Computer and Internet Use in the United States: 2016

American Community Survey Reports

By Camille Ryan
Issued August 2018
ACS-39

INTRODUCTION

The presence and use of computers has grown considerably over the past few decades. In 1984, 8 percent of households reported owning a computer according to the Current Population Survey (CPS). Over half of adults who said they used a computer at home in 1984, 59 percent reported they were learning how to use it.[1] Adults used computers for a limited number of activities such as word processing, video games, and jobs. By 2015, however, the percentage of households with a computer had increased almost tenfold to 79 percent in the CPS. In 2016, the American Community Survey (ACS) found that 89 percent of households had a computer, making it a common feature of everyday life. Nowadays, people use computers for an even wider range of uses including online banking, entertainment, socializing, and accessing health care.

Like computer use, the percentage of households using the Internet has also increased over time. The Internet has impacted multiple areas of our lives, from performing basic tasks like shopping or paying bills, to using social media to connect with family, friends, and the larger community. It has become an avenue to pursue both formal education as people take online courses to earn college degrees, and informal learning such as accessing "how-to" videos for everything from tying a necktie to remodeling your bathroom. The Internet has impacted our work life as well by facilitating greater ability to work from home and collaborate across physical and geographical boundaries by utilizing teleconferences. Access to broadband Internet,[2] in particular, is credited with having effects on individual empowerment, economic growth, and community development.[3]

Data about computer use have been collected periodically in the CPS since 1984, and data about Internet use have been collected in the CPS since 1997. The CPS data provide national- and state-level estimates. The ACS began collecting these data in 2013 and provides yearly estimates for geographies with populations of 65,000 people or more. This report uses data from the CPS to provide historical context and data from the ACS to highlight characteristics that are more current.

HIGHLIGHTS FROM ACS DATA

- Among all households in 2016, 89 percent had a computer, which includes smartphones, and 81 percent had a broadband Internet subscription.
- In 2016, the U.S. Census Bureau measured smartphone ownership or use and tablets separately for the first time, in addition to more traditional desktop or laptop computers. Seventy-six percent of households had a smartphone, and 58 percent of households had a tablet, but desktop or

[1] This estimate is from "Table 5. Purposes and Frequency of Computer Use at Home by Persons 18 Years and Over: October 1984," located at <www2.census.gov/programs-surveys/demo/tables/computer-internet/1984/p23-155/tab05.pdf>.

[2] A "broadband" Internet subscription refers to having at least one type of Internet subscription other than a dial-up subscription alone. In the ACS, it specifically refers to those who said "Yes" to one or more of the following types of subscriptions: Broadband (high speed) such as cable, fiber optic or DSL; cellular data plan for a smartphone or other mobile device; satellite; or fixed wireless.

[3] See Jayakar et al., "Broadband 2021" Report of the Interdisciplinary Workshop on the Development of a National Broadband Research Agenda, Institute for Information Policy, Penn State University, State College, PA, 2016.

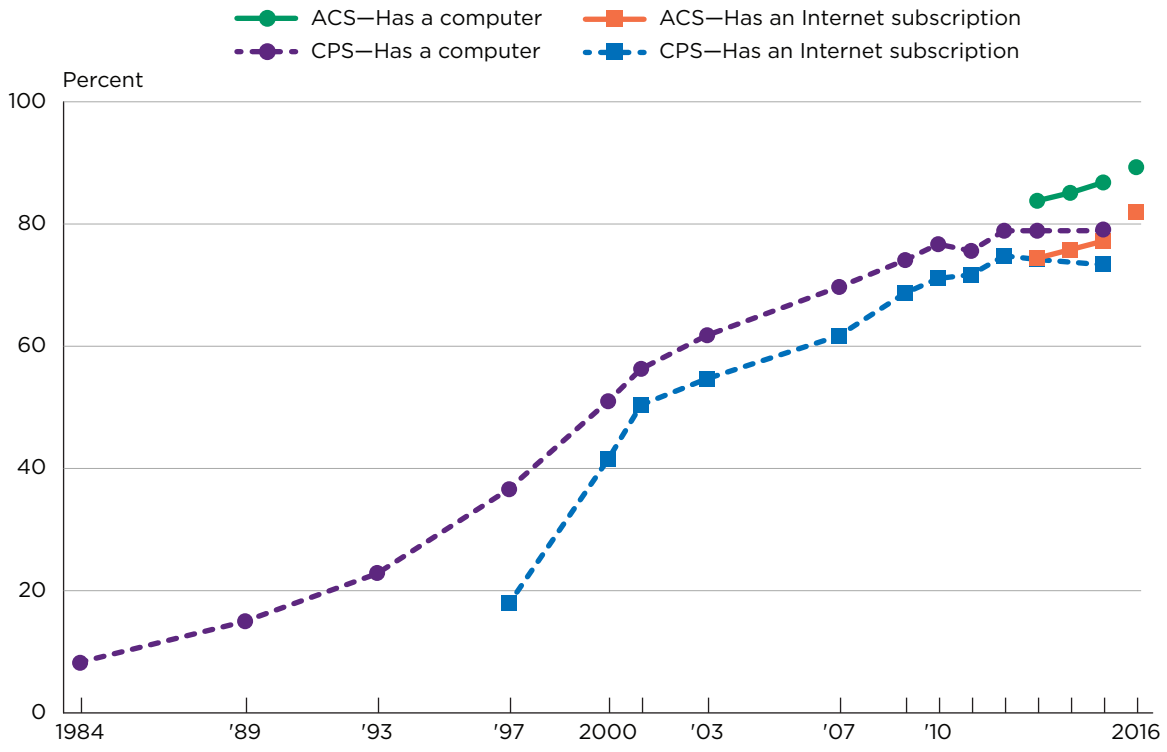
United States® Census Bureau

U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
census.gov

laptop computers still led the way with use by 77 percent of households.

- Smartphone use has become common among younger households (headed by people under age 45), households headed by Blacks or Hispanics, and households with low incomes (under $25,000) where smartphones were more prevalent than traditional laptop and desktop computers. Households headed by Hispanics were more likely to have a smartphone than households headed by non-Hispanic Whites.
- A small percentage of households have smartphones but no other type of computer for connecting to the Internet. These "smartphone only" households were more likely to be low income, Black or Hispanic.
- Nearly half of all households (48 percent) have "high connectivity"—a term used here to refer to households with a laptop or desktop computer, a smartphone, a tablet, and a broadband Internet connection. High connectivity ranged from 80 percent of households with an income of $150,000 or more, to 21 percent of households with an income under $25,000.
- Households with an Asian householder were most likely to own or use a desktop or laptop, own or use a smartphone, own or use a tablet, and have a broadband Internet subscription.
- Households in metropolitan areas were more likely to report owning or using each type of computer—desktop or laptop, a smartphone, or a tablet, and subscribing to broadband Internet compared to their nonmetropolitan counterparts.
- States on the Pacific Coast and most states in the Northeast had higher levels of broadband Internet compared to the national average. Washington had the highest rate of broadband subscriptions (87 percent), while Arkansas and Mississippi had the lowest (71 percent).

