

NO HOME LEFT  FFLINE

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**ABOUT THE DATA**

## Methodology

### Sources

The Affordable Connectivity Program (ACP) eligible household units were estimated using the Public Use Microdata Sample (PUMS) from the American Community Survey (ACS) via the Census Bureau Data API (2016-2020). PUMS data used include all 50 states, the District of Columbia, and Puerto Rico.

ACP enrollment numbers were sourced from the Universal Server Administration Co (USAC) and updated as of August 2022.

ISP coverage estimates were sourced from Form 477 data published by the FCC with data updated as of June 30, 2021. Estimates were also established as being free plans with the ACP benefit from an ESH collected source of locations where ISPs offer plans less than \$30 (free with the ACP benefit). The list of ISP's coverage is based on 477 data submitted by the ISPs, and the "free with ACP" ISP plans is pulled from the ISP's publicly available plan information.

Data crosswalk files Missouri Census Data Center Geocorr Tool were used to map PUMA areas to zip, places, counties, and states using 2018 data for the 50 states. Due to Puerto Rico being unavailable in the 2018 Geocorr tool release, Puerto Rico was mapped using 2022 definitions of zip and places. In addition, Puerto Rico PUMAs were mapped with the Census-provided 2010 PUMA equivalency files to define the crosswalks between PUMAs and places.

### Variable Description and Source

VARIABLES	DESCRIPTION	SOURCE	YEAR
<b>ACP Eligible</b>	Estimated Households meeting the ACP eligibility requirements in the 50 states and DC. Place level data includes Puerto Rico.	PUMS	2020
<b>ACP Enrolled (National, State, and Place)</b>	A sum of the total national households enrolled in the 50 states and DC from USAC's ACP enrollment numbers. Place level data includes Puerto Rico.	USAC ACP Enrollment	August 29, 2022 (National, State) June 2022 (Report, Place) August 2022 (ACP Data Dash)
<b>ACP Adoption Rate (%)</b>	ACP adoption rates are calculated using ACP enrolled households divided by ACP eligible households	PUMS, USAC	PUMS 2020, USAC 2022
<b>ACP Eligible and Unconnected</b>	Estimated households meeting the ACP eligibility requirements and with no high speed connection (No high-speed: Cell phone internet only, Dial-up only OR no internet)	PUMS 2020 & Geocorr	PUMS 2020, Geocorr 2018

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<b>ACP Eligible and Receiving Government Benefit</b>	Estimated households meeting ACP eligibility requirements that are participating in at least one of the following programs: SNAP, Medicaid, Public Assistance Income, Supplemental Security Income and/or having an Income-to-poverty ratio below the 200% poverty threshold.	PUMS	2020
<b>ACP Eligible and Covered by a "free with ACP" broadband plans</b>	Estimated households who are both eligible for ACP and located in a census tract where there is one block within the tract that offers a plan that becomes free when the ACP benefit is applied(\$30 or less).	Form 477 Data, ESH Collected list of ISPs offering free plans, PUMS	Form 477 2022, PUMS 2020
<b>ACP-Enrolled Households and Receiving Government Benefit</b>	Estimated households enrolled in ACP and also receiving SNAP, WIC, and/or Medicaid	USAC Additional Data	July 2022

## Calculations

### ACP-Eligible Household

The variables used from PUMS to identify ACP Eligible Households are:

1. HINS4: Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability
2. FS: Yearly food stamp/Supplemental Nutrition Assistance Program recipients
3. PAP: Public assistance income over the past 12 months (any amount)
4. SSIP: Supplemental Security Income over the past 12 months (any amount)
5. POVIP: Income-to-poverty ratio below the 200% poverty threshold

The household weight variable (WGTP) is used to estimate the total number of eligible households at the PUMA area code. According to ACP guidelines, four roommates who live together but do not share money are four households. They can have one ACP benefit each, four in total. In this example, the four eligible roommates will count as one ACP-eligible household, although we recognize that there are four ACP-eligible individuals. Our estimate only includes the unique

households. A limitation of this current estimate is that the PUMS data did not include other assistance programs and Tribal specific programs data. Our estimates may be slightly underestimating the true number of ACP-eligible households due to the limitation of PUMS data.

We use the 2018 release of data crosswalk files from the Missouri Census Data Center ([mcdc.missouri.edu/applications/geocorr.html](https://mcdc.missouri.edu/applications/geocorr.html)) to estimate ACP-eligible households at zip, place/city, county, and state.

