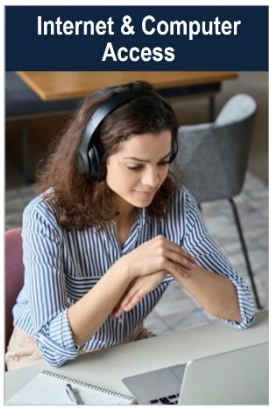

Broadband Internet and Computer Access in Washington State

Findings from the American Community Survey

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DISPARITIES in access to the internet and computing resources have long been an issue, but such disparities caught particular public attention during the early years of the COVID-19 pandemic (Vogels, 2021). More than ever, having no or limited access to the internet and computing resources could pose a barrier to distance education, telehealth services for physical and behavioral health care, other virtual social or health services for vulnerable populations (e.g., remote job coaching, remote home visiting), and remote employment opportunities (Clary, 2021; Marcus, 2021). The pandemic's sudden onset pushed many interactions into the virtual world, yielding differential benefits and drawbacks across different populations and contexts. In the context of telehealth services, for example, drawbacks for some include the high cost of internet service or computing devices, limited digital literacy, and lack of privacy; while others may experience advantages such as reduced transportation costs, increased scheduling convenience, and reduced work missed (Clary, 2021; Wood et al., 2021). With the COVID-19 public health emergency officially ending in May 2023, many service providers are assessing how best to harness the digital world moving forward, in what contexts to carry forward remote services, and how to best support populations with digital access challenges. To support this effort, this report uses data from the American Community Survey to analyze disparities in digital access by geographic location and demographic groups across Washington State.

Key Findings

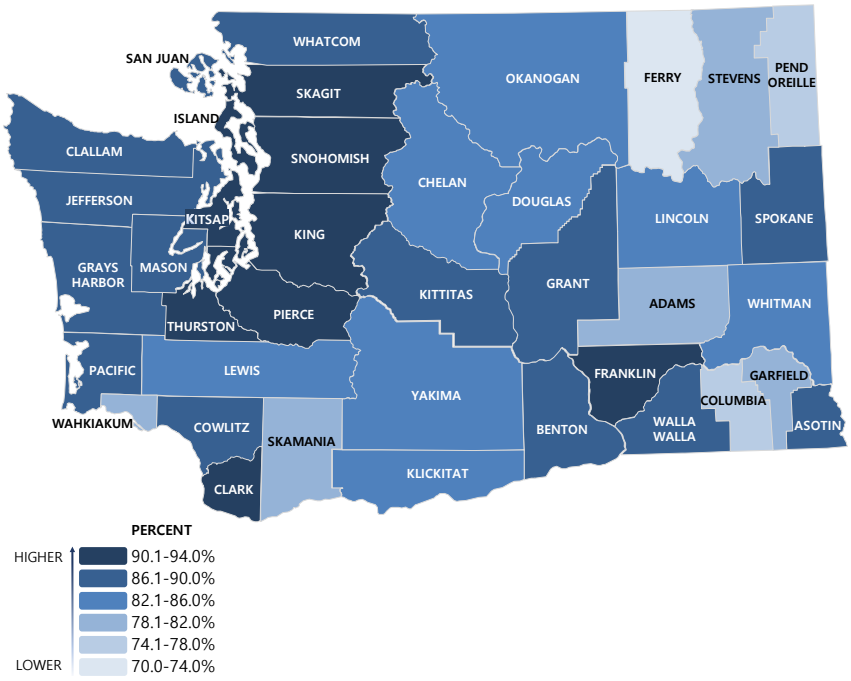
1. **While most Washington households have some type of computing device (96 percent), access to broadband internet is somewhat more limited (91 percent). Both are considered essential components of a "basic access package" needed for people to access online resources.** Disparities across demographic groups are smaller for access to computing devices (including smartphones) than they are for access to broadband internet. Access to "wired" broadband internet (e.g., DSL, cable, or fiber optic) — purportedly with highest speeds and consistency of access — is more limited than access to other types of broadband internet across the state, and is associated with even greater disparities across demographics.

2. **Statewide disparities in a basic computing and internet access package exist across multiple demographics.** Our analyses show lower rates of basic computer and internet access among people ages 65 and over; American Indian or Alaska Natives; and those who have low educational attainment, low incomes, limited English proficiency, a disability, or no children relative to their counterparts. Moreover, an "optimal access package", defined as use of a desktop or laptop computer along with a wired broadband internet service, exhibits even greater disparities.

3. **Across many demographic categories, there was increased reliance on smartphones as the only computing device where access to the "optimal access package" was limited.** Smartphone reliance was highest among those with low educational attainment (less than high school) or among households where English speaking is limited. Households with low incomes and those with Black, Indigenous, and People of Color (BIPOC) householders other than Asians also tended to have higher reliance on smartphones.[1] In contrast, older people ages 65 and over did not have higher reliance on smartphones despite their lower access to the "optimal access package."

