# Disparities in the Impact of COVID-19 on Employment and Household Consumption

Andrea Flores[†] George-Levi Gayle[‡]

March 24, 2022

**Abstract**

This paper investigates the socio-demographic differences in household responses to the COVID-19 pandemic regarding employment and consumption. We find that the significant racial disparities documented initially in terms of employment during the pandemic can be explained, in part, by differences in household income and composition, respondents' education, and occupational sorting. Nonetheless, we document pervasive racial, income, and educational gradients when focusing on household food insecurity and individuals' reliance on social insurance programs and other government assistance during the pandemic. Overall, our results highlight that the disparities observed for household income and respondents' education tend to be the most significant and most pervasive following the onset of the COVID-19 crisis. (**JEL:** J21, J24, J63, I38)

[†]Department of Economics, Washington University in St. Louis, MSC 1208-228-308, One Brookings Drive, St. Louis, MO 63130. Email: andrea.flores@wustl.edu.

[‡]Federal Reserve Bank of St. Louis and Department of Economics, Washington University in St. Louis, MSC 1208-228-308, One Brookings Drive, St. Louis, MO 63130. Email: ggayle@wustl.edu.

# 1 Introduction

Since the onset of the COVID-19 pandemic, households have experienced significant disruptions in many aspects of their lives that could potentially have long-lasting economic and social implications. In particular, it is well documented that the pandemic has had an unequal impact on employment with respect to income, race, and education that have contributed to a widening of pre-existing disparities.[1] In this paper, we adopt a more comprehensive approach by investigating how these employment gaps relate to socio-demographic gradients in the impact of the pandemic on household consumption which, to the best of our knowledge, remains an open question. Specifically, we find significant differences across racial, income, and education groups regarding the incidence of food insecurity and the reliance on social insurance programs and other forms of government assistance during the pandemic.

To implement our approach, we rely on data obtained from the first 36 weeks of the Census Bureau's Household Pulse Survey containing information on employment, housing, food sufficiency, spending patterns, and educational changes.[2] We supplement this survey data with information on state-level COVID-19 cases and death counts and average mobility changes relative to February 2020 for each corresponding week captured in the Pulse retrieved from the COVID Tracking Project and Google's Mobility Reports, respectively. Furthermore, we use the Current Population Survey data to control for pre-pandemic trends when focusing on outcomes for which there is information available before the onset of the COVID-19 pandemic. Combining these data sources, we identify the differential impact of the pandemic across socio-demographic groups by implementing a regression-based methodology that allows us to control for differences in other individual and household characteristics and state-specific differences related to differences in the containment of the virus across states.

First, we focus on trends in employment and earnings losses experienced during the pandemic. We find significant disparities in earnings losses with respect to household income and respondents' education and race that persist even after controlling for

[1] An overview of the existing evidence on the effect of COVID-19 on employment can be found in Adams-Prassl et al. (2020), Alon et al. (2020), Angelucci et al. (2020), Montenovo et al. (2020), Mongey, Pilossoph and Weinberg (2020), and Wozniak et al. (2020).

[2] As will be discussed in further detail in Section 2, we use a mix of household-level and individual-level information provided in the survey. Therefore, when focusing on outcomes reported at the household level, the socio-demographic characteristics of interest are related to those of the respondents who completed the survey.

other household and respondents' characteristics. This finding is consistent with the socio-demographic differences in the decline in employment rates observed during the pandemic. Furthermore, we find that racial and education disparities in employment and earnings losses go away once we control for household income. The elimination of the racial gap in earning loss during the pandemic once we control for household income can be attributable to the strong relationship between household income and workers' ability to work from home documented in Mongey, Pilossoph and Weinberg (2020) and Blau, Koebe and Meyerhofer (2020). To substantiate this argument, we corroborate those individuals living in households at the lower quintiles of the income distribution and without a college degree were significantly less likely to experience a switch to telework during the pandemic, which persists even after controlling for occupation. This result is in line with the decomposition results in Montenovo et al. (2020) indicating that a significant part of the socio-demographic gradients in employment losses is because of differences in pre-pandemic occupational sorting, which is strongly related to workers' ability to work from home.

