Uplands Region

State of Digital Inclusion

Center for Regional Development

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Section I - Background & Justification

The Regional Opportunity Initiatives (ROI), also known as the Uplands region, and the Purdue Center for Regional Development (PCRD) partnered to develop a comprehensive regional digital inclusion plan. The Uplands consists of eleven counties in south-central Indiana: Brown, Crawford, Daviess, Dubois, Greene, Lawrence, Martin, Monroe, Orange, Owen, and Washington.

This report is the first step in the planning process and provides valuable information to the county digital advisory teams (CDATs) as well as the regional digital advisory team (RDAT). Ensuing planning steps will include public input and drafting a county and regional digital inclusion plan. The main objective of this plan is to make the region more digital inclusive by focusing not only on broadband infrastructure but also digital literacy, devices, community and economic development, and quality of life in general.

This state of digital inclusion report was compiled using a mixed methods approach. An innovative individual digital capital survey was conducted. In addition to the survey data, multiple secondary data sources were analyzed including but not limited to Microsoft, GoDaddy, U.S. Census Bureau, Federal Communications Commission (FCC), M-Lab, and school district data, among others.

This report consists of several sections where regional and county-level data are presented. The second section discusses socioeconomic trends, including the digital economy, to set the stage and context in the region.

The third section looks at broadband deployment data from the Federal Communications Commission (FCC) to provide a detailed understanding of the broadband technologies available and visualize underserved areas—defined as areas with no access to at least 100 download and 20 upload (100/20 for short) megabit per second (Mbps) speeds. The current FCC broadband definition of 25/3 is also presented. County-level speed test results were also analyzed in this section. This section also analyzed Census data to identify areas in digital distress as well as homework gaps. An overview of the digital divide index is also discussed in this section.

In section four, findings from the digital capital survey are discussed, which focus on digital inclusion differences between counties while section five looks at differences between groups in the region.

The main objective of this report is to provide useful information to the CDATs and RDAT as they begin drafting digital inclusion plans for their communities.

Section II - Socioeconomic Trends

This section examines socioeconomic trends in the region to provide a better understanding of the context under which digital inclusion is taking place. These trends are not meant to be comprehensive. Rather, they provide a quick snapshot of multiple metrics associated with technology adoption. Notice that multiple sources are used.

First, population change and race & ethnicity breakdowns are reviewed between 2010-2019. These metrics provide an overall sense of population growth in the region as well as diversity. Next, the share of the population among specific age groups is reviewed to understand if the region's population structure is shifting. This is important because technology adoption is strongly associated with age. Younger age groups are more digitally savvy while their older counterparts required a bit more time and assistance to adopt digital technologies.

Next, educational attainment among those ages 25 years or older is examined. Again, educational attainment is a strong predictor of technology adoption and the ability to leverage it to improve an individual's quality of life. Closely related to educational attainment is income, which is analyzed next. A unique metric called per capita market income is reviewed since income is also highly associated with internet adoption and use of digital technology.

The share of self-employed and innovative entrepreneurs is reviewed next. These two metrics are highly associated with technology use and in fact, require access to adequate digital technology and use of digital applications in order to compete and grow. Regarding internet adoption and use, a new metric is introduced as a proxy to internet use among residents and businesses in the region. This metric gauges active and highly active websites per 100 residents and is strongly associated with positive economic impacts.

Finally, digital economy trends are reviewed. The concept of the digital economy continues to evolve but currently it includes a list of more than 150 industries that are digitizing at a fast pace or have a significant impact on the digital economy (e.g., data centers, retailers that sell primarily online, advanced manufacturing, etc.). Likewise, a look at the growth of jobs in the region is reviewed to better understand the demands regarding levels of digital skills. In other words, of the jobs being generated or lost in the region, did they require low, middle, or high levels of digital skills. Remote work is also reviewed to better gauge the breadth and depth of this strategy in the region.

II. Population Change & Race

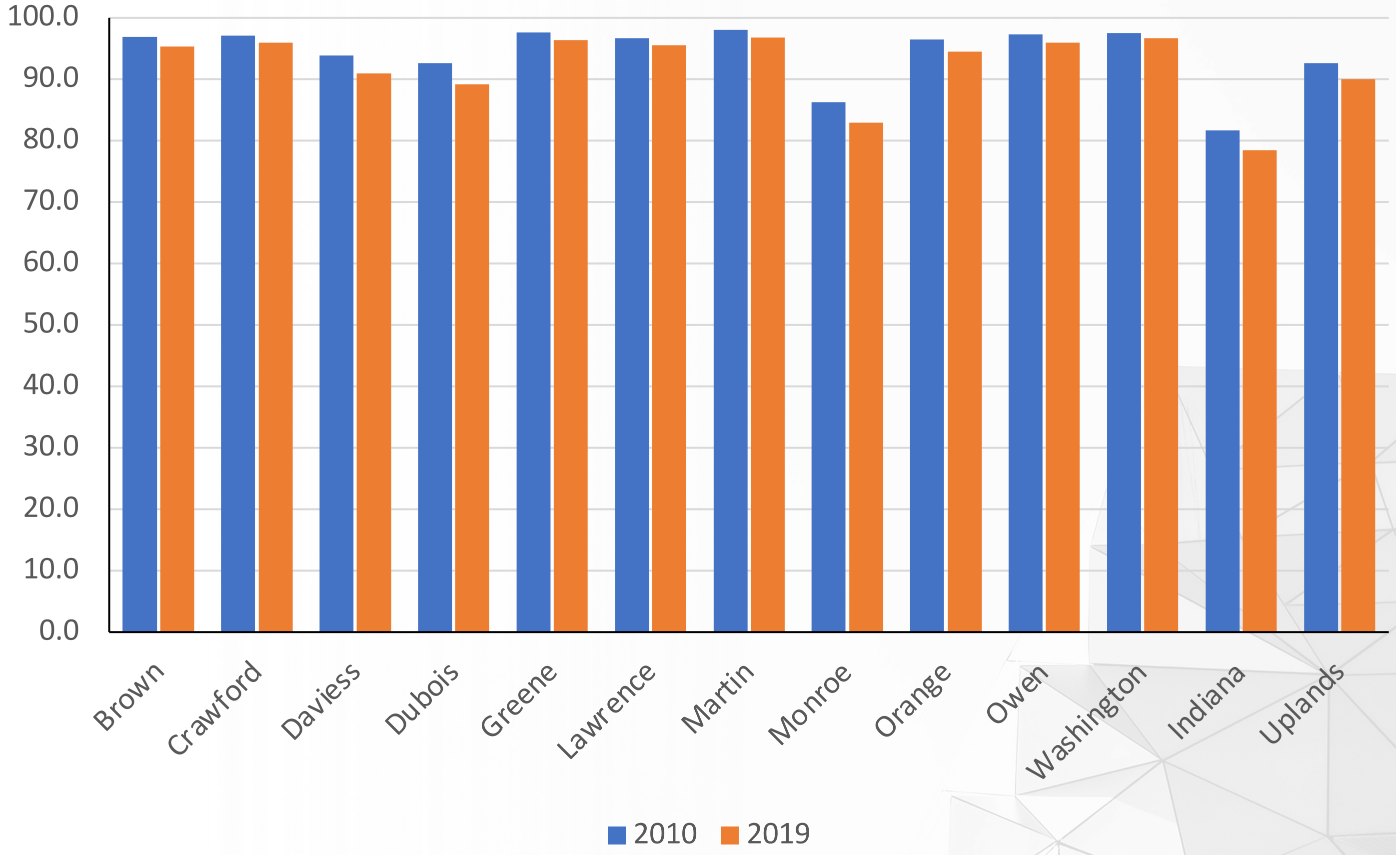
Source: U.S. Census Population Estimates

2010-2019 Population Change

Geography	2010	2019	Per. Change
Brown	15,242	15,092	-1.0
Crawford	10,713	10,577	-1.3
Daviess	31,648	33,351	5.4
Dubois	41,889	42,736	2.0
Greene	33,165	31,922	-3.7
Lawrence	46,134	45,370	-1.7
Martin	10,334	10,255	-0.8
Monroe	137,974	148,431	7.6
Orange	19,840	19,646	-1.0
Owen	21,575	20,799	-3.6
Washington	28,262	28,036	-0.8
Indiana	6,483,802	6,732,219	3.8
Uplands	396,776	406,215	2.4

The region's population increased 2.4% from 396,000 in 2010 to 406,000 in 2019. This increase was below the state's increase of 3.8%. Three counties gained population with Monroe County experiencing the largest increase (7.6%) followed by Daviess County (5.4%) and Dubois County (2.0%). Of the eight counties in the region that experienced a population decrease, Greene County suffered the largest loss (-3.7%) followed by Owen County (-3.6%).

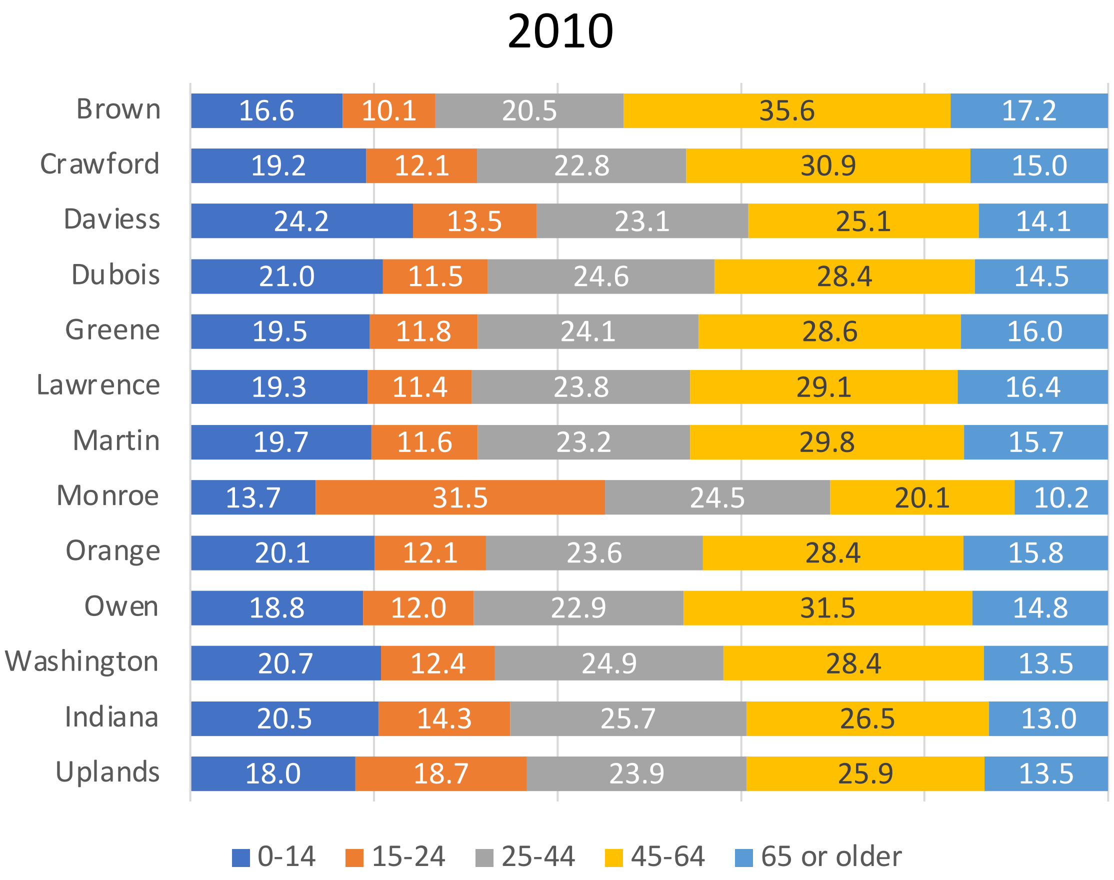
2010-2019 Percent White, non-Hispanic

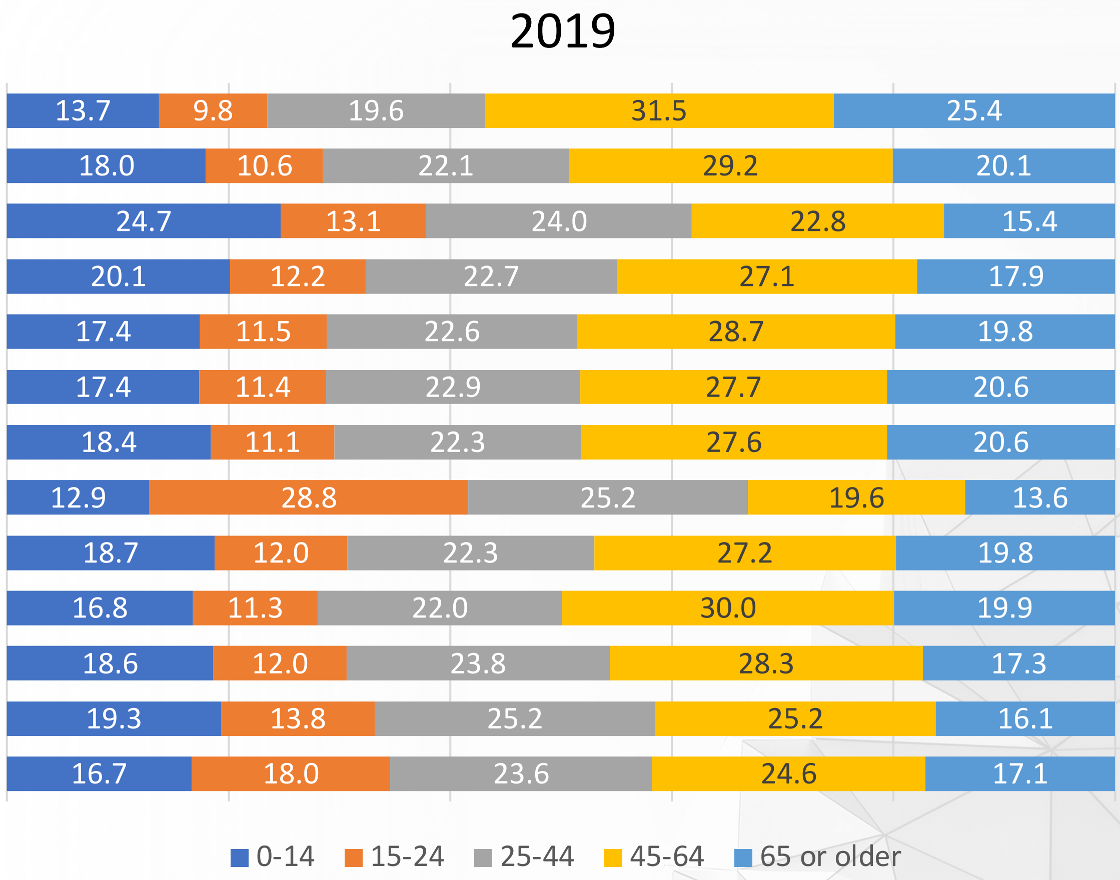


Most of the the region's population is white, non-Hispanic accounting for 90% in 2019. This has not changed much between 2010 and 2019. The share of minorities in the region increased from 7.4% in 2010 to 10% in 2019, below the state's share of 21.6% in 2019. Monroe County had the largest share of minorities in the region with 17% in 2019 followed by Dubois County with 10.8%.

II. Age Groups Breakdown

Source: U.S. Census Population Estimates





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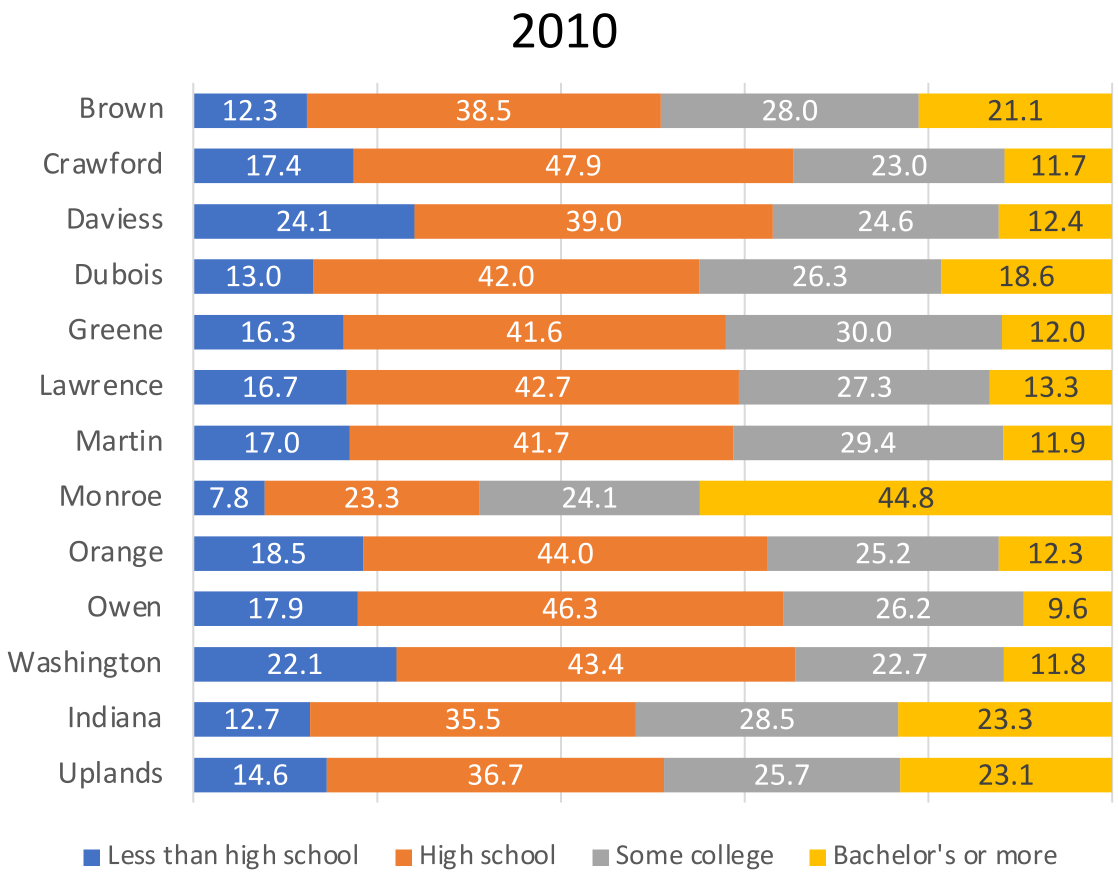
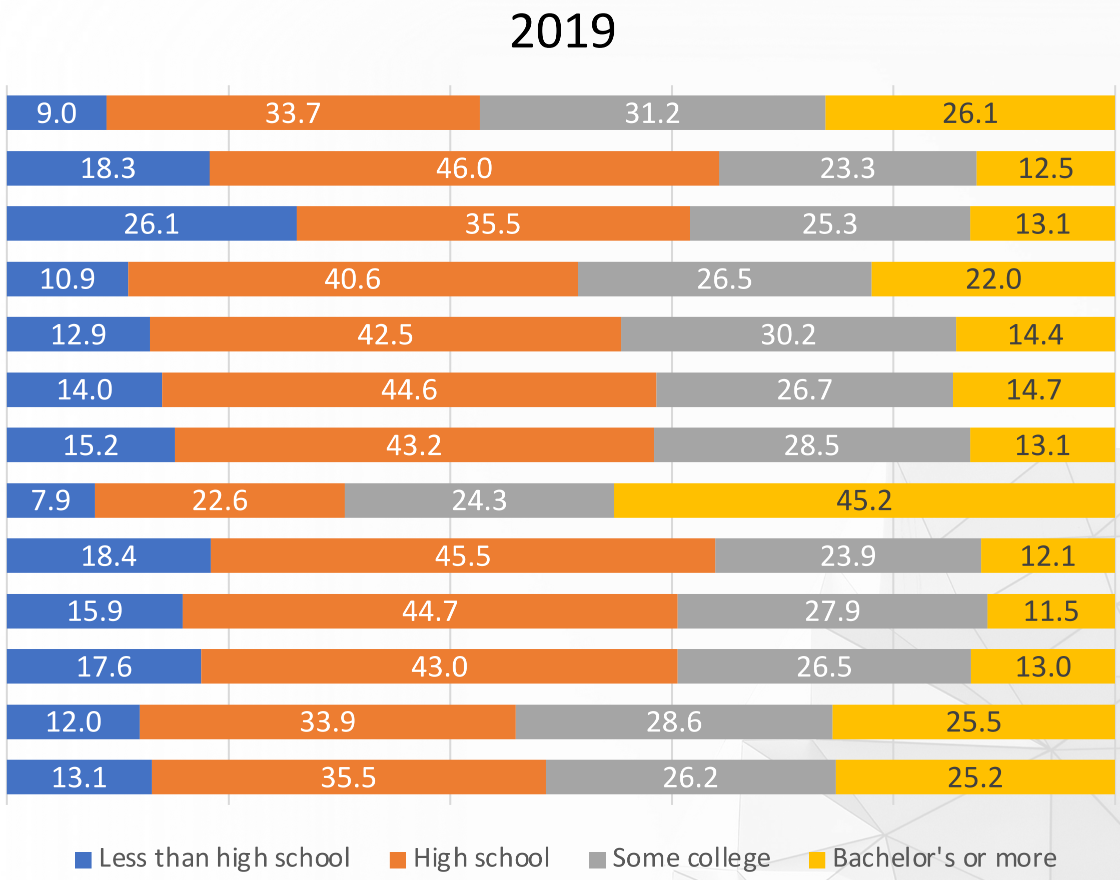
The share of those less than 25 years old decreased in the Uplands region from 36.7% in 2010 to 34.7% in 2019. On the other hand, the share of those ages 65 or older also increased in the region from 13.5% in 2010 to 17.1% in 2019. However, the proportion of those under 15 years of age decreased from 18% to 16.7%. The only county whose percentage of residents less than 15 years old increased was Daviess County. As expected, Monroe County (home to Indiana University) had the highest share in the region of those ages 15 to 24 years old. Roughly one-quarter of residents in Brown County in 2019 were ages 65 or older, the highest in the region, up from 17.2% in 2010.

