BROADBAND

Part Two:
UNDERSTANDING the DIGITAL DIVIDE
October 2020

dvrpc
DELAWARE VALLEY
REGIONAL
PLANNING COMMISSION

The Delaware Valley Regional Planning Commission is the federally designated Metropolitan Planning Organization for a diverse nine-county region in two states: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey.

DVRPC's vision for the Greater Philadelphia Region is a prosperous, innovative, equitable, resilient, and sustainable region that increases mobility choices by investing in a safe and modern transportation system; that protects and preserves our natural resources while creating healthy communities; and that fosters greater opportunities for all.

DVRPC's mission is to achieve this vision by convening the widest array of partners to inform and facilitate data-driven decision-making. We are engaged across the region, and strive to be leaders and innovators, exploring new ideas and creating best practices.

TABLE OF CONTENTS

FIGURES

TABLES

EXECUTIVE SUMMARY

Introduction

As was true with waterways, highways, railways, and electricity in prior decades, broadband is a crucial driver of job creation and economic growth. Internet applications reliant on high-speed broadband are increasingly critical for innovations in health care, education, transportation, business, and communications. The American Recovery and Reinvestment Act of 2009 allocated $7.2 billion to expand broadband services, create jobs, and stimulate economic growth. To build upon prior efforts, investments are still needed at every level (federal, state, and local) to enable all citizens to capitalize upon this technology.

Over the course of the Coronavirus Disease 2019 (COVID-19) pandemic, broadband has proved to be a vital utility. It enabled the requisite social distancing to occur while also facilitating emergency response efforts and continuity of public, private, and personal operations. The pandemic also further underscored the region's digital divide.

Therefore, the Delaware Valley Regional Planning Commission's (DVRPC's) analysis of broadband and the digital divide in Greater Philadelphia will be published as a three-part Broadband series. This enables DVRPC to fully analyze the socioeconomic impacts of the digital divide as understood prior to, and highlighted during, the pandemic, and to formulate more relevant and timely recommendations for bridging the divide.

Part One: Discussing the Technology

Part One in the series, published July 2020, maintained a narrow focus, outlining the basics of how broadband works and ascertaining the coverage areas for specific technologies and Internet Service Providers active within the region.

The report found that within the region there is some degree of a digital divide between residential and business consumers, as well as between consumers in New Jersey and Pennsylvania.

11.6%

Average estimated unemployment rate in 2017 for census tracts with below-average rates of broadband subscription per household

Part Two: Understanding the Digital Divide

This report discusses broadband's importance by sector and the trends it has facilitated, and ultimately looks to answer the question:

To what extent does a digital divide exist at the neighborhood level, and what were the ramifications of such a divide during the COVID-19 pandemic?

Importance by Sector

Broadband is increasingly important for economic, education, health, transportation, and emergency management reasons. Its availability can have significant ramifications for the region's digital divide.

Trends Facilitated by Broadband

The availability of and access to broadband has changed the ways in which the public informs and entertains itself, as well as how people shop, communicate, and commute.

The Region's Digital Divide

Greater Philadelphia's digital divide is more an issue of cost than of availability. Low-income, minority communities disproportionately fall on the wrong side of the divide. In 2017, the average estimated unemployment rate for the region was 8.0 percent compared to 11.6 percent in census tracts with household broadband below-average rates of subscriptions (less than 79.9 percent).

The Digital Divide and COVID-19

The pandemic has led to the "Great Acceleration" of pre-pandemic trends, and further exacerbated the academic, economic, medical, and social inequities related to the digital divide.

Part Three: Bridging the Digital Divide

In the third and final part of the Broadband series, Bridging the Digital Divide, DVRPC will seek to answer the question:

What strategies can be implemented within Greater Philadelphia to help bridge the digital divide so that the inequities that existed before, and that were highlighted during, the pandemic do not persist into the recovery period and beyond?

IMPORTANCE BY SECTOR

Community

Broadband technologies have the potential to revolutionize the ways in which governments and communities operate. The National Science Foundation defines a smart city as "a community that synergistically integrates intelligent technologies with the natural and built environments, including infrastructure, to improve the social, economic, and environmental well-being of those who live, work, or travel within it."[1] Although the term *smart city* typically refers to municipal governments, the concept can be applied to the public sector as a whole. There is no specific formula for utilizing smart technologies in the public sector, but goals for its implementation often include bridging the digital divide, creating mobility efficiencies, and advancing sustainability efforts.

Municipal Operations

During the pandemic, municipalities were able to migrate administrative and official processes onto digital platforms with relative ease. For instance, local planning and zoning boards were able to conduct regularly scheduled meetings and hearings remotely. However, in many localities this first required legislative changes.

Economy

In 2017, the digital economy accounted for 6.9 percent of the U.S. Gross Domestic Product. Additionally, the digital economy on average grew by 9.9 percent from 1998 to 2017, while the overall economy only grew by 2.3 percent on average during that same period.[2]

The Digital Economy

Since the COVID-19 pandemic is ongoing as this report is being written, the total economic impacts of the pandemic and state-mandated stay-at-home orders will not be fully understood for many months to come. However, there is already substantial evidence to suggest that the retail and food service industries were

1. National Science Foundation, "Smart and Connected Communities Program," nsf.gov, accessed March 2019.
2. Bureau of Economic Analysis, "How Big Is the Digital Economy?," accessed January 2020, www.bea.gov/sites/default/files/2018-04/infographic-how-big-is-the-digital-economy.pdf.

TABLE 1: Telecommunications Employees by County

County	Telecommunications Employees	Share of Telecommunications Employees	Total Employees	Telecommunications Employees as Share of Total
Bucks	1,695	10.9%	315,665	0.5%
Burlington	1,271	8.2%	243,773	0.5%
Camden	1,459	9.4%	235,055	0.6%
Chester	1,137	7.3%	302,656	0.4%
Delaware	1,065	6.8%	261,417	0.4%
Gloucester	193	1.2%	116,906	0.2%
Mercer	1,672	10.7%	229,501	0.7%
Montgomery	2,979	19.1%	567,585	0.5%
Philadelphia	4,108	26.4%	766,163	0.5%

Source: National Establishment Time Series (NETS), 2015.

⚫dvrpc

able to mitigate the negative impacts of the pandemic to some degree because of their capacity to continue operations via the digital economy.

Telecommunications Firms

In 2015, there were 2,300 telecommunications companies located within Greater Philadelphia. Approximately 58 percent of which were located in just three counties: Bucks, Montgomery, and Philadelphia, with Philadelphia alone accounting for nearly a quarter of all telecommunications firms (24.0 percent).[3]

The telecommunications sector employed 15,579 people within Greater Philadelphia in 2015, with 70.5 percent of those employees located in Pennsylvania and the remaining 29.5 percent located in New Jersey. Calculated from employment figures provided in Table 1 above, 67.1 percent of all pre-pandemic employment in the telecommunications industry for the region was located in Bucks (10.9 percent), Mercer (10.7 percent) Montgomery (19.1 percent), and Philadelphia (26.4 percent) counties. [4]

Education

Broadband enables education to extend beyond brick-and-mortar classrooms, eliminating traditional hurdles to obtaining a quality education. The availability of a

3. National Establishment Time Series (NETS), 2015.
4. Ibid.

wide range of Internet-based resources, such as online learning platforms and digital textbooks enables educators to provide education opportunities online. However, students living in households that lack broadband access are at a disadvantage when it comes to their capacity to utilize these various resources. The outcome of this inequity is commonly referred to as the "homework gap."[5] The homework gap was highlighted by the pandemic, and it is in later sections.

Emergency Management

Perhaps most importantly, broadband has the capacity to enable all other sectors to continue to operate at some degree of normalcy during an emergency. For example, telecommuting is possible for employees, and faculty and students can continue to advance modified curricula by utilizing digital technologies.

Nationally, the FirstNet broadband network was created for all first responders based on a recommendation from the 9/11 Commission Report.[6] FirstNet provides a dedicated wireless communications platform for first responders to utilize during incidents and major emergencies, and it eliminates the issue of network congestion that typically arises during an emergency. It enables first responders to communicate without competing with the general public for network availability.

Health Care

"Telehealth" is a rising trend in health care, which enables health care providers to connect directly with patients regardless of their physical location. These services are possible because of the high-speed Internet connectivity available via broadband, and the implications for telehealth have led the American Public Health Association to characterize broadband as a "super-determinant" of health. This characterization is due to its capacity to influence numerous other determinants of health, including education and employment, in addition to access to health care.[7]

Although there is a recognized connection between broadband access and health, low-income and rural populations are at risk of missing out on the benefits of this technology due to a lack of reliable or sufficient broadband connectivity, or the discretionary income needed to purchase a subscription. To address this inequity, the FCC launched the Connected Care Pilot (CCP) program, which aims to provide $100 million over 36 months to participating health care providers in order to cover the costs associated with purchasing broadband services necessary to offer connected care services.[8] CCP will enable data collection on broadband use by health care providers as a means to administer connected care services to low-income Americans and veterans.

5. Amina Fazlullah and Stephanie Ong, The Homework Gap: Teacher Perspectives on Closing the Digital Divide (San Francisco: Common Sense Media, 2019), www.commonsensemedia.org/sites/default/files/uploads/kids_action/homework-gap-report-2019.pdf.
6. Alicia Loh, "The State of FirstNet, America's Public Safety Broadband Network," Lawfare, April 16, 2019, www.lawfareblog.com/state-firstnet-americas-public-safety-broadband-network.
7. "State Laws and Policies Affecting Broadband Access in Eight Northern Region States," The Network for Public Health Law, December 6, 2018, www.networkforphl.org/resources/state-laws-and-policies-affecting-broadband-access-in-eight-northern-region-states.
8. Federal Communications Commission, "Notice of Public Rule Making: Promoting Telehealth for Low-Income Consumers," July 11, 2019, docs.fcc.gov/public/attachments/FCC-19-64A1.pdf.

Bridging the Digital Divide in a Crisis

Telecommunications companies are acknowledging the importance of broadband access during the pandemic, and have taken steps to ensure that all households have access:

- Comcast provided broadband service for free to all low-income households participating in the company's Internet Essentials program, which typically provides broadband for $9.95 per month to qualifying low-income households. Additionally, broadband speeds available through the program were permanently increased.[11]

- Cox upgraded basic subscribers from 30 megabits (Mbps) to 50 Mbps,[12] to better enable capabilities, such as telehealth and videoconferencing.

- AT&T, Verizon, and Charter utilized roll-in cell towers, which are literally cell towers on wheels (often referred to as COWS), to increase coverage and reliability in the same way that they do during a natural disaster.[13]

Transportation

Cities are increasingly interconnected and dependent upon smart wireless computer systems and networks. In today's world, public transportation, whether high-speed trains, subways, or other commuting options, no longer simply face just the task of transporting passengers from point A to point B. Further considerations with regard to public safety and the passenger's experience are also important. In order to accommodate those considerations, technologies like Dedicated Short-Range Communications[9] have the ability to increase transportation efficiencies by enabling signal prioritization for freight and public transit, electronic parking payments, and electronic toll collection. These technologies also enable vehicle safety features, such as collision avoidance and rollover warnings.

