Education Insights

The Digital Divide: Examining High-Speed Internet and Computer Access for Washington Students

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Contents

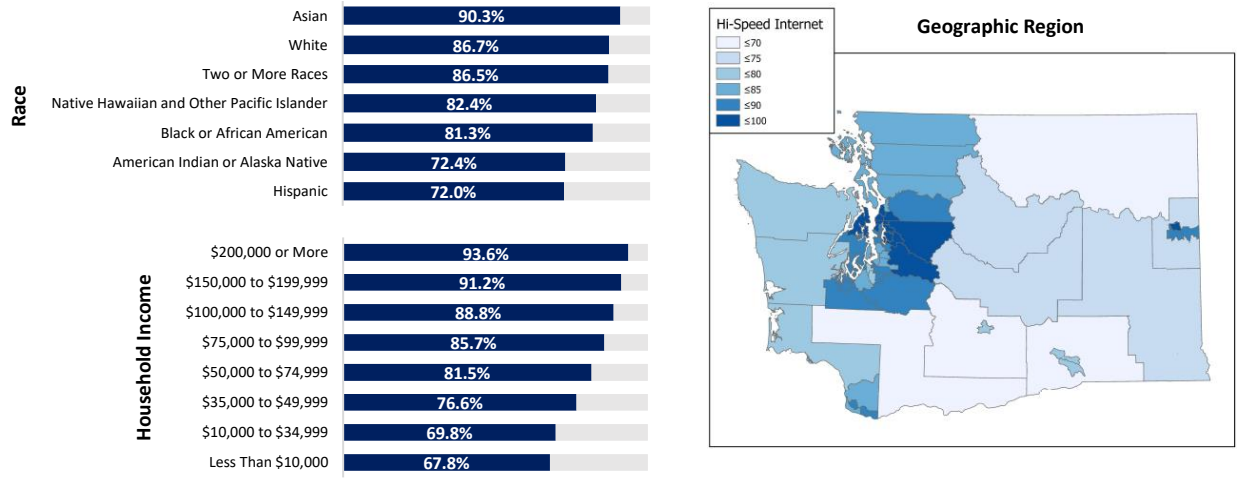
Executive Summary

The widespread shift to remote learning during the COVID-19 pandemic has amplified the need for digital technology at home. Students without adequate internet and computer access have experienced challenges participating in remote learning. Local efforts during the pandemic to help students access the digital tools needed for remote learning may have accelerated internet and computer access. However, examining existing data about internet and computer access for students in Washington can help illustrate patterns in the digital divide that may help identify issues. This report presents information and insights about the digital divide for students in Washington.

Addressing digital divide issues will ensure that all students have access to high-speed internet and computers to be successful in K-12 and postsecondary education. Analysis of data from the U.S. Census American Community Survey before the pandemic reveals that about 84 percent of all students in Washington had high-speed internet connections. Analysis also shows that about 95 percent lived in households with a desktop, laptop, or tablet computer. However, K-12 students were slightly less likely to have high-speed internet or a computer at home than postsecondary students. And overall, access to high-speed internet was less common than the availability of a computer at home.

Although Washington generally has higher rates of digital access for students than the national average, there are significant disparities for some student sub-groups when examining the data by race, household income, and geographic region. In general, students of color, students with lower household incomes, and students living in more rural areas have lower rates of access to digital tools at home.

Access to high-speed internet at home varied by sub-group for students in Washington



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Federal and state measures to help provide access to the internet and devices for remote learning during the pandemic provided necessary assistance to students and likely increased digital access for many households in Washington. Ensuring students have access to high-speed internet and have adequate devices at home should continue to be a priority, even as they return to in-person learning. Promoting access to high-speed internet and computers for all Washington households can help ensure educational access and equity that can help increase postsecondary attainment in the state. Closing the digital divide may be a critical step to opening educational opportunities and social and economic wellbeing for all Washington residents.

Introduction

Access to digital technology is fundamental to many aspects of society—including communications, services, and information sharing. Digital access has become increasingly central to daily life during the COVID-19 pandemic as more activities have been conducted online. However, data show that just 79 percent of United States households had a broadband subscription in 2019.[1] The findings from the data mean that more than one in five households in the U.S. did not have broadband access at home. Additionally, there are disparities in broadband access for different sub-populations in the U.S. For instance, roughly 79 percent of households in large urban areas had a broadband subscription in 2019, compared to only about 73 percent of rural households. We also see differences in internet users depending on income—89 percent of individuals in the top quartile of the income distribution were internet users, compared to 71 percent of individuals in the bottom income quartile (OECD, 2021).[2] These findings help illustrate the existing digital divide and suggest that many individuals do not have access to the internet at home in the U.S.

Digital technology is also an increasingly important aspect of educational access and equity. Students of all ages use the internet for educational purposes and rely on computers to complete assignments. There is some evidence that students with computers at home have better educational outcomes, including high school graduation rates (Fairlie et al., 2010). But a growing body of research has shown that many students still lack sufficient internet and computer access to complete homework and school assignments at home. National research suggests that approximately a quarter of K-12 students in the U.S. do not have broadband access or a computer or tablet at home, and rates of digital access are lower for students of color and students from lower-income households (NEA, 2020).[3]

The widespread shift to remote learning during the COVID-19 pandemic has amplified the issue as students without adequate internet and computer access have experienced challenges participating in remote learning. Local efforts during the pandemic to help students access the digital tools needed for remote learning may have accelerated internet and computer access. However, examining existing data about internet and computer access for students in Washington can help illustrate patterns in the digital divide that may help identify issues. Addressing digital divide issues will ensure that all students have access to high-speed internet and computers to be successful in K-12 and postsecondary education.

This report utilizes data from the U.S. Census American Community Survey (ACS) to provide a picture of high-speed internet and computer access for students in Washington. We present data for K-12 and postsecondary students and breakdowns by race, household income, and geography to identify gaps in access that may contribute to inequities in education. We then provide some emerging evidence of the impact of the digital divide on students during the COVID-19 pandemic. We conclude with a discussion of efforts to close the digital divide, highlighting the importance of internet and computer access for educational attainment in our state.

[1] Broadband refers to a high-speed internet connection through a fixed broadband (DSL, cable, fiber, satellite, terrestrial, and other fixed-wired technologies) or a mobile broadband connection offering speeds of 256 Kbps or higher. Data reported on U.S. trends come from OECD.
[2] Internet users includes adults ages 16-64 who used the internet in the last 3 months at the time of data collection. The bottom income quartile represents individuals with incomes in the lowest 25 percent of the income distribution.
[3] Throughout the report, data reported on national K-12 trends in digital access come from U.S. Census American Community Survey 2018 data presented in the National Education Association's (NEA) *Digital Equity for Students and Educators* report.

What do high-speed internet and computer access look like for Washington students?

Data from the U.S. Census American Community Survey (ACS) can help us understand the extent to which digital technology is available in the households of Washington students. In this section, we examine the prevalence of high-speed internet connections and computers in the homes of Washington's K-12 and postsecondary students, with particular emphasis on identifying groups of students with lower rates of access to these resources.[4] Data about high-speed internet and computer access are collected at the household level and exclude students living in group quarters, including college dormitories and juvenile detention centers.[5]

Survey responses to the ACS show that access to digital technology in the home is available for most students in Washington. Overall, about 84 percent of all students in Washington had high-speed internet connections (table 1), and about 95 percent lived in households with a desktop, laptop, or tablet computer (table 2). However, K-12 students in Washington were slightly less likely to have access to high-speed internet (83 percent) and a computer at home (94 percent) than postsecondary students (86 percent had high-speed internet and 98 percent had a computer at home). And overall, access to high-speed internet was lower than access to a computer at home.

