National Health Statistics Reports

Number 39 ■ April 20, 2011

Wireless Substitution: State-level Estimates From the National Health Interview Survey, January 2007–June 2010

by Stephen J. Blumberg, Ph.D., and Julian V. Luke, Division of Health Interview Statistics, National Center for Health Statistics; Nadarajasundaram Ganesh, Ph.D., and Michael E. Davern, Ph.D., NORC at the University of Chicago; and Michel H. Boudreaux, M.S., and Karen Soderberg, M.S., State Health Access Data Assistance Center, University of Minnesota

Abstract

Objectives—This report presents state-level estimates of the percentage of adults and children living in households that did not have a landline telephone but did have at least one wireless telephone. National estimates for the 12-month time period from July 2009 through June 2010 indicate that 23.9% of adults and 27.5% of children were living in these wireless-only households. Estimates are also presented for selected U.S. counties and groups of counties, for other household telephone service use categories (e.g., those that had only landlines and those that had landlines yet received all or almost all calls on wireless telephones), and for 12-month time periods since January–December 2007.

Methods—Small-area statistical modeling techniques were used to estimate the prevalence of adults and children living in households with various household telephone service types for 93 disjoint geographic areas that make up the entire United States. This modeling was based on January 2007–June 2010 data from the National Health Interview Survey, 2006–2009 data from the American Community Survey, and auxiliary information on the number of listed telephone lines per capita in 2007–2010.

Results—The prevalence of wireless-only adults and children varied substantially across states. State-level estimates for July 2009–June 2010 ranged from 12.8% (Rhode Island and New Jersey) to 35.2% (Arkansas) of adults and from 12.6% (Connecticut and New Jersey) to 46.2% (Arkansas) of children. For adults, the magnitude of the increase from 2007 to 2010 was lowest in New Jersey (7.2 percentage points) and highest in Arkansas (14.5 percentage points).

Keywords: cell phones • telephone surveys • noncoverage • small domain estimation

Introduction

The prevalence and use of wireless telephones (also known as cellular telephones, cell phones, or mobile phones) has changed substantially over the past decade. Today, an ever-increasing number of adults have chosen to use wireless telephones rather than landline telephones to make and receive calls. As of the first half of 2010, more than one in four American households (26.6%) had only wireless telephones—an eightfold increase over just 6 years (1). The prevalence of such "wireless-only" households now markedly exceeds the prevalence of households with only landline telephones (12.9%), and this difference is expected to grow.

The increasing prevalence of wireless-only households has implications for telephone surveys. Many health surveys, political polls, and other research studies are conducted using random-digit-dial (RDD) telephone surveys. Until recently, these surveys did not include wireless telephone numbers in their samples. Now, despite operational challenges, most major survey research organizations include wireless telephone

numbers when conducting RDD telephone surveys. If they did not, the exclusion of households with only wireless telephones (along with the 2.0% of households that have no telephone service) could bias results (2–4).

Best practices for conducting surveys by calling wireless telephones are not yet known, but substantial research has been conducted to address the known operational challenges (5). Statistical challenges also exist when combining samples of wireless-only households with samples of landline households from RDD surveys. To ensure that each sample is appropriately represented in the final data set and appropriately weighted in the final analyses, reliable estimates of the prevalence of wireless-only households are needed (5). Moreover, if the persons interviewed on their wireless telephones are not screened to exclude persons who also have landlines, reliable estimates of the prevalence of landline and wireless telephone service use may be required to address the probability that an individual could be in both samples (5).

The National Health Interview Survey (NHIS) is the most widely cited source for data on the ownership and use of wireless telephones. Every 6 months, the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS) releases a report with the most up-to-date estimates available from the federal government concerning the size and characteristics of the wireless-only population (1). That report, published as part of the NHIS Early Release Program, presents national and regional estimates.

Many RDD telephone surveys are designed to collect data and produce results at the state or local level, including several surveys conducted by CDC (e.g., the Behavioral Risk Factor Surveillance System, the National Immunization Survey, and the State and Local Area Integrated Telephone Survey). For such surveys to effectively combine samples of wireless-only households with samples of landline households, state-level estimates of the prevalence of wireless-only households are needed. Direct state-level estimates of this prevalence have not been available from NHIS data because the sample size of NHIS is insufficient for direct, reliable annual estimates for most states. However, in March 2009 NCHS released the results of statistically modeled estimates of the prevalence of wireless-only adults at the state level, using data from the 2007 NHIS and the 2008 Current Population Survey's Annual Social and Economic Supplement (6). Those estimates were the first state-level estimates of the size of this population available from the federal government.

In this report, we update those original 2007 estimates. We present results of modeled estimates of the prevalence of wireless-only adults and wireless-only children at the state level, using data from the 2007–2010 NHIS and the 2006–2009 American Community Survey (ACS), along with auxiliary information on the number of listed telephone lines per capita. By incorporating data from multiple sources, the modeled estimates presented here take advantage of the unique strengths of each data set.

This report also expands on the original 2007 estimates in three important ways. First, it includes estimates for 42 additional substate geographic areas in the United States. Second, it includes estimates not only for July 2009–June 2010, but also for 12-month time periods from January 2007 through June 2010. Third, it includes estimates not only for persons living in wireless-only households, but also for additional household telephone service use categories. Estimates are presented for adults and children living in wireless-mostly households (defined as households that have landlines yet receive all or almost all calls on wireless telephones), dual-use households (which receive significant amounts of calls on both landlines and wireless telephones), landline-mostly households (which have wireless telephones yet receive all or almost all calls on landlines), and landline-only households.

Methods

Small-area statistical modeling techniques were used to combine NHIS data collected from within specific geographies (states and some counties) with auxiliary data that are representative of those geographies to produce model-based estimates. Specifically, we used a combination of direct survey estimates from the 2007–2010 NHIS, direct survey estimates from the 2006–2009 ACS, and auxiliary information on the number of listed telephone lines per capita in 2007–2010. The small-area model was used to derive estimates of the proportion of people who lived in households that were wireless-only, wireless-mostly, dual-use, landline-mostly, and landline-only for the following seven 6-month periods: January–June 2007, July–December 2007, January–June 2008, July–December 2008, January–June 2009, July–December 2009, and January–June 2010.

Estimates were derived for adults and children for 93 nonoverlapping areas that make up the entire United States. Twenty-six of these areas were states, and one was the District of Columbia; others areas consisted of selected counties, groups of counties, or the balance of the state population excluding the selected counties. No areas crossed state lines, and every location in the United States was part of one (and only one) of the 93 areas. Areas considered for inclusion in this report included urban areas that receive federal Section 317 immunization grants and other substate areas that are strata for CDC's National Immunization Survey (7). Areas were selected for this report on the basis of available survey sample sizes and the stability of the modeled estimates.

For each telephone category, the 6-month estimates for all 93 small areas were modeled jointly. That is, all 6-month periods were modeled together in a single model rather than separately as seven models (one for each 6-month period). Separate small-area models were fitted for each telephone service use category (e.g., wireless-only,

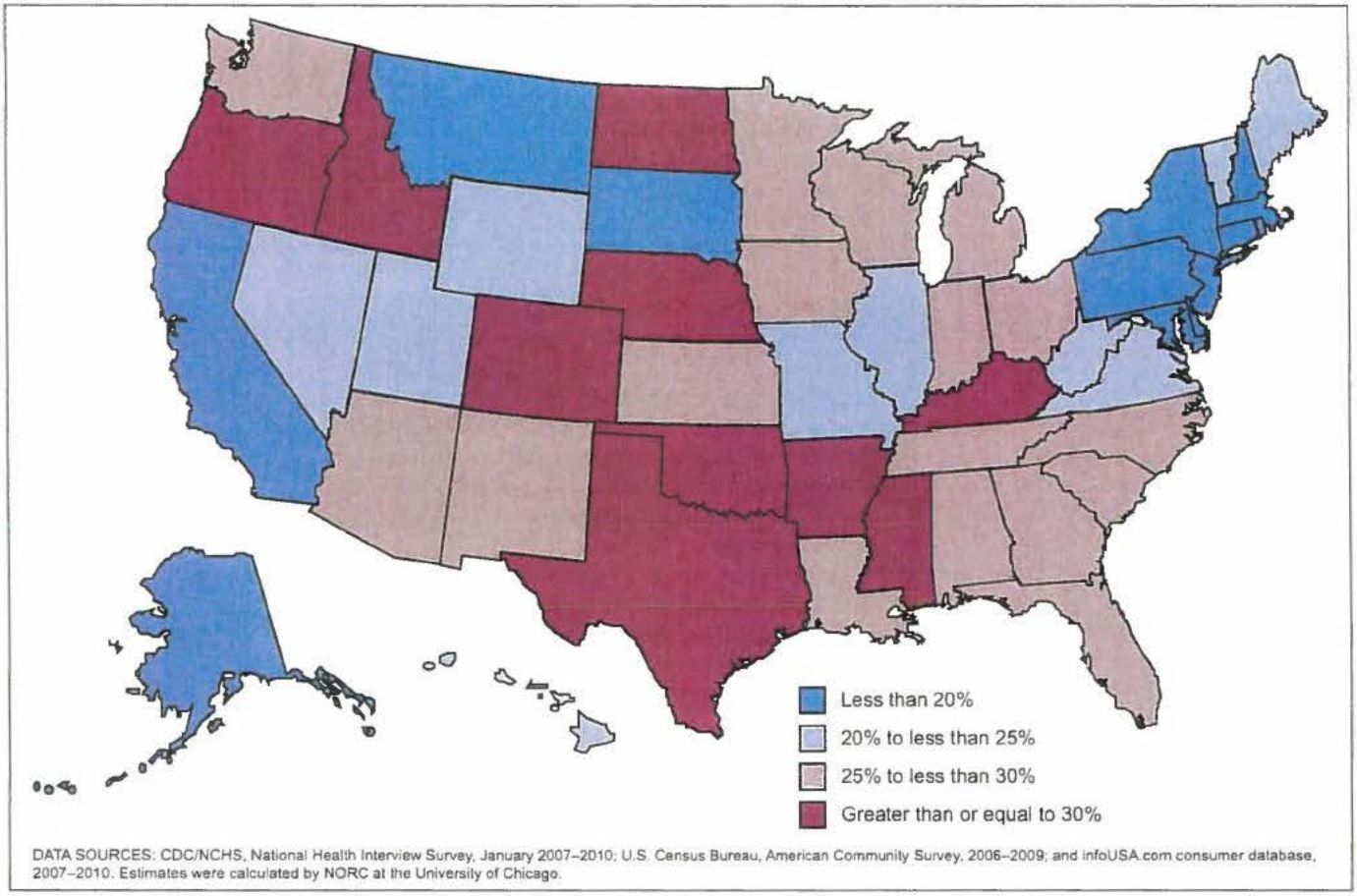
dual-use) and by age group (adults or children). The model-based estimates for each telephone service use category, small area, and 6-month period were derived using a standard small-area modeling and estimation approach known as "empirical best linear unbiased prediction" (8–10). The model-based estimates were a weighted combination of three distinct sets of estimates: (a) the direct estimate from NHIS for the small area during the 6-month period of interest, (b) a synthetic estimate derived from a regression model involving ACS and other auxiliary data for the small area during the 6-month period of interest, and (c) "adjusted direct estimates" from NHIS for the small area during all 6-month periods other than the 6-month period of interest. By using estimates from all seven 6-month periods, the model-based estimate allows for "borrowing strength" across time. When these three distinct sets of estimates were combined, the weights associated with each set reflected the relative precision of each estimate.

Although model-based estimates were produced for every small area and 6-month period, consecutive 6-month period estimates were combined to produce 12-month estimates. The small-area estimates for 12-month periods were obtained by averaging two consecutive 6-month estimates. This helped to reduce the variability of the estimates. Then, the 12-month small-area estimates for each phone category were adjusted so that they agreed with the national direct estimates from NHIS for the corresponding phone category and year. The 12-month estimates were further adjusted so that they agreed with the 2008 or 2009 ACS estimate for the population with a telephone (either landline or wireless) for each small area. For states with multiple small areas, 12-month state-level estimates were obtained by appropriately weighting the 12-month small-area estimates by population size.

Further detail regarding this estimation methodology is available in the Technical Notes section.

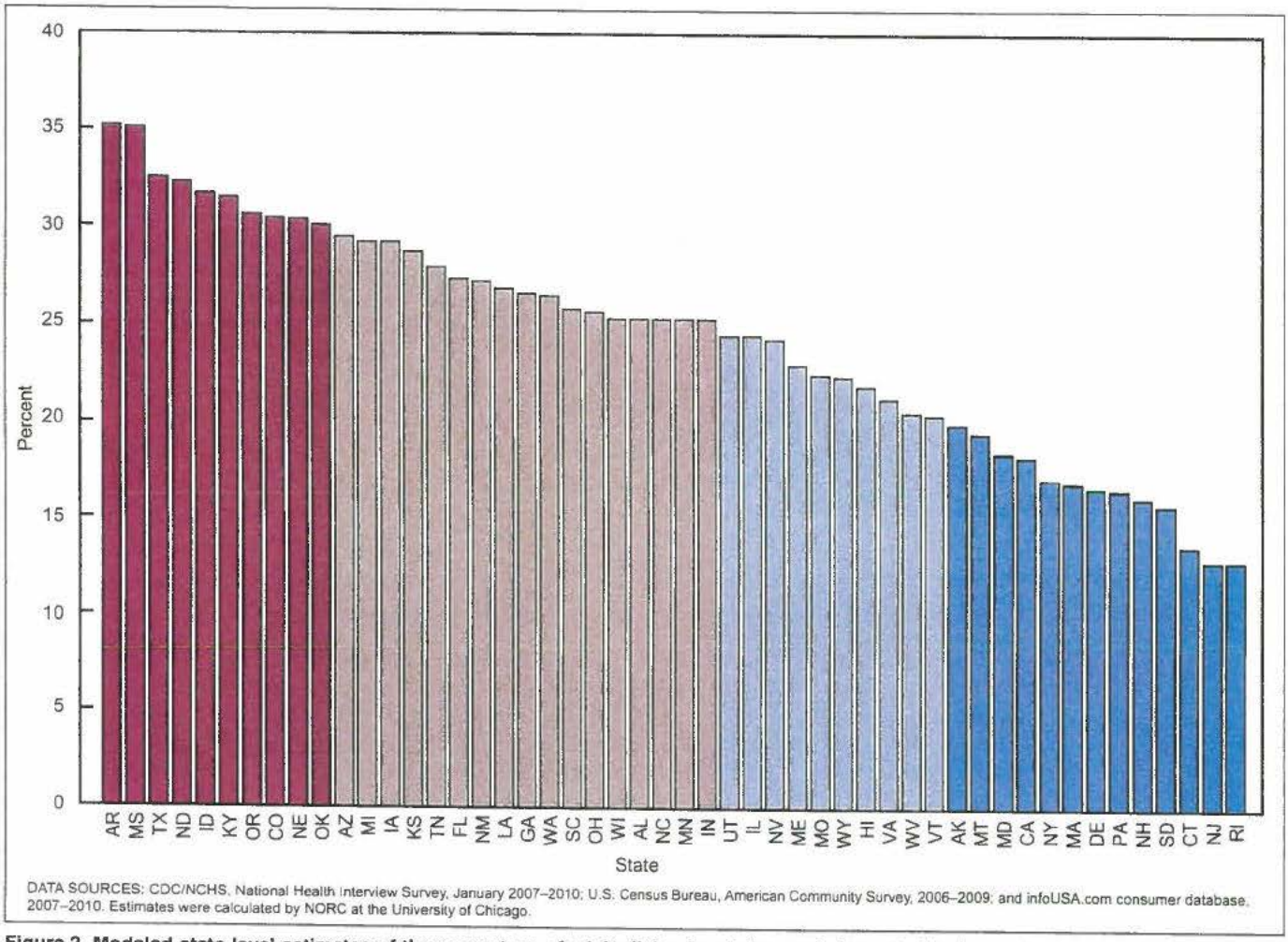
Estimates for Adults and Children Living in Wireless-only Households

Results from the small-area modeling strategy showed great variation in the prevalence of adults living in wireless-only households across states (Figures 1 and 2). Estimates for July 2009–June 2010 ranged from a high of 35.2% in Arkansas to a low of 12.8% in Rhode Island and New Jersey (Table 1). Other states in which the prevalence of wireless-only adults was relatively high



DATA SOURCES: CDC/NCHS, National Health Interview Survey, January 2007–2010; U.S. Census Bureau, American Community Survey, 2006–2009; and infoUSA.com consumer database, 2007–2010. Estimates were calculated by NORC at the University of Chicago.

Figure 1. State-level comparisons of the percentage of adults living in wireless-only households, using modeled estimates: United States, July 2009–June 2010



DATA SOURCES: CDC/NCHS, National Health Interview Survey, January 2007–2010; U.S. Census Bureau, American Community Survey, 2006–2009; and infoUSA.com consumer database, 2007–2010. Estimates were calculated by NORC at the University of Chicago.

Figure 2. Modeled state-level estimates of the percentage of adults living in wireless-only households: United States, July 2009–June 2010

(exceeding 31%) were Mississippi (35.1%), Texas (32.5%), North Dakota (32.3%), Idaho (31.7%), and Kentucky (31.5%). Several other states in the Northeast region joined Rhode Island and New Jersey with prevalence rates below 17%, including Connecticut (13.6%), New Hampshire (16.0%), Pennsylvania (16.5%), Delaware (16.5%), and Massachusetts (16.8%). Prevalence rates were also relatively low in South Dakota (15.6%).

Similarly, results showed great variation in the prevalence of wireless-only children across states, ranging from a high of 46.2% in Arkansas to a low of 12.6% in Connecticut and New Jersey (Table 2). Other states with a high prevalence of wireless-only children included Mississippi (41.9%), North Dakota (39.7%), New Mexico (38.9%), and Idaho (37.3%). Other states with a low prevalence of wireless-only children included New Hampshire (15.0%), Massachusetts (15.1%), Rhode Island (15.8%), and New York (16.6%).

Table 1 also provides the modeled estimates of the prevalence of wireless-only adults for each 12-month time period from January 2007 through June 2010. Nationally, the prevalence of wireless-only adults increased from 13.6% to 23.9%, an absolute increase of 10.3 percentage points. As expected, the values increased in every state from 2007 to 2010, and the increase in prevalence was statistically significant in every state. The absolute increase from 2007 to 2010 ranged from a high of 14.5 percentage points in Arkansas to a low of 7.2 percentage points in New Jersey. Other states with a larger-than-average increase in the prevalence of wireless-only adults included Mississippi (14.1) and North Dakota (13.0). Other states with a smaller-than-average increase included New York (7.3), Pennsylvania (7.5), Rhode Island (7.5), and Utah (7.6). Table 2 can be used to produce similar estimates of change over time for children living in wireless-only households.

Estimates for Adults Living in Households With Wireless Telephones

Table 3 presents modeled estimates for July 2009–June 2010 for the prevalence of adults living in households with various telephone service types, including but not limited to wireless-only status. Estimates are presented for adults living in wireless-mostly households, landline-mostly

households, dual-use households, and landline-only households. These results can be used to obtain the prevalence of adults living in households with any wireless telephones (regardless of whether the wireless telephones are the only telephones). Estimates ranged from a high of 91.8% in Iowa to a low of 47.9% in South Dakota. Other states exceeding 90% included Utah (90.9%), Colorado (90.7%), Kansas (90.7%), Minnesota (90.3%), and Delaware (90.3%). Other states below 70% included Montana (60.6%), Wyoming (63.3%), and Nevada (66.2%).

Table 3 can also be used to look at the prevalence of adults living in households that receive all or almost all calls on wireless telephones, regardless of whether the households have landline telephones. Both wireless-only and wireless-mostly adults are in this group. Estimates of the prevalence of adults living in households where wireless telephones are the primary means of receiving calls ranged from 52.8% in Texas to 24.9% in South Dakota. Other states exceeding 47% included Arkansas (50.9%), Mississippi (49.8%), Arizona (48.1%), and Nebraska (47.3%). Other states below 30% included Connecticut (28.2%), New Hampshire (29.4%), and Rhode Island (29.6%).

Table 4 presents modeled estimates for July 2009–June 2010 for the prevalence of children living in households with various telephone service types. The table can be used to calculate estimates for children similar to those for adults described above.

Discussion

Because of the limited availability of reliable and updated state-level prevalence estimates for the wireless-only population, survey researchers interested in combining state-level samples of wireless-only households with samples of landline households have relied on national or regional estimates of the relative sizes of these two populations (5). Similarly, telecommunications companies seeking greater understanding of conditions in state and local markets have relied on regional estimates of the prevalence of wireless-only persons (11). The results in this report clearly show that, for many states, national and regional estimates are not sufficiently accurate for these purposes.

Results from the small-area statistical models show great state-level variation in the prevalence of wireless-only adults, even within regions. The range of prevalence exceeded 10 percentage points in the Northeast region, 13 percentage points in the West region, 16 percentage points in the Midwest region, and 18 percentage points in the South region. In fact, in the Midwest region, the state with the lowest prevalence (South Dakota, 15.6%) borders the state with the highest prevalence (North Dakota, 32.3%). Wider ranges within regions were observed for estimates of the prevalence of wireless-only children.

Survey researchers and telecommunications companies interested in local areas may question whether state-level prevalence estimates are sufficiently specific. This report includes estimates for 42 counties or groups of counties, selected from a list of immunization-policy-relevant areas on the basis of available survey sample sizes and the stability of the modeled estimates. Most of these substate areas are major metropolitan cities, and national estimates suggest that adults living in metropolitan areas are more likely to live in wireless-only households than are adults living in nonmetropolitan areas. The mean of the 42 substate-area estimates of the prevalence of wireless-only adults (26.7%) was greater than the mean of the "rest of state" estimates for those 24 states (23.5%). However, for the majority of the substate areas, the prevalence of wireless-only adults did not differ significantly from the area's corresponding state-level prevalence estimate. Exceptions included Orange County (Orlando, Florida), Cook County (Chicago, Illinois), Madison/St. Clair counties (Metro East St. Louis, Illinois), Marion County (Indianapolis, Indiana), Suffolk County (Boston, Massachusetts), Wayne County (Detroit, Michigan), Essex County (Newark, New Jersey), Allegheny County (Pittsburgh, Pennsylvania), Davidson County (Nashville, Tennessee), Dallas County (Dallas, Texas), and King County (Seattle, Washington), where the prevalence of wireless-only adults significantly exceeded the corresponding state-level prevalence.

