

UNDERSTANDING RACIAL AND ETHNIC DISPARITIES IN HEALTH OUTCOMES AND UTILITY INSECURITY RESULTING FROM COVID-19



Dan Treglia, PhD, Mina Addo, MPA, Meagan Cusack, MSW, and Dennis Culhane, PhD
University of Pennsylvania

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Executive Summary

COVID-19 has had devastating effects across broad swaths of life in the United States. Estimates of more than 27 million documented cases and 543,000 documented deaths likely undercount its true toll, which has been exacerbated by longstanding social inequalities, exposing disadvantaged and marginalized populations—particularly Black and Latinx Americans—to a disproportionate share of COVID-19’s health consequences. The pandemic’s adverse outcomes aren’t limited to health, having shuttered large portions of the U.S. economy and putting many Americans out of work and at risk for losing basic necessities like food and housing.

This study seeks to understand racial and ethnic disparities in both the health consequences of the pandemic and a particularly under-acknowledged social consequence, utility insecurity in the Commonwealth of Pennsylvania. We examine these disparities using administrative data from public health agencies, utility companies, and primary data collected from hundreds of Pennsylvanians through surveys and focus groups.

We find that a breadth of vulnerabilities faced by all Pennsylvania residents are particularly acute for racial and ethnic minorities. Low-income, Black, and Latinx residents are more likely to be rent-burdened and pay more money toward their utility bills than their counterparts. They are also more likely to experience utility insecurity. Areas with higher concentrations of minority residents have much higher rates of utility arrears and disconnections as well as much higher rates of enrollment in utility assistance programs. In addition, roughly three-quarters of Black and Latinx survey respondents reported falling behind on rent or mortgage payments since March, and one-third of Black residents reported being either formally or informally evicted and were the most likely to worry about future evictions and utility shutoffs. We also found that communities with higher non-white shares of the population were hit hardest by the coronavirus, especially in the early months. The relationship between virus prevalence and race became less pronounced as the virus became more ubiquitous through the fall and winter.

These findings have important policy implications. Federal and state governments relief through moratoria on utility shutoffs should be paired with aggressive outreach to enroll potentially eligible clients into utility assistance programs and additional financial assistance for vulnerable households. Broad financial and flexible assistance, like unemployment benefits and stimulus checks, may also be helpful as households that face utility insecurity often face other financial struggles. In addition, governments and utility companies alike must do more to ensure long-term utility affordability and security among low-income households.

Introduction

COVID-19 has had devastating effects across broad swaths of life in the United States. In the last eight months there have been more than 30 million documented cases and 543,000 documented deaths—both figures are likely to be underestimates.

The coronavirus's impacts have been exacerbated by longstanding social inequalities, exposing disadvantaged and marginalized populations to a disproportionate share of COVID-19's consequences. Black Americans are 3.5 times more likely, and Latinx Americans are twice as likely, to die of COVID-19 than their white counterparts (Artiga et al., 2020). In Pennsylvania, Black Pennsylvanians represent nearly one-third of COVID-19 cases but only 11% of the Commonwealth's population (Artiga et al., 2020).

The coronavirus's impacts have been far-reaching, shuttering large portions of the economy since the U.S. outbreak began in early 2020. Beginning in mid-March the U.S. experienced 19 straight weeks of more than one million new unemployment claims, each of those surpassing the previous record of approximately 700,000 claims, set in 1982 (Federal Reserve Bank of St. Louis, 2020; Zarroli & Schneider, 2020). And though the economy has begun to recover, only half of the 22 million jobs lost between February and April have returned (Parker et al., 2020). The U.S Department of Labor estimates that 3.8 million workers lost their job permanently in September, and more than 2.4 million workers have been out of work for at least 27 weeks, putting them into the category of "long-term joblessness" (Smialek et al., 2020).

With millions unemployed or underemployed and economic recovery hindered by repeated case surges, there is justified concern about widespread housing instability. One early estimate predicted a 40-45% increase in the number of people experiencing homelessness, and subsequent analyses of rental and mortgage arrears have only increased concerns of a widespread housing crisis, suggesting that upwards of 44 million U.S. renters owe more than \$21 billion in back rent and could be subject to eviction proceedings (Community Solutions, 2020). Just as the health consequences of COVID-19 have targeted people of color, so will the eviction crisis. In one recent survey, Black and Latinx households were twice as likely as whites to say they would be unable to pay their rent in the next month (Parker et al., 2020).

Despite this focus on housing insecurity, there has been relatively little attention on the millions of Americans who have struggled to pay their utility bills and could face termination of their heat, water, and electricity. The data on COVID-19's threat to utility security is sparse but shows a consistent and concerning narrative. One analysis suggests that electric and gas arrears alone could exceed \$24 billion by the end of 2020, and a Washington Post analysis of the nation's largest energy regulators found that utility arrears by September 2020 were four times higher than they were at the same point in 2019 (Romm, 2020).

As a field of study, utility insecurity is in its nascence, the result of several factors. For one, the data required to accurately assess and analyze utility trends and vulnerabilities are largely inaccessible to researchers. Private utility companies are generally reticent to share data and even government-run utilities have become adept at limiting publicly shared data. Second,

utilities are often lumped into the category of housing costs, and data exist either in the aggregate (combining rent or mortgage with utility payments, as exists in Census data) or the focus tends to be on rent or mortgage payments that generally constitute the largest share of total housing cost.

Though the field of inquiry is new, problems of utility insecurity are well-documented. In 2015, nearly one-third of the United States' 118 million households had some difficulty paying their utilities and 17 million American households (14%) had received a utility disconnection notice (Watt, 2018). This is a problem concentrated among low-income Americans and racial and ethnic minorities (Sen, 2020). In one study, households earning above \$50,000 each year had utility costs representing 3% of their after-tax wages, while the same figure was 33% of the income of households making less than \$10,000 per year (Hernández, 2013). Urban Black households pay 54% more of their income toward utilities than the average urban household (Graff & Carley, 2020). In one survey assessing the utility insecurity and health of nearly 10,000 children, 34% lived in a household that had either moderate or severe utility insecurity (Cook et al., 2008).

There are several disparate causes of utility insecurity that often combine to produce a multiplicative disadvantage on already vulnerable households. One of the leading drivers of utility insecurity is obviously low-income—households with fewer earnings pay a higher share of their income toward utilities, even holding all other factors equal—but other factors are rarely equal. Low-income households are more likely to live in housing with inefficient or malfunctioning heating systems, or inefficient appliances, or with insufficient insulation, all of which increase energy costs. In some cases, the household may have control over those systems but lack the capital and expertise to ameliorate malfunctioning or antiquated energy systems. Low-income households are also least likely to have control over those systems, which is often relegated to landlords or building superintendents.

The resulting utility insecurity is psychologically and physiologically damaging. In one study of Detroit households, those who had received a water shutoff notice had, on average, a 2.3 point increase on a 5-point psychological distress scale, and having had a water supply shutoff that was subsequently reconnected was associated with a .99 point increase in distress (Gaber et al., 2020). Energy insecurity is also associated with food insecurity, higher risk of hospitalization, and poor/fair health (Carley & Konisky, 2020; Graff & Carley, 2020; Hernández, 2013). Those with malfunctioning or inefficient heating systems, or whose heat has been shut off, are more likely to turn to non-traditional heating sources like ovens or space heaters, putting them at risk of fire and fire-related injury and death as well as respiratory illnesses like asthma.

In this report, we examine racial and ethnic disparities in health and utility insecurity caused by the COVID-19 pandemic in the Commonwealth of Pennsylvania. First, using data from a variety of sources—including utility arrearages, terminations, and assistance program participation from utility companies, household characteristics and housing costs from the U.S. Census Bureau, and housing and utility concerns from surveys and focus groups with

Pennsylvania residents—we document the pandemic's differential impacts on utility insecurity. Second, we examine data from public health agencies, in combination with demographic data from the U.S. Census Bureau, to assess the differential rates of COVID-19 infection and death by race and ethnicity. We supplement these with survey and focus group data to understand how Pennsylvanians perceive and live with health threats from COVID-19 and how the pandemic has impacted their ability to care for themselves and their communities. Lastly, we discuss efforts to address COVID-19 challenges and, particularly, threats of utility insecurity in the wake of the pandemic.

COVID-19 Moratorium Timeline

The below timeline outlines key milestones in how state, city, and private actors in Pennsylvania responded to address utility insecurity since the onset of the COVID-19 crisis. These policy actions generally apply to only regulated utilities. While most unregulated utilities imposed their own voluntary moratoria, they began lifting those moratoria in September 2020.

March 6, 2020: Governor Tom Wolfe issued a proclamation of disaster, which provided the Public Utility Commission (PUC) the authority to issue a moratorium on the termination of utilities from publicly regulated utilities.

March 13, 2020: The PUC issued an emergency moratorium prohibiting regulated electric, natural gas, water, wastewater, telecommunications, and steam utilities from terminating customers' service during the COVID-19 pandemic emergency.

August 10, 2020: The PUC issued a letter from Chairman Dutrieuille requesting comments regarding the moratorium and customer protections for at-risk customers if the PUC lifted the absolute service termination moratorium.

October 13, 2020: The PUC entered an order lifting the absolute ban on utility service terminations, allowing terminations to begin November 9, 2020.

December 1, 2020 through March 31, 2021: The annual winter moratorium protected households at or below 25% of the Federal Poverty Level (FPL) against gas, electric, and heat-related water service terminations.

March 31, 2021: "Protected customers" (residential customers with income at or below 300% of the FPL) remained protected from utility terminations if they applied for all available assistance programs and requested a payment arrangement from their utility provider. Utilities waived all late charges, reconnection, and deposit fees.

March 31, 2021: All winter and COVID-related utility protections lifted

Data Sources

Administrative and Census Data Sources

We use data from publicly available sources as well as data provided by Community Legal Services (CLS) and the Pennsylvania Utility Law Project (PULP) obtained through litigation, requests filed under public Right to Know laws, and other inquiries made directly to public utility and health officials. Final datasets included:

Utility Insecurity

- Overdue customers and dollars overdue by utility type.
- Residential utility terminations and reconnections by electric and gas providers throughout Pennsylvania, including terminations and reconnections among confirmed low-income customers.
- Terminations for non-payment and other reasons and reconnections for payment, medical certificates, and other reasons.
- Low Income Home Energy Assistance Program (LIHEAP) Energy Assistance Summary (EASUM) for 2019 and 2020, including grants by county and race.
- Data on enrollment in the Philadelphia Electric Company's (PECO) Customer Assistance Program (CAP) and the number of households with arrearages, and the average amount of arrearages among those households. These data were provided at the Zip Code + 4 geographic level.
- Data on enrollment in the Philadelphia Gas Company's (PGW) Customer Responsibility Program (CRP). These data were provided at the Zip Code geographic level.
- Data on enrollment in the Philadelphia Water Department's (PWD) Tiered Assistance Program (TAP). These data were provided at the Zip Code geographic level.

COVID-19 Health Outcomes

- Number of cumulative cases and deaths in Pennsylvania, by county, from the Pennsylvania Department of Public Health.
- Number of cases in Pennsylvania, by Zip Code, from the Pennsylvania Department of Public Health.
- Number of cumulative cases and deaths in Philadelphia, by zip code, from the Philadelphia Department of Public Health.

Given the emphasis on understanding the racial disparities of utility insecurity and COVID-19 health outcomes, we matched these data sources with the most recent U.S. Census Bureau's American Community Survey's 5-year estimates (2014 – 2018). Data provided at the Zip Code + 4 geographic level were matched to Census block group by an outside firm, and demographic data were matched at the block group level. Data obtained by Zip Code were matched to the Census Bureau's Zip Code Tabulation Areas (ZCTAs), and county-level utility and health data were matched to the Census Bureau's county geographies.

In addition, we examined data from the U.S. Census Bureau's American Housing Survey (AHS). AHS data are reflected at the level of the Census Metropolitan Statistical Area (MSA). In the case of Philadelphia, this includes surrounding counties and Wilmington, Delaware. That the majority of observations included in this dataset are from Philadelphia provides confidence that MSA-level statistics largely reflect realities of Philadelphia and Southeastern Pennsylvania more broadly, though obviously we can be certain of neither the extent to which that is true

nor the degree to which Southeastern Pennsylvania (including Philadelphia) differs from surrounding areas included in the MSA.

Primary Data

Administrative data provide a coarse and relatively shallow assessment of the finances and health of Pennsylvania's households, and we therefore conducted primary data collection in two forms. We conducted a survey (see Appendix D) with 683 individuals across the state of Pennsylvania. The survey was conducted via Qualtrics and distributed through CLS, PULP, and other nonprofits that work with or otherwise have access to populations experiencing financial or other vulnerabilities. Among other questions, the survey most prominently asked about:

- Employment and other income sources, before and since the onset of the COVID-19 pandemic;
- Household finances, with a focus on rent and utilities and how household resources may be shifted to focus on certain expenses at the expense of others; and
- Health impacts of COVID-19 for respondents, household members, and their communities.

All respondents received a \$10 gift card for their participation.

We also conducted four focus groups to provide greater depth to our understanding of COVID-19's impact on Pennsylvania households. Three focus groups were conducted with financially vulnerable households; two included individuals in Philadelphia and the third included individuals in Allegheny County. Recruitment for these focus groups was conducted through CLS, PULP, and other partnering nonprofits, and participants received a \$20 gift card. In addition, we conducted a focus group with Resource Navigators at a Pittsburgh-area nonprofit focused on preventing eviction and utility disconnection among low-income households. All focus groups were conducted via the Zoom video conference platform. Audio from the focus groups was recorded and transcribed, and contemporaneous notes were taken as backup.

While providing important insight into the complex lived experiences of Philadelphia residents, survey and focus group participants may not be generalizable to the broader Pennsylvania population.

Methods

For quantitative data, we used descriptive, univariate, and bivariate statistics to assess variables and relationships between race and ethnicity and other factors of interest and t-tests, chi-square tests, and multivariate analyses controlling for demographic and geographic covariates, to assess the statistical significance of those relationships. For qualitative focus group data, we used thematic analysis to identify common themes. Quantitative statistical analyses were conducted using Stata and SPSS and qualitative analyses were conducted using Dedoose version 8.3.35. Maps were created used ArcGIS.

Results

Housing and Utility Insecurity

Administrative Data Findings

Pennsylvania

Past Due Accounts

Data on the number of overdue electric and gas customers—including those not on agreement, those on agreement, and those considered inactive—remained fairly constant between January and September 2020, with an average monthly total of over 120,000 past due electric customers and 80,000 past due gas customers. Data on the number of overdue water customers showed a slight upward trend between June and September, but the average monthly total of just under 25,000 overdue customers was smaller among water utility providers. (See Table 1.)

Between January and September 2020, the majority of past due accounts across all utility types were not on agreement (74.7% of electric, 69.7% of gas, and 82.3% of water accounts). However, while those on agreement made up a smaller proportion of past due accounts (18.1% of electric, 20.1% of gas, and 12.5% of water accounts), these accounts made up a higher proportion of arrears. On average, customers on agreement made up nearly half (48.8%) of water arrears, nearly one-third (31.8%) of electric arrears, and over one-quarter (27.9%) of gas arrears. Average monthly arrears were highest for electric services at over \$55 million, then gas services at over \$35 million and then for water services at over \$5 million. (See Table 1.)

Table 1: Average Monthly Past Due Accounts and Arrears by Utility Type, January through September 2020

Customer Type	Electric		Gas		Water	
	Count (%)	Past Due (%)	Count (%)	Past Due (%)	Count (%)	Past Due (%)
Not on agreement	90,233 (74.7)	\$33,838,917 (61.2)	56,014 (69.7)	\$21,449,852 (59.9)	20,193 (82.3)	\$2,374,987 (45.6)
On agreement	21,897 (18.1)	\$17,580,493 (31.8)	16,168 (20.1)	\$9,987,512 (27.9)	3,066 (12.5)	\$2,542,483 (48.8)
Inactive	8,641 (7.2)	\$3,899,870 (7.0)	8,211 (10.2)	\$4,400,795 (12.3)	1,272 (5.2)	\$295,700 (5.7)
Total	120,771	\$55,319,280	80,393	\$35,838,159	24,531	\$5,213,170

Utility Terminations

In 2017, termination rates ranged from 2.3% to 6.1% across electric providers, with an average of 4.3%. Data suggest that roughly three-quarters or more of terminations were restored, with an average of 78.9%, across all providers. Termination rates across gas providers were slightly lower, ranging from 2.4% to 5.8%, with an average of 3.6%. However, fewer overall gas terminations were restored: only 68.3% were reconnected, more than 10 percentage points less than electricity reconnections. Moreover, there was greater variation by provider, ranging from only slightly more than half (54.8%) to more than four in five (86.1%) terminations. However, it is important to note that many residents move following a termination, which is not captured in these data. (See Appendix A, Table A1.)

In 2017, termination rates were higher among customers deemed by utility providers to be low-income customers, though it is worth noting that these assessments of income status by utility providers are imperfect and unregulated, and come with their own limitations. Using this

metric, electricity terminations impacted more than one in ten low-income customers across all but one provider, ranging from 8.9% to 18.3%, with an average of 14.7%. The reconnection rate was also slightly lower: 73.8% among low-income customers compared to 78.9% among all customers. Gas terminations also impacted more than one in ten low-income customers, on average, ranging from 3.1% to 17.7%, with an average of 11.2%. The reconnection rate was also lower among low-income customers, with only 63.6% of terminations being restored among low-income customers compared to 68.3% among all customers. (See Appendix A, Table A2.)