Electronic Toll Collection

During the COVID-19 pandemic, electronic tolling enabled routes, such as the New Jersey Turnpike, to protect the health and safety of fare collectors while continuing to collect fares electronically.[10]

9. Federal Communications Commission, "Dedicated Short Range Communications (DSRC) Service," www.fcc.gov/wireless/bureau-divisions/mobility-division/dedicated-short-range-communications-dsrc-service.
10. Dan Alexander, "Turnpike, Parkway Stop Taking Cash during COVID-19 Outbreak," New Jersey 101.5, March 24, 2020, nj1015.com/turnpike-parkway-stop-taking-cash-during-covid-19-outbreak.
11. Paige Gross, "Comcast is Offering Two Months of Free Internet Through Its Internet Essentials Program," Technical.ly Philly, March 13, 2020, technical.ly/philly/2020/03/13/comcast-two-months-free-Internet-essentials.
12. Davey Alba and Cecilia Kang, "So We're Working From Home. Can the Internet Handle It?," New York Times, March 16, 2020, www.nytimes.com/2020/03/16/technology/coronavirus-working-from-home-Internet.html.
13. Ibid.

TRENDS FACILITATED BY BROADBAND

Broadband has enabled a shift in how society entertains itself, participates in the economy, and commutes to work. Many of these trends were expected to mature over the course of the following decade. However, COVID-19 has led to the "Great Acceleration" of many of these trends over the course of months instead of years.[14]

Cord Cutting

The term *cord cutting* refers to the trend towards cancelling cord-based television subscriptions, such as cable, and replacing them with streaming services instead. Cord-based television is considered *linear television* (content is scheduled and airs at specific times), whereas *streaming* refers to content that is available on demand whenever a viewer desires. Nearly 25 percent of households in the U.S. are expected to drop traditional TV by 2022.[15]

Given that the fourth-largest employer in the region, Comcast,[16] is a cable television and broadband provider, as well as the parent corporation to the broadcast company NBCUniversal, the cord-cutting trend could have profound economic implications for Greater Philadelphia.

E-Commerce

As of 2019, e-commerce represented nearly 19 percent of retail sales[17] and is expected to be higher post-pandemic.

Retail

Prior to COVID-19, nine out of 10 retail dollars were still being spent at brick-and-mortar locations. However, a recent study found that when a business combines both its physical location with an online presence, it is able to capitalize upon what is referred to as the *halo effect*. This term describes the increased likelihood that a shopper will spend money online after making a purchase at a physical location.[18]

Digital Skills Gap

A 2017 study found that 82 percent of all

14. Andy Yan, "Managing Equitable Economic Recovery," webinar, Urban Logiq, June 16, 2020, www.urbanlogiq.com/webinars/managing-equitable-economic-recovery-webinar.
15. "Cable Operators' Shift to Profit Mode Accelerates Cord-Cutting," eMarketer, August 6, 2019, www.emarketer.com/newsroom/index.php/cable-operators-shift-to-profit-mode-accelerates-cord-cutting.
16. "Employers in the Philadelphia Metro Area," Philadelphia Business Journal, July 26, 2019, www.bizjournals.com/philadelphia/subscriber-only/2019/07/26/employers-in-the-philadelphia-metro.html.
17. Greg Buzek, Retail's Renaissance: True Story of Store Openings/Closings (New York: IHL Group, August 2019).
18. International Council of Shopping Centers, The Halo Effect II: Quantifying the Impact of Omnichannel (Philadelphia: International Council of Shopping Centers, July 2019), info.icsc.org/thehaloeffectii-form.

Streaming Service Typologies

Subscription Video on Demand (SVOD) Services
SVOD Services are flat-rate services that provide subscribers with unlimited access to a library of content, whether it be original to the service or licensed.

According to London-based Digital TV Research, 78 percent of all households in the United States will have SVOD subscription by 2024.

Examples include: Netflix, Hulu, and Amazon Prime Video.

Network-Based SVOD Services
These services were launched by traditional network and cable television providers. Some are considered AVODs, or Ad-Based Video on Demand services.

Examples include: HBO Now, Disney+, and Peacock (NBCUniversal's SVOD service, the launch of which was expedited due to the pandemic).

Linear Over-The-Top (OTT) Services
OTT Servcies are apps or websites that provide steaming content over the Internet. Linear OTTs are most similar to traditional TV, but are typically offered at a lower cost. They bundle content from various traditional service providers (broadcast, cable, and satellite) and live stream content to subscribers.

Examples include: Sling TV and DirecTV Now.

---

middle-skill jobs require some degree of digital ability. These jobs tend to pay more and account for 38 percent of postings.[19]

Telecommuting

Access to broadband at home has enabled many employees to integrate telecommuting into their weekly routine. According to Global Workplace Analytics, telecommuting increased 173 percent between 2005 and 2018, with 3.6 percent of the U.S. workforce working from home at least half of the time as of 2018.[20] Telecommuting increased even more, and was a critical tool, during the pandemic. This change is anticipated to continue even after the pandemic is over, a topic of further discussion in following sections.

19. Burning Glass Technologies, The Digital Edge: Middle-Skill Workers and Careers (Boston: Burning Glass Technologies, September 2017), www.burning-glass.com/wp-content/uploads/Digital_Edge_report_2017_final.pdf.
20. "Latest Work-At-Home/Telecommuting/Mobile Work/Remote Work Statistics," Global Workplace Analytics, accessed March 2020, www.globalworkplaceanalytics.com/telecommuting-statistics.

THE REGION'S DIGITAL DIVIDE

The FCC considers a census tract "covered" by broadband if at least half of its residents have the option to purchase fixed, wired broadband-speed Internet service from at least one provider. However, as the following analysis shows, the digital divide in Greater Philadelphia is more an issue of cost than of availability.

This section highlights household subscriptions, the cost of broadband, the unemployment rate related to household broadband, as well as populations of potential disadvantage.

Availability

According to the FCC, the average number of household broadband connections in Greater Philadelphia was between 601 and 800 households per census tract. Although only 77census tracts within the region fell below that range, those tracts represent a total population of approximately 284,000.

Household Subscriptions

Although much of the nation's digital divide is a result of the lack of availability in rural areas, the divide in Greater Philadelphia is less a story of physical access as it is one of affordability within the region's urban and low-income areas.

Cost

Price is a major factor regarding subscription rates. Many households face financial constraints. A study conducted by the Pew Research Center found that price is a barrier for many households. Approximately 69 percent of Americans view not having high-speed Internet at home as a major disadvantage to finding a job or accessing other important information. Among those that do not have a subscription, 33 percent indicate that cost is the primary reason.[21]

Table 2 highlights the cost per month for broadband service. The cheaper costs are for basic service, which often falls short of capacity needs.

21. John B. Horrigan and Maeve Duggan, "Home Broadband 2015," Pew Research Center, December 21, 2015, www.pewresearch.org/internet/2015/12/21/home-broadband-2015.

TABLE 2: Broadband Costs by Provider (Pre-Pandemic)

Provider	Cost per Month	**Cost as a Percentage of the Average Household:**		
		Budget within the Region ($7,597/month)	Income within the Region ($5,741/month)	Income in Low-Subscription Neighborhoods ($1,306/month)
Xfinity	$29.99–$299.95	0.4%–3.9%	0.5%–5.2%	2.3%–23.0%
CenturyLink	$45–$85	0.6%–1.1%	0.8%–1.5%	3.4%–6.5%
AT&T	$40–$50	0.5%–0.7%	0.7%–0.9%	3.1%–3.8%
Verizon Fios	$39.99–$79.99	0.5%–1.1%	0.7%–1.4%	3.1%–6.1%

Sources: www.xfinity.com; www.centurylink.com; www.att.com; www.verizon.com; Economic Policy Institute, Family Budget Calculator, February 2020; and U.S. Census Bureau, American Community Survey, Five-Year Estimates 2013–2017.
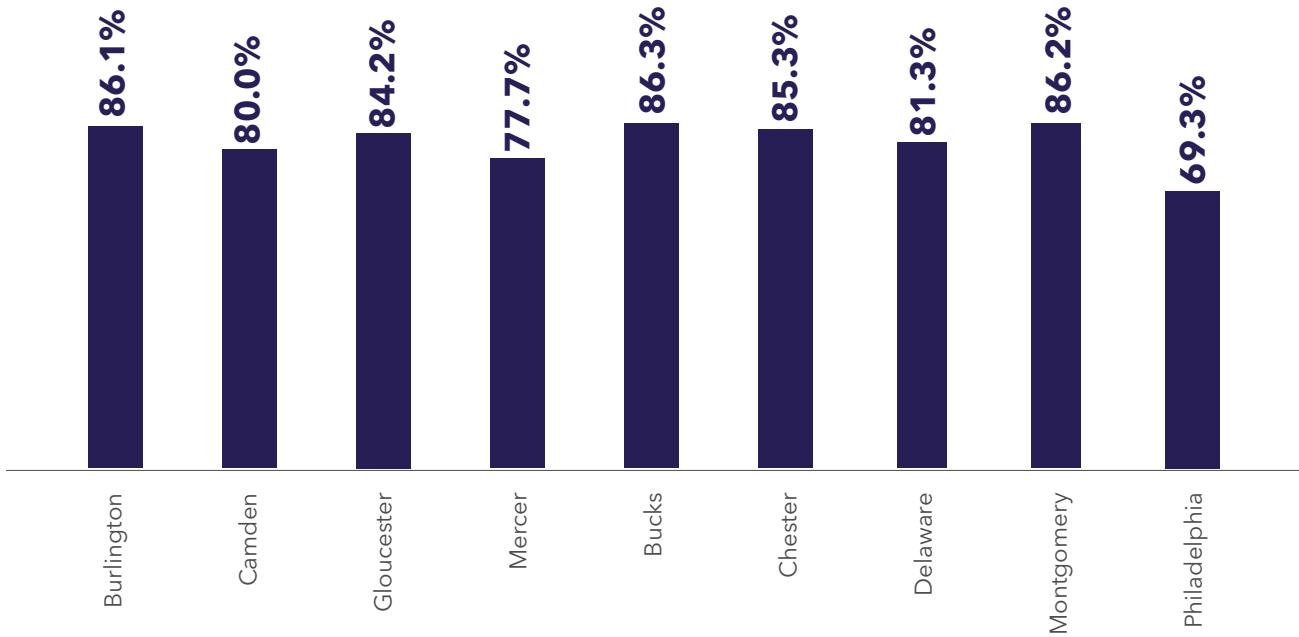
dvrpc

Subscription Rates

As previously mentioned, the average household broadband connection rate as reported by the FCC was between 601 and 800 households per census tract within Greater Philadelphia, although on average 79.9 percent of households have a broadband subscription according to the American Community Survey. The geographic distribution is illustrated in Figure 1 on page 16.

A deeper dive of subscriptions at the census tract and household levels illuminates a digital divide in terms of geography, as demonstrated in Figure 2 on page 17, and socioeconomic status, as shown in Figure 3 on page 18.

Areas where subscription rates are below 40 percent are considered by the FCC to be low-subscription census tracts, and in 2015 nearly one in four people within the United States lived in one of these areas.[22] Within Greater Philadelphia, census tracts with broadband subscription rates below 40 percent are only located in the cities of Philadelphia and Camden, and the estimated population within these areas was approximately 55,000 people in 2017. However, if you look at neighborhoods with broadband subscription rates below 50 percent, then that population increases to approximately 200,000 people. Meanwhile, more than two million people in Greater Philadelphia live in census tracts with below-average broadband

22. Adie Tomer et al., Signs of Digital Distress: Mapping Broadband Availability and Subscription in American Neighborhoods (Washington, DC: The Brookings Institute, September 2017), www.brookings.edu/wp-content/uploads/2017/09/broadbandreport_september2017.pdf.