FIGURE 1

Access to a Computing Device and Broadband Internet in Washington State, by County



COUNTY	TOTAL HOUSHOLDS	PERCENT WITH BASIC ACCESS PACKAGE
Kitsap	104,977	93.5%
King	902,308	93.2%
Snohomish	302,970	92.5%
Island	35,102	92.3%
Clark	184,173	92.2%
Pierce	335,969	91.2%
Thurston	114,556	91.0%
STATEWIDE	**2,931,841**	**90.8%**
Skagit	50,540	90.5%
Franklin	27,721	90.1%
Whatcom	89,865	89.9%
Spokane	209,640	89.2%
Mason	25,085	88.7%
Clallam	33,636	88.7%
Benton	74,290	88.3%
San Juan	8,378	88.0%
Walla Walla	22,842	87.7%
Grant	32,803	87.4%
Kittitas	18,772	87.3%
Jefferson	15,497	87.2%
Pacific	9,878	86.4%
Asotin	9,287	86.3%
Cowlitz	42,776	86.3%
Grays Harbor	29,319	86.1%
Chelan	29,474	85.3%
Yakima	84,636	84.9%
Klickitat	9,332	84.6%
Whitman	18,010	84.0%
Douglas	15,278	83.6%
Okanogan	16,630	83.2%
Lincoln	4,440	82.9%
Lewis	31,223	82.9%
Adams	6,158	82.0%
Wahkiakum	1,891	81.5%
Skamania	4,723	81.0%
Garfield	1,004	80.8%
Stevens	18,222	79.9%
Pend Oreille	5,653	77.4%
Columbia	1,849	75.3%
Ferry	2,934	70.6%

NOTES: Total number of households in each county and percentage of households with the basic access package, which is defined as access to any computing device (desktop or laptop computer, tablet, smartphone, or other device) and any broadband internet (fiber optic cable, cable, DSL, a cellular data plan, satellite, or other categories). SOURCE: Pre-tabulated ACS 2021 5-year estimates (Table S2801).

[1] The Census Bureau defines householder as "the person, or one of the people, in whose name the home is owned, being bought, or rented" (U.S. Census Bureau, 2023c).

Study Design

To understand more about digital access in Washington State, we used the American Community Survey (ACS) 2021 5-year estimates[2] of numbers and percentages of Washington State **households** and **persons in households** with access to the following digital technologies:

Computers

A desktop or laptop computer has the largest range of capabilities of computing devices. However, due to high costs, many younger and/or low-income users are "smartphone only" users and rely on smartphones as their only device for digital access.[3] The device categories we considered in this report are as follows:

- **Any computing device:** The household has one or more types of computing devices including a desktop or laptop computer, tablet, smartphone, or other computing device.
- **Desktop/laptop:** A desktop or laptop computer is available in the household. These are considered optimal devices because some tasks (e.g., applying for jobs or benefits, completing school assignments) may be significantly more challenging and in some cases not possible using smartphones or tablets, as compared to desktop or laptop computers.
- **Smartphone only:** A smartphone is the only type of computing device available.

Internet

Speed and connectivity vary by different types of connection. The Washington State Broadband Office and the Federal Communication Commission (FCC) both define broadband as internet service that provides minimum speeds of 25 Mbps for downloads and 3 Mbps for uploads.[4] We evaluated the following internet categories:

- **Any broadband:** Internet access is provided by fiber optic cable, cable, digital subscriber line (DSL), a cellular data plan, satellite, or other categories.
- **Wired broadband:** Often considered optimal internet service; it offers the highest speeds and the most consistent access (also known as high-speed internet). Services are provided by fiber optic cable, cable or DSL.
- **No internet or dial-up only:** Access through dial-up telephone lines is very slow with limited functionality for accessing information on the internet (especially video capabilities) compared to broadband internet. For our purposes, we consider this in the same category as "no internet". The vast majority of households in this category have no internet, as dial-up only access is rare (only 3.4 percent of this category is dial-up only).

Access Packages

Computing devices and internet resources are needed to access many online systems and services. We evaluated two types of access packages:

[2] 5-year estimates were used due to small populations in counties that precluded use of 1-year estimates. 2021 5-year estimates were the most current available data at the time of analysis for this report.

[3] See https://www.pewresearch.org/internet/fact-sheet/internet-broadband/?tabId=tab-011fca0d-9756-4f48-b352-d58f343696bf for statistics on internet use by American adults over time.

[4] Second substitute senate bill 5511 in 2019 created the Washington State Broadband Office and aims to expand affordable, resilient broadband service to Washington's communities. The state broadband office reports information regarding regional access to broadband internet services and has an ongoing broadband access and speed survey. See https://www.commerce.wa.gov/building-infrastructure/washington-statewide-broadband-act/. See also the FCC's interactive map showing extent of unserved or underserved broadband serviceable locations for Washington https://broadband.money/broadband-audits/washington.

- **Basic Access Package:** Household access to any computing device and any broadband internet.
- **Optimal Access Package:** Household access to optimal computing devices (a desktop or laptop computer) and wired broadband internet.