Data from 2020 suggest that while moratoriums halted terminations for non-payment of utility bills across electric, gas, and water providers in April, other types of terminations continued. Reconnections for payments, medical certificates, and other reasons accounted for a portion of terminations.

LIHEAP Energy Assistance

Between September 2019 and August 2020, LIHEAP Energy Assistance grants went to slightly less than 3% of all households across the state ($n=136,630$). This figure represented a slightly higher proportion of renters than homeowners (47.6% vs. 43%). Black residents had three times greater odds of receiving LIHEAP assistance than white residents (Odd Ratio [OR]: 3.2; 95% Confidence Interval [CI]: 3.1-3.3). On average, Black residents also received slightly more assistance (\$367 vs. \$359).

Assistance varied by county, ranging from less than 1% to nearly 12% of all households. Compared to white residents, Black residents had greater odds of receiving LIHEAP assistance in twice as many counties (45 counties vs. 22 counties). These odds were highest in Allegheny (OR: 9.1; 95% CI: 8.7-9.5), Delaware (OR: 8.9; 95% CI: 8.3-9.5), Chester (OR: 8.7; 95% CI: 7.7-9.7), Montgomery (OR: 7.6; 95% CI: 6.9-8.3), and Erie (OR: 5.9; 95% CI: 5.4-6.4) counties. Note that given the timeframe included the Coronavirus Aid, Relief, and Economic Security (CARES) Act Crisis Recovery Program, which ran from May through August 2020, these data may not represent a typical year.

Philadelphia

American Housing Survey

Black and Latinx residents of the Philadelphia metropolitan area are 2.5 times as likely to live below the FPL than their white counterparts. Additionally, only about half of Black and Latinx residents are homeowners compared with over three-quarters of white residents. (See Appendix B, Table B1.)

Black and Latinx renters pay a higher share of their income toward total housing costs than white renters (roughly one-third, on average, versus 29%), though Black and Latinx renters pay less in housing in absolute dollar terms (roughly \$911 among Black and \$954 among Latinx renters, on average, versus \$1,230 among white renters). Moreover, while white renters have higher median rents, Black and Latinx renters generally have higher total utility costs (roughly \$127 among Black and \$142 among Latinx renters, on average, versus \$125 among white renters). (See Appendix B, Table B2.)

Similarly, Black homeowners pay more of their income toward total housing costs than Latinx and white homeowners (over 23%, on average, versus 19% and 20%, respectively), though they pay less in absolute dollar terms (roughly \$881, on average, versus \$1,164 among Latinx renters and \$1,508 among white renters). Black homeowners also pay a higher share of their income toward utilities than both white and Latinx homeowners, while white homeowners pay significantly more in real estate taxes than either minority group. (See Appendix B, Table B3.)

Renters and homeowners living below the FPL pay a significant portion of their income to housing costs—over 60% for those living at between 50 and 99% of the FPL. Though rent is typically higher than monthly mortgage payments for those living below the FPL, homeowners across all levels of poverty pay more for total utilities each month—typically double—than renters, possibly due to differences in housing characteristics. (See Appendix B, Tables B4 and B5.)

Philadelphia Electric Company (PECO)

Between September 2019 and August 2020, PECO averaged 165,751 confirmed low-income customers each month. During this period, on average, over two-thirds (68.5%) of low-income customers received assistance through the utility's Customer Assistance Program (CAP). The number of PECO CAP customers increased steadily between December 2019 and September 2020, across both electric, gas, and dual service customers. Across all services, the total amount of past due accounts and the total amount past due increased between December 2019 and June 2020 and then dropped slightly through September. (See Table 2.)

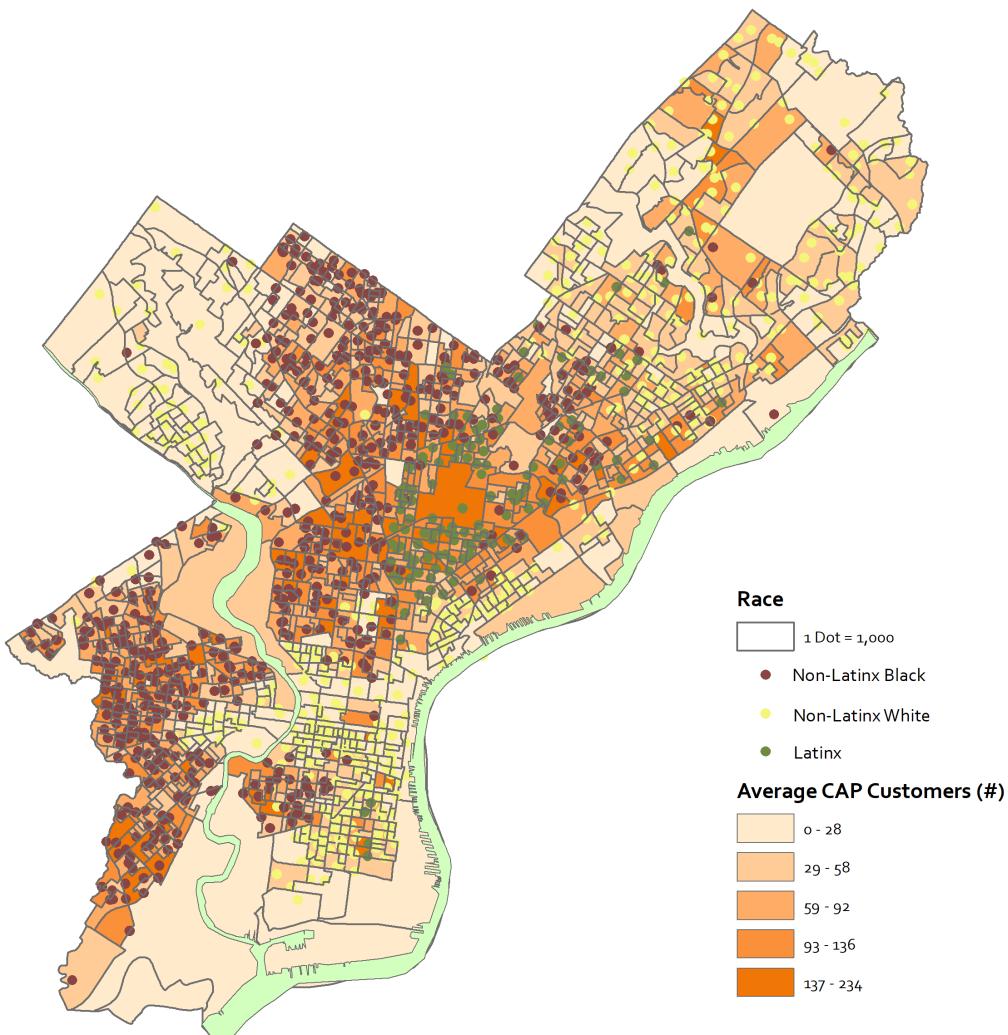
Table 2: PECO CAP Customers and Arrears

Month	Total		Electric Service		Gas Service		Dual Service	
	Count	Past Due (\$)	Count	Past Due (\$)	Count	Past Due (\$)	Count	Past Due (\$)
Dec 2019	111,878	15,049,364	92,737	11,302,376	329	175,096	18,812	3,571,891
Mar 2020	113,589	21,939,751	94,150	16,076,234	305	142,999	19,134	5,720,518
Jun 2020	114,338	22,321,576	94,635	16,348,948	292	132,879	19,411	5,839,748
Sept 2020	115,384	21,540,412	95,356	16,050,704	280	114,691	19,748	5,375,018

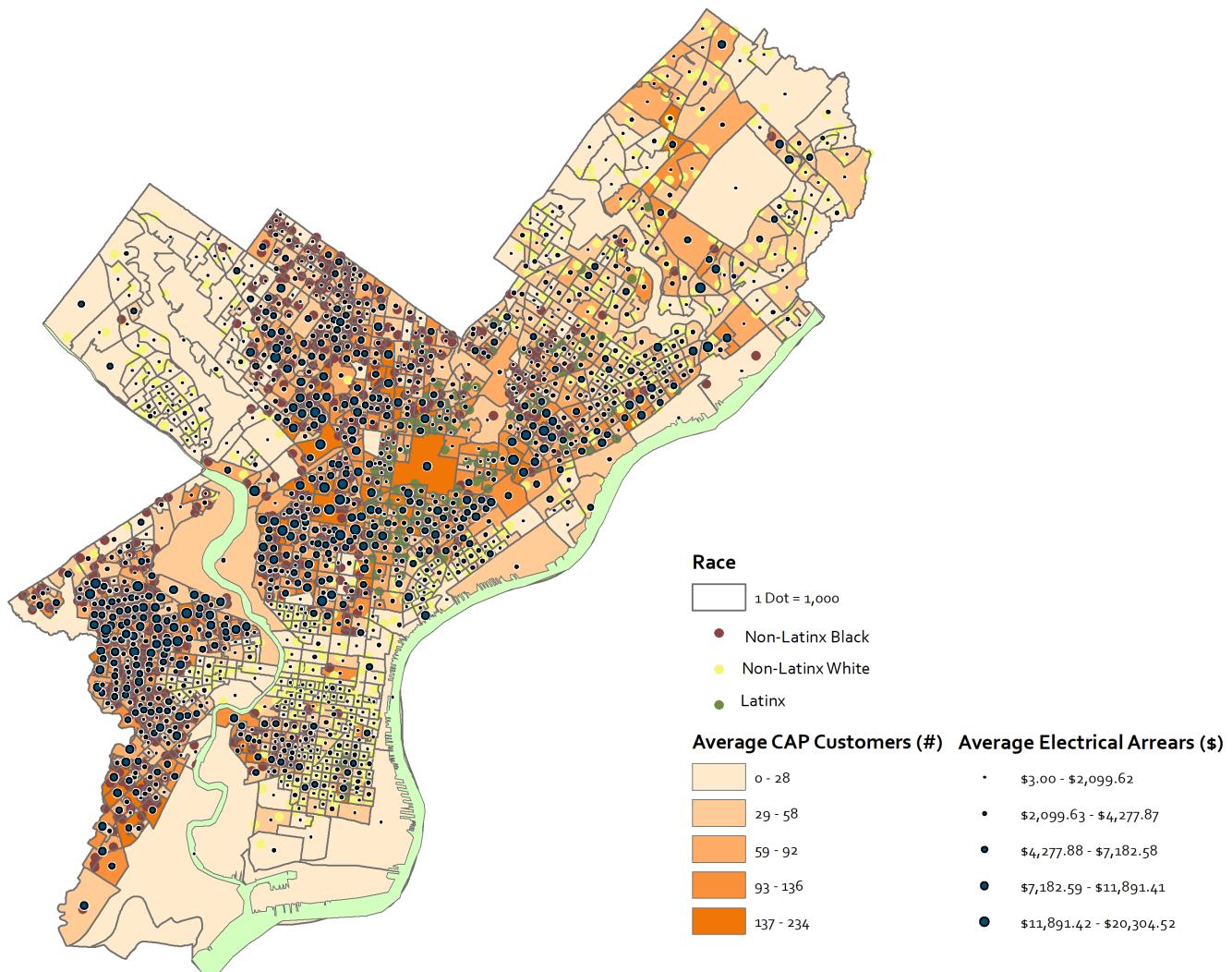
When controlling for median household income, geographies with a higher proportion of Black and housing burdened residents had higher utilization rates of CAP assistance, while geographies with a higher proportion of white residents and renters were negatively correlated with this outcome. Similarly, geographies with a higher proportion of Black and housing burdened residents had more arrears than those with a higher proportion of white residents and renters. Characteristics of geographies with higher gas and dual service arrears differed from those with higher electric service arrears. In these areas, a higher proportion of housing burdened residents was positively correlated with higher gas and dual services arrears, while a higher proportion of white and Latinx residents was negatively correlated with gas and dual services arrears. (See Appendix C, Tables C1 through C3.)

Map 1 demonstrates that areas with a higher density of CAP customers are those with a higher density of Black and Latinx residents. Similarly, Map 2 shows that the areas of greatest electrical arrearages are also those with a higher density of Black and Latinx residents.

Map 1. Density of Average CAP Customers and Race by Block Group



Map 2. Density of Average CAP Customers, Electrical Arrears, and Race by Block Group

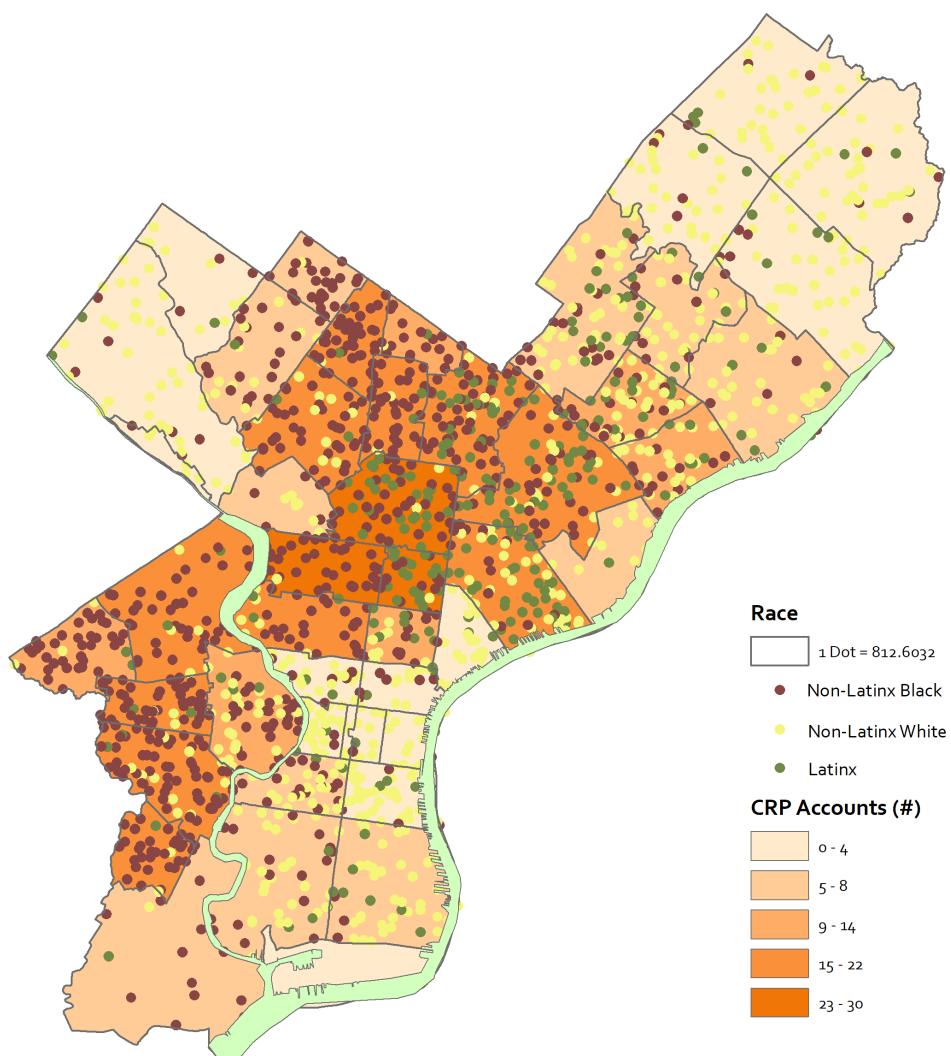


Philadelphia Gas Works (PGW)

In May 2020, PGW had 125,911 confirmed low-income customers, making up over one-quarter (26.6%) of all customers. Two in five (42.9%) low-income customers received Customer Responsibility Program (CRP) assistance. Geographies with a higher proportion of residents of Black race and Latinx ethnicity had more PGW customers receiving CRP assistance, as did areas with a higher proportion of renters. This remained true after controlling for median household income and proportion of housing burdened households. (See Appendix C, Table C4.)

Map 3 highlights that Zip Codes with a greater prevalence of CRP customers are also those with a higher density of Black and Latinx residents.