Second, we analyze the different types of non-employment related to the pandemic. We find that non-employment due to business responses to the pandemic and symptoms associated with COVID-19 was more prevalent among black and Hispanics, individuals living in households in the bottom quintiles of the income distribution, and individuals without a college degree. Even after controlling for other socio-demographic and household characteristics and respondents' occupations, these disparities persist. The patterns observed regarding non-employment due to business responses to the pandemic are consistent with the socio-demographic gradients reported in Adams-Prassl et al. (2020), and Montenovo et al. (2020) related to job losses and layoffs experienced during the pandemic. Similarly, the patterns observed in non-employment due to symptoms associated with COVID-19 are attuned with the disparities documented by Angelucci et al. (2020) and Papageorge et al. (2020) in individuals' adoption of self-protective behavior and reflective of the uneven spread of the virus across socio-demographic groups, primarily when focusing on racial differences.

We also find similar income and education gradients in the impact of the pandemic on non-employment as it relates to the childcare needs of the household. However, differences in household composition across race explain the racial disparity observed initially in childcare needs inducing non-employment. Furthermore, the pandemic has widened a pre-existing gender gap in non-employment because of the need to provide

childcare for children in the households. Women were significantly more likely to report that childcare needs were the reason for non-employment during the pandemic than their male counterparts, even after controlling for pre-pandemic trends. This finding corroborates that, besides differences in occupational sorting, the increased demand for home child care has contributed to the adverse impact of the pandemic on women's employment rates documented in Alon et al. (2020) and Montenovo et al. (2020).

Finally, we analyze two measures of consumption disparity. The first pertains to the incidence of food insufficiency experienced by households during the pandemic. The second involves families' sources of spending income to mitigate income losses during the pandemic. In terms of food insufficiency, the pandemic had a more adverse impact on black and Hispanic households, respondents without a college degree, and households at the lower quintiles of the income distribution. We follow Moffitt and Ziliak (2020), and Ziliak (2020) in using information from the December Food Security Supplement of the CPS to corroborate that such adverse impact documented among these socio-demographic groups during the pandemic has significantly worsened pre-pandemic disparities in food insecurity, mainly when focusing on differences across income quintiles and education groups.

We then investigate the different buffers used by households to face the income shock generated by the pandemic. We find that the socio-demographic groups with a higher share of households experiencing employment income losses during the pandemic relied significantly more on borrowing from family and friends and the economic impact payment (EIP) than households less adversely affected by employment income losses. When investigating how the EIP was spent, we find that a relatively higher share of households in these socio-demographic groups used this money to cover food expenditures and utilities. We find similar gaps in the percentage of households saving this additional income. This share increases monotonically with household income and respondents' education and is higher for white respondents' homes than for their non-white counterparts.

Given that the reliance on unemployment insurance (U.I.) as a spending income source does not reflect the disparities documented in employment income losses, we analyze differences in the demand for and receipt of these benefits. We find that while the education, income, and race gradients documented in terms of the share of respondents applying for U.I. benefits are consistent with the disparities documented in terms of employment income losses, these disparities are reversed when we focus on the percentage of respondents who reported receiving U.I. benefits conditional on applying for

these. This finding aligns with the criticism raised in Bitler, Hoynes and Schanzenbach (2020) that social insurance programs in the U.S. have not effectively responded to the unmet needs of relatively more disadvantaged households during the pandemic. The authors argue that these programs' shortcomings are attributable primarily to delays, coverage gaps, and the magnitude of benefits, particularly related to the U.I.

