Am.
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

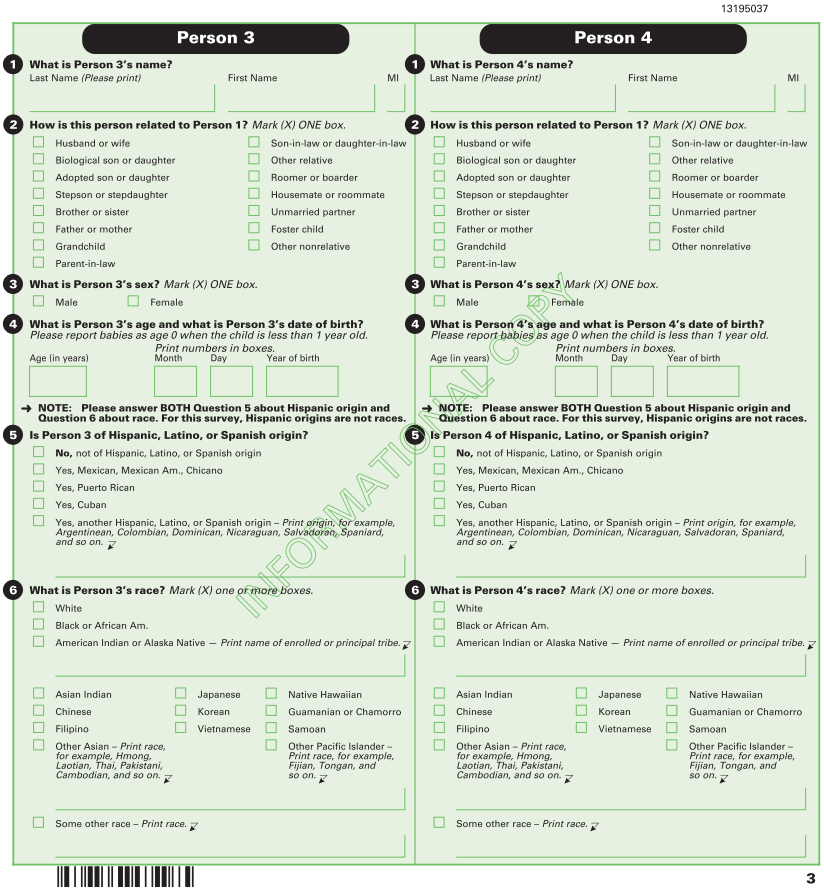
→ **NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this survey, Hispanic origins are not races.**

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 or African Am.
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.*

2

Fig. B.2 Page 2 of the ACS questionnaire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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 or African Am.
- ☐ 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 or African Am.
- ☐ 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.*