TABLE 3: Percentage of Households with Broadband Subscriptions

County	Percentage
Burlington	86.1%
Camden	80.0%
Gloucester	84.2%
Mercer	77.7%
Bucks	86.3%
Chester	85.3%
Delaware	81.3%
Montgomery	86.2%
Philadelphia	69.3%

Sources: U.S. Census Bureau, American Community Survey, Five-Year Estimates 2013–2017.

⊘dvrpc

subscription rates (less than 79.9 percent), demonstrated in Figure 2 on page 17.

As evidenced in the following analysis of the region's potentially disadvantaged populations, when digitally disconnected populations are concentrated in specific areas, then the negative social, economic, and educational impacts associated with the digital divide can become concentrated as well. For example, approximately 13,300 children under the age of 18 live in low-subscription census tracts, and more than 51,000 live in census tracts with broadband subscription rates below 50 percent. Living without in-home broadband is a challenge for children, as they may not be able to benefit from digital curricula or develop digital skills required to be competitive in the future workforce. Lack of broadband at home further exacerbates the homework gap, as highlighted by the pandemic.

As shown in Table 3, aside from Philadelphia and Mercer counties, where the household subscriptions were 69 percent and 78 percent

TABLE 4: Estimated Unemployment Rate in 2017
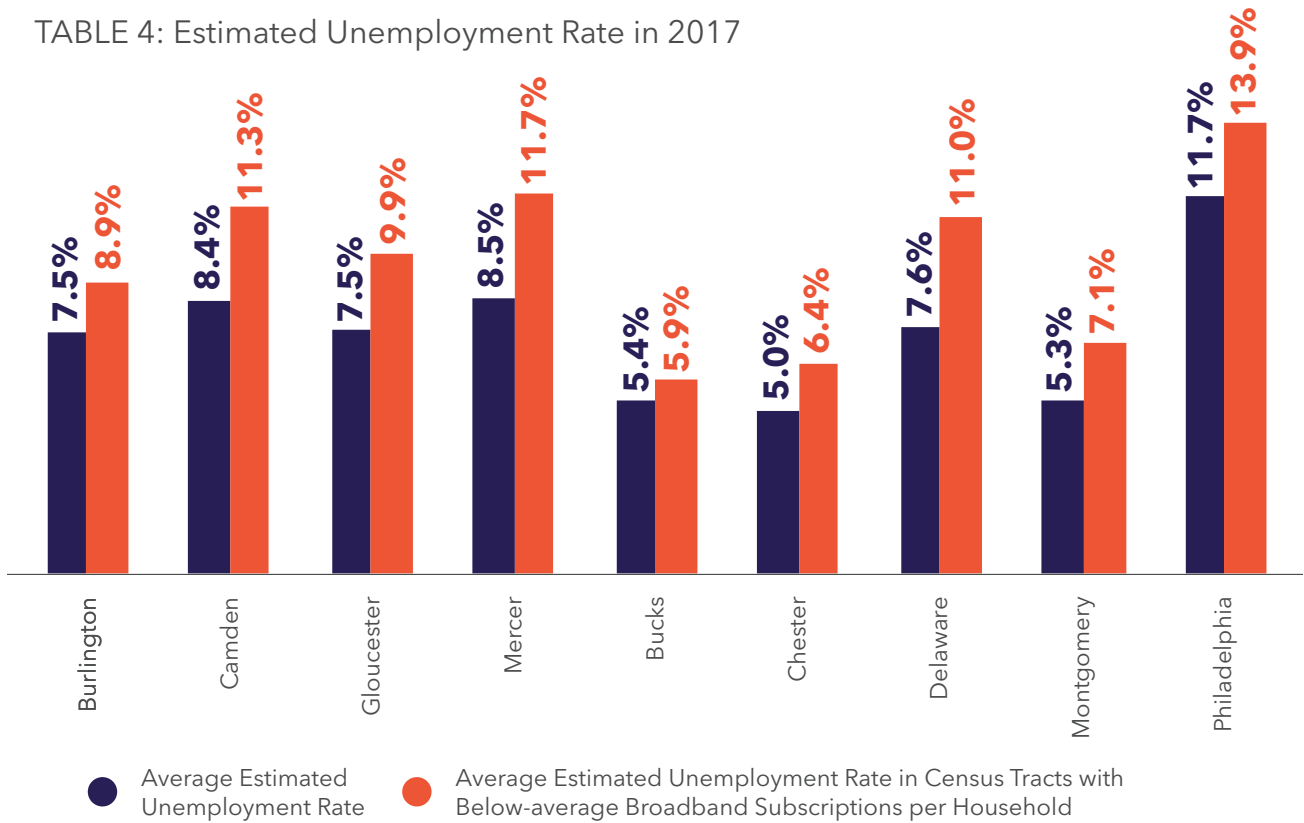
County	Average Estimated Unemployment Rate	Average Estimated Unemployment Rate in Census Tracts with Below-average Broadband Subscriptions per Household
Burlington	7.5%	8.9%
Camden	8.4%	11.3%
Gloucester	7.5%	9.9%
Mercer	8.5%	11.7%
Bucks	5.4%	5.9%
Chester	5.0%	6.4%
Delaware	7.6%	11.0%
Montgomery	5.3%	7.1%
Philadelphia	11.7%	13.9%

● Average Estimated Unemployment Rate

● Average Estimated Unemployment Rate in Census Tracts with Below-average Broadband Subscriptions per Household

respectively, household broadband subscription rates range between 80 and 86 percent. Additionally, households in Bucks, Burlington, and Montgomery counties had the highest number of broadband subscriptions at approximately 86 percent. This illustrates the extent of the digital divide between the region's urban and suburban counties.

Household broadband subscriptions in Greater Philadelphia are highly contingent upon annual household income. Region-wide, only 8.1 percent of households with an annual income of less than $20,000 have a broadband subscription, and fewer than a quarter of households with annual incomes of less than $50,000 have a broadband subscription. However, 55.4 percent of households with an annual income of $50,000 or more have a broadband subscription. The highest percentage of households with a broadband subscription (42 percent) was among those with annual incomes of $75,000 or more. In other words, as annual household incomes increased so did the rates of broadband subscription.

The Region's Digital Divide

8.0%

Average estimated unemployment rate for the region in 2017

At the regional level households earning less than $50,000 per year had an average broadband subscription rate of 24.4 percent, but this same cohort had higher than average rates in three counties: Camden (24.8 percent), Delaware (25.2 percent), and Philadelphia (32.7 percent). This suggests that lower-income households in the region's lower-density counties were less likely to have a broadband subscription compared to their counterparts in the more densely developed counties. Although there could be a number of reasons for this difference, one potential explanation could be that lower-income households within the region's denser communities are less likely to be burdened by the added expense of owning and maintaining an automobile, thereby leaving the household with the discretionary income needed for a broadband subscription.

Unemployment

The average unemployment rate was higher in census tracts with below-average broadband subscription rates. The estimated unemployment rate for the entire region was 8.0 percent, and the average percentage of households with a broadband subscription was estimated to be 79.9 percent. However, in census tracts where the number of broadband subscriptions was below the regional average, the estimated unemployment rate was 11.6 percent, which was nearly four percentage points higher than the regional average.

Counties with a higher number of household broadband subscriptions also had lower unemployment rates. Additionally, census tracts with below-average household broadband subscriptions had higher unemployment rates. The most significant increases were observed in Camden (2.9 percent increase), Delaware (3.4 percent increase), and Mercer (3.2 percent increase) counties. This is illustrated in Table 4 on the previous page.

14.9%

Estimated unemployment rate in 2017 where household broadband subscriptions are below-average and non-white populations are above-average
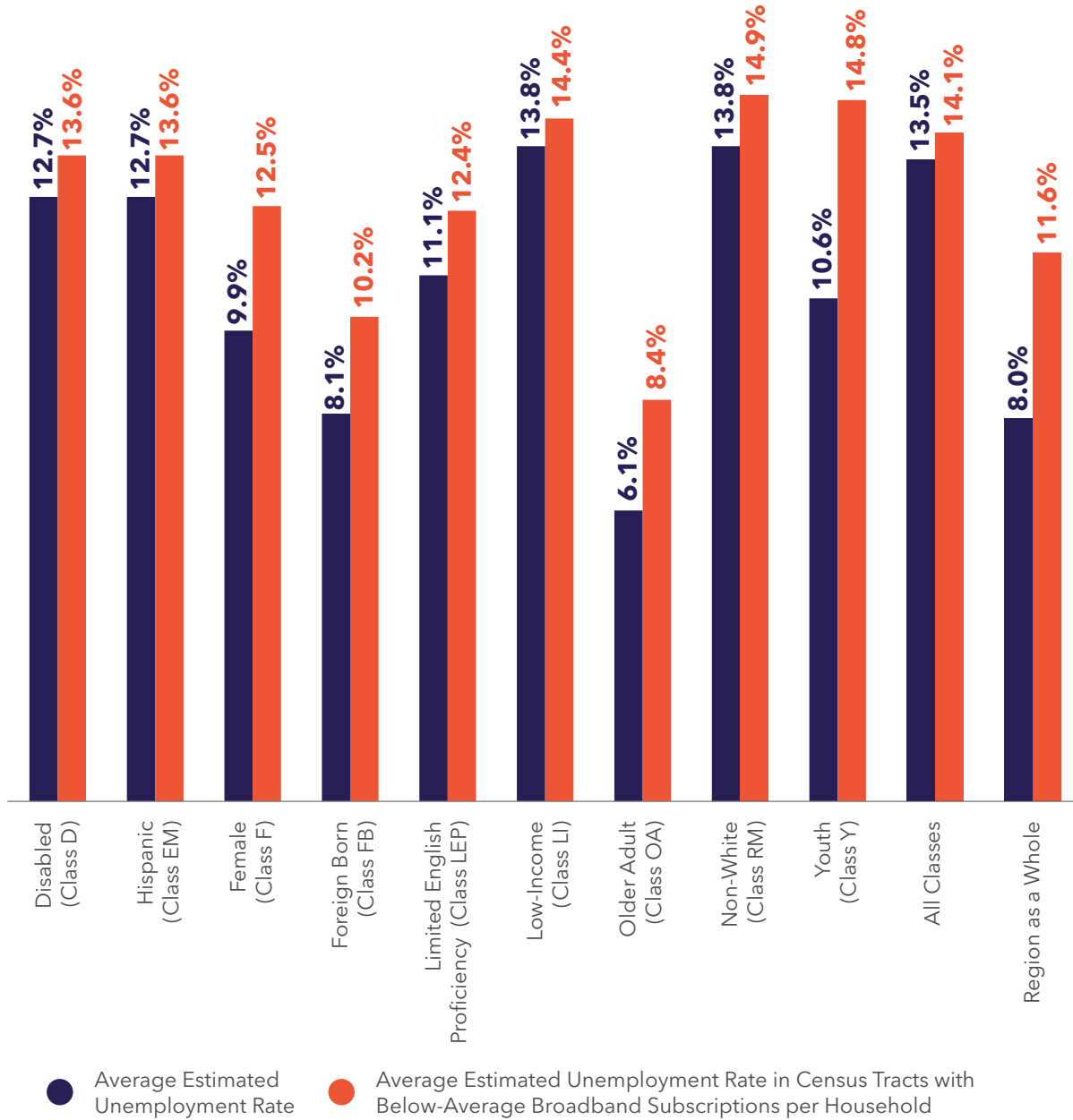
Disadvantaged Populations

DVRPC previously identified nine Indicators of Potential Disadvantage (IPD): Disabled (D), Hispanic or Latino (EM), Female (F), Foreign Born (FB), Limited English Proficiency (LEP), Low Income (LI), Older Adult (OA), Non-White (RM), and Youth (Y), and located areas within the region with above-average and well-above-average concentrations of these populations.