The remainder of the paper is organized as follows. Section 2 describes the data sources and empirical strategy used in our analysis. Section 3 presents trends in employment during the pandemic. In Section 4, we describe our findings related to the incidence of food insufficiency and the different spending income sources used by households during the pandemic. Section 5 concludes.

# 2 Data and Empirical Strategy

## 2.1 Data Sources

The dataset used in this paper is obtained from the public use files covering weeks 1-36 of the Household Pulse Survey, spanning April 23, 2020-August 30,2021.[3] The Household Pulse is an online survey created by the U.S. Census Bureau in collaboration with other federal agencies to collect timely data on household responses to the COVID-19 pandemic regarding employment, housing, food sufficiency, spending patterns, travel plans, housing, application, and receipt of social security benefits, and educational changes. The survey was carried out in three main phases and is nationally representative when using the weights provided by the Census Bureau.[4] Thus, we primarily use the combination of household-level and individual-level information on employment and consumption provided in the Pulse to document socio-demographic disparities in the pandemic's impact.

The use of alternative data collection methods during the pandemic was necessary due to the limitations imposed by the lockdowns on institutions' ability to conduct face-to-face interviews. For instance, Adams-Prassl et al. (2020) use the COVID Inequality data, which was collected through an online survey conducted around April 9-14 in 2020

[3]The public use files can be retrieved from https://www.census.gov/programs-surveys/household-pulse-survey/datasets.html .

[4]Phase 1 was collected between April 23, 2020, and July 21, 2020, Phase 2 between August 19, 2020, and October 26, 2020, and Phase 3 collected between October 28, 2020, and extending to March 29, 2021. The project was expanded to continue collecting data throughout 2021 and 2022 in Phases 3.1-3.4, thus expected to extend until May 9, 2022.

for the U.S., U.K., and Germany with sample sizes of 4,000, 4,931, and 4,002, respectively. This data source is comparable to nationally representative data such as the CPS (U.S.), LFS (U.K.), and SOEP (Germany). Angelucci et al. (2020) use nine waves of the Understanding America Study, which is a nationally-representative online panel of 6,922 US adults spanning March 10-July 21, 2020.[5] A potential shortcoming of mobile/online data collection relates to the extent to which there could exist sample selection bias due to disparate response patterns across different socio-demographic groups. To address this, the Census Bureau has consistently provided sampling weights in each release of the public use files. These weights have been constructed and shown to mitigate such non-response bias (Peterson et al. (2021)).[6] Throughout the analysis implemented in this paper, we use these sampling weights.

To control for state-level differences in the spread of the virus and the containment measures in our analysis, we supplement the Pulse data with state-level information on the number of COVID-19 cases and of mobility obtained from the COVID Tracking Project, the CDC Case Surveillance public-use data, and Google's Mobility Reports, respectively. The latter has been used for cross-country analysis to capture changes in mobility in response to lockdowns to assess the degree of compliance with this type of containment measure as in (Bargain and Aminjonov (2020)). Trends by socio-demographic groups and regions are presented in Appendix A. We also supplement the Pulse information with the Current Population Survey (CPS) data from January 2019-August 2021 for outcomes captured in both datasets. CPS data allows us to control pre-pandemic trends in these variables to capture how the pandemic has widened pre-existing gaps.

The paper explores disparities related to educational background, race, gender, and income. Specifically, we use income quintiles defined using the income brackets provided in the Pulse and following 2019 mean quintile incomes in the January 13, 2021 update of Donovan, Labonte and Dalaker (2016): (i) Bottom Quintile includes the income bracket with household income lower than $25,000, (ii) Second Quintile includes the income brackets with household income between $25,000 and $50,000, (iii) Third Quintile includes the income bracket with household income between $50,000 and $75,000, (iv) Fourth Quintile includes the income brackets with household income between $75,000 and $150,000, and (v) Top Quintile includes the income brackets with household income

[5]For the analysis of consumption, the use of transaction data is common. Baker et al. (2020) use transaction-level data from a nonprofit company called SaverLife spanning from August 2016 and March 2020.