3

Fig. B.3 Page 3 of the ACS questionnaire

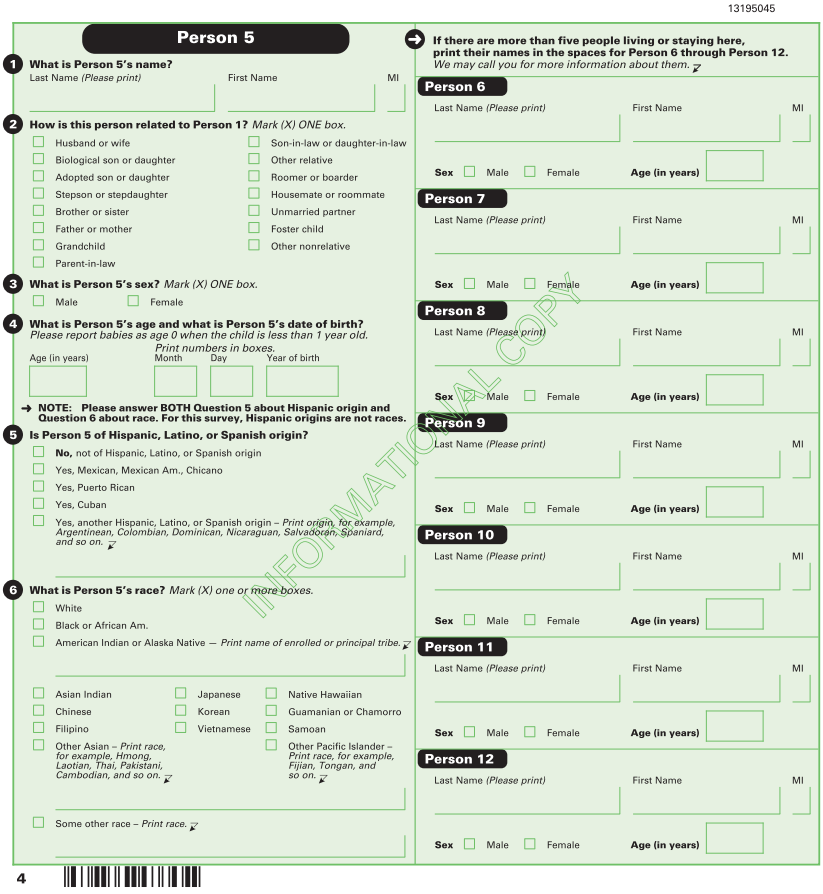
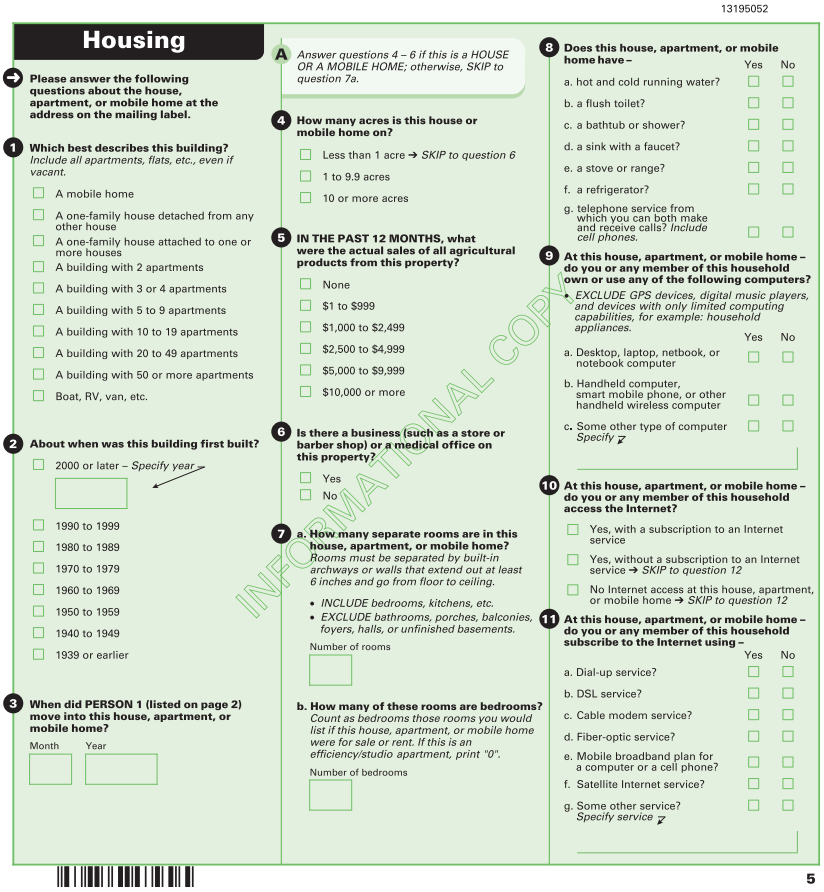


Fig. B.4 Page 4 of the ACS questionnaire



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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 At this house, apartment, or mobile home – do you or any member of this household own or use any of the following computers?