Prevalence estimates are included not only for July 2009–June 2010, but also for 12-month time periods from January 2007 through June 2010. The statistical model based on 3½ years of data—and therefore larger sample sizes in each geographic area—is more stable than a model based on only a single year of data. Estimates from the more stable model are presumed to be more reliable. Thus, we presume that the estimates for 2007 presented in this report are more reliable than the estimates for 2007 presented in our previous report (6). Modeled estimates for January 2007–June 2009 for household telephone service use categories other than wireless-only have not been included in this report but are available upon request.

The estimates developed for this report are based on data from 2007 through 2010. The number of American homes with only wireless telephones continues to grow (1), and it is very likely that the current prevalence rates of wireless-only adults and children are greater than the estimates presented here. Researchers may find that the rates of growth presented in Tables 1 and 2 for states and substate areas are useful for predicting current or future prevalence rates.

Finally, the state and substate estimates presented here may differ from estimates produced by other sources. For example, Arbitron, Inc., released Fall 2009 estimates of the prevalence of wireless-only households in local radio markets (12). Their estimates are based largely on survey responses received from mailed screening questionnaires, which may be subject to various nonresponse biases. The estimates presented here are less likely to be biased by survey nonresponse (due to the high NHIS response rates), but are more likely to be biased by the focus here on demographic characteristics in the

statistical model. Arbitron's estimates reveal higher wireless-only prevalence estimates in areas with college campuses or military bases; the statistical models here did not include any community characteristics. The NHIS sample also does not include active-duty military personnel. Survey nonresponse, sample characteristics, and model selection should all be considered when evaluating or comparing small-area estimates, including those presented here.

References

1. Blumberg SJ, Luke JV. Wireless substitution: Early release of estimates based on data from the National Health Interview Survey, January–June 2010. National Center for Health Statistics. December 2010. Available from: http://www.cdc.gov/nchs/nhis.htm.
2. Blumberg SJ, Luke JV. Coverage bias in traditional telephone surveys of low-income and young adults. Public Opin Q 71(5):734–49. 2007.
3. Blumberg SJ, Luke JV, Cynamon ML. Reevaluating the need for concern regarding noncoverage bias in landline surveys. Am J Public Health 99(10):1806–10. 2009.
4. Blumberg SJ, Luke JV, Cynamon ML, Frankel MR. Recent trends in household telephone coverage in the United States. In: Lepkowski JM, Tucker C, Brick JM, et al., eds. Advances in telephone survey methodology: 56–86. Hoboken, NJ: John Wiley & Sons. 2007.
5. AAPOR Cell Phone Task Force. New considerations for survey researchers when planning and conducting RDD telephone surveys in the U.S. with respondents reached via cell phone numbers [online]. American Association for Public Opinion Research. 2010. Available from: http://aapor.org/cell_phone_task_force.htm.
6. Blumberg SJ, Luke JV, Davidson G, et al. Wireless substitution: State-level estimates from the National Health Interview Survey, January–December 2007. National health statistics reports; no 14. Hyattsville, MD: National Center for Health Statistics. 2009. Available from: http://www.cdc.gov/nchs/data/nhsr/nhsr014.pdf.
7. CDC. National Immunization Survey: A user's guide for the 2008 public-use data file. 2009. Available from: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NIS/NISPUF08_DUG.pdf.
8. Jiang J, Lahiri P. Mixed model prediction and small area estimation (with discussion). Test 15(1):1–96. 2006.
9. Rao JNK. Small area estimation. Hoboken, NJ: John Wiley & Sons. 2003.
10. Rao JNK, Yu M. Small area estimation by combining time-series and cross-section data. Can J Stat 22(4):511–28. 1994.
11. Petitions of Qwest Corporation for forbearance pursuant to 47 U.S.C. §160(c) in the Denver, Minneapolis-St. Paul, Phoenix, and Seattle metropolitan statistical areas. WC Docket No. 07–97, Memorandum Opinion and Order, FCC 08–174. Federal Communications Commission. July 25, 2008. Available from: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-174A1.pdf.
12. Arbitron, Inc. Cell-phone-only household penetration in Arbitron radio metro areas. 2009. Available from: http://www.arbitron.com/downloads/cell_phone_penetration_map.pdf.
13. Jiang J, Lahiri P, Wan S-M, Wu C-H. Jackknifing in the Fay-Herriot model with an example. In: Statistical policy working paper 33: Proceedings of the Seminar on Funding Opportunity in Survey Research; 98–104. Washington, DC: Federal Committee on Statistical Methodology, Office of Management and Budget. 2001.
14. Magee L. R^2 measures based on Wald and likelihood ratio joint significance tests. Am Stat 44(3):250–3. 1990.

Table 1. Modeled estimates (with standard errors) of the percentage of adults aged 18 and over living in wireless-only households, by selected geographic areas and time period: United States, January 2007–June 2010

Geographic area	Jan–Dec 2007	Jul 2007–Jun 2008	Jan–Dec 2008	Jul 2008–Jun 2009	Jan–Dec 2009	Jul 2009–Jun 2010
	Percent (standard error)					
Alabama	13.1 (1.3)	15.0 (1.3)	17.9 (1.5)	20.6 (1.6)	22.7 (1.6)	25.3 (1.6)
Jefferson County	13.6 (2.1)	15.8 (2.2)	17.8 (2.3)	19.7 (2.5)	22.6 (2.5)	24.3 (2.4)
Rest of Alabama	13.0 (1.4)	14.9 (1.5)	17.9 (1.7)	20.7 (1.8)	22.7 (1.8)	25.4 (1.8)
Alaska	10.8 (2.4)	13.2 (2.5)	15.2 (2.6)	17.9 (2.8)	20.2 (3.0)	19.9 (2.9)
Arizona	17.2 (1.3)	18.5 (1.4)	20.4 (1.4)	23.8 (1.5)	27.2 (1.5)	29.4 (1.5)
Maricopa County	17.1 (1.6)	18.1 (1.7)	20.0 (1.7)	23.6 (1.9)	27.6 (1.9)	30.3 (1.9)
Rest of Arizona	17.3 (2.2)	19.2 (2.3)	21.0 (2.4)	24.0 (2.6)	26.6 (2.5)	28.2 (2.5)
Arkansas	20.7 (2.1)	23.0 (2.1)	25.5 (2.2)	30.7 (2.3)	33.5 (2.3)	35.2 (2.3)
California	8.9 (0.5)	10.5 (0.5)	12.5 (0.6)	14.9 (0.6)	16.3 (0.6)	18.2 (0.6)
Alameda County	9.6 (1.5)	11.5 (1.6)	13.6 (1.7)	14.5 (1.8)	15.3 (1.8)	17.4 (1.9)
Fresno County	14.2 (1.9)	15.0 (1.9)	15.3 (1.9)	17.2 (1.9)	19.9 (2.0)	21.5 (2.2)
Los Angeles County	7.1 (0.8)	8.6 (0.8)	10.6 (0.9)	14.1 (1.1)	16.1 (1.0)	17.0 (1.0)
Northern Counties[1]	8.0 (1.6)	9.5 (1.7)	10.3 (1.7)	12.6 (1.9)	16.0 (2.1)	18.1 (2.2)
San Bernardino County	8.7 (1.5)	10.3 (1.6)	12.4 (1.7)	14.1 (1.8)	15.5 (1.8)	18.1 (1.8)
San Diego County	7.3 (1.2)	8.7 (1.2)	10.5 (1.3)	13.1 (1.5)	16.2 (1.5)	18.4 (1.6)
Santa Clara County	9.3 (1.4)	9.7 (1.4)	10.1 (1.5)	12.4 (1.7)	15.5 (1.8)	17.7 (1.8)
Rest of California	10.1 (0.8)	11.7 (0.9)	14.1 (1.0)	16.3 (1.1)	16.5 (1.0)	18.8 (0.9)
Colorado	20.4 (1.6)	23.1 (1.7)	25.7 (1.7)	27.5 (1.7)	29.0 (1.7)	30.4 (1.6)
City of Denver Counties[2]	26.1 (2.9)	28.6 (3.0)	30.4 (3.0)	31.2 (2.9)	31.6 (2.8)	33.6 (2.8)
Rest of Colorado	16.8 (1.8)	19.6 (1.9)	22.7 (2.0)	25.1 (2.1)	27.4 (2.0)	28.4 (1.9)
Connecticut	5.6 (1.0)	6.7 (1.1)	8.2 (1.2)	9.7 (1.3)	12.1 (1.4)	13.6 (1.4)
Delaware	6.9 (1.7)	8.1 (1.8)	10.3 (2.1)	13.4 (2.4)	15.6 (2.5)	16.5 (2.5)
District of Columbia	13.8 (2.8)	15.9 (2.9)	18.5 (3.1)	21.9 (3.2)	24.9 (3.2)	27.7 (3.4)
Florida	15.2 (0.9)	17.6 (0.9)	20.4 (1.0)	22.9 (1.1)	24.9 (1.0)	27.3 (1.0)
Dade County	14.6 (1.5)	17.2 (1.6)	20.5 (1.7)	22.9 (1.8)	24.7 (1.8)	27.1 (1.7)
Duval County	17.9 (2.5)	21.2 (2.6)	24.3 (2.7)	25.8 (2.8)	26.9 (2.7)	29.3 (2.6)
Orange County	19.7 (2.4)	22.4 (2.5)	25.3 (2.7)	28.1 (2.8)	31.3 (2.7)	34.1 (2.7)
Rest of Florida	14.8 (1.1)	17.1 (1.1)	19.7 (1.2)	22.4 (1.3)	24.3 (1.3)	26.7 (1.2)
Georgia	14.7 (1.2)	16.6 (1.2)	19.4 (1.3)	21.6 (1.4)	23.4 (1.4)	26.5 (1.4)
Fulton/DeKalb Counties	16.7 (2.1)	19.9 (2.3)	24.2 (2.5)	25.4 (2.5)	26.2 (2.5)	30.3 (2.5)
Rest of Georgia	14.2 (1.4)	15.9 (1.4)	18.2 (1.5)	20.7 (1.6)	22.8 (1.6)	25.7 (1.6)
Hawaii	9.3 (1.4)	10.5 (1.5)	12.6 (1.6)	15.6 (1.7)	19.7 (1.9)	21.8 (1.9)
Idaho	19.6 (2.3)	21.2 (2.4)	23.5 (2.5)	27.4 (2.7)	30.5 (2.7)	31.7 (2.6)
Illinois	14.8 (1.1)	16.0 (1.1)	18.1 (1.2)	20.5 (1.2)	22.3 (1.2)	24.4 (1.2)
Cook County	17.8 (1.5)	19.0 (1.6)	22.5 (1.7)	26.0 (1.8)	27.6 (1.7)	29.7 (1.7)
Madison/St. Clair Counties	15.7 (2.5)	19.5 (2.7)	23.1 (3.0)	24.4 (3.0)	26.0 (3.0)	31.5 (3.1)
Rest of Illinois	13.9 (1.4)	14.9 (1.4)	16.5 (1.5)	18.6 (1.5)	20.4 (1.5)	22.3 (1.5)
Indiana	14.1 (1.2)	15.1 (1.2)	17.2 (1.3)	21.1 (1.5)	24.1 (1.4)	25.2 (1.4)
Lake County	8.3 (2.3)	11.7 (2.5)	14.6 (2.8)	15.5 (2.9)	16.6 (2.9)	18.7 (3.1)
Marion County	21.1 (2.6)	22.6 (2.7)	24.9 (2.7)	28.9 (2.9)	32.8 (3.0)	33.5 (2.9)
Rest of Indiana	13.5 (1.4)	14.1 (1.4)	16.2 (1.6)	20.3 (1.7)	23.3 (1.7)	24.4 (1.7)
Iowa	19.7 (2.1)	22.0 (2.1)	24.2 (2.2)	25.7 (2.3)	27.7 (2.2)	29.2 (2.1)
Kansas	17.2 (1.7)	20.0 (1.7)	22.1 (1.8)	24.1 (1.8)	26.7 (1.9)	28.7 (1.8)
Johnson/Wyandotte Counties	7.5 (1.7)	10.1 (1.9)	13.7 (2.2)	16.1 (2.4)	18.1 (2.5)	21.2 (2.6)
Rest of Kansas	20.4 (2.1)	23.2 (2.2)	24.8 (2.2)	26.7 (2.3)	29.5 (2.3)	31.1 (2.2)
Kentucky	21.7 (2.0)	24.0 (2.1)	26.6 (2.1)	28.4 (2.1)	30.2 (2.1)	31.5 (2.1)
Louisiana	14.1 (1.5)	15.5 (1.6)	17.1 (1.7)	20.3 (1.9)	24.2 (1.8)	26.8 (1.8)
Maine	14.2 (2.1)	15.9 (2.2)	18.0 (2.2)	20.5 (2.4)	22.5 (2.3)	22.9 (2.4)
Maryland	9.8 (1.1)	10.7 (1.1)	11.6 (1.2)	14.4 (1.3)	16.6 (1.3)	18.4 (1.4)
Baltimore City	14.1 (2.4)	14.4 (2.4)	15.2 (2.5)	19.4 (2.7)	23.1 (2.8)	23.7 (2.8)
Rest of Maryland	9.2 (1.2)	10.2 (1.3)	11.1 (1.3)	13.7 (1.4)	15.8 (1.4)	17.7 (1.5)
Massachusetts	7.9 (0.9)	9.4 (1.0)	11.5 (1.1)	13.5 (1.2)	16.0 (1.2)	16.8 (1.2)
Suffolk County	16.4 (2.5)	19.8 (2.8)	22.3 (3.0)	22.6 (2.9)	23.1 (2.8)	25.2 (2.8)
Rest of Massachusetts	7.0 (1.0)	8.3 (1.1)	10.3 (1.2)	12.5 (1.3)	15.2 (1.3)	15.8 (1.3)
Michigan	16.9 (1.2)	18.7 (1.3)	21.0 (1.3)	23.4 (1.4)	26.7 (1.3)	29.2 (1.3)
Wayne County	19.1 (2.2)	22.1 (2.2)	25.2 (2.2)	28.1 (2.4)	30.6 (2.5)	34.9 (2.4)
Rest of Michigan	16.7 (1.3)	18.4 (1.4)	20.7 (1.4)	23.1 (1.5)	26.3 (1.5)	28.6 (1.4)
Minnesota	15.8 (1.3)	18.6 (1.3)	21.0 (1.4)	22.4 (1.4)	24.1 (1.4)	25.2 (1.4)
Twin Cities Counties[3]	17.1 (1.7)	20.3 (1.8)	23.0 (1.9)	24.2 (1.9)	25.4 (1.9)	26.1 (1.8)
Rest of Minnesota	14.4 (1.8)	16.7 (1.9)	18.8 (2.0)	20.4 (2.1)	22.7 (2.1)	24.3 (2.1)
Mississippi	21.0 (1.9)	25.0 (2.0)	28.2 (2.0)	30.3 (2.1)	33.2 (2.0)	35.1 (2.0)

See footnotes at end of table.

Table 1. Modeled estimates (with standard errors) of the percentage of adults aged 18 and over living in wireless-only households, by selected geographic areas and time period: United States, January 2007–June 2010—Con.

Geographic area	Jan–Dec 2007	Jul 2007–Jun 2008	Jan–Dec 2008	Jul 2008–Jun 2009	Jan–Dec 2009	Jul 2009–Jun 2010
	Percent (standard error)					
Missouri	10.1 (1.1)	12.5 (1.2)	15.0 (1.3)	17.6 (1.4)	21.0 (1.5)	22.4 (1.5)
St. Louis County/City	13.9 (2.0)	17.2 (2.1)	19.5 (2.2)	22.9 (2.4)	26.7 (2.4)	26.9 (2.3)
Rest of Missouri	9.0 (1.3)	11.0 (1.4)	13.6 (1.6)	16.1 (1.7)	19.4 (1.7)	21.1 (1.8)
Montana	9.5 (2.0)	11.3 (2.1)	14.0 (2.3)	16.6 (2.5)	18.5 (2.5)	19.4 (2.6)
Nebraska	19.0 (2.2)	21.1 (2.3)	23.5 (2.4)	27.9 (2.6)	29.9 (2.5)	30.4 (2.4)
Nevada	11.6 (1.4)	12.6 (1.4)	14.3 (1.5)	18.1 (1.7)	22.3 (1.8)	24.2 (1.8)
Clark County	11.5 (1.6)	11.8 (1.6)	12.9 (1.7)	17.1 (2.0)	21.8 (2.1)	24.1 (2.1)
Rest of Nevada	12.1 (2.3)	14.3 (2.6)	17.7 (2.8)	20.8 (3.0)	23.6 (3.1)	24.6 (3.2)
New Hampshire	7.2 (1.5)	8.3 (1.6)	9.4 (1.7)	13.0 (1.9)	15.8 (2.0)	16.0 (2.0)
New Jersey	5.6 (0.8)	6.6 (0.9)	8.0 (0.9)	9.7 (1.0)	11.4 (1.0)	12.8 (1.0)
Essex County	7.1 (2.0)	12.0 (2.3)	18.4 (2.9)	21.2 (3.0)	23.9 (3.1)	26.5 (3.0)
Rest of New Jersey	5.5 (0.8)	6.5 (0.9)	7.7 (0.9)	9.3 (1.1)	11.0 (1.1)	12.4 (1.1)
New Mexico	17.2 (1.7)	18.4 (1.7)	20.2 (1.8)	23.5 (1.9)	26.3 (1.9)	27.2 (1.8)
Southern Counties[4]	19.4 (2.5)	20.3 (2.6)	21.2 (2.7)	25.5 (2.9)	28.3 (2.9)	29.3 (2.9)
Rest of New Mexico	16.5 (2.1)	17.7 (2.1)	19.9 (2.2)	22.7 (2.3)	25.6 (2.3)	26.3 (2.2)
New York	9.8 (0.8)	10.6 (0.8)	11.9 (0.8)	13.9 (0.9)	15.4 (0.9)	17.0 (0.9)
City of New York Counties[5]	9.5 (1.0)	10.5 (1.0)	13.0 (1.1)	15.2 (1.3)	16.9 (1.2)	19.1 (1.3)
Rest of New York	9.9 (1.1)	10.7 (1.2)	11.1 (1.2)	12.9 (1.3)	14.4 (1.3)	15.4 (1.3)
North Carolina	15.1 (1.2)	17.5 (1.3)	19.8 (1.3)	21.8 (1.4)	23.7 (1.3)	25.2 (1.3)
North Dakota	19.2 (2.9)	20.6 (2.9)	22.7 (3.1)	27.5 (3.3)	31.8 (3.4)	32.3 (3.4)
Ohio	14.3 (1.0)	16.4 (1.1)	18.2 (1.1)	20.6 (1.2)	23.2 (1.1)	25.6 (1.1)
Cuyahoga County	9.1 (1.5)	10.6 (1.6)	12.7 (1.7)	16.6 (1.9)	19.6 (2.0)	21.4 (2.0)
Franklin County	18.7 (2.5)	20.5 (2.6)	22.5 (2.6)	25.4 (2.7)	28.2 (2.8)	30.6 (2.8)
Rest of Ohio	14.5 (1.2)	16.7 (1.3)	18.5 (1.3)	20.6 (1.4)	23.0 (1.4)	25.6 (1.4)
Oklahoma	21.3 (1.9)	23.5 (2.0)	23.9 (2.0)	25.6 (2.0)	28.6 (2.0)	30.1 (2.0)
Oregon	18.5 (1.9)	19.6 (2.0)	21.5 (2.0)	24.2 (2.2)	27.6 (2.2)	30.6 (2.2)
Pennsylvania	9.0 (0.8)	10.2 (0.9)	11.7 (0.9)	13.8 (1.0)	15.4 (1.0)	16.5 (1.0)
Allegheny County	16.6 (2.8)	18.2 (2.9)	19.8 (3.0)	22.3 (3.1)	23.6 (3.1)	25.0 (3.1)
Philadelphia County	7.9 (1.7)	10.4 (1.9)	13.0 (2.1)	14.8 (2.2)	16.5 (2.2)	18.4 (2.2)
Rest of Pennsylvania	8.2 (1.0)	9.1 (1.0)	10.5 (1.1)	12.6 (1.2)	14.2 (1.2)	15.1 (1.1)
Rhode Island	5.3 (1.3)	5.8 (1.4)	6.3 (1.4)	9.4 (1.7)	11.9 (1.9)	12.8 (1.9)
South Carolina	15.4 (1.6)	17.1 (1.6)	19.3 (1.7)	21.1 (1.8)	22.8 (1.7)	25.8 (1.7)
South Dakota	7.7 (1.7)	9.0 (1.9)	11.1 (2.1)	12.5 (2.1)	14.0 (2.3)	15.6 (2.4)
Tennessee	18.6 (1.4)	20.5 (1.5)	22.1 (1.5)	24.4 (1.5)	25.6 (1.5)	27.9 (1.5)
Davidson County	25.2 (3.4)	27.0 (3.4)	28.3 (3.4)	30.4 (3.5)	33.4 (3.4)	37.5 (3.5)
Shelby County	24.0 (3.0)	25.8 (3.1)	27.5 (3.1)	30.2 (3.0)	32.4 (3.0)	32.9 (2.9)
Rest of Tennessee	16.7 (1.7)	18.6 (1.7)	20.3 (1.8)	22.6 (1.9)	23.2 (1.8)	25.7 (1.8)
Texas	19.9 (0.9)	22.6 (0.9)	24.5 (1.0)	27.2 (1.0)	30.0 (1.0)	32.5 (1.0)
Bexar County	17.9 (2.0)	19.4 (2.1)	21.7 (2.2)	24.9 (2.3)	27.0 (2.3)	29.1 (2.2)
Dallas County	27.0 (2.2)	30.3 (2.3)	33.1 (2.3)	36.5 (2.4)	40.7 (2.4)	43.2 (2.3)
El Paso County	19.8 (2.4)	20.0 (2.4)	22.0 (2.6)	27.6 (2.9)	31.0 (2.8)	32.8 (2.7)
Harris County	20.1 (1.5)	23.7 (1.6)	27.4 (1.7)	29.4 (1.8)	31.0 (1.7)	32.4 (1.6)
Rest of Texas	19.1 (1.1)	21.9 (1.2)	23.3 (1.3)	25.8 (1.3)	28.6 (1.3)	31.3 (1.3)
Utah	16.8 (2.1)	17.7 (2.2)	18.5 (2.2)	20.0 (2.2)	21.6 (2.2)	24.4 (2.3)
Vermont	8.2 (1.9)	10.5 (2.1)	13.8 (2.4)	17.0 (2.6)	20.4 (2.8)	20.3 (2.8)
Virginia	11.7 (1.2)	14.1 (1.3)	16.7 (1.4)	19.7 (1.5)	20.6 (1.5)	21.2 (1.4)
Washington	15.3 (1.1)	16.8 (1.2)	18.1 (1.2)	20.9 (1.3)	23.6 (1.3)	26.4 (1.3)
Eastern Counties[6]	20.1 (2.4)	21.1 (2.3)	22.5 (2.3)	24.1 (2.3)	25.3 (2.4)	28.6 (2.5)
King County	21.5 (2.3)	23.3 (2.3)	24.6 (2.4)	27.4 (2.4)	29.7 (2.3)	31.8 (2.3)
Western Counties[7]	9.5 (1.8)	10.1 (1.8)	11.5 (1.9)	14.8 (2.1)	17.5 (2.2)	20.4 (2.3)
Rest of Washington	12.4 (1.9)	14.2 (2.0)	15.4 (2.1)	18.4 (2.3)	21.7 (2.4)	25.0 (2.5)
West Virginia	10.4 (1.8)	12.3 (1.9)	14.2 (2.0)	16.0 (2.2)	18.5 (2.3)	20.5 (2.3)
Wisconsin	13.4 (1.4)	14.5 (1.4)	16.4 (1.5)	19.8 (1.6)	22.5 (1.6)	25.3 (1.6)
Milwaukee County	16.2 (2.1)	18.4 (2.2)	20.2 (2.4)	23.4 (2.5)	27.3 (2.6)	30.7 (2.7)
Rest of Wisconsin	12.9 (1.5)	13.8 (1.6)	15.7 (1.7)	19.1 (1.8)	21.6 (1.8)	24.2 (1.8)
Wyoming	14.1 (2.1)	14.9 (2.2)	16.0 (2.4)	19.8 (2.5)	20.9 (2.6)	22.3 (2.6)

[1]Includes Del Norte, Siskiyou, Modoc, Lassen, Shasta, Trinity, Humboldt, Mendocino, Tehama, Plumas, Butte, Glenn, Colusa, Lake, and Sierra.
[2]Includes Denver, Adams, Arapahoe, and Douglas.
[3]Includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.
[4]Includes Chaves, Lea, Eddy, Lincoln, Socorro, Catron, Sierra, Curry, Roosevelt, De Baca, Dona Ana, Otero, Luna, Grant, and Hidalgo.
[5]Includes Queens, Kings, Richmond, New York, and Bronx.
[6]Includes Asotin, Columbia, Garfield, Whitman, Adams, Walla Walla, Stevens, Ferry, Lincoln, Chelan, Douglas, Okanogan, Benton, Franklin, Grant, Kittitas, Klickitat, and Pend Oreille.
[7]Includes Kitsap, Whatcom, Thurston, Skagit, Island, Cowlitz, Mason, Clallam, Jefferson, Grays Harbor, Lewis, Pacific, San Juan, Skamania, and Wahkiakum.