Both 5-year (2017-2021) ACS Public Use Microdata Samples (PUMS; U.S. Census Bureau 2023a) and pre-tabulated data tables (U.S. Census Bureau, 2023b) were used to evaluate computing and internet access categories across different populations at the state, county, and region levels. The various breakdowns of data included in this report and subsequent appendix tables could not all be obtained from either single source, thus data availability limitations necessitated using both sources.[5] Each data table or chart presented indicates the level of analysis (households vs. persons in households) and the data source(s). In this study, we focus on Apple Health integrated managed care regions, the administrative areas for the delivery of Washington's Medicaid health services. This information can support the Health Care Authority's understanding of digital access and its relationship to telehealth utilization across the state.

Regional Access to Computing and Internet Resources

Households in Counties

More households have access to computing devices than to internet services, with 96 percent of Washington State households having access to any computing device (counties range from 86 to 97 percent) while the percentage of those with access to any broadband internet is lower by 5 percentage points with wider county-level variation (71 to 94 percent). Statewide, access to laptop or desktop computers (85 percent) is lower than access to any broadband internet (91 percent) but higher than access to wired broadband (79 percent). The percentage of households whose only computing device is a smartphone varies widely by county, ranging from 4 to 20 percent compared to 6 percent statewide. Later in the report, we show that reliance on smartphones for digital access is influenced by several demographic factors. (See Appendix Tables A1 and A2 for more detailed percentages and numbers by county including margins of error.)

In this study, the "basic access package" is comprised of access to any computing device and any source of broadband internet. We show the spatial distribution of the basic access package percentages by county on a state map (Figure 1). Statewide, about 91 percent of households have a basic access package; this access ranges from 71 to 94 percent across counties.

Households in Regions

Because of our interest in telehealth resources for Washington's Medicaid clients, we tabulated estimates by the 10 separate regional jurisdictions under which Apple Health managed care plans are administered. The lowest percentages of households with a basic access package are in Great Rivers and North Central regions at about 85 percent (Table 1). Spokane and Greater Columbia regions have the next lowest percentage of households with a basic access package (87 and 88 percent, respectively), both below the statewide level of 91 percent. Thurston-Mason region is almost at the statewide percentage, and King County region has the highest level of access, at 93 percent of households with a basic access package. Four regions have roughly 8 percent or more of households dependent on smartphones as their only computing device, with 10 percent of households in both Greater Columbia and North Central regions relying solely on smartphones.

[5] Numbers and percentages do not match exactly between figures/tables compiled from the different data sources. Additionally, the demographic categories available in the pre-tabulated data are different from those available in the PUMS data.

TABLE 1

Computing and Internet Access Across Apple Health Integrated Managed Care Regions

State/Regions	Number of Households	Any Computing Device	Laptop or Desktop Computer	Smartphone Only	Any Broadband	Wired Broadband	No Internet or Dial-Up Only	Basic Access Package
		COMPUTING DEVICES			INTERNET RESOURCES			
WA State	**2,931,841**	**95.6%**	**85.3%**	**5.9%**	**91.3%**	**78.8%**	**6.6%**	**90.8%**
Great Rivers	115,087	92.2%	77.0%	8.1%	86.1%	67.6%	11.5%	85.2%
Greater Columbia	258,411	94.1%	78.3%	10.0%	87.5%	69.7%	9.0%	86.8%
King	902,308	96.9%	89.1%	4.4%	93.6%	84.6%	4.6%	93.2%
North Central	94,185	92.7%	75.5%	10.4%	85.9%	67.3%	11.2%	85.4%
North Sound	486,855	96.2%	87.3%	5.0%	92.1%	80.1%	5.9%	91.7%
Pierce	335,969	96.0%	85.1%	6.2%	91.7%	79.8%	6.2%	91.2%
Salish	154,110	95.5%	86.5%	4.4%	92.2%	80.0%	6.2%	91.8%
Southwest	198,228	96.1%	86.2%	5.5%	92.1%	78.7%	6.1%	91.6%
Spokane	247,047	93.8%	80.6%	7.8%	88.2%	71.2%	9.5%	87.7%
Thurston-Mason	139,641	95.1%	85.9%	4.9%	91.2%	79.6%	6.6%	90.6%

NOTES: Statistics on the optimal access package were not available at the regional level. Information in this table is derived from county-level information presented in Appendix A. A map of each Apple Health Region and its associated counties can be viewed at https://www.hca.wa.gov/assets/free-or-low-cost/service_area_map.pdf. SOURCE: Regional summary of data from pre-tabulated ACS 2021 5-year estimates (Table S2801).

Statewide Demographic Differences in Access to Computer and Internet Resources

The percentage of households with access to any computing device varies across demographic categories and ranges between 82 to 99 percent, and, for each demographic category is higher than access to any broadband internet (ranges from 72 to 97 percent). The percentage of households with access to a laptop or a desktop computer ranges from 70 to 91. Access to wired broadband across demographic categories ranges from 54 to 88 percent, and households reliant on only a smartphone as a computing device ranges from 2 to 22 percent (See Appendix Table B1).

In this section, we focus on demographic disparities in rates of access across three computing device/internet combination measures: the Basic Access Package (any computing device and any broadband internet access), the Optimal Access Package (laptop/desktop and Wired Broadband representing highspeed access), and Smartphone Only (no other computing device).