II. Educational Attainment

Source: EMSI



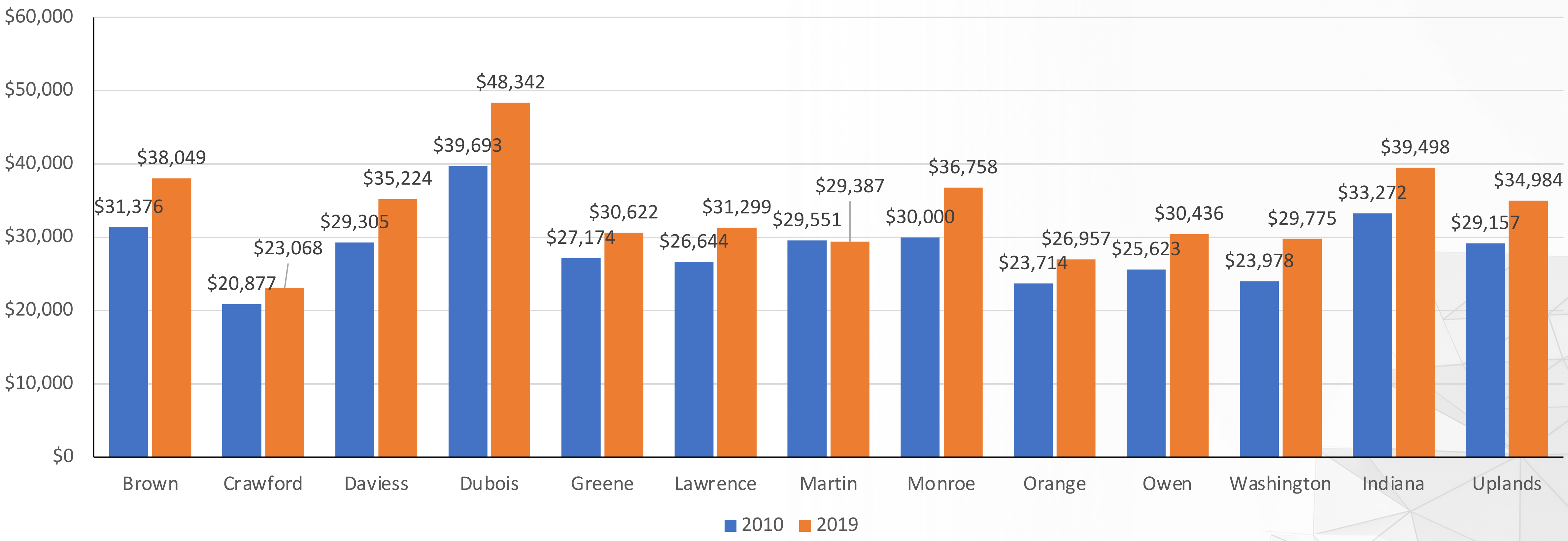


The share of the population 25 years or older by educational attainment shows that those with a bachelor's or more increased across the region, except for Orange County. In the region, about 23.1% of those ages 25 years or older in 2010 had a bachelor's degree compared to 25.2% in 2019; the region's share is very close to the state's share. As expected, Monroe County had the largest share of those with a bachelor's degree or more with 45.2% while Orange County had the lowest share with about 12.1%. The share of those with less than high school decreased across the region except for Crawford and Daviess Counties, where it increased between 2010 and 2019.

II. Per Capita Market Income

Source: Bureau of Economic Analysis

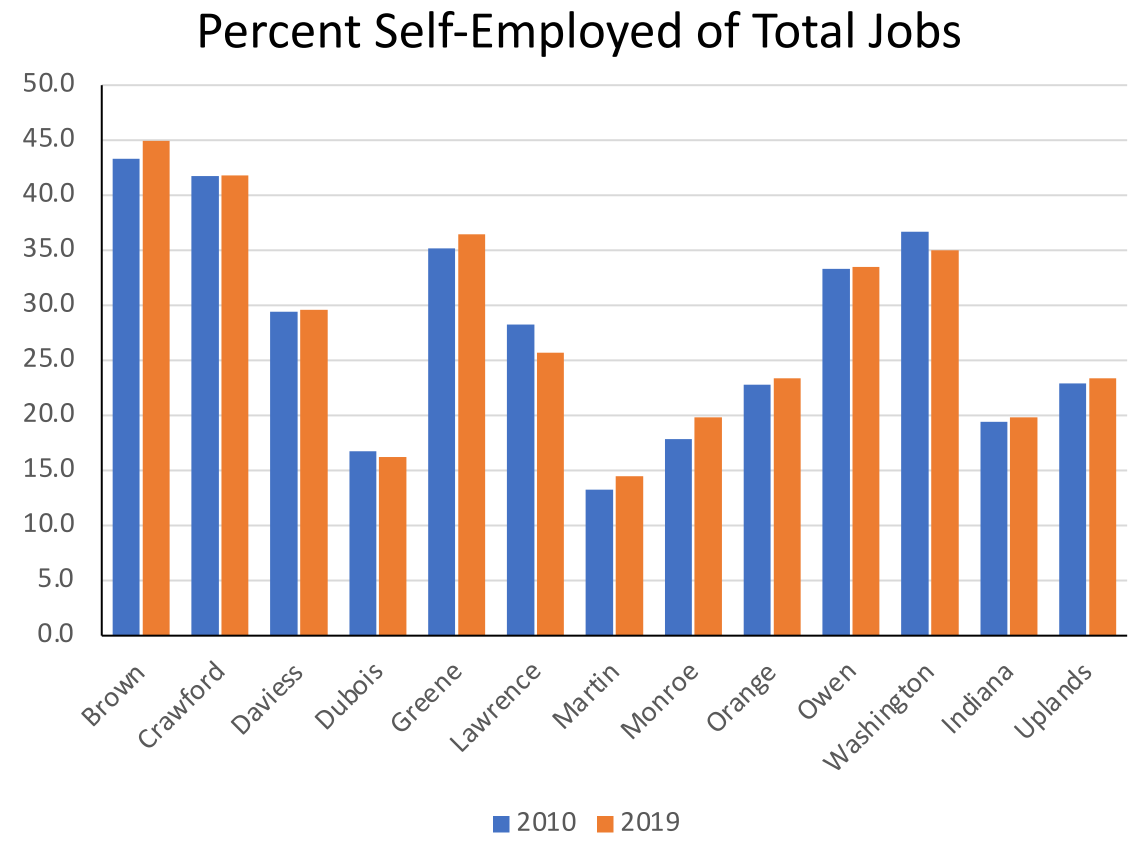
2010 & 2019 Per capita market income (in 2019 dollars)

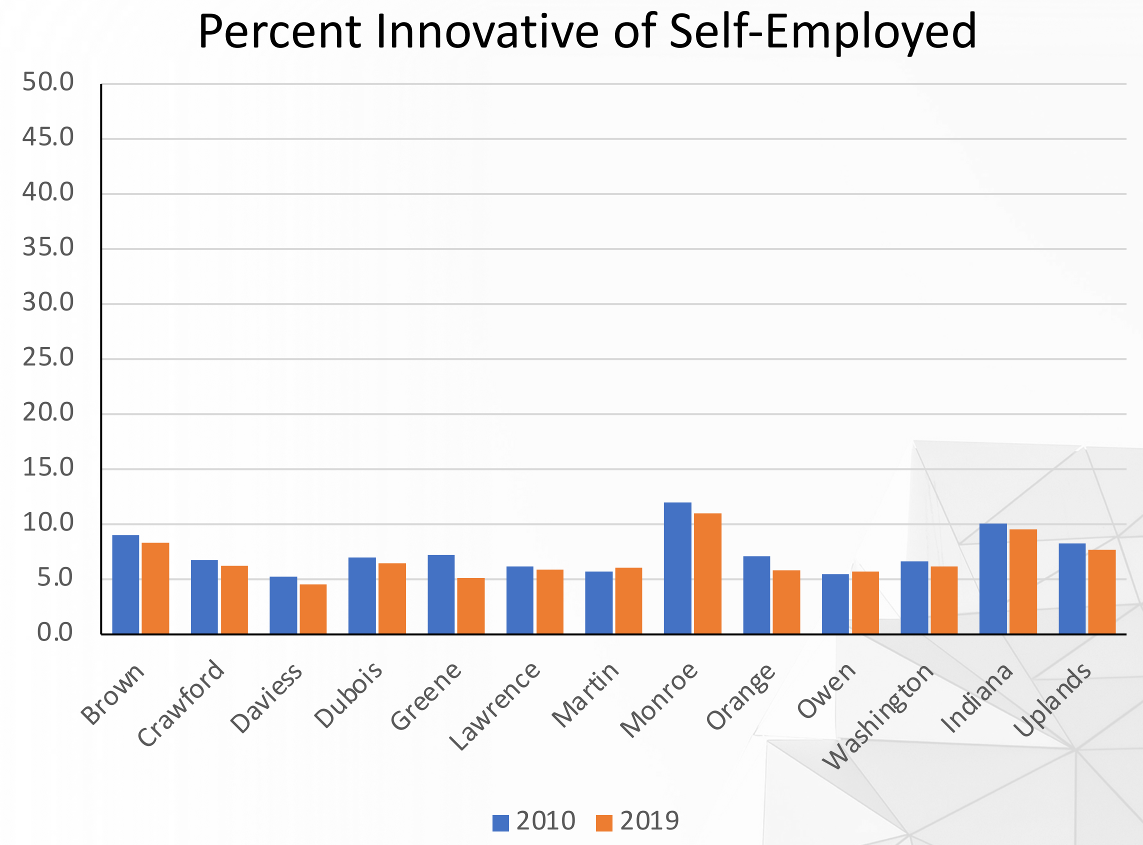


This graph shows the per capita market income (PCMI) in the region between 2010 and 2019. Per capita market income subtracts government transfers to individuals (such as retirement and disability insurance, medical benefits, income maintenance benefits, unemployment insurance, and veterans' benefits) from personal income. Figures are adjusted for inflation (in 2019 dollars). PCMI increased across the region. The largest increase took place in Dubois County followed by Brown County. Overall, PCMI in the region increased from $29,157 in 2010 to $34,984 in 2019. However, PCMI in the region is still below the state PCMI of $39,498 in 2019.

II. Self-Employed & Innovative Entrepreneurs

Source: Low & Isserman (2015); EMSI





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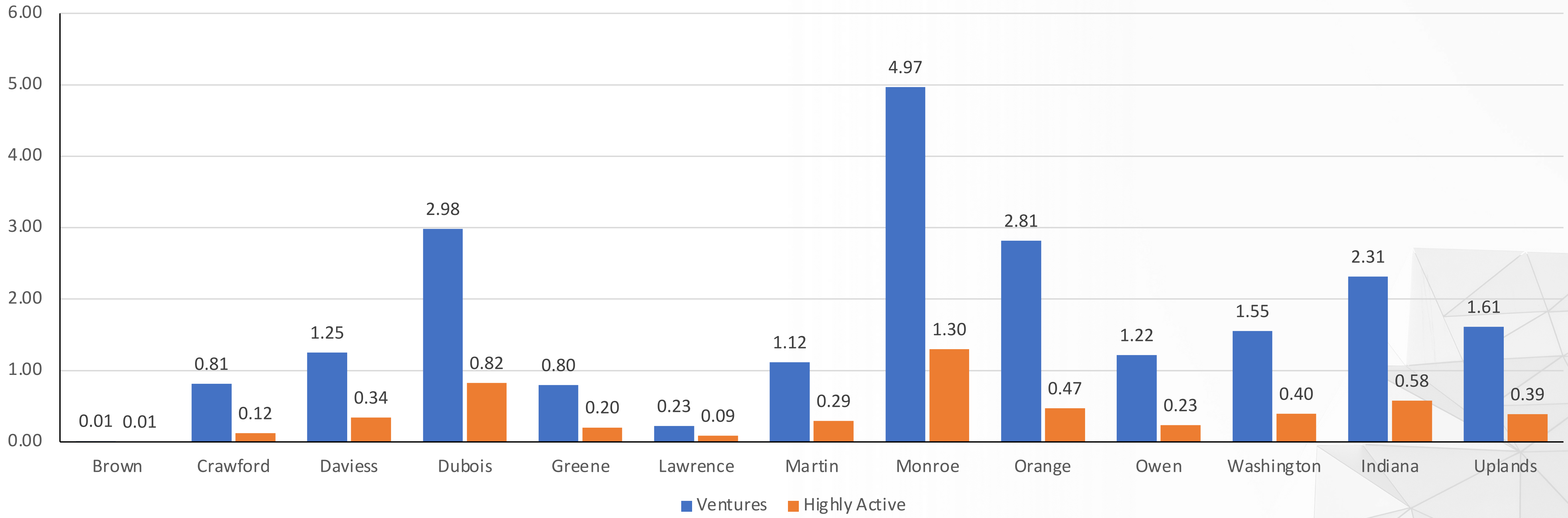
Self-employed includes those who consider self-employment to be a significant part of their income as well as extended proprietors or those that earn an income through self-employment but do not consider it their primary job. As shown, the region has a higher share of self-employed compared to the state. All counties in the region experienced an increase in their self-employed share except for Dubois and Washington counties. Research identifies multiple types of entrepreneurs ranging from innovative to reactive. Reactive entrepreneurs typically fill in local needs (e.g., grocery shops). Innovative entrepreneurs are considered the ones with more growth potential and are defined by 35 industries ranging from electric power generation to software publishers to office administrative services. For this metric, the region had a lower share compared to the state.

II. Venture Density (Websites)

Source: GoDaddy

2019 Venture and highly active venture density (websites per 100 residents)

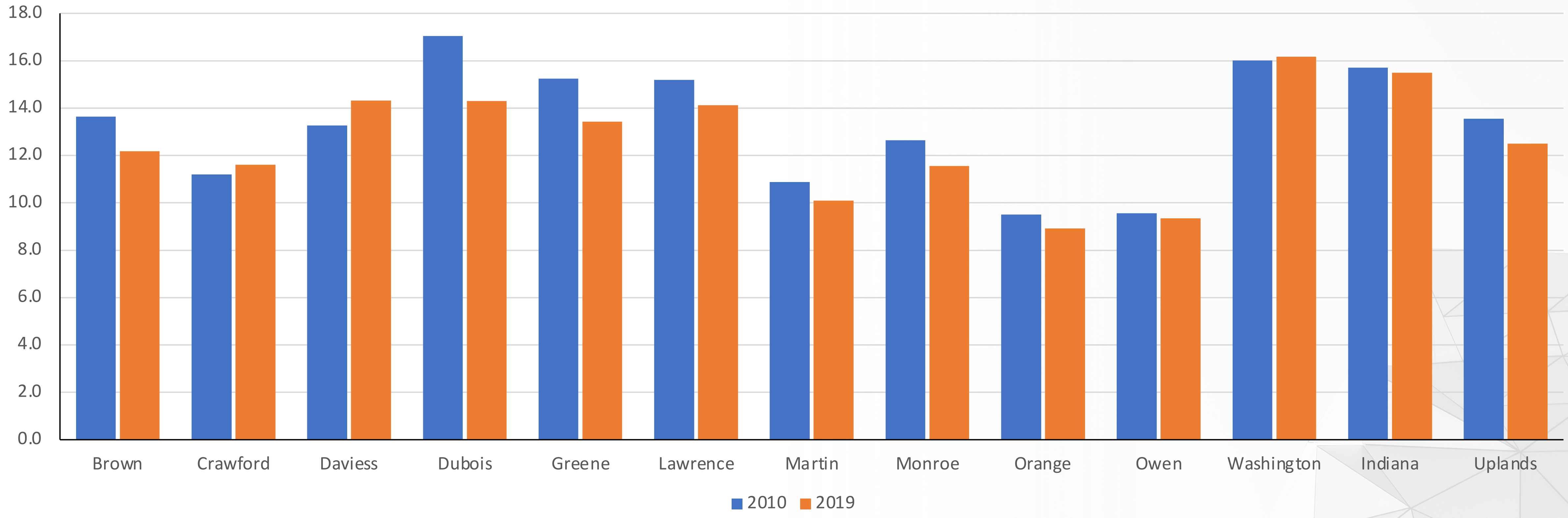


This graph shows data from the internet hosting company GoDaddy. They calculated ventures and highly active ventures density (websites per 100 residents) at the county-level as of December 2019. A venture includes active websites as well as services attached to a website (email, payments, social media, etc.). A highly active venture considers how busy the website is, how networked or linked it is to other websites, and how built-out it is (breadth and depth of services available on the website). This is a good indicator of internet adoption and use and is associated with a positive economic impact. As expected, the highly active venture density is much lower compared to the venture density. On average, the venture density in the region was of 1.613 compared to 2.315 in the state. Monroe County had the highest venture and highly active venture densities in the region.

II. Digital Economy: 2010 & 2019

Source: Bureau of Economic Analysis; EMSI

Percent digital economy jobs of total jobs

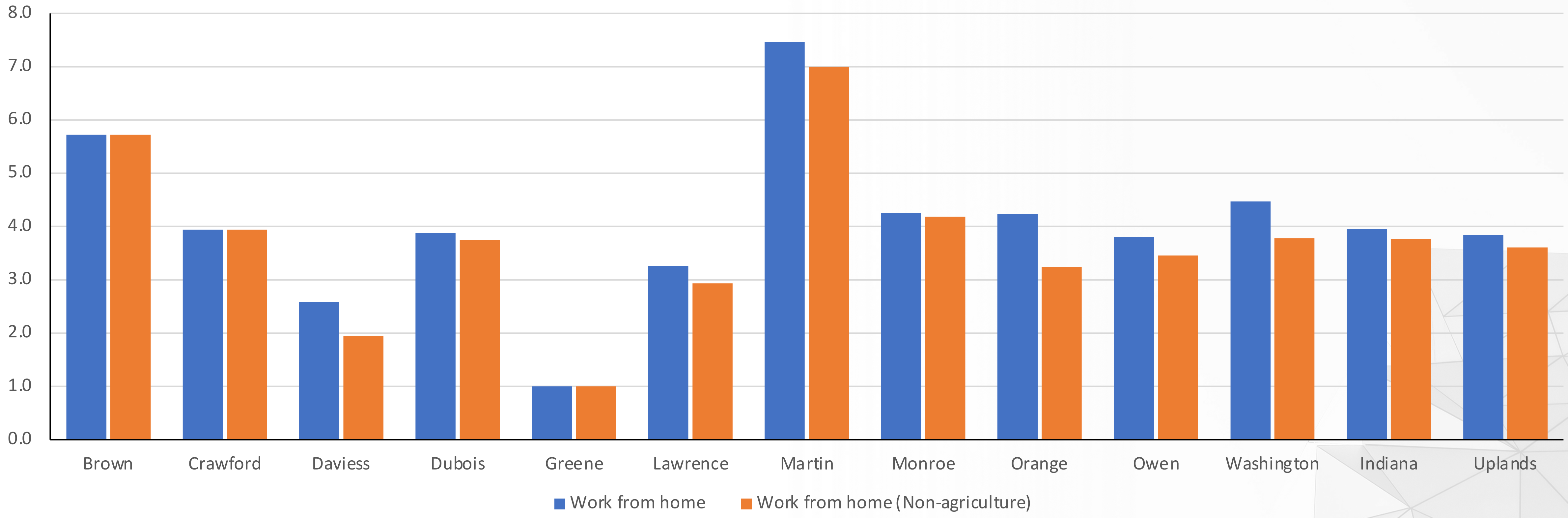


The digital economy is defined as a group of 189 industries (includes industries known as advanced industries), whose activities are strongly associated with the digital economy (e.g., communication equipment manufacturing, distribution centers, or retail that takes place primarily online). This portion of the economy has higher wages and is experiencing on average faster growth in the nation. The share of digital economy jobs decreased between 2010 and 2019 across the region, from 13.6% to 12.5% except in Washington County. While the data do not indicate why the digital economy has decreased, reasons could include lack of skilled workers or inadequate connectivity. The region's share is about three percentage points lower compared to the state's (15.5% versus 12.5%). Dubois County had the highest share in 2010 while Washington County had the highest share in 2019.