Table 2. Modeled estimates (with standard errors) of the percentage of children under age 18 years living in wireless-only households, by selected geographic areas and time period: United States, January 2007–June 2010

Geographic area	Jan–Dec 2007	Jul 2007–Jun 2008	Jan–Dec 2008	Jul 2008–Jun 2009	Jan–Dec 2009	Jul 2009–Jun 2010
	Percent (standard error)					
Alabama	13.5 (2.2)	18.3 (2.5)	22.6 (2.8)	22.4 (2.8)	24.7 (2.7)	30.9 (2.8)
Jefferson County	18.1 (4.0)	23.4 (4.3)	24.6 (4.4)	24.6 (4.5)	29.5 (4.5)	33.1 (4.3)
Rest of Alabama	12.7 (2.5)	17.5 (2.8)	22.2 (3.2)	22.1 (3.2)	23.9 (3.0)	30.5 (3.1)
Alaska	*7.2 (3.1)	*11.5 (3.8)	13.4 (3.9)	14.3 (4.2)	19.1 (4.7)	21.0 (4.9)
Arizona	19.5 (2.1)	20.2 (2.1)	21.2 (2.2)	25.1 (2.4)	30.7 (2.4)	34.8 (2.4)
Maricopa County	18.4 (2.5)	18.4 (2.5)	20.0 (2.6)	24.8 (2.8)	31.3 (2.9)	35.5 (3.1)
Rest of Arizona	21.4 (3.7)	23.4 (3.8)	23.2 (3.8)	25.6 (4.1)	29.8 (3.9)	33.6 (3.7)
Arkansas	28.2 (3.9)	32.2 (3.9)	33.3 (3.7)	37.1 (3.8)	41.6 (3.7)	46.2 (3.8)
California	7.7 (0.7)	10.1 (0.8)	12.5 (0.9)	14.8 (1.0)	16.5 (0.9)	19.7 (0.9)
Alameda County	*5.1 (1.8)	7.8 (2.2)	9.9 (2.4)	9.6 (2.5)	11.5 (2.6)	15.4 (2.8)
Fresno County	13.5 (2.7)	13.5 (2.7)	14.1 (2.8)	19.0 (3.3)	24.4 (3.6)	27.8 (3.8)
Los Angeles County	6.4 (1.1)	7.9 (1.2)	9.2 (1.3)	12.4 (1.6)	14.5 (1.5)	17.4 (1.5)
Northern Counties[1]	*7.6 (2.3)	9.4 (2.5)	9.7 (2.5)	13.1 (2.7)	19.8 (3.3)	22.9 (3.5)
San Bernardino County	9.4 (2.4)	11.2 (2.5)	13.6 (2.7)	14.9 (2.8)	18.1 (2.8)	22.5 (3.0)
San Diego County	7.0 (1.9)	7.6 (2.0)	8.7 (2.1)	10.9 (2.3)	16.1 (2.5)	18.6 (2.5)
Santa Clara County	7.6 (2.0)	10.0 (2.2)	9.1 (2.1)	10.6 (2.3)	14.8 (2.6)	17.5 (2.7)
Rest of California	8.3 (1.2)	11.9 (1.5)	15.6 (1.6)	17.7 (1.8)	17.5 (1.6)	20.7 (1.5)
Colorado	18.6 (2.5)	21.5 (2.7)	22.6 (2.7)	22.7 (2.7)	27.4 (2.6)	31.1 (2.6)
City of Denver Counties[2]	23.2 (4.7)	26.9 (4.9)	28.8 (5.0)	28.1 (5.0)	31.4 (4.8)	36.0 (4.7)
Rest of Colorado	15.2 (2.7)	17.7 (2.8)	18.1 (2.8)	18.7 (2.8)	24.5 (2.8)	27.5 (2.8)
Connecticut	*3.7 (1.3)	*4.3 (1.4)	6.3 (1.7)	7.5 (1.9)	10.1 (2.1)	12.6 (2.2)
Delaware	*6.6 (2.7)	*8.8 (3.1)	*10.9 (3.5)	13.3 (3.8)	16.8 (4.1)	20.1 (4.3)
District of Columbia	*10.5 (4.8)	*12.6 (5.1)	*15.8 (5.5)	*19.3 (6.0)	25.0 (6.4)	30.3 (7.0)
Florida	16.2 (1.5)	19.3 (1.5)	22.3 (1.6)	25.1 (1.8)	30.5 (1.7)	34.2 (1.6)
Dade County	16.1 (2.6)	19.1 (2.7)	24.1 (3.0)	25.3 (3.0)	28.9 (2.9)	35.2 (3.0)
Duval County	19.3 (3.9)	21.9 (4.2)	23.4 (4.2)	25.2 (4.3)	27.4 (4.1)	32.0 (4.0)
Orange County	18.4 (3.9)	22.8 (4.0)	27.0 (4.4)	27.6 (4.5)	33.8 (4.4)	39.5 (4.3)
Rest of Florida	15.8 (1.8)	18.8 (1.9)	21.5 (2.0)	24.8 (2.3)	30.7 (2.2)	33.7 (2.1)
Georgia	17.2 (2.1)	19.9 (2.2)	22.7 (2.2)	25.1 (2.4)	27.8 (2.3)	33.5 (2.3)
Fulton/DeKalb Counties	15.7 (3.5)	19.6 (3.7)	22.1 (4.0)	20.0 (3.8)	22.4 (3.9)	29.8 (4.0)
Rest of Georgia	17.5 (2.4)	20.0 (2.5)	22.8 (2.5)	26.1 (2.7)	28.8 (2.7)	34.2 (2.6)
Hawaii	*7.5 (2.3)	11.1 (2.6)	14.6 (3.0)	16.1 (3.3)	20.4 (3.5)	23.6 (3.4)
Idaho	23.1 (3.9)	25.1 (4.0)	26.2 (4.1)	31.8 (4.5)	33.8 (4.1)	37.3 (3.9)
Illinois	13.1 (1.8)	15.4 (1.9)	17.9 (1.9)	19.5 (2.1)	22.4 (2.0)	27.4 (2.1)
Cook County	13.5 (2.2)	16.9 (2.5)	21.6 (2.9)	22.1 (2.9)	23.9 (2.7)	29.0 (2.7)
Madison/St. Clair Counties	12.8 (3.6)	19.4 (4.3)	22.9 (4.6)	22.7 (4.7)	28.7 (4.9)	38.0 (5.3)
Rest of Illinois	13.0 (2.3)	14.7 (2.4)	16.6 (2.4)	18.5 (2.6)	21.6 (2.6)	26.3 (2.6)
Indiana	15.3 (2.0)	16.3 (2.1)	17.9 (2.2)	22.4 (2.5)	27.8 (2.5)	31.2 (2.4)
Lake County	17.5 (4.8)	23.3 (5.1)	25.6 (5.3)	26.3 (5.6)	29.7 (5.4)	35.1 (5.7)
Marion County	18.3 (3.9)	20.2 (4.1)	22.7 (4.3)	25.3 (4.4)	32.4 (4.8)	36.7 (4.7)
Rest of Indiana	14.5 (2.5)	14.9 (2.5)	16.1 (2.6)	21.4 (3.0)	26.7 (3.0)	29.7 (2.9)
Iowa	14.3 (3.0)	17.1 (3.0)	17.7 (3.1)	19.2 (3.3)	24.6 (3.3)	29.8 (3.2)
Kansas	18.2 (2.7)	22.3 (2.9)	24.8 (3.0)	26.9 (3.1)	31.1 (3.1)	34.8 (2.9)
Johnson/Wyandotte Counties	*5.4 (2.3)	*6.8 (2.8)	12.8 (3.3)	14.6 (3.5)	17.4 (3.8)	23.0 (4.1)
Rest of Kansas	22.7 (3.5)	27.0 (3.7)	29.1 (3.9)	31.3 (4.0)	35.9 (3.8)	39.0 (3.7)
Kentucky	22.4 (3.1)	24.3 (3.2)	29.1 (3.4)	29.3 (3.3)	30.9 (3.2)	34.9 (3.2)
Louisiana	17.1 (2.6)	19.0 (2.7)	22.4 (2.9)	26.7 (3.2)	31.1 (2.9)	34.4 (3.0)
Maine	*4.8 (2.0)	10.5 (2.9)	15.4 (3.6)	16.4 (3.8)	19.4 (3.7)	21.6 (3.8)
Maryland	6.0 (1.4)	6.9 (1.5)	8.6 (1.7)	11.4 (2.0)	15.0 (2.1)	18.0 (2.2)
Baltimore City	11.7 (3.3)	13.6 (3.5)	15.3 (3.7)	18.0 (3.9)	22.3 (4.2)	27.4 (4.5)
Rest of Maryland	5.3 (1.5)	6.0 (1.6)	7.8 (1.9)	10.6 (2.2)	14.1 (2.3)	16.8 (2.4)
Massachusetts	5.3 (1.3)	6.7 (1.4)	8.5 (1.5)	9.8 (1.8)	12.7 (1.9)	15.1 (2.0)
Suffolk County	15.1 (4.5)	20.1 (5.3)	21.3 (5.7)	22.0 (5.5)	25.5 (5.6)	28.1 (5.7)
Rest of Massachusetts	4.4 (1.3)	5.5 (1.4)	7.3 (1.6)	8.7 (1.8)	11.6 (2.0)	14.1 (2.1)
Michigan	15.3 (2.0)	18.0 (2.1)	22.0 (2.3)	25.4 (2.5)	30.6 (2.5)	35.6 (2.4)
Wayne County	22.9 (4.1)	27.7 (3.9)	30.2 (4.0)	32.9 (4.3)	38.6 (4.5)	42.9 (4.2)
Rest of Michigan	14.5 (2.2)	17.0 (2.3)	21.2 (2.5)	24.7 (2.7)	29.7 (2.7)	34.7 (2.6)
Minnesota	8.7 (1.6)	13.1 (1.9)	16.1 (2.0)	17.8 (2.2)	20.8 (2.3)	23.5 (2.3)
Twin Cities Counties[3]	7.2 (2.0)	12.2 (2.4)	16.3 (2.7)	17.6 (2.8)	19.5 (2.9)	21.0 (2.9)
Rest of Minnesota	10.5 (2.6)	14.2 (3.0)	15.8 (3.1)	17.9 (3.4)	22.4 (3.5)	26.5 (3.6)
Mississippi	20.9 (3.3)	26.5 (3.4)	31.2 (3.6)	32.9 (3.7)	36.0 (3.4)	41.9 (3.3)

See footnotes at end of table.

Table 2. Modeled estimates (with standard errors) of the percentage of children under age 18 years living in wireless-only households, by selected geographic areas and time period: United States, January 2007–June 2010—Con.

Geographic area	Jan–Dec 2007	Jul 2007–Jun 2008	Jan–Dec 2008	Jul 2008–Jun 2009	Jan–Dec 2009	Jul 2009–Jun 2010
	Percent (standard error)					
Missouri	8.9 (1.9)	11.3 (2.0)	16.1 (2.4)	18.7 (2.6)	22.2 (2.6)	26.5 (2.7)
St. Louis County/City	*8.1 (2.5)	10.8 (2.8)	14.4 (3.2)	16.1 (3.3)	19.2 (3.3)	22.9 (3.5)
Rest of Missouri	9.1 (2.3)	11.5 (2.5)	16.6 (2.9)	19.5 (3.2)	23.1 (3.1)	27.5 (3.3)
Montana	13.4 (3.5)	18.3 (3.9)	23.9 (4.3)	26.1 (4.5)	30.7 (4.6)	35.1 (4.5)
Nebraska	15.5 (3.4)	19.1 (3.6)	21.7 (3.7)	26.8 (4.1)	28.0 (3.8)	29.5 (3.7)
Nevada	8.6 (1.9)	11.0 (2.1)	13.5 (2.3)	17.3 (2.7)	22.9 (2.9)	26.8 (3.0)
Clark County	*6.5 (2.1)	8.1 (2.2)	10.1 (2.4)	14.0 (3.0)	20.3 (3.4)	24.9 (3.5)
Rest of Nevada	14.2 (4.2)	18.6 (4.9)	23.1 (5.3)	26.5 (5.4)	29.9 (5.5)	32.2 (5.7)
New Hampshire	*4.4 (1.9)	*7.0 (2.4)	*7.3 (2.5)	*7.7 (2.6)	11.3 (2.9)	15.0 (3.3)
New Jersey	5.0 (1.2)	6.8 (1.4)	8.1 (1.5)	8.8 (1.6)	10.3 (1.5)	12.6 (1.6)
Essex County	*2.9 (1.9)	*6.4 (2.5)	11.6 (3.4)	14.5 (3.7)	21.5 (4.4)	26.9 (4.7)
Rest of New Jersey	5.1 (1.2)	6.9 (1.4)	8.0 (1.5)	8.6 (1.6)	9.9 (1.6)	12.1 (1.7)
New Mexico	21.7 (3.0)	23.6 (3.0)	26.2 (3.1)	28.9 (3.2)	34.5 (3.1)	38.9 (3.0)
Southern Counties[4]	31.1 (5.1)	32.6 (5.2)	33.4 (5.3)	41.7 (5.8)	44.1 (5.6)	46.0 (5.6)
Rest of New Mexico	18.0 (3.6)	20.1 (3.5)	23.2 (3.7)	23.6 (3.7)	30.6 (3.7)	36.0 (3.5)
New York	6.5 (1.0)	7.2 (1.0)	8.5 (1.1)	9.9 (1.2)	12.5 (1.3)	16.6 (1.4)
City of New York Counties[5]	7.0 (1.4)	8.6 (1.5)	10.0 (1.7)	12.1 (1.9)	14.6 (1.9)	19.1 (2.1)
Rest of New York	6.1 (1.4)	6.3 (1.4)	7.3 (1.5)	8.1 (1.6)	10.9 (1.7)	14.9 (1.9)
North Carolina	16.0 (2.2)	19.7 (2.3)	22.9 (2.4)	24.5 (2.5)	26.7 (2.4)	31.4 (2.3)
North Dakota	19.4 (4.7)	20.1 (4.6)	22.7 (4.9)	31.0 (5.8)	38.8 (5.9)	39.7 (5.9)
Ohio	12.8 (1.7)	16.0 (1.9)	17.2 (2.0)	18.7 (2.1)	24.3 (2.1)	28.8 (2.1)
Cuyahoga County	*8.0 (2.4)	12.1 (2.8)	13.3 (2.8)	15.1 (2.9)	22.3 (3.3)	28.3 (3.6)
Franklin County	12.3 (2.9)	17.7 (3.3)	15.4 (3.0)	14.0 (3.0)	20.8 (3.5)	25.7 (3.7)
Rest of Ohio	13.6 (2.2)	16.3 (2.3)	18.0 (2.5)	19.8 (2.6)	25.1 (2.6)	29.3 (2.6)
Oklahoma	21.9 (3.3)	26.9 (3.5)	26.3 (3.4)	27.2 (3.5)	31.7 (3.4)	35.2 (3.5)
Oregon	19.0 (3.1)	20.3 (3.2)	22.8 (3.4)	25.1 (3.5)	29.6 (3.5)	36.1 (3.6)
Pennsylvania	8.4 (1.4)	10.3 (1.4)	10.4 (1.5)	12.4 (1.6)	15.5 (1.6)	18.2 (1.7)
Allegheny County	*14.0 (4.4)	15.0 (4.2)	15.3 (4.2)	18.1 (4.6)	21.8 (4.8)	24.4 (5.1)
Philadelphia County	*7.0 (2.5)	11.5 (3.1)	13.4 (3.3)	13.8 (3.4)	17.8 (3.7)	23.1 (4.0)
Rest of Pennsylvania	7.9 (1.6)	9.5 (1.7)	9.3 (1.7)	11.5 (1.9)	14.4 (1.9)	16.7 (1.9)
Rhode Island	*5.8 (2.1)	*7.2 (2.4)	*6.4 (2.2)	8.9 (2.6)	13.0 (2.9)	15.8 (3.1)
South Carolina	18.6 (3.0)	20.6 (3.0)	21.5 (3.0)	23.4 (3.2)	28.1 (3.2)	33.6 (3.2)
South Dakota	*6.9 (2.6)	*8.8 (2.9)	*9.6 (3.1)	*10.5 (3.2)	15.1 (4.0)	20.5 (4.8)
Tennessee	21.8 (2.4)	25.6 (2.5)	28.1 (2.6)	29.2 (2.6)	30.8 (2.4)	36.3 (2.5)
Davidson County	23.0 (5.7)	25.6 (5.4)	27.0 (5.4)	28.4 (5.5)	35.2 (5.6)	38.9 (5.5)
Shelby County	26.7 (5.1)	28.1 (5.1)	28.5 (5.0)	30.5 (4.7)	34.1 (4.6)	39.0 (4.9)
Rest of Tennessee	20.5 (2.9)	25.0 (3.1)	28.2 (3.2)	29.0 (3.3)	29.5 (3.0)	35.4 (3.1)
Texas	21.4 (1.3)	25.8 (1.5)	27.5 (1.5)	29.2 (1.6)	33.3 (1.5)	36.5 (1.5)
Bexar County	23.3 (3.5)	22.2 (3.4)	27.0 (3.6)	35.6 (4.2)	38.4 (3.9)	37.8 (3.6)
Dallas County	24.1 (3.3)	28.6 (3.6)	33.1 (3.5)	34.2 (3.5)	37.5 (3.4)	42.8 (3.2)
El Paso County	24.2 (4.1)	26.0 (4.1)	26.7 (4.1)	32.9 (4.4)	35.7 (4.0)	36.7 (3.9)
Harris County	22.0 (2.5)	26.1 (2.7)	31.5 (3.0)	33.3 (3.2)	34.3 (2.8)	38.0 (2.6)
Rest of Texas	20.6 (1.7)	25.7 (1.9)	26.3 (2.0)	27.2 (2.1)	31.9 (1.9)	35.3 (1.9)
Utah	14.4 (2.8)	15.6 (2.9)	15.3 (2.8)	16.2 (2.8)	21.4 (3.1)	25.9 (3.4)
Vermont	*3.1 (2.0)	*6.0 (2.9)	*9.9 (3.8)	*10.5 (3.6)	16.1 (4.3)	19.8 (4.8)
Virginia	8.5 (1.7)	11.2 (1.8)	13.2 (2.0)	15.9 (2.2)	19.4 (2.2)	20.1 (2.1)
Washington	11.4 (1.6)	12.9 (1.6)	14.0 (1.7)	17.1 (1.9)	22.3 (2.0)	27.0 (2.1)
Eastern Counties[6]	19.7 (3.5)	20.2 (3.4)	23.4 (3.5)	25.1 (3.3)	28.6 (3.5)	34.4 (4.0)
King County	10.1 (2.8)	11.3 (2.8)	12.4 (2.9)	16.5 (3.3)	20.2 (3.3)	22.9 (3.3)
Western Counties[7]	*9.5 (2.9)	10.1 (2.9)	11.1 (3.1)	14.1 (3.3)	19.1 (3.6)	24.4 (4.1)
Rest of Washington	10.7 (2.7)	13.2 (2.9)	13.6 (2.9)	16.6 (3.3)	23.1 (3.7)	28.4 (3.8)
West Virginia	11.2 (3.0)	14.3 (3.3)	16.5 (3.4)	18.6 (3.6)	22.2 (3.8)	26.6 (3.9)
Wisconsin	13.2 (2.3)	13.9 (2.3)	16.0 (2.4)	19.0 (2.6)	22.8 (2.6)	28.6 (2.8)
Milwaukee County	13.6 (3.3)	15.9 (3.6)	18.0 (3.8)	20.4 (3.9)	26.7 (4.2)	35.3 (4.6)
Rest of Wisconsin	13.1 (2.7)	13.4 (2.7)	15.5 (2.7)	18.6 (3.0)	22.0 (3.1)	27.1 (3.2)
Wyoming	*9.9 (3.4)	*11.6 (3.5)	13.4 (3.8)	16.8 (4.0)	20.2 (4.4)	23.2 (4.5)

* Estimate has a relative standard error greater than 30% and does not meet National Center for Health Statistics standards for reliability or precision.
[1]Includes Del Norte, Siskiyou, Modoc, Lassen, Shasta, Trinity, Humboldt, Mendocino, Tehama, Plumas, Butte, Glenn, Colusa, Lake, and Sierra.
[2]Includes Denver, Adams, Arapahoe, and Douglas.
[3]Includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.
[4]Includes Chaves, Lea, Eddy, Lincoln, Socorro, Catron, Sierra, Curry, Roosevelt, De Baca, Dona Ana, Otero, Luna, Grant, and Hidalgo.
[5]Includes Queens, Kings, Richmond, New York, and Bronx.
[6]Includes Asotin, Columbia, Garfield, Whitman, Adams, Walla Walla, Stevens, Ferry, Lincoln, Chelan, Douglas, Okanogan, Benton, Franklin, Grant, Kittitas, Klickitat, and Pend Oreille.
[7]Includes Kitsap, Whatcom, Thurston, Skagit, Island, Cowlitz, Mason, Clallam, Jefferson, Grays Harbor, Lewis, Pacific, San Juan, Skamania, and Wahkiahum.

