

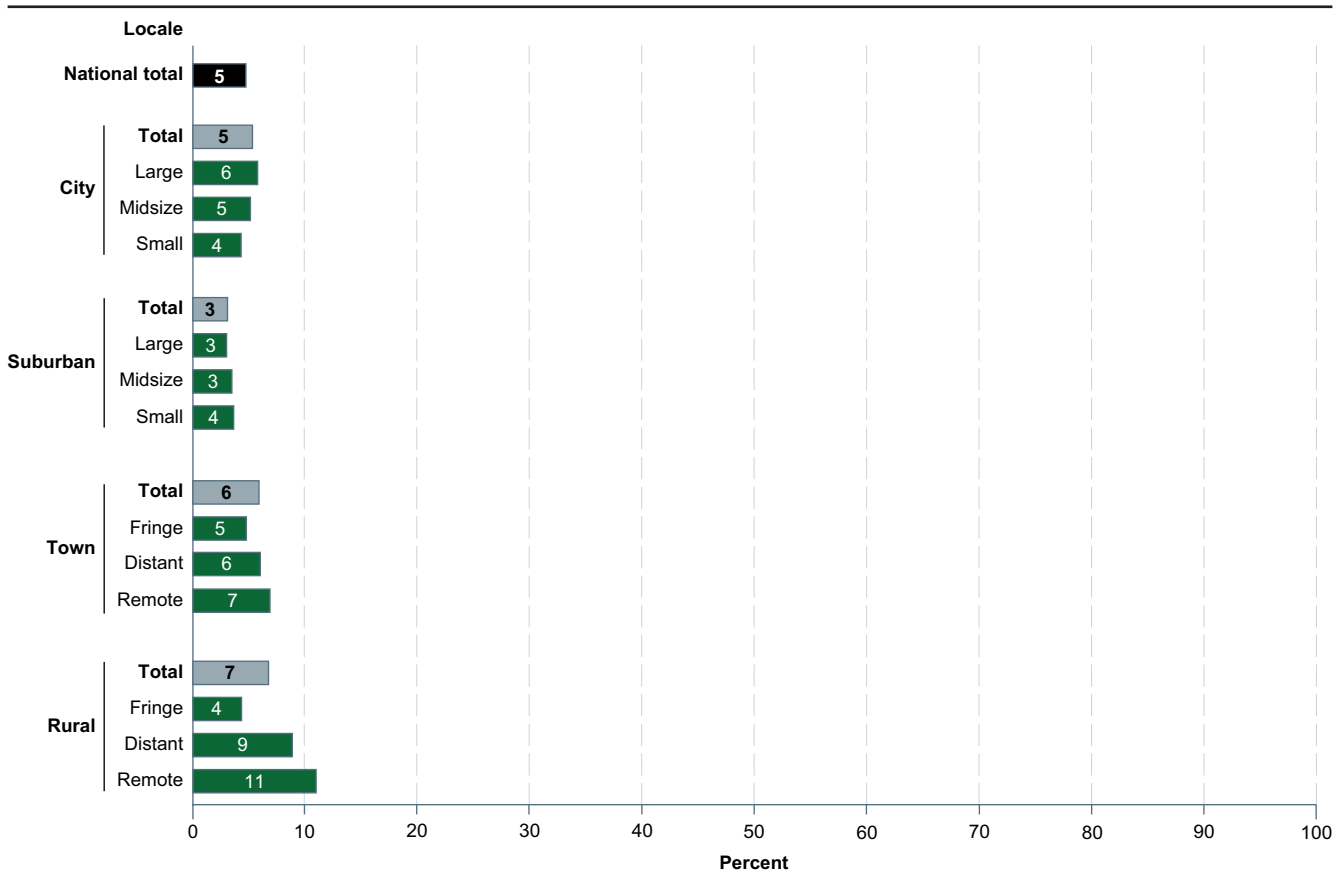
## Rural Students' Access to the Internet

*In 2019, some 76 percent of students living in rural areas had fixed broadband internet access at home. This was lower than the percentages living in towns (79 percent), cities (80 percent), and suburban areas (87 percent).*