II. Work from Home Trends

Source: 2015-2019 ACS

Percent workers 16 and older working from home



Although remote work or work from home has been around for a while, the COVID pandemic has emphasized its potential as a feasible rural economic development strategy. This graph shows the percent of workers 16 and older that worked from home. Since farmers can be included as working from home, a share shows overall working from home and the share that does not include working from home in agriculture. Overall, farmers do not account for most of the those working from home in the region. For example, the work from home share for the region was 3.8% compared to 3.6% in the non-agriculture industry. Martin County had the highest share of those working from home at 7.5% compared to Greene with only 1%.

Source: Brookings Institution; EMSI

2010 & 2019 Jobs that required digital skills

This table shows the breakdown of jobs based on occupations whose digital skill levels were identified. The low digital skills category included 104 occupations; the middle digital skills category included 245 occupations; and the high digital skills category included 169 occupations. These jobs categorized on digital skill levels accounted for roughly 86% of total jobs. In other words, the digital skills required was not possible to identify for about 14% of total jobs.

The state overall added a net of roughly 414,000 jobs between 2010 and 2019 among these types of jobs (with digital skill levels identified) or an increase of 13.4%. On the other hand, the region added roughly 14,000 jobs or an increase of 8.1%. About 5,000 jobs were gained that required low digital skills or 37.4% of total versus a gain of 6,000 or 42.1% of total net requiring middle digital skills and close to 3,000 or 20.4% of total net requiring high digital skills.

Crawford and Greene Counties lost jobs requiring low, middle, and high digital skills. On the other hand, Daviess, Dubois, Lawrence, Martin, Monroe, and Washington Counties gained jobs requiring low, middle, and high digital skills. When all is said and done, about 62% of new jobs in the region required middle or high digital skills.

Jobs with Digital Skills Identified	Total			Digital Skill Level Change		
	2010	2019	Difference	Low	Middle	High
Brown	4,815	4,848	+33	+18	-74	+90
Crawford	3,042	2,742	-301	-133	-104	-63
Daviess	13,879	16,086	+2,207	+970	+901	+335
Dubois	28,045	31,022	+2,977	+1,378	+979	+620
Greene	9,957	9,512	-445	-122	-77	-246
Lawrence	16,706	17,556	+850	+99	+551	+200
Martin	7,171	7,693	+522	+138	+357	+27
Monroe	70,109	76,865	+6,755	+2,174	+2,672	+1,910
Orange	8,880	8,937	+58	-43	+87	+13
Owen	6,396	6,934	+538	+346	+193	-1
Washington	7,827	8,951	+1,124	+534	+548	+42
Indiana	3,093,477	3,507,681	+414,204	+155,632	+158,585	+99,987
Uplands	176,828	191,147	+14,319	+5,359	+6,034	+2,927

Note: A previous version of this table was incorrect. Current table has been corrected.

Section III – Broadband Deployment

This section looks at multiple metrics concerning broadband deployment and internet speeds. Internet speeds are reviewed because the current federal broadband definition is based on speeds, specifically 25 megabits per second (Mbps) download and 3 megabits per second upload, or 25/3 for short. Availability of 100/20 is also included since several states are planning deployment around those speeds. The Uplands region should attempt to plan for this speed threshold as well. Otherwise, the region and the state will be at a competitive disadvantage.

While the multiple metrics reviewed in this section may result in contradicting results, this is important for two main reasons. First, it highlights that broadband availability data are far from perfect and results will vary depending on which metric is used. These discrepancies should prompt more accurate and granular data gathering prior to broadband deployment efforts. Second, it makes it clear that broadband infrastructure planning needs to begin at the local level. This is a complex issue and requires broad coalitions and all hands-on deck to be resolved.

Second, availability of maximum advertised speeds were analyzed. The source of this data is the Federal Communications Commission (FCC) Form 477. Internet providers submit information using this form twice per year. However, this data is known to overstate broadband availability for multiple reasons, specifically in rural areas. Regardless, this is the only dataset available and thus it is used for illustrative purposes and to jumpstart meaningful conversations. Data only includes residential service and does not include satellite technology.

Next, data provided by Microsoft is reviewed. This data looked at server logs (when computers requested to update Windows or Office) and calculated the share of people in a county not using the internet at a minimum speed of 25 Mbps download. In other words, this data looks at actual usage speeds versus maximum advertised speeds provided by the FCC From 477. Discrepancies between these two datasets are significant.

Like Microsoft's data, a third metric is reviewed showing results of speed tests conducted by internet users in the region and stored by M-Lab. While speed tests are not a perfect metric, they too provide a different story to the maximum advertised data.

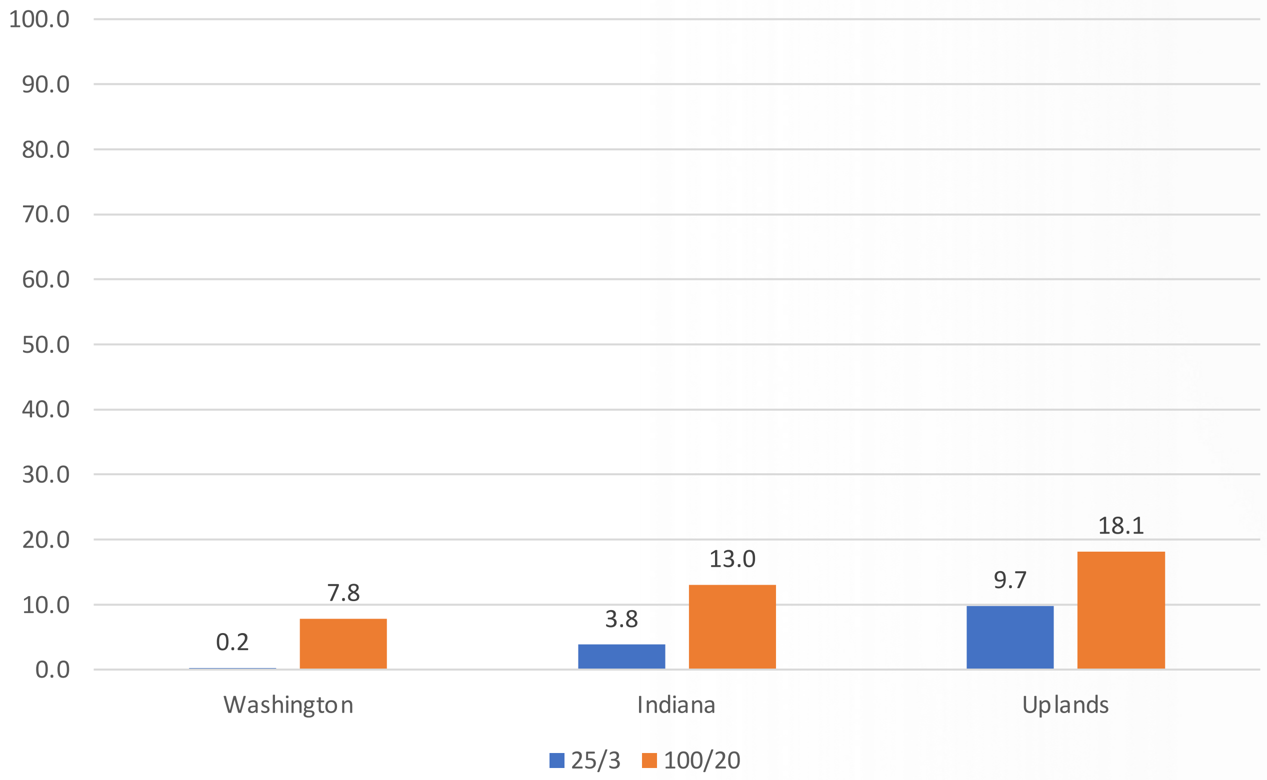
In addition, census data is analyzed to identify areas in digital distress as well as homework gaps. Digital distress refer to areas where a higher share of homes either do not have internet access or rely solely on cellular data connections and do not have a computing device or rely solely on mobile devices when using the internet. Research has found that relying solely on cellular data connection or mobile devices undermines the technology's potential due to limited data plans and smaller screens. Related to digital distress is a metric that identifies areas in the region that are at a disadvantage when implementing e-learning and remote work because of limited connectivity and/or a higher share of their jobs not being remote work friendly. While this issue surfaced due to COVID-19, changes brought by the pandemic will persist still leaving these areas at a disadvantage.

Finally, parts of the region with homework gaps are identified. The homework gap is a term used to describe a situation where children are not able to engage in e-learning and/or complete homework assignment due to lack of adequate connectivity and devices at home.

Finally, a broad metric called the digital divide index (DDI) is reviewed. The DDI incorporates multiple indicators including availability, adoption, and socioeconomic characteristics known to impact technology adoption (see Section II) to identify areas in the region in need of not only broadband infrastructure investment but also efforts to ensure all residents and businesses in the region have access to, can afford, and can utilize this technology and its applications for community and economic development purposes.

Source: FCC Form 477 December 2019 v1

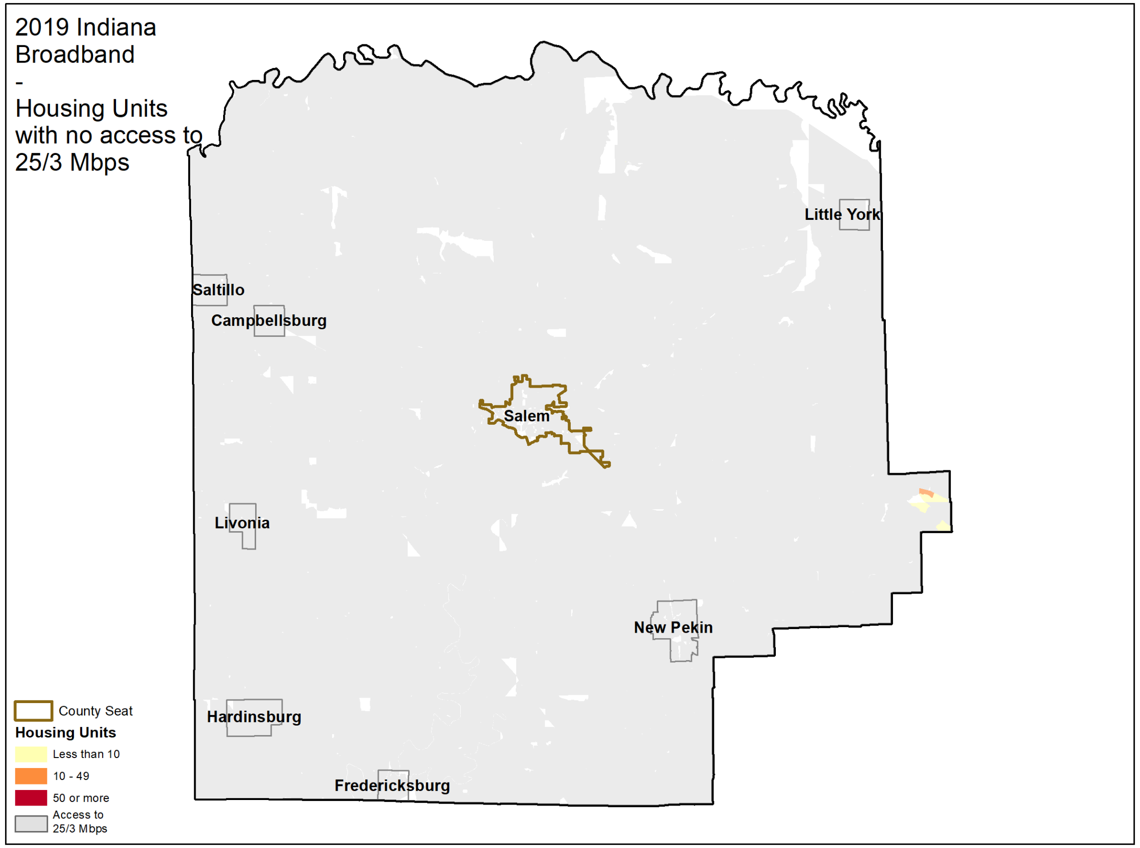
2019 Percent of housing units **without** access to advertised 25/3 & 100/20 (Mbps)

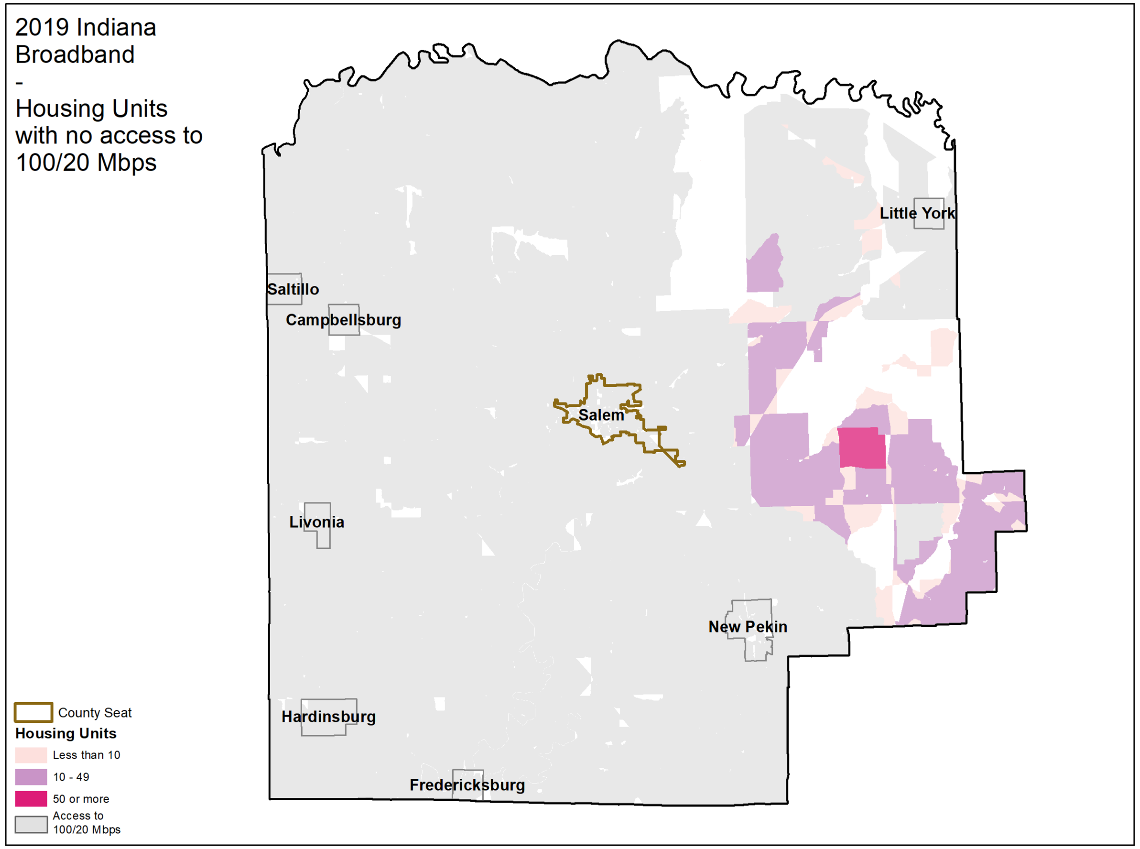


This graph shows the percent of housing units without access to 25/3 & 100/20. Crawford County had the highest share of unserved housing units for both speed tiers while Washington County had the lowest share (0.2%) for 25/3 and Monroe County (5.5%) for 100/20. Most counties in the region had shares higher than the state average of 3.8% for 25/3 and 13% for 100/20. All in all, there were roughly 17,000 housing units in the region without access to advertised 25/3 and about 32,000 without access to advertised 100/20.

Source: FCC Form 477 December 2019 v1

2019 Housing unit density outside the 25/3 & 100/20 footprint





These maps show the housing unit density outside the 25/3 & 100/20 footprints in the region. The darker orange indicates a higher number of housing units per Census block outside of the speed tier. For example, Daviess County seems entirely covered by 25/3 service. However, when looking at 100/20, several orange areas appear. This indicates housing units outside of the 100/20 footprint.

III. Broadband Technology: Access

Source: FCC Form 477 December 2019 v1

2019 Percent housing units with access to advertised 25/3 & 100/20 by technology

% Housing Units	DSL		Fixed Wireless		Cable		Fiber	
	25/3	100/20	25/3	100/20	25/3	100/20	25/3	100/20
Brown	63.9	54.7	75.9	56.3	52.8	52.8	68.4	48.2
Crawford	36.4	0.1	36.4	0.1	0.1	0.1	0.0	0.0
Daviess	91.0	83.8	99.1	88.7	66.6	66.6	33.3	33.3
Dubois	73.6	70.4	77.5	74.1	59.9	59.9	66.5	66.5
Greene	76.7	62.1	82.8	67.5	69.4	69.4	1.4	1.4
Lawrence	82.8	80.4	85.7	83.1	77.8	77.8	9.5	9.5
Martin	71.1	58.8	76.5	64.6	54.0	54.0	27.5	27.5
Monroe	79.8	76.3	76.4	74.1	93.5	93.5	48.3	47.7
Orange	62.4	57.3	84.1	78.6	58.3	58.3	51.5	51.5
Owen	41.0	25.6	47.0	37.8	31.1	31.1	41.1	40.5
Washington	81.1	74.0	91.6	85.2	47.2	47.2	79.8	79.8
Indiana	89.4	82.3	80.7	72.5	84.3	82.9	40.6	40.2
Uplands	74.7	67.6	78.2	71.2	69.9	69.9	41.4	40.2

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This table shows the percent of housing units with access to advertised 25/3 & 100/20 Mbps by broadband technology. For example, 68.4% of housing units in Brown County had access to 25/3 speeds through fiber.

For both 25/3 & 100/20, the most accessible technology in the region was fixed wireless serving 78.2% and 71.2% of housing units, respectively. On the other hand, the most accessible technology in the state for 25/3 was DSL versus cable for 100/20.

Monroe County had the highest share of homes with access to 100/20 through cable at 93.5%.

Source: FCC Form 477 December 2019 v1

2019 Average maximum advertised speeds by technology (Mbps)

This table shows the average maximum advertised speeds by technology in megabits per second (Mbps). Overall, cable and fiber had significantly higher advertised download and upload speeds. Fiber, however, was the one advertising almost symmetrical speeds (identical download and upload speeds).