Figure 1.
Percentage of Households With Computer and Internet Use: 1984 to 2016



Note: For more information, visit <www.census.gov/cps> and <www.census.gov/acs>.
Source: U.S. Census Bureau, 1984–2015 Current Population Survey, 2013–2016 American Community Survey, 1-Year Estimates.

COMPUTER AND INTERNET USE OVER TIME

Figure 1 shows the percentage of households with computer and Internet use from 1984 to 2016 using data from the CPS and the ACS. Although both surveys show changes over time for computer and Internet use, it is important to note the estimates for each measure will vary between the surveys due to differences in question wording, data collection methods, and weighting procedures. For more information, see the text box titled "Key Differences Between the American Community Survey and the Current Population Survey." In 1984, 8 percent of households had a computer according to the CPS. By 2000, about half of all households (51 percent) had a computer. In 2015, this percentage had grown to 79 percent. The ACS, by contrast, indicated that in 2013, 84 percent of households had a computer (desktop or laptop, handheld, or other), with the percentage growing to 87 percent in 2015. In 2016, 89 percent of households had a computer. This percentage is not directly comparable to previous years of the ACS because of changes to the questions used to collect data on computer use, Internet access, and type of Internet subscriptions. These changes are discussed in greater detail in a subsequent section of this report.

In 1997, the CPS began collecting data about Internet use in addition to computer ownership. The CPS indicated 18 percent of households in 1997 used the Internet. A decade later, in 2007, this percentage had more than tripled to 62 percent and in 2015 increased to 73 percent. The percentage of households in the ACS using the Internet grew from 74 percent in 2013 to 77 percent in 2015. In 2016, 82 percent of households had a subscription to the Internet. Once again, caution should be used in comparing the 2016 estimate with previous years due to the change in questions.

Key Differences Between the American Community Survey and the Current Population Survey

The Current Population Survey (CPS) has been collecting data about computer use since 1984 and about Internet use since 1997. In 2013, the American Community Survey (ACS) also began collecting data on these topics as mandated by the 2008 Broadband Data Improvement Act. Strengths of the CPS data include greater detail available through its longer questionnaire and its longer time series. Whereas the ACS, with its larger sample size, provides estimates for smaller population groups and at more detailed levels of geography.

Estimates of computer and Internet use vary between these surveys due to differences in question wording, data collection methods, and weighting procedures. CPS questionnaires were revised in 2010, 2011, 2013, and 2015, while the ACS questionnaire was updated in 2016 (see the "Changes to the 2016 ACS Computer and Internet Use Questions" section). Research has shown that responses can be sensitive to questionnaire wording, especially as it relates to Internet access using smartphones.[1] Timing of interviews might also affect the data. ACS data are collected year-round each year. CPS data are collected using the computer and Internet supplement. The data were collected in October of most years through 2010 and again in 2012. In 2011, the CPS computer and Internet supplement was administered in July. The supplement was fielded every other year starting in 2013, with data collection in July for 2013 and 2015. In 2017, collection took place in November. Weighting procedures also impact differences between the surveys. The CPS estimates are based on population control-based weights, whereas the ACS is based on both housing unit- and population-based weights.

[1] Jamie Lewis and Dorothy Barth, "2016 American Community Survey Content Test Evaluation Report: Computer and Internet Use," American Community Survey Memorandum Series ACS17-RER-09, located at <www.census.gov/library/working-papers/2017/acs/2017_Lewis_01.html>.

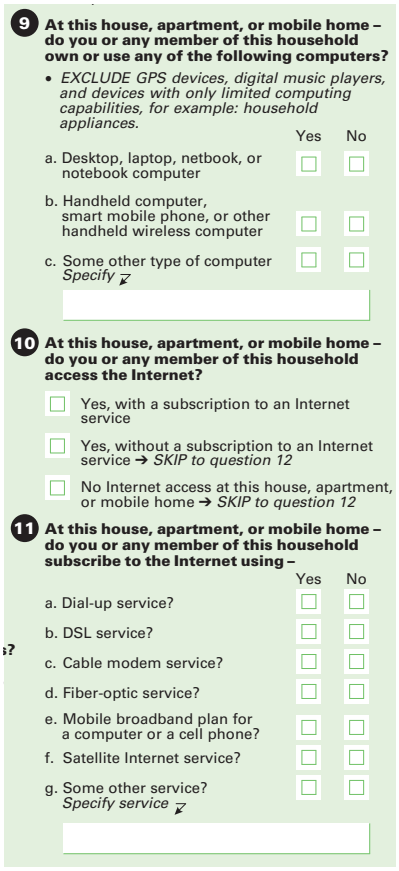
CHANGES TO THE 2016 ACS COMPUTER AND INTERNET USE QUESTIONS

Multiple changes were made in 2016 to ACS questions on computer use, Internet access, and type of Internet subscription. There were several reasons for making these changes, including improving the measurement of Internet subscriptions and cellular data plans among households with smartphones, as well as keeping up with rapid changes in the types of computing devices available and the terminology used to describe them. Because of these changes, caution should be used when comparing the estimates for 2016 to those from previous years since changes may be due to the revised wording and improved measurement rather than a change in use. Figure 2 shows the 2015 and 2016 questions as they appear in the paper questionnaire to illustrate the specific changes.

Tables 1 through 3 show basic distributions for key variables in 2015 and 2016 to further highlight differences. Table 1 shows an overall increase in the percentage of households with a computer, with 87 percent of households owning or using a computer in 2015 compared to 89 percent in 2016. This may be due, in part, to the addition of a new category for tablets. By contrast, the percentage of households with certain categories of computers, specifically "desktop or laptop" and "some other type of computer," fell from 2015 to 2016. Respondents who owned tablets may have previously marked "desktop or laptop" or "some other type of computer" because there was not an explicit option for tablets in 2015. Another reason that the percentage of "desktop or laptop" may have fallen is because "netbooks" and "notebooks" were