Table 1. High-speed internet access at home for Washington students

High-Speed Internet Access	All Students		K-12		Postsecondary	
	Number	Percent	Number	Percent	Number	Percent
Yes	**1,328,643**	**83.5%**	**973,299**	**82.7%**	**355,344**	**85.7%**
No (no high-speed internet)	175,410	11.0%	137,748	11.7%	37,662	9.1%
N/A (no paid access to the internet)	87,002	5.5%	65,609	5.6%	21,393	5.2%
Total	1,591,055	100%	1,176,656	100%	414,399	100%

Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Table 2. Computer access at home for Washington students

Computer Category	All Students		K-12		Postsecondary	
	Number	Percent	Number	Percent	Number	Percent
Laptop, Desktop, or Tablet	**1,509,588**	**94.9%**	**1,104,057**	**93.8%**	**405,531**	**97.9%**
No Computer Access	81,467	5.1%	72,599	6.2%	8,868	2.1%
Total	1,591,055	100%	1,176,656	100%	414,399	100%

Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

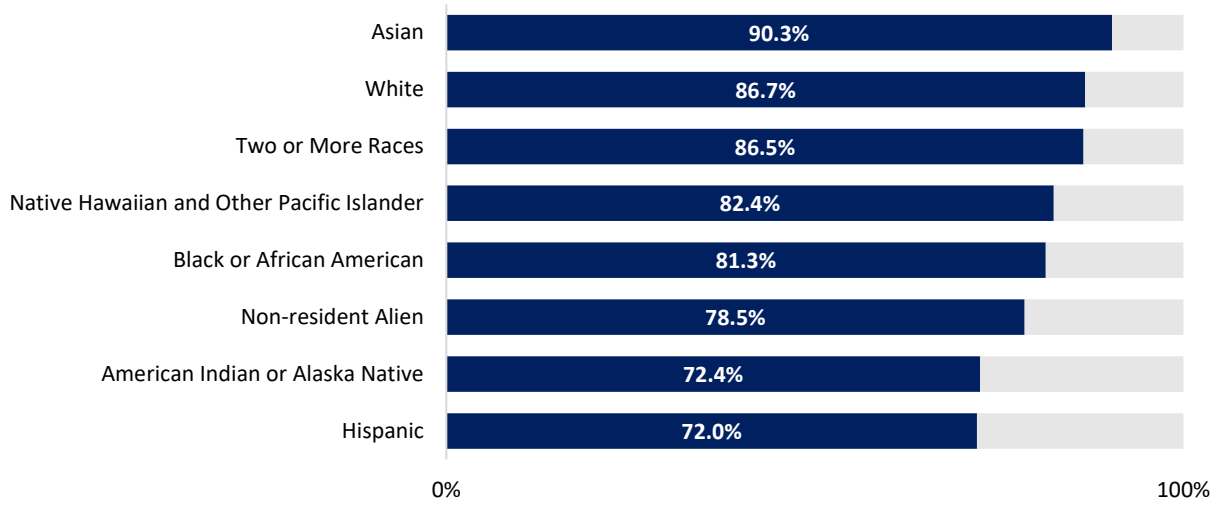
[4] All Washington data reported in this section come from the American Community Survey (ACS) 2015-2019 PUMS dataset. These data were collected prior to the COVID-19 pandemic and the widespread shift to remote learning. During that period, schools put in place programs and policies to make sure that all students were equipped with a computer and internet access so they could engage in remote learning. These actions may have had a significant effect on the number of students who have access to internet and computers at home in the state.

[5] The ACS estimates show 3,884 K-12 students and 43,687 postsecondary students living in group quarters. These students constitute less than one percent of the K-12 student population and a little less than ten percent of the postsecondary student population.

Examining differences in digital access by race

Although high-speed internet connections and computers are broadly available in the households of Washington students, access to these digital resources is not universal, and there were significant differences in access between racial groups (figure 1).[6] For example, access to high-speed internet at home ranged from over 85 percent for Asian and White students to around 72 percent for Hispanic and American Indian/Alaska Native students.

Figure 1. Washington students with high-speed internet access at home by race



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

The disparities show a similar pattern but are more significant for K-12 students (figure 2). Among K-12 students, about 92 percent of Asian students and 86 percent of White students lived in households with high-speed internet access. In contrast, only about 71 percent of American Indian/Alaska Native and Hispanic students did. Although high-speed internet access tends to be higher in Washington than national averages, the patterns in the Washington data are similar to national disparities. Nationally, K-12 students who are White (81 percent) or Asian (87 percent) were more likely to like in a household with high-speed internet access than students who are American Indian/Alaska Native (54 percent), Black (69 percent), or Hispanic (70 percent) (NEA, 2020).

The internet access trends for postsecondary students in Washington were similar (figure 3). The highest high-speed internet access rates among postsecondary students were among students of two or more races, White, and Asian students. Like K-12 students, Hispanic and American Indian/Alaska Native postsecondary students had the lowest rate of high-speed internet access at around 80 percent.

[6] Appendix A presents the racial distribution of students in Washington who are included in this analysis.

Figure 2. Washington K-12 students with high-speed internet access at home by race

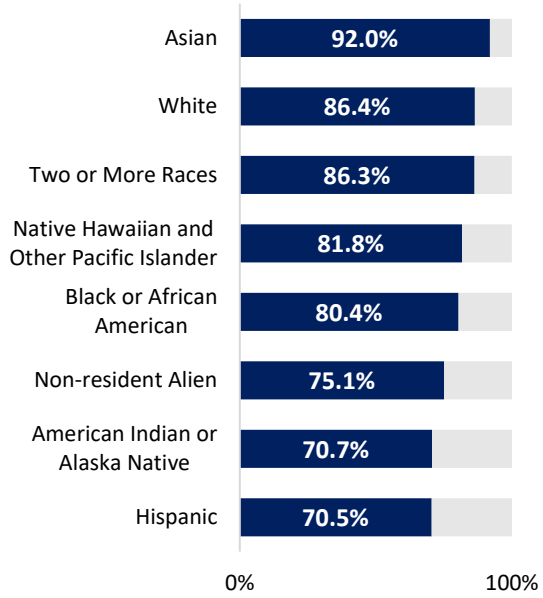
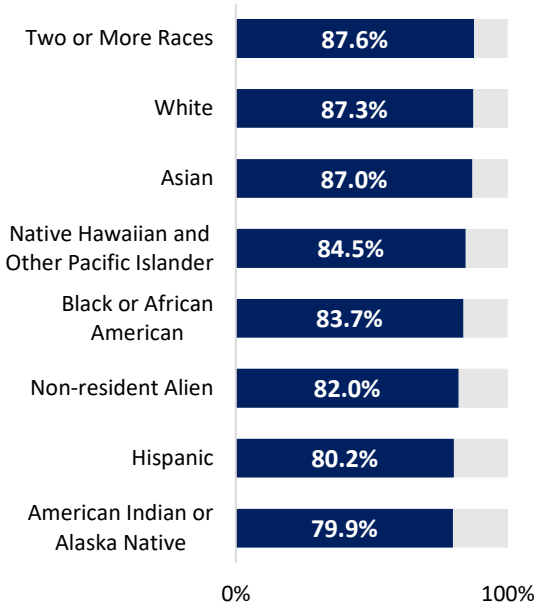


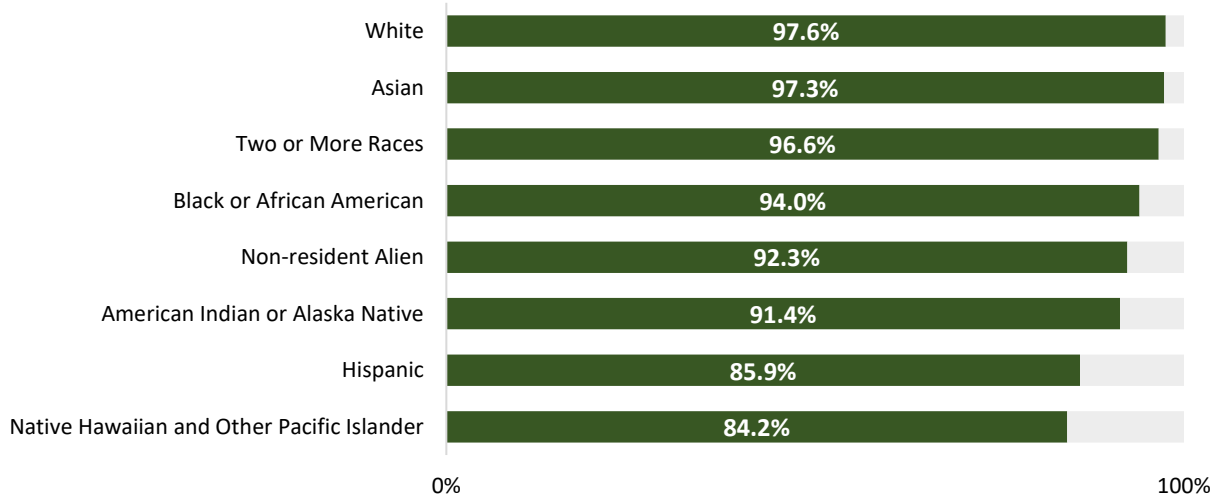
Figure 3. Washington postsecondary students with high-speed internet access at home by race



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Computers in the household were much more common than high-speed internet access, but differences between racial groups remain (figure 4). For example, about 98 percent of White students and 97 percent of Asian students in Washington lived in a household with a computer. However, only about 86 percent of Hispanic students and 84 percent of Native Hawaiian/Pacific Islander students did.