Map 3. Density of CRP Accounts and Race by Zip Code

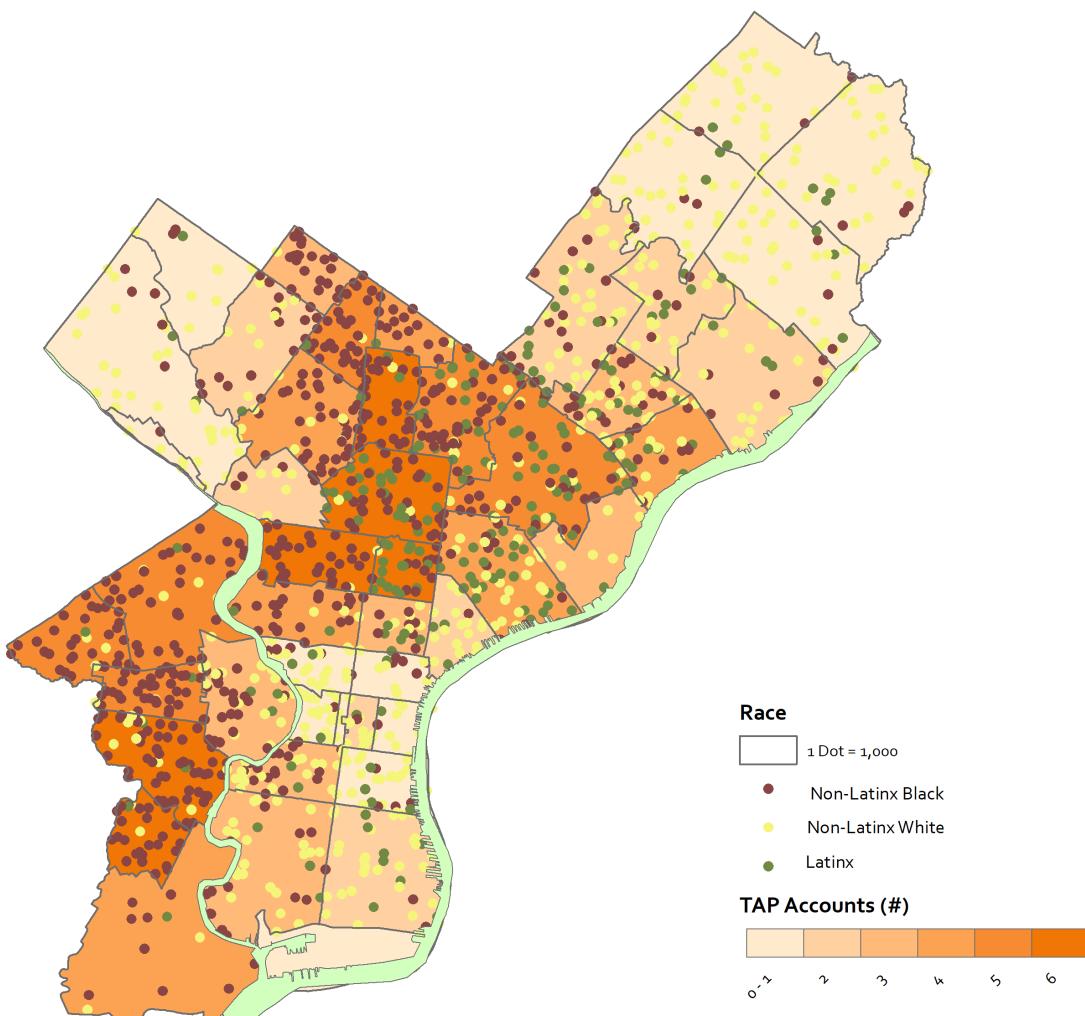


Philadelphia Water Department (PWD)

In 2020, PWD served 478,905 customers. Just over 3% received aid through the Tiered Assistance Program (TAP). Geographies with a higher proportion of residents of Black race and Latinx ethnicity had higher rates of TAP assistance, holding constant median household income, proportion of housing burdened households, and proportion of renters. (See Table C5.) Note that TAP is more heavily utilized by owners than renters, which likely has an impact on our findings.

Map 4 demonstrates that Zip Codes with more TAP customers have the highest concentrations of density of Black and Latinx residents.

Map 4. Density of TAP Accounts and Race by Zip Code



Survey Findings

Demographics and Household Characteristics

Slightly more women completed the survey than men, particularly among Latinx respondents. White respondents reported higher overall levels of education and income and were more likely to report household income from one or more jobs, investments, and Social Security or other retirement than both Black and Latinx respondents. (See Appendix E, Table E1.)

Black respondents were more likely to rent their homes than white and Latinx respondents and Latinx respondents were most likely to report current severe housing instability, staying with family or friends or in a hotel or motel than either Black or white respondents. White respondents were more likely to be homeowners than either minority group. (See Appendix E, Table E1.)

Monthly Housing Costs

Over half of white respondents reported paying \$749 or less in monthly rent or mortgage payments, a significantly higher proportion than either Black or Latinx respondents. However, they were also significantly more likely to report paying the most—more than \$2,000—for monthly rent or mortgage payments than either minority group. (See Appendix E, Table E2.)

White respondents were more likely to report paying gas, deliverable fuel, and wastewater charges than both Black and Latinx respondents, while higher proportions of Black and Latinx respondents reported responsibility for paying electric and water charges. Among respondents responsible for paying these utilities, Black respondents reported paying significantly more for electricity and gas than either white or Latinx respondents. White respondents reported paying more for deliverable fuel, water, and wastewater than either minority group. (See Appendix E, Table E2.)

Housing and Utility Insecurity

Despite recent moratoriums on evictions, more than three in ten Black respondents reported being evicted or forced to move since March 2020, a much higher proportion than either white or Latinx respondents. More than half of those forced to leave stated that their eviction was court-ordered. Roughly three-quarters of Black and Latinx respondents reported falling behind on rent or mortgage payments since March and a slightly smaller proportion of each reported falling behind on utility payments. Fewer (about half) white respondents also reported falling behind on both rent or mortgage and utility payments. When asked about concern over future evictions and utility shutoffs, Black respondents reported significantly more concern than either white or Latinx respondents. Black respondents were also the least likely to report that they felt their home was a safe and healthy place to spend a lot of time during the pandemic. (See Appendix E, Table E3).

Black respondents were much less likely than white and Latinx respondents to report “rarely or never” delaying required payments for some necessary expenses in order to pay for others. Among those who reported delaying payments, one in five Black respondents indicated that they delayed payment of utility bills in order to pay other necessary expenses “most or all of the time,” more than twice the rate of white and Latinx respondents. (See Appendix E, Table E3.)

Among all respondents, between one-quarter and half reported receiving assistance for rental support, loan forbearance, utility shutoff prevention, and food assistance during the pandemic across all racial groups. Latinx respondents reported receiving rental support and loan forbearance at significantly higher rates than either Black or white respondents. Budget billing and CAP were the most utilized utility assistance programs. Differences in utility assistance utilization were typically not statistically significant across racial groups except for LIHEAP, which was more frequently used by Black respondents. (See Appendix E, Table E3.)

Concerns about COVID-19

The household impacts of COVID-19 differed markedly by race. Over 40% of both Black and white respondents reported transitioning to a remote work environment, while slightly more than one-quarter of Latinx respondents reported the same. More white respondents reported continuing to work on-site than either minority group. In addition, about half of Black respondents reported a job loss—20 percentage points more than either white or Latinx respondents. Across all groups, about two in five reported reduced work hours and one in five reported seeking additional work. (See Appendix E, Table E4.)

Despite economic hardships, between one-quarter and two-thirds of all respondents reported an increase in their utility bills. Significantly more Black respondents reported increases in electricity and gas bills compared to both white and Latinx respondents. Significantly more Black and white respondents reported increases in water bills. Fewer Latinx respondents reported utility bill increases across all categories. (See Appendix E, Table E4.)

When asked about factors that had caused their household concern during the pandemic, nearly half of respondents across all groups reported concern about paying the rent or mortgage (49.4%) and paying utility bills (46.5%). Additionally, over two-thirds reported concerns over job loss (38.7%), reduced work hours (38.9%), and childcare (34.0%). There were significant differences across racial groups: Black respondents were most likely to endorse concern over job loss, paying off debts, and transportation; white respondents were most likely to endorse concern over reduced work hours; and Latinx respondents were most likely to endorse concern over paying the rent or mortgage and mental health issues. Black and white respondents more frequently indicated that childcare, education, and/or remote learning was a concern than Latinx respondents. Finally, when asked which of these factors was their primary concern, all racial groups indicated that job loss and household members getting COVID-19 were one of their top three concerns. Black respondents also reported paying the rent or mortgage and medical issues other than COVID-19 as primary concerns, while white respondents reported childcare and Latinx respondents reported mental health issues as primary concerns. (See Appendix E, Table E4.)

Focus Group Findings

Focus group findings are consistent with patterns observed in the quantitative data: the COVID-19 pandemic has revealed and amplified long-standing financial and material hardships for many low-income Pennsylvanians. Against this backdrop, this section summarizes challenges encountered by focus group participants and resource navigators' clients, forcing many people to make difficult decisions about which bills to prioritize and where to make sacrifices. Our findings also offer insights into experiences with public assistance programs, seeking to understand helpful programs as well as ongoing need.

Financial Hardship

Low wages compared to the cost of living meant that participants were financially vulnerable long before the COVID-19 pandemic hit. One Pittsburgh-area navigator estimated that as

many as one-fifth of the agency's clients earn less than \$10 per hour, making it difficult for families to save money or have any wiggle room in their budgets under normal circumstances. Workers cope by working long hours to make ends meet.

"Clients are working 50 to 60 hours a week making an average of eight to nine and a half bucks. A \$12 [an hour] gig is a good gig for a lot of our clients. And when you math that out, if you're working with someone who needs rehousing or their car crapped out and now they can't get to their job, they are on shoe strings."

Community members reported facing further financial strains stemming from job loss, reduced earnings, and an inability to work. Single mothers of young children faced a specific challenge: conflict between the need for childcare and ability to work outside the home. Those with school age children described helping with remote schooling during the day, when they would otherwise be working.

"Most of the time, my kids went to school Monday to Friday, that wasn't childcare, but it was in a way. So, when they went to school, I would go to work. So now that they're out of school and they're going on remote, I have to stay at home with them and I have to help them with schoolwork and everything. So I'm not able to go to work, and pick up shifts or anything because of that. I don't have anybody else to watch them. And then everybody [childcare centers] is kind of scared to take them anyway, everybody's scared to catch COVID. So, it's harder for me to make money. So, I had to apply for unemployment benefits."

Low income workers faced worsening financial circumstances as the pandemic stretched on. Workers who initially kept their jobs were being laid off. As one Philadelphia participant described:

"I work with a lot of workers at the airport for Philadelphia. They laid off 250 people two weeks ago [in late September]. So, they were working through the pandemic until this moment. Now that the moratorium is about to end, they're actually in worse shape than they were several months ago."

Others who were initially furloughed were learning that they wouldn't get their jobs back. Some workers saw their hours dramatically reduced, but they didn't qualify for unemployment insurance because they were still working. Participants across focus groups expressed a general sense of fear and uncertainty about their jobs at the time of their participation and in the future.

"Those who were able to keep their jobs, or even part-time keep their jobs, have been super concerned because I think most of the folks I work with were just trying to figure out when the next shoe is going to drop. Things have been changing so quickly."

As employment became more challenging, workers reached the time limit on unemployment benefits, the expanded federal benefit ended, and other temporary relief programs closed. Workers were not sure where or how to find jobs in this new environment. Many were also

grappling with whether they could risk their own health, and the safety of those in their household, by working outside the home.

For those who became sick with COVID-19, lack of paid sick leave meant they faced the additional burden of lost wages. This could quickly escalate into a serious financial challenge when more than one member of a household was affected.

"I have had a few clients who have been sick themselves. One of my clients was working at a grocery store and when she got sick, she wasn't allowed to work for a certain number of weeks. So, she was in a position where her husband got exposed and then she couldn't go into work again. So largely it's just people not being able to work and get their normal income. And that just snowballs into a lot of bills not getting paid."

Basic Needs

Utilities

Participants across all three focus groups had difficulty affording utilities; gas and electric bills were most commonly cited. Internet was challenging among households with school-age children and for people who were working from home. Internet was also an important resource for staying connected to family and community members, particularly among those with health conditions.

"It's literally the only way for me to continue to make income. Also, it's the only way I have to really have interaction with folks because it's not safe for me to go. So yeah, for me, Internet. And then I know a lot of folks with kids because that's the only way their kids are getting any school, the internet, which has been a hit or miss on having laptops and having availability, much less also getting the internet access."

Internet was also critical for connecting clients to resources. Pre-COVID, community members could visit social service agencies or local libraries in-person to seek help, but following the onset of the pandemic, many agencies were no longer open, operating with limited hours and staff, or required appointments to access resources. Yet, Internet access was often critical to even learning about relief program requirements. Some Pittsburgh area navigators adapted and started to visit clients in their home to assist with applications, relying on personal phones or tablets to access online materials.

"I've talked to quite a few people who are at a loss as to how to get paperwork back and forth. They're not comfortable enough with say a cell phone to sign something or take a picture and upload it."

"I have a lot of residents like that. And what I do is I put on my mask and go to the house. I've downloaded all types of info on my phone, any kind of application I may need."

Focus group participants mentioned water bills less often, possibly because some lived in apartments where water was included in the rent. In Philadelphia, public water utilities are more common and water bills are linked to the property owner, but private water companies

are more prevalent outside of Philadelphia, and private water utility accounts are linked to the tenant, not the property owner. For this reason, consumers who rely on private water companies may have a different very experience, particularly if they are struggling to afford water bills. One participant, an employee of a community-based agency in North Philadelphia, said that seniors who own their homes were more likely than younger clients to worry about water bills.

In general, participants managed expenses by making difficult choices about which bills to prioritize and which to delay. Most participants prioritized household expenses. In their words:

"I had to make sure I got the most important things first, like the most important bills, gas and electric, make sure those were paid. And you know, a few months I actually had to go without a phone too. To make sure we had food in the house, like basic necessities and everything else. You got to prioritize what you want and what you need, get the necessities. And then sometimes what you want, you have to put it on the back burner for a while just to make sure your house is okay."

"More of what I'm hearing is people paying pieces of it. There's still rent that has to be paid because I need a roof. And so whatever's left over, we're piecing out to these other kind of areas."

Those with health conditions were further burdened by the cost of medication, which also factored into their decisions.

"So I think there's some really tough choices. And there's another choice, which is medications and paying for those. So you have to maybe stick with having grilled cheese sandwiches for a month. So that you can get your medication and you're paying \$20 on that electric bill and \$40 on the gas bill now that it's getting close to the winter."

With respect to utilities, participants also discussed adjusting their budgets as the seasons change.

"I think that gas for the summertime was probably the bill that really could go without. You can microwave a sandwich. If you have a toaster oven, you can use that. You have some other options on food. As we're going to close to winter time, that might have to change up because you're going to need [gas] heat."

Food

Participants across the focus groups mentioned difficulty meeting other basic needs due to financial hardship. Food was particularly challenging for a number of reasons including price increases in stores, difficulty finding items in local stores, and inconsistent food relief programs. One focus group consisted of several residents of a supportive housing program. In one participant's words: "We don't pay utilities here, but we do pay rent. So, my thing is mainly the food. So that's why I get help."

Participants went to great lengths to buy groceries, such as traveling to suburban areas where they noted a difference in options compared with what was available in their local stores.

"The urban neighborhoods are suffering. Meanwhile, the suburban neighborhoods are a little bit more well off. That's one thing I noticed. Because I have family that live in the suburbs, and then I have family that live in more urban neighborhoods. I've had to travel, we've had to do the whole community thing and find somebody with a car, and all traveled to the suburbs to a market together to get food. So, it's been hard. It's been hard."

Some families began stocking up on food at the start of the pandemic and grocery stores struggled to keep up with the demand. As described by a Pittsburgh-area navigator:

"We didn't know what to expect. I got my groceries at the last minute, to where I had to talk to the meat department to ask, "When is the truck coming?" That's how I had to get my food. So, if I had to wiggle through to get some food, I know everybody had to. So at the beginning, it was very hard."

Later, COVID-related challenges were exacerbated by civil uprisings, where some stores were damaged and closed for a period of time.

"For a certain amount of time there was no meat in the market. People were buying up all the food. There was no food available to people. So, people were doing a lot of desperate things. People are operating from a scare mindset, because there's not enough of anything. Like right now, if you go look for rubbing alcohol right now ... the simplest things, things that you never thought wouldn't be available to you, are now not available to you. I can't go buy rubbing alcohol now. There's none available."

In Philadelphia and the Pittsburgh area, local organizations were offering food boxes, but they were not a reliable source of support. One Philadelphia resident noted: "They were giving out food boxes here then they moved to another building. But I don't think they're even doing it there anymore." Food programs were also suspended when workers contracted COVID.

"Yeah. A lot of people stopped the food boxes because some people [workers] were getting sick. Even though we get extra food stamps now because our kids were in free and reduced school meals, ... I still had a caseworker bringing me food boxes maybe every other Thursday. And then it had to stop because someone in the kitchen ended up contracting COVID, so I haven't been getting them anymore."

Food access was also influenced by access to transportation. Vehicle access was particularly important in the Pittsburgh area where distribution sites were inconveniently located.

"Sometimes when they're doing these food distributions, it's a little further out than most of us are able to get to. So, if we don't have a vehicle, we're unable to get to the distribution site to get the food."

Similarly, drive-through only sites and rules around distribution exacerbated food access challenges for some Pittsburgh-area families.

"A lot of the distributions have been drive-through only, and one family per vehicle. So even if you were doing a shared ride, it wouldn't matter because it's one food box per

family, per vehicle. And they didn't have walk-up services available at a lot of these food distributions."

To fill this gap, resource navigators started picking up and distributing food boxes to clients who would not otherwise have access. Some navigators noted that transportation was a long-standing challenge, so they had become accustomed to delivering resources to clients' homes.

Transportation

Transportation access, in general, was a common theme in focus group discussions. At the start of the pandemic, Pittsburgh made public transit available for free, but riders were required to have protective gear, which became a barrier to access. As described by one Pittsburgh area navigator: "Everyone didn't have protective gear at arm's reach for them, or didn't know where they could get it, or again, didn't have the money to purchase it."

In all areas, residents who typically relied on public transit turned to ridesharing to avoid crowded buses and trains. This was critical for participants with underlying health conditions that made them vulnerable to COVID. But rideshare company policies designed to promote safety also proved burdensome for riders.

"And then rideshares, like Uber, moved pretty quickly to single passenger, which would feel safer. But the cost of them has been insane. Rides that used to cost me maybe \$10 or \$15, were \$40 or \$50."

In addition to the cost of the service, limiting the number of passengers meant that families couldn't necessarily use rideshare.

"As we know, Ubers and Lyfts didn't allow more than two to three people in their vehicle, and you could only use the back seat. So, if you're a family of four or more, that was a barrier for you for transportation, if you don't have your own vehicle to get to and from."