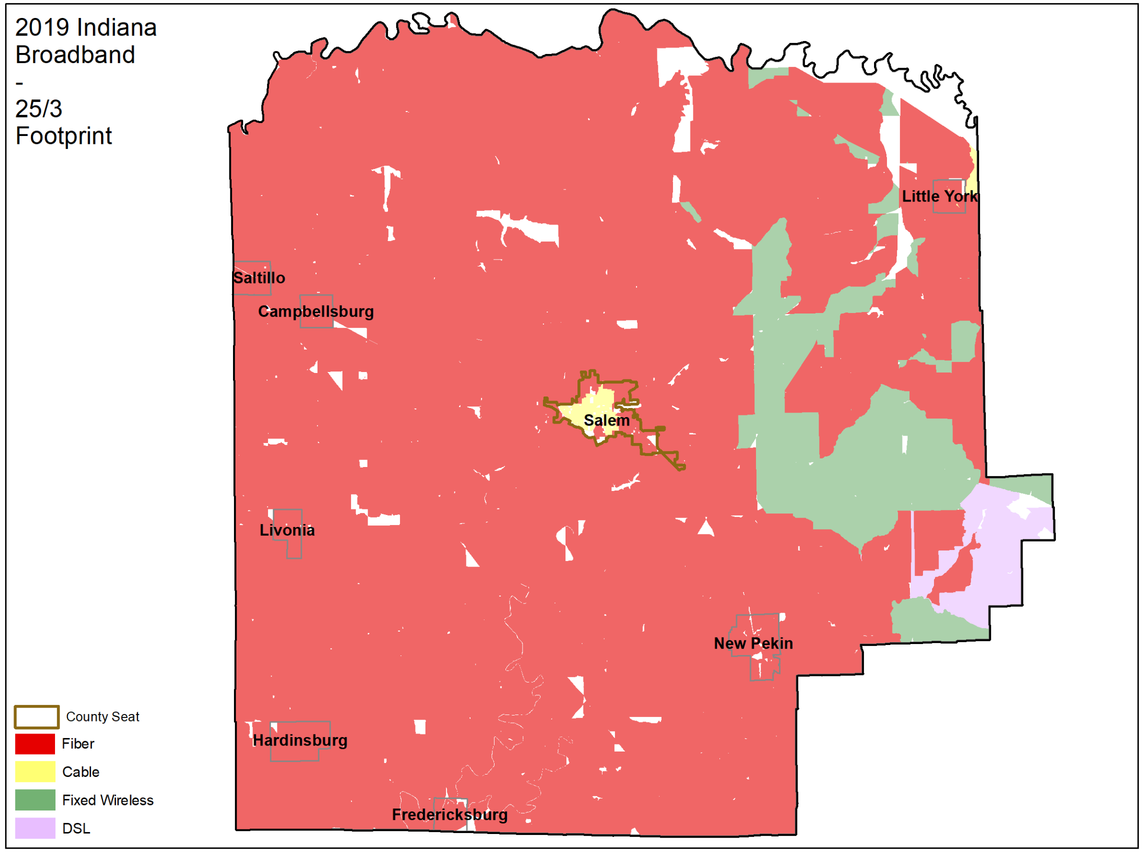
Note how the average per technology varies across counties. For example, the average advertised download DSL speed for Brown County was 10 Mbps compared to 22 in Crawford County.

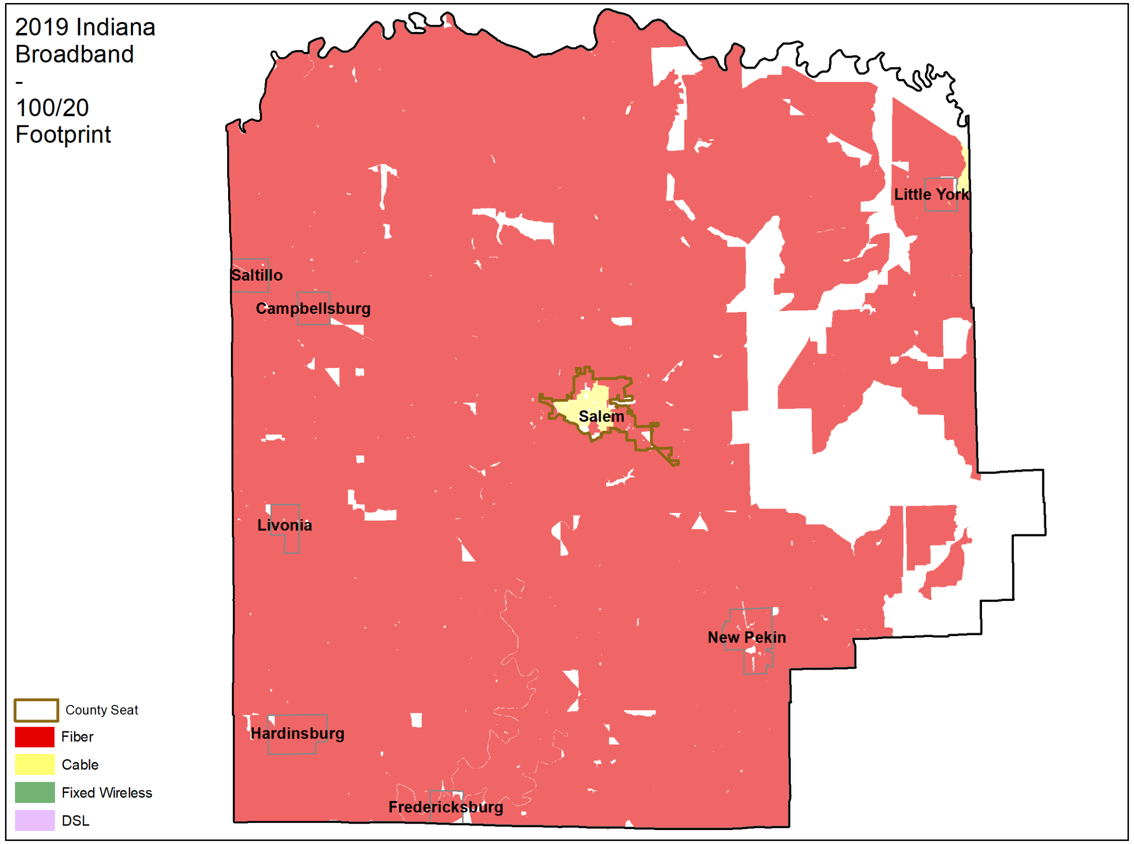
For the region, cable technology had the highest average advertised download speed (980 Mbps) while fiber had the highest average advertised speed (487 Mbps).

Maximum Advertised Speeds (Mbps)	DSL		Fixed Wireless		Cable		Fiber	
	Download	Upload	Download	Upload	Download	Upload	Download	Upload
Brown	10	0.8	9	1	960	46	174	120
Crawford	22	1	8	3	987	35	NA	NA
Daviess	14	0.9	36	10	993	49	997	997
Dubois	14	1	7	3	940	35	984	338
Greene	15	1	25	2	985	41	67	61
Lawrence	25	3	8	3	988	39	890	890
Martin	25	1	22	9	985	49	975	975
Monroe	28	5	8	3	987	35	386	386
Orange	17	2	9	4	999	49	771	771
Owen	13	2	12	1	987	35	855	855
Washington	22	1	15	4	940	35	357	236
Indiana	20	2	24	7	935	36	813	695
Uplands	20	2	19	5	980	40	671	487

Source: FCC Form 477 December 2019 v1

2019 25/3 & 100/20 broadband technology footprint



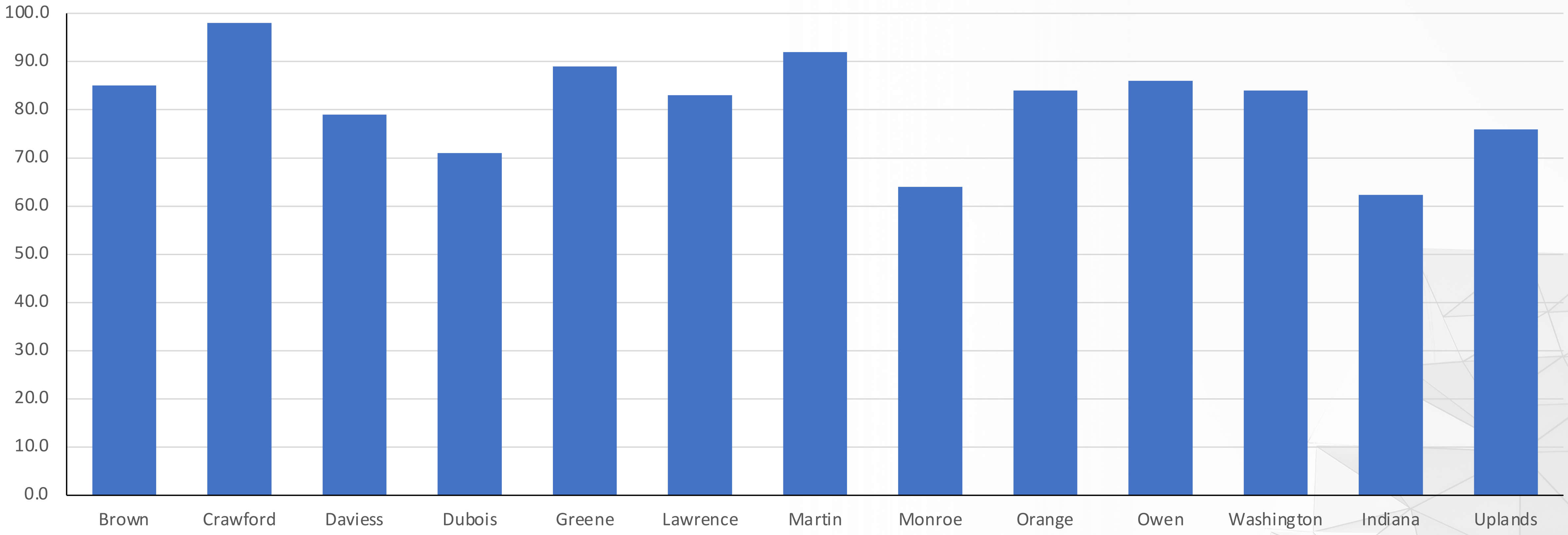


These maps show the 25/3 & 100/20 footprints in the region by technology. Note that fiber is on top followed by cable, fixed wireless, and DSL. If DSL is visible, this means there are no other technologies at those speed tiers since it is the bottom layer. For example, in Greene County, cable (yellow) is the most accessible technology for 100/20 speeds while fixed wireless (green) is for 25/3. County seats are outlined for reference.

III. Actual Download Speed Use

Source: Microsoft

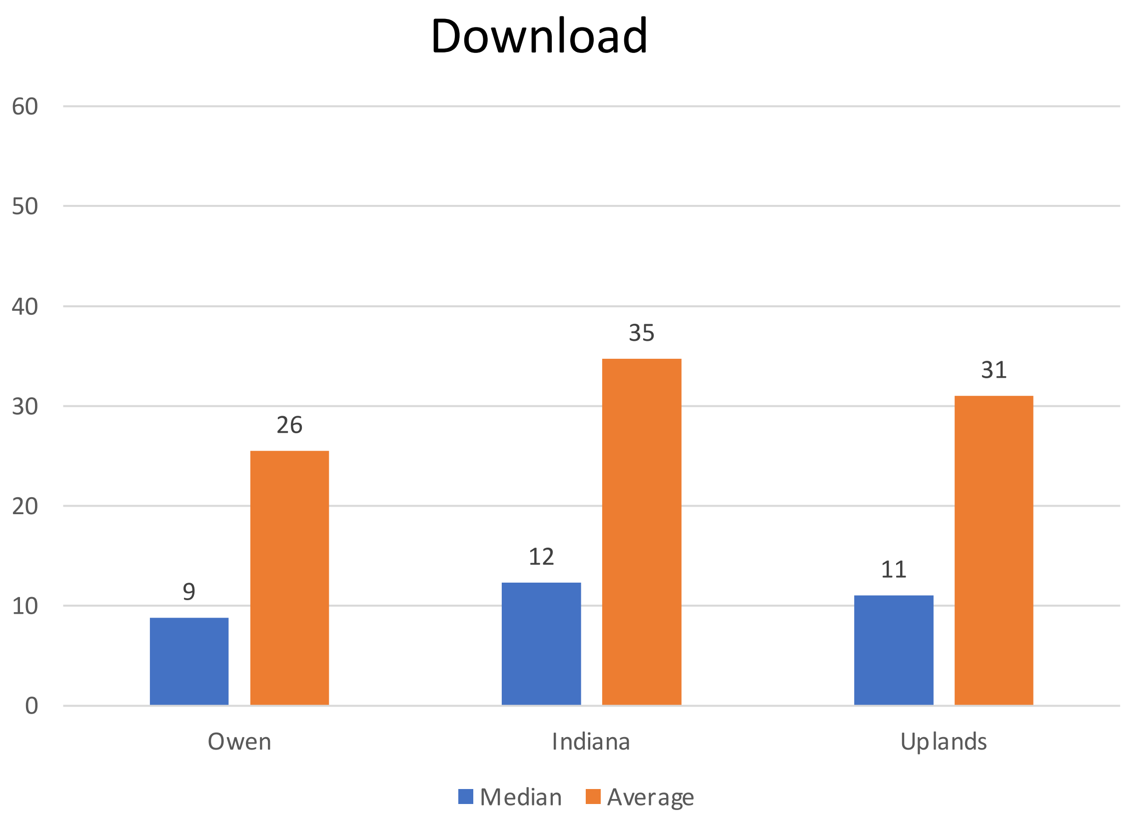
2019 Percent people **not using** the internet at a speed of at least 25 Megabits per second (Mbps)

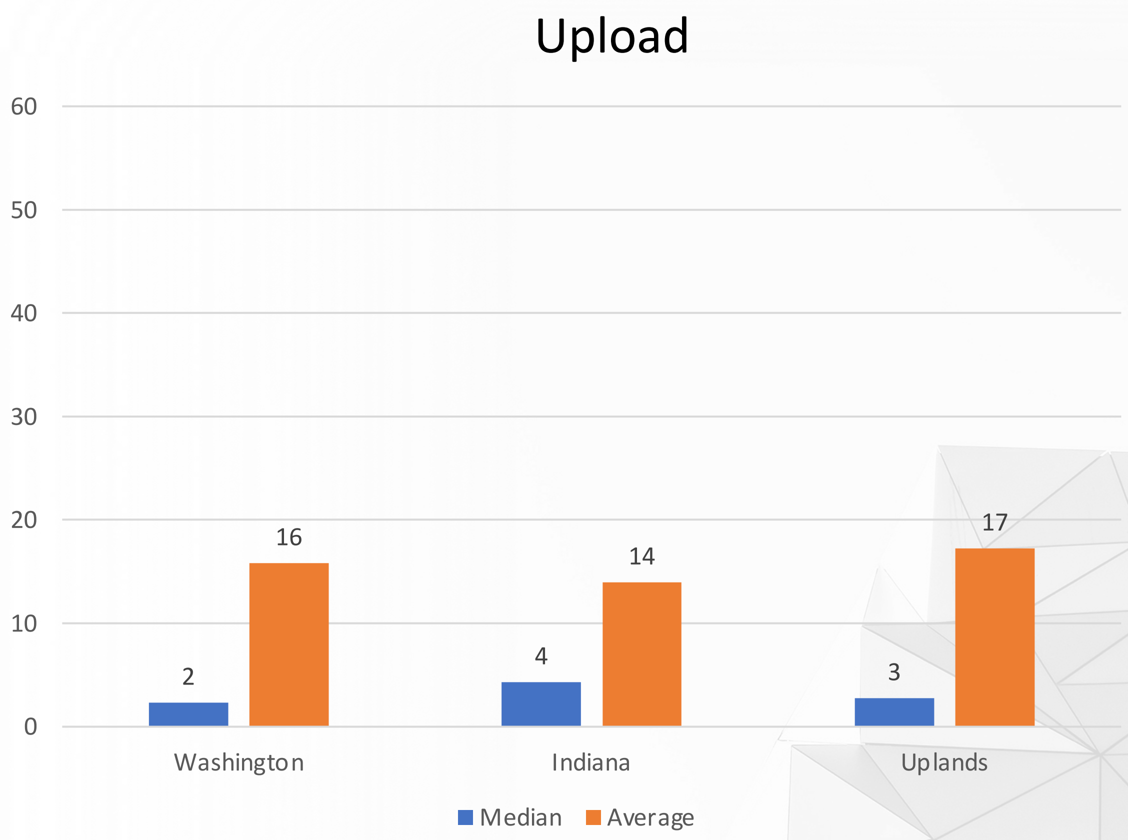


This graph includes data compiled by Microsoft where the percentage of people not using the internet at a speed of at least 25 Mbps download is shown. As the chart reveals, almost the entire population in Crawford County did not use the internet at a minimum of 25 Mbps download. Overall, about three-quarters of the population in the region did not use the internet at a minimum speed of 25 Mbps, higher than the state's share of 62.4%. This places the region at a competitive disadvantage. People may not be using the internet at this minimum speed for multiple reasons including Wi-Fi home configuration, operating system on their devices, number of devices connected at the time data was gathered, or issues with the internet connection.

III. Speed Test Results (Mbps)

Source: M-Lab

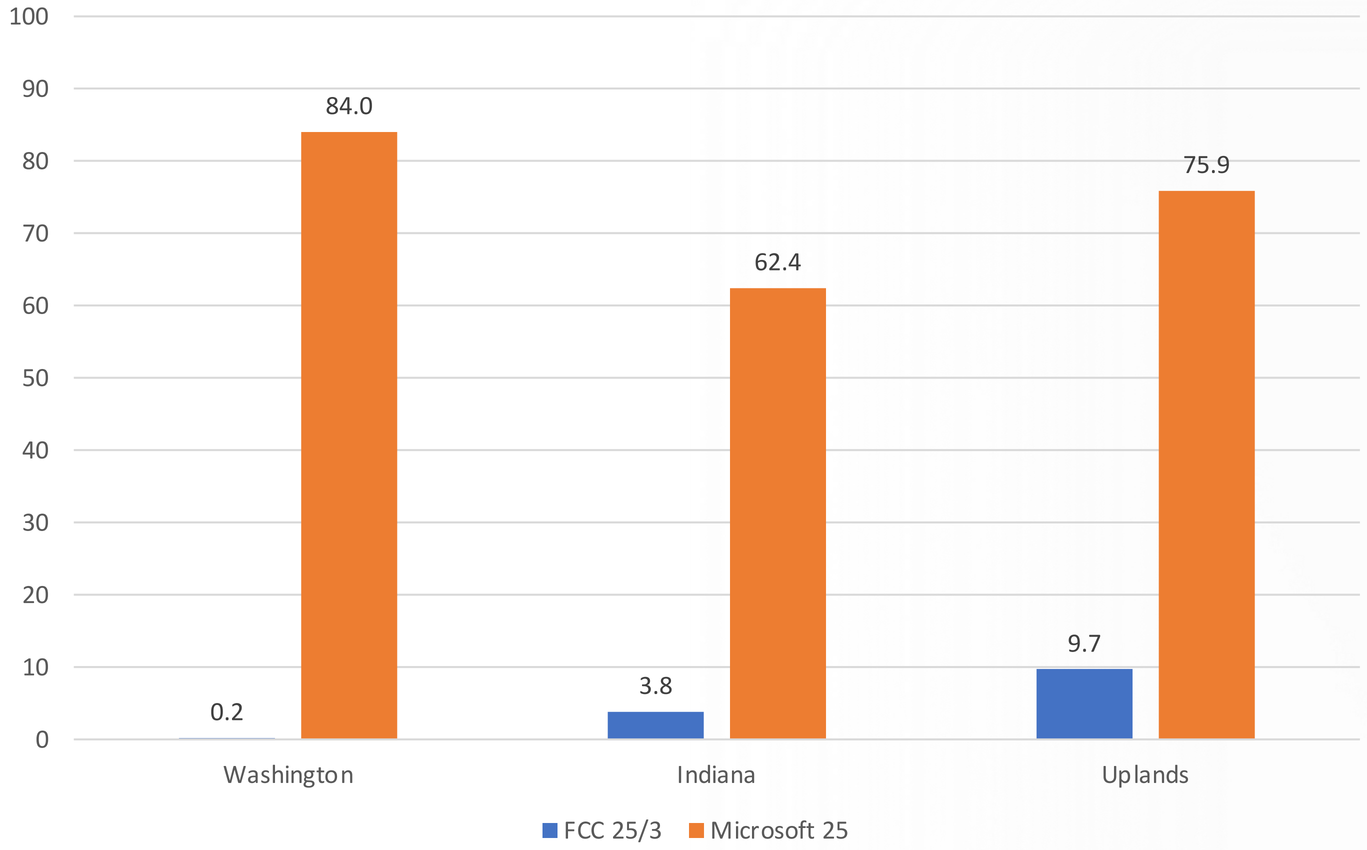




The graphs highlight data provided by M-Lab that stores speed test results from across the country. During 2019, there were about 107,800 speed tests conducted in the region. Each county had more than 1,000 tests completed. Average speeds are higher because they may include outliers while the median shows the value in the middle of the distribution. In other words, a median value indicates that half of all speed tests fall below the median and the other half above. Notice how overall upload speeds were slower than download speeds. This points to a potential issue of asymmetrical speeds. Households and businesses are producing more content, rather than consuming, and faster upload speeds are becoming critical.