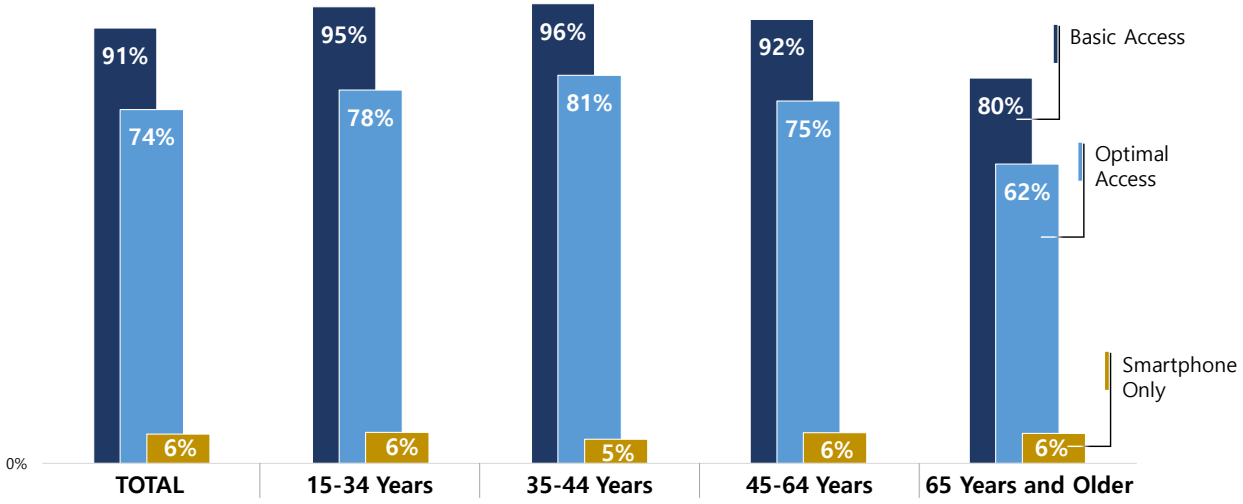
Age

The highest percentages of households with any access package are in the category where the householder is between 35 and 44 years of age (Figure 2) at 96 and 81 percent, respectively, for the basic and optimal access packages. This age category also has the smallest percentage point difference between the basic and optimal access packages. Households where the householder is age 65 and over have the lowest percentages at 80 and 62 percent for basic and optimal access packages, respectively. Unlike patterns observed for comparisons of other demographic categories such as education, income and race/ethnicity discussed later, there is no increased reliance on smartphones among householders ages 65 years and older offsetting their lower levels of optimal access.

FIGURE 2

Access Packages and Reliance on Smartphones by Householder's Age

Percent of Washington State Households



NOTES: Smartphone only is included in the basic but not the optimal access package. More detailed information including margins of errors can be found in Appendix Table B. SOURCE: ACS PUMS 2021 5-year estimates.

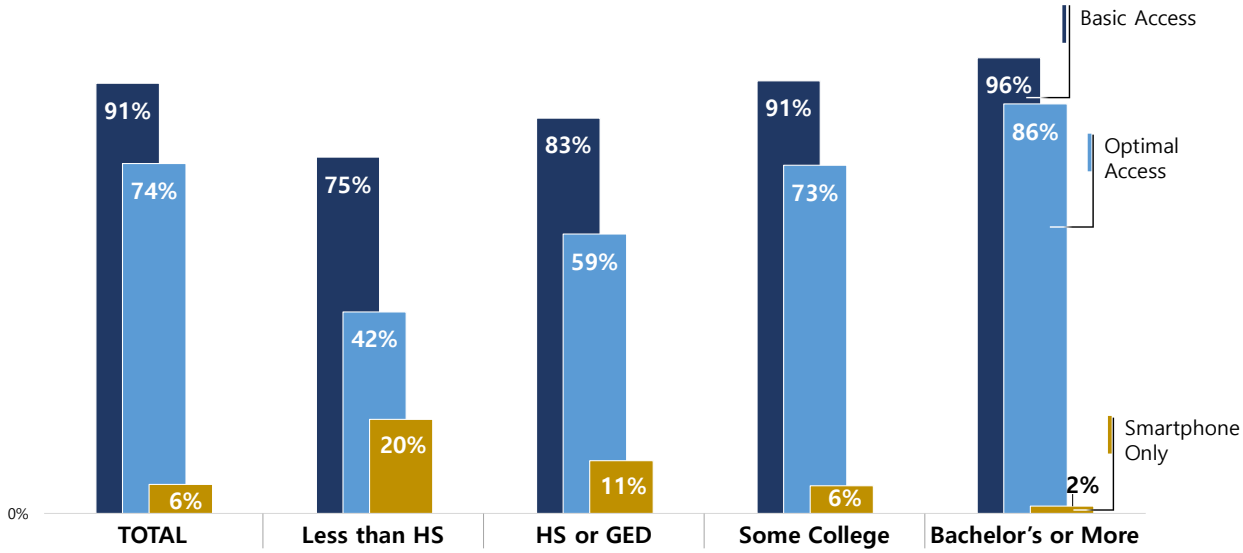
Education

As education of householders increases, so do the percentages of households with the basic and optimal access packages (Figure 3). The gap between the percentage of households with the basic versus the optimal access packages is also smaller as householder education increases. Only 42 percent of those with less than a high school education have an optimal access package versus 86 percent of those with a bachelor's degree or higher. The pattern is opposite for households relying on smartphones as their only computing device; 20 percent of householders with less than a high school diploma rely on smartphones, the highest rate observed for any education level.