Moratoria/Assistance Programs

Focus group participants expressed concern over the end of moratoria on evictions and utility shut offs. The majority were aware of approaching deadlines and were worried about what would happen once these programs ended.

"I'm concerned with what might happen. People are struggling as is, and unemployment helps, but it's not enough, especially when you have children. So, when they've ended, even though you're not shutting them off now, the money still piles up. The bills are still due every month. They're not disappearing. They're not going away. And if you're not able to pay them, what are you going to do if you have a lot of back payment? Is that when they're going to come? 'Oh, well COVID is over. We're going to shut your utilities off because you haven't paid.' What are they going to do about the back pay for the people who actually really aren't able to pay anything?"

Participants were also discouraged by the process of applying for eviction prevention. A Pittsburgh area resident was told that renters were required to wait until they were 30 days

behind to apply for help, but suggested few people would want to wait that long when they know they're in trouble. Another Pittsburgh area resident added that eviction prevention required both the landlord and tenant to apply. Pittsburgh area navigators reported that in addition to cooperation from landlords, assistance programs required landlords to be in good standing, which tenants cannot control.

"The remaining rental assistance that is available is contingent on the landlord being up-to-date on their taxes. The landlord does not get in trouble if they aren't up-to-date on their taxes, only the tenant loses out on access to the program. And then another pickle that we've been struggling with, I think across Pennsylvania, is all of the rental assistance programs require that the landlord agree to participate, which was a huge hindrance for CARES. And I think everyone in here knows that struggle. But that doesn't go away when CARES is done."

In addition to these challenges, there was a \$750 cap on the amount of rental support that could be provided, a figure much lower than average market rate rent. These challenges led people to seek support from local agencies, such as the Urban League, which offered rental assistance.

Pittsburgh area navigators raised another concern related to access to assistance programs: identification or documentation required to confirm eligibility.

"I think that a huge barrier is identification, having a state-issued photo ID or having a photo ID that's valid. Somebody will say, 'I have my driver's license, but it's expired.' Or, 'I lost my social security card. I lost my birth certificate, or it's at a storage unit that I no longer have access to,' or something like that. And then the other major barrier would be having bills or ID that has your current address on them. A lot of people, the bills aren't in their names. They're staying with somebody else or they just haven't updated their documents with their new address because they're moving every year."

Similarly, a Pittsburgh area navigator who served primarily Latinx residents mentioned that not having an ID or not being willing to provide an ID can exclude clients from assistance programs.

"Most of our clients are Latino and some of them do not have what is needed to qualify or apply for this kind of assistance. Some of the programs, like part of a rent relief program, the clients need to have a social security number or an ID number, and not everybody in our community is willing to provide this information. For the rent relief, we find a way to apply when the person has the ID number, which is not a lot of people. But for the utility bills, we have our internal help assistance as well that we try to actually assist families. But it is a day by day case."

We asked focus group participants for input on unmet needs, including suggestions for improving existing programs. Overall, participants felt like they and others in their community were not necessarily aware of the range of programs available to them. In some cases, clients learned about assistance through visits to social service agencies, but COVID-19 health restrictions meant that fewer people could access services in-person. Another concern related

to program design and access as application processes aren't always designed for marginalized populations. For example, English-language learners, those who are not computer savvy, or those without reliable access to a computer and/or Internet may be prevented from applying. A Philadelphia area participant observed that the City was making a greater effort to reach out through community-based organizations and churches, which was described as positive. At the same time, these organizations were already overburdened by trying to meet community members' needs in a worsening economic environment.

COVID-19 Health Impacts

Administrative Data Findings

Pennsylvania

We analyzed COVID-19 health outcomes across the Commonwealth at multiple time points to understand trends in the spread and severity of the pandemic. To do this, we collected data in mid-September 2020 and then in mid-December 2020 in response to rising infections and deaths starting in the fall. Table 3 shows COVID-19 cases and deaths, by race and ethnicity, at both points in time.

As of mid-September, Black Pennsylvanians were more likely to be among those positive for COVID-19 (20%) or dying as a result of COVID-19 (18%) than their share of the state's population (11%). The same was true for COVID-19 cases among the Latinx population (13% of cases and 7% of the population), but not deaths. The demographic correlates of COVID-19 outcomes remained largely intact through December. Black residents remained more likely to be included among COVID-19 cases (18%) and deaths (16%) than their share in Pennsylvania's overall population and Latinx residents were more likely to be included in COVID-19 cases (21%).

Table 3: Comparing Race and Ethnicity: COVID-19 Outcomes and the Pennsylvania Population (September and December 2020)

	PA Population	September, 2020		December, 2020	
		COVID-19 Cases	COVID-19 Deaths	COVID-19 Cases	COVID-19 Deaths
Race					
White	80.80%	75%	75%	78%	78%
Black or African American	11.10%	20%	18%	18%	16%
American Indian and Alaska Native	0.20%	-	-	-	-
Asian	3.30%	3%	2%	3%	2%
Native Hawaiian and other Pacific Islander	0.00%	-	-	-	-
Other race	2.00%	2%	4%	2%	4%
Multiracial	2.40%	-	-	-	-
Ethnicity					
Latinx	7.10%	13%	5%	21%	5%

COVID-19 Rates by County

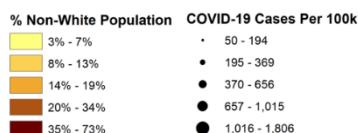
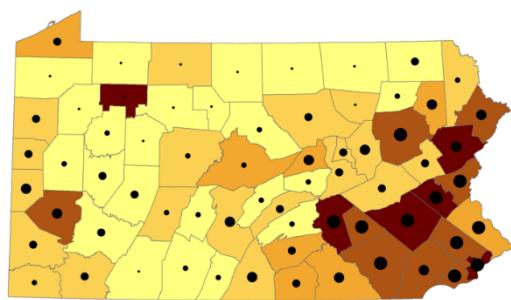
We further assessed COVID-19 outcomes by county to evaluate the association between COVID-19 outcomes and county-level racial and ethnic composition. In September, counties with a larger share of non-white residents were disproportionately impacted by COVID-19. The

top 10 counties with the largest number of COVID-19 infections included seven of the 10 counties with the largest share of non-white residents. Further signifying this relationship, high case numbers generally aligned with higher infection rates. (See Appendix F, Table F1.)

However, this relationship appeared to change as the coronavirus spread. By December, the number of COVID-19 infections remained high in counties with a larger share of non-white residents, but an analysis of infection rates shows little difference based on county-level racial and ethnic composition. Only one of the top 10 counties with the highest infection rates was among the 10 counties with the largest share of non-white population in mid-December. (See Appendix F, Tables F2 and F3.)

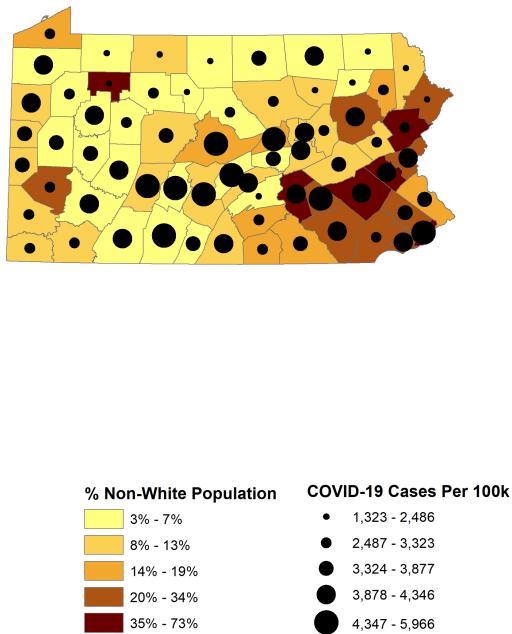
Spatial and regression analyses provide further evidence of these associations. Map 5 shows that counties with a larger share of non-white residents also had higher rates of COVID-19 infections in September. This was confirmed by a regression analysis showing that a one percentage point increase in non-white share of the population was associated with nearly 2,600 more cases per 100,000 residents. (See Appendix F, Tables F4 and F5.)

Map 5: COVID-19 Cases by County (September 2020)



In December, however, those differences were no longer visible. In contrast to September data, Map 6 illustrates the ubiquity of the virus across the state. COVID-19 cases and rates grew in counties with and without a large share of non-white residents. Regression analyses showed that between September and December, the relationship between county-level racial and ethnic composition and COVID-19 rates had largely evaporated. (See Appendix F, Tables F6 and F7.)

Map 6: COVID-19 Cases by County (December 2020)



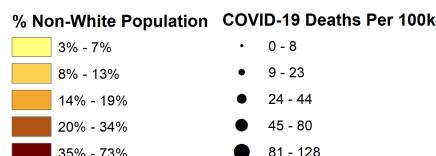
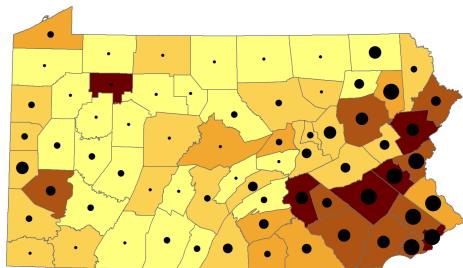
COVID-19 Deaths by County

Analyses examining COVID-19 deaths uncovered similar patterns. In September, the 10 counties with the most COVID-19 deaths included eight of the top 10 counties with the largest share of non-white residents while in December, slightly different patterns emerged.

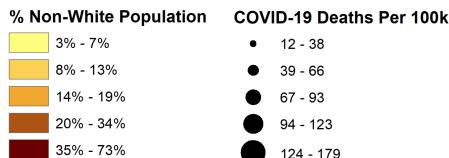
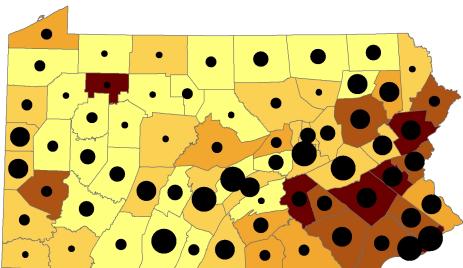
Consistent with September data, the number of COVID-19 deaths were highest in counties with a large share of non-white residents; however, these disparities disappeared when examining rates rather than raw numbers—just three of the top 10 counties with the largest share of non-white residents were included among the top 10 counties with the highest COVID-19 deaths rates by mid-December. (See Appendix F, Tables F8 through F10.)

Spatial and regression analyses corroborate this pattern. In September, there was a significant relationship between the share of non-white residents and the COVID-19 death rate. (See Map 7 and Appendix F, Tables F11 and F12). By December, the visual relationship is no longer evident, yet a persistent statistically significant relationship remains between county-level racial and ethnic composition and the COVID-19 death rate with each one percentage point increase in the non-white population associated with an increase of 99 deaths per 100,000 residents. This is different than the longitudinal pattern observed in infection rates, perhaps a result of the persistent structural health inequalities facing communities of color. (See Map 8 and Appendix F, Tables F13 and F14.) Despite the persistence of the relationship, comparing Map 7 (September data) to Map 8 (December data) shows that the relationship may have weakened as the disease continued to spread.

Map 7: COVID-19 Deaths by County (September 2020)



Map 8: COVID-19 Deaths by County (December 2020)



COVID-19 Rates by Pennsylvania Zip Code

The large size and racial heterogeneity within each of Pennsylvania's counties may mask the relationship between COVID-19 health outcomes and race and ethnicity. Therefore, we also analyzed Zip Code data to examine COVID-19 cases and community demographics at a much more granular level. Regression results demonstrate a much stronger relationship between community racial and ethnic composition and COVID-19 impact than could be observed in county-level analyses. At the Zip Code level, a one-percentage point increase in the share of

non-white residents is associated with 9 additional COVID-19 cases, a finding that was consistent across disaggregated racial groups. (See Appendix F, Tables F15 and F16.)

Philadelphia

In November 2020, Philadelphia reported 58,012 COVID-19 cases and 1,942 deaths. By December, those figures had grown to 87,395 COVID-19 cases—a 50% increase in one month—and 2,188 deaths.

Tables 4 and 5 show the disproportionate impact of COVID-19 on Black Philadelphians in November and December 2020. While Black residents represent about 42% of Philadelphia's population, they represented a higher share of hospitalizations (57%) and deaths (52%) in November, while white residents were underrepresented in adverse COVID-19 outcomes. These patterns persisted through December, by which point Black Philadelphians continued to represent a disproportionate amount of COVID cases (46%) and deaths (50%) relative to their share of Philadelphia's population (42%). White Philadelphians remained underrepresented.

Table 4: Philadelphia COVID-19 Outcomes by Race (November 2020)

	Population	Cases	Hospitalizations	Deaths
Race				
White	41.2%	26.3%	19.3%	31.3%
Black or African American	42.3%	48.0%	56.9%	52.2%
American Indian and Alaska Native	0.4%	0.1%	0.1%	0.0%
Asian and Asian American	7.2%	4.5%	3.9%	3.7%
Native Hawaiian and Pacific Islander	0.1%	0.1%	0.1%	0.0%
Some Other Race	5.9%	6.3%	4.3%	2.9%
Multi-Racial	3.0%	-	-	-
Ethnicity				
Hispanic or Latinx	14.5%	14.7%	15.4%	9.9%

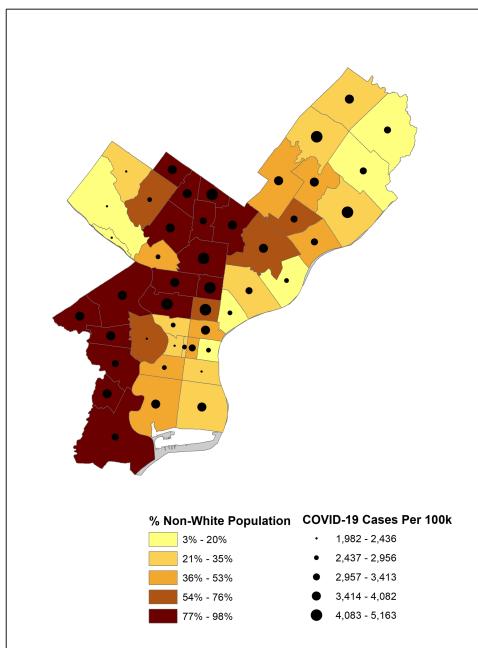
Table 5: Philadelphia COVID-19 Outcomes by Race (December 2020)

	Population	Cases	Deaths
Race			
White	41.2%	27.6%	31.9%
Black or African American	42.3%	46.0%	49.5%
American Indian and Alaska Native	0.4%	-	-
Asian and Asian American	7.2%	4.6%	4.2%
Native Hawaiian and Pacific Islanders	0.1%	-	-
Some Other Race	5.9%	8.1%	4.8%
Multi-Racial	3.0%	-	-
Ethnicity			
Hispanic or Latinx	14.5%	10.6%	9.6%

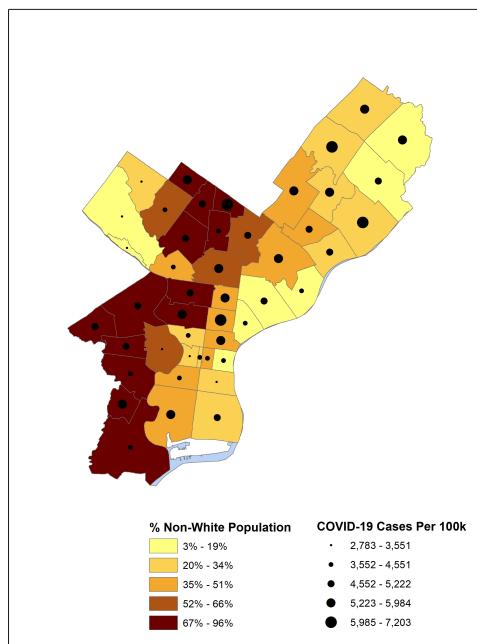
COVID-19 Cases by Philadelphia Zip Code

Maps 9 and 10 highlight the connection between community composition and COVID-19 outcomes over time. Map 9 shows the concentration of COVID-19 cases in disproportionately non-white Zip Codes in November, a relationship that became less clear in December, as shown in Map 10.

Map 9: COVID-19 Cases by Philadelphia Zip Code (November 2020)



Map 10: COVID-19 Cases by Philadelphia Zip Code (December 2020)



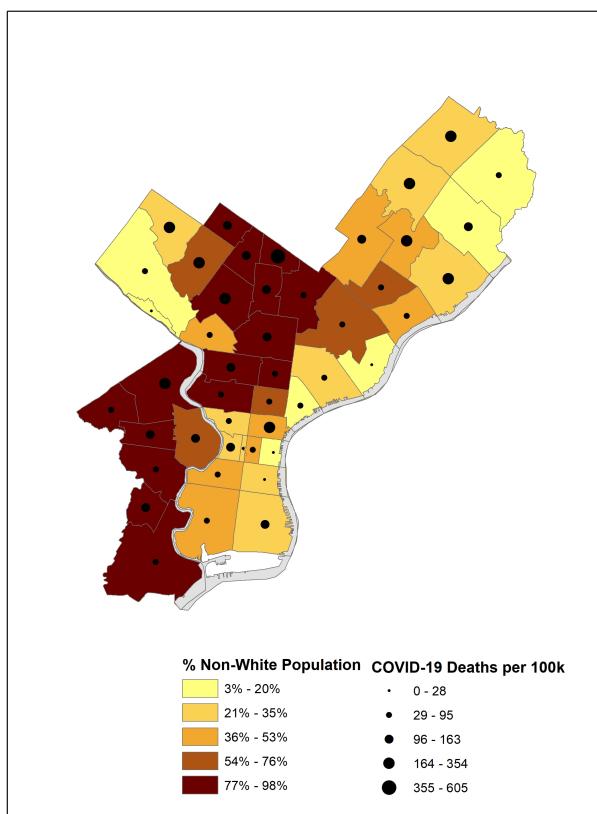
A series of quantitative analyses assess these findings more systematically. Examining the association between Zip Codes with the largest number and highest rates of COVID-19 cases

does not show a meaningful pattern with racial and ethnic composition. (See Appendix F, Tables F17 through F20.) However, more rigorous regression results demonstrate a relationship between community racial composition and COVID-19 in both periods of observation. A one percentage point increase in the non-white share of a Zip Code's population was associated with an increase in 1,416 cases per 100,000 residents in November, which remained largely intact and significant in December. In particular, a larger share of Black residents was associated with increases in COVID-19 cases in both months. (See Appendix F, Tables F21 through 24.)