Table 3. Modeled estimates (with standard errors) of the percent distribution of household telephone status for adults aged 18 years and over, by selected geographic areas: United States, July 2009–June 2010

Geographic area	Wireless-only	Wireless-mostly	Dual-use	Landline-mostly	Landline-only	No telephone service[1]	Total
	Percent (standard error)						
Alabama	25.3 (1.6)	18.4 (1.4)	29.8 (2.0)	15.1 (1.6)	9.5 (1.3)	1.9	100.0
Jefferson County	24.3 (2.4)	18.9 (2.2)	32.8 (3.2)	14.4 (2.3)	8.7 (1.9)	0.9	100.0
Rest of Alabama	25.4 (1.8)	18.4 (1.6)	29.3 (2.3)	15.2 (1.8)	9.7 (1.4)	2.0	100.0
Alaska	19.9 (2.9)	20.4 (2.8)	22.2 (3.7)	19.7 (3.3)	16.3 (3.3)	1.6	100.0
Arizona	29.4 (1.5)	18.7 (1.3)	25.4 (1.8)	11.9 (1.3)	11.7 (1.3)	2.9	100.0
Maricopa County	30.3 (1.9)	20.3 (1.7)	27.4 (2.3)	9.9 (1.5)	8.9 (1.4)	3.1	100.0
Rest of Arizona	28.2 (2.5)	16.1 (1.9)	22.4 (2.7)	14.9 (2.3)	15.9 (2.4)	2.5	100.0
Arkansas	35.2 (2.3)	15.7 (1.7)	20.0 (2.3)	11.4 (1.8)	15.7 (2.0)	2.1	100.0
California	18.2 (0.6)	20.8 (0.6)	33.5 (0.7)	14.8 (0.6)	11.5 (0.5)	1.3	100.0
Alameda County	17.4 (1.9)	22.5 (2.0)	34.3 (2.9)	16.3 (2.2)	8.8 (1.7)	0.7	100.0
Fresno County	21.5 (2.2)	9.0 (1.5)	29.4 (3.0)	19.0 (2.5)	19.5 (2.5)	1.7	100.0
Los Angeles County	17.0 (1.0)	20.0 (1.1)	38.1 (1.4)	10.4 (0.9)	12.8 (1.0)	1.6	100.0
Northern Counties[2]	18.1 (2.2)	14.9 (1.9)	21.8 (2.9)	23.7 (2.9)	20.3 (2.7)	1.3	100.0
San Bernardino County	18.1 (1.8)	20.4 (1.9)	36.0 (2.8)	12.2 (1.8)	10.2 (1.7)	1.1	100.0
San Diego County	18.4 (1.6)	18.8 (1.6)	34.3 (2.3)	16.9 (1.8)	10.7 (1.4)	0.9	100.0
Santa Clara County	17.7 (1.8)	24.2 (2.0)	34.5 (2.8)	13.1 (1.9)	9.8 (1.7)	0.6	100.0
Rest of California	18.8 (0.9)	22.1 (1.0)	30.9 (1.2)	16.5 (1.0)	10.4 (0.8)	1.2	100.0
Colorado	30.4 (1.6)	15.7 (1.2)	29.7 (1.9)	15.0 (1.5)	7.5 (1.1)	1.7	100.0
City of Denver Counties[3]	33.6 (2.8)	16.0 (2.1)	27.1 (3.1)	14.7 (2.4)	7.3 (1.8)	1.3	100.0
Rest of Colorado	28.4 (1.9)	15.4 (1.5)	31.3 (2.4)	15.1 (1.8)	7.7 (1.3)	2.0	100.0
Connecticut	13.6 (1.4)	14.6 (1.4)	32.5 (2.3)	21.8 (2.0)	16.7 (1.8)	0.8	100.0
Delaware	16.5 (2.5)	17.7 (2.5)	28.4 (3.8)	27.6 (3.6)	8.5 (2.3)	1.2	100.0
District of Columbia	27.7 (3.4)	16.3 (2.8)	30.0 (4.0)	12.6 (2.8)	10.7 (2.7)	2.7	100.0
Florida	27.3 (1.0)	16.5 (0.8)	29.5 (1.1)	12.5 (0.8)	12.2 (0.8)	1.8	100.0
Dade County	27.1 (1.7)	19.7 (1.5)	32.0 (2.2)	7.4 (1.2)	11.9 (1.5)	1.9	100.0
Duval County	29.3 (2.6)	15.9 (2.0)	26.8 (3.0)	13.2 (2.2)	12.4 (2.2)	2.3	100.0
Orange County	34.1 (2.7)	17.5 (2.1)	28.9 (3.1)	8.9 (1.9)	8.6 (1.9)	2.0	100.0
Rest of Florida	26.7 (1.2)	15.9 (1.0)	29.3 (1.4)	13.7 (1.1)	12.6 (1.0)	1.8	100.0
Georgia	26.5 (1.4)	19.0 (1.2)	26.4 (1.6)	13.4 (1.2)	12.4 (1.2)	2.2	100.0
Fulton/DeKalb Counties	30.3 (2.5)	21.2 (2.2)	26.4 (2.9)	12.0 (2.1)	8.0 (1.8)	2.1	100.0
Rest of Georgia	25.7 (1.6)	18.4 (1.4)	26.4 (1.9)	13.7 (1.4)	13.4 (1.4)	2.3	100.0
Hawaii	21.8 (1.9)	17.5 (1.8)	32.4 (2.7)	18.1 (2.2)	8.3 (1.5)	1.8	100.0
Idaho	31.7 (2.6)	15.1 (1.9)	24.5 (2.9)	18.0 (2.5)	9.5 (1.9)	1.2	100.0
Illinois	24.4 (1.2)	17.6 (1.0)	30.4 (1.5)	16.8 (1.2)	9.3 (0.9)	1.5	100.0
Cook County	29.7 (1.7)	18.6 (1.4)	29.1 (2.0)	13.6 (1.5)	7.0 (1.1)	2.0	100.0
Madison/St. Clair Counties	31.5 (3.1)	14.8 (2.3)	28.3 (3.6)	12.9 (2.5)	10.8 (2.5)	1.7	100.0
Rest of Illinois	22.3 (1.5)	17.4 (1.3)	30.9 (1.9)	18.0 (1.6)	10.0 (1.2)	1.4	100.0
Indiana	25.2 (1.4)	15.1 (1.1)	28.5 (1.8)	14.2 (1.3)	15.0 (1.4)	2.1	100.0
Lake County	18.7 (3.1)	16.8 (2.8)	23.3 (4.1)	19.2 (3.7)	20.7 (4.1)	1.3	100.0
Marion County	33.5 (2.9)	16.1 (2.1)	25.2 (3.2)	16.2 (2.7)	7.2 (1.9)	1.9	100.0
Rest of Indiana	24.4 (1.7)	14.7 (1.4)	29.5 (2.1)	13.4 (1.6)	15.8 (1.7)	2.2	100.0
Iowa	29.2 (2.1)	16.5 (1.7)	29.1 (2.6)	16.9 (2.1)	7.0 (1.4)	1.3	100.0
Kansas	28.7 (1.8)	12.8 (1.3)	31.4 (2.2)	17.9 (1.8)	7.8 (1.2)	1.4	100.0
Johnson/Wyandotte Counties	21.2 (2.6)	13.0 (2.0)	43.3 (3.9)	12.7 (2.5)	8.6 (2.1)	1.2	100.0
Rest of Kansas	31.1 (2.2)	12.7 (1.6)	27.6 (2.6)	19.5 (2.3)	7.6 (1.5)	1.5	100.0
Kentucky	31.5 (2.1)	13.8 (1.5)	19.0 (2.2)	20.7 (2.2)	12.8 (1.8)	2.2	100.0
Louisiana	26.8 (1.8)	16.2 (1.5)	34.4 (2.4)	9.4 (1.4)	10.7 (1.5)	2.6	100.0
Maine	22.9 (2.4)	11.4 (1.7)	19.7 (2.7)	31.9 (3.1)	13.2 (2.3)	0.9	100.0
Maryland	18.4 (1.4)	21.2 (1.4)	29.6 (1.9)	20.4 (1.7)	9.2 (1.2)	1.2	100.0
Baltimore City	23.7 (2.8)	19.8 (2.6)	30.3 (3.7)	13.5 (2.6)	9.7 (2.4)	3.0	100.0
Rest of Maryland	17.7 (1.5)	21.4 (1.6)	29.5 (2.1)	21.3 (1.9)	9.2 (1.3)	0.9	100.0
Massachusetts	16.8 (1.2)	14.7 (1.2)	34.7 (1.9)	21.6 (1.6)	11.2 (1.2)	1.0	100.0
Suffolk County	25.2 (2.8)	9.3 (1.9)	30.3 (3.6)	15.5 (2.8)	18.1 (3.0)	1.7	100.0
Rest of Massachusetts	15.8 (1.3)	15.3 (1.3)	35.2 (2.0)	22.3 (1.8)	10.4 (1.3)	0.9	100.0
Michigan	29.2 (1.3)	15.3 (1.1)	24.7 (1.5)	19.9 (1.3)	9.1 (0.9)	1.8	100.0
Wayne County	34.9 (2.4)	13.3 (1.7)	24.4 (2.6)	15.5 (2.1)	10.0 (1.8)	2.0	100.0
Rest of Michigan	28.6 (1.4)	15.5 (1.1)	24.8 (1.6)	20.3 (1.5)	9.0 (1.0)	1.7	100.0
Minnesota	25.2 (1.4)	16.1 (1.2)	32.5 (1.8)	16.4 (1.4)	8.7 (1.1)	1.0	100.0
Twin Cities Counties[4]	26.1 (1.8)	16.8 (1.5)	35.6 (2.4)	15.0 (1.8)	5.7 (1.1)	0.9	100.0
Rest of Minnesota	24.3 (2.1)	15.3 (1.7)	28.9 (2.7)	18.2 (2.3)	12.1 (1.9)	1.2	100.0
Mississippi	35.1 (2.0)	14.7 (1.4)	25.8 (2.1)	13.7 (1.7)	8.7 (1.3)	2.0	100.0

See footnotes at end of table.

Table 3. Modeled estimates (with standard errors) of the percent distribution of household telephone status for adults aged 18 years and over, by selected geographic areas: United States, July 2009–June 2010—Con.

Geographic area	Wireless-only	Wireless-mostly	Dual-use	Landline-mostly	Landline-only	No telephone service[1]	Total
	Percent (standard error)						
Missouri	22.4 (1.5)	15.5 (1.3)	30.0 (2.0)	16.4 (1.6)	13.8 (1.5)	1.9	100.0
St. Louis County/City	26.9 (2.3)	12.4 (1.7)	30.4 (2.9)	17.4 (2.4)	11.1 (2.0)	1.9	100.0
Rest of Missouri	21.1 (1.8)	16.5 (1.6)	29.9 (2.4)	16.1 (1.9)	14.6 (1.8)	1.8	100.0
Montana	19.4 (2.6)	13.7 (2.1)	16.9 (2.9)	10.6 (2.3)	37.0 (3.8)	2.3	100.0
Nebraska	30.4 (2.4)	16.9 (1.9)	24.3 (2.7)	16.1 (2.2)	11.1 (1.9)	1.3	100.0
Nevada	24.2 (1.8)	14.6 (1.4)	17.7 (1.9)	9.7 (1.4)	32.0 (2.2)	1.8	100.0
Clark County	24.1 (2.1)	10.4 (1.5)	15.3 (2.1)	8.2 (1.6)	40.2 (2.8)	1.8	100.0
Rest of Nevada	24.6 (3.2)	25.1 (3.0)	23.7 (3.8)	13.5 (2.9)	11.3 (2.9)	1.8	100.0
New Hampshire	16.0 (2.0)	13.4 (1.8)	31.0 (3.1)	27.8 (3.0)	10.6 (2.0)	1.3	100.0
New Jersey	12.8 (1.0)	21.8 (1.3)	36.0 (1.8)	18.2 (1.4)	9.6 (1.0)	1.5	100.0
Essex County	26.5 (3.0)	13.3 (2.3)	30.0 (3.7)	*2.9 (1.4)	25.6 (3.6)	1.7	100.0
Rest of New Jersey	12.4 (1.1)	22.1 (1.3)	36.2 (1.8)	18.7 (1.5)	9.1 (1.1)	1.5	100.0
New Mexico	27.2 (1.8)	11.7 (1.3)	27.8 (2.2)	10.4 (1.5)	19.1 (1.9)	4.0	100.0
Southern Counties[5]	29.3 (2.9)	9.3 (1.8)	25.6 (3.5)	10.5 (2.4)	22.6 (3.3)	2.6	100.0
Rest of New Mexico	26.3 (2.2)	12.5 (1.6)	28.6 (2.6)	10.3 (1.8)	17.7 (2.2)	4.5	100.0
New York	17.0 (0.9)	13.5 (0.8)	32.7 (1.3)	17.9 (1.1)	16.8 (1.0)	2.0	100.0
City of New York Counties[6]	19.1 (1.3)	14.7 (1.1)	31.6 (1.7)	10.1 (1.1)	21.6 (1.5)	2.9	100.0
Rest of New York	15.4 (1.3)	12.6 (1.1)	33.6 (1.9)	23.8 (1.7)	13.2 (1.4)	1.4	100.0
North Carolina	25.2 (1.3)	16.1 (1.1)	24.6 (1.5)	19.9 (1.3)	12.4 (1.1)	1.8	100.0
North Dakota	32.3 (3.4)	9.5 (2.0)	26.1 (3.8)	12.5 (2.7)	18.3 (3.4)	1.3	100.0
Ohio	25.6 (1.1)	17.2 (1.0)	25.7 (1.3)	20.2 (1.2)	9.1 (0.8)	2.1	100.0
Cuyahoga County	21.4 (2.0)	18.7 (1.8)	23.8 (2.5)	20.2 (2.3)	14.6 (2.0)	1.3	100.0
Franklin County	30.6 (2.8)	17.3 (2.2)	28.9 (3.4)	16.9 (2.7)	*3.9 (1.4)	2.4	100.0
Rest of Ohio	25.6 (1.4)	17.0 (1.2)	25.6 (1.6)	20.6 (1.4)	9.0 (1.0)	2.2	100.0
Oklahoma	30.1 (2.0)	17.0 (1.6)	30.4 (2.5)	12.5 (1.7)	8.3 (1.4)	1.8	100.0
Oregon	30.6 (2.2)	15.0 (1.7)	18.1 (2.3)	22.4 (2.4)	12.2 (1.9)	1.7	100.0
Pennsylvania	16.5 (1.0)	16.5 (1.0)	32.0 (1.4)	23.4 (1.3)	10.4 (0.9)	1.3	100.0
Allegheny County	25.0 (3.1)	14.7 (2.5)	26.2 (3.9)	20.7 (3.4)	12.3 (2.9)	1.0	100.0
Philadelphia County	18.4 (2.2)	27.1 (2.5)	25.5 (3.0)	16.3 (2.5)	9.2 (1.9)	3.5	100.0
Rest of Pennsylvania	15.1 (1.1)	15.1 (1.1)	33.7 (1.7)	24.8 (1.5)	10.3 (1.1)	1.0	100.0
Rhode Island	12.8 (1.9)	16.8 (2.0)	27.8 (3.1)	23.2 (2.8)	17.8 (2.6)	1.5	100.0
South Carolina	25.8 (1.7)	18.5 (1.5)	26.5 (2.1)	15.9 (1.7)	11.0 (1.4)	2.3	100.0
South Dakota	15.6 (2.4)	9.3 (1.8)	14.3 (2.8)	8.6 (2.2)	50.8 (4.0)	1.3	100.0
Tennessee	27.9 (1.5)	17.1 (1.2)	27.6 (1.8)	16.3 (1.5)	9.4 (1.2)	1.8	100.0
Davidson County	37.5 (3.5)	15.4 (2.4)	22.6 (3.6)	15.8 (2.9)	*7.4 (2.2)	1.3	100.0
Shelby County	32.9 (2.9)	17.7 (2.3)	27.3 (3.4)	10.8 (2.3)	9.3 (2.2)	2.1	100.0
Rest of Tennessee	25.7 (1.8)	17.2 (1.5)	28.3 (2.2)	17.3 (1.8)	9.7 (1.4)	1.8	100.0
Texas	32.5 (1.0)	20.3 (0.8)	24.0 (1.0)	12.5 (0.8)	9.0 (0.6)	1.8	100.0
Bexar County	29.1 (2.2)	17.7 (1.8)	32.9 (2.7)	7.1 (1.5)	11.5 (1.8)	1.6	100.0
Dallas County	43.2 (2.3)	17.7 (1.7)	16.9 (2.1)	10.9 (1.7)	9.4 (1.6)	1.9	100.0
El Paso County	32.8 (2.7)	14.8 (2.0)	17.5 (2.7)	8.1 (1.9)	23.3 (2.9)	3.4	100.0
Harris County	32.4 (1.6)	22.1 (1.4)	19.5 (1.5)	14.4 (1.4)	9.6 (1.1)	1.9	100.0
Rest of Texas	31.3 (1.3)	20.9 (1.1)	25.0 (1.3)	13.1 (1.0)	8.0 (0.8)	1.7	100.0
Utah	24.4 (2.3)	13.9 (1.8)	35.3 (3.2)	17.2 (2.5)	7.7 (1.7)	1.4	100.0
Vermont	20.3 (2.8)	15.2 (2.4)	21.0 (3.5)	27.8 (3.8)	13.9 (3.0)	1.8	100.0
Virginia	21.2 (1.4)	17.9 (1.3)	30.5 (1.9)	18.6 (1.6)	10.0 (1.2)	1.8	100.0
Washington	26.4 (1.3)	17.2 (1.1)	26.7 (1.6)	18.7 (1.4)	9.6 (1.0)	1.4	100.0
Eastern Counties[7]	28.6 (2.5)	19.8 (2.2)	20.7 (2.8)	15.0 (2.4)	14.3 (2.4)	1.6	100.0
King County	31.8 (2.3)	16.5 (1.8)	28.8 (2.7)	14.9 (2.1)	6.9 (1.5)	1.1	100.0
Western Counties[8]	20.4 (2.3)	15.9 (2.0)	27.2 (3.1)	22.4 (2.8)	13.1 (2.3)	1.0	100.0
Rest of Washington	25.0 (2.5)	17.7 (2.1)	26.5 (3.1)	20.6 (2.8)	8.3 (1.9)	1.8	100.0
West Virginia	20.5 (2.3)	13.4 (1.9)	22.7 (2.9)	20.4 (2.7)	20.3 (2.7)	2.7	100.0
Wisconsin	25.3 (1.6)	10.4 (1.1)	25.1 (1.9)	20.8 (1.8)	17.2 (1.6)	1.3	100.0
Milwaukee County	30.7 (2.7)	5.0 (1.2)	32.6 (3.4)	9.6 (2.0)	21.0 (2.9)	1.1	100.0
Rest of Wisconsin	24.2 (1.8)	11.5 (1.3)	23.6 (2.2)	23.0 (2.1)	16.5 (1.8)	1.3	100.0
Wyoming	22.3 (2.6)	13.1 (2.0)	22.0 (3.2)	5.9 (1.7)	35.5 (3.6)	1.2	100.0

* Estimate has a relative standard error greater than 30% and does not meet National Center for Health Statistics standards for reliability or precision.
[1]The proportion of adults living in households with no telephone service was not modeled. Other proportions were adjusted so that this estimate agreed with the 2009 American Community Survey estimate for this proportion.
[2]Includes Del Norte, Siskiyou, Modoc, Lassen, Shasta, Trinity, Humboldt, Mendocino, Tehama, Plumas, Butte, Glenn, Colusa, Lake, and Sierra.
[3]Includes Denver, Adams, Arapahoe, and Douglas.
[4]Includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.
[5]Includes Chaves, Lea, Eddy, Lincoln, Socorro, Catron, Sierra, Curry, Roosevelt, De Baca, Dona Ana, Otero, Luna, Grant, and Hidalgo.
[6]Includes Queens, Kings, Richmond, New York, and Bronx.
[7]Includes Asotin, Columbia, Garfield, Whitman, Adams, Walla Walla, Stevens, Ferry, Lincoln, Chelan, Douglas, Okanogan, Benton, Franklin, Grant, Kittitas, Klickitat, and Pend Oreille.
[8]Includes Kitsap, Whatcom, Thurston, Skagit, Island, Cowlitz, Mason, Clallam, Jefferson, Grays Harbor, Lewis, Pacific, San Juan, Skamania, and Wahkiakum.