### ACP Enrolled Household

USAC provides enrollment data at the state level weekly, and enrollment data at the zip code, and county level for the months of January to August 2022.

To estimate the ACP enrollment in city level, the crosswalk files (2018 version) from the Missouri Census Data Center was used to find the percent of households within the city boundaries by each zip code.

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### Unconnected Household

The variables used from PUMS to identify unconnected households are:

1. ACCESSINET: Access to the Internet
2. DIALUP: Dial-up service
3. HISPEED: Broadband (high speed) Internet service such as cable, fiber optic, or DSL service
4. OTHSVCEX: Other Internet service
5. SATELLITE: Satellite Internet service

The household weight variable is used to estimate the total number of unconnected households at the PUMA area code, then used crosswalk files from the Missouri Census Data Center for estimates at the zip, place/city, county, and state levels.

### ACP Eligible and Unconnected

Any households meeting the aforementioned requirements for ACP eligibility and unconnected were defined as ACP-eligible and unconnected households, and the household weight variable in PUMS and Geocorr crosswalk files were used to estimate the total number of ACP-eligible and unconnected households at city/place, zip, county, and state level.

### ACP Eligible and Receiving Government Benefit

The variables used from PUMS to identify households receiving one or more government benefits are:

1. HINS4: Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability
2. FS: Yearly food stamp/Supplemental Nutrition Assistance Program recipients
3. PAP: Public assistance income over the past 12 months (any amount)
4. SSIP: Supplemental Security Income over the past 12 months (any amount)

Any household that meets the ACP Eligible criteria listed above and households receiving government benefits are included in this estimate. The household weight variable is used to estimate the total, and the geocorr crosswalk files are used to estimate this at the Census place level.

### ACP Eligible Households and Covered by a "free with ACP" broadband plan

The estimate uses Form 477 coverage data, and an EducationSuperHighway -collected list of ISPs and their plan. We also use our estimate of ACP-eligible households and unconnected at the county level. Those county numbers are crosswalked with a Geocorr county to census tract file to make estimates at a lower level.

Given the limitations in the availability of ISP data, our estimate assumes that if an ISP offers a particular plan free with the ACP, the same plan would be available across the state as long as the ISP offers coverage in a particular area. This assumption may not hold true in all cases and would mean the true population with access to these "Free with ACP" plans would be lower than our estimate.

Within the Form 477 data, an ISP will report if they have coverage for a particular census block. Our estimate assumes if an ISP covers a particular census block that, the coverage will extend to the entire census tract. This assumption likely overestimates given that there may be blocks within a tract not covered by an ISP and due to the shortfalls of Form 477 data. It is possible when a block is marked as covered by an ISP, the ISP does not, in fact, cover the whole block.

If a plan is available at minimum speeds of 25 Mbps for download and 3 Mbps for upload for an area for \$30 or less a month, that is considered a plan that is available for free with the ACP benefit.

### ACP Enrolled Households and Receiving Government Benefits (SNAP, WIC, Medicaid)

This is an estimated value of the percentage of ACP-Enrolled households who are also currently receiving SNAP, WIC, or Medicaid. The ACP enrolled households by government benefit programs were estimated by using USAC ACP application data (Applicant-Selected Eligibility Categories on National Verifier (NV)) and ACP subscription data by Method of Verification. The estimation method was as follows. First, the proportion of application to subscription through NV was calculated for each government benefit program. Second, the proportion of application to subscription is then multiplied by the number of ACP Enrolled through the

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NV to estimate the number of ACP Enrolled who are also receiving SNAP, WIC, or Medicaid to obtain the total number of ACP enrolled households through NV. Third, since the USAC data only shows the Applicant-Selected Eligibility Categories on National Verifier (NV) Applications, we assume this same proportion applies to ACP Enrolled using Lifeline and Alternative Verification processes. Therefore, the same proportion of application to subscription in NV were used for Lifeline and other Alternative Verification processes to obtain a total number of ACP Enrolled by government benefit programs through different verification methods.

Total households receiving SNAP were obtained from USDA SNAP data tables from FY 2022. An estimate of the total households receiving WIC uses the total number of women receiving WIC from USDA WIC data tables from June 2022. An estimate of the total households receiving Medicaid was calculated from Census PUMS. Using the estimate of the number of ACP Enrolled who are also receiving SNAP, WIC, or Medicaid, we divide each estimate by category to the total households of that category for the percentage of ACP Eligible Households that are also receiving SNAP, WIC, or Medicaid.