[6]https://www.census.gov/programs-surveys/household-pulse-survey/technical-documentation.html provides further technical information.

higher than $150,000.[7]

To analyze trends in employment during the pandemic, we use the data available in the Pulse regarding job losses, changes in work arrangements, and employment interruptions. We also use data from the CPS to document how these trends have differed before and after the pandemic and to control for occupation-specific fixed effects. For employment interruptions associated with the pandemic, we focus on three main types of non-employment experienced during the pandemic. These relate to non-employment due to business responses to the pandemic, the onset of COVID-19 symptoms, and meeting childcare needs. Even though information on individuals' employment status was collected throughout the 36 weeks we use from the Pulse, information on the three types of non-employment we focus on throughout the analysis is available until the end of week 27 (ending on March 29, 2021).

When focusing on outcomes related to household consumption, we delve into three essential aspects collected in the Pulse. The first one pertains to the incidence with which households experienced food insufficiency during the pandemic. We supplement the Pulse information on food security during the pandemic with the CPS Food Security Supplement for 2018 and 2019, exploiting the fact that relevant information is available in both surveys to control for pre-pandemic trends in food insufficiency. This is similar to the approach implemented in Ziliak (2020), Moffitt and Ziliak (2020) and Bitler, Hoynes and Schanzenbach (2020). The second relates to the use made by households of the Economic Impact Payment received during the pandemic as the Pulse contains information on how households spent this transfer during weeks 7-12 of the survey. Finally, we focus on gaps in applying and receiving unemployment insurance (U.I.) benefits.

## 2.2 Empirical Strategy

In general, for outcomes observed only during the pandemic, we implement the following linear regression model to quantify the differential impact of the pandemic across

[7] In the Pulse, family income is reported in a discrete way such that it is binned as follows: 1) Less than $25,000; 2) $25,000-$34,999; 3) $35,000-$49,999; 4) $50,000-$74,499; 5) $75,000-$99,999; 6) $100,000-$149,999; 7) $150,000-$199,999; 8) $200,000 and above. Following the mean quintile household income reported in Donovan, Labonte and Dalaker (2016), we group the bins included in the Pulse in the following way: bottom quintile includes income lower than $25,000 so that the mean quintile household income is $15,286, the second quintile includes the income brackets $25,000-$34,99 and $35,000-$49,999 so that mean quintile household income is $40,652, the third quintile includes the income brackets $50,000-$74,499 so that mean quintile household income is $68,938, the fourth quintile includes the income brackets $75,000-$99,999 and $100,000-$149,999 so that the mean quintile income is $111,112, and the fifth quintile includes the income brackets $150,000-$199,999 and $200,000 and above so that mean quintile income is $254,449.

socio-demographic groups

$$Y_{it} = \alpha + \boldsymbol{\beta}_G \mathbf{G}_i + \boldsymbol{\beta} \mathbf{X}_{it} + \eta_t + \eta_s + \nu_{st} + \epsilon_{it}$$

where $\mathbf{G}_i$ includes indicators of individual $i$'s socio-demographic characteristics including education, race, and income quintile, and $\mathbf{X}_{it}$ denotes other socio-demographic characteristics individual and household. Furthermore, $\eta_t$ denotes time-specific fixed effects (survey week fixed effects for data obtained from the Pulse and month fixed effects when using data from the CPS), $\eta_s$ denotes state fixed effects, and $\nu_{st}$ denotes time-varying state characteristics. Among the latter, we consider the total number of new COVID-19 cases reported in state $s$ during period $t$ and the different indices of geographic mobility documented for state $s$ during period $t$. Thus, for socio-demographic group $G$, the coefficient of interest throughout the analysis is captured by $\beta_G$.