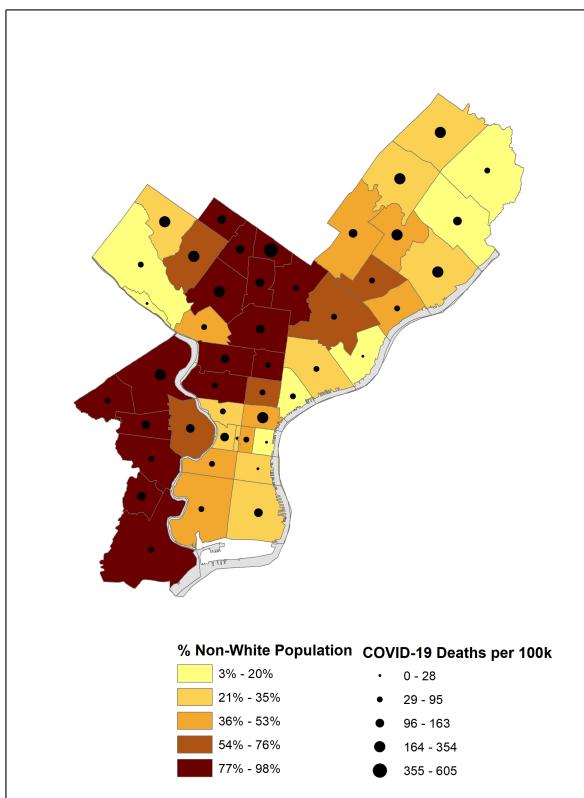
COVID-19 Deaths by Philadelphia Zip Code

We conducted similar spatial and regression analyses of COVID-19 deaths within Philadelphia. Maps 11 (November data) and 12 (December data) do not suggest a strong relationship between COVID-19 deaths and a Zip Code's racial composition, a finding corroborated by a comparison of Zip Codes with the largest number and highest rates of COVID-19 deaths and regression analyses. (See Appendix F, Tables F25 through F32.)

Map 11: COVID-19 Deaths by Zip Code (November 2020)



Map 12: COVID-19 Deaths by Zip Code (December 2020)



Summary

Analyses conducted using data from earlier and later in the fall of 2020 led to slightly different conclusions. Overall, the *number* of COVID-19 cases and deaths remained highest in areas of the state with the highest percentages of non-white population. However, our analysis did not find a consistent pattern linking *rates* of COVID-19 infection and the proportion of non-white population.

Several factors can explain these results. While the number of COVID-19 cases and deaths decreased during the summer, the U.S. experienced a second wave starting in the fall. As the overall number of COVID-19 cases and deaths increased, patterns of infections and deaths shifted. Initially, COVID-19 cases and deaths were concentrated in large urban areas, which tend to have more non-white residents. Over time, the virus spread throughout the state, including to predominantly white areas. Missing data may also influence Philadelphia Zip Code-level findings: the 2018 ACS demographic estimates do not include data for all zip codes, thus limiting our analysis to only those Zip Codes with complete demographic data (N=46) and corresponding data on COVID-19 outcomes.

Focus Group Findings

COVID Health Disparities

Focus group findings were consistent with administrative data showing higher rates of COVID infection and deaths in counties with a larger share of non-white residents. Several focus group participants indicated that close family members had been affected by COVID or they themselves had been sick. Many also felt that they and members of their community—including close friends and family, colleagues, and the clients of those who worked at social service agencies—had been hit harder than other communities. In one extreme case, a participant indicated that she had lost 10 family members to COVID-19 and described its emotional toll.

"I've lost over 10 family members this year... over 10 family members. I've been to literally maybe about two or three family funerals a month. And the biggest one for me was just passed, was my grandma. My grandma was older and she already had organ failure. And then when COVID came, she got sick and she passed away. So, with everything else going on, plus us having the grief from death of our family members, it's really, a tough time for everybody. My kids, my kids are even affected by it. They wake up in the morning and they keep asking me about Nana. So, it's like, it's affecting all of us."

As the pandemic continued, conditions appeared to worsen:

"Personally, in my family, we now have five members of our family who have gotten COVID in the last month. So that's been hard. They've been out of work. They're trying to figure that out also. Just when you're thinking how worried we all were back in like April and May, and now that it's supposed to be getting 'better,' I actually know more people who have COVID now than I did in the beginning. In our reality, it's definitely getting worse for the folks I know than it was in the beginning."

Health Care Access

Focus group participants described a range of factors that made it difficult to access health care. Participants had difficulty making medical appointments or getting medical tests when hospitals and providers stopped accepting new patients due to fears about COVID exposure. Though these measures were designed to promote public health, they also affected access to routine care.

"I work with a few immigrants who were looking for a new physician. And now that COVID is here, it has been even harder for them to find a physician that takes new patients. Because some of the phone calls that I've done, they're saying that they're only taking normal patients that they already had. They're not taking new patients due to COVID. So just for them to either get [COVID] testing, or for them to just get dental services, or just overall physical for a job, that has become a barrier."

Residents of low-income communities are more likely to be in poor health than their wealthier counterparts, and underlying health conditions were a common theme in focus group discussions. Workers from community-based organizations spoke about the health-related

challenges their communities were facing long before COVID, which made people more vulnerable to getting ill. Participants also mentioned delaying or avoiding care due to fears about COVID exposure in health care settings.

"Before COVID, the number of folks, especially in my working community, [who] had health issues...cancer, diabetes, and respiratory issues were already pretty staggering. Germantown has some of the highest rates. I also work a lot with folks in North Philly who have some of this city's highest rates of asthma. This has already been hard health-wise, and then COVID hit and it felt like it made everything a lot worse."

Several participants also mentioned health conditions that put them at higher risk for COVID infection and serious consequences.

"You feel like you're closed in, the walls are closed in, because for a while, I was really scared to go outside. I really was. Even when I wasn't feeling well, I did not go to the doctors or what have you, because I was like, I'm not going around them because see, I suffer from fibro myalgia. And so, I was like, I can't, I'm not going in no hospital."

"Having a chronic illness like lupus, it's an autoimmune disease in which my immune system is overactive and it can attack different organs, like my skin, my brain, and my kidneys, my lungs. And so the treatment is to shut off or to suppress my immune system. So a virus like this, it's fairly scary for someone like myself. If you think of what we were saying to do back in March, that's what I'm like every March because the regular flu could put me in the hospital. I've had to be hospitalized because of an ingrown toenail that became infected and became a blood infection because my immune system can't fight regular stuff. At one point, I actually couldn't get services because one of the treatments I needed was in the hospital. Right now, I've been for about two months with something wrong with my stomach, but because we can't do physical testing, it's been really difficult for them to figure out what test is safe to run for me to figure out what's going on. And so, it just makes everything way more complicated to figure out how to deal with when you have chronic illnesses."

Pittsburgh-area navigators mentioned that some providers pivoted to doing home visits, but there remains a critical need for home care which could protect seniors from getting sick.

"I have clients that I'm working with and also members of my community that are having trouble getting home health care services for in-home care due to the COVID, especially with seniors. A lot of seniors aren't willing to go out and risk getting care because they do have weak immune systems, most of them that are already sick. So, I do know that that's been a barrier right there. Getting the home health aide services and the in-home nurses to come into people's home and do their daily living and assist them with their care."

The cost of health care, and specifically COVID testing, also influenced access to care. As described by a Pittsburgh-area participant: "I've had people in my community who may have been exposed or feel like they've been exposed, but are reluctant to go and get tested because

they either don't know details of how to get tested, or they're unsure of what they'll have to pay to get tested and the high cost of testing itself."

Mental Health Toll of COVID

Several participants discussed the mental health toll of the pandemic. Fear and uncertainty about the virus itself, financial strains, and the added pressures of lockdowns and social distancing were a topic of discussions. Single parents, in particular, struggled with the pressure of child rearing without support. In the past, some could count on support from family or other members of their social network, but with COVID affecting communities as a whole, single parents were often managing on their own.

"I feel like I need support with my kids. I love my kids to death, but sometimes I need a break. All of us parents do. Sometimes I need a break because I have to not only be present for me, but I have to be present for them. And it's hard when you don't get any space away from them."

Similarly, another single parent coped by reminding herself that she had to stay strong for her children when she was felt overwhelmed.

"Because when I'm on that mood, I would try to stay out that mood because it puts me on a negative level where I don't want to be, because I have kids that look up to me. Like I said, when I be in that mood, I don't like being around nobody. So now that I be trying to cope, I remind myself, I'm doing this for my kids. It's very stressful and very struggling, like she said, and it do be hard to stay focused sometimes, but what helps me get through the day is my kids. So, it's like my kids are my mental therapy, to realize this ain't going to be forever."

As the pandemic continued, some people also worried about the long-term consequences of their experiences. In one person's words: "Six months now of one thing after another ... We know that poverty is traumatic and causes lots of health issues, and stress has a lot of negative impacts into people's ability to think and make decision-making. What is the outcome of folks who are living in this much stress and anxiety?"

Conclusion

This study demonstrates a breadth of vulnerabilities facing all Pennsylvania residents which are particularly acute for racial and ethnic minorities. Low-income, Black, and Latinx residents are more likely to be rent-burdened than their counterparts and pay more money toward their utility bills than their white counterparts. They are also more likely to experience utility insecurity. Areas with higher concentrations of minority residents had much higher rates of utility arrears and disconnections as well as much higher rates of enrollment in utility assistance programs than other regions. In addition, survey results demonstrated the disproportionate risk of housing and utility insecurity on Black and Latinx Pennsylvanians. Roughly three-quarters of Black and Latinx respondents reported falling behind on their rent or mortgage since March, and a third of Black respondents reported being formally or informally evicted since the pandemic began, despite state and federal eviction moratoria. Black

respondents were also the most likely to be worried about future evictions and utility shutoffs and were the group most likely to state that they at least sometimes delay payments on some necessary expenses to pay for others, with utility bills being high on the list of deferred bills.

Black and Latinx residents were also the most likely to be directly impacted by COVID-19. In September individuals identifying as Black represent 11% of the Commonwealth's population but 20% of COVID-19 cases and 18% of deaths; Hispanic households are 13% of Pennsylvania cases despite comprising only 7% of the population, though the death rate among Hispanics is slightly lower (5%), and this narrative remained largely constant through December. In addition, areas with concentrations of non-white—particularly Black and Hispanic identifying—populations faced significantly higher COVID-19 infection and death rates in the pandemic's early days. These relationships held true within Philadelphia: Black Philadelphians represent 44% of the city's population but 48% of all COVID-19 cases, 57% of hospitalizations, and 52% of deaths—and Zip Codes with higher rates of Black residents had more COVID-19 cases, hospitalizations, and deaths than largely white areas of the city. Black survey respondents were much more likely to state that they had been infected or knew someone that had been infected than white respondents. Compared to higher income white respondents, Black respondents were more likely to be in poor health, with more comorbidities, and express greater concerns about healthcare access and risk of COVID-19 illness.

Another incidental conclusion of this report is that inquiries of utility insecurity are significantly hindered by lack of data. As has been pointed out by others, private utility companies—even ones that are publicly regulated—are under no obligation to share data and are often reticent to do so. This makes detailed examinations of utility insecurity—and true housing insecurity—nearly impossible and hinders the ability to create and target policy and programming for those that need it most.

Limitations

There are notable limitations to this study. Surveys were conducted during a single week in the fall and findings, even from the same group, may have changed over time; if anything, it is likely that as the pandemic and the resultant recession has persisted, findings would be grimmer now than they were during the period of data collection. In addition, our survey was conducted with a nonprobability sample recruited through contact with cooperating nonprofit service providers, and survey findings are therefore not necessarily generalizable to all or any subset of Pennsylvanians.

We were also severely constrained by our limited access to utilities, which we noted as a finding. The lack of access to these data hinder our—and others'—ability to ascertain demographic and other correlates of utility insecurity and hinders efforts to better address pressing needs. In addition, we were reliant on utility companies' determinations of "confirmed low-income" which, as we noted earlier, may have reliability or validity issues.

Policy Implications and Recommendations

For the time being, federal and state governments can provide immediate relief through moratoria on utility shutoffs through the end of the COVID-19 pandemic, which should be paired with aggressive outreach to enroll potentially eligible clients into utility assistance programs. With COVID-19 surges leading to stalled recoveries, unemployment and underemployment will remain high as wages remain low, putting low-income households into greater debt to their utility companies as well as their landlords and mortgage holders that are temporarily unable to take action. Federal and state aid should help to ease the growing burdens on affected households. The CARES Act, passed in March 2020, provided \$34.9 million in additional LIHEAP funding to Pennsylvania, but that is a small fraction of the actual need; through October, Pennsylvania utility arrears exceeded \$700 million (Graff & Carley, 2020; Romm, 2020).

This situation calls for additional federal stimulus. Beyond LIHEAP—or other such narrowly targeted programs—financial assistance in the form of renewals in one-time stimulus checks, enhanced and extended unemployment benefits, and the Paycheck Protection Program—or new spending in flexible homelessness prevention services that can cover utility arrears—would help low-income Pennsylvania households weather the current COVID-19 crisis. Broad financial and flexible assistance—like unemployment benefits and stimulus checks—are especially helpful as households facing utility insecurity are often subject to other financial challenges like food and healthcare insecurity and difficulty paying rent.

The Commonwealth will, at some point, emerge from the COVID-19 crisis, and it is important that federal and state policymakers act with an eye toward minimizing utility insecurity in the long-term. For one, Congress should provide additional resources to the \$650 million Department of Energy's Weatherization Assistance Program (WAP). This will help low-income households increase their energy efficiency and, resultantly, reduce their utility bills and use of dangerous nontraditional energy and heating sources like space heaters. The WAP has direct energy savings of \$1.40 for every dollar spent on the program and when other costs—like healthcare and lost wages—are included, program savings jump to \$4.1 for every dollar spent (*About the Weatherization Assistance Program | Department of Energy*, n.d.). Utility insecure households, like low-income households generally, are more likely to rent than own their homes and, therefore, targeting landlords should be a priority of weatherization programs (Hernandez and Bird (2016)). However, it is important that these already vulnerable tenants not see increases in their rent to cover the capital costs of any renovations.

In addition, utility companies can reduce arrearage and shutoff rates by capping payments at a certain percentage of household income. That Black and Latinx households can pay an average of 7-10% of their income toward utilities when the federal government considers any housing spending in excess of 30% of income to be “rent burdening” means that gaps in utility, housing, and income insecurity will widen over time. Utility companies can also promote level billing to reduce spikes during extreme weather. Moreover, they can promote and institute fresh start, debt forgiveness, and flexible deferred payment programs that reduce or eliminate late fees (Hernandez & Bird, 2010). Safe and sanitary housing being among the most basic of human

needs, federal, state, and local governments should play active roles in working with utility providers to increase the availability of these programs and promoting them to low-income households. Local studies—like this one—are critical to understanding the geographic regions and demographic groups with the greatest need and should be pursued wherever possible to improve policy and programming targeting and efficiency.