Figure 4. Washington students with computer access at home by race



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

There was considerable variation in rates of home computer access among racial groups in the K-12 population (figure 5). At the low end of the range, only about 82 percent of Native Hawaiian/Pacific Islander students and 84 percent of Hispanic students had a computer in the home. Asian and White

students had the highest rates, at 97 percent in each case. Nationally, K-12 students who are American Indian/Alaska Native (75 percent), Black (83 percent), or Hispanic (85 percent) were less likely to have an adequate device at home than their White (95 percent) and Asian peers (96 percent) (NEA, 2020).

The prevalence of computers in the household among postsecondary students showed less variation by race (figure 6). However, White and Asian students were still more likely to have a computer at home than other racial groups. On the other hand, Native Hawaiian/Pacific Islander postsecondary students were the least likely to have a computer at home (92 percent).

Figure 5. Washington K-12 students with computer at home by race

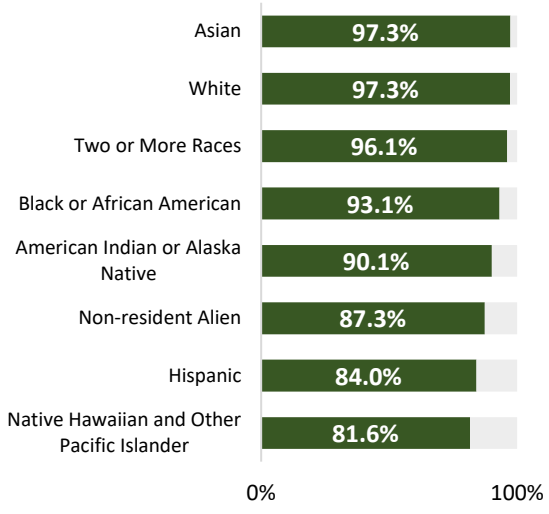
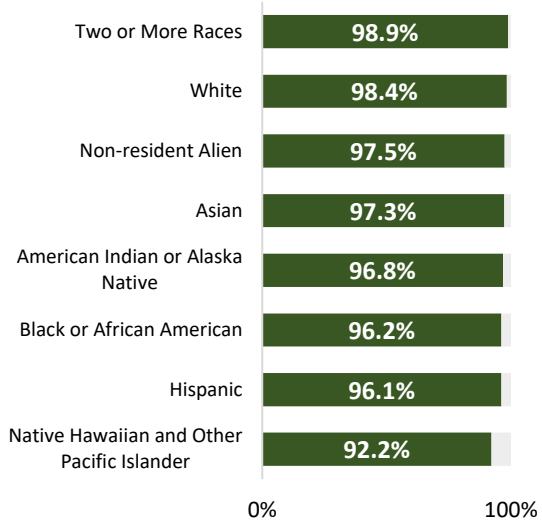


Figure 6. Washington postsecondary students with computer at home by race



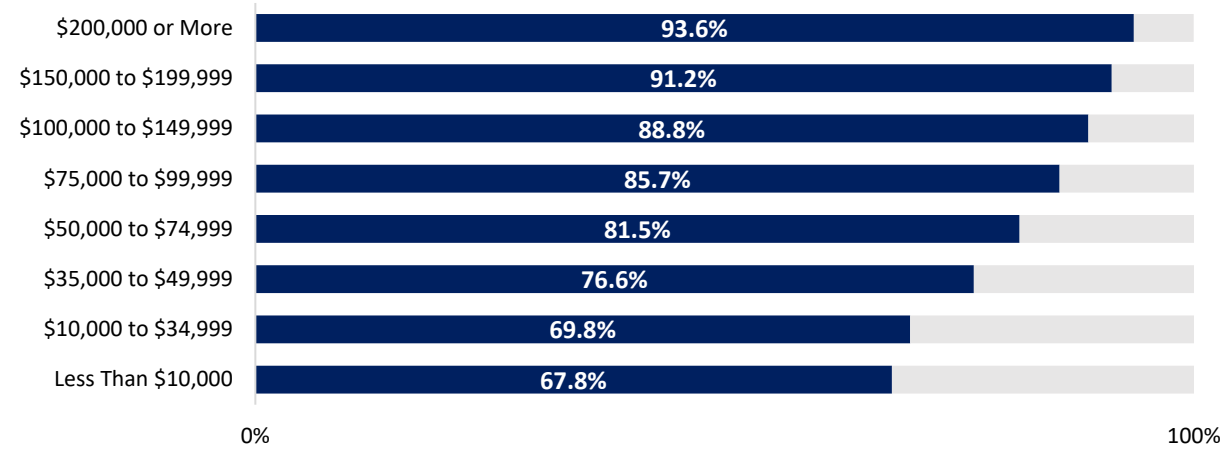
Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Examining differences in digital access by household income

Household access to resources can vary with income, and it is not surprising that we see the most disparate rates of internet and computer access among income sub-groups. Among all students in Washington, students living in households with lower incomes tended to have lower rates of high-speed internet access at home than those living in households with higher incomes (figure 7).[7] In the total student population, only 68 percent of those living in households earning less than $10,000 per year had a high-speed internet connection at home. The rate was only about 70 percent of students in households in the $10,000-$34,999 income range. The rate rises steadily along with income to almost 94 percent for households with annual incomes of $200,000 or more.

[7] Appendix B presents the household income distribution of students in Washington who are included in this analysis.

Figure 7. Washington students with high-speed internet access at home by household income



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Variation in high-speed internet access by income is significant for K-12 students (figure 8). Only about 61 percent of K-12 students living in households earning less than $10,000 had home access to high-speed internet. However, the rate rises with income to almost 94 percent for those in households earning $200,000 or more. National data show similar disparities—K-12 students whose households fell below the federal poverty level were less likely to have high-speed internet access at home (58 percent) than those who were above the federal poverty level (81 percent) (NEA, 2020).

Disparities in high-speed internet access were less pronounced for postsecondary students than K-12 students in Washington (figure 9). About 78 percent of students in the lowest income group had high-speed internet access. Rates of high-speed internet access rose steadily for each income group, reaching almost 93 percent for households earning $200,000 or more.

Figure 8. Washington K-12 students with high-speed internet access at home by household income

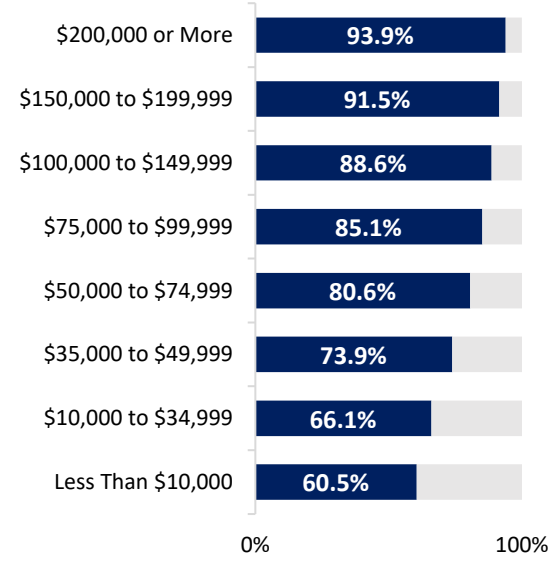
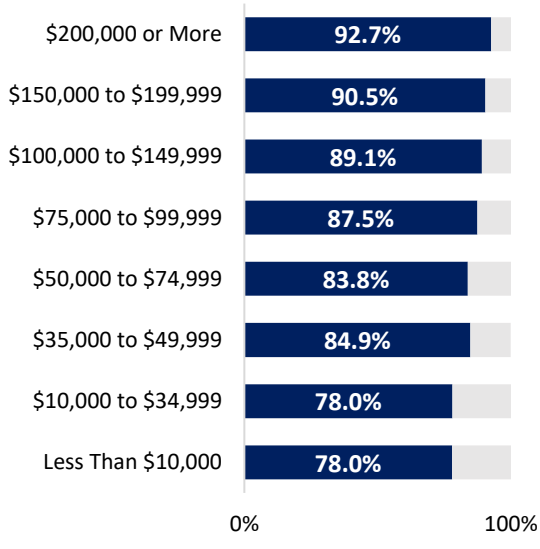