Figure 2.
Computer and Internet Use Questions: 2015 and 2016

2015 American Community Survey



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

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

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

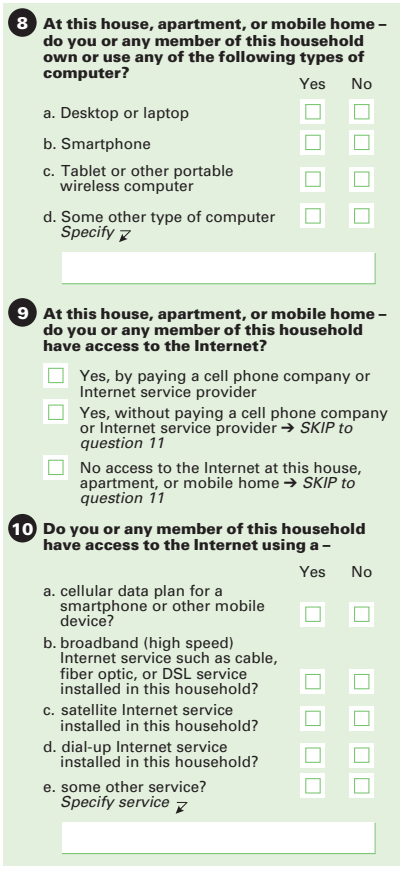
10 **At this house, apartment, or mobile home – do you or any member of this household access the Internet?**

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

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

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

2016 American Community Survey



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

	Yes	No
a. Desktop or laptop	☐	☐
b. Smartphone	☐	☐
c. Tablet or other portable wireless computer	☐	☐
d. Some other type of computer *Specify*	☐	☐

9 **At this house, apartment, or mobile home – do you or any member of this household have access to the Internet?**

- ☐ Yes, by paying a cell phone company or Internet service provider
- ☐ Yes, without paying a cell phone company or Internet service provider ➔ *SKIP to question 11*
- ☐ No access to the Internet at this house, apartment, or mobile home ➔ *SKIP to question 11*

10 **Do you or any member of this household have access to the Internet using a –**

	Yes	No
a. cellular data plan for a smartphone or other mobile device?	☐	☐
b. broadband (high speed) Internet service such as cable, fiber optic, or DSL service installed in this household?	☐	☐
c. satellite Internet service installed in this household?	☐	☐
d. dial-up Internet service installed in this household?	☐	☐
e. some other service? *Specify service*	☐	☐

Note: For more information, visit <www.census.gov/acs>.
Source: U.S. Census Bureau, 2015 and 2016 American Community Survey.

Table 1.

Percentage of Households With Computers by Type: 2015 and 2016

Computer type	2015		Computer type	2016	
	Estimate	Margin of error (±)[1]		Estimate	Margin of error (±)[1]
Total households	**118,208,250**	**155,130**	**Total households**	**118,860,065**	**154,606**
Desktop, laptop, netbook, or notebook computer	78.2	0.1	Desktop or laptop	77.4	0.1
Handheld computer, smart mobile phone, or other handheld wireless computer	74.8	0.1	Smartphone	76.5	0.1
Tablet or other portable wireless computer	N	N	Tablet or other portable wireless computer	57.8	0.1
Some other type of computer	6.7	0.1	Some other type of computer	3.0	0.1
Has one or more computers	86.8	0.1	Has one or more computers	89.3	0.1
No computer	13.2	0.1	No computer	10.7	0.1

N Not available or not comparable.

[1] A margin of error is a measure of an estimate's variability. The larger the margin of error is in relation to the size of the estimate, the less reliable the estimate. When added to and subtracted from the estimate, the margin of error forms the 90 percent confidence interval.

Note: For more information, visit <www.census.gov/acs>.

Source: U.S. Census Bureau, 2015 and 2016 American Community Survey, 1-Year Estimates.

Table 2.

Percentage of Households With Internet Access: 2015 and 2016

Household subscription status	2015		Household subscription status	2016	
	Estimate	Margin of error (±)[1]		Estimate	Margin of error (±)[1]
Total households	**118,208,250**	**155,130**	**Total households**	**118,860,065**	**154,606**
With an Internet subscription	77.2	0.1	With an Internet subscription	81.9	0.1
Without an Internet subscription	22.8	0.1	Without an Internet subscription	18.1	0.1

[1] A margin of error is a measure of an estimate's variability. The larger the margin of error is in relation to the size of the estimate, the less reliable the estimate. When added to and subtracted from the estimate, the margin of error forms the 90 percent confidence interval.

Note: The category "Without an Internet subscription" includes those who accessed the Internet without a subscription and those with no Internet access at all. For more information, visit <www.census.gov/acs>.

Source: U.S. Census Bureau, 2015 and 2016 American Community Survey, 1-Year Estimates.

not specifically listed as part of this category in 2016.

Table 2 shows that the percentage of households that reported having access to the Internet in 2015, 77 percent, was lower than the level in 2016, 82 percent. While this may reflect greater Internet use, it was probably influenced by wording changes as well.

The largest difference is shown in Table 3, which shows types of Internet subscriptions. In 2015, 49 percent of households with an Internet subscription reported a "mobile broadband" subscription, compared with 83 percent of these households reporting a "cellular data plan" in 2016. Preliminary research on the revised questions suggested respondents had a better understanding of the phrase "cellular data plan" versus "mobile broadband." In addition, combining the categories for cable, DSL, and fiber optic in 2016 may have affected reporting. In 2016, the percentage of Internet-subscribing homes with "broadband (high-speed)" was lower than the total having any DSL, cable, or fiber optic subscription in 2015. A higher percentage of households also reported satellite subscriptions in 2016. Preliminary research indicated respondents may have been more likely to choose

Table 3.

Percentage of Households With Internet Access by Type of Internet Subscription: 2015 and 2016

Household subscription type	2015		Household subscription type	2016	
	Estimate	Margin of error (±)[1]		Estimate	Margin of error (±)[1]
Total households	**91,313,308**	**190,613**	**Total households**	**97,307,412**	**217,695**
Dial-up	2.6	0.1	Dial-up	2.8	0.1
Cable, fiber optic, or DSL	86.8	0.1	Broadband (high speed) such as cable, fiber optic, or DSL	82.2	0.1
Cable	60.8	0.1	N	N	N
Fiber optic	12.1	0.1	N	N	N
DSL	21.8	0.1	N	N	N
Mobile broadband	49.3	0.1	Cellular data plan	83.3	0.1
Satellite	6.2	0.1	Satellite	7.7	0.1
Some other service	1.7	0.1	Some other service	1.4	0.1

N Not available or not comparable.

[1] A margin of error is a measure of an estimate's variability. The larger the margin of error is in relation to the size of the estimate, the less reliable the estimate. When added to and subtracted from the estimate, the margin of error forms the 90 percent confidence interval.