Table 4. Modeled estimates (with standard errors) of the percent distribution of household telephone status by selected geographic areas, for children under age 18 years: United States, July 2009–June 2010

Geographic area	Wireless-only	Wireless-mostly	Dual-use	Landline-mostly	Landline-only	No telephone service[1]	Total
	Percent (standard error)						
Alabama	30.9 (2.8)	21.7 (2.4)	30.3 (3.0)	10.9 (2.1)	*4.1 (1.4)	2.2	100.0
Jefferson County	33.1 (4.3)	24.6 (3.7)	34.2 (4.8)	*4.0 (2.0)	*3.3 (2.0)	0.8	100.0
Rest of Alabama	30.5 (3.1)	21.2 (2.6)	29.7 (3.4)	12.1 (2.5)	*4.2 (1.6)	2.4	100.0
Alaska	21.0 (4.9)	23.5 (4.6)	20.4 (5.5)	19.6 (5.4)	*14.6 (5.4)	0.8	100.0
Arizona	34.8 (2.4)	22.8 (2.0)	25.8 (2.4)	6.3 (1.3)	7.5 (1.5)	2.9	100.0
Maricopa County	35.5 (3.1)	24.3 (2.7)	26.3 (3.1)	*4.2 (1.4)	6.7 (1.9)	3.1	100.0
Rest of Arizona	33.6 (3.7)	20.2 (2.9)	25.0 (3.6)	9.9 (2.5)	9.0 (2.6)	2.5	100.0
Arkansas	46.2 (3.8)	21.8 (3.0)	16.8 (3.1)	*6.3 (2.1)	*6.1 (2.2)	2.7	100.0
California	19.7 (0.9)	23.0 (0.9)	34.4 (1.1)	11.4 (0.8)	10.1 (0.7)	1.4	100.0
Alameda County	15.4 (2.8)	24.5 (3.2)	39.8 (4.2)	13.7 (3.0)	*6.1 (2.2)	0.4	100.0
Fresno County	27.8 (3.8)	13.4 (2.7)	22.0 (3.9)	15.7 (3.4)	19.4 (4.1)	1.7	100.0
Los Angeles County	17.4 (1.5)	21.0 (1.6)	38.3 (2.1)	9.4 (1.3)	12.1 (1.4)	1.8	100.0
Northern Counties[2]	22.9 (3.5)	17.5 (3.0)	24.2 (4.0)	17.8 (3.6)	16.4 (3.7)	1.3	100.0
San Bernardino County	22.5 (3.0)	23.0 (3.0)	33.5 (3.6)	11.7 (2.5)	7.9 (2.2)	1.4	100.0
San Diego County	18.6 (2.5)	18.5 (2.4)	37.4 (3.4)	15.2 (2.6)	9.5 (2.2)	0.8	100.0
Santa Clara County	17.5 (2.7)	21.3 (2.8)	44.8 (3.8)	7.5 (2.0)	7.9 (2.2)	1.0	100.0
Rest of California	20.7 (1.5)	25.9 (1.6)	31.5 (1.8)	11.4 (1.3)	9.1 (1.2)	1.5	100.0
Colorado	31.1 (2.6)	18.9 (2.0)	36.2 (2.9)	8.6 (1.6)	*3.9 (1.2)	1.4	100.0
City of Denver Counties[3]	36.0 (4.7)	21.4 (3.6)	33.6 (5.1)	*4.7 (2.3)	*3.5 (2.2)	0.9	100.0
Rest of Colorado	27.5 (2.8)	17.0 (2.3)	38.1 (3.3)	11.4 (2.2)	*4.3 (1.5)	1.8	100.0
Connecticut	12.6 (2.2)	18.1 (2.5)	38.0 (3.6)	19.5 (2.9)	11.2 (2.5)	0.5	100.0
Delaware	20.1 (4.3)	23.3 (4.0)	33.7 (5.7)	15.7 (4.4)	*5.7 (3.2)	1.4	100.0
District of Columbia	30.3 (7.0)	22.8 (6.4)	35.2 (8.1)	*6.5 (4.0)	*3.0 (3.2)	2.1	100.0
Florida	34.2 (1.6)	21.6 (1.4)	29.7 (1.7)	5.4 (0.9)	6.9 (1.0)	2.2	100.0
Dade County	35.2 (3.0)	21.7 (2.5)	32.1 (3.2)	*3.3 (1.2)	*5.3 (1.6)	2.4	100.0
Duval County	32.0 (4.0)	19.5 (3.2)	27.9 (4.3)	*6.5 (2.4)	12.2 (3.4)	1.8	100.0
Orange County	39.5 (4.3)	21.2 (3.3)	30.4 (4.5)	*4.5 (2.0)	*2.9 (1.8)	1.6	100.0
Rest of Florida	33.7 (2.1)	21.8 (1.8)	29.3 (2.1)	5.8 (1.1)	7.1 (1.2)	2.2	100.0
Georgia	33.5 (2.3)	21.8 (1.9)	24.2 (2.2)	9.3 (1.6)	9.0 (1.6)	2.2	100.0
Fulton/DeKalb Counties	29.8 (4.0)	24.5 (3.5)	33.7 (4.6)	*3.2 (1.7)	*6.5 (2.7)	2.3	100.0
Rest of Georgia	34.2 (2.6)	21.2 (2.2)	22.3 (2.5)	10.5 (1.8)	9.5 (1.8)	2.2	100.0
Hawaii	23.6 (3.4)	28.0 (3.6)	35.8 (4.3)	*7.8 (2.4)	*2.6 (1.6)	2.2	100.0
Idaho	37.3 (3.9)	19.7 (3.0)	27.0 (3.9)	12.0 (2.9)	*2.9 (1.6)	1.2	100.0
Illinois	27.4 (2.1)	21.0 (1.9)	32.8 (2.3)	12.0 (1.7)	5.3 (1.2)	1.5	100.0
Cook County	29.0 (2.7)	19.0 (2.3)	33.5 (3.0)	9.1 (1.9)	6.9 (1.7)	2.5	100.0
Madison/St. Clair Counties	38.0 (5.3)	16.1 (3.5)	34.4 (5.7)	*8.1 (3.3)	*1.9 (1.8)	1.4	100.0
Rest of Illinois	26.3 (2.6)	21.9 (2.4)	32.5 (3.0)	13.1 (2.2)	5.0 (1.5)	1.2	100.0
Indiana	31.2 (2.4)	17.9 (1.9)	30.4 (2.7)	8.9 (1.6)	8.9 (1.8)	2.7	100.0
Lake County	35.1 (5.7)	21.3 (4.3)	25.1 (5.8)	*12.3 (4.4)	*5.3 (3.4)	0.8	100.0
Marion County	36.7 (4.7)	18.2 (3.4)	26.0 (4.8)	14.8 (3.9)	*3.5 (2.2)	0.7	100.0
Rest of Indiana	29.7 (2.9)	17.4 (2.3)	31.7 (3.2)	7.5 (1.9)	10.3 (2.3)	3.3	100.0
Iowa	29.8 (3.2)	19.4 (2.7)	37.5 (3.7)	8.4 (2.2)	*3.8 (1.6)	1.1	100.0
Kansas	34.8 (2.9)	14.2 (2.0)	36.2 (3.2)	10.4 (2.1)	*3.3 (1.3)	1.1	100.0
Johnson/Wyandotte Counties	23.0 (4.1)	14.4 (3.2)	53.9 (5.9)	*4.5 (2.3)	*3.5 (2.3)	0.7	100.0
Rest of Kansas	39.0 (3.7)	14.1 (2.5)	30.0 (3.8)	12.4 (2.7)	*3.2 (1.6)	1.3	100.0
Kentucky	34.9 (3.2)	19.7 (2.5)	18.0 (2.8)	17.2 (2.8)	7.2 (2.0)	2.9	100.0
Louisiana	34.4 (3.0)	19.7 (2.5)	32.6 (3.3)	5.7 (1.7)	*4.7 (1.6)	2.9	100.0
Maine	21.6 (3.8)	17.1 (3.2)	28.7 (4.7)	22.1 (4.4)	*9.8 (3.4)	0.6	100.0
Maryland	18.0 (2.2)	25.2 (2.4)	35.8 (3.1)	16.6 (2.4)	*3.3 (1.2)	1.1	100.0
Baltimore City	27.4 (4.5)	21.7 (4.0)	31.4 (5.3)	*9.2 (3.3)	*7.4 (3.4)	3.0	100.0
Rest of Maryland	16.8 (2.4)	25.6 (2.7)	36.3 (3.3)	17.5 (2.7)	*2.9 (1.2)	0.9	100.0
Massachusetts	15.1 (2.0)	18.2 (2.1)	43.7 (3.0)	14.9 (2.2)	7.4 (1.7)	0.7	100.0
Suffolk County	28.1 (5.7)	*12.5 (4.3)	35.7 (7.2)	*10.6 (4.6)	*12.6 (5.5)	0.5	100.0
Rest of Massachusetts	14.1 (2.1)	18.7 (2.2)	44.3 (3.2)	15.3 (2.4)	7.0 (1.7)	0.7	100.0
Michigan	35.6 (2.4)	19.2 (1.9)	25.2 (2.4)	13.2 (1.9)	5.2 (1.2)	1.7	100.0
Wayne County	42.9 (4.2)	15.5 (2.9)	22.1 (3.9)	*8.2 (2.5)	*9.4 (3.0)	2.0	100.0
Rest of Michigan	34.7 (2.6)	19.6 (2.1)	25.5 (2.6)	13.8 (2.1)	4.7 (1.3)	1.7	100.0
Minnesota	23.5 (2.3)	19.0 (2.0)	37.8 (2.9)	14.8 (2.1)	*4.1 (1.3)	0.8	100.0
Twin Cities Counties[4]	21.0 (2.9)	17.1 (2.5)	40.1 (3.8)	16.9 (3.0)	*4.4 (1.7)	0.5	100.0
Rest of Minnesota	26.5 (3.6)	21.4 (3.1)	34.9 (4.3)	12.3 (3.0)	*3.8 (1.9)	1.2	100.0
Mississippi	41.9 (3.3)	19.2 (2.5)	24.1 (3.1)	9.2 (2.1)	*2.6 (1.2)	3.0	100.0

See footnotes at end of table.

Table 4. Modeled estimates (with standard errors) of the percent distribution of household telephone status by selected geographic areas, for children under age 18 years: United States, July 2009–June 2010—Con.

Geographic area	Wireless-only	Wireless-mostly	Dual-use	Landline-mostly	Landline-only	No telephone service[1]	Total
	Percent (standard error)						
Missouri	26.5 (2.7)	18.8 (2.3)	29.9 (3.0)	13.1 (2.2)	9.3 (2.1)	2.3	100.0
St. Louis County/City	22.9 (3.5)	17.3 (3.0)	36.0 (4.5)	16.5 (3.5)	*4.8 (2.2)	2.4	100.0
Rest of Missouri	27.5 (3.3)	19.3 (2.7)	28.2 (3.6)	12.2 (2.7)	10.6 (2.7)	2.3	100.0
Montana	35.1 (4.5)	18.1 (3.3)	11.4 (3.3)	*5.5 (2.4)	27.0 (5.2)	3.0	100.0
Nebraska	29.5 (3.7)	17.1 (2.8)	35.8 (4.3)	8.7 (2.5)	*7.8 (2.6)	1.1	100.0
Nevada	26.8 (3.0)	17.6 (2.3)	17.6 (2.8)	6.8 (1.9)	29.3 (3.7)	1.9	100.0
Clark County	24.9 (3.5)	13.8 (2.6)	14.3 (3.1)	*7.4 (2.3)	38.0 (4.8)	1.7	100.0
Rest of Nevada	32.2 (5.7)	28.1 (4.7)	26.7 (6.1)	*5.2 (3.0)	*5.5 (3.6)	2.4	100.0
New Hampshire	15.0 (3.3)	15.3 (3.0)	41.1 (5.0)	24.7 (4.5)	*2.3 (1.7)	1.5	100.0
New Jersey	12.6 (1.6)	25.4 (2.1)	42.7 (2.6)	12.2 (1.8)	5.6 (1.2)	1.5	100.0
Essex County	26.9 (4.7)	15.3 (3.7)	34.3 (5.5)	*0.0 (0.1)	22.2 (5.4)	1.3	100.0
Rest of New Jersey	12.1 (1.7)	25.8 (2.2)	43.0 (2.7)	12.7 (1.8)	5.0 (1.2)	1.5	100.0
New Mexico	38.9 (3.0)	18.6 (2.2)	24.2 (2.8)	5.5 (1.6)	8.9 (2.1)	4.0	100.0
Southern Counties[5]	46.0 (5.6)	20.3 (4.0)	15.6 (4.4)	*3.6 (2.3)	*11.3 (4.4)	3.2	100.0
Rest of New Mexico	36.0 (3.5)	17.8 (2.7)	27.7 (3.5)	*6.3 (2.0)	7.9 (2.3)	4.4	100.0
New York	16.6 (1.4)	15.4 (1.3)	40.9 (2.0)	14.4 (1.5)	10.7 (1.3)	1.9	100.0
City of New York Counties[6]	19.1 (2.1)	15.9 (1.9)	38.3 (2.8)	9.1 (1.7)	14.9 (2.1)	2.7	100.0
Rest of New York	14.9 (1.9)	15.0 (1.8)	42.9 (2.8)	18.4 (2.2)	7.5 (1.6)	1.4	100.0
North Carolina	31.4 (2.3)	21.2 (2.0)	26.6 (2.4)	12.0 (1.8)	6.8 (1.4)	2.0	100.0
North Dakota	39.7 (5.9)	12.4 (3.5)	37.0 (6.7)	*7.0 (3.4)	*3.4 (2.8)	0.6	100.0
Ohio	28.8 (2.1)	19.3 (1.8)	28.5 (2.3)	15.5 (1.8)	5.2 (1.2)	2.7	100.0
Cuyahoga County	28.3 (3.6)	22.2 (3.1)	21.4 (3.6)	22.2 (3.7)	5.3 (2.1)	0.6	100.0
Franklin County	25.7 (3.7)	19.4 (3.1)	38.1 (4.6)	13.4 (3.3)	*1.3 (1.2)	2.0	100.0
Rest of Ohio	29.3 (2.6)	18.9 (2.1)	28.2 (2.7)	14.8 (2.2)	5.7 (1.5)	3.1	100.0
Oklahoma	35.2 (3.5)	19.9 (2.8)	30.4 (3.7)	*6.1 (1.9)	*7.1 (2.3)	1.3	100.0
Oregon	36.1 (3.6)	16.1 (2.6)	23.1 (3.4)	16.6 (3.1)	*7.0 (2.2)	1.1	100.0
Pennsylvania	18.2 (1.7)	21.5 (1.7)	36.4 (2.2)	16.5 (1.8)	5.7 (1.1)	1.7	100.0
Allegheny County	24.4 (5.1)	22.5 (4.5)	34.0 (6.5)	*16.7 (5.1)	*1.4 (1.8)	1.0	100.0
Philadelphia County	23.1 (4.0)	32.1 (4.1)	20.6 (4.2)	16.2 (3.9)	*5.6 (2.6)	2.5	100.0
Rest of Pennsylvania	16.7 (1.9)	19.6 (2.0)	39.4 (2.6)	16.6 (2.1)	6.2 (1.4)	1.6	100.0
Rhode Island	15.8 (3.1)	20.1 (3.2)	30.6 (4.4)	18.3 (3.7)	13.9 (3.6)	1.3	100.0
South Carolina	33.6 (3.2)	24.3 (2.8)	21.8 (3.0)	9.4 (2.2)	7.9 (2.1)	3.0	100.0
South Dakota	20.5 (4.8)	14.2 (3.6)	20.8 (5.6)	*4.5 (2.8)	39.1 (8.0)	0.9	100.0
Tennessee	36.3 (2.5)	21.0 (2.0)	27.1 (2.5)	9.7 (1.7)	*4.0 (1.2)	1.9	100.0
Davidson County	38.9 (5.5)	25.4 (4.3)	29.8 (5.6)	*3.4 (2.2)	*1.6 (1.7)	0.9	100.0
Shelby County	39.0 (4.9)	23.1 (3.9)	27.6 (5.0)	*5.1 (2.5)	*3.5 (2.3)	1.6	100.0
Rest of Tennessee	35.4 (3.1)	20.0 (2.5)	26.6 (3.1)	11.6 (2.3)	*4.4 (1.5)	2.1	100.0
Texas	36.5 (1.5)	22.9 (1.3)	24.0 (1.4)	8.0 (0.9)	6.7 (0.8)	1.9	100.0
Bexar County	37.8 (3.6)	21.2 (2.8)	30.8 (3.7)	*3.9 (1.6)	*5.1 (1.9)	1.1	100.0
Dallas County	42.8 (3.2)	18.8 (2.5)	19.0 (2.8)	8.3 (2.0)	8.5 (2.1)	2.6	100.0
El Paso County	36.7 (3.9)	16.4 (2.9)	18.2 (3.4)	*5.4 (2.1)	18.8 (3.7)	4.4	100.0
Harris County	38.0 (2.6)	22.8 (2.2)	17.7 (2.1)	8.8 (1.6)	10.6 (1.8)	2.2	100.0
Rest of Texas	35.3 (1.9)	24.0 (1.7)	25.0 (1.8)	8.4 (1.2)	5.6 (1.0)	1.8	100.0
Utah	25.9 (3.4)	17.6 (2.8)	39.9 (4.3)	10.5 (2.7)	*5.2 (2.1)	0.8	100.0
Vermont	19.8 (4.8)	17.5 (4.0)	19.2 (5.2)	32.7 (6.4)	*9.9 (4.3)	1.0	100.0
Virginia	20.1 (2.1)	20.6 (2.0)	38.8 (2.7)	14.5 (2.0)	3.8 (1.1)	2.1	100.0
Washington	27.0 (2.1)	20.6 (1.8)	30.8 (2.4)	12.7 (1.7)	7.7 (1.5)	1.3	100.0
Eastern Counties[7]	34.4 (4.0)	23.3 (3.3)	14.5 (3.2)	11.0 (2.9)	15.3 (3.6)	1.4	100.0
King County	22.9 (3.3)	18.1 (2.8)	40.4 (4.2)	12.6 (2.8)	*5.2 (2.0)	0.8	100.0
Western Counties[8]	24.4 (4.1)	21.8 (3.6)	28.0 (4.8)	17.2 (4.1)	*7.3 (3.0)	1.3	100.0
Rest of Washington	28.4 (3.8)	20.7 (3.2)	31.0 (4.4)	11.1 (3.0)	*7.2 (2.7)	1.6	100.0
West Virginia	26.6 (3.9)	17.4 (3.1)	26.9 (4.4)	15.5 (3.7)	*10.8 (3.5)	2.7	100.0
Wisconsin	28.6 (2.8)	15.4 (2.1)	31.7 (3.1)	15.1 (2.5)	8.0 (1.9)	1.3	100.0
Milwaukee County	35.3 (4.6)	9.4 (2.6)	31.6 (4.9)	*10.1 (3.2)	*12.2 (3.7)	1.3	100.0
Rest of Wisconsin	27.1 (3.2)	16.7 (2.6)	31.7 (3.7)	16.2 (2.9)	*7.0 (2.1)	1.3	100.0
Wyoming	23.2 (4.5)	19.6 (3.8)	27.5 (5.4)	*6.2 (2.9)	22.8 (5.7)	0.7	100.0

0.0 Quantity more than zero but less than 0.05.
* Estimate has a relative standard error greater than 30% and does not meet National Center for Health Statistics standards for reliability or precision.
[1]The proportion of children living in households with no telephone service was not modeled. Other proportions were adjusted so that this estimate agreed with the 2009 American Community Survey estimate for this proportion.
[2]Includes Del Norte, Siskiyou, Modoc, Lassen, Shasta, Trinity, Humboldt, Mendocino, Tehama, Plumas, Butte, Glenn, Colusa, Lake, and Sierra.
[3]Includes Denver, Adams, Arapahoe, and Douglas.
[4]Includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.
[5]Includes Chaves, Lea, Eddy, Lincoln, Socorro, Catron, Sierra, Curry, Roosevelt, De Baca, Dona Ana, Otero, Luna, Grant, and Hidalgo.
[6]Includes Queens, Kings, Richmond, New York, and Bronx.
[7]Includes Asotin, Columbia, Garfield, Whitman, Adams, Walla Walla, Stevens, Ferry, Lincoln, Chelan, Douglas, Okanogan, Benton, Franklin, Grant, Kittitas, Klickitat, and Pend Oreille.
[8]Includes Kitsap, Whatcom, Thurston, Skagit, Island, Cowlitz, Mason, Clallam, Jefferson, Grays Harbor, Lewis, Pacific, San Juan, Skamania, and Wahkiakum.

Technical Notes

Survey data sources

The estimates presented in this report are based on National Health Interview Survey (NHIS) data collected from January 2007 through June 2010 and on American Community Survey (ACS) data collected from 2006 through 2009. NHIS is a multipurpose health survey conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS). ACS is a multipurpose survey conducted by the U.S. Census Bureau to produce estimates of demographic, social, economic, and housing characteristics.

NHIS is an annual multistage probability household survey of a large sample of households drawn from the civilian noninstitutionalized household population of the United States. This face-to-face survey interview is administered by trained field representatives from the U.S. Census Bureau. NHIS interviews are conducted continuously throughout the year to collect information on health status, health-related behaviors, and health care utilization. The survey also includes information about household telephones and whether anyone in the household has a wireless telephone.

The sample for NHIS is stratified by state, which allows use of NHIS data in statistical models that produce state-level estimates. However, for most states, the limited number of sampling strata and small sample sizes preclude reliable direct state-level estimates. Household telephone status information was obtained for 75,408 persons in 2007, for 74,014 persons in 2008, for 88,374 persons in 2009, and for 46,014 persons in January–June 2010. Fewer than 0.5% of persons with completed NHIS family-level interviews had missing data for household telephone status.

NHIS was used to derive the direct estimates for each telephone service use category by age group (adult or child), small area, and 6-month period. These estimates were the dependent variables in each statistical model. Also, NHIS was the source for the national estimates used for raking the model-based estimates for each telephone service use category by age group and year.

ACS is a multistage probability survey that provides data on households and group quarters. Here we use a subset of the full ACS sample—the civilian noninstitutionalized population—to represent a population similar to that sampled for NHIS. Data are collected continuously through a combination of mailed, telephone, and face-to-face interviews. ACS is both nationally and state-level representative and has included approximately 2 million housing units per year since 2006.