III. Broadband Metric Comparison: % No Access

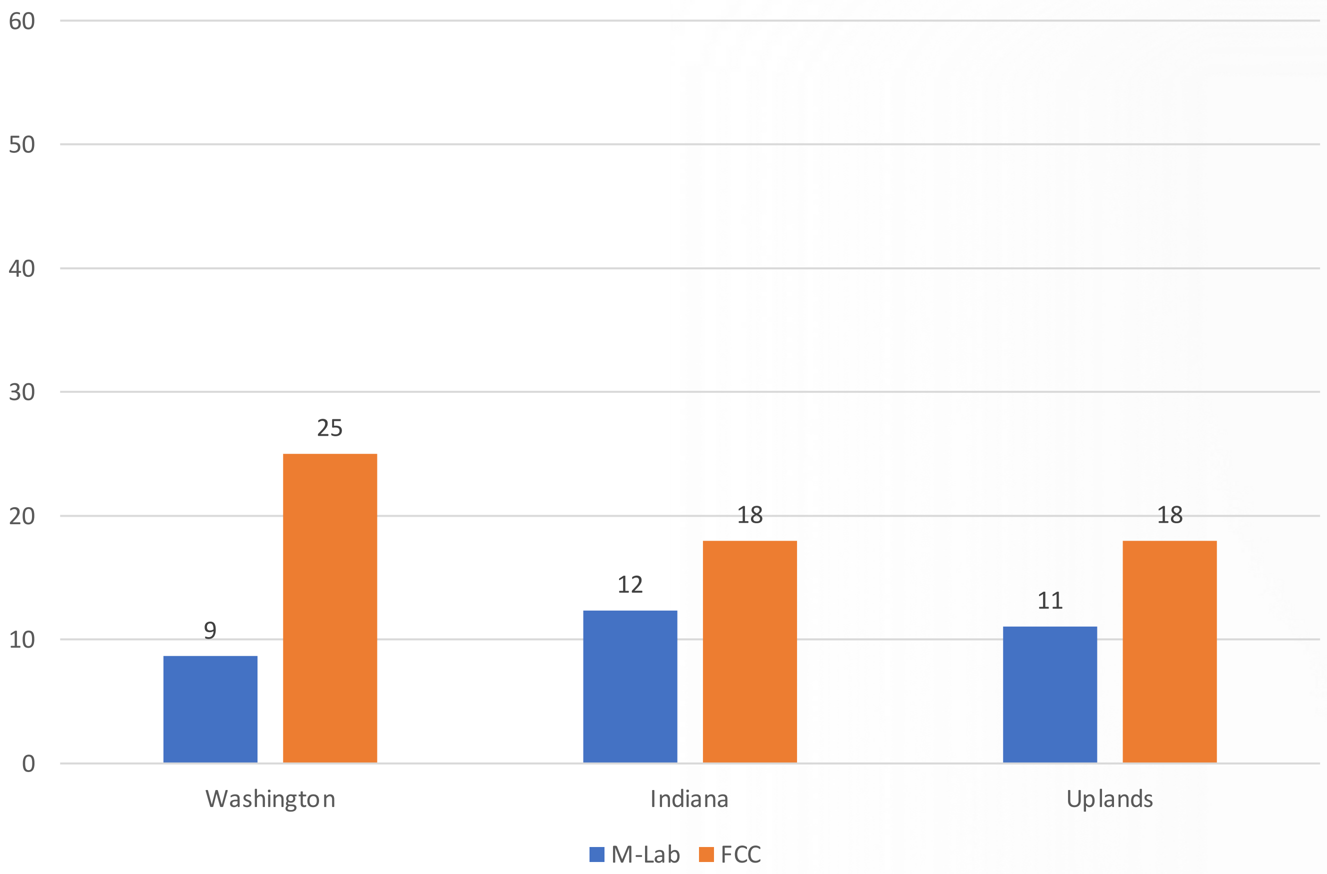
Source: FCC; Microsoft



The graph compares the FCC and Microsoft metrics regarding percent housing units with no access to advertised 25/3 Mbps (FCC) and percent population not using internet at a minimum of 25 Mbps download (Microsoft). While these two metrics are not entirely comparable, since one focuses on population and use at a minimum of 25 Mbps download while the other one looks at housing units and advertised speeds of 25/3 Mbps, they showcase how broadband data varies on the source utilized. In other words, additional efforts must be made to obtain more accurate broadband data such as household and/or individual surveys as well as school district and student data.

III. Speed Metric Comparison: Median Download (Mbps)

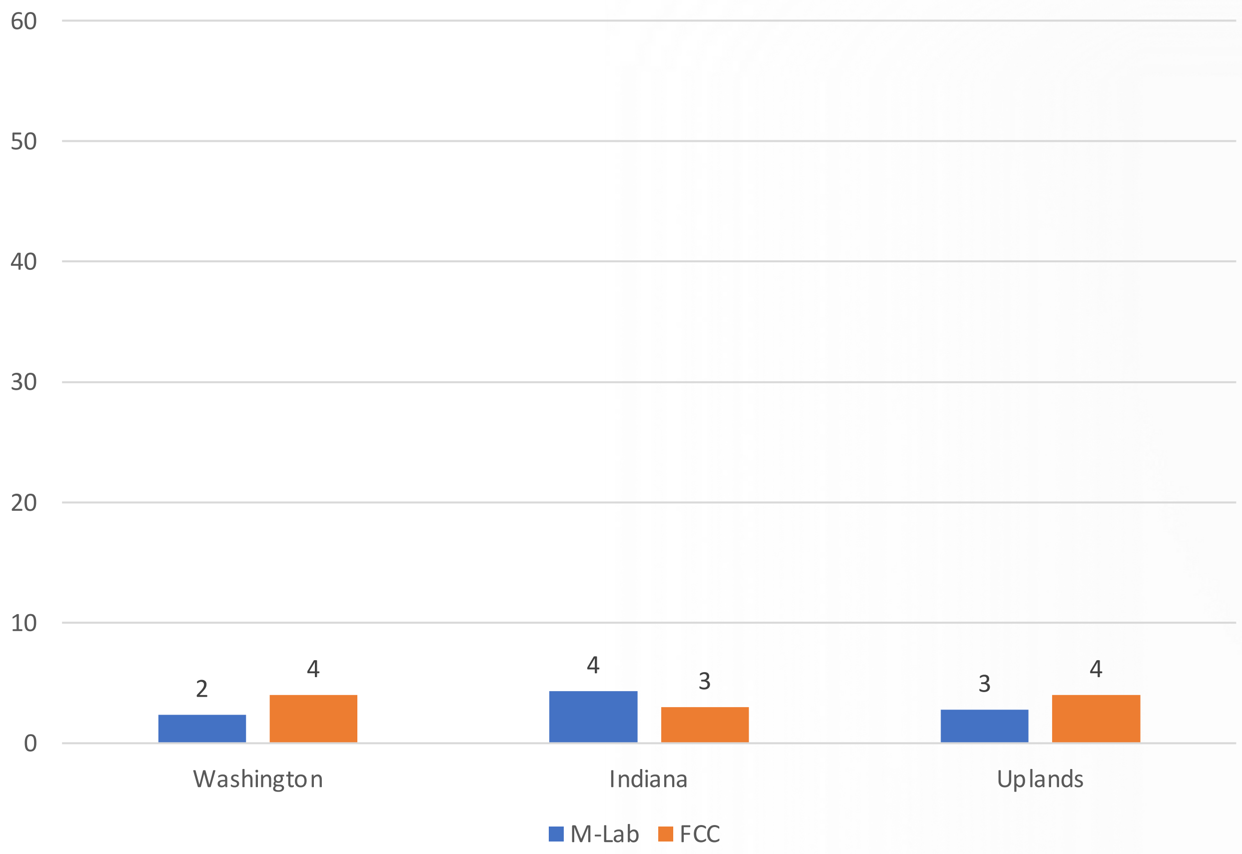
Source: FCC; M-Lab



The graph compares the median download speeds reported by the FCC and by M-Lab. Again, while these two metrics are not entirely comparable, since one is advertised speeds while the other is results of speed tests, it does show differences between what is being advertised and what customers are getting. Dubois and Monroe Counties did have higher median actual speeds compared to the advertised speeds. All other counties had higher advertised speeds. Main point is that, again, broadband metrics vary depending on the source being used.

III. Speed Metric Comparison: Median Upload (Mbps)

Source: FCC; M-Lab



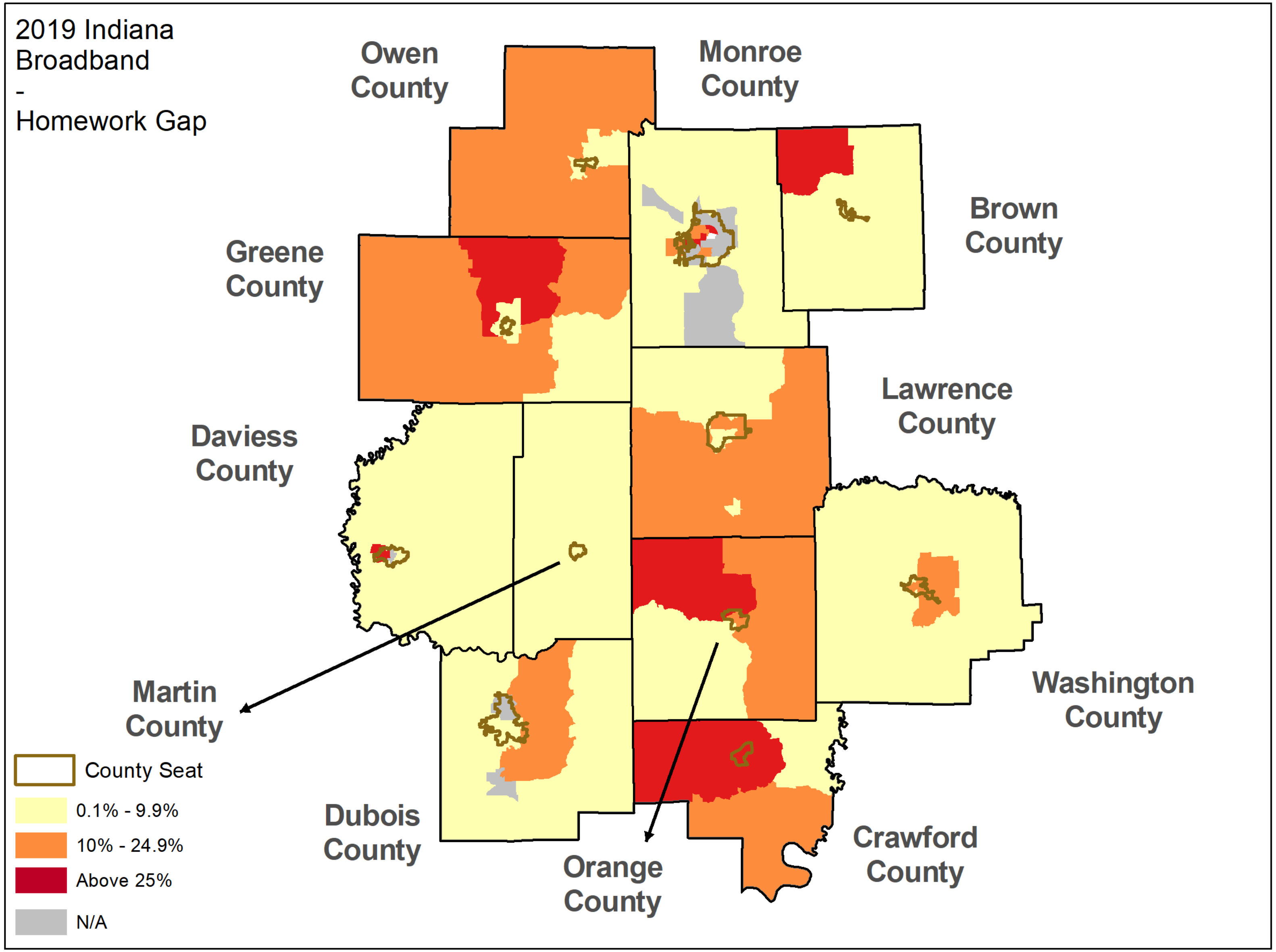
The graph compares the median upload speeds reported by the FCC and by M-Lab. Again, while these two metrics are not entirely comparable, since one is advertised speeds while the other is the median of speed test results, it does show differences between what is being advertised and what customers are getting. Dubois and Monroe Counties, as well as the state of Indiana, did have higher median actual speeds compared to the advertised speeds. All other counties had higher advertised speeds. Main point is that, again, broadband metrics vary depending on the source being used.

III. Homework Gap

Source: PCRD; 2015-2019 ACS

The map shows census tracts with the percent of children with a computer but no internet subscription as of 2019. A darker color indicates a higher percentage of children with no internet or homework gap.

Children with a computer but no internet	Homework Gap (%)
Brown	10.0
Crawford	19.5
Daviess	9.8
Dubois	4.2
Greene	14.6
Lawrence	10.4
Martin	6.7
Monroe	4.6
Owen	16.3
Orange	14.2
Washington	8.7
Indiana	7.7
Uplands	8.9

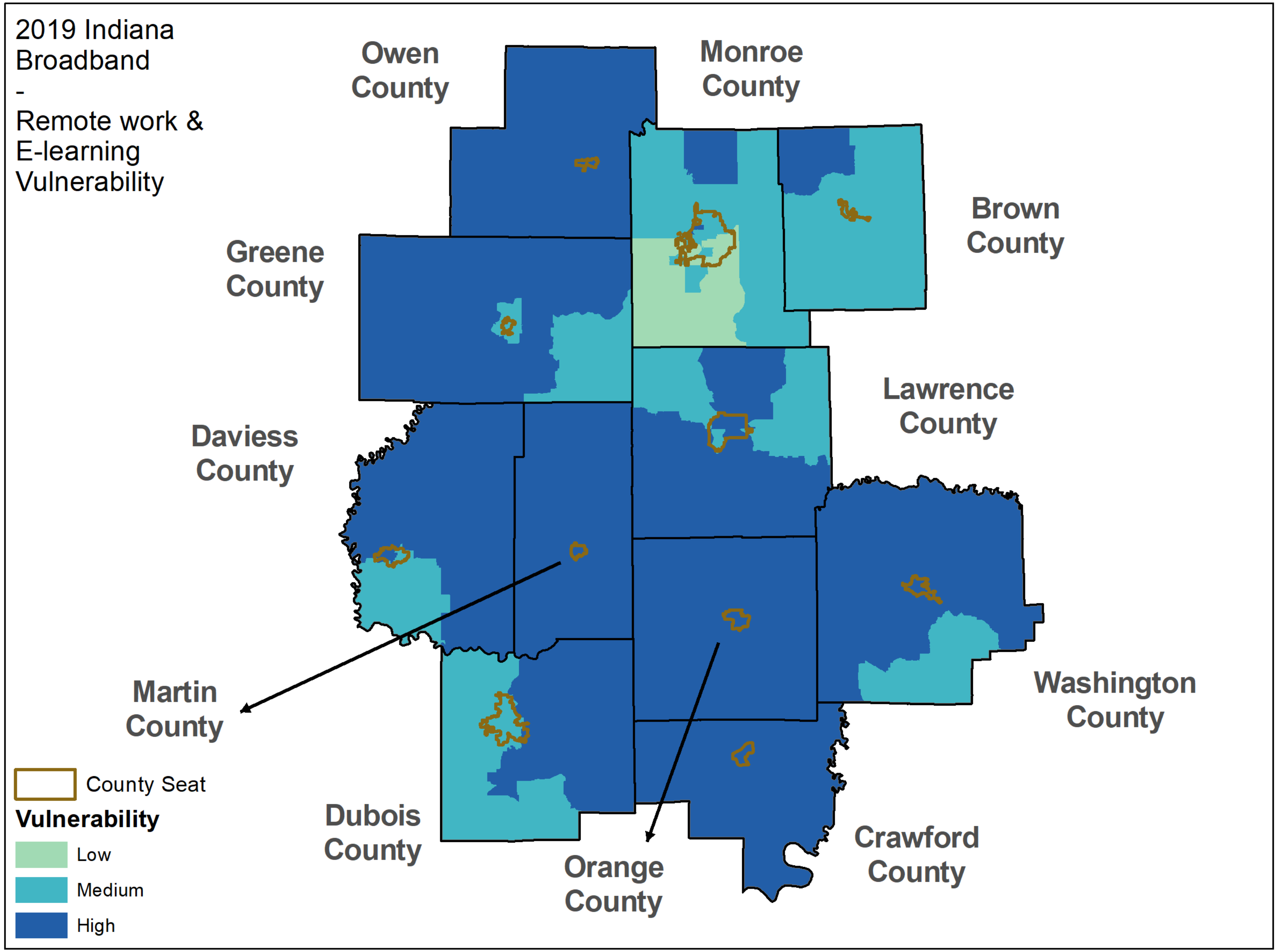


III. Remote Work & e-Learning Vulnerability (ReV)

Source: PCRD; 2015-2019 ACS

The map shows the census tract in the region by level of vulnerability to engage in remote work or e-learning due to inadequate connectivity, higher share of children with no internet, or higher share of jobs not conducive to remote work. Table shows the percent of in highly vulnerable census tracts.

Households	High Vulnerability (%)
Brown	20.1
Crawford	100.0
Daviess	69.6
Dubois	37.0
Greene	74.8
Lawrence	67.9
Martin	100.0
Monroe	4.3
Owen	100.0
Orange	100.0
Washington	76.5
Indiana	31.5
Uplands	46.5

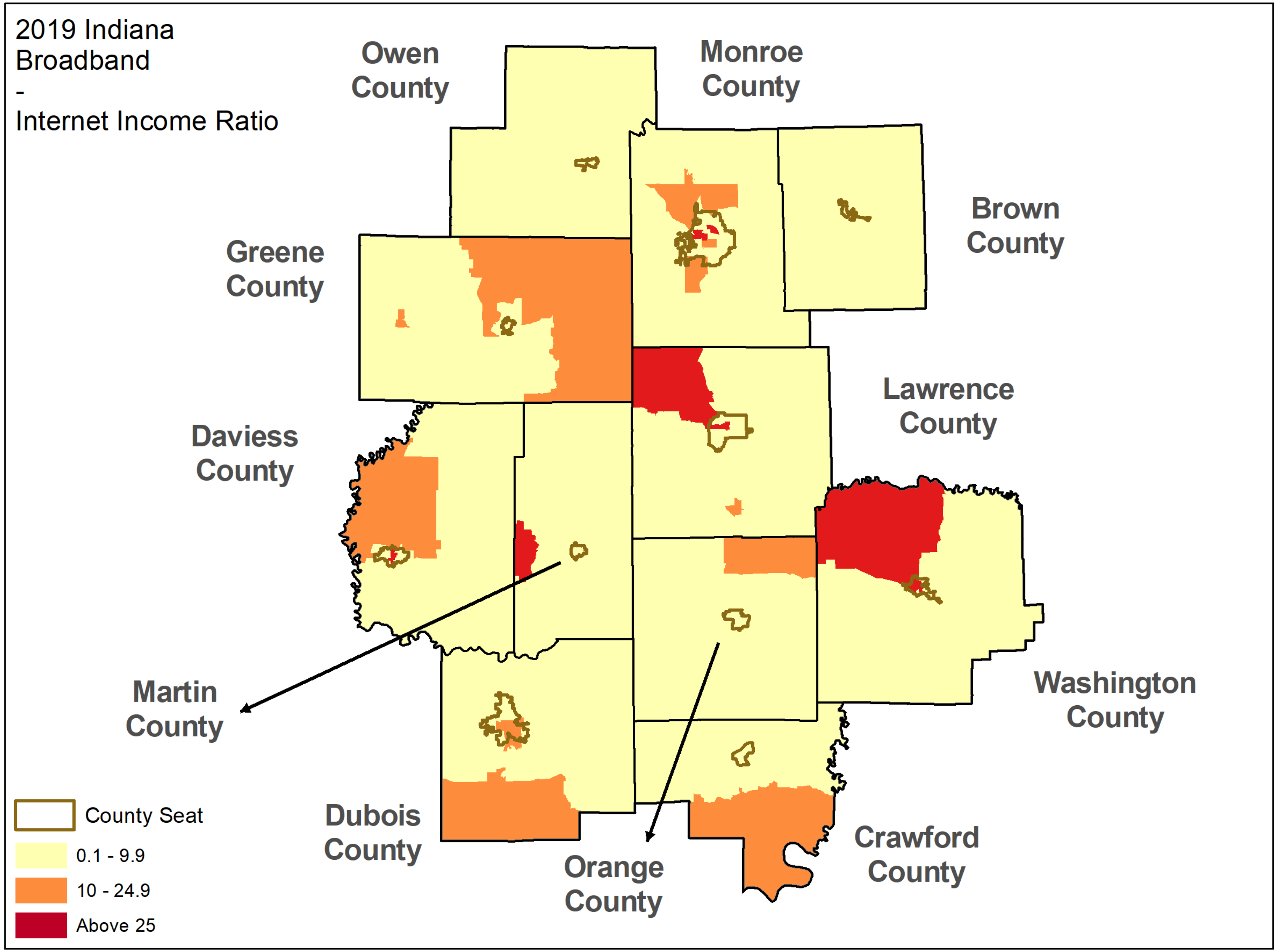


III. Internet Income Ratio (IIR)

Source: PCRD; 2015-2019 ACS

Map shows census tracts with the internet income ratio. A higher ratio indicates higher inequality regarding household income and internet access. For example, the share of low-income households without internet is 7.4 times higher compared to wealthier households in Washington County.