- *EXCLUDE GPS devices, digital music players, and devices with only limited computing capabilities, for example: household appliances.*

	Yes	No
a. Desktop, laptop, netbook, or notebook computer	☐	☐
b. Handheld computer, smart mobile phone, or other handheld wireless computer	☐	☐
c. Some other type of computer *Specify*	☐	☐

10 At this house, apartment, or mobile home – do you or any member of this household access the Internet?

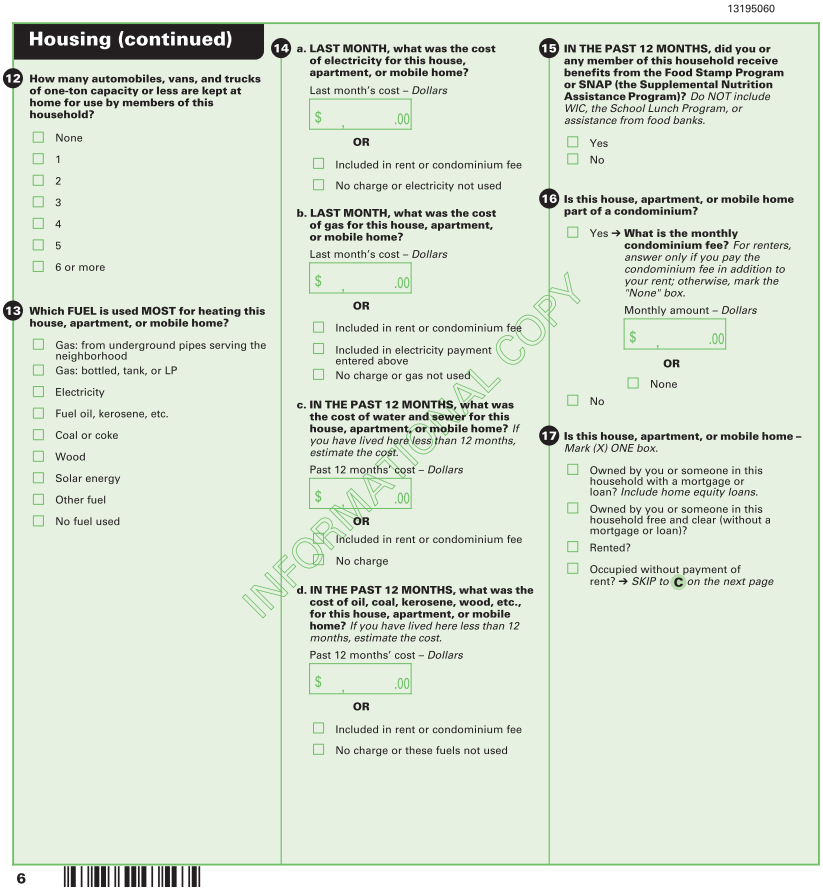
- ☐ Yes, with a subscription to an Internet service
- ☐ Yes, without a subscription to an Internet service → *SKIP to question 12*
- ☐ No Internet access at this house, apartment, or mobile home → *SKIP to question 12*

11 At this house, apartment, or mobile home – do you or any member of this household subscribe to the Internet using –

	Yes	No
a. Dial-up service?	☐	☐
b. DSL service?	☐	☐
c. Cable modem service?	☐	☐
d. Fiber-optic service?	☐	☐
e. Mobile broadband plan for a computer or a cell phone?	☐	☐
f. Satellite Internet service?	☐	☐
g. Some other service? *Specify service*	☐	☐

5

Fig. B.5 Page 5 of the ACS questionnaire



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Housing (continued)

12 **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

13 **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

14 **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

15 **IN THE PAST 12 MONTHS, did you or any member of this household receive benefits from the Food Stamp Program or SNAP (the Supplemental Nutrition Assistance Program)?** *Do NOT include WIC, the School Lunch Program, or assistance from food banks.*