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Appendix A. Utility Provider Data

Table A1. 2017 Residential Terminations and Reconnections by Energy Provider

	Residential Customers	Terminations	Reconnections	Termination Rate	Ratio Reconnections/Terminations
Electricity Providers					
Duquesne	532,204	21,575	15,622	4.1%	72.4%
Met-Ed	499,192	23,870	19,607	4.8%	82.1%
PECO-Electric	1,463,266	89,257	74,228	6.1%	83.2%
Penelec	501,533	21,096	15,957	4.2%	75.6%
Penn Power	144,286	4,360	3,415	3.0%	78.3%
PPL	1,223,076	42,216	31,280	3.5%	74.1%
West Penn	624,914	14,234	10,812	2.3%	76.0%
Total	4,988,471	216,608	170,921	4.3%	78.9%
Gas Providers					
Columbia	393,410	10,728	5,878	2.7%	54.8%
NFG	196,950	5,490	4,578	2.8%	83.4%
PECO-Gas	480,586	19,813	17,061	4.1%	86.1%
Peoples	333,761	9,744	5,884	2.9%	60.4%
Peoples-Equitable	247,930	7,757	5,171	3.1%	66.7%
PGW	474,960	27,443	18,324	5.8%	66.8%
UGI-Gas	352,720	8,580	4,816	2.4%	56.1%
UGI Penn Natural	154,319	4,840	2,799	3.1%	57.8%
Total	2,634,636	94,395	64,511	3.6%	68.3%

Table A2. 2017 Low-Income Residential Terminations and Reconnections by Energy Provider

	Confirmed Low-Income Customers	Terminations	Reconnections	Termination Rate	Ratio Reconnections/Terminations
Electricity Providers					
Duquesne	48,500	4,301	3,233	8.9%	75.2%
Met-Ed	69,787	12,769	9,461	18.3%	74.1%
PECO-Electric	155,803	21,950	19,077	14.1%	87.0%
Penelec	88,036	12,910	8,898	14.7%	68.9%
Penn Power	19,695	2,484	1,660	12.6%	66.8%
PPL	181,782	30,717	21,207	16.9%	69.0%
West Penn	68,644	7,860	5,098	11.5%	64.9%
Total	632,247	92,991	68,634	14.7%	73.8%
Gas Providers					
Columbia	67,959	6,425	3,123	9.5%	48.6%
NFG	25,612	3,835	2,137	15.0%	55.7%
PECO-Gas	27,784	4,917	4,022	17.7%	81.8%
Peoples	60,077	2,535	1,528	4.2%	60.3%
Peoples-Equitable	44,627	1,397	929	3.1%	66.5%
PGW	146,488	19,887	14,702	13.6%	74.0%
UGI-Gas	33,508	5,649	2,511	16.9%	44.5%
UGI Penn Natural	21,973	3,357	1,566	15.3%	46.6%
Total	428,028	48,002	30,518	11.2%	63.6%

Appendix B. American Housing Survey Data

Table B1. Demographic and Household Characteristics

	Non-Latinx Black			Non-Latinx White			Latinx			Total		
	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019
Count	475.0	519.4	535.1	1,450.0	1,479.2	1,499.7	155.0	154.1	167.5	2,216.1	2,308.4	2,343.1
Education												
High school graduate or higher	86.4	87.2	86.3	94.4	95.2	95.1	68.8	64.8	73.6	90.8	91.3	91.6
Bachelor's degree or higher	22.9	21.5	22.3	45.1	49.0	51.3	20.2	19.0	27.3	39.4	41.8	43.5
Household Income												
Less than \$10,000	19.9	21.1	17.1	5.4	6.2	5.1	15.1	13.4	ID	9.0	10.3	8.4
\$10,000-\$19,999	14.5	14.3	ID	8.0	5.6	5.8	ID	ID	ID	9.9	7.8	6.1
\$20,000-\$39,999	25.6	18.2	ID	14.1	12.8	10.5	ID	ID	ID	16.5	14.4	13.1
\$40,000-\$59,999	14.3	14.0	19.1	13.5	13.0	11.6	17.4	ID	ID	13.9	13.6	13.3
\$60,000-\$99,999	13.8	15.1	19.1	26.3	23.2	23.0	20.9	20.1	ID	23.4	21.4	22.5
\$100,000 or more	11.9	17.3	18.8	32.7	39.2	43.9	ID	ID	ID	27.4	32.6	36.6
Housing tenure												
Renter	49.5	48.8	48.6	23.7	22.5	21.9	55.4	51.1	49.3	32.5	31.8	30.6
Homeowner	50.5	51.2	51.4	76.3	77.5	78.1	44.5	48.9	50.7	67.5	68.2	69.4
Poverty Level												
Less than 50%	12.3	18.2	14.5	4.4	4.7	4.3	14.3	10.7	ID	7.0	8.3	7.2
50-99%	15.3	9.9	8.5	4.5	4.0	4.5	12.1	17.1	10.1	7.4	6.2	5.9
100-149%	11.2	13.3	6.1	6.0	5.3	3.5	12.1	12.9	ID	7.4	7.4	4.2
150-199%	11.2	6.5	8.5	6.1	5.6	4.8	10.5	12.5	11.5	7.2	6.4	6.1
200% or more	50.1	52.1	62.4	79.1	80.4	82.8	51.0	46.8	61.3	71.0	71.7	76.6

Note. ID=Insufficient Data

Table B2. Median Monthly Renter Housing Costs by Race

	Non-Latinx Black			Non-Latinx White			Latinx			Total		
	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019
Count	235.3	253.6	259.9	344.2	332.9	328.1	85.9	78.7	82.6	719.8	734.2	716.7
Total Costs (\$)	854	882	999	1,100	1,243	1,348	973	958	930	933	1,068	1,166
Total as Percent of Income (%)	33	38	29	29	29	29	38	44	28	31	31	28
Rent (\$)	705	760	850	990	1,050	1,200	825	750	850	850	925	1,000
Total Utilities	125	118	139	111	134	131	133	155	139	122	129	139
Electricity (\$)	73	81	86	78	89	91	87	97	85	77	88	87
Gas (\$)	54	47	44	42	42	54	64	52	45	47	45	49
Fuel Oil (\$)	ID	ID	ID	ID	92	125	ID	ID	ID	ID	83	104
Other Fuel (\$)	250	ID	100	ID	4	ID	4	4	67	ID	4	67
Water (\$)	50	58	39	50	43	40	67	56	ID	50	50	40
Trash (\$)	23	ID	ID	20	25	27	ID	ID	ID	23	25	25
Property Insurance (\$)	17	13	16	15	17	15	13	14	ID	15	15	16

Note. ID=Insufficient Data

Table B3. Median Monthly Homeowner Housing Costs by Race

	Non-Latinx Black			Non-Latinx White			Latinx			Total		
	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019
Count	239.8	265.8	275.2	1,105.7	1,146.3	1,171.7	69	75.4	85	1,496.3	1,574.1	1,626.4
Total Costs (\$)	891	888	863	1,440	1,507	1,576	1,181	1,182	1,128	1,356	1,392	1,400
Total as Percent of Income (%)	27	23	20	21	20	19	20	20	16	21	20	19
Mortgage (\$)	749	797	730	1,073	1,113	1,121	902	864	950	1,047	1,058	1,081
Real Estate Taxes (\$)	150	ID	160	350	400	417	ID	150	250	300	350	370
Total Utilities (\$)	230	203	236	275	269	281	251	271	279	267	265	268
Electricity (\$)	87	99	94	119	127	127	106	115	130	115	121	123
Gas (\$)	67	62	66	71	64	72	69	73	69	70	65	70
Fuel Oil (\$)	125	92	83	150	100	125	108	ID	ID	133	100	113
Other Fuel (\$)	ID	ID	ID	42	21	23	58	ID	ID	42	17	ID
Water (\$)	60	58	50	58	57	50	70	60	70	58	58	50
Trash (\$)	23	33	26	27	27	26	27	27	27	27	27	26
Property Insurance (\$)	69	67	70	77	83	87	59	70	83	75	81	83
Homeowner Association Fee (\$)	42	ID	ID	75	77	102	ID	ID	ID	72	79	96

Note. ID=Insufficient Data

Table B4. Median Monthly Renter Housing Costs by Poverty Level

	Less than 50%			50-99%			100-149%			150-199%			200% or more			Total		
	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019
Count	88.1	92.5	90.9	109.4	91.7	87.1	80.0	88.6	49.3	61.4	65.2	52.5	380.9	396.2	436.9	719.8	734.2	716.7
Total Costs (\$)	785	803	791	728	779	848	939	892	1122	944	1,002	1,150	1,119	1,252	1,310	993	1,068	1,166
Total as Percent of Income (%)	ID	ID	ID	68	63	66	49	50	52	40	39	42	23	21	23	31	31	28
Rent (\$)	650	700	700	650	620	650	775	800	958	800	878	990	1,000	1,069	1,200	850	925	1,000
Total Utilities (\$)	117	107	122	118	126	125	124	116	129	125	143	126	122	142	147	122	129	139
Electricity (\$)	68	77	77	71	81	70	77	74	80	75	91	88	84	94	92	77	88	87
Gas (\$)	47	49	35	55	54	61	41	41	49	55	45	ID	46	45	53	46	45	49
Fuel Oil (\$)	ID	ID	ID	ID	ID	ID	ID	42	150	ID	ID	ID	ID	92	125	ID	83	104
Other Fuel (\$)	ID	4	ID	ID	4	ID	250	ID	ID	ID	ID	ID	ID	ID	ID	ID	4	67
Water (\$)	50	ID	ID	40	56	ID	60	65	21	67	53	28	60	50	25	50	50	25
Trash (\$)	23	ID	ID	23	ID	ID	ID	ID	ID	27	ID	40	ID	25	37	20	25	40
Property Insurance (\$)	15	15	ID	17	13	15	16	12	ID	14	16	17	15	16	15	14	15	16

Note. ID=Insufficient Data

Table B5. Median Monthly Homeowner Housing Costs by Poverty Level

	Less than 50%			50-99%			100-149%			150-199%			200% or more			Total		
	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019	2015	2017	2019
Count	66.4	98.6	78.6	55.3	51.4	50.0	83.6	82.7	49.2	97.9	81.6	90.3	1,193.1	1,259.8	1,358.4	1,496.3	1,574.1	1,626.4
Total Costs (\$)	755	653	908	789	512	735	891	902	850	838	990	1079	1,509	1,558	1,572	1,356	1,392	1,400
Total as Percent of Income (%)	ID	ID	ID	67	63	69	53	52	47	38	41	42	19	17	17	21	20	19
Mortgage (\$)	ID	675	ID	507	534	ID	664	788	ID	556	915	748	1,096	1,126	1,114	1,047	1,056	1,081
Real Estate Taxes (\$)	ID	150	ID	ID	ID	ID	ID	250	150	ID	233	350	350	394	300	350	370	
Total Utilities (\$)	218	212	195	224	228	210	228	245	242	226	214	250	278	276	279	267	265	268
Electricity (\$)	83	98	74	98	90	72	86	100	81	91	105	95	121	129	128	115	121	123
Gas (\$)	62	62	66	62	41	63	67	73	70	64	58	68	72	66	71	70	65	70
Fuel Oil (\$)	121	108	83	125	ID	ID	125	125	ID	146	42	ID	150	100	113	133	100	113
Other Fuel (\$)	21	23	ID	ID	70	ID	ID	8	ID	ID	ID	42	ID	23	42	17	ID	
Water (\$)	50	50	40	52	67	ID	60	54	46	58	50	54	58	58	55	58	58	50
Trash (\$)	40	33	4	28	ID	ID	27	27	25	25	25	27	27	27	26	27	27	26
Property Insurance (\$)	83	67	92	71	ID	66	75	67	75	64	ID	74	75	83	83	75	81	83
Homeowner Association Fee (\$)	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	65	73	82	72	79	96

Note. ID=Insufficient Data

Appendix C. Regression Analyses of Utility Assistance and Arrears

Table C1. Regression Analysis Modeling Effects on Proportion of CAP Customers by Block Group

	β	b	SE	p-value
Intercept	43.579	-	3.525	0.000
% Non-Latinx Black	0.289	0.233	0.035	0.000
% Non-Latinx White	-0.441	-0.448	0.033	0.000
% Latinx	-0.016	-0.008	0.037	0.655
Median household income	-2.815E-05	-0.030	0.000	0.002
% Housing burdened	0.159	0.074	0.024	0.000
% Renters	-0.133	-0.109	0.014	0.000

Notes. β =unstandardized coefficient, b=standardized coefficient, SE=standard error;
N=9,733; Adjusted R²=0.431

Table C2. Regression Analysis Modeling Effects on Mean Electric Arrears

	β	b	SE	p-value
Intercept	1,024.649	-	256.658	0.000
% Non-Latinx Black	27.307	0.337	2.522	0.000
% Non-Latinx White	-13.522	-0.211	2.390	0.000
% Latinx	1.254	0.009	2.667	0.638
Median household income	0.003	0.045	0.001	0.000
% Housing burdened	13.249	0.095	1.715	0.000
% Renters	-4.560	-0.057	1.018	0.000

Notes. β =unstandardized coefficient, b=standardized coefficient, SE=standard error;
N=9,733; Adjusted R²=0.291

Table C3. Regression Analysis Modeling Effects on Mean Dual Energy and Gas Arrears

	β	b	SE	p-value
Intercept	245.116		240.053	0.307
% Non-Latinx Black	4.526	0.069	2.359	0.055
% Non-Latinx White	-7.597	-0.146	2.235	0.001
% Latinx	-8.479	-0.076	2.494	0.001
Median household income	0.006	0.117	0.001	0.000
% Housing burdened	11.781	0.104	1.604	0.000
% Renters	0.150	0.002	0.952	0.875

Notes. β =unstandardized coefficient, b=standardized coefficient, SE=standard error;
N=9,733; Adjusted R²=0.054

Table C4. Regression Analysis Modeling Effects on Proportion of CRP Customers by Zip Code

	β	<i>b</i>	SE	<i>p</i> -value
Intercept	-4.476	-	10.192	0.663
% Non-Latinx Black	0.262	0.979	0.079	0.002
% Non-Latinx White	0.138	0.468	0.092	0.141
% Latinx	0.377	0.587	0.084	0.000
Median household income	0.000	-0.424	0.000	0.000
% Housing burdened	-0.032	-0.023	0.136	0.814
% Renters	0.087	0.141	0.042	0.045

Notes. β =unstandardized coefficient, *b*=standardized coefficient, SE=standard error;

N=56; Adjusted R^2 =0.869

Table C5. Regression Analysis Modeling Effects on Proportion of TAP Customers by Zip Code

	β	<i>b</i>	SE	<i>p</i> -value
Intercept	3.260	-	1.992	0.109
% Non-Latinx Black	0.040	0.650	0.015	0.014
% Non-Latinx White	0.001	0.012	0.018	0.965
% Latinx	0.050	0.332	0.016	0.004
Median household income	-3.455e-5	-0.404	0.000	0.000
% Housing burdened	-0.028	-0.089	0.026	0.291
% Renters	-0.002	-0.014	0.008	0.802

Notes. β =unstandardized coefficient, *b*=standardized coefficient, SE=standard error;

N=56; Adjusted R^2 =0.904

Appendix D. Utility Insecurity Survey

In which county do you live?

What is your Zip Code?

What is your current living situation?

- Rent my own housing
- Own my own housing
- Staying with family or friends
- Hotel or motel
- Transitional housing
- Institution, such as a medical or detention facility
- No fixed address, such as a car, park, abandoned building, homeless shelter, or hotel/motel paid for with an emergency shelter voucher
- Other (Please describe)

How many adults live in your household, including yourself?

How many children live in your household?

What is your total monthly rent or mortgage payment?

- Less than \$500
- \$500-\$749
- \$750-\$999
- \$1,000-\$1,249
- \$1,250-\$1,499
- \$1,500-\$1,749
- \$1,750-\$2,000
- More than \$2,000

In addition to your rent or mortgage, are you responsible for paying any of the following utilities? Select all that apply

- Gas
- Water
- Electricity
- Wastewater
- Deliverable fuel (like oil, propane, wood, or coal)
- I don't pay for any of these utilities

How much was your gas bill last month?

- Less than \$25
- \$25-\$49
- \$50-\$74

- \$75-\$99
- \$100-\$149
- \$150-\$200
- More than \$200

How much was your water bill last month?

- Less than \$25
- \$25-\$49
- \$50-\$74
- \$75-\$99
- \$100-\$149
- \$150-\$200
- More than \$200

How much was your electricity bill last month?

- Less than \$25
- \$25-\$49
- \$50-\$74
- \$75-\$99
- \$100-\$149
- \$150-\$200
- More than \$200

How much was your wastewater bill last month?

- Less than \$25
- \$25-\$49
- \$50-\$74
- \$75-\$99
- \$100-\$149
- \$150-\$200
- More than \$200

How much was your bill for deliverable fuel (like oil, propane, wood, or coal) last month?

- Less than \$25
- \$25-\$49
- \$50-\$74
- \$75-\$99
- \$100-\$149
- \$150-\$200
- More than \$200

What are your household's current source(s) of income? Select all that apply

- One or more jobs
- Child support
- Unemployment insurance

- Supplemental Security Income or Social Security Disability Insurance (SSI/SSD)
- Investments
- Social Security retirement benefits or other retirement income
- Other (Please describe)
- No source of income

What is your household's current total monthly income from all sources before taxes?

- Less than \$500
- \$500-\$999
- \$1,000-\$1,499
- \$1,500-\$1,999
- \$2,000-\$2,499
- \$2,500-\$2,999
- \$3,000-\$3,499
- \$3,500-\$3,999
- \$4,000-\$4,499
- \$4,500-\$4,999
- \$5,000-\$5,499
- \$5,500-\$5,999
- \$6,000 or more

Did anyone in your household lose income as a result of the COVID-19 pandemic?

- Yes
- No

Prior to the COVID-19 pandemic, what was your household's total monthly income from all sources before taxes?