FIGURE 3

Access Packages and Reliance on Smartphones by Housholder's Education

Percent of Washington State Households where Householder is Age 25+



NOTES: Smartphone only is included in the basic but not the optimal access package. More detailed information including margins of errors can be found in Appendix Table B. SOURCE: ACS PUMS 2021 5-year estimates.

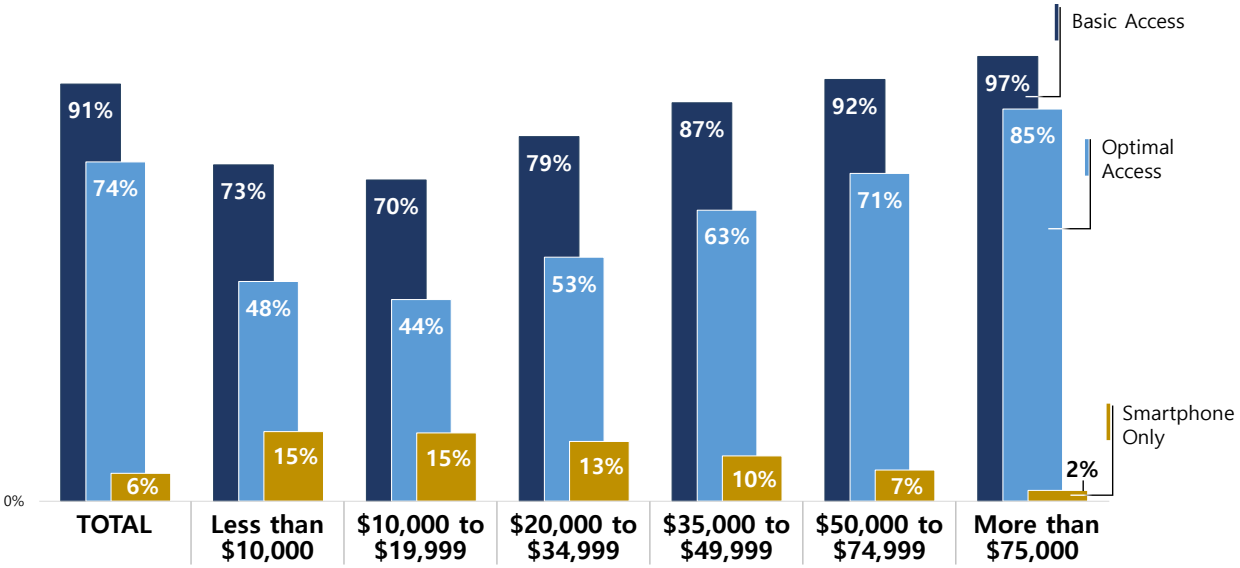
Household Income

As with educational attainment, the percentages of households with the basic and optimal access packages mostly increase with income (Figure 4). There is an exception in that households in the lowest income category of less than $10,000 per year have slightly higher percentages with the basic and optimal access packages. This could be due to greater access to or take up of internet assistance programs, such as the federal Affordable Connectivity Program. The percentage of households reliant on smartphones is highest among lower income households.

FIGURE 4

Access Packages and Reliance on Smartphones by Household Income

Percent of Washington State Households



NOTES: Smartphone only is included in the basic but not the optimal access package. More detailed information including margins of errors can be found in Appendix Table B. SOURCE: ACS PUMS 2021 5-year estimates.