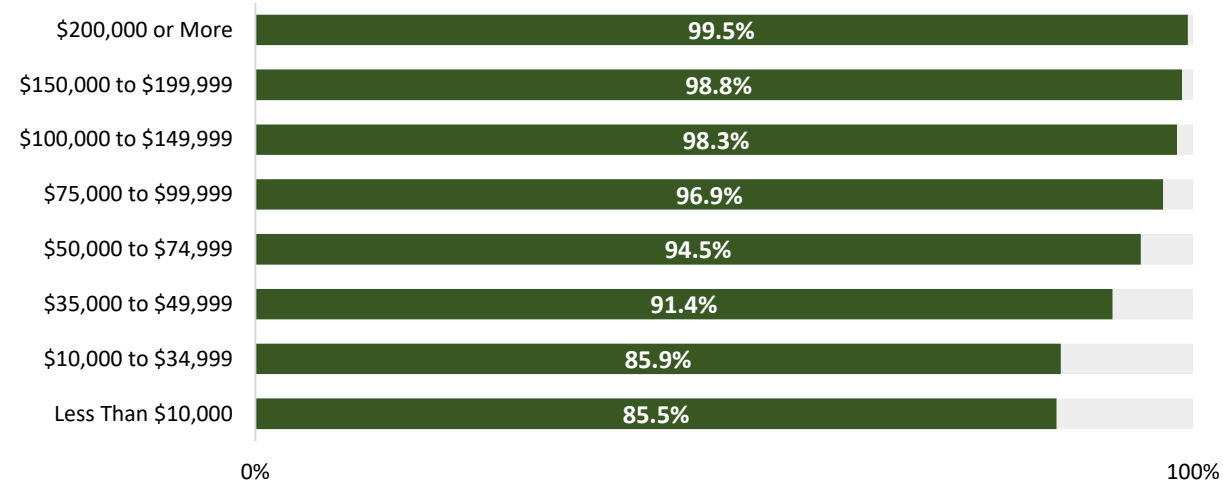
Figure 9. Washington postsecondary students with high-speed internet access at home by household income



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Computer access was more common for Washington students, but there were differences in access by income (figure 10). As with internet connections, the prevalence of computers in the home increased with income. Among all students in households earning less than $10,000 per year, about 86 percent had a home computer. The rate rises steadily as income rises, reaching over 99 percent for households earning $200,000 or more.

Figure 10. Washington students with computer access at home by income



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Disparities in computer access by income level were significant for K-12 students in Washington (figure 11). For example, only about 78 percent of students in households earning less than $10,000 had access to a computer at home, compared to more than 99 percent of students in households with the highest incomes. Nationally, K-12 students from households with incomes below the federal poverty level were also significantly less likely to have an adequate device at home (75 percent) than students about the federal poverty level (94 percent) (NEA, 2020).

Computer access at home was more common for postsecondary students than K-12 students overall (figure 12). However, those with lower household incomes were less likely to have a computer at home than those with higher incomes. Computer access ranged from 96 percent for postsecondary students in households below $10,000 in annual income to over 99 percent for students in the highest income groups.

Figure 11. Washington K-12 students with computer access at home by income

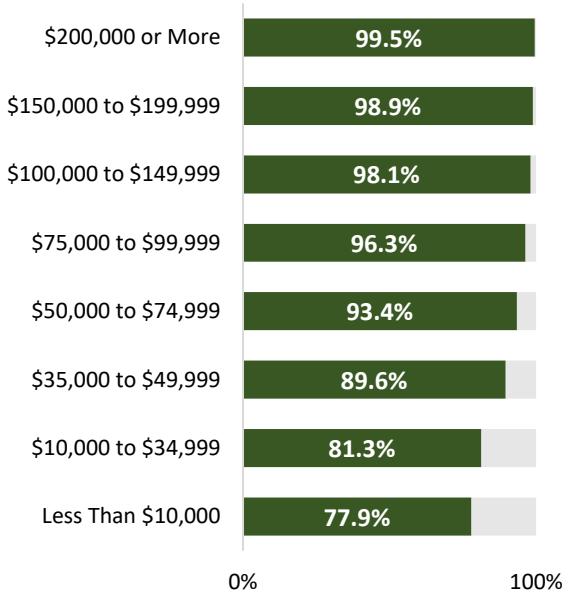


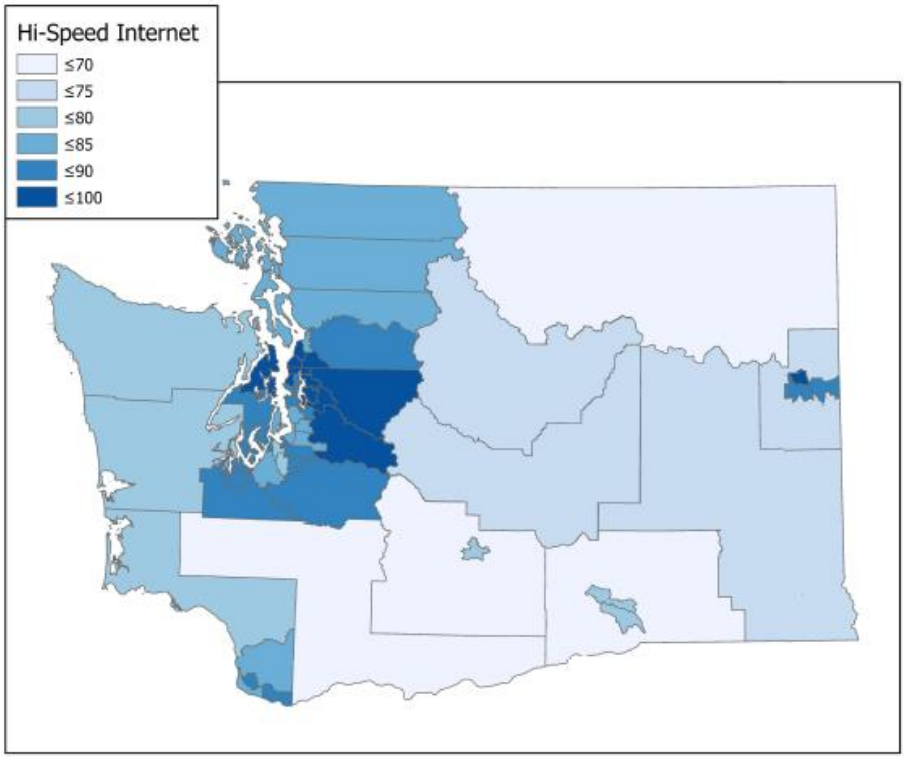
Figure 12. Washington postsecondary students with computer access at home by income

Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Examining differences in digital access by geographic region

Disparities in household income, local infrastructure, and other characteristics of households and their environments produce some disparities in digital access in different geographic regions of Washington (figure 13). Areas that may be considered more rural tended to have lower rates of students with access to high-speed internet at home than more urban areas of the state. For instance, the proportion of all students with high-speed internet access at home ranged from 55 percent in the northeastern corner of the state to more than 95 percent in some areas of King County. In general, students living in the Puget Sound region and around Spokane tended to have higher rates of high-speed internet access at home than students living in more rural areas. See Appendix C for a detailed geographic breakdown of high-speed internet access for students in Washington.

Figure 13. Washington students with high-speed internet access at home by region



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers. Geographic regions shown are U.S. Census Public Use Microdata Areas (PUMAs).

K-12 students were less likely to have high-speed internet access at home overall, and disparities between regions were more pronounced (figure 14). For instance, high-speed internet access ranged from 55 percent in the northeastern corner of the state (including Stevens, Okanogan, Pend Oreille, and Ferry Counties) to almost 97 percent in parts of King County. This Washington data corresponds with national data findings that suggest that students living in metropolitan locations were more likely to have high-speed internet access at home (80 percent) than those living in nonmetropolitan locations (66 percent) (NEA, 2020).