When supplementing the Pulse data with the CPS to include information on months before the onset of the pandemic, we consider a variation of the specification implemented in Angelucci et al. (2020). Specifically, we implement the following linear regression model

$$Y_{it} = \alpha + \gamma Post_t + \boldsymbol{\beta}_G G_i + \boldsymbol{\beta}_{Gt} Post_t \times \mathbf{G}_i + \boldsymbol{\beta} \mathbf{X}_{it} + \eta_t + \eta_s + \nu_{st} + \epsilon_{it}$$

where $Post_t$ is an indicator of whether $t$ corresponds to a pandemic month (after March 2020). Thus, for socio-demographic group $G$, the coefficient of interest throughout the analysis is captured by $\beta_{Gt}$ as it captures the differential impact of the pandemic on group $G$ when accounting for pre-existing gaps in the relevant outcome.

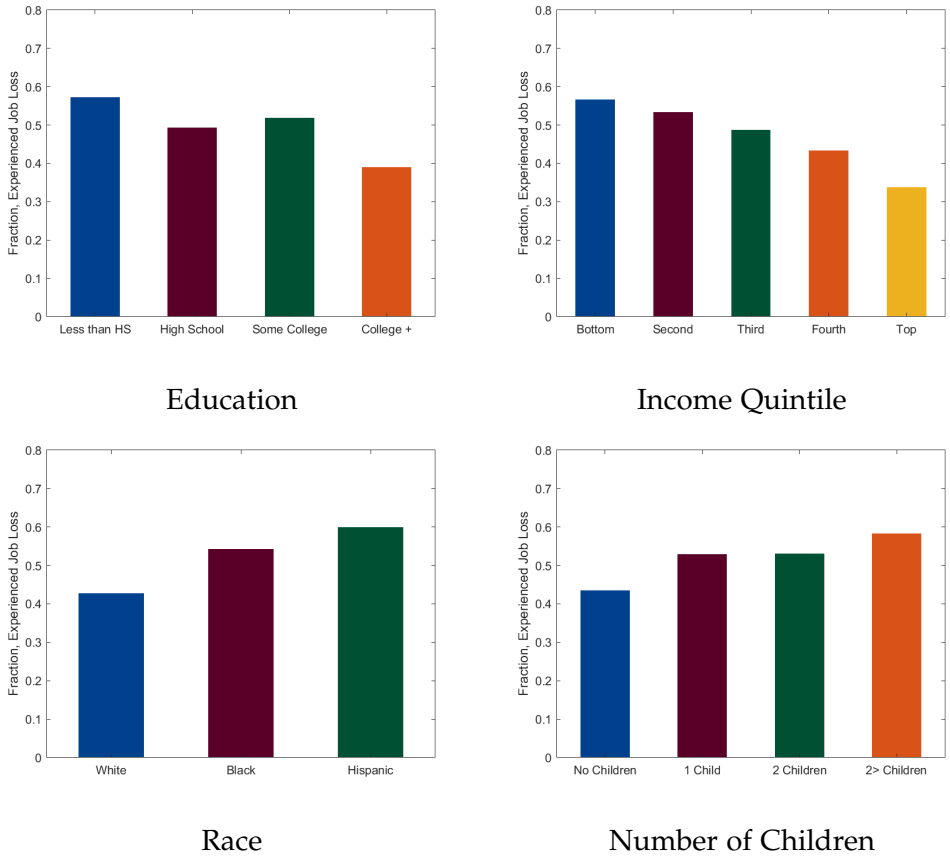
# 3 Employment

This section presents the analysis of COVID-19 on (1) the incidence of employment income losses, (2) changes in work arrangements, and (3) individuals' employment status during the week before the interview. Among those who were not working during the survey's reference period, we further investigate the reasons for non-employment, including experiencing COVID-19 symptoms, business closures associated with the pandemic, and meeting child care needs.

## 3.1 Employment Income Losses

Overall, approximately 48% of households had experienced a loss in employment income since March 13, 2020. However, there exist noticeable differences in the incidence of income losses across households' characteristics. Figure 1 presents the fraction of households within each socio-demographic group that reported an employment income loss since the onset of the COVID-19 crisis.