ACS data are released for calendar years rather than for 6-month periods. Moreover, 2010 ACS data will not be released until Fall 2011. Therefore, ACS data for 2006 were used in models for both 6-month periods of 2007 (i.e., January–June 2007 and July–December 2007). Similarly, ACS data for 2007 were used in models for both 6-month periods of 2008; ACS data for 2008 were used in models for both 6-month periods of 2009; and ACS data for 2009 were used in models for the 6-month period January–June 2010. Moreover, the 2008 and 2009 ACS were the sources for the proportion of adults or children living in households with any telephone service (landline or wireless). These ACS estimates were used as benchmarking totals when raking the model-based estimates.

NHIS and ACS sampling weights adjust for the probability of selection of each household, and they are adjusted for nonresponse. The results in this report are based on weighted estimates. *R* software (http://www.r-project.org) was used to derive the model-based estimates and standard errors. Design effects were included in the models to account for the complex survey designs.

Auxiliary data sources

The two-sample estimation model used in our previous report (6) incorporated auxiliary data on the number of wireless telephone subscriptions per state. These data were obtained from the Federal Communications Commission's Automated Reporting Management Information System database. The major wireless telecommunications companies are no longer required to update this database with data for every state, and relevant data from 2006 and 2007 did not prove to be a significant covariate in any of the models.

Instead, the numbers of listed telephone lines for 2007–2010 were obtained from a consumer database compiled by infoUSA.com, Inc. This database is updated bimonthly with information from 37 sources, including postal delivery sequence files, National Change of Address lists, utility company records, and more than 4,000 White Pages directories. These data were available for each calendar year rather than each 6-month period. Therefore, annual data on listed telephone lines were used in models for both 6-month periods of that calendar year. We divided the count of listed telephone lines by the number of civilian noninstitutionalized persons.

Definitions

For each family contacted by NHIS, one adult family member is asked whether "you or anyone in your family has a working cellular telephone." A family can be an individual or a group of two or more related persons living together in the same housing unit (a "household"). Thus, a family can consist of only one person, and more than one family can live in a household (including, for example, a household where there are multiple single-person families, as when unrelated roommates are living together).

To produce the statistics for this report, families are identified as "wireless families" if anyone in the family had a working cellular telephone at the time of interview. This person (or persons) could be a civilian adult, a member of the military, or a child. Households are identified as "wireless-only" if they include at least one wireless family and if there are no working landline telephones inside the

household. To determine whether there was a working landline telephone inside the household, survey respondents were asked if there was "at least one phone inside your home that is currently working and is not a cell phone."

Household telephone status (rather than family telephone status) is used because most telephone surveys draw samples of households rather than families. Adults and children are identified as wireless-only if they live in a wireless-only household. Individual ownership or use of wireless telephones is not determined. A similar approach is used to identify adults and children living in landline-only households and in households with both landline and wireless telephones.

NHIS includes an additional question for persons living in families with both landline and wireless telephones. The respondent for the family is asked to consider all of the telephone calls his or her family receives and to report whether "all or almost all calls are received on cell phones, some are received on cell phones and some on regular phones, or very few or none are received on cell phones." This question permits the identification of persons living in "wireless-mostly" households (defined as households with both landline and cellular telephones in which all families receive all or almost all calls on cell phones) and "landline-mostly" households (defined as households with both landline and cellular telephones in which all families receive all or almost all calls on landline telephones). "Dual-use" households are those with both landline and cellular telephones that are neither wireless-mostly or landline-mostly. That is, they receive some calls on cell phones and some on landline telephones.

Small-area model

This section describes in detail the small-area model and the derivation of the model-based estimates and standard errors for the proportion of adults living in households that were wireless-only (WO), wireless-mostly (WM), dual-use (DU), landline-mostly (LM), and landline-only (LO). Derivation of the estimates and standard errors for the proportion of children living in households that are WO, WM, DU, LM, and LO is similar to the derivation given below and is not repeated here.

NHIS was used to obtain direct estimates of adults living in households that were WO, WM, DU, LO, and LM for the following 6-month periods: January–June 2007, July–December 2007, January–June 2008, July–December 2008, January–June 2009, July–December 2009, and January–June 2010. Direct estimates were derived for 93 small areas that form a mutually exclusive and exhaustive partition of the United States. Twenty-six of these small areas were states; others were selected counties, groups of counties, or the balance of the state population excluding the selected counties. No areas crossed state lines, and every location in the United States was part of one (and only one) of the 93 areas. See Tables I and II for a list of the small areas and the direct estimates of adults living in households that were WO or LO.

Typically when modeling proportions, the direct estimates are transformed using an arcsine transformation (9,13). The arcsine transformation preserves the bounds of 0 and 1 for proportions. In equation form, the transformed direct estimate for WO is

$$y_{it}^{WO} = 2\sin^{-1}\sqrt{z_{it}^{WO}},$$

where z_{it}^{WO} is the direct estimate for the proportion of adults living in households that are WO, i denotes the small areas ($i = 1,...,93$), and t denotes the 6-month periods ($t = 1,...,7$).

The small-area model is a cross-sectional and time-series model (9,10). The transformed direct estimate for small area i and 6-month period t is given by

$$y_{it}^{WO} = \mu_t + x_{it}'\beta + v_i + u_{it} + e_{it}, \quad (1)$$

where μ_t is the intercept term for 6-month period t; x_{it} is a vector of covariates for small area i and 6-month period t; and β is a vector that has the same number of entries as the number of covariates in the vector x_{it}. The v_i values are random effects that capture the small-area-specific effect not captured by the regression component ($\mu_t + x_{it}'\beta$); u_{it} is a small-area-by-time random effect; and e_{it} is the sampling error associated with the transformed direct estimate. Standard distributional assumptions of normality with mean zero and unknown variance were assumed for the small-area-specific random effects, and the small-area-by-time effects were assumed to follow a first-order autoregressive model. The regression parameters (coefficients β) are assumed to be time-invariant, and it is only the intercept term and the random effects that capture the variation in the small-area parameters over time. The sampling errors were assumed to be normally distributed with mean zero and with sampling variance estimated using a Taylor series method.

The set of possible covariates were the demographic estimates from ACS and the number of listed telephone lines per capita. The demographic estimates were calculated from ACS for each of the 93 small areas. The dependent variables were calculated at the person level for each small area (e.g., proportion of adults in WO households), and demographic estimates were calculated at the person level for each small area (e.g., proportion of persons living in one-person households). Area definitions from ACS and NHIS matched precisely for all but five areas: Suffolk County (Boston, Massachusetts), Essex County (Newark, New Jersey), Wayne County (Detroit, Michigan), Cook County (Chicago, Illinois), and Harris County (Houston, Texas). Minor differences in these definitions were not expected to bias the model-based estimates. All the covariates were standardized (by subtracting the mean and then dividing by the standard deviation) prior to fitting the models.

Among the set of possible covariates, the best set of covariates was selected using an Akaike information criterion (AIC). In particular, AIC was used to select the best set of covariates for a person-level (i.e., total population) model, and then these selected covariates were used for the adult and

Table I. Direct estimates (with standard errors) of the percentage of adults aged 18 years and over living in wireless-only households, by selected geographic areas and time period: United States, January 2007–June 2010

Geographic area	Jan–Jun 2007	Jul–Dec 2007	Jan–Jun 2008	Jul–Dec 2008	Jan–Jun 2009	Jul–Dec 2009	Jan–Jun 2010
	Percent (standard error)						
Alabama							
Jefferson County	7.2 (3.7)	23.7 (4.7)	12.5 (4.2)	15.3 (6.8)	9.6 (1.9)	33.7 (3.0)	21.6 (6.9)
Rest of Alabama	10.9 (5.1)	12.8 (3.8)	13.0 (3.4)	23.3 (2.9)	18.7 (5.4)	25.1 (4.0)	27.0 (7.0)
Alaska	2.3 (3.2)	21.2 (5.2)	14.8 (10.3)	12.3 (6.5)	14.5 (14.7)	15.7 (2.8)	16.8 (10.6)
Arizona							
Maricopa County	15.6 (3.7)	16.2 (3.2)	16.1 (3.8)	23.1 (5.9)	22.7 (4.9)	37.6 (7.9)	30.6 (1.7)
Rest of Arizona	17.9 (3.9)	22.1 (3.3)	22.3 (8.8)	22.3 (2.8)	33.0 (9.4)	25.1 (4.6)	24.0 (11.7)
Arkansas	17.1 (4.6)	25.1 (6.5)	18.6 (4.4)	26.8 (7.8)	44.4 (1.9)	28.4 (3.5)	38.6 (5.5)
California							
Alameda County	8.8 (3.4)	6.2 (1.4)	17.1 (3.7)	11.9 (7.9)	13.7 (4.2)	12.3 (2.1)	20.4 (3.7)
Fresno County	17.2 (5.7)	19.7 (2.3)	20.4 (7.7)	14.7 (2.6)	13.9 (2.7)	14.7 (4.0)	13.8 (1.0)
Los Angeles County	4.5 (0.9)	8.1 (1.1)	7.8 (1.6)	13.0 (2.7)	16.9 (1.6)	17.1 (1.4)	17.6 (0.9)
Northern Counties[1]	4.0 (2.0)	2.6 (2.8)	14.5 (3.3)	0.8 (0.6)	16.7 (2.9)	14.8 (8.6)	25.9 (9.3)
San Bernardino County	4.7 (2.2)	4.4 (2.0)	19.2 (10.1)	22.6 (2.4)	11.8 (4.0)	15.6 (3.5)	15.5 (1.3)
San Diego County	5.5 (2.5)	6.6 (2.3)	7.3 (2.5)	11.4 (1.9)	11.6 (4.3)	21.3 (5.6)	17.8 (3.0)
Santa Clara County	7.5 (2.2)	7.2 (3.8)	9.8 (3.5)	5.7 (2.7)	13.2 (3.1)	19.9 (4.5)	20.5 (3.7)
Rest of California	8.3 (1.2)	10.9 (1.1)	11.9 (1.3)	17.3 (2.3)	16.1 (2.0)	15.6 (1.3)	22.4 (1.5)
Colorado							
City of Denver Counties[2]	27.9 (8.0)	40.2 (3.9)	36.8 (8.2)	24.1 (10.0)	38.9 (3.7)	22.8 (3.1)	40.9 (6.8)
Rest of Colorado	12.4 (0.7)	17.9 (5.3)	20.0 (1.7)	27.5 (9.5)	24.7 (1.5)	32.8 (4.4)	24.9 (2.5)
Connecticut	7.8 (2.9)	2.7 (1.3)	11.4 (5.1)	5.5 (2.2)	10.3 (3.4)	12.8 (2.8)	15.1 (2.8)
Delaware	2.3 (2.2)	7.3 (3.0)	0.6 (0.7)	26.6 (21.5)	10.0 (0.1)	18.0 (9.1)	12.5 (3.3)
District of Columbia	30.4 (3.6)	17.9 (9.9)	11.5 (5.6)	–	13.8 (5.3)	13.0 (3.4)	36.0 (7.5)
Florida							
Dade County	13.7 (2.8)	8.7 (1.2)	26.0 (5.6)	21.8 (5.4)	30.4 (3.0)	22.3 (0.5)	32.0 (6.0)
Duval County	13.7 (2.9)	42.6 (16.8)	18.3 (6.5)	21.1 (1.4)	29.9 (1.5)	33.9 (8.6)	22.3 (1.6)
Orange County	19.9 (8.9)	19.2 (4.5)	27.9 (5.4)	25.9 (10.6)	25.0 (5.2)	39.1 (6.0)	31.8 (0.9)
Rest of Florida	12.6 (2.2)	16.9 (2.2)	17.6 (2.3)	23.0 (2.5)	21.9 (4.0)	25.8 (2.0)	27.9 (3.3)
Georgia							
Fulton/DeKalb Counties	16.8 (2.4)	8.8 (1.6)	24.8 (2.5)	27.6 (6.7)	18.4 (6.4)	23.3 (1.4)	41.7 (3.3)
Rest of Georgia	10.8 (2.5)	17.7 (2.8)	13.1 (2.1)	23.4 (3.4)	16.8 (2.9)	26.0 (2.3)	26.3 (2.7)
Hawaii	12.6 (8.2)	4.6 (4.7)	10.8 (2.5)	9.0 (0.6)	19.4 (5.5)	29.2 (4.6)	25.9 (4.3)
Idaho	26.4 (4.2)	15.4 (7.5)	22.9 (5.9)	15.9 (7.2)	48.1 (4.5)	27.3 (8.6)	34.6 (5.9)
Illinois							
Cook County	14.8 (3.2)	15.6 (1.6)	16.5 (2.5)	33.7 (7.6)	27.4 (6.0)	30.0 (4.2)	28.2 (3.0)
Madison/St. Clair Counties	6.6 (8.6)	19.1 (0.9)	28.8 (10.0)	30.9 (7.0)	1.5 (2.0)	27.5 (0.8)	45.0 (6.9)
Rest of Illinois	14.2 (3.1)	17.4 (3.7)	13.8 (3.0)	21.0 (3.5)	15.2 (4.0)	21.8 (2.1)	20.9 (2.5)
Indiana							
Lake County	2.7 (2.6)	26.2 (3.8)	18.2 (11.9)	–	–	9.7 (3.3)	25.4 (10.8)
Marion County	20.6 (3.7)	18.1 (8.9)	18.2 (1.9)	26.9 (13.2)	30.1 (9.9)	44.8 (5.3)	23.2 (5.0)
Rest of Indiana	14.5 (1.9)	10.5 (4.5)	11.2 (3.3)	14.9 (2.0)	26.6 (6.6)	23.7 (2.6)	26.8 (4.4)
Iowa	24.1 (6.9)	18.3 (5.5)	28.9 (7.5)	27.5 (8.8)	19.6 (5.9)	25.3 (5.7)	30.1 (5.0)
Kansas							
Johnson/Wyandotte Counties	3.4 (2.1)	0.6 (0.8)	5.6 (3.0)	15.3 (3.5)	14.5 (3.9)	16.0 (2.3)	38.2 (7.1)
Rest of Kansas	17.8 (3.3)	20.3 (2.3)	32.8 (4.4)	19.2 (10.1)	30.2 (5.3)	30.9 (5.5)	31.7 (9.8)
Kentucky	21.7 (5.0)	23.7 (6.0)	23.8 (5.8)	28.3 (4.4)	27.4 (5.8)	34.4 (4.1)	29.4 (6.2)
Louisiana	14.0 (3.9)	12.7 (4.3)	17.5 (2.7)	13.7 (2.2)	22.7 (2.4)	26.7 (3.8)	28.7 (4.6)
Maine	19.1 (8.7)	11.7 (2.6)	20.1 (5.4)	17.7 (9.1)	30.9 (8.3)	20.9 (9.9)	17.1 (5.7)
Maryland							
Baltimore City	18.4 (8.6)	6.7 (3.8)	11.1 (3.1)	6.9 (6.1)	35.7 (5.5)	24.2 (2.5)	17.4 (2.3)
Rest of Maryland	6.7 (2.4)	11.1 (3.6)	8.9 (2.1)	11.6 (2.2)	16.9 (5.2)	15.9 (2.2)	19.9 (3.7)
Massachusetts							
Suffolk County	15.2 (2.0)	27.7 (7.9)	35.8 (6.5)	7.0 (5.3)	19.5 (5.8)	19.7 (9.7)	26.9 (5.2)
Rest of Massachusetts	9.2 (2.9)	4.9 (1.9)	9.7 (2.6)	8.2 (1.3)	16.6 (5.4)	16.7 (1.4)	16.2 (3.1)
Michigan							
Wayne County	16.1 (2.5)	18.7 (2.8)	29.3 (6.5)	34.2 (3.4)	26.8 (4.7)	25.3 (9.5)	45.2 (4.6)
Rest of Michigan	15.6 (3.8)	18.1 (3.4)	19.0 (3.4)	23.9 (2.3)	21.5 (2.8)	31.5 (2.6)	26.6 (2.0)
Minnesota							
Twin Cities Counties[3]	15.5 (2.6)	23.1 (8.6)	24.7 (4.8)	26.5 (2.8)	24.1 (1.5)	26.6 (4.3)	20.7 (2.5)
Rest of Minnesota	13.8 (3.2)	11.9 (3.8)	23.4 (3.4)	14.8 (0.6)	21.8 (7.9)	24.4 (4.7)	25.5 (7.8)
Mississippi	17.0 (6.5)	20.6 (5.0)	31.8 (6.5)	26.7 (3.6)	29.9 (5.7)	34.8 (2.4)	39.3 (4.6)

See footnotes at end of table.

Table I. Direct estimates (with standard errors) of the percentage of adults aged 18 years and over living in wireless-only households, by selected geographic areas and time period: United States, January 2007–June 2010—Con.

Geographic area	Jan–Jun 2007	Jul–Dec 2007	Jan–Jun 2008	Jul–Dec 2008	Jan–Jun 2009	Jul–Dec 2009	Jan–Jun 2010
	Percent (standard error)						
Missouri							
St. Louis County/City	13.5 (3.0)	14.9 (6.5)	31.2 (13.1)	12.6 (4.8)	31.1 (1.2)	25.9 (1.9)	20.5 (7.0)
Rest of Missouri	6.5 (1.4)	6.9 (3.1)	10.5 (1.4)	11.9 (2.6)	14.2 (2.7)	26.0 (4.9)	18.4 (3.0)
Montana	3.0 (0.6)	3.1 (0.2)	8.1 (2.9)	26.3 (4.7)	16.7 (1.2)	23.5 (0.5)	18.4 (2.2)
Nebraska	14.7 (4.0)	28.4 (5.2)	13.7 (3.7)	28.4 (11.1)	43.1 (5.6)	25.3 (3.4)	31.6 (7.3)
Nevada							
Clark County	11.8 (0.8)	4.1 (3.0)	10.6 (3.9)	9.5 (3.3)	18.5 (2.9)	26.9 (4.7)	25.0 (0.4)
Rest of Nevada	7.7 (4.3)	6.3 (1.0)	5.8 (5.8)	20.2 (1.9)	21.6 (5.0)	33.7 (11.1)	8.5 (5.7)
New Hampshire	3.4 (2.8)	16.4 (2.2)	6.7 (4.0)	15.3 (3.9)	17.7 (7.7)	9.5 (1.1)	19.2 (5.2)
New Jersey							
Essex County	5.7 (2.0)	2.3 (2.4)	11.1 (5.5)	19.7 (9.1)	22.4 (14.2)	28.8 (9.6)	27.2 (4.4)
Rest of New Jersey	6.0 (0.7)	6.1 (2.0)	7.3 (1.8)	8.1 (1.9)	10.2 (0.8)	11.4 (1.4)	11.6 (2.1)
New Mexico							
Southern Counties[4]	15.6 (3.0)	35.3 (6.1)	10.2 (2.3)	15.7 (1.4)	42.7 (7.6)	21.8 (4.7)	31.5 (6.6)
Rest of New Mexico	24.1 (5.5)	6.3 (1.8)	22.3 (13.2)	14.8 (7.3)	31.6 (8.7)	28.7 (5.7)	21.9 (3.1)
New York							
City of New York Counties[5]	11.1 (1.3)	8.8 (1.4)	10.1 (1.7)	14.1 (2.6)	14.8 (1.4)	17.6 (2.2)	20.3 (1.2)
Rest of New York	11.6 (3.4)	15.8 (5.8)	10.1 (1.8)	10.5 (2.5)	12.7 (3.4)	12.7 (2.3)	14.4 (2.9)
North Carolina	15.1 (2.5)	14.3 (2.3)	21.1 (2.7)	19.5 (4.7)	23.4 (2.6)	22.3 (2.3)	25.9 (2.1)
North Dakota	18.0 (9.9)	8.9 (5.1)	14.7 (8.2)	13.8 (2.0)	38.3 (16.5)	39.4 (14.5)	48.5 (12.5)
Ohio							
Cuyahoga County	6.0 (1.5)	7.9 (3.2)	8.2 (2.0)	17.3 (3.7)	21.0 (4.9)	18.7 (2.4)	21.7 (3.6)
Franklin County	23.9 (12.6)	8.3 (0.5)	26.0 (8.7)	17.1 (3.5)	30.0 (4.7)	22.0 (5.3)	40.3 (3.9)
Rest of Ohio	13.6 (2.8)	15.5 (2.7)	18.8 (2.5)	16.2 (4.2)	22.5 (2.7)	22.9 (2.1)	28.6 (2.6)
Oklahoma	18.7 (2.4)	35.2 (6.2)	24.0 (2.9)	18.9 (9.1)	23.0 (6.7)	32.9 (3.9)	26.2 (4.3)
Oregon	19.1 (5.7)	16.0 (4.7)	18.0 (5.3)	24.3 (10.2)	20.8 (6.6)	35.7 (8.0)	31.4 (7.5)
Pennsylvania							
Allegheny County	3.2 (1.8)	37.6 (7.9)	9.4 (5.2)	51.3 (36.5)	23.5 (0.9)	32.3 (7.8)	22.5 (3.7)
Philadelphia County	4.6 (2.2)	14.0 (4.8)	7.7 (6.2)	6.3 (2.7)	14.4 (5.3)	19.3 (6.7)	19.3 (3.7)
Rest of Pennsylvania	8.0 (2.1)	8.2 (1.7)	9.8 (1.5)	11.6 (2.3)	14.4 (2.8)	14.2 (2.4)	15.0 (1.5)
Rhode Island	1.6 (0.4)	6.9 (4.4)	1.2 (0.9)	5.4 (3.2)	26.8 (6.3)	13.6 (3.0)	11.0 (3.5)
South Carolina	18.1 (3.4)	18.7 (3.8)	17.6 (2.1)	22.4 (3.9)	15.3 (3.2)	21.1 (4.1)	29.7 (5.8)
South Dakota	10.7 (1.2)	3.3 (2.4)	10.4 (0.0)	10.8 (5.3)	2.9 (0.7)	14.6 (4.7)	5.4 (0.9)
Tennessee							
Davidson County	23.5 (14.6)	27.2 (5.7)	34.5 (2.8)	13.4 (7.4)	24.8 (5.6)	51.5 (8.1)	28.8 (2.1)
Shelby County	24.0 (10.1)	41.5 (13.3)	15.5 (2.6)	27.1 (10.0)	36.1 (9.5)	42.9 (20.9)	26.6 (1.6)
Rest of Tennessee	14.8 (3.2)	19.6 (4.3)	18.9 (2.5)	20.8 (5.9)	25.2 (4.4)	17.6 (2.9)	34.4 (4.8)
Texas							
Bexar County	21.3 (10.7)	13.3 (5.5)	18.3 (4.1)	17.6 (2.1)	33.3 (7.1)	23.3 (4.2)	34.7 (1.7)
Dallas County	28.3 (9.6)	20.1 (4.1)	40.7 (5.9)	27.4 (5.5)	41.6 (8.0)	40.1 (3.4)	51.1 (2.5)
El Paso County	19.0 (5.0)	4.1 (2.4)	15.5 (1.9)	30.9 (10.2)	42.3 (6.3)	24.6 (1.8)	50.1 (3.3)
Harris County	19.1 (2.3)	19.0 (2.2)	28.5 (2.5)	28.5 (6.8)	31.3 (2.1)	28.9 (3.4)	32.9 (3.0)
Rest of Texas	16.1 (1.8)	20.7 (2.2)	23.5 (1.9)	22.3 (2.6)	28.5 (2.0)	29.0 (1.9)	34.1 (1.4)
Utah	21.1 (2.8)	23.4 (4.4)	15.2 (3.7)	16.9 (1.4)	17.7 (2.1)	21.7 (3.8)	23.5 (2.8)
Vermont	3.7 (2.6)	2.9 (2.1)	5.6 (3.7)	16.6 (6.2)	22.0 (5.8)	34.2 (8.8)	18.0 (0.1)
Virginia	10.9 (1.7)	11.2 (3.3)	16.8 (3.4)	17.6 (5.0)	27.3 (6.5)	15.7 (2.3)	22.6 (3.0)
Washington							
Eastern Counties[6]	30.9 (7.1)	16.7 (3.1)	18.0 (1.3)	14.3 (1.9)	25.2 (1.7)	12.2 (1.9)	49.2 (14.3)
King County	16.0 (6.5)	30.8 (9.0)	26.0 (6.0)	33.8 (7.0)	20.5 (8.0)	30.2 (7.0)	34.9 (5.9)
Western Counties[7]	7.1 (3.9)	15.2 (5.1)	1.0 (0.9)	15.6 (3.6)	15.8 (4.0)	23.0 (7.2)	18.3 (2.8)
Rest of Washington	6.0 (4.4)	17.0 (4.6)	14.3 (2.8)	10.4 (1.9)	20.4 (7.4)	25.4 (8.1)	28.9 (6.0)
West Virginia	11.1 (8.0)	7.9 (5.7)	17.6 (3.4)	8.3 (1.1)	10.8 (4.0)	20.0 (4.6)	16.0 (3.7)
Wisconsin							
Milwaukee County	12.0 (1.7)	23.2 (6.4)	18.1 (8.9)	14.8 (9.3)	19.7 (6.8)	32.8 (3.9)	32.1 (5.3)
Rest of Wisconsin	11.2 (3.0)	18.7 (4.6)	8.5 (2.3)	22.7 (6.1)	16.1 (3.1)	23.7 (4.5)	26.4 (3.2)
Wyoming	9.6 (4.5)	21.0 (1.8)	13.1 (7.9)	29.3 (4.3)	29.6 (4.6)	4.5 (1.1)	14.0 (2.6)

– Quantity zero.