- ☐ Yes
- ☐ No

16 **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

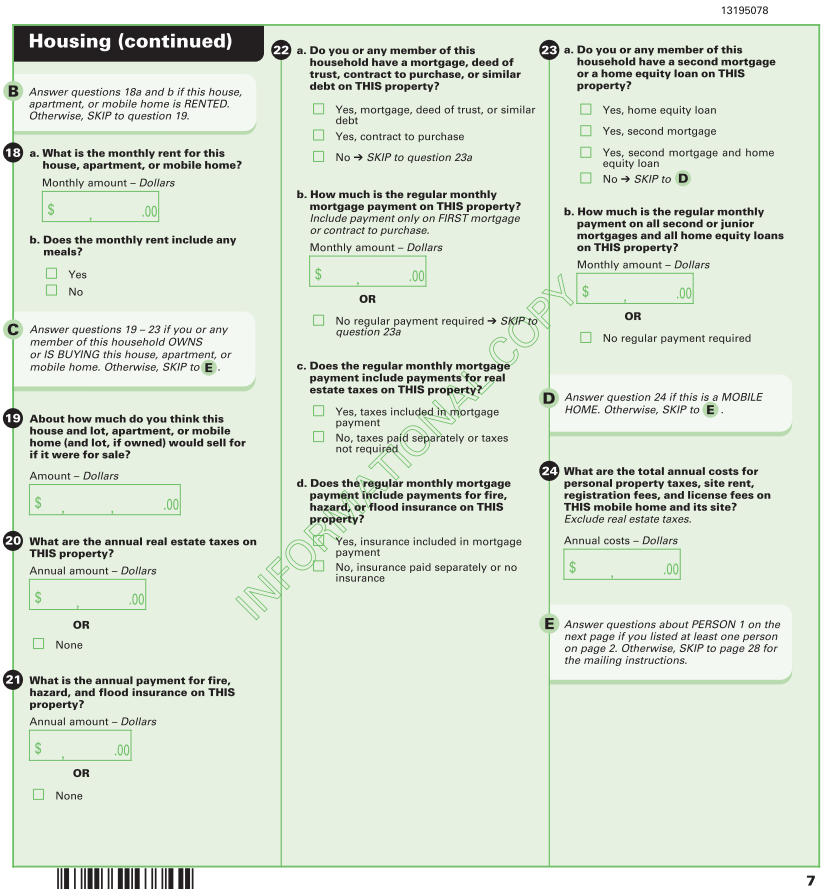
  - ☐ None
- ☐ No

17 **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** *on the next page*

6

Fig. B.6 Page 6 of the ACS questionnaire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Housing (continued)

B *Answer questions 18a and b if this house, apartment, or mobile home is RENTED. Otherwise, SKIP to question 19.*

18 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 19 – 23 if you or any member of this household OWNS or IS BUYING this house, apartment, or mobile home. Otherwise, SKIP to* **E** .

19 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

20 What are the annual real estate taxes on THIS property?
Annual amount – *Dollars*
$, .00
OR
☐ None

21 What is the annual payment for fire, hazard, and flood insurance on THIS property?
Annual amount – *Dollars*
$, .00
OR
☐ None