Figure 1: Loss of Employment Income Experienced in the Household since March 13th, 2020




*Notes:* Averages across all available weeks are reported.

There are significant differences in household employment income losses by education group. About 58% of households in which the respondent has less than a high school diploma report experiencing a drop in employment income since the pandemic's start; this compares to only about 39% of households with a college degree or higher report experiencing an earnings loss. After controlling for additional characteristics such as household income, the respondent's age, the state-level mobility changes, and the av-

erage number of new COVID-19 cases and deaths at the state level. The results in Table 1 show that the education gradient in the incidence of employment income losses is non-monotonic among households in which the respondent did not have a college degree. Additionally, Table 1 shows that families where the respondent did not have a college degree were more likely to experience an employment income loss during the pandemic relative to those of college graduates; this was slightly higher among households of respondents with some college (7.4 percentage points compared to 4.7 percentage points among households of high school dropouts and 3.5 percentage points among households of high school graduates).

The incidence of employment income losses during the COVID-19 pandemic monotonically decreases with household income. Approximately 57% of households in the bottom quintile of the income distribution report experiencing a loss in employment income since March 13, 2020, dropping to 33% of families in the top quintile of the income distribution. Table 1 shows that this income gradient persists even after controlling for other socio-demographic characteristics and average state-level mobility and cases. Specifically, we find that households in the bottom quintile were 22.6 percentage points more likely to experience a loss in employment income during the pandemic than families in the top quintile of the income distribution.

There are also substantial racial differences in income losses due to the pandemic. Approximately 43% of white respondents' households report experiencing a decline in employment income during the pandemic; this climbs to 55% and 60% of black and Hispanic respondents' households. The results in Table 1 show that these racial differences in income losses persist even after controlling for household income and composition, respondent's education, and changes in work arrangements. Specifically, we find that the probability of experiencing an employment income loss among households of black and Hispanic respondents was 5.3 percentage points and 7.5 percentage points higher than among families of white respondents, respectively.

## 3.2 Changes in Work Arrangements

Adams-Prassl et al. (2020) find that the share of tasks that can be done from home is a strong predictor of the percentage of workers who have experienced a job loss throughout the pandemic, explaining up to 69% of the variation in job losses related to COVID-19 in the US. Given the socio-demographic patterns presented above regarding the incidence of employment income losses experienced by households since the start of the

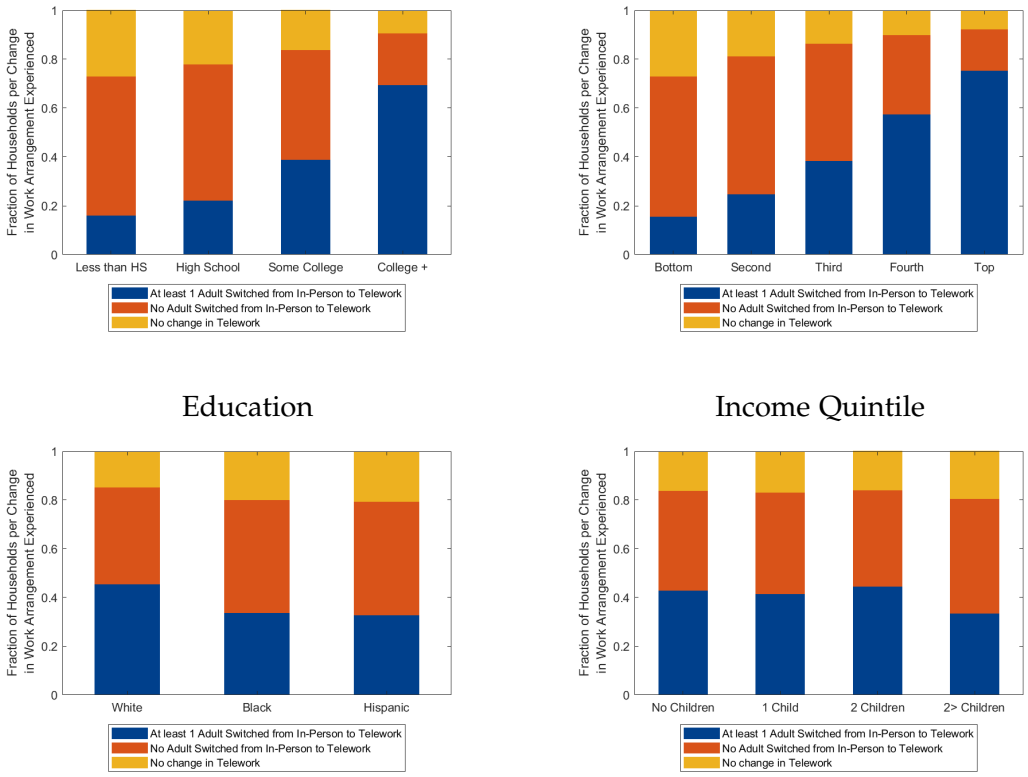
Table 1: Households' Probability of Experiencing a Loss in Employment Income