[1]Includes Del Norte, Siskiyou, Modoc, Lassen, Shasta, Trinity, Humboldt, Mendocino, Tehama, Plumas, Butte, Glenn, Colusa, Lake, and Sierra.

[2]Includes Denver, Adams, Arapahoe, and Douglas.

[3]Includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.

[4]Includes Chaves, Lea, Eddy, Lincoln, Socorro, Catron, Sierra, Curry, Roosevelt, De Baca, Dona Ana, Otero, Luna, Grant, and Hidalgo.

[5]Includes Queens, Kings, Richmond, New York, and Bronx.

[6]Includes Asotin, Columbia, Garfield, Whitman, Adams, Walla Walla, Stevens, Ferry, Lincoln, Chelan, Douglas, Okanogan, Benton, Franklin, Grant, Kittitas, Klickitat, and Pend Oreille.

[7]Includes Kitsap, Whatcom, Thurston, Skagit, Island, Cowlitz, Mason, Clallam, Jefferson, Grays Harbor, Lewis, Pacific, San Juan, Skamania, and Wahkiakum.

Table II. Direct estimates (with standard errors) of the percentage of adults aged 18 years and over living in landline-only households, by selected geographic areas and time period: United States, January 2007–June 2010

Geographic area	Jan–Jun 2007	Jul–Dec 2007	Jan–Jun 2008	Jul–Dec 2008	Jan–Jun 2009	Jul–Dec 2009	Jan–Jun 2010
	Percent (standard error)						
Alabama							
Jefferson County	21.3 (10.3)	20.1 (3.9)	8.1 (1.5)	11.0 (6.9)	22.1 (2.0)	6.8 (3.0)	9.0 (2.2)
Rest of Alabama	13.5 (1.9)	22.1 (3.7)	13.8 (4.1)	14.6 (1.6)	5.1 (1.5)	14.5 (1.9)	6.5 (1.6)
Alaska	21.6 (8.3)	14.0 (6.2)	27.0 (6.5)	19.0 (11.9)	17.7 (6.6)	16.8 (4.4)	20.1 (5.8)
Arizona							
Maricopa County	16.5 (3.2)	20.6 (1.1)	17.7 (2.8)	17.3 (4.2)	10.6 (3.1)	9.7 (3.1)	6.2 (1.9)
Rest of Arizona	18.4 (0.8)	19.2 (5.3)	14.2 (3.0)	13.3 (1.4)	9.7 (2.4)	14.8 (3.9)	25.8 (12.7)
Arkansas	20.8 (4.1)	30.8 (5.2)	15.1 (3.9)	13.8 (2.5)	14.4 (2.5)	22.4 (4.5)	12.5 (1.5)
California							
Alameda County	20.6 (4.8)	11.9 (1.7)	14.0 (2.4)	5.2 (4.9)	11.7 (3.5)	6.8 (1.0)	11.6 (4.6)
Fresno County	28.2 (3.7)	38.7 (6.1)	21.6 (5.4)	25.3 (5.8)	15.4 (0.9)	17.9 (2.6)	26.5 (2.0)
Los Angeles County	23.8 (2.9)	16.8 (2.3)	14.6 (2.1)	19.2 (2.5)	11.3 (2.1)	13.8 (1.6)	12.4 (0.8)
Northern Counties[1]	31.7 (9.0)	37.9 (1.8)	40.4 (5.3)	25.6 (1.2)	27.1 (3.0)	20.1 (2.2)	12.1 (3.1)
San Bernardino County	28.2 (5.7)	22.0 (5.6)	31.3 (8.4)	11.6 (2.4)	8.4 (1.6)	9.0 (1.6)	10.2 (3.3)
San Diego County	16.4 (2.2)	11.3 (1.8)	13.8 (4.9)	11.7 (3.4)	17.0 (2.1)	10.2 (1.9)	11.7 (0.9)
Santa Clara County	12.8 (1.9)	9.5 (3.3)	13.8 (5.1)	19.2 (6.8)	14.8 (4.8)	7.2 (1.9)	12.1 (2.8)
Rest of California	22.6 (2.3)	17.6 (1.5)	18.5 (1.8)	10.0 (1.5)	13.4 (2.0)	10.8 (1.4)	10.1 (1.1)
Colorado							
City of Denver Counties[2]	19.9 (2.0)	16.4 (4.9)	11.1 (5.2)	9.5 (3.4)	8.8 (7.2)	7.6 (4.6)	4.5 (1.3)
Rest of Colorado	15.3 (3.2)	14.5 (2.4)	10.7 (1.9)	8.6 (2.9)	3.5 (1.2)	8.2 (1.7)	9.2 (2.2)
Connecticut	17.8 (5.5)	23.0 (2.7)	16.7 (3.9)	18.9 (4.8)	22.8 (3.3)	18.5 (2.0)	17.2 (1.1)
Delaware	11.9 (5.2)	31.8 (4.3)	10.6 (3.0)	9.3 (2.2)	–	15.9 (8.6)	9.1 (6.9)
District of Columbia	16.8 (1.3)	22.3 (18.0)	8.5 (6.6)	19.2 (0.3)	11.7 (5.4)	18.6 (3.2)	5.6 (4.6)
Florida							
Dade County	15.2 (3.0)	12.8 (1.7)	21.9 (4.5)	11.6 (3.5)	7.1 (2.7)	15.0 (3.0)	10.9 (1.0)
Duval County	20.6 (6.9)	11.1 (4.6)	11.7 (9.7)	18.4 (5.4)	36.2 (2.9)	13.4 (3.6)	8.4 (0.4)
Orange County	20.2 (9.5)	14.0 (13.3)	10.7 (2.4)	4.2 (4.9)	11.7 (1.4)	7.0 (1.9)	13.0 (3.9)
Rest of Florida	21.8 (2.0)	13.8 (1.7)	18.0 (2.8)	10.5 (1.6)	14.4 (2.2)	14.2 (1.5)	11.9 (1.7)
Georgia							
Fulton/DeKalb Counties	11.4 (2.1)	6.0 (2.6)	16.3 (2.7)	8.9 (3.5)	16.2 (4.7)	11.2 (3.1)	7.4 (0.6)
Rest of Georgia	27.7 (4.6)	19.0 (5.6)	23.3 (4.8)	14.0 (1.1)	11.4 (2.8)	13.0 (1.8)	15.0 (3.4)
Hawaii	23.7 (4.0)	18.8 (3.7)	18.3 (1.0)	13.3 (5.8)	13.3 (2.3)	5.7 (1.5)	5.8 (2.6)
Idaho	10.1 (6.1)	23.1 (1.6)	10.3 (1.8)	10.6 (6.1)	10.0 (4.8)	14.0 (3.0)	6.9 (1.6)
Illinois							
Cook County	16.3 (2.2)	12.0 (3.4)	15.2 (2.1)	7.6 (1.9)	8.1 (1.8)	7.8 (2.2)	7.0 (0.8)
Madison/St. Clair Counties	27.2 (4.5)	18.9 (9.5)	7.6 (5.4)	7.3 (3.6)	12.7 (4.6)	11.7 (4.3)	10.2 (3.8)
Rest of Illinois	14.4 (3.9)	22.5 (5.4)	18.9 (4.0)	12.6 (2.0)	13.1 (2.2)	9.9 (2.6)	10.0 (1.5)
Indiana							
Lake County	15.6 (6.1)	55.9 (3.9)	22.4 (5.9)	72.6 (22.6)	23.7 (9.2)	11.2 (8.0)	42.3 (9.7)
Marion County	20.7 (2.7)	15.2 (1.6)	12.1 (2.5)	13.8 (5.5)	18.2 (8.7)	4.1 (1.6)	2.5 (0.6)
Rest of Indiana	32.3 (3.0)	26.8 (4.3)	35.6 (3.1)	20.8 (2.2)	10.5 (2.8)	18.5 (3.6)	12.4 (3.2)
Iowa	20.6 (5.3)	10.8 (4.3)	7.9 (1.5)	7.8 (1.3)	9.2 (2.7)	7.4 (2.2)	5.9 (1.1)
Kansas							
Johnson/Wyandotte Counties	12.0 (12.2)	21.0 (6.3)	36.6 (4.1)	7.1 (3.7)	18.9 (4.6)	10.4 (3.7)	1.6 (1.2)
Rest of Kansas	16.1 (3.8)	8.7 (3.0)	10.5 (2.4)	6.7 (0.3)	13.0 (2.7)	8.9 (3.3)	5.7 (0.8)
Kentucky	29.8 (6.7)	18.4 (5.8)	16.7 (3.2)	17.0 (5.8)	12.1 (3.6)	12.1 (4.4)	13.8 (3.2)
Louisiana	16.5 (2.6)	17.3 (4.6)	11.5 (4.2)	11.7 (2.2)	6.7 (1.8)	10.7 (2.0)	14.2 (5.3)
Maine	29.4 (6.8)	18.4 (4.5)	15.4 (2.5)	7.1 (4.2)	19.2 (6.9)	12.3 (3.9)	15.0 (2.4)
Maryland							
Baltimore City	22.7 (5.1)	14.9 (8.6)	23.7 (4.8)	34.3 (14.9)	15.2 (2.0)	5.8 (2.3)	6.8 (3.5)
Rest of Maryland	15.0 (2.7)	20.4 (4.0)	11.7 (1.6)	10.8 (1.3)	6.2 (1.8)	12.0 (4.4)	8.5 (2.7)
Massachusetts							
Suffolk County	26.9 (0.8)	43.9 (2.6)	12.6 (2.1)	40.3 (2.9)	15.0 (7.4)	26.9 (6.1)	14.5 (4.0)
Rest of Massachusetts	20.2 (2.5)	18.4 (1.9)	15.0 (3.2)	20.5 (3.7)	10.6 (2.3)	10.7 (1.9)	9.8 (1.4)
Michigan							
Wayne County	20.1 (5.8)	17.1 (5.0)	15.3 (4.2)	15.9 (2.1)	10.7 (6.7)	11.2 (2.7)	8.6 (2.7)
Rest of Michigan	17.8 (1.9)	14.8 (2.9)	13.1 (1.4)	11.4 (1.6)	13.1 (2.4)	11.0 (1.8)	7.0 (1.1)
Minnesota							
Twin Cities Counties[3]	11.4 (1.6)	11.1 (1.6)	6.5 (1.3)	11.3 (4.9)	5.3 (1.0)	9.9 (2.1)	3.6 (0.6)
Rest of Minnesota	17.2 (3.3)	24.3 (10.5)	14.2 (3.9)	11.6 (4.3)	9.0 (4.2)	13.1 (1.2)	13.4 (3.0)
Mississippi	26.2 (7.7)	35.0 (4.8)	12.0 (3.6)	16.6 (2.5)	16.1 (3.7)	7.1 (1.9)	7.4 (1.9)

See footnotes at end of table.

Table II. Direct estimates (with standard errors) of the percentage of adults aged 18 years and over living in landline-only households, by selected geographic areas and time period: United States, January 2007–June 2010—Con.

Geographic area	Jan–Jun 2007	Jul–Dec 2007	Jan–Jun 2008	Jul–Dec 2008	Jan–Jun 2009	Jul–Dec 2009	Jan–Jun 2010
	Percent (standard error)						
Missouri							
St. Louis County/City	19.2 (7.9)	13.0 (8.6)	22.9 (11.3)	19.9 (8.1)	12.4 (4.4)	9.6 (3.2)	11.4 (1.9)
Rest of Missouri	34.5 (6.8)	27.8 (5.6)	33.6 (6.9)	25.2 (3.6)	15.9 (4.6)	12.9 (3.9)	11.0 (2.8)
Montana	55.5 (12.5)	60.4 (3.9)	60.7 (17.3)	40.7 (14.0)	21.0 (16.7)	42.4 (8.2)	45.0 (18.3)
Nebraska	17.0 (7.6)	6.5 (3.8)	10.7 (2.9)	21.3 (10.5)	7.2 (1.5)	19.4 (3.2)	7.5 (4.9)
Nevada							
Clark County	58.8 (5.8)	56.3 (9.2)	58.1 (10.1)	51.2 (16.9)	69.2 (1.8)	47.2 (5.9)	22.6 (0.6)
Rest of Nevada	46.8 (18.2)	17.0 (5.1)	25.1 (10.5)	15.7 (8.5)	8.3 (1.9)	2.9 (2.6)	15.0 (2.8)
New Hampshire	29.4 (1.1)	26.8 (6.1)	9.1 (3.4)	14.3 (7.6)	10.4 (4.6)	14.4 (4.6)	6.3 (0.9)
New Jersey							
Essex County	74.3 (9.6)	56.5 (16.1)	79.9 (5.3)	31.7 (6.1)	22.2 (10.0)	19.4 (4.9)	12.2 (5.8)
Rest of New Jersey	12.8 (2.7)	12.7 (1.5)	10.8 (1.7)	11.3 (2.2)	10.5 (1.3)	10.1 (1.6)	9.1 (2.3)
New Mexico							
Southern Counties[4]	47.5 (10.8)	4.7 (2.9)	38.3 (2.9)	24.4 (1.9)	21.2 (4.6)	27.4 (0.7)	23.6 (6.4)
Rest of New Mexico	24.3 (1.9)	24.7 (2.2)	23.4 (12.6)	21.1 (5.3)	35.7 (14.1)	10.6 (1.7)	22.2 (2.4)
New York							
City of New York Counties[5]	32.8 (5.0)	29.9 (4.5)	32.8 (4.6)	25.9 (2.6)	25.3 (2.2)	23.5 (3.1)	18.8 (1.2)
Rest of New York	22.8 (2.4)	24.1 (3.3)	24.1 (2.5)	26.7 (5.6)	27.1 (2.8)	11.0 (1.5)	12.4 (1.8)
North Carolina	22.9 (2.3)	21.7 (3.8)	18.7 (1.6)	16.9 (2.2)	15.4 (1.5)	11.6 (2.0)	13.4 (1.7)
North Dakota	26.6 (18.0)	37.3 (14.6)	26.8 (11.4)	34.4 (0.6)	13.4 (11.0)	14.9 (5.2)	17.6 (0.8)
Ohio							
Cuyahoga County	22.6 (3.8)	14.3 (4.2)	27.7 (12.2)	20.3 (5.4)	16.1 (4.2)	15.8 (2.6)	11.7 (2.4)
Franklin County	14.0 (5.6)	6.7 (5.5)	1.1 (0.9)	7.3 (6.9)	16.1 (2.2)	8.4 (2.2)	–
Rest of Ohio	23.2 (2.0)	19.1 (1.8)	14.1 (2.2)	11.4 (1.2)	11.7 (1.7)	12.0 (1.9)	5.8 (1.1)
Oklahoma	12.3 (1.7)	8.0 (1.7)	16.8 (2.6)	16.7 (4.7)	11.7 (2.1)	9.5 (2.9)	6.7 (1.9)
Oregon	17.0 (3.0)	19.1 (1.1)	20.2 (5.4)	10.9 (4.0)	14.9 (3.5)	10.3 (0.6)	14.1 (3.3)
Pennsylvania							
Allegheny County	42.1 (5.5)	11.5 (1.2)	16.8 (2.5)	5.1 (3.2)	17.6 (4.1)	9.4 (1.8)	18.4 (5.9)
Philadelphia County	16.4 (5.1)	36.3 (3.3)	26.5 (8.6)	18.2 (3.4)	6.7 (2.8)	9.0 (4.8)	5.3 (1.6)
Rest of Pennsylvania	19.5 (1.8)	22.5 (3.8)	16.7 (2.3)	21.0 (4.2)	12.7 (1.5)	11.2 (2.3)	8.7 (1.4)
Rhode Island	15.4 (2.1)	21.9 (9.0)	23.1 (7.7)	28.6 (1.9)	8.8 (4.1)	19.5 (6.6)	22.9 (4.0)
South Carolina	17.4 (3.7)	21.7 (2.9)	13.9 (2.5)	8.2 (4.3)	10.1 (1.6)	14.9 (4.2)	10.1 (2.2)
South Dakota	79.8 (4.7)	78.8 (7.4)	84.4 (0.1)	59.1 (14.0)	77.3 (4.9)	53.8 (10.8)	29.0 (16.5)
Tennessee							
Davidson County	7.4 (4.1)	6.7 (3.4)	6.3 (2.7)	35.3 (22.8)	9.5 (2.9)	5.3 (4.5)	7.4 (2.8)
Shelby County	15.5 (3.0)	12.5 (5.9)	21.9 (6.7)	10.2 (2.4)	22.6 (0.7)	2.6 (2.3)	9.5 (1.0)
Rest of Tennessee	18.6 (5.4)	19.1 (4.0)	13.1 (3.2)	16.5 (3.3)	12.4 (3.1)	10.9 (2.0)	8.1 (3.2)
Texas							
Bexar County	22.3 (1.7)	7.8 (4.9)	10.8 (1.1)	9.1 (4.2)	20.4 (1.0)	11.6 (2.9)	11.9 (1.4)
Dallas County	13.0 (3.4)	9.9 (3.5)	5.5 (1.5)	11.9 (4.7)	8.3 (2.6)	15.1 (3.2)	8.0 (2.9)
El Paso County	9.3 (4.8)	29.6 (9.8)	21.2 (3.0)	29.0 (17.0)	23.4 (2.6)	26.9 (9.2)	29.3 (1.6)
Harris County	13.4 (1.5)	13.6 (1.4)	14.9 (2.9)	13.4 (4.3)	2.8 (1.1)	11.7 (1.6)	10.0 (1.3)
Rest of Texas	13.9 (2.1)	13.8 (2.4)	12.9 (1.4)	11.2 (1.2)	9.2 (2.1)	9.1 (1.0)	6.8 (1.1)
Utah	9.7 (3.3)	8.8 (2.6)	14.0 (4.1)	9.8 (4.1)	7.0 (0.3)	6.5 (1.5)	12.9 (2.0)
Vermont	20.6 (1.4)	22.3 (4.8)	19.4 (9.3)	5.1 (0.6)	3.9 (2.8)	23.0 (7.2)	14.0 (1.5)
Virginia	17.5 (3.4)	17.3 (2.5)	19.5 (3.7)	14.8 (3.0)	13.2 (2.6)	11.4 (1.5)	8.6 (1.0)
Washington							
Eastern Counties[6]	40.7 (8.5)	10.2 (0.2)	11.7 (5.5)	11.3 (1.9)	13.2 (2.0)	11.0 (2.7)	17.2 (4.4)
King County	13.1 (2.1)	9.7 (3.4)	5.3 (1.6)	15.9 (1.7)	10.4 (3.1)	9.1 (3.0)	5.1 (1.0)
Western Counties[7]	20.5 (2.6)	6.2 (5.2)	16.0 (3.8)	20.8 (3.4)	11.1 (6.8)	12.8 (4.7)	13.2 (2.2)
Rest of Washington	8.6 (1.3)	8.9 (5.0)	18.9 (3.5)	9.1 (5.4)	12.4 (3.2)	5.8 (3.6)	7.5 (2.9)
West Virginia	33.9 (6.2)	29.2 (6.3)	21.9 (3.6)	23.4 (9.9)	19.4 (3.2)	28.5 (13.1)	13.5 (6.9)
Wisconsin							
Milwaukee County	37.7 (2.5)	23.3 (12.3)	28.8 (6.1)	14.8 (4.9)	35.1 (6.5)	14.8 (3.1)	25.2 (5.3)
Rest of Wisconsin	34.0 (5.0)	32.5 (6.3)	27.9 (5.0)	16.2 (6.5)	14.9 (1.9)	16.3 (2.1)	15.8 (2.2)
Wyoming	27.7 (4.4)	45.5 (1.0)	48.3 (6.1)	29.7 (0.6)	29.6 (3.1)	55.0 (14.0)	39.0 (2.1)

– Quantity zero.
[1]Includes Del Norte, Siskiyou, Modoc, Lassen, Shasta, Trinity, Humboldt, Mendocino, Tehama, Plumas, Butte, Glenn, Colusa, Lake, and Sierra.
[2]Includes Denver, Adams, Arapahoe, and Douglas.
[3]Includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.
[4]Includes Chaves, Lea, Eddy, Lincoln, Socorro, Catron, Sierra, Curry, Roosevelt, De Baca, Dona Ana, Otero, Luna, Grant, and Hidalgo.
[5]Includes Queens, Kings, Richmond, New York, and Bronx.
[6]Includes Asotin, Columbia, Garfield, Whitman, Adams, Walla Walla, Stevens, Ferry, Lincoln, Chelan, Douglas, Okanogan, Benton, Franklin, Grant, Kittitas, Klickitat, and Pend Oreille.
[7]Includes Kitsap, Whatcom, Thurston, Skagit, Island, Cowlitz, Mason, Clallam, Jefferson, Grays Harbor, Lewis, Pacific, San Juan, Skamania, and Wahkiahum.

child models. Model selection using AIC involves selecting the model that minimizes twice the difference between the number of parameters in the model and the maximized value of the log likelihood function. Because this criterion was used to select covariates for the person-level model, in some of the adult or child models some of the covariates were not statistically significant at conventional alpha levels. However, for ease of interpretation, we used the same set of covariates for the adult and child models. Tables III and IV present the best set of covariates for each of the phone categories.