Postsecondary students across the state tended to be more likely to have access to high-speed internet, but notable disparities by region remained (figure 15). For example, in the northeastern corner, just 59 percent had high-speed internet access, compared to almost 95 percent in parts of King County.

Figure 14. Washington K-12 students with high-speed internet access at home by region

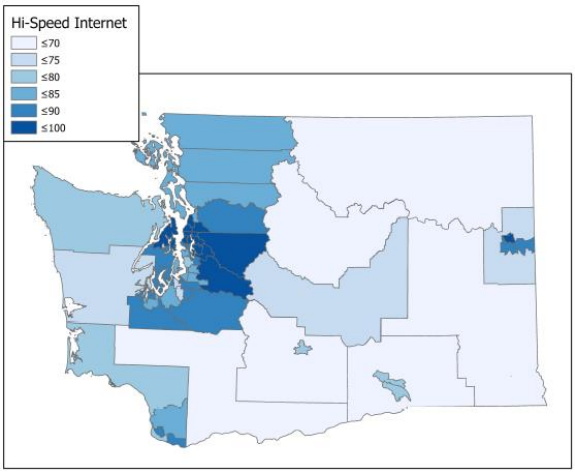
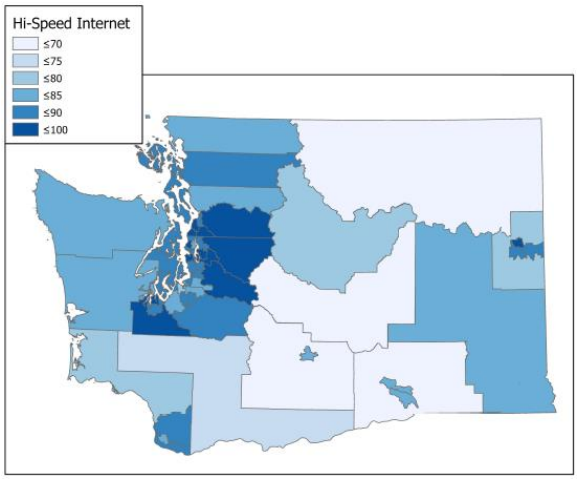


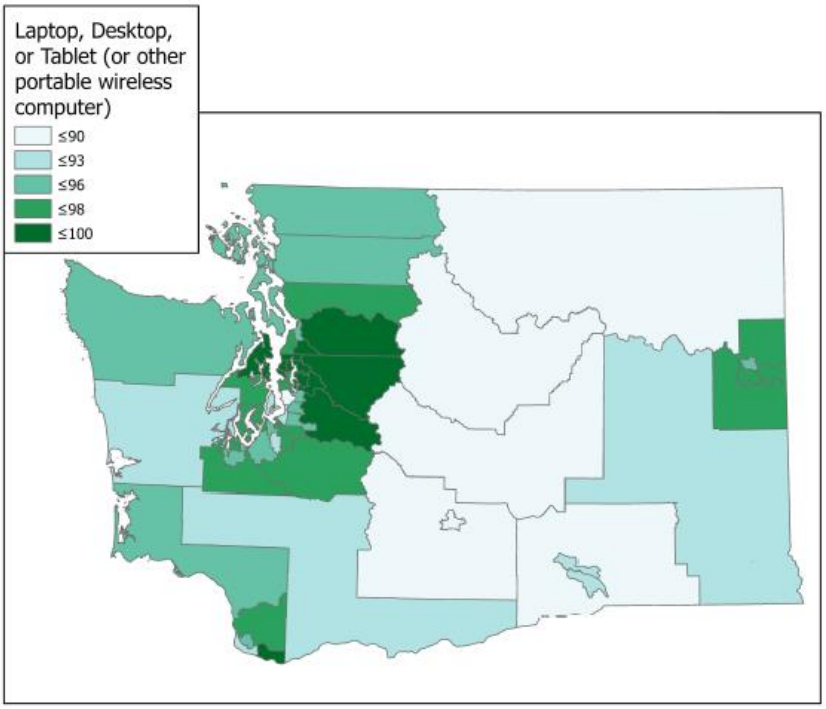
Figure 15. Washington postsecondary students with high-speed internet access at home by region



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers. Geographic regions shown are U.S. Census Public Use Microdata Areas (PUMAs).

Computer access in the state also varied by geographic region, but the disparities were less significant than for high-speed internet access (figure 16). For example, rates of computer access for all students ranged from about 82 percent in parts of Yakima County to more than 99 percent for parts of King County. See Appendix D for a detailed geographic breakdown of computer access for students in Washington.

Figure 16. Washington students with computer access at home by region



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers. Geographic regions shown are U.S. Census Public Use Microdata Areas (PUMAs).

There was significantly more variation in computer access by geographic region for K-12 students than for postsecondary students (figure 17). For instance, computer access at home ranged from about 80 percent for K-12 students in parts of Yakima County to nearly 100 percent for K-12 students in parts of King County. National data findings also suggest disparities in computer access by geography—students living in metropolitan locations were more likely to have an adequate device at home (91 percent) than those living in nonmetropolitan locations (87 percent) (NEA, 2020).

Among postsecondary students, the northeastern corner of the state (including Stevens, Okanogan, Pend Oreille, and Ferry Counties) was the only area with computer access rates below 93 percent. More areas had computer access rates above 98 percent (figure 18).

Figure 17. Washington K-12 students with computer access at home by region

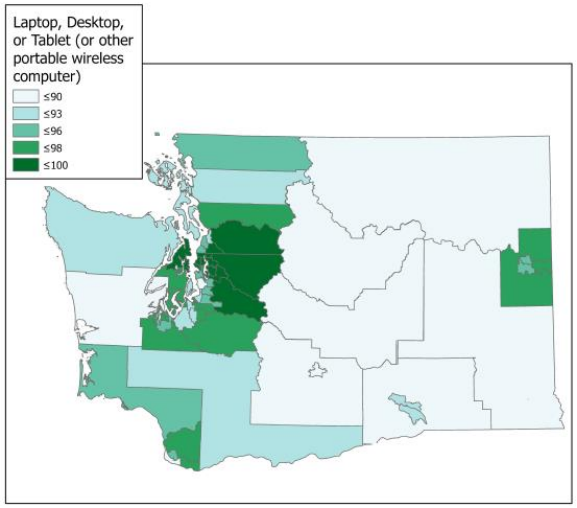
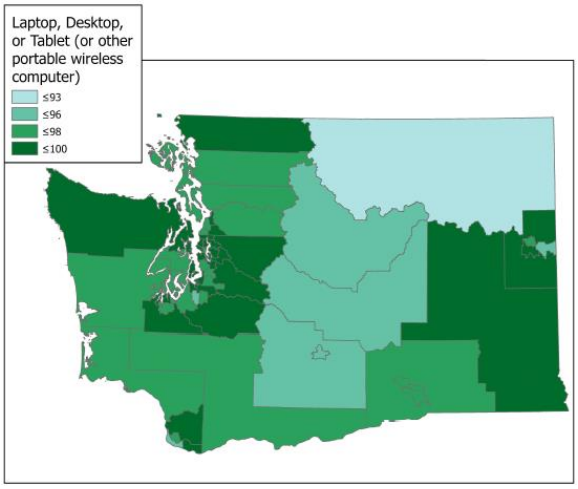


Figure 18. Washington postsecondary students with computer access at home by region



Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers. Geographic regions shown are U.S. Census Public Use Microdata Areas (PUMAs).

While many Washington students live in households with high-speed internet access and a computer, some sub-groups lack some digital resources. Overall, K-12 students have lower rates of access to high-speed internet and computers than postsecondary students in Washington, and racial, income, and regional disparities are greater for K-12 students as well. Addressing disparities in high-speed internet and computer access for K-12 students of color, students with lower household incomes, and students living in more rural areas can help close the digital divide.

Although postsecondary students in Washington tended to have higher rates of high-speed internet and computer access, there are still some disparities among student sub-groups. In particular, lower-income students and some students of color have lower rates of access to high-speed internet and computers at home that are critical for educational access and success. These disparities in digital resources may further exacerbate educational inequities that exist in our state. Therefore, addressing disparities in high-speed internet and computer access for all students in Washington is critical to ensuring educational access to help increase our state's educational attainment.

What do we know about internet and computer access for students during the COVID-19 pandemic?