Note: The category "Cable, fiber optic, or DSL" for the 2015 estimate was not a category that appeared on the 2015 questionnaire. This category is shown for comparison purposes and denotes any household that selected at least one of the categories for cable, fiber optic, or DSL. Although 86.8 percent of total households with an Internet subscription indicated "cable, fiber optic, or DSL," the sum of the individual categories will not add up to 86.8 percent because the individual categories are not mutually exclusive. For more information, visit <www.census.gov/acs>.

Source: U.S. Census Bureau, 2015 and 2016 American Community Survey, 1-Year Estimates.

satellite in 2016 if they were unsure about the type of subscription they had.

COMPUTER AND INTERNET USE BY SELECTED CHARACTERISTICS

Table 4 displays computer and Internet use for households by a variety of demographic, social, and geographic characteristics using data from the ACS. Among all households with a computer, 77 percent had a desktop or laptop, 76 percent had a smartphone,[4] 58 percent had a tablet, and 81 percent had a broadband Internet subscription.

Householder age is an important factor for understanding computer ownership or use and having a broadband Internet subscription. Households headed by a person aged 65 and over lagged behind households with younger householders on both indicators. By contrast, differences in computer ownership or use among the under age 65 groups were small, 4.5 percentage points between those 45 to 64 years old and those 15 to 34 years old.[5] The gap between the 65-and-over age group and households headed by younger people was especially large for smartphone use. Of households with householders aged 15 to 34, 93 percent had a smartphone, compared with 49 percent where the householder was 65 years and older. Although households headed by householders aged 15 to 34 led the way in smartphone use, households headed by a person aged 35 to 44 had higher rates of ownership in other categories of computers. Of households headed by those aged 35 to 44, 83 percent[6] had a desktop or laptop, compared to 80 percent of households with a householder aged 15 to 34 years old. The difference was even greater for tablet ownership, a new category in 2016 where 70 percent of households with a householder aged 35 to 44 owned a tablet, compared with 63 percent of households with a householder aged 15 to 34.

Computer and Internet use also varied according to race and Hispanic origin of the householder. Households with an Asian householder were most likely to own or use a desktop or laptop, own or

[4] The estimate for the percentage of smartphones is displayed in Table 4 as 76.5 because estimates were rounded to the nearest tenth for this table. However, the estimate calculated to the nearest hundredth is 76.47 percent. Therefore, this estimate rounded to the nearest whole number is 76 percent.

[5] Computer ownership or use was not significantly different for households with a householder aged 15 to 34 and those with a householder aged 35 to 44.

[6] The estimate for the percentage of desktops or laptops is displayed in Table 4 as 83.5 percent because estimates were rounded to the nearest tenth for this table. However, the estimate calculated to the nearest hundredth is 83.47 percent. Therefore, this estimate rounded to the nearest whole number is 83 percent.

Table 4.

Computer and Internet Use for Households by Selected Characteristics: 2016

Household characteristics	Total households (in thousands)		Households with a computer								Households with an Internet subscription[1]			
			Total		Desktop or laptop computer		Smartphone		Tablet		With any Internet subscription		With a broadband subscription	
	Estimate	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]
TOTAL HOUSEHOLDS	**118,860**	**155**	**89.3**	**0.1**	**77.4**	**0.1**	**76.5**	**0.1**	**57.8**	**0.1**	**81.9**	**0.1**	**81.4**	**0.1**
Age of householder														
15–34 years	22,314	75	96.5	0.1	79.6	0.2	92.6	0.1	63.4	0.2	87.5	0.2	87.4	0.2
35–44 years	20,383	46	96.4	0.1	83.5	0.2	91.2	0.1	70.0	0.2	89.2	0.1	89.1	0.1
45–64 years	46,300	66	92.0	0.1	81.1	0.1	80.3	0.1	61.0	0.1	85.0	0.1	84.7	0.1
65 years and older	29,863	53	74.8	0.1	65.6	0.1	48.5	0.1	40.2	0.1	67.8	0.1	66.8	0.1
Race and Hispanic origin of householder														
White alone, non–Hispanic	80,844	83	89.9	0.1	80.9	0.1	74.9	0.1	59.3	0.1	83.9	0.1	83.4	0.1
Black alone, non–Hispanic	14,297	39	84.1	0.2	63.9	0.2	74.8	0.2	48.5	0.2	72.6	0.2	72.3	0.2
Asian alone, non–Hispanic	5,452	23	95.2	0.2	89.0	0.2	87.6	0.2	70.3	0.3	90.3	0.2	90.1	0.2
Hispanic (of any race)	15,355	46	88.7	0.1	67.5	0.2	81.8	0.2	53.7	0.2	77.3	0.2	77.1	0.2
Age of household members														
Without members under 18 years	81,929	154	85.9	0.1	74.5	0.1	69.8	0.1	50.8	0.1	78.2	0.1	77.7	0.1
With member(s) under 18 years	36,931	76	96.9	0.1	83.6	0.1	91.2	0.1	73.3	0.2	90.0	0.1	89.8	0.1
Limited English–speaking household[3]														
No	113,457	167	89.9	0.1	78.6	0.1	76.9	0.1	58.8	0.1	82.8	0.1	82.3	0.1
Yes	5,403	42	76.8	0.3	51.4	0.4	67.1	0.3	36.6	0.4	62.8	0.4	62.5	0.4
Household income														
Less than $25,000	25,207	75	71.7	0.1	51.3	0.2	55.4	0.2	32.5	0.2	58.8	0.2	58.2	0.2
$25,000–$49,999	26,733	70	87.2	0.1	70.3	0.2	70.4	0.1	47.3	0.2	77.5	0.2	76.9	0.2
$50,000–$99,999	35,732	104	95.3	0.1	85.7	0.1	82.9	0.1	64.2	0.2	89.4	0.1	89.0	0.1
$100,000–$149,999	16,668	59	98.1	0.1	93.6	0.1	90.2	0.1	76.6	0.2	94.8	0.1	94.6	0.1
$150,000 and more	14,520	52	98.8	0.1	96.4	0.1	92.6	0.1	83.5	0.2	96.5	0.1	96.4	0.1
Metropolitan status and region														
Metropolitan area	101,357	90	90.3	0.1	78.9	0.1	78.2	0.1	59.3	0.1	83.3	0.1	82.9	0.1
Nonmetropolitan area	17,503	75	83.1	0.2	68.6	0.3	66.4	0.2	48.8	0.3	73.7	0.3	73.0	0.3
Northeast	20,993	31	89.0	0.1	78.9	0.2	74.5	0.1	58.4	0.2	83.0	0.1	82.5	0.1
Metropolitan area	19,204	27	89.3	0.1	79.3	0.2	75.6	0.2	59.0	0.2	83.4	0.1	83.0	0.1
Nonmetropolitan area	1,789	10	85.5	0.3	75.3	0.4	62.6	0.5	52.0	0.5	78.2	0.4	77.3	0.4
Midwest	26,467	53	88.5	0.1	76.5	0.1	74.1	0.1	56.6	0.2	81.4	0.1	80.9	0.1
Metropolitan area	20,508	32	89.6	0.1	77.9	0.1	76.2	0.1	58.2	0.2	82.9	0.1	82.4	0.1
Nonmetropolitan area	5,960	29	84.6	0.2	71.5	0.3	66.9	0.3	51.1	0.3	76.5	0.3	75.7	0.3
South	44,776	82	88.4	0.1	74.7	0.1	76.7	0.1	56.1	0.2	79.7	0.1	79.3	0.1
Metropolitan area	37,501	51	90.0	0.1	77.0	0.1	78.8	0.1	58.2	0.1	81.8	0.1	81.5	0.1
Nonmetropolitan area	7,275	38	79.9	0.3	62.4	0.4	65.7	0.3	45.0	0.4	68.9	0.4	68.3	0.4
West	26,624	31	91.9	0.1	81.5	0.1	80.1	0.1	61.2	0.2	85.1	0.1	84.7	0.1
Metropolitan area	24,145	26	92.4	0.1	82.2	0.1	81.1	0.1	62.1	0.2	85.8	0.1	85.4	0.1
Nonmetropolitan area	2,479	15	87.0	0.3	74.9	0.4	69.7	0.4	51.8	0.4	78.1	0.4	77.3	0.4