- Less than \$500
- \$500-\$999
- \$1,000-\$1,499
- \$1,500-\$1,999
- \$2,000-\$2,499
- \$2,500-\$2,999
- \$3,000-\$3,499
- \$3,500-\$3,999
- \$4,000-\$4,499
- \$4,500-\$4,999
- \$5,000-\$5,499
- \$5,500-\$5,999
- \$6,000 or more

Which, if any, of the following have occurred to adults in your household as a result of the COVID-19 pandemic? Select all that apply

- Now working remotely (when previously worked on-site)

- Continuing to work on-site (outside of the home)
- Job loss
- Reduced work hours
- Had to seek additional work
- Loss of health insurance
- Had to purchase protective gear (like mask, gloves, or face shield)
- Had to purchase new technology (like a computer, tablet, or phone)
- Increase in gas bill
- Increase in water bill
- Increase in electricity bill
- Other COVID-19 impacts (Please describe)
- None of the above

Have you, or anyone you know, become sick as a result of COVID-19? Select all that apply

- You or a member of your household
- Someone else you know
- I don't know anyone who has become sick as a result of COVID-19

Have you, or has anyone you know, been hospitalized as a result of COVID-19? Select all that apply

- You or a member of your household
- Someone else you know
- I don't know anyone who has been hospitalized as a result of COVID-19

Has anyone you know passed away as a result of COVID-19? Select all that apply

- A member of your household
- Someone else you know
- No one I know has passed away as a result of COVID-19

Which of the following factors, if any, have caused your household concern during the COVID-19 pandemic? Select all that apply

- Household member(s) getting COVID-19
- Paying rent or mortgage
- Paying utility bills
- Paying off debts (like car payments or credit card bills)
- Job loss
- Reduced work hours
- Providing enough food for the household
- Child care, education, and/or remote learning
- Medical issues related to COVID-19
- Medical issues other than COVID-19

- Mental health issues (like depression or anxiety)
- Transportation
- Household changes (like someone moved in or someone moved out)
- None of the above

Of the concerns you selected on the previous item, which one has caused your household the MOST concern during the COVID-19 pandemic? Select one

- Household member(s) getting COVID-19
- Paying rent or mortgage
- Paying utilities (like gas, water, or electricity bills)
- Job loss
- Reduced work hours
- Providing enough food for the household
- Child care, education, and/or remote learning
- Medical issues related to COVID-19
- Medical issues other than COVID-19
- Mental health issues (like depression or anxiety)
- Transportation
- Household changes (like someone moved in or someone moved out)
- None of the above

Since March, has your household faced eviction or been forced to move from your apartment or home?

- Yes
- No

Did you receive a court order for this eviction?

- Yes
- No

What prompted you to be evicted or feel forced to move? Select all that apply

- Couldn't pay rent or mortgage
- Issues with the condition of the housing
- Intimidation from the landlord
- Issues with my housing subsidy
- Personal disputes with members of my household or neighbors
- Other (Please describe)

Since March, how many months have you been behind on your rent or mortgage payment?

Since March, how many months have you been behind on your utility payments, including gas, water, and electricity?

How often do you delay payment for some necessary expenses in order to pay for others (like not buying medications in order to afford a utility bill, like gas, water, or electricity)?

- Rarely or never
- About half the time
- Most or all of the time

How often do you delay payment on utility bills, like gas, water, or electricity, in order to pay for other necessary expenses?

- Rarely or never
- About half the time
- Most or all of the time

Some evictions and foreclosures have been postponed due to the COVID-19 pandemic. How concerned are you that, when evictions and foreclosures resume, you will face eviction or foreclosure?

- Not at all
- A little
- A moderate amount
- A lot
- A great deal

Utility shutoffs have been postponed due to the COVID-19 pandemic. How concerned are you that, when utility shutoffs resume, one of your utilities, like gas, water, or electricity, will be turned off?

- Not at all
- A little
- A moderate amount
- A lot
- A great deal

Right now, people are being advised to stay at home to prevent the spread of COVID-19. Do you feel that your home is a safe and healthy place to spend a lot of time in right now?

- Yes
- No

Since the beginning of the COVID-19 pandemic, have you received assistance for any of the following? Select all that apply

- Rental support
- Loan forbearance (for a mortgage or car loan)
- Utility shutoff prevention (for gas, water, or electricity)
- Food assistance
- Other (Please describe)
- I haven't received any assistance

Have you used or heard about any of the following utility assistance programs, including for gas, water, and electricity, available in Pennsylvania? Response options include: (1) Used it, (2) Heard about it, but never used it, and (3) Never heard about it

Budget Billing

Customer Assistance Program (CAP) (also known as CRP for PGW, LIRA for NFG, OnTrack for PPL, and PCAP for FirstEnergy)

Customer Assistance Referral and Evaluation Program (CARES)

Hardship funds (also known as DEF, MEAF and UESF)

Low-Income Home Energy Assistance Program (LIHEAP)

Low Income Usage Reduction Program (LIURP)

Weatherization Assistance Program

Is there anything else you would like to share to help us understand the impact of the COVID-19 pandemic on people living in Pennsylvania?

What is your gender identity?

- Female
- Male
- Non-binary
- Prefer to self-describe (Please describe)

How do you identify your race? Select all that apply

- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- White or Caucasian
- Other (Please describe)

Are you Hispanic or Latina/Latino/Latinx?

- Yes
- No

What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree
- High school graduate (high school diploma or GED)
- Some college or Associate degree
- Bachelor's degree
- Graduate or professional degree

In general, would you say your health is...

- Excellent

- Very good
- Good
- Fair
- Poor

Appendix E. Utility Insecurity Survey Data

Table E1. Demographic and Household Characteristics

	Non-Latinx Black	Non-Latinx White	Latinx	Other	Total	p-value
Count	109	208	204	114	635	NA
Gender						.095
Female	53.2	53.4	65.2	51.8	56.9	
Male	45.9	46.2	34.8	48.2	42.8	
Non-binary	0.9	0.5	0	0	0.3	
Education						<.001
Less than high school	21.1	6.6	17.6	1.8	11.7	
High school graduate or higher	41.3	29.8	29.9	28.9	31.7	
Some college or Associate degree	19.3	27.4	28.4	38.6	28.3	
Bachelor's degree	16.5	31.7	22.1	26.3	25.0	
Graduate or professional degree	1.8	4.8	2.0	4.4	3.3	
Monthly pre-tax household income						<.001
\$ Less than \$500	1.8	1.9	0.5	1.8	1.4	
\$500-\$999	6.4	4.8	3.4	3.5	4.4	
\$1,000-\$1,499	10.1	8.2	41.4	1.8	6.1	
\$1,500-\$1,999	11.0	11.1	2.9	4.4	7.2	
\$2,000-\$2,499	9.2	5.3	12.3	11.4	9.3	
\$2,500-\$2,999	13.8	9.1	24.5	14.0	15.7	
\$3,000-\$3,499	15.6	7.2	8.8	15.8	10.7	
\$3,500-\$3,999	11.9	8.7	4.4	16.7	9.3	
\$4,000-\$4,499	7.3	7.7	11.8	8.8	9.1	
\$4,500-\$4,999	4.6	5.8	6.4	8.8	6.3	
\$5,000-\$5,499	4.6	8.7	8.3	7.9	7.7	
\$5,500-\$5,999	0	6.3	9.3	1.8	5.4	
\$6,000 or more	3.7	15.4	2.9	3.5	7.2	
Household income sources						
One or more jobs	90.8	92.8	86.8	72.8	86.9	<.001
Child support	13.8	10.1	11.3	14.0	11.8	.663
Unemployment insurance	18.3	19.2	13.7	27.2	18.7	.033
SSI/SSD	9.2	9.1	10.3	7.9	9.3	.916
Investments	2.8	16.8	25.0	11.4	16.1	<.001
Social security or other retirement	8.3	18.3	9.3	17.5	13.5	.010
Number of adults in household						<.001
One	14.7	8.7	4.4	16.7	9.8	
Two	50.5	40.9	68.6	38.6	51.0	
Three	13.8	21.2	16.7	19.3	18.1	
Four	16.5	18.8	5.9	17.5	14.0	
Five or more	4.6	10.6	4.4	7.9	7.1	
Number of children in household						<.001
None	31.2	20.2	42.2	15.8	28.3	
One	44.0	41.8	41.2	59.6	45.2	
Two	14.7	32.2	15.7	13.2	20.5	
Three or more	10.1	5.8	1.0	11.4	6.0	

	Non-Latinx Black	Non-Latinx White	Latinx	Other	Total	p-value
Living situation						<.001
Renter	67.0	40.9	38.7	40.4	44.6	
Homeowner	16.5	40.4	28.9	32.5	31.2	
Staying with family or friends	9.2	13.9	18.6	15.8	15.0	
Hotel or motel	0.9	0	11.8	2.6	4.4	
Transitional housing	2.8	3.4	1.0	7.9	3.3	
Institution (e.g., medical, detention)	0.9	0	1.0	0	0.5	
No fixed address	1.8	1.0	0	0	0.6	
Other	0.9	0.5	0	0.9	0.5	

Table E2. Monthly Housing Costs by Race

	Non-Latinx Black	Non-Latinx White	Latinx	Other	Total	p-value
Count	109	208	204	114	635	
Rent or mortgage payment						<.001
Less than \$500	15.6	23.1	10.3	19.3	17.0	
\$500-\$749	30.3	29.8	18.1	19.3	24.3	
\$749-\$999	22.9	20.2	22.5	20.2	21.4	
\$1,000-\$1,249	16.5	12.5	34.8	11.4	20.2	
\$1,250-\$1,499	7.3	4.8	9.3	10.5	7.7	
\$1,500-\$1,749	5.5	1.9	2.5	13.2	4.7	
\$1,750-\$2,000	0.9	1.0	2.5	0.9	1.4	
More than \$2,000	0.9	6.7	0	5.3	3.3	
Responsible for paying utilities						
Electric	94.5	88.5	90.2	89.5	90.2	.382
Gas	33.9	48.6	17.2	36.8	33.9	<.001
Deliverable fuel	19.3	34.1	26.0	21.1	26.6	.012
Water	84.4	78.8	84.8	78.9	81.7	.313
Wastewater	27.5	30.8	16.2	33.3	26.0	.001
Electric bill	103	184	184	102	573	<.001
Less than \$25	6.8	7.6	3.8	10.8	6.8	
\$25-\$49	39.8	23.9	13.0	21.6	22.9	
\$50-\$74	11.7	21.2	39.7	24.5	26.0	
\$75-\$99	13.6	15.8	27.2	22.5	20.2	
\$100-\$149	15.5	25.0	15.2	17.6	18.8	
\$150-\$200	9.7	4.9	1.1	2.0	4.0	
More than \$200	2.9	1.6	0	1.0	1.2	
Gas bill	37	101	35	42	215	.001
Less than \$25	10.8	11.9	17.1	14.3	13.0	
\$25-\$49	21.6	30.7	42.9	23.8	29.8	
\$50-\$74	16.2	28.7	38.6	35.7	27.9	
\$75-\$99	13.5	11.9	8.6	2.4	9.8	
\$100-\$149	35.1	11.9	2.9	7.1	13.5	
\$150-\$200	2.7	2.0	0	14.3	4.2	
More than \$200	0	3.0	0	2.4	1.9	

	Non-Latinx Black	Non-Latinx White	Latinx	Other	Total	p-value
Deliverable fuel bill	21	71	53	24	169	<.001
Less than \$25	23.8	18.3	22.6	4.2	18.3	
\$25-\$49	23.8	25.4	22.6	12.5	22.5	
\$50-\$74	14.3	12.7	26.4	20.8	18.3	
\$75-\$99	19.0	4.2	15.1	8.3	10.1	
\$100-\$149	4.8	9.9	11.3	54.2	16.0	
\$150-\$200	14.3	12.7	1.9	0	7.7	
More than \$200	0	16.9	0	0	7.1	
Water bill	92	164	173	90	519	<.001
Less than \$25	25.0	25.0	15.0	23.3	21.4	
\$25-\$49	34.8	40.9	35.3	25.6	35.3	
\$50-\$74	14.1	17.7	38.7	22.2	24.9	
\$75-\$99	16.3	7.9	9.2	15.6	11.2	
\$100-\$149	6.5	1.8	1.7	11.1	4.2	
\$150-\$200	1.1	5.5	0	1.1	2.1	
More than \$200	2.2	1.2	0	1.1	1.0	
Wastewater bill	30	64	33	38	165	<.001
Less than \$25	23.3	31.3	48.5	23.7	31.5	
\$25-\$49	13.3	29.7	30.3	28.9	26.7	
\$50-\$74	33.3	23.4	12.1	7.9	19.4	
\$75-\$99	23.3	4.7	6.1	36.8	15.8	
\$100-\$149	6.7	10.9	3.0	0	6.1	
\$150-\$200	0	0	0	2.6	0.6	

Table E3. Housing and Utility Insecurity by Race

	Non-Latinx Black	Non-Latinx White	Latinx	Other	Total	p-value
Count	109	208	204	114	635	
Housing insecurity post-COVID						
Eviction/forced move	30.3	13.0	14.7	14.9	16.9	.001
If yes, court ordered	60.6	29.6	33.3	23.5	39.3	.023
If yes, reason						
Couldn't pay rent/mortgage	63.6	70.4	73.3	52.9	66.4	.507
Issues with housing condition	24.2	40.7	43.3	11.8	31.8	.077
Intimidation by landlord	0	29.6	16.7	5.9	13.1	.006
Issues with housing subsidy	21.2	37.0	43.3	11.8	29.9	.069
Personal dispute	6.1	44.4	30.0	35.3	27.1	.007
Behind on rent/mortgage payment	73.4	45.7	77.9	72.8	65.7	<.001
If yes, average number of months	1.95	2.21	2.10	1.99	2.07	.396
Behind on utility payment	68.8	50.5	73.5	55.3	61.9	<.001
If yes, average number of months	1.76	1.97	2.16	2.19	2.04	.101
Behind on utility payments only	5.5	8.2	2.0	1.8	4.6	.009
Concern over future eviction						<.001
Not at all	12.8	28.8	36.8	14.9	26.1	
A little	23.9	27.4	25.5	29.8	26.6	
A moderate amount	39.4	35.6	31.9	33.3	34.6	
A lot	15.6	6.3	4.4	13.2	8.5	
A great deal	8.3	1.9	1.5	8.8	4.1	

	Non-Latinx Black	Non-Latinx White	Latinx	Other	Total	p-value
Concern over future utility shut-off						<.001
Not at all	8.3	23.6	33.3	17.5	23.0	
A little	26.6	24.5	17.2	36.0	24.6	
A moderate amount	38.5	36.1	36.3	8.8	31.7	
A lot	15.6	14.4	11.3	30.7	16.5	
A great deal	11.0	1.4	2.0	7.0	4.3	
Feel home is safe and healthy	79.8	86.5	92.2	55.3	81.6	<.001
Delayed payments						
On necessary expenses to pay others						<.001
Rarely or never	36.7	58.2	66.2	41.2	54.0	
About half the time	58.7	39.4	29.9	50.0	41.6	
Most of all of the time	4.6	2.4	3.9	8.8	4.4	
On utility bills						.076
Rarely or never	15.9	18.4	18.8	9.0	15.8	
About half the time	63.8	73.6	75.4	77.6	72.6	
Most of all of the time	20.3	8.0	5.8	13.4	11.6	
Assistance						
Rental support	27.5	22.6	50.0	22.8	32.3	<.001
Loan forbearance	25.7	30.8	51.0	46.5	39.2	<.001
Utility shutoff prevention	36.7	32.7	33.3	27.2	32.6	.494
Food assistance	34.9	27.9	26.0	23.7	27.7	.260
Utility assistance						
Budget billing	35.8	39.4	28.9	28.9	33.5	.089
CAP	28.4	21.2	20.6	38.6	25.4	.001
CARES	14.7	14.9	14.7	17.5	15.3	.906
Hardship funds	17.4	15.4	15.2	16.7	15.9	.949
LIHEAP	35.8	20.2	20.6	23.7	23.6	.010
LIURP	25.7	16.3	19.6	23.7	20.3	.185
Weatherization Assistance Program	22.0	19.2	21.6	27.2	21.9	.432

Table E4. Concerns about COVID-19 by Race

	Non-Latinx Black	Non-Latinx White	Latinx	Other	Total	p-value
Count						
COVID-19 health impacts						
Illness						
Self or member of household	22.0	8.7	8.8	23.7	13.7	<.001
Someone else I know	40.4	52.9	62.7	54.4	54.2	.002
Hospitalization						
Self or member of household	6.4	8.2	6.4	17.5	9.0	.005
Someone else I know	38.5	46.2	56.9	65.8	51.8	<.001
Death						
Member of household	3.7	4.8	4.4	8.8	5.2	.285
Someone else I know	25.7	29.8	48.0	55.3	39.5	<.001

	Non-Latinx Black	Non-Latinx White	Latinx	Other	Total	p-value
Impacts on adults in household						
Now working remotely	43.1	44.7	28.4	40.4	38.4	.004
Continuing to work on-site	26.6	43.3	38.7	10.5	33.1	<.001
Job loss	49.5	29.3	27.9	55.3	37.0	<.001
Reduced work hours	47.7	48.1	41.2	36.8	43.8	.169
Had to seek additional work	24.8	22.1	21.6	30.7	23.9	.271
Loss of health insurance	17.4	17.8	20.6	26.3	20.2	.268
Had to purchase protective gear	52.3	47.6	31.4	39.5	41.7	.001
Had to purchase new technology	11.9	18.8	17.6	19.3	17.3	.417
Increase in electricity bill	45.9	39.9	24.5	41.2	36.2	<.001
Increase in gas bill	38.5	28.8	16.7	24.6	25.8	<.001
Increase in water bill	32.1	33.7	21.1	28.1	28.3	.030
General household concerns						
Household member(s) getting COVID-19	22.9	31.7	25.0	24.6	26.8	.257
Paying rent or mortgage	49.5	43.3	57.8	45.6	49.4	.022
Paying utility bills	47.7	41.3	52.9	43.0	46.5	.100
Paying off debts	31.2	27.4	18.1	37.7	26.9	.001
Job loss	45.9	40.9	25.5	51.8	38.7	<.001
Reduced work hours	39.4	49.0	30.4	35.1	38.9	.001
Providing enough food for household	31.2	26.9	27.0	24.6	27.2	.731
Childcare/education/remote learning	40.4	41.3	22.5	35.1	34.0	<.001
Medical issues related to COVID-19	25.7	28.4	25.0	30.7	27.2	.689
Medical issues other than COVID-19	21.1	28.4	18.1	20.2	22.4	.078
Mental health issues	18.3	17.8	24.0	33.3	22.7	.009
Transportation	13.8	5.3	6.4	20.2	9.8	<.001
Household changes	2.8	3.8	2.5	7.9	3.9	.097
Primary household concern						<.001
Household member(s) getting COVID-19	10.5	18.0	34.3	14.0	21.3	
Paying rent or mortgage	13.3	11.2	6.9	6.1	9.2	
Paying utility bills	4.8	3.9	4.9	7.0	4.9	
Job loss	32.4	24.3	14.7	28.1	23.2	
Reduced work hours	3.8	11.2	8.3	13.2	9.4	
Providing enough food for household	3.8	1.5	5.4	1.8	3.2	
Childcare/education/remote learning	3.8	15.0	9.3	9.6	10.3	
Medical issues related to COVID-19	8.6	6.8	1.5	0.9	4.3	
Medical issues other than COVID-19	10.5	5.8	2.5	1.8	4.8	
Mental health issues	7.6	1.9	12.3	11.4	7.9	
Transportation	1.0	0.5	0	0.9	0.5	
Household changes	0	0	0	5.3	1.0	

Appendix F: COVID-19 Health Outcomes

Table F1. Pennsylvania Counties with the Largest Number of COVID-19 Cases (September 2020)

County	Population	Cases	Cases per 100,000 People
Philadelphia*	1,575,522	28,452	1,806
Montgomery*	821,301	10,768	1,311
Delaware*	563,527	9,848	1,748
Allegheny*	1,225,561	9,681	790
Bucks	626,370	7,020	1,121
Lancaster	538,347	6,389	1,187
Berks*	416,642	5,711	1,371
Chester*	517,156	5,248	1,015
Lehigh*	362,613	5,067	1,397
Northampton	301,778	3,944	1,307

Notes. *Indicates that the county is among the top 10 Pennsylvania counties in terms of non-white population.