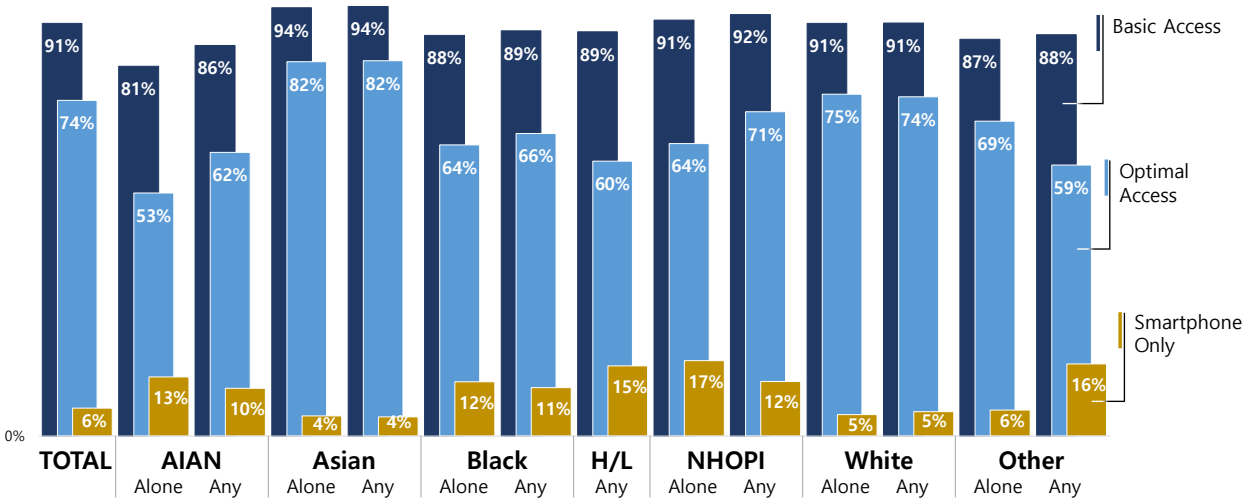
Race and Ethnicity

Households headed by people who are American Indian or Alaskan Native (AIAN) alone or in any combination with another race or ethnicity, Black or African American (alone or in any combination), Hispanic or Latino, or some other race/ethnicity have lower percentages with the basic and optimal access packages compared to statewide percentages. Those with Native Hawaiian and Other Pacific Islander (NHOPI) and White (alone or in combination with any other race or ethnicity) householders have similar percentages as the statewide level for the basic access package but NHOPI has lower levels of the optimal access package (Figure 5). Households headed by people who identified as Asian had the highest percentages with the basic and optimal access packages at 94 and 82 percent, respectively. Lower optimal access package percentages were generally associated with higher smartphone only percentages.

FIGURE 5

Access Packages and Smartphone Reliance by Householder Race and Hispanic Origin

Percent of Washington State Households



NOTES: Smartphone only is included in the basic but not the optimal access package. **AIAN** = American Indian/Alaska Native | **Black** = Includes African American | **NHOPI** = Native Hawaiian or Other Pacific Islander | **H/L** = Hispanic or Latino | **Alone** = Race alone and non-Hispanic | **Any** = Race or ethnicity alone or in combination with any other race or ethnicity. More detailed information including margins of errors can be found in Appendix Table B. SOURCE: ACS PUMS 2021 5-year estimates.

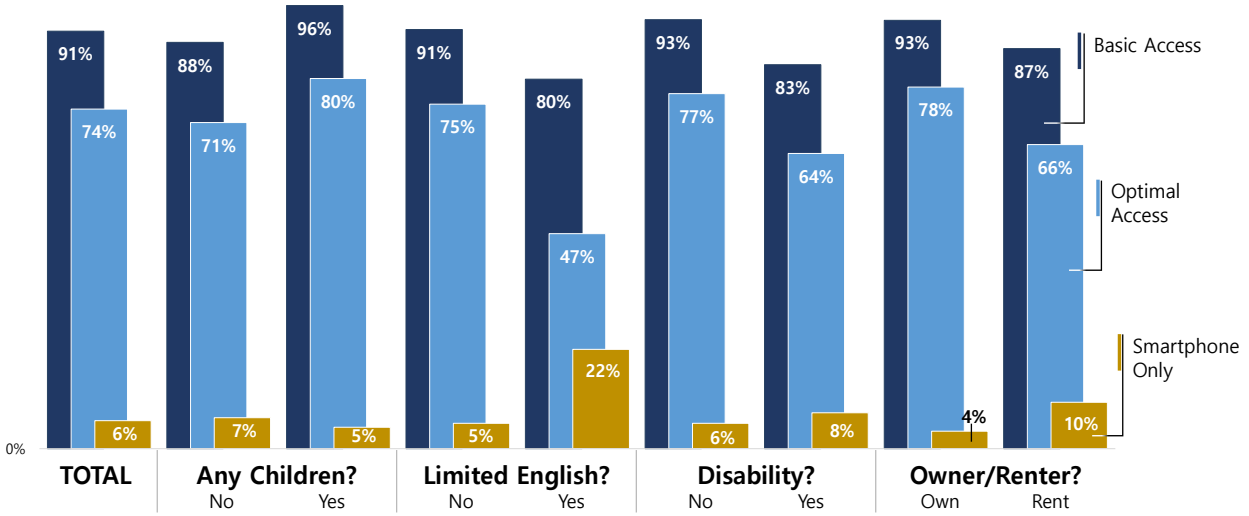
Other Characteristics

The percent of households without children and youth (under age 18), with limited English proficiency (LEP), who have a household member with a disability, and who are renting their house are all lower, for both the basic and optimal access packages, compared to those without those characteristics (see Figure 6). Reliance on smartphones as the only type of computing device was highest for LEP households at 22 percent.

FIGURE 6

Access Packages and Reliance on Smartphones by Other Household Characteristics

Percent of Washington State Households with Indicated Characteristics



NOTES: Smartphone only is included in the basic but not the optimal access package. "Any children" indicates the presence of household members younger than age 18. "Limited English" proficiency indicates that all household members ages 14 and older speak English less than 'very well.' More detailed information including margins of errors can be found in Appendix Table B. SOURCE: ACS PUMS 2021 5-year estimates.