See notes at end of table

Table 4.

Computer and Internet Use for Households by Selected Characteristics: 2016—Con.

Household characteristics	Total households (in thousands)		Households with a computer								Households with an Internet subscription[1]			
			Total		Desktop or laptop computer		Smartphone		Tablet		With any Internet subscription		With a broadband subscription	
	Estimate	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]	Percent	Margin of error (±)[2]
Total households with householder 25 years and older	**114,474**	**138**	**89.0**	**0.1**	**77.4**	**0.1**	**75.8**	**0.1**	**57.9**	**0.1**	**81.8**	**0.1**	**81.4**	**0.1**
Educational attainment of householder														
Less than high school graduate	12,282	45	68.6	0.2	45.0	0.2	56.6	0.3	32.9	0.2	56.1	0.2	55.7	0.2
High school graduate (includes equivalency)	28,062	72	81.6	0.1	64.0	0.2	65.1	0.1	44.7	0.2	71.8	0.2	71.2	0.2
Some college or associate's degree	34,789	84	93.0	0.1	81.6	0.1	79.5	0.1	60.8	0.1	85.8	0.1	85.3	0.1
Bachelor's degree or higher	39,341	139	97.2	0.1	93.3	0.1	86.3	0.1	72.7	0.1	93.4	0.1	93.1	0.1

[1] About 4.2 percent of all households reported household Internet use without a paid subscription. These households are not included in these columns.

[2] A margin of error is a measure of an estimate's variability. The larger the margin of error is in relation to the size of the estimate, the less reliable the estimate. When added to and subtracted from the estimate, the margin of error forms the 90 percent confidence interval.

[3] A "limited English-speaking household" is one in which no member 14 years old and over (1) speaks only English or (2) speaks a non–English language and speaks English "very well."

Note: A broadband subscription refers to households who said "Yes" to one or more of the following categories: broadband (high speed) such as cable, fiber optic, or DSL, cellular data plan, satellite, or fixed wireless. For more information, visit <www.census.gov/acs>.

Source: U.S. Census Bureau, 2016 American Community Survey, 1–Year Estimates.

use a smartphone, and own or use a tablet. Households with an Asian householder were also most likely to have a broadband Internet subscription. In contrast, households with a Black householder were the least likely to own or use a desktop or laptop, own or use a tablet or to have a broadband subscription. Differences in ownership or use of smartphones across households headed by each race and Hispanic origin groups were smaller than differences in desktop or laptop ownership or use or broadband subscription.[7] For example, the gap between households headed by Asians and households headed by Blacks (the groups with the highest and lowest values for the percentage of households with any type of computer) was 13 percentage points for smartphones, but 18 percentage points for broadband Internet subscription and 25 percentage points for desktop or laptop ownership or use. Similarly, the difference between Asians and Hispanics in smartphone use was also smaller than for other types of computer use. Relative to non-Hispanic Whites, smartphone use by Hispanics was actually higher.

Households with children under 18 years old were more likely to have a computer and Internet subscription than households without children. The proportion of households with children under 18 years old that owned or used any type of computer was 97 percent versus 86 percent of households without children. Households with

[7] There were a few exceptions, with larger differences in smartphones than desktops or laptops when comparing Asians with non-Hispanic Whites or Blacks with Hispanics. Differences in smartphone ownership or use exceeded differences in broadband subscription when comparing Asians with non-Hispanic Whites, non-Hispanic Whites with Hispanics, or Blacks with Hispanics.

children under 18 years were also more likely to have a broadband Internet subscription, 90 percent versus 78 percent of households without children. A similar pattern was found for nonlimited English-speaking households, whose computer use and broadband Internet subscriptions were higher than that of limited English-speaking households.[8]

Differences in computer use and broadband Internet subscriptions by household income were pronounced.[9] Of households with an income of $150,000 or higher, 99 percent had a computer and 96 percent had a broadband Internet subscription. Among households with an income of less than $25,000, the proportions were 72 percent and 58 percent, respectively.

Households in metropolitan areas were more likely to report owning or using a computer (90 percent) and subscribing to broadband Internet (83 percent) than their nonmetropolitan counterparts (83 percent and 73 percent, respectively). This pattern of higher rates for metropolitan areas was also observed for each region of the country—Northeast, Midwest, South, and West. Overall the highest rates of computer use and broadband access were in the metropolitan West, while the lowest rates were in the nonmetropolitan South.

Computer and Internet use also varied according to householders' educational attainment. The share of households owning or using each type of computer and having broadband Internet increased with each level of education. The 48 percentage-point gap in ownership of desktop or laptop computers between the highest and lowest categories of educational attainment is particularly noteworthy. Desktops or laptops were used by only 45 percent of households headed by a person who did not complete high school, compared with 93 percent of those with a bachelor's degree or higher.