Households with no internet access	% < $35k	% 75k +	IIR
Brown	34.0	14.1	2.4
Crawford	54.3	13.4	4.0
Daviess	48.7	12.5	3.9
Dubois	37.7	6.1	6.2
Greene	45.5	10.9	4.2
Lawrence	42.5	10.1	4.2
Martin	45.8	8.0	5.7
Monroe	23.9	5.0	4.8
Owen	45.3	11.9	3.8
Orange	42.8	15.9	2.7
Washington	54.6	7.4	7.4
Indiana	37.3	6.5	5.7
Uplands	37.0	8.4	4.4

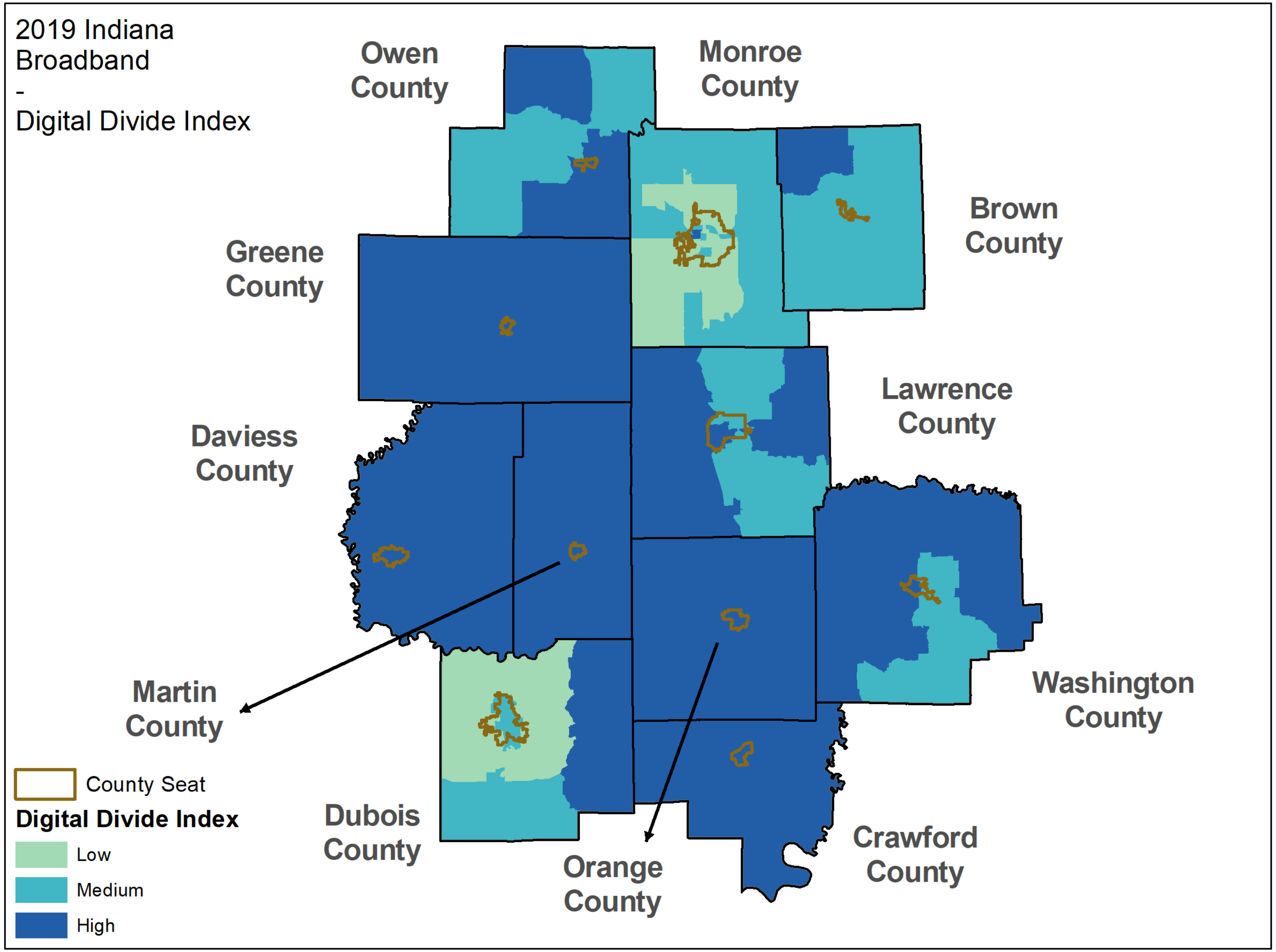


III. Digital Divide Index

Source: PCRD; 2015-2019 ACS

The map shows census tracts and their digital divide index (DDI) score. DDI includes 10 variables divided into infrastructure/adoption (INFA) and socioeconomic (SE) scores ranging from 0 to 100 where a higher score indicates a higher divide. For example, a higher SE score implies more efforts on relevance & literacy while a higher INFA score implies more efforts to improve infrastructure or adoption. Data used to calculate the scores included all tracts in the state.

County	SE	INFA	DDI
Brown	53.8	36.1	37.1
Crawford	100.0	79.2	100.0
Daviess	65.5	32.8	41.4
Dubois	36.6	30.8	22.5
Greene	71.8	36.5	48.1
Lawrence	70.0	28.0	40.1
Martin	73.3	36.4	48.9
Monroe	39.0	31.3	24.3
Orange	92.8	30.1	55.4
Owen	71.3	40.2	50.9
Washington	74.7	30.0	44.5



Section IV – Digital Capital Survey

All indicators analyzed thus far are considered secondary data sources. In other words, other organizations compiled these data and are available for public use. While these metrics are very useful, digital inclusion is a new concept and requires additional metrics to not only better inform planning efforts, but also set a baseline to gauge performance over time. For this reason, an innovative individual digital capital survey was conducted in the region. This survey gauges the levels of digital capital among individuals in the region. Measuring and understanding levels of digital capital is critical since this capital allows individuals to not only maximize the benefits of internet use, but also translate online use into offline benefits and vice versa.

Survey gathered data on three dimensions of digital capital in addition to gauging internet benefits. These three dimensions include cost, satisfaction and willingness to pay, device and internet access, and internet use and resourcefulness. In addition, internet benefits were also measured. In the end, this survey not only gauged levels of device and internet access, resourcefulness and utilization, and internet benefits among individuals but also identified differences between groups. Device and internet access, resourcefulness and utilization, and internet benefits were each normalized to a range from 0 to 10 for easier comprehension and comparison. The higher the number, the more digital inclusive the community is on that metric. For example, a higher internet benefit number the more the individuals benefitted from the technology as measured by the survey.

This information should complement other data and inform digital inclusion planning as well as setting a benchmark to measure progress of digital inclusion interventions and strategies in the future.

The survey was conducted online and distributed by the CDATs across multiple groups in their communities including, but not limited to, local chambers of commerce, economic development organizations, nonprofits, and other community groups for about 4-weeks between mid-October and mid-November 2020. Internet access at home was not an issue since survey could be completed using smartphone. The total number of survey responses was 3,332. To align this convenient sample with the region’s demographic characteristics, the survey was weighted by gender, educational attainment, earnings, and age.

Source: PCRD

Survey versus weighted demographic characteristics

Percentages	Survey	Weighted	Census
Male	33.5	43.9	49.5
Female	66.5	56.1	50.5
High school or less	14.7	52.9	44.4
Some college	30.5	31.8	32.6
Bachelor's or more	54.9	15.3	22.9
18-34 years	14.4	27.9	34.0
35-64 years	70.7	50.7	46.0
65 years or older	14.8	21.4	20.0
Less than $35,000	23.2	57.3	60.4
$35,000 - $74,999	46.9	32.6	29.6
$75,000 or more	29.9	10.2	10.0

Given that survey responses did not meet entirely the random criteria for a scientific sample, the convenient sample was weighted by gender, education, age, and earnings to align as much as possible to the region's characteristics according to the census. This should give appropriate weight to each group making survey findings more accurate.

The table shows the share of responses by gender, education, age, and earnings under the **survey** column. On the other hand, the share of the region's population by group is shown under the **census** column. Notice for example how those individuals with a bachelor's or higher were oversampled since the share of the survey was 54.9% versus 22.9% according to the census.

However, once the weights were applied, the new share of residents by group is shown under the **weighted** column. While the share will not be identical to the census' share, it is an improvement compared to the original sample. In this case, the share of those with a bachelor's degree or higher declined to 15.3% after applying the weights compared to 54.9% of the original share. This weighted figure is closer to the census share of 22.9%.

Section V – Regional Analysis

The previous sections focused on multiple metrics broken down by counties in the region as well as the region overall, including figures from the digital capital survey. This section focuses on further analyzing regional data from the digital capital survey.

This analysis related to digital inclusion looked at three socioeconomic characteristics of survey respondents in the region: educational attainment, age groups, and earning levels. This was not possible at the county-level due to sample size.

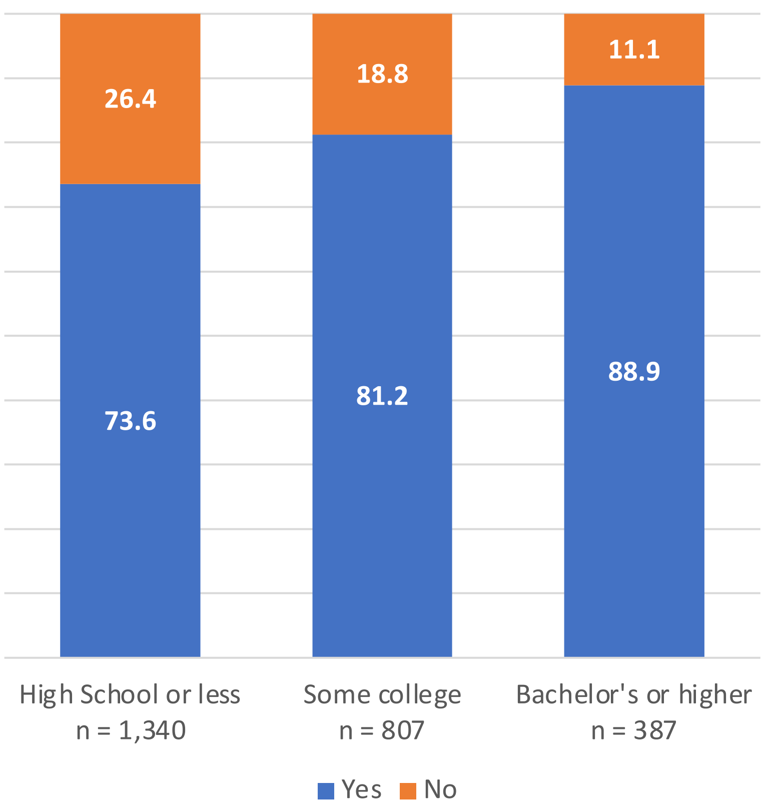
Home internet access, monthly cost (no bundles), technology type, willingness to pay, desktop/laptop ownership and performance, average weekly and monthly internet uses, earnings and savings due to online activity, and two metrics related to anxiety and quality of life in general were analyzed across each of the socioeconomic groups. The objective is to further understand inequities in the region that lead to digital exclusion.

In other words, it is important to understand digital inclusion levels not only between counties but also between specific groups within the region.

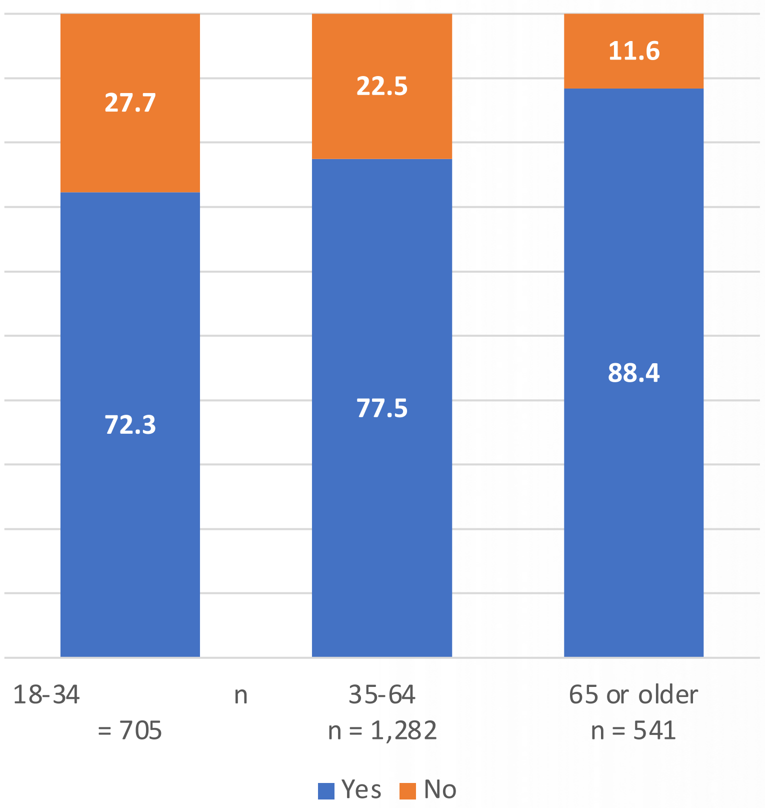
V. Home Internet Access: Selected Characteristics

Source: PCRD

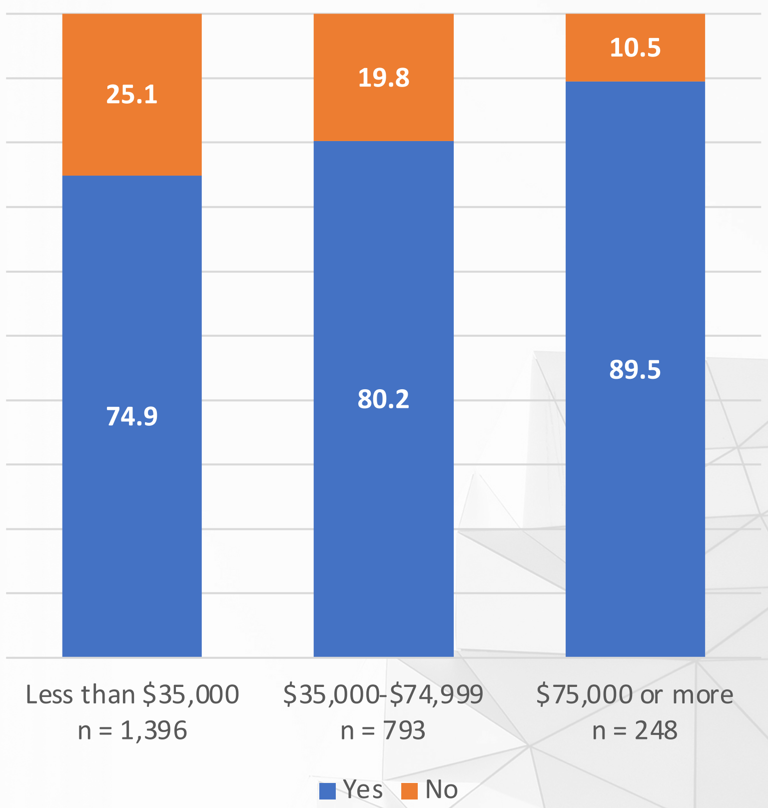
Educational Attainment



Age Groups



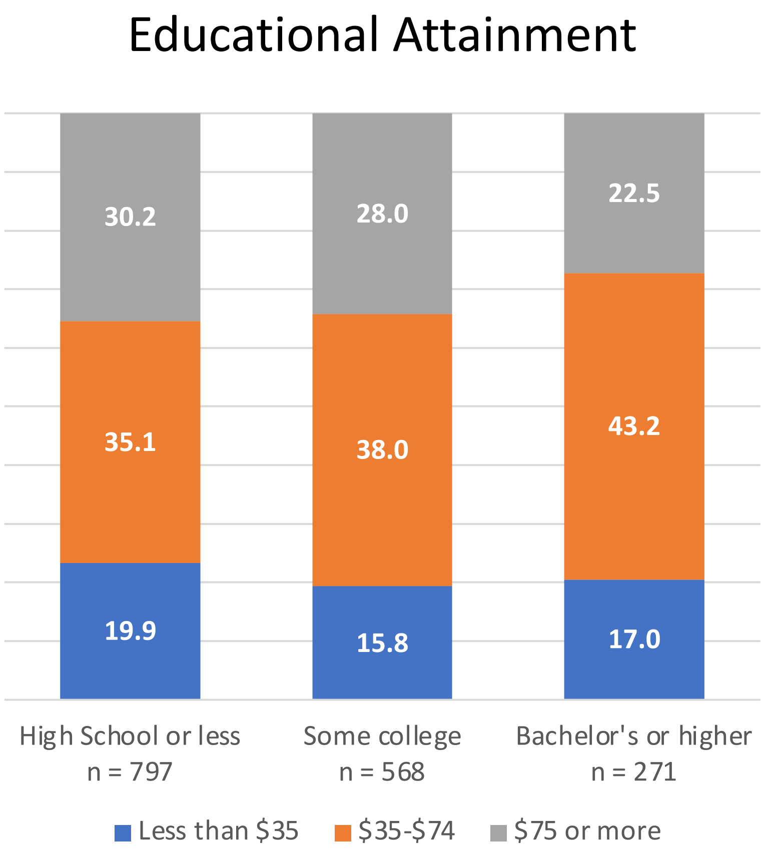
Earning Levels

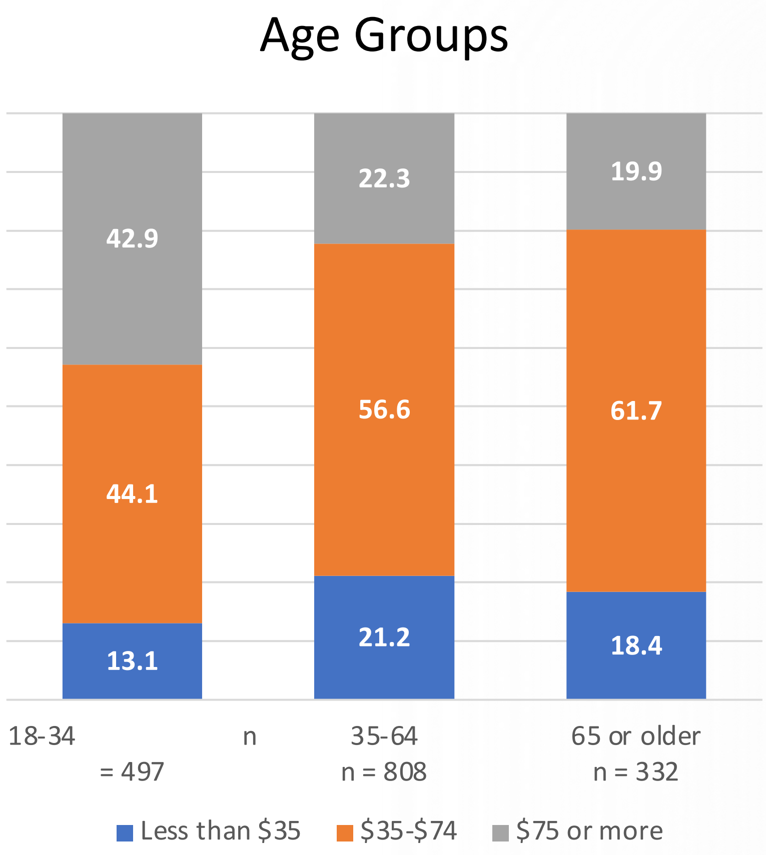


Regarding home internet access, there are some disparities in the region as shown in the graph above. For example, a little more than one-quarter of survey respondents (26.4%) with a high school diplomas or less did not have access at home compared to 11.1% of those with a bachelor's or higher. Similar patterns are seen with earnings as well as age groups. The fact that younger age groups have a higher share of those with no home internet access may be because they may rely on other devices and other locations to access the internet. It may also be related to not being able to afford the service at home plus a smartphone cellular/data plan.