In census tracts where the number of broadband subscriptions was below the regional average (less than 79.9 percent) and the concentration of IPDs was above or well above the regional average, the unemployment rate increased from 8.0 percent for the region as a whole to 14.1 percent, as illustrated in Table 5 on the following page. Furthermore, the highest unemployment rate, 14.9 percent, was observed in census tracts where household broadband subscriptions are below-average and non-white populations are above-average.

Although this report does not suggest that a causal link exists between broadband subscriptions and unemployment, this analysis did observe that as the number of broadband subscriptions went down, the unemployment rate increased. Any number of variables could explain this dynamic, including less discretionary income in census tracts with increased concentrations of low-income populations, but no matter the cause it highlights an educational and economic disadvantage.

.

TABLE 5: Estimated Unemployment Rate in 2017 in Census Tracts with Above-Average IPDs

	Average Estimated Unemployment Rate	Average Estimated Unemployment Rate in Census Tracts with Below-Average Broadband Subscriptions per Household
Disabled (Class D)	12.7%	13.6%
Hispanic (Class EM)	12.7%	13.6%
Female (Class F)	9.9%	12.5%
Foreign Born (Class FB)	8.1%	10.2%
Limited English Proficiency (Class LEP)	11.1%	12.4%
Low-Income (Class LI)	13.8%	14.4%
Older Adult (Class OA)	6.1%	8.4%
Non-White (Class RM)	13.8%	14.9%
Youth (Class Y)	10.6%	14.8%
All Classes	13.5%	14.1%
Region as a Whole	8.0%	11.6%

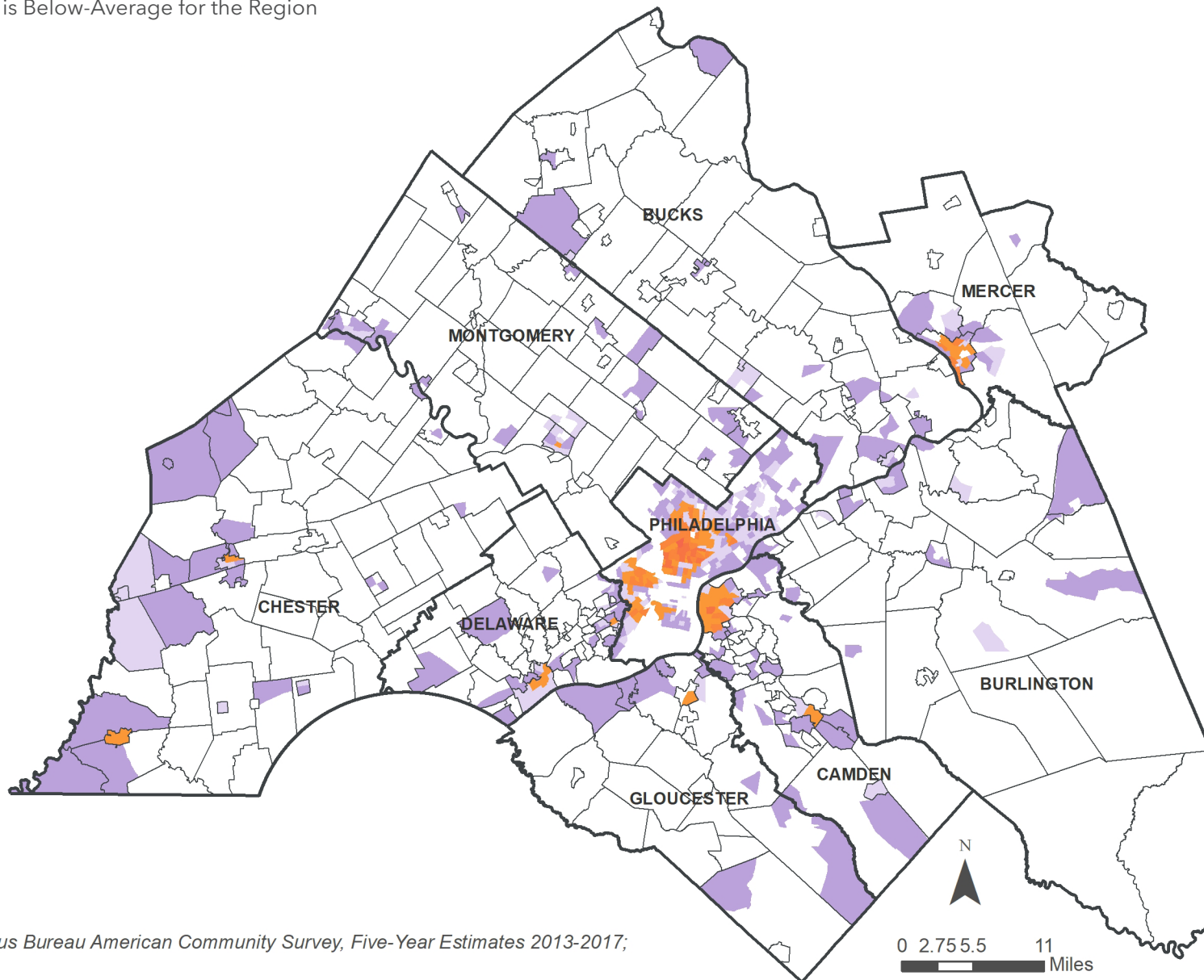*Sources: U.S. Census Bureau, American Community Survey, Five-Year Estimates 2013–2017.*

FIGURE 1: Percentage of Households with a Broadband Subscription
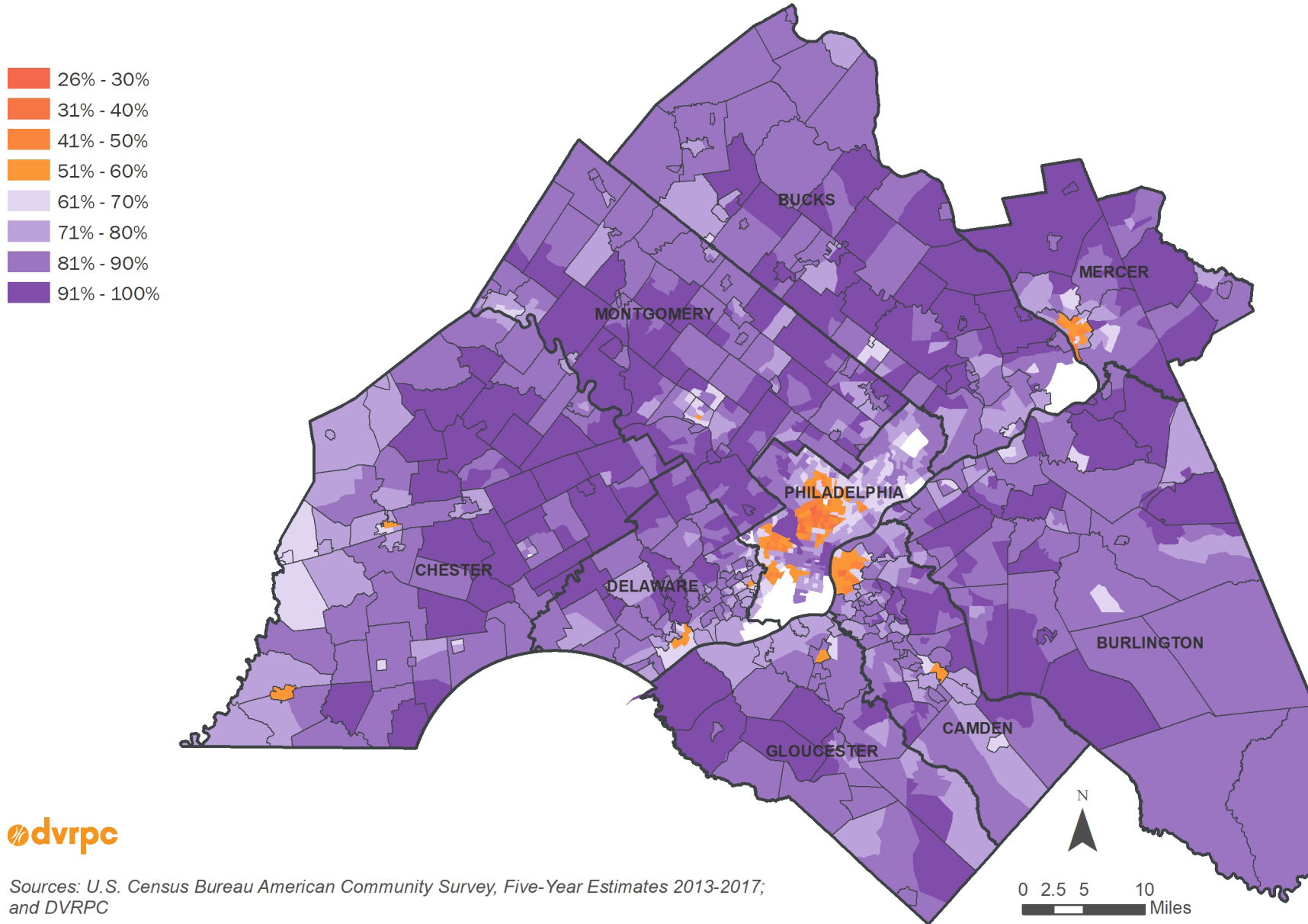
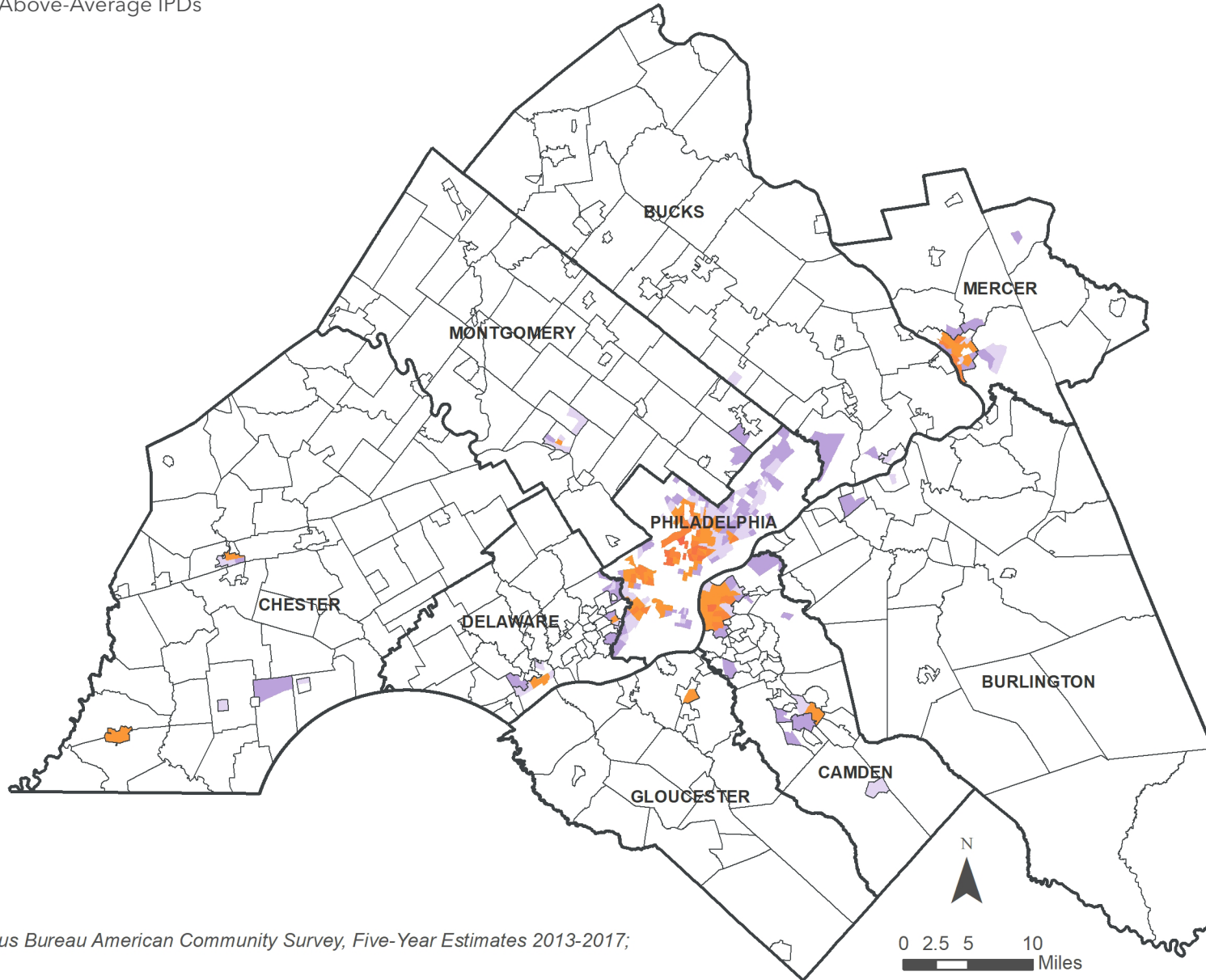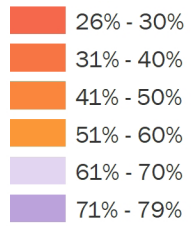|	
	26% - 30%
	31% - 40%
	41% - 50%
	51% - 60%
	61% - 70%
	71% - 80%
	81% - 90%
	91% - 100%