In recent years, the majority of the nation's students have accessed the Internet to work on homework assignments. However, not all students have reliable internet access in their homes.<sup>1</sup> Mixed findings exist about the relationship between internet access and student academic performance. Nevertheless, some studies have found evidence of a positive association between home computer and internet access and academic achievement.<sup>2, 3</sup> Additionally, high percentages of schools have relied on distance education during the COVID-19 pandemic.<sup>4</sup> During the pandemic, teachers of students with limited

home internet access were less likely to report that they were able to communicate with students at home and were less likely to report that their students were completing class work on time.<sup>5</sup> Thus, students who do not have access to the Internet at home may be at risk for negative academic outcomes. This indicator analyzes differences in student access to the Internet at home by locale prior to the pandemic.<sup>6</sup> Additionally, this indicator investigates differences in student access to the Internet by poverty level. Data for this indicator come from the American Community Survey (ACS).<sup>7</sup>

**Figure 1. Among 5- to 17-year-old students with known poverty status living in households, percentage with no access to the Internet or only dial-up access to the Internet at home, by home locale: 2019**

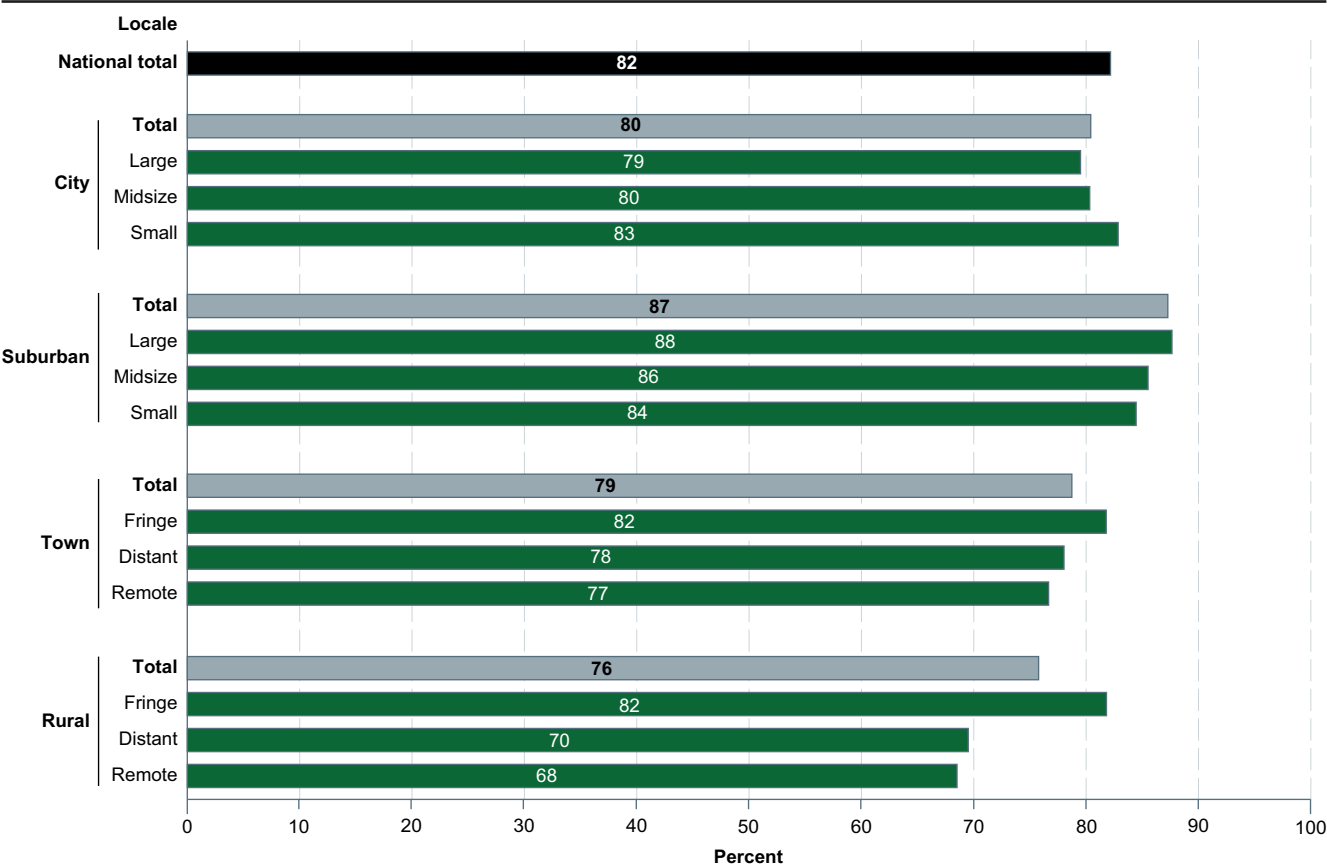


NOTE: "No access to the Internet or only dial-up access to the Internet" includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service. Data are based on sample surveys of the entire population residing within the United States. This figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Excludes children under age 15 who are not related to the householder by birth, marriage, or adoption (e.g., foster children) because their family and individual income is not known and a poverty status cannot be determined for them. Although rounded numbers are displayed, figures are based on unrounded data. SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2019, Restricted-Use Data File. See *Digest of Education Statistics 2020*, table 218.70.

In 2019, some 5 percent of all 5- to 17-year-old students, or 2.4 million students, were living in homes without internet access.<sup>8</sup> The percentage of students without internet access varied based on the locale of their homes. Seven percent of students in rural areas, or 663,000 students, were without home internet access. This was higher than the percentages living in towns (6 percent),

cities (5 percent), and suburban areas (3 percent). Eleven percent of students in the remote rural sublocale lived in homes without internet access in 2019, which was higher than the national percentage. It was also higher than the percentages in all other sublocales (ranging from 3 percent in large suburban areas to 9 percent in distant rural areas).

**Figure 2. Among 5- to 17-year-old students with known poverty status living in households, percentage with fixed broadband access to the Internet at home, by home locale: 2019**