Regional and county-level patterns of computer and internet access across demographic categories often but not always mirrored statewide patterns, with exceptions occurring more frequently in places with smaller populations (see Appendix C). Due to data availability limitations, regional and county-level demographic access patterns were derived from a different form of ACS data (pre-tabulated 2021 5-year ACS estimates) and are at a different level of observation (persons in households) compared to the charts reflecting statewide patterns earlier in this section.

Discussion

This study presents descriptive statistics on internet and computer access across different geographies and populations within Washington State. Access to a basic computing and internet package varies across counties with most urban counties having the highest percentages of households with the basic access package. Internet access appeared to be the most limiting factor across all counties and demographic categories.

Our analyses show disparities in basic computer and internet access among people ages 65 and over; American Indian or Alaska Natives; and those who have low educational attainment, low incomes, or limited English proficiency relative to their counterparts. Disparities are increased for access to an "optimal access package" that includes use of a desktop or laptop computer and wired broadband internet (e.g., cable, fiber optic, DSL).

Across many demographic categories, we observed increased reliance on smartphones as the only computing device where access to the optimal access package was limited. The percent of households (or persons in households) who were smartphone reliant was highest among those with educational attainment below the high school level or among households where English speaking is limited. Households in the two lowest income brackets and those with BIPOC householders other than Asians also tended to have higher reliance on smartphones.

Despite the general trend, householders ages 65 and older were not observed to offset lower access to the optimal access package with increased reliance on smartphones. This may be due to being born long before the internet launched in 1983 and thus not being "digital natives" — not having grown up surrounded by internet and modern information technologies (Dingli, 2015). Similarly, use of smartphones only was only slightly increased among those living with (vs. without) household members with a disability and also those without children and youth under age 18 (vs. with) despite the lower percentages of basic and optimal access packages observed for these groups.

Our data regarding smartphone reliance are in line with a national survey conducted by Pew Research Center (Pew Research Center, 2021) showing that income and education have a large effect on the percent of U.S. adults who say they do not use broadband at home but own smartphones.[6] The Pew research study showed that, in 2021, 27 percent of U.S. adults with household incomes under $30,000 per year do not use broadband at home but own smartphones. In Washington it seems this is lower; about 15 percent of households in the three lowest income brackets (collectively representing incomes of $34,999 and less) are reliant on smartphones as their only computing device. The Pew Research survey also notes large differences in smartphone dependency between Hispanic, Black and White U.S. adults. Differences in smartphone reliance were minimal across age categories in Washington State households (younger age groups did not appear to be much more reliant on smartphones than older people) compared to that observed in the Pew survey and overall, the percentages of smartphone only users were lower in Washington State than in the national survey.

[6] The question addressed by Pew Research was different from the ACS survey questions. Pew Research showed the percent of U.S. adults who say they do not use broadband at home but own smartphones for internet access while we present ACS data showing people that rely on smartphones as their only computing device.

In Washington and elsewhere, providing smartphone-friendly service platforms may decrease disparities in access to important services such as telehealth, portals for applying for or accessing state benefits, and other opportunities. For example, a national assessment of the digital landscape for benefits enrollment in five major public assistance programs across the U.S. found that despite major advancements in online applications since 2019, as of 2024 only 53 percent of benefits programs are "mobile responsive" meaning they have online applications that can be accessed via mobile devices. In Washington State specifically, the report concluded that Medicaid can be applied for via mobile device using the Washington Healthplanfinder website; that SNAP, TANF, and child care assistance can be applied for online using the not-mobile-responsive Washington Connection website; and WIC cannot be applied for online (Code for America, 2024).[7]

The data we present in this report are somewhat complimentary to findings reported by the Washington Student Achievement Council (Kwakye, 2021) who used 2015-2019 PUMS data to evaluate wired broadband (called high-speed internet in their report) and computer access for Washington students (both K-12 and Postsecondary students). Our report included data for all Washington households over a timeframe (2017-2021) that included the first two years of the COVID-19 pandemic. Overall patterns in disparities for the optimal access package in our report and high-speed internet percentages shown in Kwakye et al. are similar regarding income and race/ethnicity. It is possible that access to high-speed internet expanded in the timeframe we evaluated for families with school-age children (due to school shutdowns and remote learning), and this would not have been reflected in the Kwakye et al. (2021) study that focused on a pre-pandemic timeframe. It would be interesting to see updated information post-pandemic for Washington students.