Sources: U.S. Census Bureau American Community Survey, Five-Year Estimates 2013-2017; and DVRPC

The Region's Digital Divide

FIGURE 2: Census Tracts with Household Broadband
Subscription That is Below-Average for the Region
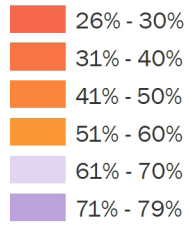
Legend:
- 26% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 60%
- 61% - 70%
- 71% - 79%

BUCKS

MERCER

MONTGOMERY

PHILADELPHIA

CHESTER

DELAWARE

BURLINGTON

CAMDEN

GLOUCESTER

N

0 2.75 5.5   11
                      Miles

dvrpc

*Sources: U.S. Census Bureau American Community Survey, Five-Year Estimates 2013-2017;
and DVRPC*

Broadband: Understanding the Digital Divide

FIGURE 3: Census Tracts with Below-Average Household Broadband
Subscription and Above-Average IPDs

Legend:
- 26% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 60%
- 61% - 70%
- 71% - 79%

BUCKS

MERCER

MONTGOMERY

PHILADELPHIA

CHESTER

DELAWARE

BURLINGTON

CAMDEN

GLOUCESTER

N

0   2.5   5   10
Miles

dvrpc

THE DIGITAL DIVIDE AND COVID-19

Assistant Director of Workforce and Economic Inclusion at Drexel University, Howard Pinder, stated that "digital access is no longer a luxury; it is essential to life in the 21st century,"[23] and this was certainly borne out during the pandemic.

The World Health Organization declared COVID-19 a pandemic on March 11, 2020, and the health crisis related to COVID-19 quickly became an economic crisis as well.

The stay-at-home orders were intended to protect the health and safety of the public. For those with access to broadband, academic, economic, and social life transitioned to an entirely digital life with relative ease. However, as previously discussed in this report, access to and availability of broadband is not equal throughout the region, and the pandemic quickly highlighted those inequities.

Economy

The economic impacts of COVID-19 were quickly realized as locally and state-mandated stay-at-home orders went into effect, and brick-and-mortar establishments were forced to close. Businesses that were able to quickly pivot to an all-digital business model were better able to weather the crisis. To do so was often contingent upon which side of the digital divide the business was on.

E-Commerce

Businesses that had already adapted to the digital economy were better able to take advantage of business-sustaining trends, such as BOPIS (Buy Online, Pickup in Store), and will be better positioned to continue to do so well into recovery. The apparel industry alone is expected to see an increase of 20 to 40 percent in online sales over the next six to 12 months.[24]

Access to Capital

Since 2009, there has been a 14 percent decrease in bank branch locations within Philadelphia due to the shift towards online banking platforms, and as of 2019, only 5 percent of branch locations within

23. Howard Pinder, "As COVID-19 Deepens the Digital Divide, a Call to Move Beyond Simply Providing Access," Technical.ly Philly, April 27, 2020, technical.ly/philly/2020/04/27/as-covid-19-deepens-the-digital-divide-a-call-to-move-beyond-simply-providing-access.
24. Antonio Gonzalo et al., "Fashion's Digital Transformation: Now or Never," McKinsey & Company, May 6, 2020, www.mckinsey.com/industries/retail/our-insights/fashions-digital-transformation-now-or-never.

45%

Higher median COVID-19 case count in Philadelphia zip codes containing census tracts with below-average rates of household broadband subscription

---

the city were located within Philadelphia's low-income neighborhoods.[25]

During the pandemic, one ramification of this trend was the inability of minority-owned businesses to obtain funds through the Paycheck Protection Program, which was part of the Coronavirus Aid, Relief, and Economic Security (CARES) Act.[26]

Education

As previously discussed, broadband has the power to eliminate geographic and phsyical barriers to obtaining a quality education and accessing valuable information. This is only true, however, if students have access to broadband.

The Homework Gap

Prior to the pandemic, nearly 60 percent of teachers in Title I schools incorporated digital learning into their curricula.[27] Less than a month before the region's first stay-at-home orders were issued, a bill

was introduced in the U.S. Senate for the creation of a "Homework Gap Trust Fund," which would "require the FCC to use a portion of the proceeds from the auction of the C-band to fund measures to provide students with access to the Internet at home."[28] The status of this bill is still pending, meanwhile in the months following its introduction the pandemic has only served to widen the digital divide and exacerbate the homework gap.

School Closures

On March 18, just seven days into the pandemic, the Philadelphia School District announced that it would not provide any online curricula for the duration of the stay-at-home orders, due to the vast inequities that this would create between students who have a computer and broadband Internet at home, and those that do not.[29] Only 41 percent of students between the third and eighth grades had computers at home, while 51 percent

25. Jeff Blumenthal, "Branched Out," Philadelphia Business Journal, May 23, 2019, www.bizjournals.com/philadelphia/news/2019/05/23/the-bank-gap-why-the-poorest-philadelphians.html.
26. Kennedy Rose, "Minority-owned Businesses are Underbanked in COVID-19 Crisis, Philadelphia Chambers Say," Philadelphia Business Journal, April 20, 2020, www.bizjournals.com/philadelphia/news/2020/04/20/philadelphia-chambers-of-commerce-inority-owned.html.
27. Fazlullah and Ong, The Homework Gap.
28. U.S. Congress, Senate, Homework Gap Trust Fund Act, S.3362, 116th Cong., introduced in Senate February 27, 2020.
29. Maryclaire Dale, "Philadelphia Schools, Citing Inequity, Won't Teach Online," U.S. News & World Report, March 18, 2020, www.usnews.com/news/us/articles/2020-03-18/philadelphia-schools-citing-inequity-wont-teach-online.

TABLE 6: Schools That Are Located within Low-Subscription Census Tracts

Public School and Municipality	Median Household Income	Educational Attainment*	Unemployment Rate in 2017
Dr. Ethel Allen, Philadelphia	$19,236	75.4%	7.0%
James G. Blaine, Philadelphia	$12,588	76.0%	27.2%
Invincible City Charter, Camden	$18,625	70.3%	16.4%
William Dick, Philadelphia	$12,588	76.0%	27.2%
Dr. U.S. Wiggins College Prep., Camden	$18,625	70.3%	16.4%
Fairhill, Philadelphia	$15,846	55.6%	26.0%
Edward Gideon, Philadelphia	$12,588	76.0%	27.2%
Leslie P. Hill, Philadelphia	$19,236	75.4%	7.0%
John B. Stetson Charter, Philadelphia	$13,017	52.8%	26.3%
John Whittier Greenleaf Family, Camden	$18,625	70.3%	16.4%
William D. Kelley, Philadelphia	$16,725	73.8%	15.2%
Kenderton Elementary, Philadelphia	$11,904	77.5%	16.0%
Mastery CS-Cleveland Elementary, Philadelphia	$14,751	79.6%	27.3%
Luiz Munoz-Marin Elementary, Philadelphia	$13,017	52.8%	26.3%
Potter-Thomas Elementary, Philadelphia	$15,846	55.6%	26.0%
M. Hall Stanton Elementary, Philadelphia	$15,659	82.7%	10.2%
Strawberry Mansion High, Philadelphia	$19,236	75.4%	7.0%
John Welsh Elementary, Philadelphia	$13,967	48.5%	13.5%
All of Greater Philadelphia	$68,869	89.9%	8.0%

Note: Educational Attainment refers to percentage of population with at least a high school diploma.

Sources: U.S. Census Bureau, American Community Survey, Five-Year Estimates 2013–2017; and DVRPC.

between the ninth and 12th grades had computers at home.[30]

As it became clear that the pandemic would require prolonged school closures, the Philadelphia School District allocated $11 million for the purchase of 50,000 laptops for students to take home. In response, the chief executive officer of Comcast, one of the region's dominant broadband providers, donated $5 million to help offset this expense.[31]

Table 6 provides a socioeconomic snapshot of the communities surrounding public schools located within the region's low-subscription census tracts (fewer than 40 percent of households have broadband subscriptions). All of these areas are located entirely within either the city of Camden or the city of Philadelphia, as demonstrated in Figure 4 on page 24.

Since nearly all of the region's low-subscription census tracts are located within Philadelphia, provision of laptop computers only solved one-half of the the region's homework gap equation: the other half being the lack of broadband.