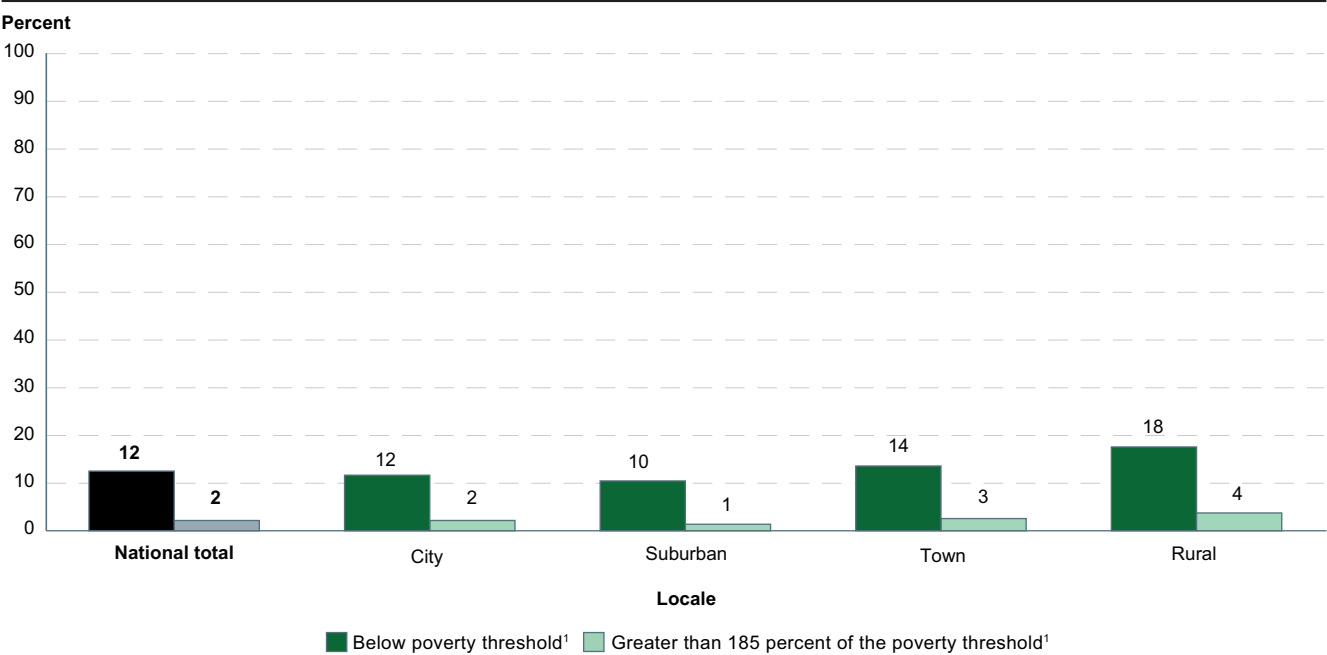


NOTE: "Fixed broadband access to the Internet" excludes households with mobile broadband but includes households with all other non-dial-up internet services, such as DSL, cable modem, and fiber-optic cable. Data are based on sample surveys of the entire population residing within the United States. This figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Excludes children under age 15 who are not related to the householder by birth, marriage, or adoption (e.g., foster children) because their family and individual income is not known and a poverty status cannot be determined for them. Although rounded numbers are displayed, figures are based on unrounded data. SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2019, Restricted-Use Data File. See *Digest of Education Statistics 2020*, table 218.70.

Students who access the Internet at home may do so through different methods. These methods can include using a fixed broadband subscription,<sup>9</sup> using a mobile broadband subscription,<sup>10</sup> or using a method that does not depend on having a subscription.<sup>11</sup> Some 82 percent of all 5- to 17-year-old students had fixed broadband internet access at home. Eleven percent had a mobile broadband subscription. Two percent accessed the Internet without a subscription. The prevalence of internet access methods varied by home location. In 2019, compared with other locales, students in rural areas less commonly had home access to fixed broadband internet and more commonly had mobile broadband internet access at home. For example, 76 percent of students living in rural areas

had fixed broadband internet access at home compared to 79 percent living in towns, 80 percent in cities, and 87 percent in suburban areas. Students in remote rural areas had a lower percentage of fixed broadband internet access (69 percent) than students in any other locale or sublocale except for distant rural areas. In contrast, the percentage of students living in rural areas who had mobile broadband internet access at home (16 percent) was higher than the percentages living in towns (13 percent), cities (12 percent), and suburban areas (8 percent). Furthermore, the percentages of students who lived in distant and remote rural areas who had mobile broadband access (20 and 18 percent, respectively) were higher than the corresponding percentages in all other sublocales.

**Figure 3. Percentage of 5- to 17-year-old students with no access to the Internet or only dial-up access to the Internet at home, by home locale and selected poverty status: 2019**