Table 5 and Figure 3 examine differences in the percentage of households with a broadband Internet subscription across states.[10] Washington had the highest level of broadband Internet compared to the nation and all other states. States on the Pacific coast and most states in the Northeast, such as Massachusetts, New Hampshire, and New Jersey, had higher levels of broadband Internet than the national average (81 percent).[11] These also tended to be the states with higher incomes than the national average.[12] Colorado, Maryland, and Utah were also states with higher percentages of a broadband subscription. Arkansas and Mississippi had the lowest rates of broadband use, both at 71 percent, and had low median household incomes.[13]

Figure 4 presents broadband Internet and computer types by household and householder characteristics.[14] Overall, 48 percent of American households had "high connectivity," meaning they had four key computer and Internet items: a desktop or laptop, a smartphone, a tablet, and a broadband Internet subscription. Households where the householder was 35 to 44 years old were most likely to be highly connected at 62 percent. Households with a householder 65 years and older were the least likely to be highly connected at 28 percent. Households with higher household income were also more likely to be highly connected. Of households with a household income of $150,000 or more, 80 percent had broadband, a desktop or laptop, a smartphone, and a tablet. At the opposite end, among low-income households (income under $25,000), 21 percent had high connectivity. Among race and Hispanic origin groups, Asians

[8] A "limited English-speaking household" is one in which no member 14 years old and over (1) speaks only English or (2) speaks a non-English language and speaks English "very well."

[9] For computer use, the gap between the highest and lowest category was 27 percentage points. For broadband Internet subscriptions, the gap was 38 percentage points.

[10] Table 5 and Figure 3 use data from the 2016 ACS, 1-year estimates.

[11] Northeastern states that did not differ from the national average include Vermont and Maine, and broadband subscription was lower in Pennsylvania compared with the United States overall.

[12] For data showing household income for states, see the ranking tables for household income at <https://factfinder.census.gov/bkmk/table/1.0/en/ACS/16_1YR/R1901.US01PRF>. Median household income in Oregon was not statistically different from the national average.

[13] The percentage of households with a broadband Internet subscription in Arkansas was not statistically different than the percentage of households with a broadband Internet subscription in Mississippi.

[14] Figure 4 uses data from the 2016 ACS, 1-year estimates.

Table 5.

Percentage of Households With a Broadband Internet Subscription: 2016

Geographical area	Percent	Margin of error (±)[1]
Washington	87.4	0.3
Colorado	86.9	0.3
New Hampshire	86.4	0.8
Maryland	85.8	0.4
Alaska	85.7	1.1
Massachusetts	85.5	0.3
California	85.4	0.1
Utah	85.4	0.5
Oregon	84.9	0.5
New Jersey	84.2	0.3
Connecticut	84.1	0.6
Minnesota	83.5	0.3
Virginia	83.4	0.4
Delaware	83.3	0.9
Hawaii	83.2	0.8
Wyoming	83.2	1.3
Arizona	83.1	0.4
Rhode Island	82.8	0.9
Illinois	82.0	0.3
New York	81.7	0.2
Nebraska	81.6	0.7
North Dakota	81.4	1.0
UNITED STATES	**81.4**	**0.1**
Wisconsin	81.3	0.3
Florida	81.2	0.2
Vermont	81.1	0.9
Nevada	80.9	0.7
Ohio	80.9	0.3
Georgia	80.7	0.4
Maine	80.7	0.8
Michigan	80.5	0.3
Pennsylvania	80.5	0.2
Texas	80.5	0.2
Kansas	80.3	0.6
District of Columbia	79.8	1.3
Iowa	79.6	0.5
South Dakota	79.5	0.9
Idaho	79.4	0.9
Missouri	79.3	0.4
Indiana	79.2	0.4
North Carolina	79.0	0.3
Montana	78.9	1.0
Kentucky	77.3	0.5
Oklahoma	77.2	0.4
South Carolina	77.0	0.5
Tennessee	76.7	0.4
Alabama	74.7	0.5
Louisiana	74.4	0.5
West Virginia	74.2	0.8
New Mexico	73.7	0.8
Arkansas	70.9	0.7
Mississippi	70.7	0.7

[1] A margin of error is a measure of an estimate's variability. The larger the margin of error is in relation to the size of the estimate, the less reliable the estimate. When added to and subtracted from the estimate, the margin of error forms the 90 percent confidence interval.

Note: For more information, visit <www.census.gov/acs>.

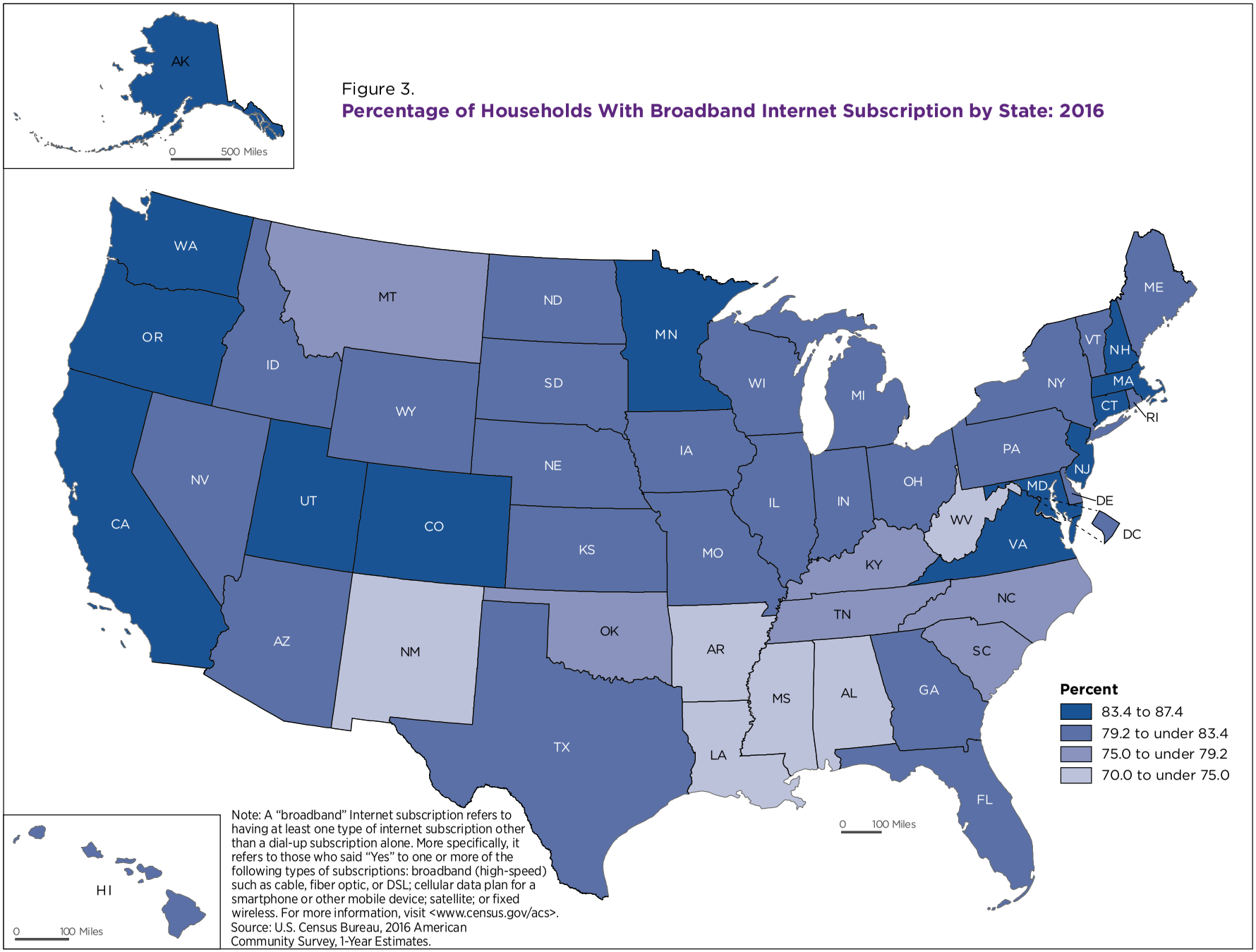
Source: U.S. Census Bureau, 2016 American Community Survey, 1-Year Estimates.