30. Kristen A. Graham and Maddie Hanna, "Philly Schools to Distribute Computers to Students as Coronavirus Could Force Closure for the Rest of the School Year," Philadelphia Inquirer, March 24, 2020, www.inquirer.com/health/coronavirus/coronavirus-philly-schools-technology-year-computer-chromebook-20200324.html.
31. Kristen A. Graham, "Philly Schools Spending $11M on Computers to be Used During Coronavirus Closures; Comcast CEO, Family Donating $5M," Philadelphia Inquirer, March 26, 2020, www.inquirer.com/health/coronavirus/coronavirus-covid-19-philadelphia-schools-closed-computers-comcast-brian-roberts-donation-20200327.html.

Family Practice and Counseling Network (FPCN)

Philadelphia, Pennsylvania

FPCN was awarded $206,763 from the FCC's COVID-19 Telehealth Program. The funds will be used for "a telehealth platform and remote monitoring equipment to provide integrated telehealth and remote monitoring services to vulnerable patient populations."[35]

FPCN is a Philadelphia-based health care provider with five locations throughout the city. Three of these locations are within neighborhoods with household broadband subscription rates that are below-average, and zip codes with total COVID-19 cases that are higher than average.

Health

The inequitable distribution and availability of technological advances, such as broadband and telehealth, led to inequities in how the public's health was specifically impacted during the pandemic, despite legislative efforts aimed at mitigating those impacts.

Telehealth

During the pandemic, many large insurers (including: Aetna, Anthem, Blue Cross Blue Shield, Cigna and UnitedHealthcare) waived or covered costs associated with telehealth. According to a study conducted in March 2020, 53 percent of surveyed health practicioners were using telehealth platforms for the first time due to restrictions related to COVID-19.[32]

Additionally, there was a 35 percent increase in telehealth adoption in the United States between March and April 2020, and during the same period there was an 82 percent increase among people who self-reported as having an education level of high-school or less.[33]

Legislation

The capacity for telehealth to alleviate the public health crisis surrounding COVID-19 was understood early on in the pandemic. In order to facilitate the public's access to telehealth services, the federal government appropriated funding for various telehealth initiatives as part of the CARES Act.[34]

With the $200 million appropriated from this legislation, the FCC created its COVID-19 Telehealth Program, which

32. Jeane Han, "Telemedicine Could Be More Widely Adopted Due to the Coronavirus," eMarketer, April 13, 2020, www.emarketer.com/content/telemedicine-could-be-more-widely-adopted-due-to-the-coronavirus.
33. Noah Brode, "Telemedicine Adoption Continues to Boom During Coronavirus Pandemic," Civic Science, April 21, 2020, civicscience.com/telemedicine-adoption-continues-to-boom-during-coronavirus-pandemic/.
34. "CARES Act Funding and Support for Telehealth," Davis Wright Tremaine LLP, April 2020.
35. NJBIA, "FCC Approves $105M in COVID-19 Telehealth Program Applications," NJIBA, June 12, 2020, njbia.org/fcc-approves-105m-in-covid-19-telehealth-program-applications/.

distributed funds to eligible health care providers to be used for the expansion of telehealth services during the pandemic.[36]

COVID-19 Cases in Philadelphia

In Philadelphia, COVID-19 cases were reported at the zip code level, whereas household broadband subscription rates obtained from the American Community Survey are reported at the census tract level. Therefore, it is difficult to conduct an exact analysis of the two datasets.

With that said, census tracts within Philadelphia that have below-average rates of household broadband subscription were generally located within zip codes that had a median of 624 cases as of June 11, 2020, as depicted in Figure 5 on page 25.

Conversely, census tracts within Philadelphia that have at least average rates of household broadband subscription were generally located within zip codes with a median of 431 cases. This is demonstrated in Figure 6 on page 26.

As there are innumerable variables to consider (e.g., profession, population density, transit ridership, etc.), this report does not suggest a causal link between household broadband subscription and COVID-19 infection. However, these findings do indicate that households within Philadelphia that had broadband subscriptions observed lower rates of infection during the pandemic.

Public Engagement

Public engagement during the pandemic was entirely digital, which in some ways enabled greater participation as proximity and transportation to the meetings were no longer hurdles. However, this meant that the burden to participate was also significantly increased for those without broadband or computers at home.

Communications

Broadband enabled officials, such as Philadelphia's Mayor Jim Kenney and Health Commissioner Thomas Farley to hold press conferences daily but attend digitally from their respective offices to ensure social distancing was practiced.

Telecommuting

As of 2020, approximately 56 percent of employees said that they could work from home,[37] which is consistent with the nearly half of all employed adults estimated to have worked from home during the pandemic.[38] Although it is anticipated that only one-third of all jobs can be done entirely from home, these jobs account for nearly 50 percent of wages in the US.[39]

If this increase in telecommuting persists long-term, it could potentially impact everything from land use and development patterns, to commercial and residential property values and vacancy rates—not to mention potentially leading to a modern manifestation of "white flight" if efforts to bridge the digital divide fail.

36. Federal Communications Commission, "COVID-19 Telehealth Program Frequently Asked Questions (FAQs)," accessed April 2020, www.fcc.gov/covid-19-telehealth-program-frequently-asked-questions-faqs.
37. "How Many People Could Work-from-home," Global Workplace Analytics, accessed June 2020, www.globalworkplaceanalytics.com/how-many-people-could-work-from-home.
38. Katherine Guyot and Isabel V. Sawhill, "Telecommuting Will Likely Continue Long After the Pandemic," Brookings Institute, April 6, 2020, www.brookings.edu/blog/up-front/2020/04/06/telecommuting-will-likely-continue-long-after-the-pandemic/.
39. Jonathan Dingel and Brent Neiman, How Many Jobs Can Be Done at Home? (Chicago: Becker Friedman Institute for Economics at the University of Chicago, June 2020), bfi.uchicago.edu/wp-content/uploads/BFI_White-Paper_Dingel_Neiman_3.2020.pdf.

FIGURE 4: Locations of Schools in Census Tracts with Low Rates of Household Broadband Subscription

○ Public School in Low-Subscription Census Tract

⬛ Below 40% (Defined by the FCC as a Low-Subscription Census Tract)