| | (1) Earn. Loss | (2) Earn. Loss | (3) Earn. Loss | (4) Earn. Loss | (5) Earn. Loss | (6) Earn. Loss | (7) Earn. Loss | (8) Earn. Loss |
|---|---|---|---|---|---|---|---|---|
| 𝟙(Black) | 0.114*** | | | 0.080*** | 0.100*** | 0.077*** | 0.054*** | 0.053*** |
| | (0.004) | | | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| 𝟙(Hispanic) | 0.164*** | | | 0.129*** | 0.139*** | 0.121*** | 0.076*** | 0.075*** |
| | (0.004) | | | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| 𝟙(Other Race) | 0.007 | | | 0.015*** | 0.027*** | 0.026*** | -0.010* | -0.011** |
| | (0.005) | | | (0.005) | (0.006) | (0.005) | (0.005) | (0.005) |
| 𝟙(Bottom quintile) | | 0.244*** | | 0.212*** | | 0.178*** | 0.186*** | 0.196*** |
| | | (0.005) | | (0.005) | | (0.005) | (0.005) | (0.005) |
| 𝟙(Second quintile) | | 0.208*** | | 0.183*** | | 0.153*** | 0.166*** | 0.174*** |
| | | (0.004) | | (0.004) | | (0.004) | (0.004) | (0.004) |
| 𝟙(Third quintile) | | 0.159*** | | 0.143*** | | 0.118*** | 0.131*** | 0.138*** |
| | | (0.004) | | (0.004) | | (0.004) | (0.004) | (0.004) |
| 𝟙(Fourth quintile) | | 0.099*** | | 0.092*** | | 0.077*** | 0.086*** | 0.089*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) | (0.003) |
| 𝟙(Less than HS) | | | 0.192*** | | 0.147*** | 0.084*** | 0.039*** | 0.047*** |
| | | | (0.008) | | (0.008) | (0.008) | (0.008) | (0.008) |
| 𝟙(HS) | | | 0.112*** | | 0.096*** | 0.047*** | 0.028*** | 0.035*** |
| | | | (0.003) | | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Some College) | | | 0.135*** | | 0.124*** | 0.089*** | 0.069*** | 0.074*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) | (0.002) |
| Household Size | | | | | | | 0.065*** | 0.065*** |
| | | | | | | | (0.002) | (0.002) |
| Num. of Children | | | | | | | -0.031*** | -0.031*** |
| | | | | | | | (0.002) | (0.002) |
| 𝟙(Female, Respondent) | | | | | | | -0.012*** | -0.012*** |
| | | | | | | | (0.002) | (0.002) |
| 𝟙(Married, Respondent) | | | | | | | -0.034*** | -0.033*** |
| | | | | | | | (0.003) | (0.003) |
| State Avg. Mobility, Retail | | | | | | | 0.052 | 0.054 |
| | | | | | | | (0.110) | (0.110) |
| State Avg. Mobility, Transit | | | | | | | -0.142 | -0.140 |
| | | | | | | | (0.101) | (0.101) |
| State Avg. Mobility, Grocery | | | | | | | -0.019 | -0.020 |
| | | | | | | | (0.099) | (0.099) |
| State Avg. Mobility, Workplaces | | | | | | | 0.083 | 0.084 |
| | | | | | | | (0.082) | (0.082) |
| State Avg. Mobility, Residential | | | | | | | 0.001 | 0.004 |
| | | | | | | | (0.096) | (0.096) |
| Avg. Num. of New Cases, State | | | | | | | -0.017 | -0.018 |
| | | | | | | | (0.012) | (0.012) |
| 𝟙(At Least 1 Adult Switching to Tele-Work) | | | | | | | | 0.024*** |
| | | | | | | | | (0.003) |
| Constant | 0.367*** | 0.242*** | 0.305*** | 0.237*** | 0.289*** | 0.211*** | 0.070*** | 0.054*** |
| | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.009) | (0.014) | (0.014) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 834165 | 834165 | 834165 | 834165 | 834165 | 834165 | 834165 | 834165 |