V. Home Internet Monthly Cost: Selected Characteristics, Internet Only (No Bundles)

Source: PCRD



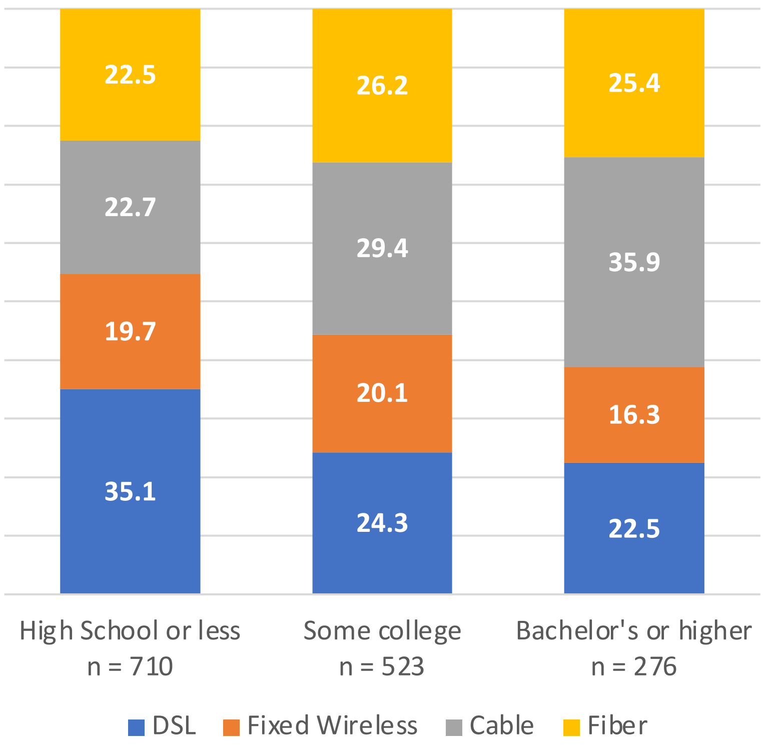


Participants that did have internet service at home provided data on the monthly cost of the service. While internet service cost is many times included as a "bundle", the survey did allow to capture solely internet cost excluding cost from other bundle elements (e.g., voice, TV). Graph shows the share of internet only monthly cost tiers by specific characteristics. For example, notice how 30.2% of those with high school diploma or less paid $75 or more per month compared to only 22.5% of those with a bachelor's or higher. In other words, a larger share of those with less education paid more for internet monthly. Among different age groups, a higher share of younger folks paid more compared to their older peers. Regarding earnings, roughly the same share of respondents paid $75 or more per month regardless of earning level. In other words, a much higher share comprising of less educated, younger, and low-income folks are paying for more expensive internet.

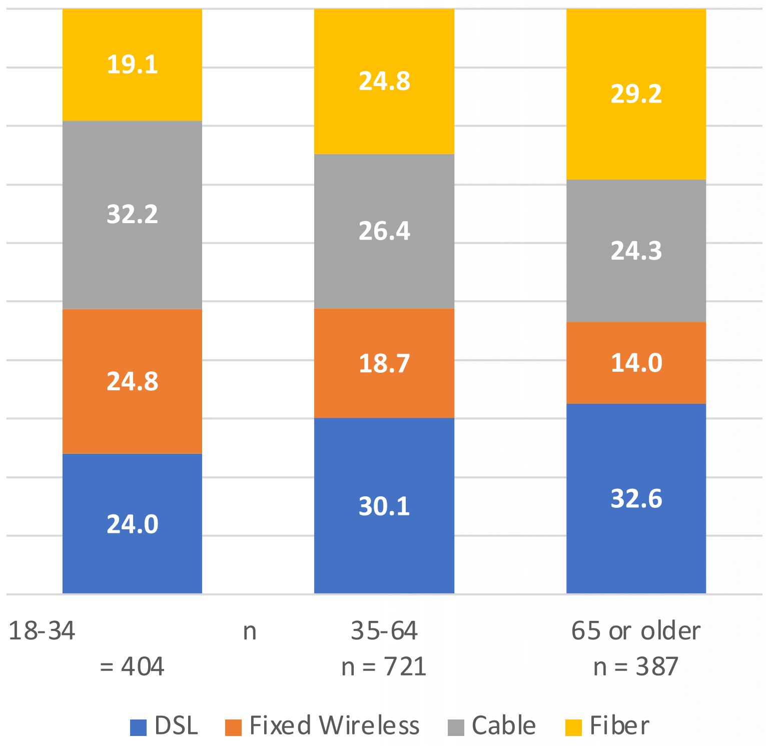
V. Home Internet Technology: Selected Characteristics

Source: PCRD

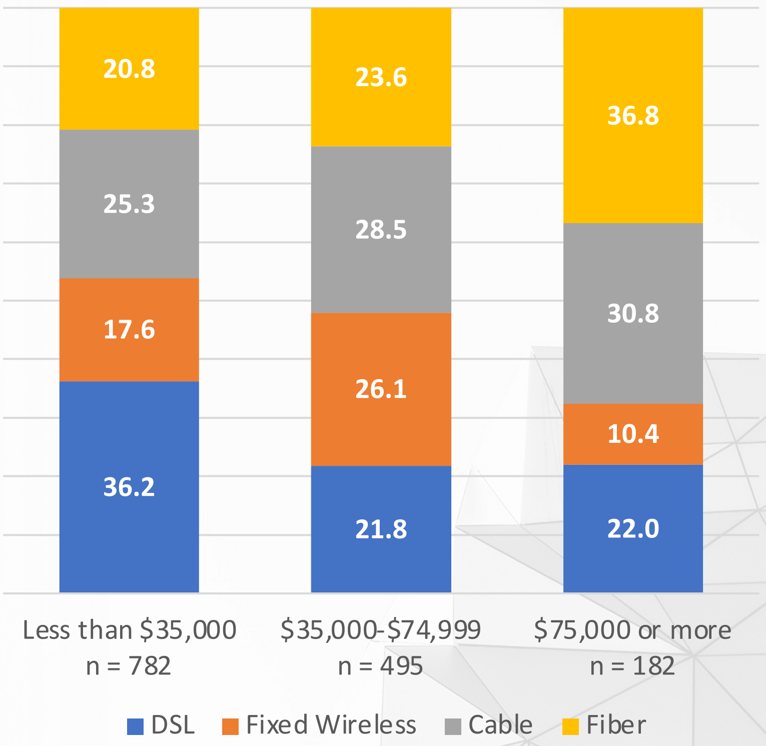
Educational Attainment



Age Groups



Earning Levels



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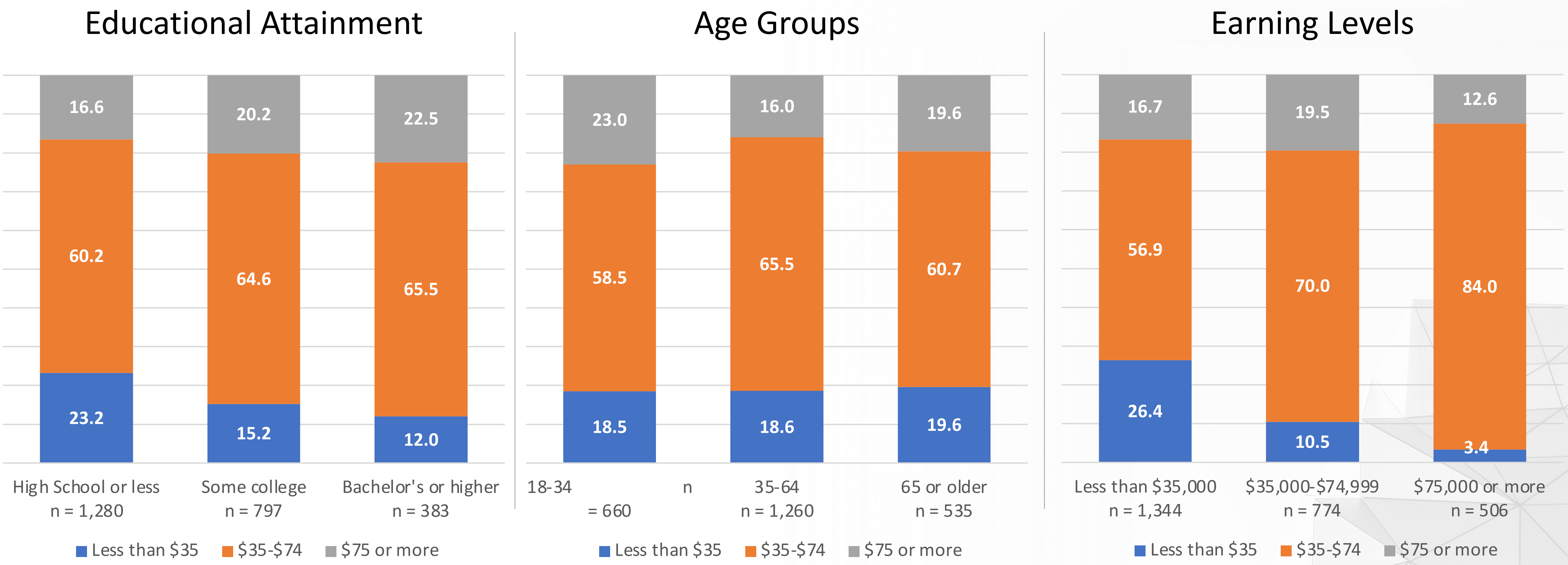
Participants that did have internet service at home provided data also on the type of internet used for their home connection. Graph shows the share of internet technology used at home by specific characteristics. A higher share of more educated people had fiber at their home (25.4%) while a higher share of less educated people (35.1%) had access to DSL. Regarding age, a higher share of older people had fiber at home (29.2%) compared to younger people (19.1% - a ten percentage point difference). However, the largest difference is noticeable regarding earnings. Almost 37% of those making $75,000 or more had fiber versus only 20.8% of individuals making less than $35,000 per year. Based on data provided on slide/page 18, cable and fiber provide the highest average download and upload speeds. In other words, a higher share of less educated, younger, and especially low-income respondents in the region had access to slower yet more expensive technologies (see slide/page 55).

V. Home Internet: Selected Characteristics, Willingness to Pay

Source: PCRD

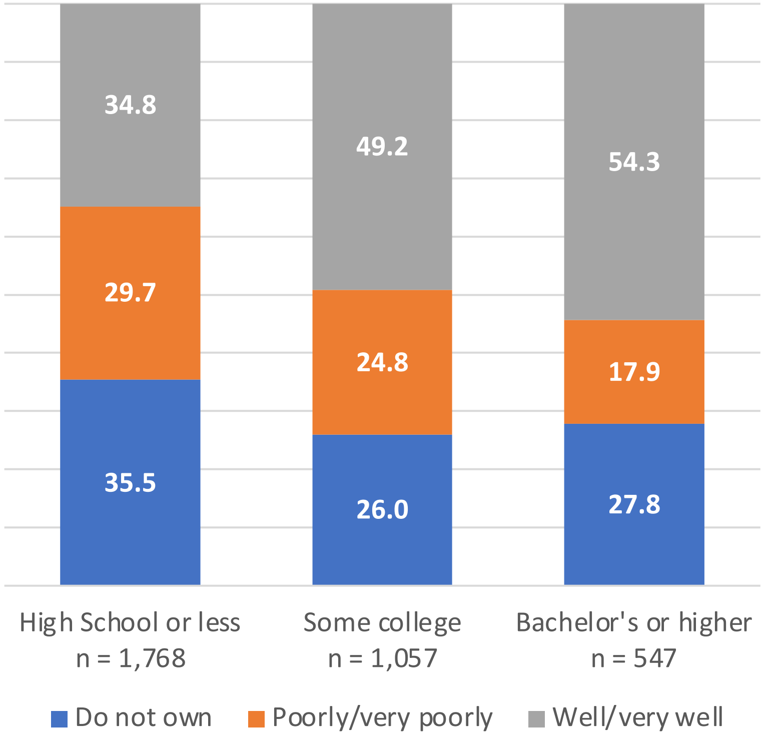


Survey participants shared their willingness to pay preferences for adequate and reliable internet at home. As expected, a higher share of more educated individuals (22.5%) are willing to pay $75 or more per month. Interestingly, a higher share of younger individuals (23%) were willing to pay more compared to those ages 35-64 years (16%). This may be because they perhaps value the technology more. Surprisingly, however, a higher share of low-income individuals (16.7%) were willing to pay more compared to more wealthier individuals (12.6%). This means that the value of the technology is high regardless of earning levels in the region. Also, the pandemic may have helped increase the value of the technology across all groups.

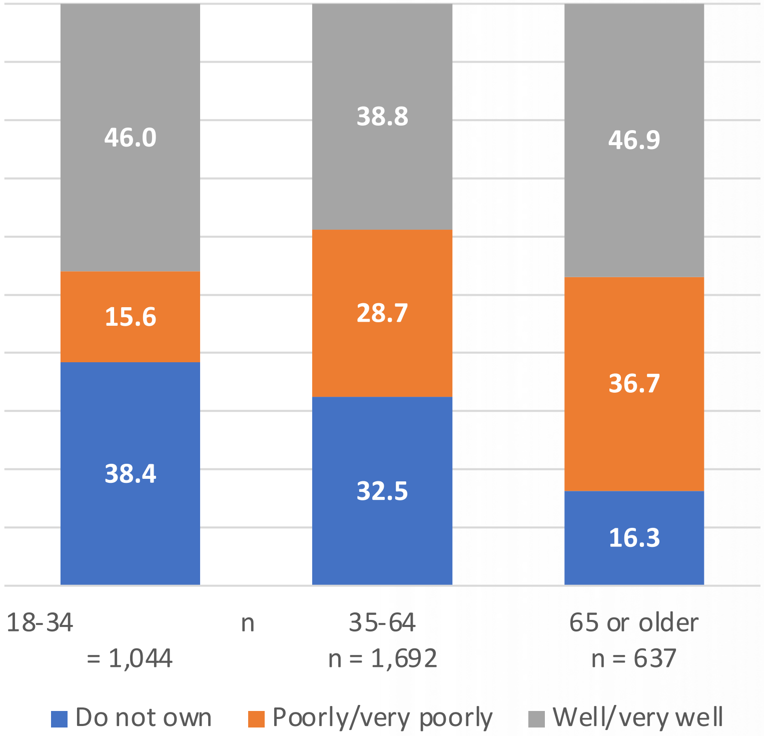
V. Devices: Selected Characteristics, Desktop/Laptop Ownership & Performance

Source: PCRD

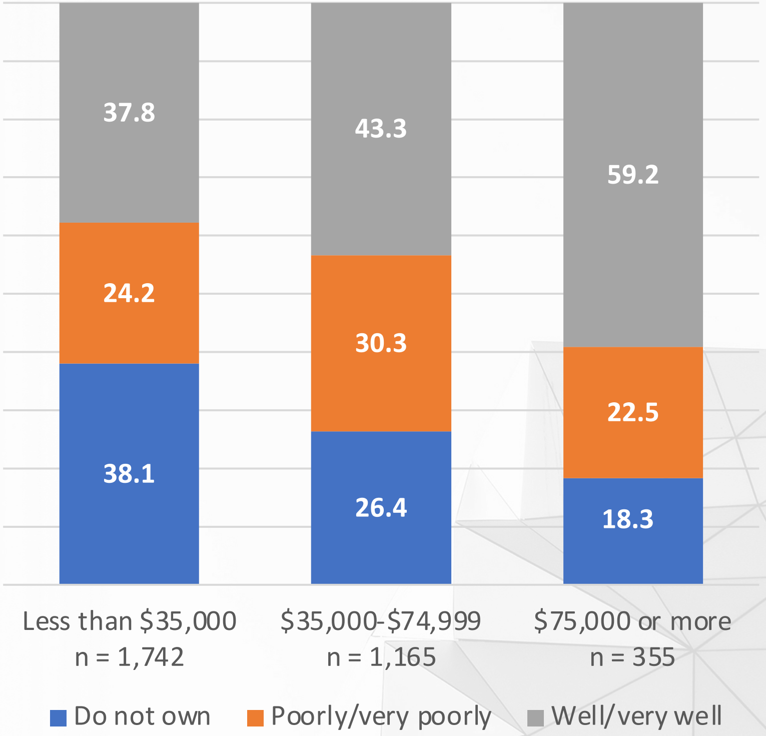
Educational Attainment



Age Groups



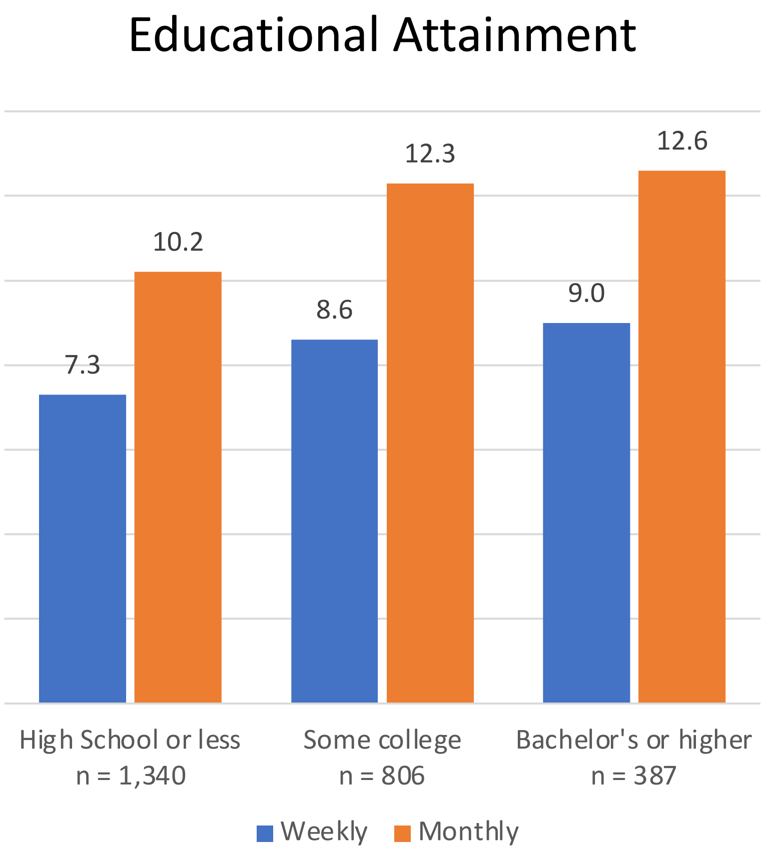
Earning Levels

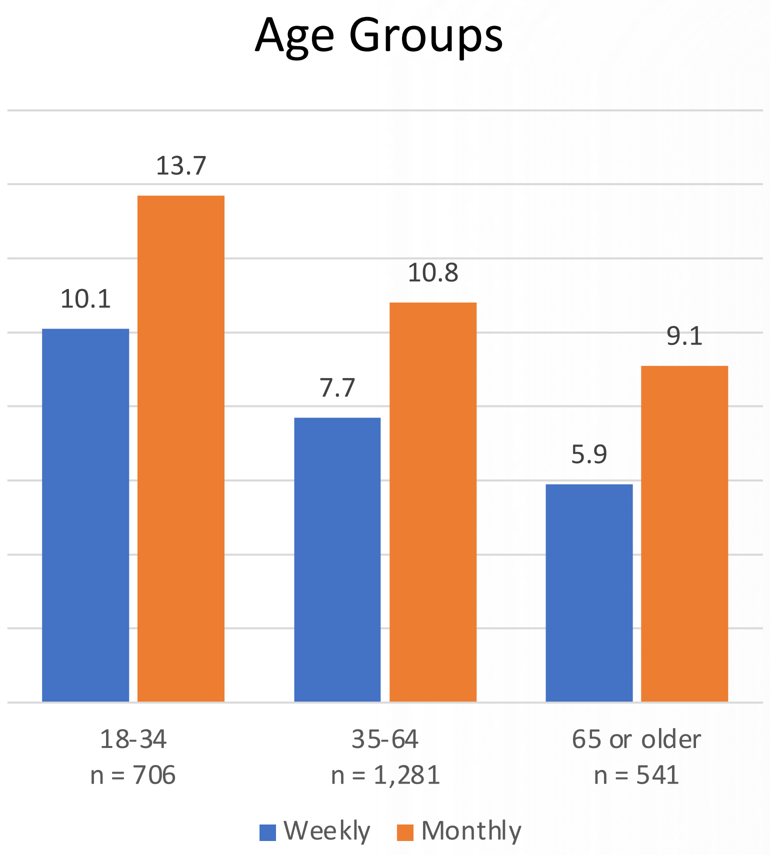


Regarding devices, survey participants shared what devices they owned and how well they worked over the past year. Graph shows the percent of responses of desktop or laptop ownership and performance by selected characteristics. According to research, the internet can be leveraged more with desktops or laptops compared to mobile devices with smaller screens. Individuals without a desktop/laptop and relying solely on mobile devices could be in digital distress. As expected, a higher share of less educated, younger, and low-income individuals did not own a desktop or laptop compared to higher educated, older, and wealthier individuals. In fact, only a little more than one-third (34.8%) of respondents with high school diploma or less owned a desktop or laptop that worked well or very well over the past year compared to more than half of those with a bachelor's degree or higher. A similar pattern is visible regarding earnings.