Study Considerations

Just over half of Washington State counties have populations under 65,000 (the cut point for being able to access 1-year ACS estimates) so we used 2021 5-year ACS estimates, meaning data was derived from surveys conducted between 2017 and 2021. This time span covers the COVID-19 pandemic where there was a large push to increase internet and computing resources to families with children in schools. Another consideration is that people experiencing homelessness are not represented in this report; people experiencing homelessness who are living on the streets are not included in the ACS' sampling design (Glassman, 2024) while people experiencing homelessness who temporarily reside in emergency and transitional shelters are sampled but are not questioned about computer and internet access. The data also do not account for access through public resources, like libraries or community centers. Additionally, information is aggregated over large geographic areas, including some areas with varied topographies some of which present physical barriers to quality internet. The FCC has developed a set of interactive maps presenting how well broadband serviceable locations across the U.S. are served with internet.[8] Finally, this report focuses on computing devices and internet access. However, other important factors such as digital literacy and access to technical support (Marcus, 2021; King County, 2020) are not included here because these were not asked of respondents of the ACS. These are still important aspects of digital access, especially for those who did not grow up as "digital natives" (Dingli, 2015).

[7] The "Benefits Enrollment Field Guide" from Code for America (2024) evaluated the online enrollment experience across U.S. states and territories for five major public benefits programs: Modified Adjusted Gross Income (MAGI) Medicaid, the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF), the Child Care Assistance Program (CCAP), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Results are available at https://codeforamerica.org/programs/social-safety-net/benefits-enrollment-field-guide/.

[8] See https://www.arcgis.com/home/item.html?id=22ca3a8bb2ff46c1983fb45414157b08#overview.

Recommendations

First, an awareness of computer and internet access limitations that particularly impact already disadvantaged populations is essential for health and social service delivery systems and staff at every level—statewide (e.g., legislators, program administrators), intermediate entities (e.g., managed care organizations, area agencies on aging), service delivery organizations (e.g., behavioral health agencies, public schools), and frontline workers (e.g., clinicians, community service offices staff). Building on this awareness, this study points to the importance of providing both smartphone-friendly service platforms as well as non-web-based options to reduce barriers to applying for and accessing services. All online service platforms/websites should be designed with the expectation that some users will need to access them primarily using a mobile device. However, the needs of clients are different and complex so providing both in-person and remote options for service delivery is necessary. Additionally, providing information about available services in a variety of formats, including non-web-based methods (e.g., outreach and engagement efforts through schools, community centers, senior centers, physical fliers, etc.) will be more likely to reach the most vulnerable clients. To complement findings from this study, it may be useful to study internet and computer resource access and challenges for specific service populations, such as Medicaid-enrolled individuals who utilize behavioral health and recovery services. One approach could be to leverage existing client surveys such as the DSHS Client Survey to evaluate digital barriers across health and social service clients in Washington State.

STUDY DESIGN AND DATA SOURCES

Analytical approach. We evaluated detailed computing and internet access categories for the state across a variety of different demographics using 2021 5-year Public Use Microdata Samples (PUMS; U.S. Census Bureau, 2023a). Internet, computing devices and Access package categories are described on Page 3 and 4 of this report above. These categories were also tabulated by age of householder, race and Hispanic origin, age of household members (none under age 18 vs. with under age 18 members), limited English speaking (yes or no), disability status of household members (yes disability/no disability), housing tenure (rent vs. own), household income, and educational attainment.

Using pre-tabulated 5-year summary 2021 ACS data tables, we evaluated the detailed computer and internet access categories in households by county and Integrated Managed Care (IMC) region. From these tables, we could only determine numbers and percentages of the basic access package, not the optimal access package. Data presented by county were compiled data from tables S2801, B28003, and the County and State table B28002 Variance Replicate Tables (VRE) to generate margin of errors for derived categories.

To evaluate access by demographic categories by county and region, we used a different pre-tabulated table that showed data by populations in households. The demographic categories were less detailed than we could obtain via PUMS data and are as they were summarized in the ACS tables (table S2802).

SURVEY QUESTIONS

Data used for this analysis was taken from American Community Survey data published by the United States Census Bureau. See https://www.census.gov/programs-surveys/acs/about/forms-and-instructions.2021.html#list-tab-9466845 for sample questionnaires and details on questions for specific demographics evaluated in this report. We have listed the questions involving computer and internet resources below. The Census Bureau defines "householder" as "The person, or one of the people, in whose name the home is owned, being bought, or rented...If there is no such person present, any household member 15 years old and over can serve as the householder." (U.S. Census Bureau, 2023c).

Computer and internet resource data: Data were collected via questions 9-11 (for 2021) in the Housing section of the ACS questionnaire. Questions that ask to "specify" have a box for a write-in answer. The following are the questions related to computer and internet resources.

- **(9)** At this house, apartment, or mobile home – do you or any member of this household own or use any of the following types of computers? (Yes/No)
  a. Desktop or laptop
  b. Smartphone
  c. Tablet or other portable wireless computer
  d. Some other type of computer. *Specify*
- **(10)** At this house, apartment, or mobile home – do you or any member of this household have access to the Internet? (3 Choices)
  Yes, by paying a cell phone company or Internet service provider
  Yes, without paying a cell phone company or Internet service provider ➔ SKIP question 11
  No access to the Internet at this house, apartment, or mobile home ➔ SKIP question 11
- **(11)** 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*.

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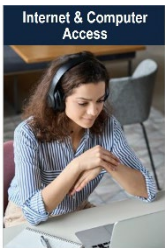

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