were the most likely to be highly connected, while non-Hispanic Blacks were the least likely to be highly connected.

It is interesting to observe households who lacked a desktop or laptop, but were still connected to the Internet—that is, they relied on smartphones, rather than a desktop or laptop or tablet, for Internet connectivity. These households will be referred to as "smartphone-only households" for the sake of brevity. The prevalence of smartphone-only households decreased with age of householder, in a similar way to "high-connectivity households." On the other hand, when it came to income, race, and Hispanic origin, the pattern was reversed. Low-income households were least likely to be high-connectivity households, but had the highest proportion of smartphone-only households. Similarly, households with a Black and Hispanic householder had lower rates of high connectivity than households with a White or Asian householder, but higher proportions that were smartphone-only. As smartphones continue to evolve and increase in popularity, it will be interesting to see what happens with this group.[15]

[15] For further discussion of the "handheld-only" group, see Lewis, Jamie M., "Handheld Device Ownership: Reducing the Digital Divide?" SEHSD Working Paper 2017-04, U.S. Census Bureau, 2017. This group was also examined by Thom File and Camille Ryan, "Computer and Internet Use in the United States: 2013," *American Community Survey Report*, ACS-28, U.S. Census Bureau, 2014.

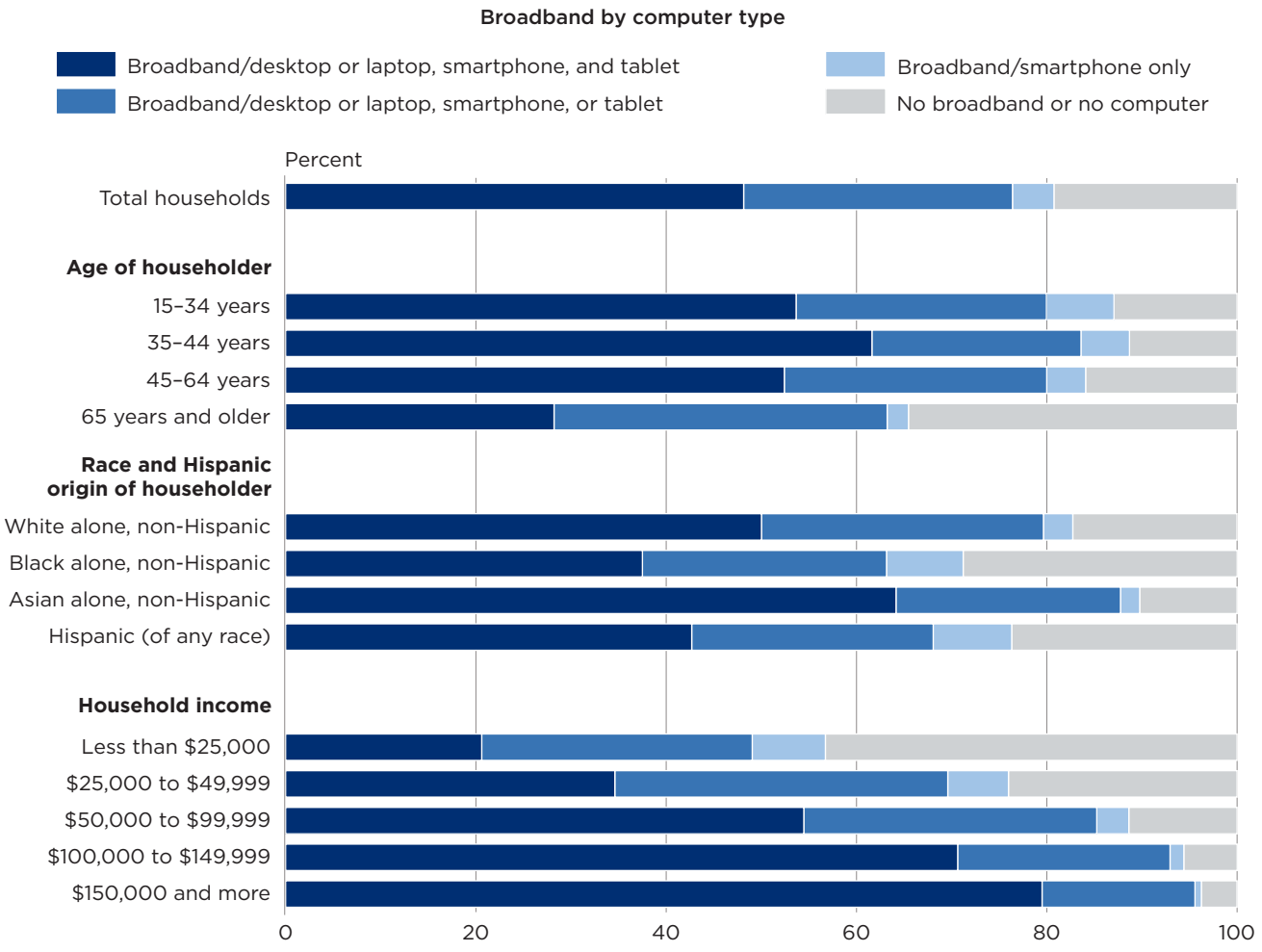
Figure 3.
Percentage of Households With Broadband Internet Subscription by State: 2016



Note: A "broadband" Internet subscription refers to having at least one type of internet subscription other than a dial-up subscription alone. More specifically, it refers to those who said "Yes" to one or more of the following types of subscriptions: broadband (high-speed) such as cable, fiber optic, or DSL; cellular data plan for a smartphone or other mobile device; satellite; or fixed wireless. For more information, visit <www.census.gov/acs>.
Source: U.S. Census Bureau, 2016 American Community Survey, 1-Year Estimates.