22 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 23a*

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 23a*

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

23 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

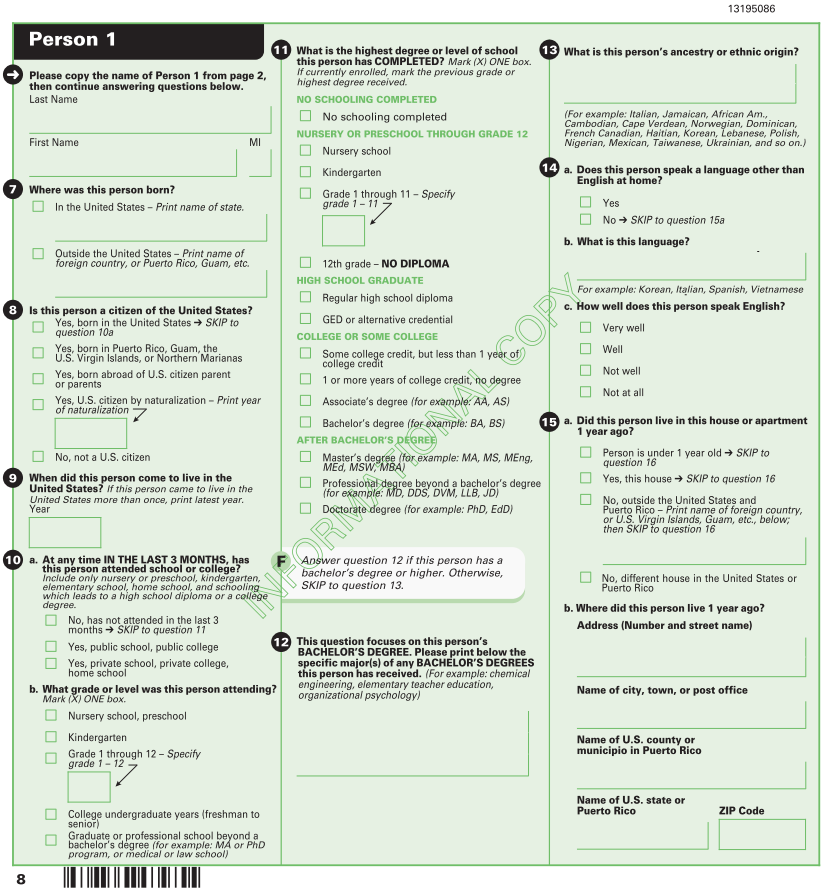
D *Answer question 24 if this is a MOBILE HOME. Otherwise, SKIP to* **E** .

24 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.*

7

Fig. B.7 Page 7 of the ACS questionnaire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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 question 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?** *If this person came to live in the United States more than once, print latest year.*
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

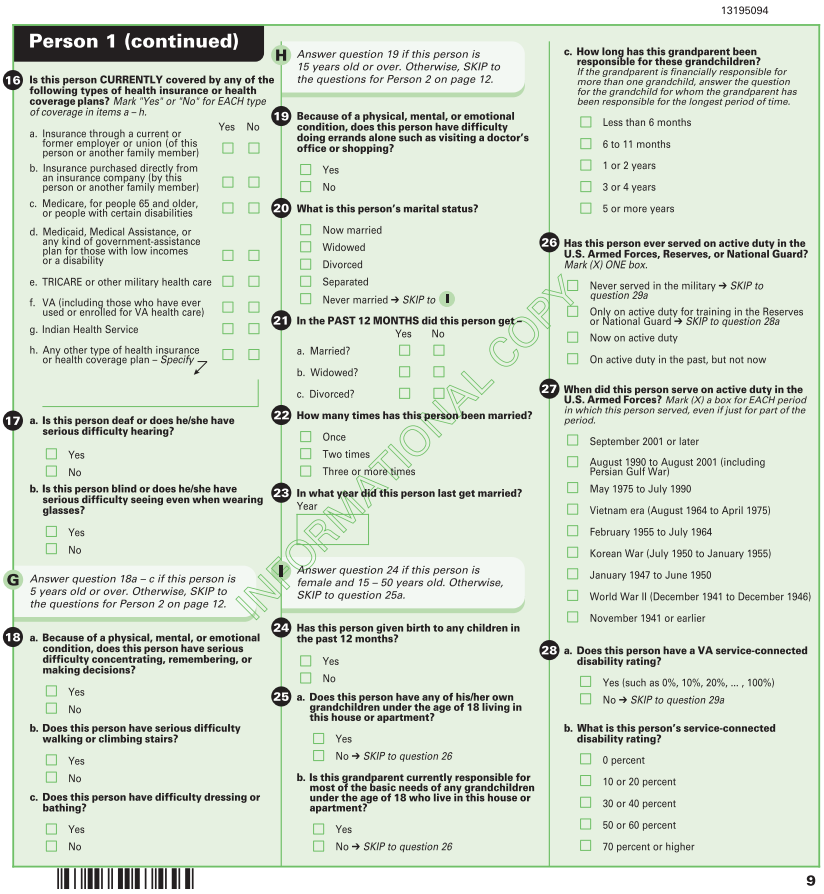
c. How well does this person speak English?
☐ Very well
☐ Well
☐ Not well
☐ Not at all