⬛ Below 50%

⬛ Below 79.9% (The Regional Average for Greater Philadelphia)
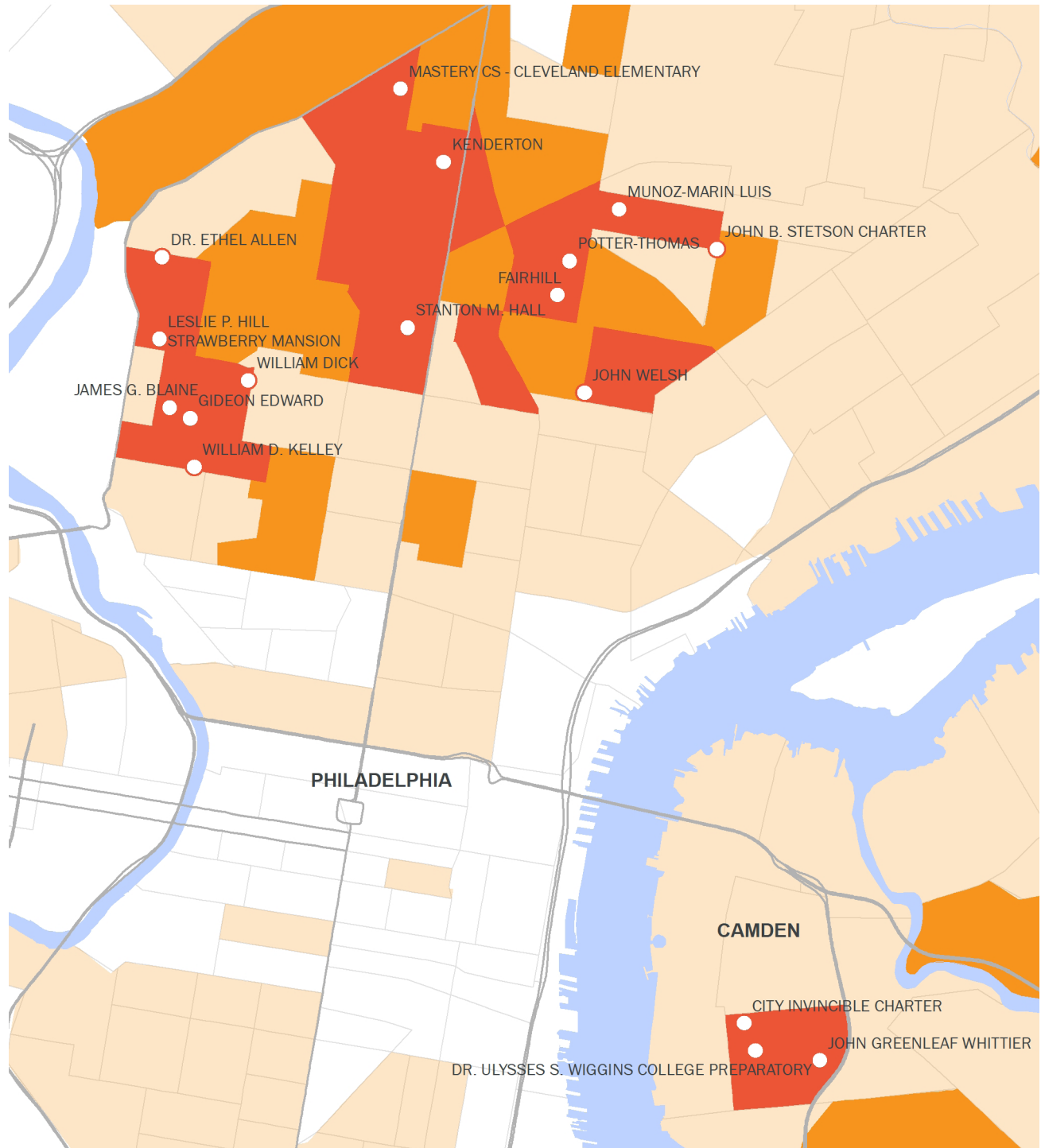
Sources: U.S. Census Bureau American Community Survey,
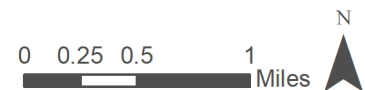Five-Year Estimates 2013-2017; and DVRPC
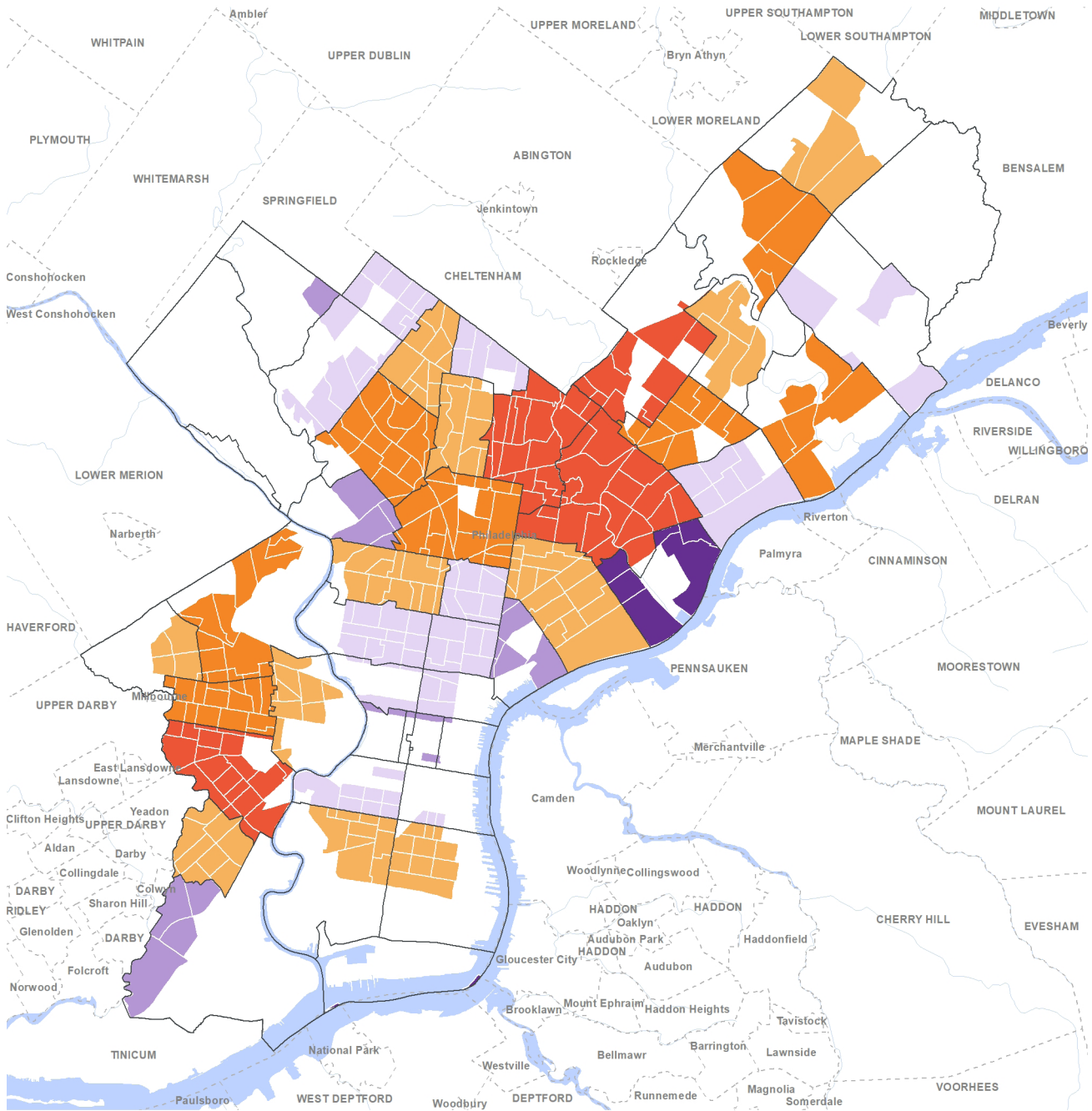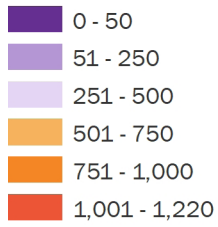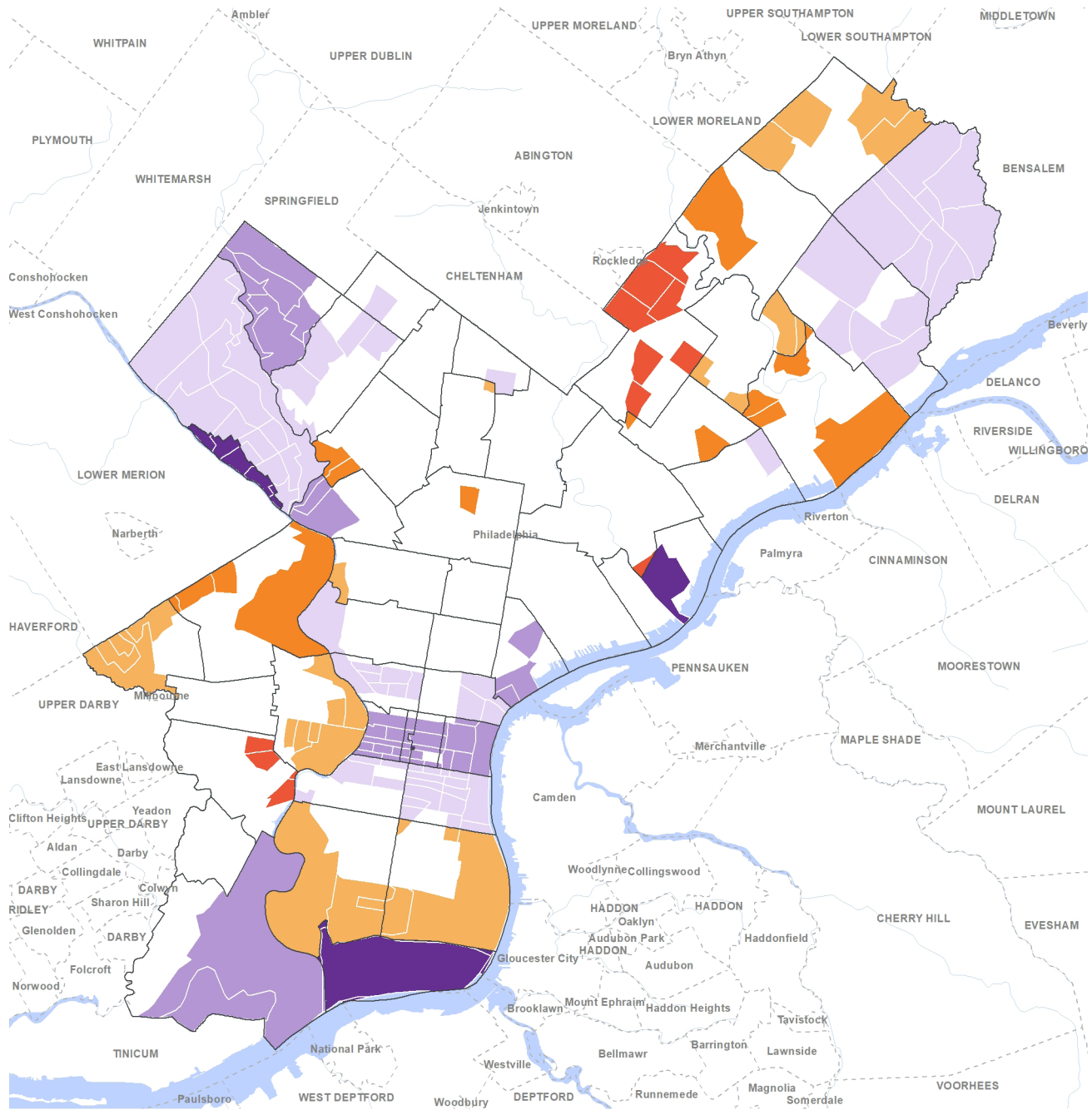
The Digital Divide and COVID-19

FIGURE 5: COVID-19 Cases in Below-Average Subscription Census Tracts as of June 11, 2020

Legend:
- 0 - 50
- 51 - 250
- 251 - 500
- 501 - 750
- 751 - 1,000
- 1,001 - 1,220

Sources: Sources: U.S. Census Bureau American Community Survey, Five-Year Estimates 2013-2017; www.opendataphilly.com, June 11, 2020; and DVRPC

Broadband: Understanding the Digital Divide

FIGURE 6: COVID-19 Cases in Above-Average Subscription Census Tracts as of June 11, 2020

Legend:
- 0 - 50
- 51 - 250
- 251 - 500
- 501 - 750
- 751 - 1,000
- 1,001 - 1,220

The Digital Divide and COVID-19

SUMMARY

Findings

Prior to the COVID-19 pandemic, broadband was often considerd to be a luxury and not a necessity. However, broadband's capacity to enable the emergency response efforts and continuity of public, private, and personal operations during the pandemic demonstrated that it is in fact a necessary utility.

As discussed in this report, those on the wrong side of the digital divide (typically low-income minority neighborhoods in the region's urban areas, as demonstrated in Figure 7 on the following page) were disproportionately impacted academically, economically, and medically, during the pandemic. If the region does not work to bridge that ditgital divide, then those same communities will be disproportionately left behind as Greater Philadelphia enters into a period of recovery.

Broadband will play a vital role in shaping the way the public will shop, work, educate, and communicate going forward, and it is imperative that the region work now to bridge the digital divide.
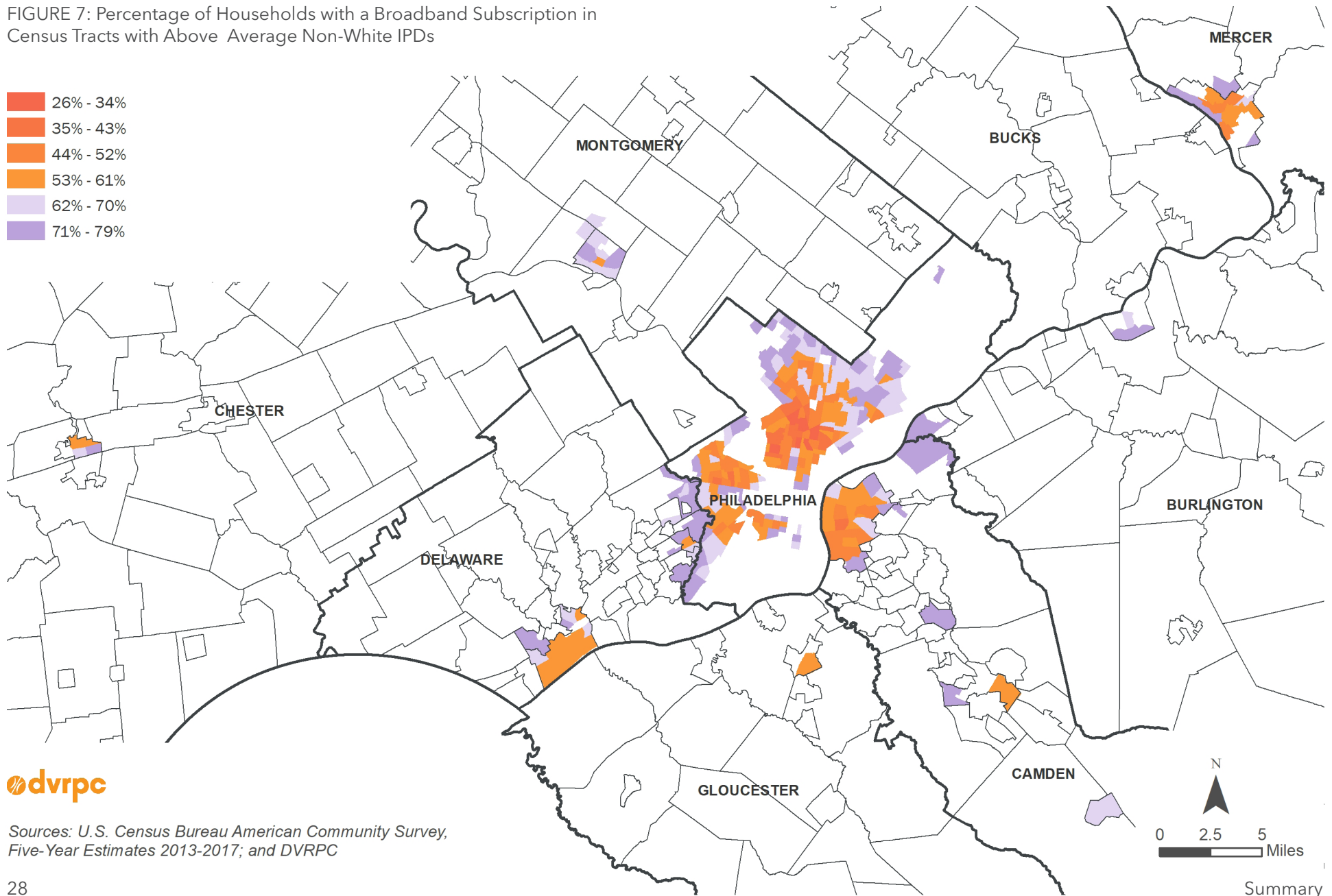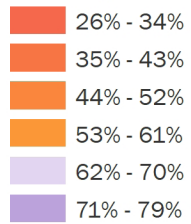
Next Steps

COVID-19 highlighted the multitude of academic, economic, medical, and social inequities present before the pandemic that were exacerbated by the digital divide.