Data from the ACS provides a picture of digital access before the pandemic. However, the onset of the COVID-19 crisis and widespread shift to remote learning in Spring 2020 heightened students' need for digital access. Although more current data is limited, findings from national research indicate that many students faced challenges with digital access they needed to participate in remote learning.

At the beginning of the pandemic, a nationally representative survey found that roughly one in five parents of school-aged children reported that their children would not be able to complete their schoolwork because they did not have adequate internet access at home. The same survey showed that parents of lower-income backgrounds were more likely to report that their children would need to do their homework on a cellphone (43 percent) than upper-income parents (10 percent). Lower-income households were also more likely to report a concern about paying for home broadband and cellphone bills (52 percent) than upper-income households (9 percent) (Vogels et al., 2020).[8] These findings suggest that digital access posed challenges for students during the shift to remote learning that disproportionately impacted students from lower-income families.

Teachers also reported challenges associated with students' digital access during the pandemic. A national survey found that 20 percent of teachers reported concerns about students' technology access, including a lack of internet access, device access, or challenges using technology. Teachers working in schools in towns and rural areas, schools with a higher proportion of students of color, and schools serving a higher proportion of low-income students were significantly more likely to report that some of their students did not have internet access at home. And teachers whose students had a lower rate of internet access at home reported lower levels of students completing assignments, and a lower likelihood of communicating with families during remote learning (Stelitano et al., 2020).[9] These findings help illustrate technology access issues and the potential consequences for students during the pandemic.

College students have also reported issues with digital access during the pandemic that affected their course participation. A national survey of college students found that while the majority of students had internet access at home, internet connectivity issues interfered with their ability to participate in their courses at least occasionally for almost half of students surveyed (44 percent). Nearly a quarter of students (23 percent) had hardware and software issues, which sometimes interfered with their ability to participate in their courses. The survey also found disparate technology access issues by student groups. Hispanic and Black students were more likely to experience internet connectivity issues and hardware or software issues than White students. Low-income students were also more likely to have technology access issues than higher-income students (Means and Neisler, 2020).[10] Digital access issues have impacted postsecondary students' course participation during the pandemic. Specifically, issues have disproportionately affected some students of color and low-income students, potentially exacerbating existing inequities in higher education access and attainment.

[8] Pew Research Center survey of 4,917 U.S. adults conducted April 7-12, 2020. Sample was randomly selected and survey results were weighted to be representative of the U.S. adult population.
[9] American Instructional Resources Survey of 5,978 teachers and school leaders conducted May-June 2020. Sample is nationally representative.
[10] Digital Promise and Langer Research Associates survey of 1,008 students at 2-year and 4-year institutions conducted May 13-June 1, 2020. Sample was randomly selected.

Several initiatives in Washington have emerged to help provide internet and computers to students who otherwise would not have access. For example, during the spring of 2020, the Office of Superintendent of Public Instruction (OSPI) spent $8.8 million to implement the K-12 Internet Access Program that offered students of low-income families the ability to connect to the internet through the end of the 2020-2021 school year for free if they don't have access (OSPI, 2020). And in October 2020, Governor Inslee allocated $24 million of the state's federal CARES Act funds to purchase computing devices for approximately 64,000 students and school staff across the state who did not already have a device (WA Governor's Office, 2020). These statewide measures provided necessary assistance to students and expedited access to digital resources to ensure continued access to education during the pandemic. Ensuring students have access to high-speed internet and have adequate devices at home should continue to be a priority, even as students return to in-person learning after the pandemic.

Discussion

Data and research suggest that many students lack access to the digital resources needed to fully participate in online educational activities from home, which has been especially important during the period of widespread remote learning during the pandemic. In response to the need for remote learning, decision-makers adopted several initiatives to provide students with internet and devices during the pandemic that may have improved digital access. But it is possible that some students are still struggling with the digital divide and will lose access once temporary supports dissipate after the return to in-person learning. Therefore, ensuring internet and computer access for students across the state will continue to be an essential priority for educational access and equity.

Technology also has the potential to expand access to postsecondary education opportunities. Without readily available access to physical or online higher educational opportunities, communities tend to have lower postsecondary enrollment and completion rates and educational attainment rates than those with higher education opportunities (Rosenboom and Blagg, 2018). For Washington residents who don't live near a physical campus, ensuring that they have adequate computer and internet access can provide them with opportunities to gain a postsecondary credential. Creating sustainable solutions to address the digital divide is critical to improving educational attainment for all Washington residents.

Statewide and national efforts have aimed to increase broadband access for more households. For instance, the Washington Community Economic Revitalization Board's Rural Broadband Program provides grants and loans to local governments and tribes to build infrastructure to provide high-speed, open-access broadband service to rural underserved communities.[11] Additionally, recent Washington State legislation gives public utility districts and ports new authority to provide broadband internet.[12]

Nationally, the Biden Administration's American Jobs Plan proposes to invest $100 billion to bring affordable, reliable, high-speed broadband to all Americans.[13] And in May 2021, the U.S. Department of Education and the FCC launched an outreach campaign to inform K-12 students who receive free or reduced-price lunch and postsecondary students who receive Pell Grants that they are eligible for the

[11] See: https://www.commerce.wa.gov/building-infrastructure/community-economic-revitalization-board/rural-broadband/
[12] See Engrossed Substitute House Bill 1336: https://app.leg.wa.gov/billsummary?BillNumber=1336&Initiative=false&Year=2021 and 2nd Substitute Senate Bill 5383: https://app.leg.wa.gov/billsummary?BillNumber=5383&Initiative=false&Year=2021
[13] See: https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/

temporary Emergency Broadband Benefit Program.[14] The program offers a $50 discount per month for broadband services ($75 for households on qualifying Tribal lands) and a one-time $100 discount to purchase a connected device, including a laptop, desktop, or tablet computer.

Other states have also invested resources to improve the digital divide, including increasing broadband infrastructure and addressing affordability barriers to broadband service and adequate devices for students. Some states have implemented policies to extensively measure the availability of broadband infrastructure. For example, Georgia's Achieving Connectivity Everywhere Act created detailed maps of broadband access to show unserved areas in the state and inform future internet access expansion efforts. The maps helped identify unserved areas that the FCC did not previously identify. Other states have aimed to strengthen broadband infrastructure and accessibility. For instance, in Tennessee, efforts to increase broadband infrastructure have been coupled with programs designed to increase subscription rates, like low-income assistance and digital literacy initiatives. Combining assistance programs with infrastructure expansion efforts can help expand the impact of infrastructure investments. Some states have also focused on increasing access to devices. For instance, Illinois, Michigan, and Mississippi implemented statewide programs to expand access to home devices for students during the pandemic. Some efforts, like those in New York City, prioritized providing devices to students with the highest need—including students who live in shelters or temporary housing or foster care settings, students with disabilities, multilingual learners, and students who qualify for free and reduced-price lunch (Kelley and Sisneros, 2020). These policies help illustrate some of the ways that states across the country are working to narrow the digital divide to increase internet and computer access for students.

Access to technology is critical to participating in coursework, especially during the widespread remote learning period during the COVID-19 pandemic. Access to technology is also essential for college students and may expand the reach of online postsecondary opportunities for individuals who cannot attend programs on physical campuses. The digital divide issue—especially for students of color, low-income households, and those living in more rural areas—was amplified during the pandemic. However, it will continue to be an important issue in educational access and equity even after the pandemic.

Conclusion

Digital resources, including high-speed internet and computer access at home, are integral to educational access. Students of all ages rely on the internet for academic assignments and need adequate devices to engage with their coursework while at home. In Washington, research from before the pandemic shows that approximately 17 percent of K-12 students and 14 percent of postsecondary students did not have access to high-speed internet at home. Roughly 6 percent of K-12 students and 2 percent of postsecondary students did not have a computer at home. Statewide initiatives during the pandemic have provided internet and computers to students who lacked access so they could participate in remote learning during the pandemic. These initiatives have likely accelerated digital

[14] The Emergency Broadband Benefit Program provides support for internet and devices to help low-income households stay connected during the COVID-19 pandemic and will end when the fund is expended or 6 months after the end of the public health emergency. See: https://www.fcc.gov/emergency-broadband-benefit-program and https://www.ed.gov/news/press-releases/department-education-launches-outreach-campaign-millions-k-12-students-and-federal-pell-grant-recipients-now-eligible-monthly-discounts-broadband-internet-service.

access and possibly narrowed the digital divide for Washington students. Ensuring that these supports are sustained beyond the pandemic should be a continued priority in our state's efforts to increase educational access and attainment.