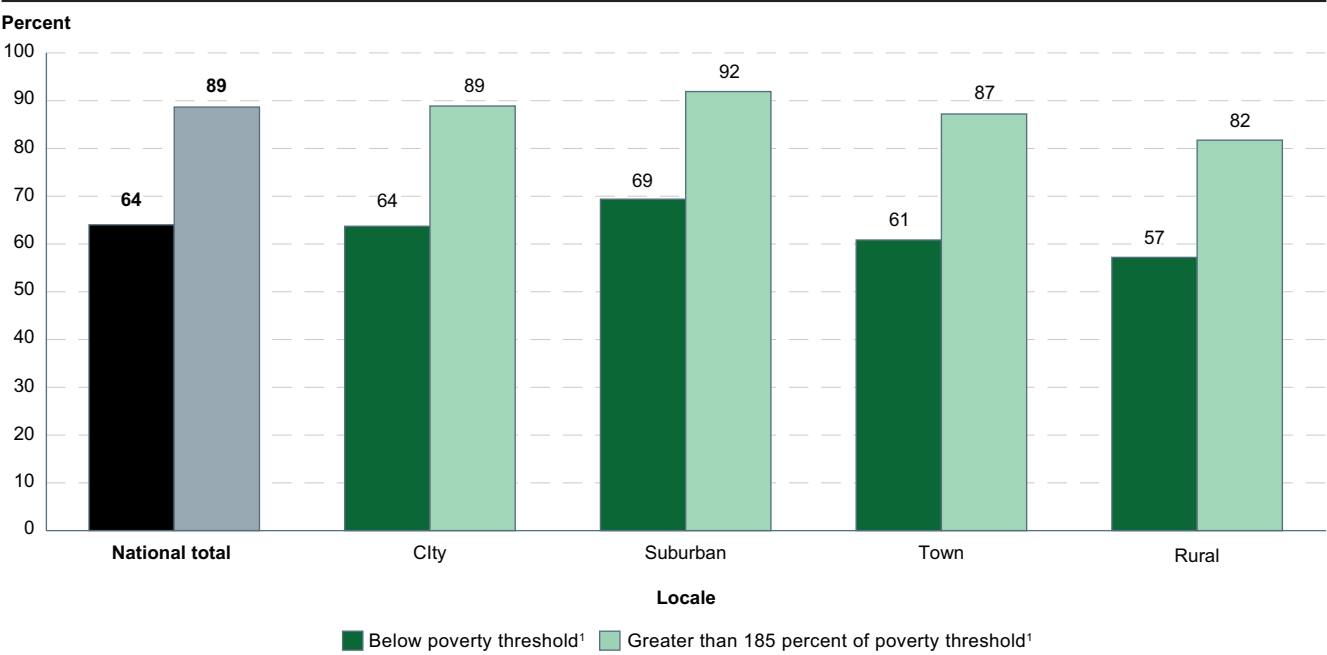


<sup>1</sup> Students are considered to be in poverty if their family income falls below the Census Bureau's poverty threshold. The Census Bureau determines poverty status using a set of money income thresholds that vary by family size and composition and that are updated annually to account for inflation. In 2019, for example, the poverty threshold for a family of four with two children was \$25,926. Respondents were interviewed throughout the year and reported on the income they received during the previous 12 months. For additional information about poverty status, see <https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html>.  
NOTE: "No access to the Internet or only dial-up access to the Internet" includes households where no member accesses the Internet at home as well as households where members access the Internet only with a dial-up service. Data are based on sample surveys of the entire population residing within the United States. This figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Excludes children under age 15 who are not related to the householder by birth, marriage, or adoption (e.g., foster children) because their family and individual income is not known and a poverty status cannot be determined for them. Although rounded numbers are displayed, figures are based on unrounded data.  
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2019, Restricted-Use Data File. See *Digest of Education Statistics 2020*, table 218.70.

The percentage of 5- to 17-year-old students without internet access at home in 2019 varied by poverty status.<sup>12</sup> For example, nationally, 12 percent of students living in families below the poverty threshold did not have access to the Internet at home. This was higher than the 2 percent of high-income families, with incomes greater than 185 percent of the poverty threshold, who were without internet access at home. This pattern was observed across each locale. However, the gap between the percentages of students living below the poverty threshold versus those

living in high-income families who had no home internet access varied by locale. For example, a 14 percentage point gap existed between students in rural areas based on their poverty status. This gap in rural areas was larger than the gaps for towns (11 points), cities (9 points), and suburban areas (9 points). A 16 percentage point gap existed in remote rural areas. This gap in remote rural areas was larger than the gaps in most other locales, particularly in all sublocales of cities and suburban areas.

Figure 4. Percentage of 5- to 17-year-old students with fixed broadband access to the Internet at home, by home locale and selected poverty status: 2019



<sup>1</sup> Students are considered to be in poverty if their family income falls below the Census Bureau's poverty threshold. The Census Bureau determines poverty status using a set of money income thresholds that vary by family size and composition and that are updated annually to account for inflation. In 2019, for example, the poverty threshold for a family of four with two children was \$25,926. Respondents were interviewed throughout the year and reported on the income they received during the previous 12 months. For additional information about poverty status, see <https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html>.  
NOTE: "Fixed broadband access to the Internet" excludes households with mobile broadband but includes households with all other non-dial-up internet services, such as DSL, cable modem, and fiber-optic cable. Data are based on sample surveys of the entire population residing within the United States. This figure includes only students living in households, because respondents living in group quarters (e.g., shelters, healthcare facilities, or correctional facilities) were not asked about internet access. Excludes children under age 15 who are not related to the householder by birth, marriage, or adoption (e.g., foster children) because their family and individual income is not known and a poverty status cannot be determined for them. Although rounded numbers are displayed, figures are based on unrounded data.  
SOURCE: U.S. Department of Commerce, Census Bureau, American Community Survey (ACS), 2019, Restricted-Use Data File. See *Digest of Education Statistics 2020*, table 218.70.