### ACP Data Dashboard

The dashboard includes metrics previously described and uses enrollment data from USAC and eligibility data from the census. It shows the enrollment rates of most cities. The boundaries and definitions of those cities are using census place files. For optimization, census-designated places (CDP) with less than 5000 households except those from Hawaii (as all cities in Hawaii are measured as CDPs) have been removed, but the data can be requested from ESH. Enrollment in the data dashboard is updated to the most recent available numbers and reflects adoption rates from January to August 2022.

Puerto Rico as a territory in total and its cities are included on the enrollment dashboard. Overall totals referenced in the report do not include Puerto Rico; therefore total numbers found in the dashboard will differ from estimates in the overall report.

### National Best Practice Goals

The national best practice is based on all census places and their adoption rates as of May 31, 2022. Of all places in the 50 states and Washington D.C., we

found the 99th percentile for adoption rates was an adoption rate of 61%. If the nation enrolled at the national best practice rate of 61%, we estimate 31.4 million households will have enrolled. If previously unconnected households enroll at the same rate as the general population as a whole, we estimate that 11 million households will have enrolled and have access to the internet where they previously were unconnected. These 11 million would represent nearly two-thirds of the affordability gap.

**No Home Left Offline 2021. Full Report and Methodology, [click here](#).**

### Unconnected Households and Communities

Using the 2019 1-Year American Community Survey (ACS), we define households that are unconnected as any household with dial-up with no other type of Internet subscription, households with cellular data plan with no other type of Internet subscription, and any household with no internet access.

We define unconnected communities as census tracts in metropolitan statistical areas in all 50 states, including the District of Columbia, where the total percentage of unconnected households is 25% or more. Internet subscription data at the census tract level is provided by the 2019 5-Year ACS.

### Households in the Broadband Affordability Gap

We define these households as households that are unconnected but have access to high-speed Internet infrastructure but cannot afford to connect. According to the ACS, for households with annual incomes of less than \$20,000, only 27% have high-speed broadband at home. By comparison, 92% of households with annual incomes of \$75,000 or more have high-speed broadband. Because of the strong correlation between income and internet adoption, we assume any unconnected household with infrastructure available and with an income of less than \$75,000 as households in the broadband affordability gap. Using the ACS, we estimate the number of unconnected households by state that make less than \$75,000. We estimate that 18.1 million households are in the broadband affordability gap. For households that are unconnected due to infrastructure, more information is provided below in the “Availability of Broadband Networks” section.



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### Availability of Broadband Networks

Using Pew Research, June 2021 Mobile Technology and Home Broadband 2021, “...25% say they do not have a home subscription because broadband service is not available where they live or not available at an acceptable speed”, we estimate that 7.1 million of the estimated unconnected households are unconnected because of lack of infrastructure or insufficient infrastructure. To determine broadband infrastructure availability by state, we analyzed the Speedtest by Ookla Global Fixed and Mobile Network Performance Dataset. This analysis included speed test data from fixed networks from unit areas called quadkeys across the 50 states during Q3 2020, Q4 2020, Q1 2021, and Q2 2021. We assumed each unit area with no data or quadkeys with download/upload speeds less than 25/3 Mbps as areas that lack broadband infrastructure or have insufficient broadband infrastructure. Each quadkey is mapped to its state, and the proportion of quadkeys that lack or have insufficient broadband infrastructure is divided by the total number of quadkeys for that state to estimate the proportion of households in any state that are unconnected and also lack infrastructure. Once we estimate the number of households nationwide and by state that are unconnected and also lack infrastructure, we estimate the number of unconnected households with broadband infrastructure available by taking the complement. Hence, we estimate that 21.1 million households are unconnected but have broadband infrastructure available.

### Multi-family residential housing (MDUs) and the digital divide

The percentage of unconnected households in multifamily dwelling units (MDUs) and public housing is an estimate based on EducationSuperHighway's data of MDUs combined with HUD housing data and census reported figures of overall total households in a state in the broadband affordability gap. Unconnected households in MDUs and public housing are estimated using local census unconnected rates applied to the full dataset of MDUs. An unconnected household is defined as those with no internet access, cell-only internet, or dial-up-only internet.