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

8

Fig. B.8 Page 8 of the ACS questionnaire



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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

I *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 live 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, Reserves, or National Guard?** *Mark (X) ONE box.*

☐ Never served in the military → *SKIP to question 29a*
☐ Only on active duty for training in the Reserves or National Guard → *SKIP to question 28a*
☐ Now on active duty
☐ On active duty in the past, but not now

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)
☐ May 1975 to July 1990
☐ Vietnam era (August 1964 to April 1975)
☐ February 1955 to July 1964
☐ 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?**

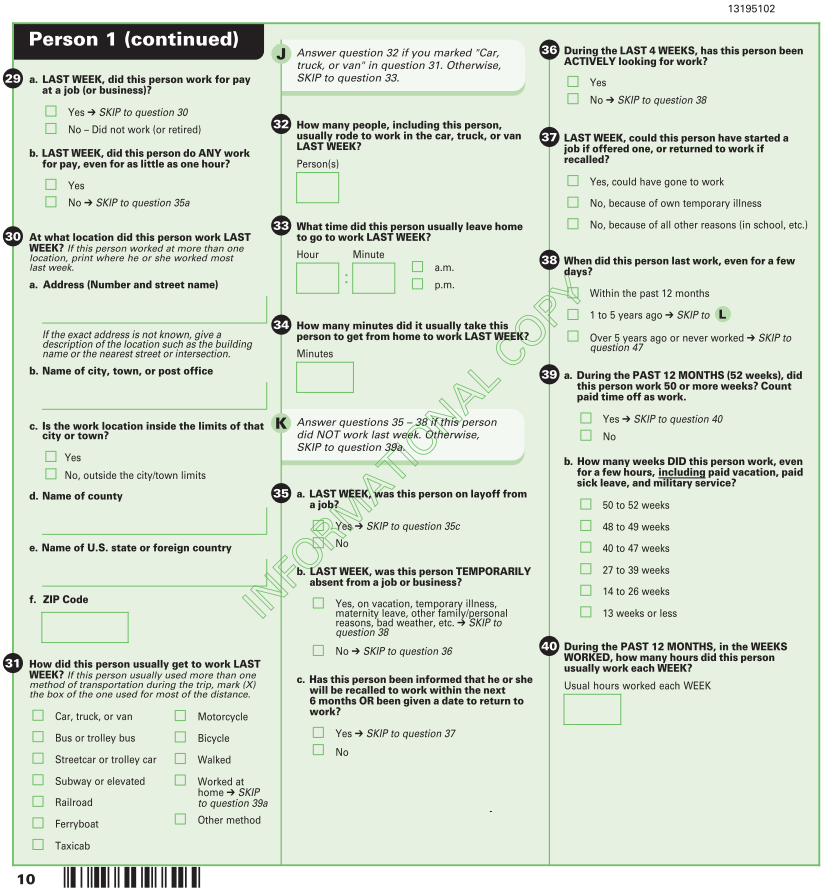
☐ Yes (such as 0%, 10%, 20%, ... , 100%)
☐ No → *SKIP to question 29a*

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

9

Fig. B.9 Page 9 of the ACS questionnaire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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?