Digital resources may also help increase access to postsecondary education opportunities, especially for Washington residents who do not live near a physical campus. Data suggest that high-speed internet and computer access rates are lower for some more rural areas of the state. Without high-speed internet and computers at home, individuals living in these more rural areas may have challenges accessing online postsecondary education opportunities. Promoting access to digital resources, including high-speed internet and computers, for all Washington households can help ensure educational access and equity that can help increase postsecondary attainment in the state. Closing the digital divide may be a critical step to opening educational opportunities and social and economic wellbeing for all Washington residents.

Methodology Notes

The report uses U.S. Census American Community Survey (ACS) sample surveys conducted in the five years from 2015 through 2019. The data are weighted to estimate population headcounts. The analysis for the report selected records for students from Kindergarten through graduate school. The selection resulted in estimates of household and personal characteristics for 1,591,055 students, of whom 1,176,656 were K-12 and 414,399 were in postsecondary institutions. Students living in group quarters are excluded from the sample because the questions are asked only of family or individual households and exclude people living in group quarters, including college dormitories.

We focus attention on responses to two sets of questions. One asks if there is high-speed internet access in the household. The other asks whether there is a laptop or desktop computer in the home or if there is a tablet or other mobile computer. We combine responses to these two questions to estimate students living in households with some type of computer.

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Appendix A.

Table A. Distribution of students in Washington by race

Race	All Students		K-12		Postsecondary	
	Number	Percent	Number	Percent	Number	Percent
American Indian or Alaska Native	18,219	1.2%	14,701	1.3%	3,518	0.9%
Asian	100,422	6.3%	67,003	5.7%	33,419	8.1%
Black or African American	59,869	3.8%	42,448	3.6%	17,421	4.2%
Hispanic	274,208	17.2%	231,706	19.7%	42,502	10.3%
Native Hawaiian and Other Pacific Islander	10,075	0.6%	7,630	0.7%	2,445	0.6%
White	908,139	57.1%	659,277	56.0%	248,862	60.1%
Other Race	3,381	0.2%	2,617	0.2%	764	0.2%
Two or More Races	128,147	8.1%	106,064	9.0%	22,083	5.3%
Non-resident Alien	88,595	5.6%	45,210	3.8%	43,385	10.5%
Total	1,591,055	100.0%	1,176,656	100.0%	414,399	100.0%

Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Appendix B.

Table B. Distribution of students in Washington by household income

Income	All Students		K-12		Postsecondary	
	Number	Percent	Number	Percent	Number	Percent
Less Than $10,000	61,660	3.9%	35,885	3.1%	25,775	6.2%
$10,000 to $34,999	208,774	13.1%	143,926	12.2%	64,848	15.7%
$35,000 to $49,999	157,066	9.9%	118,249	10.1%	38,817	9.4%
$50,000 to $74,999	254,426	16.0%	188,908	16.1%	65,518	15.8%
$75,000 to $99,999	227,842	14.3%	171,814	14.6%	56,028	13.5%
$100,000 to $149,999	320,476	20.1%	241,670	20.5%	78,806	19.0%
$150,000 to $199,999	162,523	10.2%	121,595	10.3%	40,928	9.9%
$200,000 or More	198,288	12.5%	154,609	13.1%	43,679	10.5%
Total	1,591,055	100.0%	1,176,656	100.0%	414,399	100.0%

Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.

Appendix C.

Table C. Washington students with high-speed internet access at home by geographic region

Geographic Region	All Students	K-12 Students	Postsecondary Students
Benton & Franklin Counties--Pasco, Richland (North) & West Richland Cities	76.6%	75.6%	80.9%
Benton County (East Central)--Kennewick & Richland (South) Cities	79.1%	78.1%	83.5%
Chelan & Douglas Counties	70.4%	68.8%	78.3%
Clallam & Jefferson Counties	76.9%	76.0%	80.0%
Clark County (North)--Battle Ground City & Orchards	84.6%	83.9%	88.3%
Clark County (Southeast)--Vancouver (East), Camas & Washougal Cities	87.8%	87.6%	88.7%
Clark County (Southwest)--Vancouver City (West & Central)	81.6%	79.9%	86.8%
Clark County (West Central)--Salmon Creek & Hazel Dell	88.4%	89.8%	83.7%
Cowlitz, Pacific & Wahkiakum Counties	76.9%	76.8%	77.2%
Grant & Kittitas Counties	71.6%	72.2%	69.9%
Grays Harbor & Mason Counties	75.1%	73.7%	81.6%
King County (Central)--Renton City, Fairwood, Bryn Mawr & Skyway	87.6%	86.8%	89.9%
King County (Central)--Sammamish, Issaquah, Mercer Island & Newcastle Cities	93.9%	94.1%	93.2%
King County (Far Southwest)--Federal Way, Des Moines Cities & Vashon Island	83.5%	81.8%	89.5%
King County (Northeast)--Snoqualmie City, Cottage Lake, Union Hill & Novelty Hill	93.4%	93.1%	94.6%
King County (Northwest Central)--Greater Bellevue City	95.6%	96.6%	92.7%
King County (Northwest)--Redmond, Kirkland Cities, Inglewood & Finn Hill	94.3%	96.5%	89.0%
King County (Northwest)--Shoreline, Kenmore & Bothell (South) Cities	91.9%	93.0%	89.3%
King County (Southeast)--Maple Valley, Covington & Enumclaw Cities	91.7%	91.4%	92.8%
King County (Southwest Central)--Kent City	84.7%	83.0%	89.2%
King County (Southwest)--Auburn City & Lakeland	82.3%	81.8%	83.7%
King County (West Central)--Burien, SeaTac, Tukwila Cities & White Center	81.0%	78.8%	87.5%
Kitsap County (North)--Bainbridge Island City & Silverdale	92.4%	93.5%	89.0%

Geographic Region (cont'd)	All Students	K-12 Students	Postsecondary Students
Kitsap County (South)--Bremerton & Port Orchard Cities	89.0%	89.6%	87.2%
Lewis, Klickitat & Skamania Counties	68.5%	66.9%	74.6%
Pierce County (Central)--Tacoma City (Central)	75.5%	74.2%	78.3%
Pierce County (East Central)--Puyallup City & South Hill	89.2%	89.5%	88.3%
Pierce County (North Central)--Tacoma (Port) & Bonney Lake (Northwest) Cities	86.2%	86.6%	84.7%
Pierce County (Northwest)--Peninsula Region & Tacoma City (West)	88.8%	89.0%	88.2%
Pierce County (South Central)--Tacoma City (South), Parkland & Spanaway	77.5%	74.6%	85.9%
Pierce County (Southeast)--Graham, Elk Plain & Prairie Ridge	85.8%	85.4%	87.3%
Pierce County (West Central)--Lakewood City & Joint Base Lewis-McChord	83.9%	83.5%	84.8%
Seattle City (Downtown)--Queen Anne & Magnolia	89.2%	88.8%	89.5%
Seattle City (Northeast)	87.0%	91.7%	83.6%
Seattle City (Northwest)	92.6%	93.5%	91.4%
Seattle City (Southeast)--Capitol Hill	88.5%	88.3%	88.8%
Seattle City (West)--Duwamish & Beacon Hill	86.3%	84.1%	92.1%
Skagit, Island & San Juan Counties	82.1%	80.9%	86.5%
Snohomish County (Central & Southeast)--Lake Stevens & Monroe Cities	89.4%	89.0%	91.0%
Snohomish County (Central)--Everett City (Central & East) & Eastmont	84.7%	83.4%	88.3%
Snohomish County (North)--Marysville & Arlington Cities	84.3%	84.3%	84.3%
Snohomish County (South Central)--Bothell (North), Mill Creek Cities & Silver Firs	92.8%	92.5%	94.1%
Snohomish County (Southwest)--Edmonds, Lynnwood & Mountlake Terrace Cities	90.5%	90.3%	90.9%
Snohomish County (West Central)--Mukilteo & Everett (Southwest) Cities	91.7%	90.8%	94.0%
Spokane County (East Central)--Greater Spokane Valley City	85.4%	85.3%	85.7%
Spokane County (North Central)--Spokane City (North)	90.5%	90.4%	91.0%
Spokane County (Outer)--Cheney City	73.8%	71.1%	79.9%
Spokane County (South Central)--Spokane City (South)	85.9%	86.0%	85.6%