In the third and final part of the Broadband series, Bridging the Digital Divide, DVRPC will seek the to answer the question:

What strategies can be implemented within Greater Philadelphia to help bridge the digital divide so that the inequities that existed before, and that were highlighted during, the pandemic do not persist into the recovery period and beyond?

FIGURE 7: Percentage of Households with a Broadband Subscription in Census Tracts with Above Average Non-White IPDs

Legend:
- 26% - 34%
- 35% - 43%
- 44% - 52%
- 53% - 61%
- 62% - 70%
- 71% - 79%

MONTGOMERY
BUCKS
MERCER
CHESTER
DELAWARE
PHILADELPHIA
BURLINGTON
GLOUCESTER
CAMDEN

dvrpc

Sources: U.S. Census Bureau American Community Survey, Five-Year Estimates 2013-2017; and DVRPC

N

0   2.5   5
Miles

SOURCES

Sources:

Alba, Davey, and Cecilia Kang. "So We're Working From Home. Can the Internet Handle It?" New York Times. March 16, 2020. www.nytimes.com/2020/03/16/technology/coronavirus-working-from-home-internet.html.

Alexander, Dan. "Turnpike, Parkway Stop Taking Cash during COVID-19 Outbreak." New Jersey 101.5. March 24, 2020. nj1015.com/turnpike-parkway-stop-taking-cash-during-covid-19-outbreak/.

Blumenthal, Jeff. "Branched Out." Philadelphia Business Journal. May 23, 2019. www.bizjournals.com/philadelphia/news/2019/05/23/the-bank-gap-why-the-poorest-philadelphians.html.

Brode, Noah. "Telemedicine Adoption Continues to Boom During Coronavirus Pandemic." Civic Science. April 21, 2020. civicscience.com/telemedicine-adoption-continues-to-boom-during-coronavirus-pandemic/.

Bureau of Economic Analysis. "How Big Is the Digital Economy?" Accessed January 2020. www.bea.gov/sites/default/files/2018-04/infographic-how-big-is-the-digital-economy.pdf.

Burning Glass Technologies. The Digital Edge: Middle-Skill Workers and Careers. Boston: Burning Glass Technologies, September 2017. www.burning-glass.com/wp-content/uploads/Digital_Edge_report_2017_final.pdf.

Buzek, Greg. Retail's Renaissance: True Story of Store Openings/Closings. New York: IHL Group, August 2019.

"Cable Operators' Shift to Profit Mode Accelerates Cord-Cutting." eMarketer. August 6, 2019. www.emarketer.com/newsroom/index.php/cable-operators-shift-to-profit-mode-accelerates-cord-cutting/.

Dale, Maryclaire. "Philadelphia Schools, Citing Inequity, Won't Teach Online." U.S. News & World Report. March 18, 2020. www.usnews.com/news/us/articles/2020-03-18/philadelphia-schools-citing-inequity-wont-teach-online.

SOURCES Cont.

Dingel, Jonathan, and Brent Neiman. How Many Jobs Can Be Done at Home? Chicago: Becker Friedman Institute for Economics at the University of Chicago, June 2020. bfi.uchicago.edu/wp-content/uploads/BFI_White-Paper_Dingel_Neiman_3.2020.pdf.

"Employers in the Philadelphia Metro Area." Philadelphia Business Journal. July 26, 2019. www.bizjournals.com/philadelphia/subscriber-only/2019/07/26/employers-in-the-philadelphia-metro.html.

Fazlullah, Amina, and Stephanie Ong. The Homework Gap: Teacher Perspectives on Closing the Digital Divide. San Francisco: Common Sense Media, 2019. www.commonsensemedia.org/sites/default/files/uploads/kids_action/homework-gap-report-2019.pdf.

Federal Communications Commission. "COVID-19 Telehealth Program Frequently Asked Questions (FAQs)." Accessed April 2020. www.fcc.gov/covid-19-telehealth-program-frequently-asked-questions-faqs.

———. "Dedicated Short Range Communications (DSRC) Service." www.fcc.gov/wireless/bureau-divisions/mobility-division/dedicated-short-range-communications-dsrc-service.

———. "Notice of Public Rule Making: Promoting Telehealth for Low-Income Consumers." July 11, 2019. docs.fcc.gov/public/attachments/FCC-19-64A1.pdf.

Frappier, Danielle, Michael C. Sloan, Adam D. Romney, Robert G. Scott Jr., and Patrick J. Curran Jr. "CARES Act Funding and Support for Telehealth." Davis Wright Tremaine LLP. April 7, 2020. www.dwt.com/insights/2020/04/fcc-cares-act-telehealth-programs.

Gonzalo, Antonio, Holger Harreis, Carols Sanchez Altable, and Cyrielle Villepelet. "Fashion's Digital Transformation: Now or Never." McKinsey & Company. May 6, 2020. www.mckinsey.com/industries/retail/our-insights/fashions-digital-transformation-now-or-never.

Graham, Kristen A. "Philly Schools Spending $11M on Computers to be Used During Coronavirus Closures; Comcast CEO, Family Donating $5M." Philadelphia Inquirer. March 26, 2020. www.inquirer.com/health/coronavirus/coronavirus-covid-19-philadelphia-schools-closed-computers-comcast-brian-roberts-donation-20200327.html.

SOURCES Cont.

Graham, Kristen A., and Maddie Hanna. "Philly Schools to Distribute Computers to Students as Coronavirus Could Force Closure for the Rest of the School Year." Philadelphia Inquirer. March 24, 2020. www.inquirer.com/health/coronavirus/coronavirus-philly-schools-technology-year-computer-chromebook-20200324.html.

Gross, Paige. "Comcast is Offering Two Months of Free Internet Through Its Internet Essentials Program." Technical.ly Philly. March 13, 2020. technical.ly/philly/2020/03/13/comcast-two-months-free-internet-essentials/.

Guyot, Katherine, and Isabel V. Sawhill. "Telecommuting Will Likely Continue Long After the Pandemic." Brookings Institute. April 6, 2020. www.brookings.edu/blog/up-front/2020/04/06/telecommuting-will-likely-continue-long-after-the-pandemic/.

Han, Jeane. "Telemedicine Could Be More Widely Adopted Due to the Coronavirus." eMarketer. April 13, 2020.www.emarketer.com/content/telemedicine-could-be-more-widely-adopted-due-to-the-coronavirus.

Horrigan, John B., and Maeve Duggan. "Home Broadband 2015." Pew Research Center. December 21, 2015. www.pewresearch.org/internet/2015/12/21/home-broadband-2015/.

 "How Many People Could Work-from-home." Global Workplace Analytics. Accessed June 2020. globalworkplaceanalytics.com/how-many-people-could-work-from-home.

International Council of Shopping Centers. The Halo Effect II: Quantifying the Impact of Omnichannel. Philadelphia: International Council of Shopping Centers, July 2019. info.icsc.org/thehaloeffectii-form.

"Latest Work-At-Home/Telecommuting/Mobile Work/Remote Work Statistics." Global Workplace Analytics. Accessed March 2020. globalworkplaceanalytics.com/telecommuting-statistics.

Loh, Alicia. "The State of FirstNet, America's Public Safety Broadband Network." Lawfare. April 16, 2019. www.lawfareblog.com/state-firstnet-americas-public-safety-broadband-network.

National Establishment Time Series (NETS). 2015.

SOURCES Cont.

National Science Foundation. "Smart and Connected Communities Program." nsf.gov. Accessed March 2019.

NJBIA. "FCC Approves $105M in COVID-19 Telehealth Program Applications." NJIBA. June 12, 2020. njbia.org/fcc-approves-105m-in-covid-19-telehealth-program-applications/.

OpenDataPhilly. "COVID Tests and Cases." Accessed June 2020. www.opendataphilly.org/dataset/covid-cases.

Pinder, Howard. "As COVID-19 Deepens the Digital Divide, a Call to Move Beyond Simply Providing Access." Technical.ly Philly. April 27, 2020. technical.ly/philly/2020/04/27/as-covid-19-deepens-the-digital-divide-a-call-to-move-beyond-simply-providing-access/.

Rose, Kennedy. "Minority-owned Businesses are Underbanked in COVID-19 Crisis, Philadelphia Chambers Say." Philadelphia Business Journal. April 20, 2020. www.bizjournals.com/philadelphia/news/2020/04/20/philadelphia-chambers-of-commerce-inority-owned.html.

"State Laws and Policies Affecting Broadband Access in Eight Northern Region States." The Network for Public Health Law. December 6, 2018. www.networkforphl.org/resources/state-laws-and-policies-affecting-broadband-access-in-eight-northern-region-states/.

Tomer, Adie, Elizabeth Kneebone, and Ranjitha Shivaram. Signs of Digital Distress: Mapping Broadband Availability and Subscription in American Neighborhoods. Washington, DC: The Brookings Institute, September 2017. www.brookings.edu/wp-content/uploads/2017/09/broadbandreport_september2017.pdf.

U.S. Congress. Senate. Homework Gap Trust Fund Act. S.3362. 116th Cong. Introduced in Senate February 27, 2020.

Yan, Andy. "Managing Equitable Economic Recovery." Webinar. Urban Logiq. June 16, 2020. urbanlogiq.com/webinars/managing-equitable-economic-recovery-webinar/.

SOURCES Cont.

Sites Accessed:

Broadband Now. Accessed January 2020. www.broadbandnow.com.

Federal Communications Commission. Accessed January 2020. www.fcc.gov.

National Broadband USA. Accessed January 2020. www.broadbandusa.ntia.doc.gov.

DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION

ABSTRACT   This report is the second in a three-part series aimed at assessing the digital divide within the region (both pre- and mid-COVID-19). The third and final part will provide recommendations and strategies for how to bridge that divide.

STAFF CONTACT   Spencer K. Gober, AICP
Planner, Office of Community and Economic Development
(215) 238-2844
sgober@dvrpc.org

Delaware Valley Regional Planning Commission
190 N Independence Mall West, 8th Floor
Philadelphia, PA 19106-1520
Phone: (215) 592-1800
Fax: (215) 592-9125
Internet: www.dvrpc.org

BROADBAND

DELAWARE VALLEY
dvrpc
REGIONAL
PLANNING COMMISSION

Connect With Us!