The percentage of 5- to 17-year-old students with fixed broadband internet access at home in 2019 also varied by poverty status. For example, in rural areas, 57 percent of students living in families with incomes below the poverty threshold had access to fixed broadband at home. This was lower than the 82 percent of rural students in high-income families who had access to fixed broadband. Similarly, this pattern of lower percentages of students in

families with incomes below the poverty threshold than in these high-income families living in homes with fixed broadband appeared in cities, suburban areas, and towns. The percentage point gap in students' access to fixed broadband between these families was larger in rural areas than in suburban areas (25 vs. 23 percent). However, this gap in rural areas was not measurably different from the gaps in cities and towns.

**Endnotes:**

<sup>1</sup> Auxier, B., and Anderson, M. (2020). *As Schools Close Due to the Coronavirus, Some U.S. Students Face a Digital 'Homework Gap.'* Washington, DC: Pew Research Center. Retrieved July 19, 2022, from <https://www.pewresearch.org/fact-tank/2020/03/16/as-schools-close-due-to-the-coronavirus-some-u-s-students-face-a-digital-homework-gap/>.

<sup>2</sup> Daoud, R., Starkey, L., Eppel, E., Vo, T.D., and Sylvester, A. (2021). The Educational Value of Internet Use in the Home for School Children: A Systematic Review of Literature. *Journal of Research on Technology in Education*, 53(4): 353-374. Retrieved July 19, 2022, from <https://www.tandfonline.com/doi/abs/10.1080/15391523.2020.1783402>.

<sup>3</sup> Hampton, K.N., Fernandez, L., Robertson, C.T., and Bauer, J.M. (2020). *Broadband and Student Performance Gaps*. James H. and Mary B. Quello Center, Michigan State University. Retrieved June 21, 2022, from [https://quello.msu.edu/wp-content/uploads/2020/03/Broadband\\_Gap\\_Quello\\_Report\\_MSU.pdf](https://quello.msu.edu/wp-content/uploads/2020/03/Broadband_Gap_Quello_Report_MSU.pdf).

<sup>4</sup> Irwin, V., Zhang, J., Wang, X., Hein, S., Wang, K., Roberts, A., York, C., Barmer, A., Bullock Mann, F., Dilig, R., and Parker, S. (2021). Impact of the Coronavirus Pandemic on the Elementary and Secondary Education System. *Report on the Condition of Education 2021* (NCES 2021-144). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved July 19, 2022, from <https://nces.ed.gov/pubs2021/2021144.pdf>.

<sup>5</sup> Stelitano, L., Doan, S., Woo, A., Diliberti, M.K., Kaufman, J.H., and Henry, D. (2020). *The Digital Divide and COVID-19: Teachers' Perceptions of Inequities in Students' Internet Access and Participation in Remote Learning*. Santa Monica, CA: RAND Corporation. Retrieved June 21, 2022, from [https://www.rand.org/pubs/research\\_reports/RRA134-3.html](https://www.rand.org/pubs/research_reports/RRA134-3.html).

<sup>6</sup> Please visit NCES's [Education Across America website](#) for the definition of locale.

<sup>7</sup> Excludes children under age 15 who are not related to the householder by birth, marriage, or adoption (e.g., foster children) because their family and individual income is not known and a poverty status cannot be determined for them.

<sup>8</sup> In this indicator, "without internet access" and "no internet access" refer to having no internet access or access only through dial-up.

<sup>9</sup> Excludes mobile broadband, but includes all other non-dial-up internet services, such as DSL, cable modem, and fiber-optic cable.

<sup>10</sup> Includes computer and cell phone plans.

<sup>11</sup> Includes respondents living in a city or town that provides free internet services for its residents.

<sup>12</sup> In this indicator, "high-income families" are those with incomes greater than 185 percent of the poverty threshold. Students are considered to be in poverty if their family income falls below the Census Bureau's poverty threshold, which is a dollar amount that varies depending on a family's size and composition and is updated annually to account for inflation. In 2019, for example, the poverty threshold for a family of four with two children was \$25,926. Respondents were interviewed throughout the year and reported on the income they received during the previous 12 months. For additional information about poverty status, see <https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html>.

**Reference tables:** *Digest of Education Statistics 2020*, table 218.70

**Glossary:** Distance education; Locale codes

**Related indicators and resources:** [Children's Internet Access at Home \[Condition of Education\]](#); [Impact of the Coronavirus Pandemic on the Elementary and Secondary Education System \[Condition of Education\]](#)