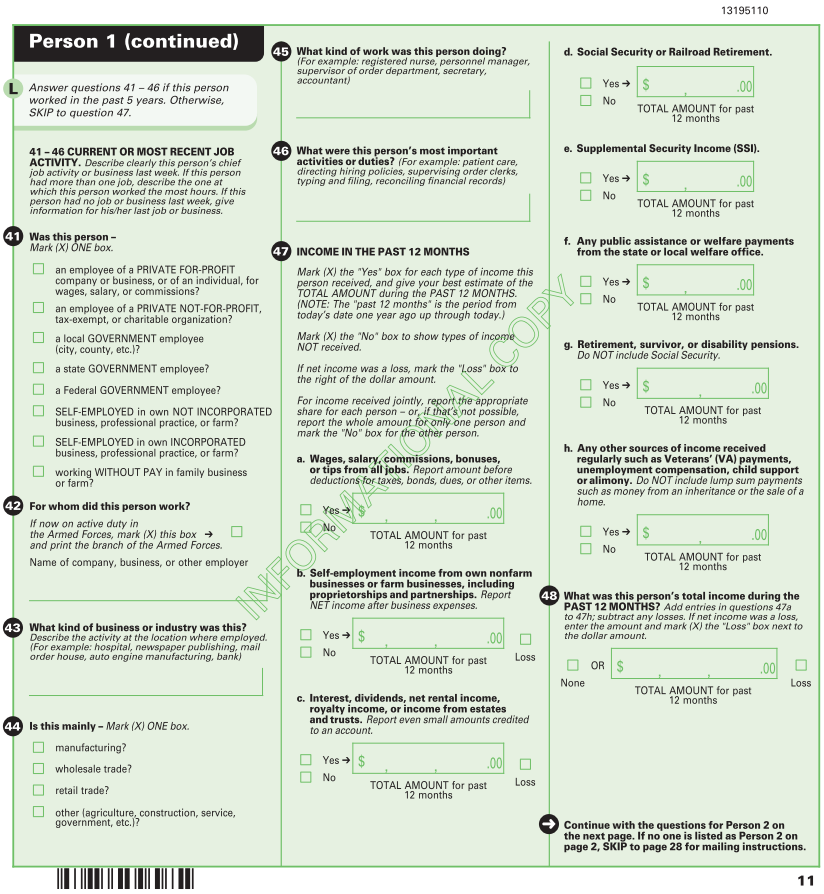
- ☐ 50 to 52 weeks
- ☐ 48 to 49 weeks
- ☐ 40 to 47 weeks
- ☐ 27 to 39 weeks
- ☐ 14 to 26 weeks
- ☐ 13 weeks or less

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

10

Fig. B.10 Page 10 of the ACS questionnaire



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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.**