Table F2. Pennsylvania Counties with the Largest Number of COVID-19 cases (December 2020)

County	Population	Cases	Cases per 100,000 People
Philadelphia*	1,575,522	75,542	4,795
Allegheny*	1,225,561	40,124	3,273
Montgomery*	821,301	28,468	3,466
Delaware*	563,527	24,420	4,333
Bucks	626,370	24,067	3,842
Lancaster	538,347	22,075	4,101
Berks*	416,642	18,056	4,333
York	444,014	17,077	3,846
Chester*	517,156	15,850	3,064
Lehigh*	362,613	15,288	4,216

Notes. *Indicates that the county is among the top 10 Pennsylvania counties in terms of non-white population

Table F3. Pennsylvania Counties with the Highest Rate of COVID-19 cases per 100,000 People (December 2020)

County	Population	Cases per 100,000 people
Mifflin	46,362	5,966
Cambria	134,550	5,224
Lebanon	138,674	4,998
Blair	123,842	4,934
Huntingdon	45,421	4,921
Bedford	48,611	4,878
Union	45,114	4,832
Philadelphia*	1,575,522	4,795
Centre	161,443	4,762
Franklin	153,751	4,346

Notes. *Indicates that the county is among the top 10 Pennsylvania counties in terms of non-white population

Table F4. Regression Analysis of COVID-19 Cases per 100,000 People and Share of Non-White Residents in Pennsylvania (September 2020)

	β	p-value
Intercept	224.25	0.00
% Non-White	2581.58	0.000*

Notes. β =unstandardized coefficient; N=67; Adjusted $R^2=0.5988$

Table F5. Regression Analysis of COVID-19 Cases per 100,000 People and Share of Non-White Residents, Disaggregated, in Pennsylvania (September 2020)

	β	p-value
Intercept	175.18	0.37
% Black or African American	595.62	0.300
% American Indian	-24,215.46	0.360
% Asian or Asian American	9,084.63	0.000*
% Hispanic	5,060.03	0.003*
% Native Hawaiian or Pacific Islander	93,172.48	0.264
% Other Race	-340.05	0.937
% Multi Racial	2,002.16	0.724

Notes. β =unstandardized coefficient; N=67; Adjusted $R^2=0.6903$

Table F6. Regression Analysis of COVID-19 Cases per 100,000 People and Share of Non-White Residents in Pennsylvania (December 2020)

	β	p-value
Intercept	3381.86	0.000
% Non-White	1284.34	0.154

Notes. β =unstandardized coefficient; N=67; Adjusted $R^2=0.0161$

Table F7. Regression Analysis of COVID-19 Cases per 100,000 People and Share of Non-White Residents, Disaggregated, in Pennsylvania (December 2020)

	β	p-value
Intercept	3,191.75	0.000
% Black or African American	-2,025.98	0.363
% American Indian	-47,611.62	0.642
% Asian or Asian American	10,067.39	0.206
% Hispanic	-9,878.568	0.118
% Native Hawaiian or Pacific Islander	67,818.88	0.833
% Other Race	37,809.09	0.026*
% Multi Racial	20,697.48	0.348

Notes. β =unstandardized coefficient, N=67; Adjusted R^2 =0.6903

Table F8. Pennsylvania Counties with the Largest Number of COVID-19 Deaths (September 2020)

County	Population	Deaths	Deaths per 100,000 People
Philadelphia*	1,575,522	1,759	112
Montgomery*	821,301	862	105
Delaware*	563,527	721	128
Bucks	626,370	585	93
Lancaster	538,347	428	80
Berks*	416,642	378	91
Chester*	517,156	352	68
Lehigh*	362,613	342	94
Northampton*	301,778	297	98
Allegheny*	1,225,561	296	24

Notes. *Indicates that the county is among the top 10 Pennsylvania counties in terms of non-white population

Table F9. Pennsylvania Counties with the Largest Number of COVID-19 Deaths (December 2020)

County	Population	Deaths
Philadelphia*	1,575,522	2,197
Montgomery*	821,301	1,005
Delaware*	563,527	847
Bucks	626,370	772
Allegheny*	1,225,561	681
Lancaster	538,347	597
Berks*	416,642	489
Chester*	517,156	434
Lehigh*	362,613	423
Northampton	301,778	360

Notes. *Indicates that the county is among the top 10 Pennsylvania counties in terms of non-white population

Table F10. Pennsylvania Counties with Highest Rates of COVID-19 Deaths per 100,000 People (December 2020)

County	Population	Deaths	Deaths per 100,000 people
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Northumberland	92,325	165	178.72
Mifflin	46,362	73	157.46
Delaware*	563,527	847	150.30
Huntingdon	45,421	68	149.71
Schuylkill	143,555	204	142.11
Philadelphia*	1,575,522	2,197	139.45
Bedford	48,611	65	133.71
Bucks	626,370	772	123.25
Montgomery*	821,301	1,005	122.37
Northampton	301,778	360	119.29

Notes. *Indicates that the county is among the top 10 Pennsylvania counties in terms of non-white population

Table F11. Regression Analysis of COVID-19 Deaths per 100,000 People and Share of Non-White Residents in Pennsylvania (September 2020)

	β	p-value
Intercept	5.21	0.240
% Non-White	181.37	0.000*

Notes. β =unstandardized coefficient; N=67; Adjusted R²= 0.4710

Table F12. Regression Analysis of COVID-19 Deaths per 100,000 People and Share of Non-White Residents, Disaggregated, in Pennsylvania (September 2020)

	β	p-value
Intercept	4.87	0.496
% Black or African American	31.28	0.529
% American Indian	-2671.46	0.245
% Asian or Asian American	824.54	0.000*
% Hispanic	595.09	0.000*
% Native Hawaiian or Pacific Islander	2214.37	0.758
% Other Race	-711.31	0.059
% Multi-Racial	-153.25	0.755

Notes. β =unstandardized coefficient; N=67; Adjusted R²= 0.6262

Table F13. Regression Analysis of County-Level COVID-19 Deaths per 100,000 People and Share of Non-White Residents in Pennsylvania (December 2020)

	β	p-value
Intercept	65.38	0.000
% Non-White	98.65	0.008*

Notes. β =unstandardized coefficient; N=67; Adjusted R²= 0.0888

Table F14. Regression Analysis of County-Level COVID-19 Deaths per 100,000 People and Share of Non-White Residents, Disaggregated, in Pennsylvania (December 2020)

	β	p-value
Intercept	70.78	0.000
% Black or African American	1.90	0.983
% American Indian	-4,621.22	0.275
% Asian or Asian American	483.02	0.142
% Hispanic	358.56	0.167
% Native Hawaiian or Pacific Islander	-3,788.96	0.775
% Other Race	-227.82	0.739
% Multi Racial	-191.66	0.832

Notes. β =unstandardized coefficient; N=67; Adjusted $R^2=0.0809$

Table F15. Regression Analysis of COVID-19 Cases by Zip Code and Share of Non-white Residents in Pennsylvania (September 2020)

	β	p-value
Intercept	11.16	0.015
% Non-White	9.16	0.000*

Notes. β =unstandardized coefficient; N=67

Table F16. Regression Analysis of COVID-19 Cases by Zip Code and Share of Non-White Residents in Pennsylvania (September 2020)

	β	p-value	β
Intercept	3.26	0.508	
% Black	7.31	0.000*	
% Asian-American	20.78	0.000*	
% Another Race	13.48	0.000*	
% Multi-Racial	6.19	0.000*	

Notes. β =unstandardized coefficient; N=1,415; Adjusted $R^2=0.4716$

Table F17. Top 10 Philadelphia Zip Codes with the Largest Number of COVID-19 Cases (November 2020)

Zip Code	Population	Cases
19124	68,965	2,718
19120	74,971	2,716
19111	68,263	2,564
19140	51,667	2,194
19143*	65,247	2,112
19134	61,509	2,024
19149	59,633	1,955
19148	52,594	1,929
19145	46,623	1,837
19136	34,470	1,749

Notes. *Indicates that the Zip Code is among the top 10 Philadelphia Zip Codes in terms of non-white population

Table F18. Philadelphia Zip Codes with the Largest Number of COVID-19 Cases (December 2020)

Zip Code	Population	Cases
19124	68,965	3,916
19120	74,971	3,915
19111	68,263	3,774
19140	51,667	2,985
19134	61,509	2,887
19143*	65,247	2,856
19149	59,633	2,793
19148	52,594	2,659
19145	46,623	2,584
19136	34,470	2,483

Notes. *Indicates that the Zip Code is among the top 10 Philadelphia Zip Codes in terms of non-white population

Table F19. Philadelphia Zip Codes with the Highest Rates of COVID-19 Cases per 100,000 People (November 2020)

Zip Code	Population	Cases per 100,000 people
19126*	15,863	5,163
19136	34,470	5,074
19121	30,733	4,611
19122	22,187	4,606
19115	34,479	4,353
19133	27,419	4,282
19140*	51,667	4,246
19152	37,067	4,082
19142*	28,144	4,075
19123	15,681	4,043

Notes. *Indicates that the Zip Code is among the top 10 Philadelphia Zip Codes in terms of non-white population

Table F20. Philadelphia Zip Codes with the Highest Rates of COVID-19 Cases (December 2020)

Zip Code	Population	Cases per 100,000 people
19136	34,470	7,203
19126*	15,863	6,984
19122	22,187	6,593
19115	34,479	6,525
19121	30,733	5,983
19152	37,067	5,951
19116	34,912	5,920
19154	34,253	5,786
19140*	51,667	5,777
19124	68,965	5,678

Notes. *Indicates that the Zip Code is among the top 10 Philadelphia Zip Codes in terms of non-white population

Table F21. Regression Analysis of COVID-19 Deaths per 100,000 People and Share of Non-White Residents by Philadelphia Zip Code (November 2020)

	β	p-value
Intercept	2,576.71	0.000
% Non-White	1,416.37	0.000*

Notes. β =unstandardized coefficient; N=46; Adjusted R²= 0.2596

Table F22. Regression Analysis of COVID-19 Cases per 100,000 People and Share of Non-White Residents, Disaggregated, by Philadelphia Zip Code (November 2020)

	β	p-value
Intercept	2,536.15	0.000
% Black or African American	1,256.20	0.001*
% American Indian	-26,758.28	0.682
% Asian or Asian American	2,804.99	0.138
% Hispanic	1,456.28	0.110
% Native Hawaiian or Pacific Islander	208,428.4	0.252
% Other Race	7,655.74	0.783
% Multi Racial	-3,128.32	0.742

Notes. β =unstandardized coefficient; N=46; Adjusted R²=0.2191

Table F23. Regression Analysis of COVID-19 Cases per 100,000 People and Share of Non-White Residents by Philadelphia Zip Code (December 2020)

	β	p-value
Intercept	4157.27	0.000
% Non-White	1214.55	0.022*

Notes. β = unstandardized coefficient, N=46, Adjusted R²=0.0935

Table F24. Regression Analysis of COVID-19 Cases per 100,000 people and Share of Non-White Residents, Disaggregated, by Philadelphia Zip Code (December 2020)

	β	p-value
Intercept	4,280.64	0.000
% Black or African American	1,159.04	0.049*
% American Indian	-70,097.89	0.526
% Asian or Asian American	3,190.38	0.311
% Hispanic	2,299.94	0.084
% Native Hawaiian or Pacific Islander	197,276.5	0.482
% Other Race	41,336.46	0.434
% Multi-Racial	-16,550.52	0.264

Notes. β = unstandardized coefficient, N=46, Adjusted R²=0.0813

Table F25. Philadelphia Zip Codes with the Largest Number of COVID-19 Deaths (November 2020)

Zip Code	Population	Deaths
19115	34,479	122
19131*	44,972	102
19144	42,556	100
19126*	15,863	96
19116	34,912	89
19111	68,263	79
19104	54,311	79
19152	37,067	78
19119	29,391	77
19136	34,470	76

Notes. *Indicates that the Zip Code is among the top 10 Philadelphia Zip Codes in terms of non-white population

Table F26. Philadelphia Zip Codes with the Largest Number of COVID-19 Deaths (December 2020)

Zip Code	Population	Deaths
19115	34,479	134
19144	42,556	108
19131*	44,972	107
19126	15,863	100
19116	34,912	95
19111	68,263	89
19104	54,311	86
19119	29,391	85
19152	37,067	82
19136	34,470	81

Notes. *Indicates that the Zip Code is among the top 10 Philadelphia Zip Codes in terms of non-white population

Table F27. Philadelphia Zip Codes with the Highest Rate of COVID-19 Deaths (November 2020)

Zip Code	Population	Deaths per 100,000 people
19126*	15,863	605.18
19115	34,479	353.84
19123	15,681	318.86
19119	29,391	261.98
19116	34,912	254.93
19144	42,556	234.98
19131*	44,972	226.81
19136	34,470	220.48
19118	10,919	219.80
19152	37,067	210.43

Notes. *Indicates that the Zip Code is among the top 10 Philadelphia Zip Codes in terms of non-white population

Table F28. Philadelphia Zip Codes with the Highest Rate of COVID-19 Deaths (December 2020)

Zip Code	Population	Deaths	Deaths per 100,000 people
19126*	15,863	100	630.40
19115	34,479	134	388.64
19123	15,681	50	318.86
19119	29,391	85	289.20
19116	34,912	95	272.11
19144	42,556	108	253.78
19131*	44,972	107	237.93
19136	34,470	81	234.99
19152	37,067	82	221.22
19118	10,919	24	219.80

Notes. *Indicates that the Zip Code is among the top 10 Philadelphia Zip Codes in terms of non-white population

Table F29. Regression Analysis of COVID-19 Deaths per 100,000 People and Share of Non-White Residents by Philadelphia Zip Code (November 2020)

	β	p-value
Intercept	78.89	0.170
% Non-White	78.79	0.126

Notes. β =unstandardized coefficient; N=46; Adjusted R^2 = 0.0206

Table F30. Regression Analysis of COVID-19 Deaths per 100,000 People and Share of Non-White Residents, Disaggregated, by Philadelphia Zip Code (November 2020)

	β	p-value
Intercept	-12.70	0.821
% Black or African American	81.07	0.135
% American Indian or Alaska Native	3,593.08	0.714
% Asian or Asian American	16.98	0.952
% Hispanic	-214.19	0.117
% Native Hawaiian or Pacific Islander	15,137.44	0.577
% Other Race	3,393.78	0.417
% Multi Racial	3,920.95	0.009*

Notes. β =unstandardized coefficient; N=46; Adjusted R^2 = 0.1256

Table F31. Regression Analysis of COVID-19 Deaths per 100,000 People and Share of Non-White Residents by Philadelphia Zip Code (December 2020)

	β	p-value
Intercept	88.45	0.029
% Non-White	79.68	0.183

Notes. β =unstandardized coefficient; N=46; Adjusted R^2 = 0.0181

Table F32. Regression Analysis of COVID-19 Deaths per 100,000 people and Share of Non-White Residents, Disaggregated, by Philadelphia Zip Code (December 2020)

	β	p-value
Intercept	-32.05	0.617
% Black or African American	97.84	0.117
% American Indian or Alaska Native	4,859.33	0.682
% Asian or Asian American	49.11	0.884
% Hispanic	-19.89	0.887
% Native Hawaiian or Pacific Islander	16,131.11	0.592
% Other Race	6,008.77	0.292
% Multi-Racial	4,234.31	0.010*

Notes. β =unstandardized coefficient; N=46; Adjusted R^2 = 0.1366