Geographic Region (cont'd)	All Students	K-12 Students	Postsecondary Students
Stevens, Okanogan, Pend Oreille & Ferry Counties	55.4%	54.7%	59.4%
Thurston County (Central)--Olympia, Lacey & Tumwater Cities	85.4%	84.3%	88.2%
Thurston County (Outer)	88.2%	86.8%	92.6%
Walla Walla, Benton (Outer) & Franklin (Outer) Counties	66.5%	66.0%	68.3%
Whatcom County--Bellingham City	81.3%	81.2%	81.5%
Whitman, Asotin, Adams, Lincoln, Columbia & Garfield Counties	73.5%	65.9%	82.9%
Yakima County (Central)--Greater Yakima City	76.7%	75.3%	82.2%
Yakima County (Outer)--Sunnyside & Grandview Cities	61.6%	61.0%	65.7%

Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.
Note: Geographic regions listed are U.S. Census Public Use Microdata Areas (PUMAs), which are non-overlapping, statistical geographic areas that partition each state or equivalent entity into geographic areas containing no fewer than 100,000 people each. The Census Bureau defines PUMAs for the tabulation and dissemination of decennial census and American Community Survey (ACS) Public Use Microdata Sample (PUMS) data.

Appendix D.

Table D. Washington students with computer access at home by geographic region

Geographic Region	All Students	K-12 Students	Postsecondary Students
Benton & Franklin Counties--Pasco, Richland (North) & West Richland Cities	91.7%	90.7%	96.3%
Benton County (East Central)--Kennewick & Richland (South) Cities	92.6%	91.4%	97.8%
Chelan & Douglas Counties	86.7%	84.9%	95.3%
Clallam & Jefferson Counties	93.5%	91.9%	99.1%
Clark County (North)--Battle Ground City & Orchards	97.2%	96.9%	98.6%
Clark County (Southeast)--Vancouver (East), Camas & Washougal Cities	98.2%	97.9%	99.5%
Clark County (Southwest)--Vancouver City (West & Central)	91.2%	89.8%	95.7%
Clark County (West Central)--Salmon Creek & Hazel Dell	95.6%	95.1%	97.1%
Cowlitz, Pacific & Wahkiakum Counties	94.4%	93.8%	96.6%
Grant & Kittitas Counties	88.9%	86.4%	95.8%
Grays Harbor & Mason Counties	90.5%	88.9%	97.8%
King County (Central)--Renton City, Fairwood, Bryn Mawr & Skyway	95.5%	94.5%	98.4%
King County (Central)--Sammamish, Issaquah, Mercer Island & Newcastle Cities	98.2%	98.1%	98.9%
King County (Far Southwest)--Federal Way, Des Moines Cities & Vashon Island	92.4%	90.7%	98.6%
King County (Northeast)--Snoqualmie City, Cottage Lake, Union Hill & Novelty Hill	98.6%	98.4%	99.4%
King County (Northwest Central)--Greater Bellevue City	99.2%	99.1%	99.5%
King County (Northwest)--Redmond, Kirkland Cities, Inglewood & Finn Hill	99.3%	99.8%	98.0%
King County (Northwest)--Shoreline, Kenmore & Bothell (South) Cities	98.6%	98.4%	99.0%
King County (Southeast)--Maple Valley, Covington & Enumclaw Cities	99.0%	99.3%	98.1%
King County (Southwest Central)--Kent City	94.4%	93.2%	97.6%
King County (Southwest)--Auburn City & Lakeland	94.5%	93.6%	97.4%
King County (West Central)--Burien, SeaTac, Tukwila Cities & White Center	88.6%	85.9%	96.7%
Kitsap County (North)--Bainbridge Island City & Silverdale	98.6%	98.7%	98.0%

Geographic Region (cont'd)	All Students	K-12 Students	Postsecondary Students
Kitsap County (South)--Bremerton & Port Orchard Cities	96.6%	96.3%	97.4%
Lewis, Klickitat & Skamania Counties	92.9%	91.9%	96.9%
Pierce County (Central)--Tacoma City (Central)	94.0%	91.9%	98.6%
Pierce County (East Central)--Puyallup City & South Hill	97.2%	97.2%	97.2%
Pierce County (North Central)--Tacoma (Port) & Bonney Lake (Northwest) Cities	97.3%	96.9%	98.9%
Pierce County (Northwest)--Peninsula Region & Tacoma City (West)	97.4%	97.3%	97.5%
Pierce County (South Central)--Tacoma City (South), Parkland & Spanaway	92.5%	91.7%	94.8%
Pierce County (Southeast)--Graham, Elk Plain & Prairie Ridge	97.2%	96.6%	100.0%
Pierce County (West Central)--Lakewood City & Joint Base Lewis-McChord	93.2%	91.7%	97.1%
Seattle City (Downtown)--Queen Anne & Magnolia	99.0%	98.9%	99.0%
Seattle City (Northeast)	98.8%	98.2%	99.3%
Seattle City (Northwest)	99.0%	99.3%	98.6%
Seattle City (Southeast)--Capitol Hill	96.2%	96.0%	96.5%
Seattle City (West)--Duwamish & Beacon Hill	96.1%	95.3%	98.2%
Skagit, Island & San Juan Counties	93.8%	92.7%	97.8%
Snohomish County (Central & Southeast)--Lake Stevens & Monroe Cities	98.3%	98.4%	97.8%
Snohomish County (Central)--Everett City (Central & East) & Eastmont	94.2%	92.8%	98.2%
Snohomish County (North)--Marysville & Arlington Cities	97.3%	97.1%	97.9%
Snohomish County (South Central)--Bothell (North), Mill Creek Cities & Silver Firs	98.5%	98.5%	98.5%
Snohomish County (Southwest)--Edmonds, Lynnwood & Mountlake Terrace Cities	96.1%	95.2%	97.6%
Snohomish County (West Central)--Mukilteo & Everett (Southwest) Cities	96.1%	95.5%	97.6%
Spokane County (East Central)--Greater Spokane Valley City	96.4%	96.5%	96.0%
Spokane County (North Central)--Spokane City (North)	95.2%	94.6%	97.2%
Spokane County (Outer)--Cheney City	97.1%	96.3%	98.9%
Spokane County (South Central)--Spokane City (South)	97.0%	95.6%	99.7%

Geographic Region (cont'd)	All Students	K-12 Students	Postsecondary Students
Stevens, Okanogan, Pend Oreille & Ferry Counties	88.6%	88.0%	92.0%
Thurston County (Central)--Olympia, Lacey & Tumwater Cities	95.3%	94.6%	97.2%
Thurston County (Outer)	97.1%	96.5%	99.3%
Walla Walla, Benton (Outer) & Franklin (Outer) Counties	89.8%	87.8%	96.8%
Whatcom County--Bellingham City	96.0%	93.8%	99.3%
Whitman, Asotin, Adams, Lincoln, Columbia & Garfield Counties	92.0%	86.6%	98.7%
Yakima County (Central)--Greater Yakima City	87.2%	85.6%	93.8%
Yakima County (Outer)--Sunnyside & Grandview Cities	82.4%	80.4%	95.6%

Source: American Community Survey (ACS) 2015-2019 PUMS data. Sample excludes students living in group quarters, such as college dormitories or juvenile detention centers.
Note: Geographic regions listed are U.S. Census Public Use Microdata Areas (PUMAs), which are non-overlapping, statistical geographic areas that partition each state or equivalent entity into geographic areas containing no fewer than 100,000 people each. The Census Bureau defines PUMAs for the tabulation and dissemination of decennial census and American Community Survey (ACS) Public Use Microdata Sample (PUMS) data.

About the Washington Student Achievement Council

The Washington Student Achievement Council is committed to increasing educational opportunities and attainment in Washington. The Council has three main functions:

- Lead statewide strategic planning to increase educational attainment.
- Administer programs that help people access and pay for college.
- Advocate for the economic, social, and civic benefits of higher education.

The Council has nine members. Four members represent each of Washington's major education sectors: four-year public baccalaureates, four-year private colleges, public community and technical colleges, and K-12 public schools. Five are citizen members, including one current student.

If you would like copies of this document in an alternative format, please contact the Washington Student Achievement Council at:

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