V. Internet Use: Selected Characteristics, Avg. Weekly & Monthly No. of Uses

Source: PCRD

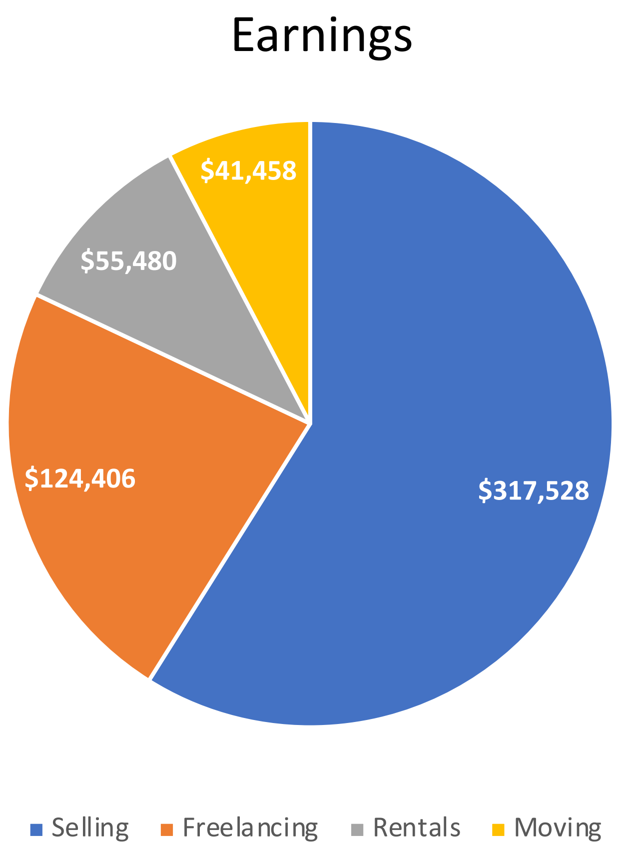


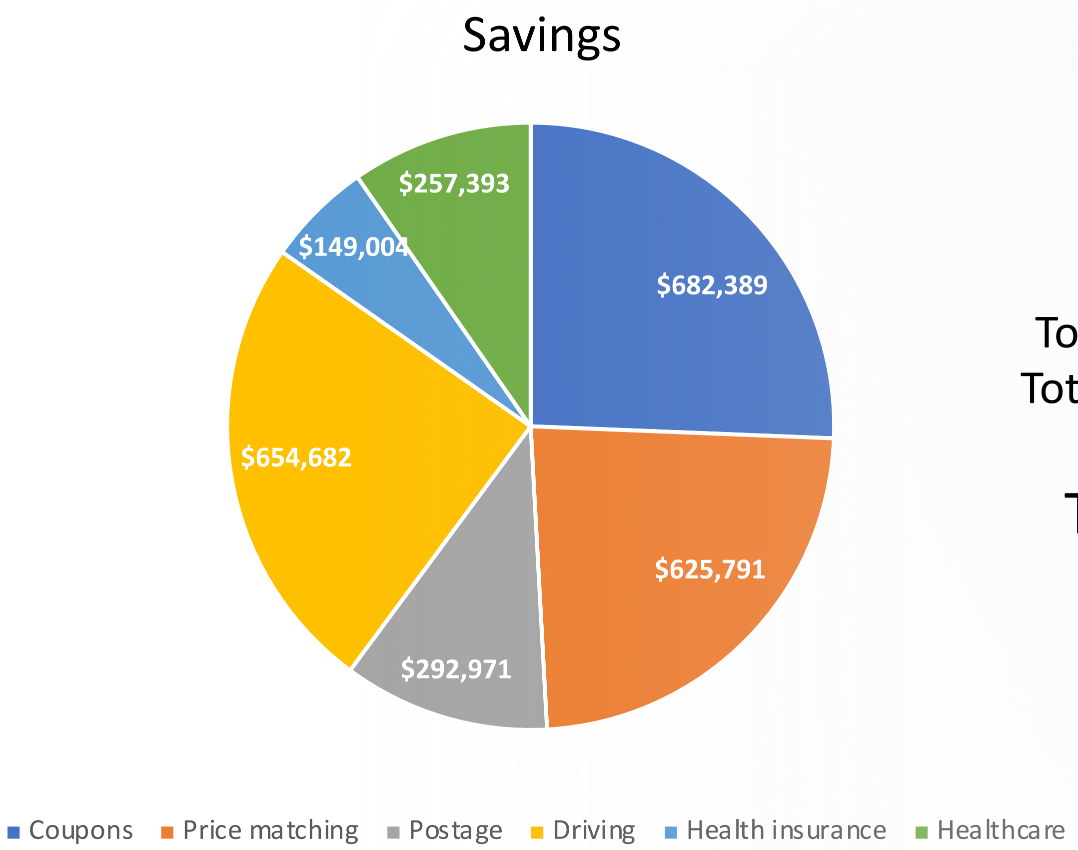


Respondents were asked to identify the frequency (at least once weekly, at least once monthly, etc.) and what they used the internet for (a total of 25 uses were listed ranging from browsing the web to using social media to remote work). Graph shows the average number of uses at least once weekly and at least once monthly. The average of at least once monthly is higher because not all internet uses are used daily or weekly (e.g., online banking, joining social groups, etc.). As expected, younger individuals used the internet in more different ways compared to their older peers, both weekly and monthly. A similar pattern is visible among the educational attainment and earning levels groups, where higher educated and wealthier individuals used the internet in more different ways at least once weekly and at least once monthly compared to their less educated and lower income counterparts.

V. Internet Use: Online Earnings and Savings by Type

Source: PCRD





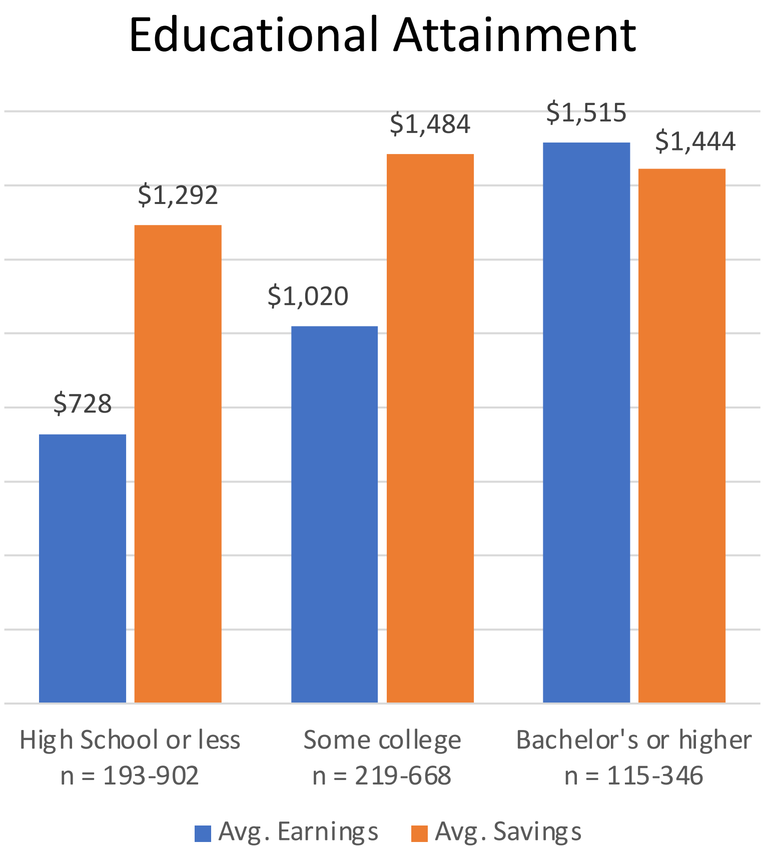
Total Earnings: $538,872
Total Savings: $2,662,230

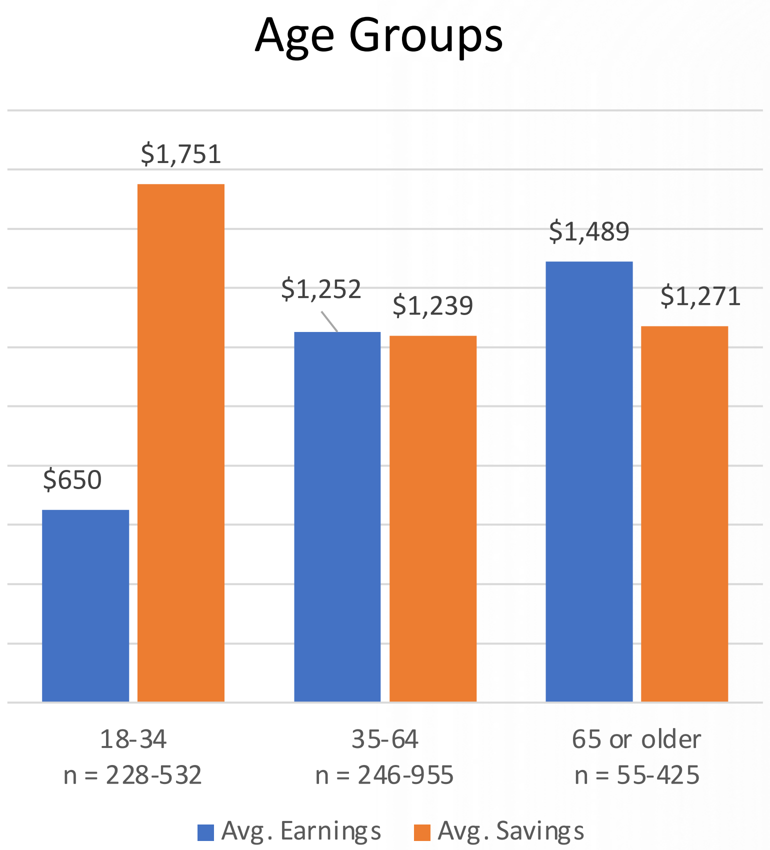
Total: $3,201,102

Survey asked about four ways to earn money online (not including the individual's job if remote working) and six ways to save money online and provided dollar ranges. In order to conservatively estimate the dollar amounts earned or saved by survey respondents in the region, the median value of those ranges was added up for each of the earnings and savings options provided. Charts show the breakdown of these online earnings and savings. The amount saved was five times higher compared to the amount earned (remember, these earnings did not include the primary source of income). Selling online was responsible for the largest share of earnings while saving by using coupons was responsible for the largest share among online savers. Savings due to driving less was the second highest. However, keep in mind the survey was conducted during a pandemic. Overall, the total dollar amount earned or saved by survey participants in the region was $3.2 million.

V. Internet Use: Selected Characteristics, Avg. Online Earnings & Savings

Source: PCRD

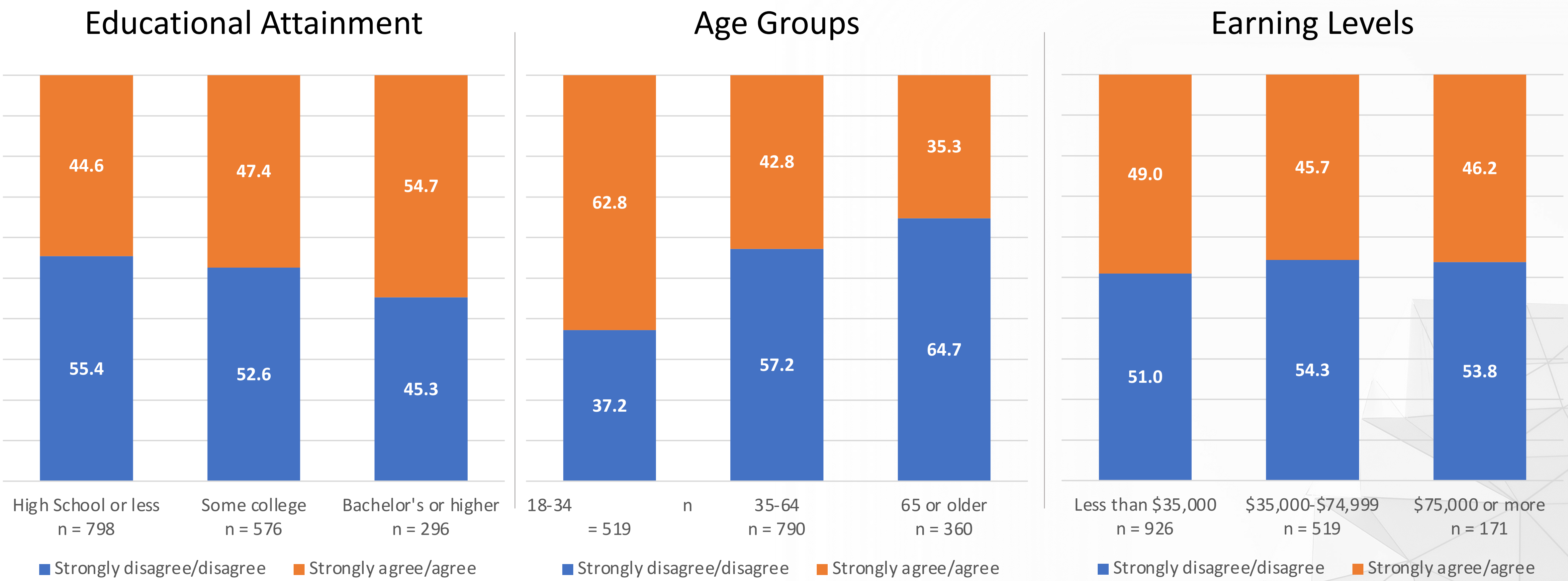




The earned and saved amounts calculated (see slide/page 60) were calculated for specific groups in the region. Graph shows that in general, the average savings were higher than the average earnings. Notice how younger individuals saved significantly more than their older peers. This implies that they may be more online saving savvy. A concerning trend, however, is that the more educated and the wealthier earned and saved more on average compared to their less educated and lower income peers. For example, more educated people earned more than twice what their less educated peers did. In other words, the internet's potential to level the playing field seems to not be happening since more advantaged groups are benefitting the most.

V. Internet Use: Selected Characteristics, Became Anxious

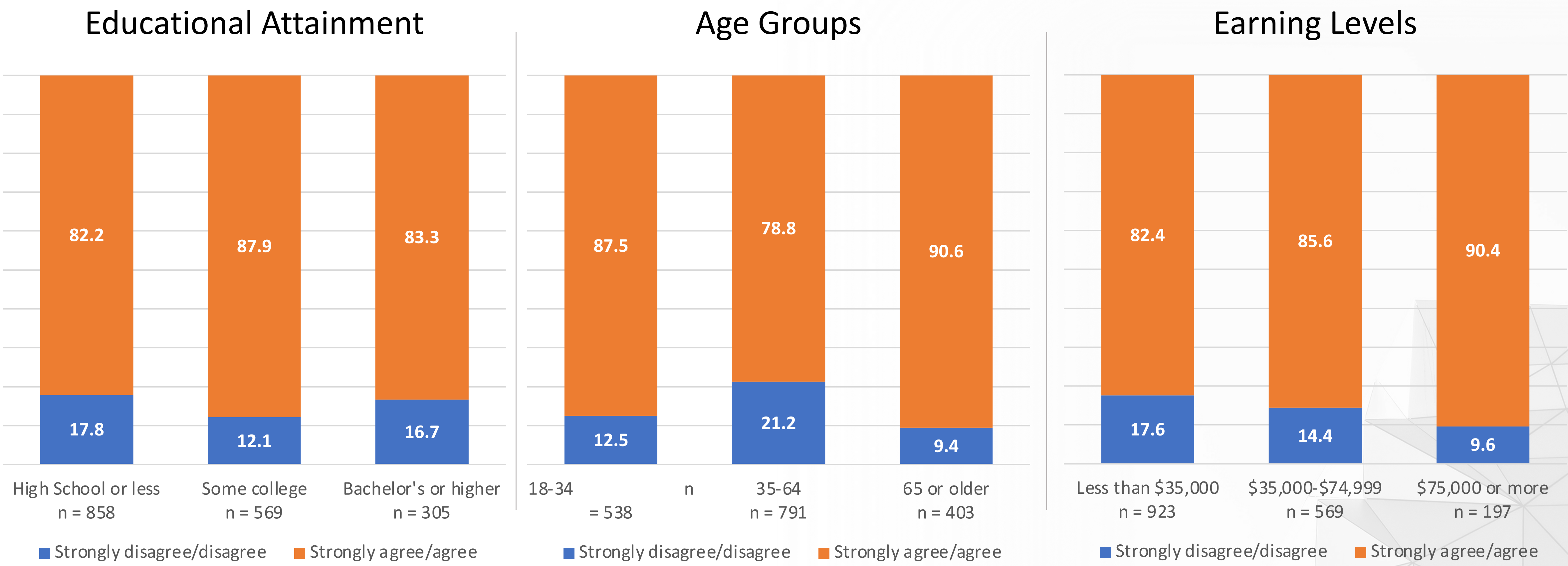
Source: PCRD



Related to earning and saving money online, survey asked participants about specific perceptions regarding their internet use of the past year. One of these perceptions had to do with becoming more anxious due to online activities and exposure. Graph shows the agreement level breakdown. Interesting is that a higher share of respondents with a bachelor's degree strongly agreed or agreed that it did make them more anxious compared to less educated individuals. Also, biggest differences took place among the age groups. Younger people were almost twice as likely to have become more anxious due to their internet use compared to older people. A reason for this may be that they spend more time online. There seems to not be any significant differences among the earning levels group.

V. Internet Use: Selected Characteristics, Improved Quality of Life

Source: PCRD



Related to earning and saving money online, survey asked participants about specific perceptions regarding their internet use of the past year. One of these perceptions had to do with internet use improving their quality of life overall. Graph shows the agreement level breakdown. Earning levels show some differences where a lower share of low earning people (82.4%) felt the internet improved their quality of life compared to higher earning individuals (90.4%). Also, a lower share of respondents ages 35 to 64 said internet improved their quality of life compared to their younger and older peers. In the end, however, most respondents (80% or higher) regardless of their educational attainment, age, or earnings, strongly agreed or agreed that using the internet over the past year improved their quality of life overall.