Model-based estimate for the proportion of adults in wireless-only households

The parameter of interest in the model given by Eqn 1 is the true but unknown value for the arcsine-transformed proportion of adults living in wireless-only households for a given small area and 6-month period, and it can be expressed as the sum of a small-area/6-month-period mean, the small-area effect, and the small-area-by-time effect.

The model-based estimate used in estimating the proportion of adults living in wireless-only households was derived using a best linear unbiased prediction (BLUP) approach (see reference 10, p. 516). Because the BLUP depends on unknown variance components, an empirical model-based estimate, referred to as the empirical BLUP (EBLUP), is obtained by substituting the maximum likelihood estimate for the unknown variance components in the BLUP.

The 12-month estimates for the arcsine-transformed proportion of adults living in wireless-only households was obtained by a simple average of the consecutive 6-month-period estimates. The 12-month model-based estimate for the proportion of adults living in wireless-only households in each small area was then obtained by back-transforming the previously mentioned annual estimate. A more direct approach could have been to model the annual 12-month direct estimates instead of modeling 6-month direct estimates, but model-based moving averages were desired for overlapping 12-month periods to smooth out short-term fluctuations and highlight longer-term trends. Hence, we needed to combine successive 6-month model-based estimates.

The model given by Eqn 1 was also fitted for the proportion of adults living in WM, DU, LM, and LO households. Similar to fitting the model for adults living in WO households, the best set of covariates was selected for each of the models for WM, DU, LM, and LO, and the unknown parameters in each model were estimated by the maximum likelihood estimator. Table V presents R^2 statistics that reflect the relative fit of each model. These statistics estimate the proportion of variability in the data that is accounted for by the statistical models, including the covariates and random effects (14). Models for adults fit better than models for children, perhaps because covariates were initially selected for a person-level (i.e., total population) model that included more adults than children. The WO and LO models fit better than the WM, DU, and LM models, perhaps because decisions to own only a wireless or landline telephone are more strongly related to the covariates than are decisions to use one or the other when both are owned.

The 12-month model-based estimate for the proportion of adults living in households that are WM, DU, LM, or LO was derived using methodology similar to the derivation of the 12-month estimate for adults living in households that are WO. Next, the set of 12-month estimates for WO, WM, DU, LM, and LO for every small area and time period were raked such that for the corresponding time period, the raked estimates agreed with the NHIS national-level direct estimate for WO, WM, DU, LM, and LO. Also, for each small area, the raked estimates for January–December 2007, July 2007–June 2008, January–December 2008, and July 2008–June 2009 agreed with the 2008 ACS estimate for the proportion of adults living in households with a telephone (landline or cell phone), and the raked estimates for January–December 2009 and July 2009–June 2010 agreed with the 2009 ACS estimate for the proportion of adults living in households with a telephone. These raked estimates are the final published small-area-level estimates.

For states with multiple small areas, in order to derive state-level estimates for proportion of adults in WO, WM, DU, LM, and LO households, the raked small-area-level estimates were appropriately weighted by the number of adults. For example, if a state consists of two small areas, the state-level proportion of adults in WO households was obtained by multiplying the number of adults in each small area and the raked small-area estimate for the proportion of adults in WO households, then summing this product across the two small areas, and finally dividing the sum by the state-level total for number of adults. These estimates are the final published state-level estimates.

Variance estimation

An estimate for the variance of the EBLUP for each small area/6-month period was derived using equation 5.2 of reference 10 (p. 518). However, because the final model-based estimate involved combining successive 6-month periods, back-transformation, and raking, the initial estimate for the variance was then adjusted to take into account each of these steps.

We recognize that Eqn 1 could have been extended to a multivariate model that would include all telephone service use categories (WO, WM, DU, LM, and LO) and age groups. This approach would have produced more-efficient estimates by using the dependence of the random effects. That is, the multivariate model would have produced estimates with smaller standard errors compared with the estimates produced using Eqn 1, but this approach would have been computationally more demanding.

Table III. Estimated regression coefficients (with standard errors) for models predicting the percentage of adults living in households with various telephone statuses: United States, January 2007–June 2010

Predictor[1]	Wireless-only	Wireless-mostly	Dual-use	Landline-mostly	Landline-only
	Coefficient (standard error)				
Intercept					
Jan–Jun 2007	0.685 (0.022)	0.713 (0.018)	1.169 (0.018)	0.859 (0.018)	0.967 (0.022)
Jul–Dec 2007	0.724 (0.022)	0.752 (0.019)	1.148 (0.019)	0.828 (0.019)	0.920 (0.023)
Jan–Jun 2008	0.780 (0.022)	0.767 (0.018)	1.121 (0.018)	0.829 (0.017)	0.889 (0.022)
Jul–Dec 2008	0.835 (0.023)	0.792 (0.019)	1.116 (0.019)	0.843 (0.018)	0.819 (0.023)
Jan–Jun 2009	0.916 (0.022)	0.838 (0.019)	1.117 (0.019)	0.799 (0.018)	0.768 (0.023)
Jul–Dec 2009	0.962 (0.021)	0.845 (0.018)	1.114 (0.017)	0.785 (0.016)	0.751 (0.022)
Jan–Jun 2010	0.998 (0.024)	0.850 (0.018)	1.087 (0.020)	0.772 (0.018)	0.704 (0.023)
Household size					
One person	0.098 (0.027)	...†	−0.062 (0.021)	...†	...†
Two persons	0.149 (0.022)	...	−0.086 (0.022)	...	...
Three persons	0.034 (0.011)	...	...†	...	...
Four persons	...†	0.053 (0.013)	...	...	−0.038 (0.015)
Five persons	...	0.054 (0.015)	...	...	...
Six persons	...	...	...	0.052 (0.020)	...
Race or ethnicity of household members					
All are Hispanic	...	...	...	−0.079 (0.017)	...
All are black	...	...	0.050 (0.019)	...	−0.125 (0.036)
All are white	...	−0.075 (0.017)	...	...	...
Age of household members[2]					
All adults are under 31	...	...	0.054 (0.017)	−0.114 (0.029)	...
At least one adult is 65 or over	−0.081 (0.018)	...	0.063 (0.022)	...	...
Education of most educated adult household member[3]					
Less than high school diploma	...	...	...	0.063 (0.018)	...
Some college	...	...	−0.039 (0.018)	...	...
College degree or higher	...	...	...	...	−0.113 (0.026)
Employment status of household members[4]					
All adults are attending school	...	...	...	0.045 (0.017)	−0.042 (0.019)
Household composition[5]					
One or more adults and one or more children	...	−0.140 (0.040)	...	...	...
One or more adults and one or more children (squared)	...	−0.044 (0.013)	...	...	...
Two or more adults and one or more children	0.129 (0.032)	0.111 (0.039)	...	0.122 (0.037)	...
Two or more adults and one or more children (squared)	...	0.032 (0.014)	...	...	...
No children	...	...	...	0.142 (0.035)	...
All adults are male	...	0.051 (0.019)	...	...	...
All adults are female	...	...	...	...	0.112 (0.041)
Home ownership					
Rented	...	−0.078 (0.019)	...	−0.132 (0.024)	0.062 (0.024)
Rented and all household members are under age 31	...	...	...	0.100 (0.031)	...
Poverty status of individuals[6]					
Less than 200% of poverty (all persons)	...	...	−0.405 (0.144)	...	...
200%–399% of poverty (all persons)	...	...	−0.170 (0.078)	...	...
Less than 200% of poverty (adults, aged 18 and over)	0.068 (0.013)	...	0.300 (0.131)	...	...
200%–399% of poverty (adults, aged 18 and over)	...	...	0.143 (0.075)	...	...
Less than 200% of poverty (children, aged 0–17 years)	...	0.046 (0.018)	...	...	−0.099 (0.031)
Listed telephones					
Listed telephone numbers per capita	−0.054 (0.014)	...	...	...	...

See footnotes at end of table.

Table III. Estimated regression coefficients (with standard errors) for models predicting the percentage of adults living in households with various telephone statuses: United States, January 2007–June 2010—Con.

Predictor[1]	Wireless-only	Wireless-mostly	Dual-use	Landline-mostly	Landline-only
Census region[7]	Coefficient (standard error)				
Northeast	...	...	...	0.133 (0.035)	...
Midwest	0.099 (0.031)	−0.065 (0.026)	...	...	...
South	0.081 (0.031)	...	...	...	...

... Category not applicable.

† Here, not applicable means the coefficient was not statistically significant in the person-level model, and therefore the covariate was not retained in this model.

[1]Except for the intercepts, poverty status, census region, and listed telephones, all predictors refer to the proportion of persons in the geographic area who live in households with the specified characteristic. The linear terms of all covariates were considered. The square term of a covariate was considered only if the linear term was also included in the model. A square term of a covariate is indicated by (squared).

[2]The proportion of persons living in households where all adults were between ages 31 and 44, and the proportion of persons living in households where all adults were between ages 45 and 64, were not statistically significant in any model.

[3]The proportion of persons living in households where the education of the most educated adult was a high school diploma was not statistically significant in any model.

[4]The proportion of persons living in households where at least one adult was employed was not statistically significant in any model.

[5]The proportion of persons living in households with one adult and one or more children, the proportion of persons living in households with no related adults, the proportion of persons living in households with related adults, and the proportion of persons living in households with more than one family in the household were not statistically significant in any model.

[6]The proportion of persons at or above 400% of poverty, the proportion of adults at or above 400% of poverty, the proportion of children at 200%–399% of poverty, and the proportion of children at or above 400% of poverty were not statistically significant in any model.

[7]Indicator for the West region was not statistically significant in any model.

Comparison of state-level adult wireless-only estimates for 2007

The modeling approach used in this report is distinct from that used in the previous report (6). In the previous report, a two-sample strategy was used to estimate the prevalence of adults living in wireless-only households for the year 2007. That approach involved using the national sample of NHIS data to fit a multinomial logistic regression model with state-level fixed effects. Then, the fitted NHIS model was applied to the CPS microdata to obtain predicted probabilities for each person in the data set. The average predicted probability within the state was used for the model-based estimate of adults living in wireless-only households. Next, NHIS was used to derive state-level direct estimates for adults living in wireless-only households. Finally, a blended estimate was derived by combining the state-level, model-based estimate and the state-level direct estimate. The two sets of estimates were combined based on the relative precision of each estimate.

The approach used in the present report involves modeling the direct estimates for each small-area/6-month period instead of modeling individual observations. The approach used in the previous report involved blending the model-based estimate with the direct estimate; the final estimate under that approach is no longer consistent under the model. The current approach derives an "optimal" estimate under a model, which also automatically is a weighted combination of the direct estimate, a regression estimate, and "adjusted direct estimates." This approach allows the model-based estimate to incorporate the direct estimate for the small-area/6-month period of interest, and also, the adjusted direct estimates for other 6-month periods. That is, the current approach allows for "borrowing strength" across time. In comparison, using the modeling approach in the previous report, there is no obvious method for blending the direct estimate, the model-based estimate, and the direct estimates for 6-month periods other than the 6-month period of interest, because the direct estimates for other 6-month periods need to be "adjusted" prior to blending. (An adjustment is necessary to ensure that the direct estimates for other 6-month periods are unbiased for the small-area/6-month period of interest.)

Also, the approach used in the current report allows for the production of accurate standard errors when combining estimates for consecutive 6-month periods and when combining estimates for multiple small areas in a state. Using the approach in the previous report, we would not be able to produce accurate standard errors when combining estimates because the correlation among the blended estimates cannot be estimated.

We compared the modeled state-level estimates and confidence intervals of the percentage of adults living in wireless-only households for January–December 2007 using the current model (Table I) and the previous report's model (6). The estimates differ (data not shown); however, the largest differences are associated with estimates that have wide confidence intervals. For example, the 2007 adult wireless-only estimate for the District of Columbia changed from 25.4% (using the approach in the previous report) to 13.8%, but the confidence interval associated with the estimate using the current model is significantly narrower. There are several states (e.g., Iowa, Kentucky, Nebraska, New Mexico, North Dakota, Oklahoma) for which significantly narrower confidence intervals are obtained using the current model. In part, this occurs because the process of borrowing strength across time helps to moderate the impact of any outlier estimates. Direct estimates for a specific 6-month period that are unusually high or unusually low have less impact on the final 12-month state-level estimate when they are considered in a model that incorporates six other 6-month time periods. Examples of these outlier estimates can be seen in Table I for several areas in 2007. For example, the direct estimates for the District of

Columbia for January–June 2007 and for Oklahoma for July–December 2007 were substantially higher than for any other 6-month time period for those areas.

For some states (e.g., Delaware, Hawaii, Idaho, Maine, Montana, South Dakota, Vermont, Wyoming), the current model gives a wider confidence interval. We believe that some of the confidence intervals associated with the estimates from the model used in the previous report had unrealistically narrow confidence intervals (e.g., Vermont). This may have occurred because, for the model used in the previous year, "widest plausible intervals" were constructed as a proxy for confidence intervals. We believe that the confidence intervals associated with the estimates using the current model are more accurate. These confidence intervals have coverage probability approximately equal to the nominal level of 95%.

Table IV. Estimated regression coefficients (with standard errors) for models predicting the percentage of children living in households with various telephone status: United States, January 2007–June 2010

Predictor[1]	Wireless-only		Wireless-mostly		Dual-use		Landline-mostly		Landline-only	
Intercept	Coefficient (standard error)									
Jan–Jun 2007	0.608	(0.029)	0.745	(0.024)	1.278	(0.027)	0.767	(0.027)	0.823	(0.028)
Jul–Dec 2007	0.666	(0.030)	0.802	(0.026)	1.223	(0.028)	0.747	(0.029)	0.740	(0.029)
Jan–Jun 2008	0.763	(0.030)	0.835	(0.025)	1.203	(0.027)	0.712	(0.027)	0.688	(0.028)
Jul–Dec 2008	0.781	(0.031)	0.858	(0.026)	1.198	(0.029)	0.703	(0.029)	0.643	(0.030)
Jan–Jun 2009	0.872	(0.031)	0.915	(0.027)	1.190	(0.028)	0.660	(0.028)	0.569	(0.029)
Jul–Dec 2009	0.994	(0.028)	0.926	(0.024)	1.165	(0.025)	0.609	(0.026)	0.563	(0.027)
Jan–Jun 2010	1.022	(0.032)	0.942	(0.025)	1.106	(0.029)	0.602	(0.028)	0.511	(0.029)
Household size										
One person	0.061	(0.039)		...†	−0.068	(0.029)		...†		...†
Two persons	0.138	(0.028)		...	−0.083	(0.031)		...		...
Three persons	0.022	(0.017)		...		...†		...		...
Four persons		...†	0.052	(0.018)		...		...	−0.030	(0.021)
Five persons		...	0.072	(0.022)		...		...		...
Six persons		...		...		...	0.067	(0.030)		...
Race or ethnicity of household members										
All are Hispanic		...		...		...	−0.105	(0.026)		...
All are black		...		...	0.067	(0.025)		...	−0.134	(0.044)
All are white		...	−0.081	(0.022)		...		...		...
Age of household members[2]										
All adults are under 31		...		...	0.054	(0.024)	−0.145	(0.043)		...
At least one adult is 65 or over	−0.033	(0.023)		...	0.061	(0.031)		...		...
Education of most educated adult household member[3]										
Less than high school diploma		...		...		...	0.098	(0.027)		...
Some college		...		...	−0.035	(0.024)		...		...
College degree or higher		...		...		...		...	−0.118	(0.032)
Employment status of household members[4]										
All adults are going to school		...		...		...	0.064	(0.026)	−0.085	(0.025)
Household composition[5]										
One or more adults and one or more children		...	−0.202	(0.053)		...		...		...
One or more adults and one or more children (squared)		...	−0.061	(0.018)		...		...		...
Two or more adults and one or more children	0.124	(0.045)	0.144	(0.052)		...	0.194	(0.055)		...
Two or more adults and one or more children (squared)		...	0.050	(0.019)		...		...		...
No children		...		...		...	0.198	(0.052)		...
All adults are male		...	0.045	(0.024)		...		...		...
All adults are female		...		...		...		...	0.119	(0.053)

See footnotes at end of table.

Table IV. Estimated regression coefficients (with standard errors) for models predicting the percentage of children living in households with various telephone status: United States, January 2007–June 2010—Con.

Predictor[1]	Wireless-only	Wireless-mostly	Dual-use	Landline-mostly	Landline-only
Home ownership		Coefficient (standard error)			
Rented	...	−0.118 (0.024)	...	−0.147 (0.036)	0.117 (0.027)
Rented and all household members are under age 31	...	...	...	0.113 (0.047)	...
Poverty status of individuals[6]					
Less than 200% of poverty (all persons)	...	...	−0.660 (0.204)	...	...
200%–399% of poverty (all persons)	...	...	−0.259 (0.116)	...	...
Less than 200% of poverty (adults, aged 18 and over)	0.113 (0.016)	...	0.477 (0.186)	...	...
200%–399% of poverty (adults, aged 18 and over)	...	...	0.227 (0.112)	...	...
Less than 200% of poverty (children, aged 0–17 years)	...	0.084 (0.023)	...	...	−0.095 (0.039)
Listed telephones					
Listed telephone numbers per capita	−0.070 (0.019)	...	...	...	...
Census region[7]					
Northeast	...	...	...	0.170 (0.053)	...
Midwest	0.105 (0.038)	−0.094 (0.031)	...	...	...
South	0.150 (0.037)	...	...	...	...

... Category not applicable

† Here, not applicable means the coefficient was not statistically significant in the person-level model, and therefore the covariate was not retained in this model.

[1]Except for the intercepts, poverty status, census region, and listed telephones, all predictors refer to the proportion of persons in the geographic area who live in households with the specified characteristic. The linear terms of all covariates were considered. The square term of a covariate was considered only if the linear term was also included in the model. A square term of a covariate is indicated by (squared).

[2]The proportion of persons living in households where all adults were between ages 31 and 44, and the proportion of persons living in households where all adults were between ages 45 and 64, were not statistically significant in any model.

[3]The proportion of persons living in households where the education of the most educated adult was a high school diploma was not statistically significant in any model.

[4] The proportion of persons living in households where at least one adult is employed was not statistically significant in any model.

[5]The proportion of persons living in households with one adult and one or more children, the proportion of persons living in households with no related adults, the proportion of persons living in households with related adults, and the proportion of persons living in households with more than one family in the household were not statistically significant in any model.

[6]The proportion of persons at or above 400% of poverty, the proportion of adults at or above 400% of poverty, the proportion of children at 200%–399% of poverty, and the proportion of children at or above 400% of poverty were not statistically significant in any model.

[7]Indicator for the West region was not statistically significant in any model.

Table V. Goodness-of-fit (R^2) statistics for models predicting the percentage of persons living in households with various household telephone status, by age: United States, January 2007–June 2010

Dependent variable	Wireless-only	Wireless-mostly	Dual-use	Landline-mostly	Landline-only
Percentage of adults	0.85	0.56	0.71	0.77	0.88
Percentage of children	0.76	0.31	0.64	0.57	0.64

Acknowledgments

NCHS thanks NORC's Center for Excellence in Survey Research and SHADAC at the University of Minnesota for providing resources that supported this research. The authors are solely responsible for the content of this report. Nadarajasundaram Ganesh was the primary author of the Technical Notes section and developed the statistical models. We thank Marketing Systems Group for providing the auxiliary data on listed telephone numbers, the staff of the NCHS Research Data Center for their assistance, and Avi Singh (NORC at the University of Chicago) for his comments on an earlier version of the Technical Notes.

Suggested citation

Blumberg SJ, Luke JV, Ganesh N, et al. Wireless substitution: State-level estimates from the National Health Interview Survey, January 2007–June 2010. National health statistics reports; no 39. Hyattsville, MD: National Center for Health Statistics. 2011.

U.S. DEPARTMENT OF
HEALTH & HUMAN SERVICES

Centers for Disease Control and Prevention
National Center for Health Statistics
3311 Toledo Road
Hyattsville, MD 20782

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

FIRST CLASS
POSTAGE & FEES PAID
CDC/NCHS
PERMIT NO. G-284

To receive this publication regularly, contact the National Center for Health Statistics by calling 1–800–232–4636
E-mail: cdcinfo@cdc.gov
Internet: http://www.cdc.gov/nchs

DHHS Publication No. (PHS) 2011–1250
CS220921
T38954 (4/2011)