Fig. B.11 Page 11 of the ACS questionnaire

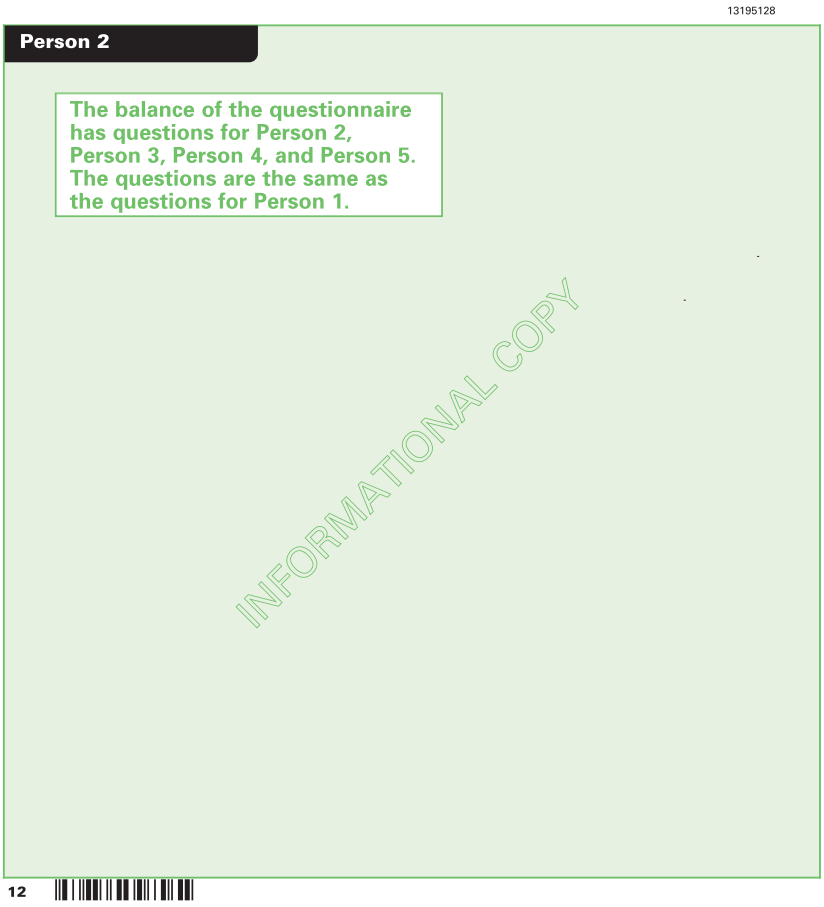
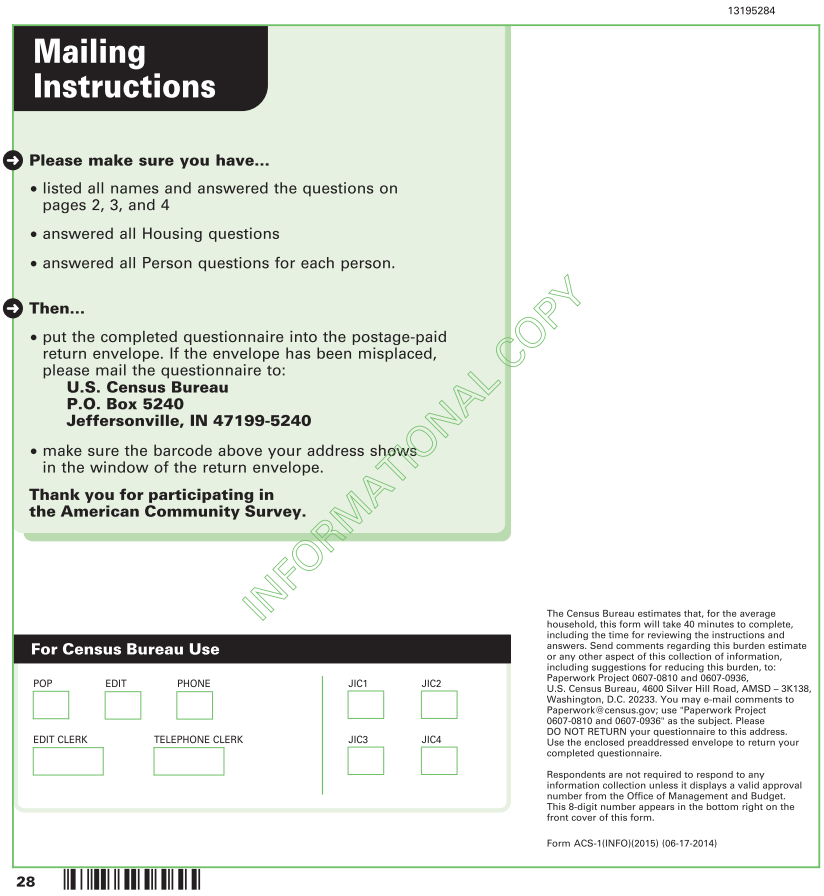


Fig. B.12 Page 12 of the ACS questionnaire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Mailing Instructions

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 40 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 and 0607-0936, 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 and 0607-0936" 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)(2015) (06-17-2014)

28

Fig. B.13 The last page of the ACS questionnaire