Figure 4.

Percentage of Households by Broadband Internet Subscription and Computer Type: 2016



Note: For more information, visit <www.census.gov/acs>.
Source: U.S. Census Bureau, 2016 American Community Survey, 1-Year Estimates.

Defining "High Connectivity" Over Time

As technology continues to change over time, so too does the definition of what it means to be "highly connected." For the purposes of this report, this concept is used to capture those who have broadband Internet and also own or use a full range of computing devices. This group also tends to reflect those who are early adopters of new technology. In previous reports, these were respondents who owned or used a desktop or laptop, handheld device, and had broadband. However, in this report, this definition has been updated to include tablets and refers specifically to smartphones instead of handheld devices. This definition will continue to evolve over time as new devices become available and categories are updated to reflect these changes.

CONCLUSION

This report highlights computer and Internet use using data from the CPS and the ACS. Both surveys show increases over time in computer and Internet use. ACS data show the use of technology varied by demographic, social, economic, and geographic characteristics. Households headed by people aged 65 and older had lower computer use and broadband subscriptions compared with households headed by younger age groups. Households with children under 18 years old and nonlimited English-speaking households were more likely to own or use computers and have broadband Internet. Income, race, and Hispanic origin also had an impact. Nonmetropolitan areas lagged metropolitan areas in computer use and broadband subscriptions, with the nonmetropolitan South showing the lowest levels. Different types of technology were used differently. Tablets have become common, but not as widespread as more traditional laptops and desktops. Smartphones have become very widespread, becoming more prevalent than traditional laptops and desktops for households headed by younger people (people under 45 years), lower-income households (under $25,000), Black households, and Hispanic households. Some of these have become smartphone-only households whose link to the Internet is limited to these devices only. As technology continues to evolve, the Census Bureau will continue to measure computer and Internet use throughout the country and its many communities.

SOURCE AND ACCURACY

The data presented in this report are based on the American Community Survey (ACS) and the Current Population Survey (CPS). The ACS analyses use data from 2013 to 2016. Data for each year are based on a sample interviewed from January 1 through December 31 of that year. For example, the 2016 data are based on a sample interviewed from January 1, 2016, through December 31, 2016. The estimates based on the sample from each year describe the average values of person, household, and housing unit characteristics over the year of collection. Sampling error is the uncertainty between an estimate based on a sample and the corresponding value that would be obtained if the estimate were based on the entire population (as from a census). Measures of sampling error are provided in the form of margins of error for key estimates included in this report. All comparative statements for ACS in this report have undergone statistical testing, and comparisons are significant at the 90 percent level unless otherwise noted. In addition to sampling error, nonsampling error may be introduced during any of the operations used to collect and process survey data such as editing, reviewing, or keying data from questionnaires. For more information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors, please see the ACS 1-Year Accuracy of the Data documents for 2013, 2014, 2015, and 2016 located at <www.census.gov/programs-surveys/acs/technical-documentation/code-lists.html>.

Data from the CPS are shown for the Computer and Internet Supplement for 2015 and earlier years of the supplement. Data from the Computer and Internet Use Supplements were collected in the 50 states and the District of Columbia. The data do not represent residents of Puerto Rico and U.S. Island Areas.

The data are based on a sample of about 60,000 addresses. The estimates in this report are controlled to independent national population estimates by age, sex, race, and Hispanic origin for March 2015.

Beginning with 2010, estimates are based on 2010 Census population counts and are updated annually taking into account births, deaths, emigration, and immigration. The CPS is a household survey primarily used to collect employment data. The sample universe for the basic CPS consists of the resident civilian noninstitutionalized population of the United States. People in institutions, such as prisons, long-term care hospitals, and nursing homes, are not eligible to be interviewed in the CPS. Students living in dormitories are included in the estimates only if information about them is reported in an interview at their parents' home. Since the CPS is a household survey, people who are homeless and not living in shelters are not included in the sample. For further documentation about the CPS Computer and Internet Use Supplement, see <www.census.gov/programs-surveys/cps/technical-documentation/complete.2015.html>.

Data for the 2015 CPS Computer and Internet Use Supplement were collected in July. The supplement was also administered in July during 2013 and 2015. Data were collected in October for most years through 2010 and again in 2012. In 2017, collection took place in November.

The estimates in this report are based on responses from a sample of the population and may differ from actual values because of sampling variability or other factors. As a result, apparent differences between the estimates for two or more groups may not be statistically significant.

All comparative statements for CPS have undergone statistical testing and are significant at the 90 percent confidence level, unless otherwise noted. In this report, the variances of estimates were calculated using both the Successive Difference Replication (SDR) method and the Generalized Variance Function (GVF) approach. Further information about the source and accuracy of the estimates is available at <www.census.gov/programs-surveys/cps/technical-documentation/complete.2015.html>.

What Is the American Community Survey?

The American Community Survey (ACS) is a nationwide survey designed to provide communities with reliable and timely demographic, social, economic, and housing data for the nation, states, congressional districts, counties, places, and other localities every year. It has an annual sample size of about 3.54 million addresses across the United States and Puerto Rico and includes both housing units and group quarters (e.g., nursing homes and prisons). The ACS is conducted in every county throughout the nation, and every municipio in Puerto Rico, where it is called the Puerto Rico Community Survey. Beginning in 2006, ACS data were released annually for geographic areas with populations of 65,000 and greater. For information on the ACS sample design and other topics, visit <www.census.gov/programs-surveys/acs/>.

NOTES

The Census Bureau also reports estimates about computer and Internet use based on data from the CPS. The CPS Computer and Internet Use Supplement includes questions about computer ownership, types of computing devices, Internet use, and types of Internet subscriptions. The CPS data about computer and Internet use are collected periodically and questions can vary from year to year. For complete documentation on the CPS Computer and Internet Use Supplements, including questionnaires, see <www.census.gov/programs-surveys/cps/technical-documentation/complete.html>. For information on computer and Internet use estimates from the ACS and how they differ from those based on the CPS, see the report "Comparison of Data on Computer and Internet Use in the American Community Survey and the Current Population Survey: 2013" at <www.census.gov/library/working-papers/2017/demo/SEHSD-WP2017-11.html>.

CONTACT

For questions related to the contents of this report and the accompanying tables, contact the author:

Camille Ryan
<camille.l.ryan@census.gov>
301-763-6168

Education and Social Stratification Branch
Social, Economic, and Housing Statistics Division
U.S. Census Bureau

SUGGESTED CITATION

Ryan, Camille, "Computer and Internet Use in the United States: 2016," *American Community Survey Reports*, ACS-39, U.S. Census Bureau, Washington, DC, 2017.