pandemic, it is then pertinent to investigate whether there are comparable patterns in households' work arrangement changes. Figure 2 presents the differences in the ability of adults living in the respondents' households to switch from in-person work to work from home by education, income, race, and the number of children in the family. Table 2 presents the results from implementing a linear probability model (LPM) on the incidence that at least one adult in the respondent's household switched their typical in-person work to telework during the pandemic.

Approximately 15% of households in which the respondent has less than a high school diploma report at least one adult household member substituting their typical

Figure 2: Changes in Household Adults' Work Arrangements




Education

Income Quintile

Race

Number of Children

*Notes:* [1] Averages across weeks are reported. [2] Information on changes in household members' work arrarangements is available only in Phase 2 and Phase 3 of the survey: question explicitly defines telework as working from home and asks whether any adult in the household has substituted some or all of their typical in-person work for telework because of the pandemic (including the respondent) with the options being (a) yes, at least one adult, (b) no, no adults have substituted their typical in-person work for telework, and (c) no, there has been no change in telework.

in-person work for telework. In contrast, more than 60% of households with a college degree or higher report at least one adult household member starting to work from home during the pandemic. The LPM results suggest that the probability of at least one adult in the household switching to telework during the pandemic is 33.4 percentage points lower for families in which the respondent does not have a high school diploma compared to homes in which the respondent has a college degree or higher.

We also find a sharp income gradient in the incidence of at least one adult household member starting working from home due to the pandemic. Approximately 13% of households at the bottom of the income distribution report at least one adult working

from home due to the pandemic. In contrast, approximately 70% of families at the top of the distribution report switching between in-person work and telework. The LPM results show that the probability of experiencing at least one adult switching to telework during the pandemic is lower by 41.9 percentage points for households in the bottom quintile of the distribution relative to families in the top quintile.

Similar to the differences in employment income losses, Figure 2 shows that there are also noticeable racial differences in the incidence of changes in households' work arrangements. Around 33% of black families and Hispanic households had at least one adult working from home due to COVID-19. In contrast, about 45% of white respondents' households had at least one adult teleworking in response to the pandemic. Column 1 of Table 2 shows a racial disparity in the probability of at least one adult switching to telework during the pandemic by indicating that this probability is lower by 7.1 and 9.5 percentage points for black and Hispanic households, respectively, compared to their white counterparts. However, after controlling for household income and respondents' education, these racial differences are eliminated, which means that the racial gap is the ability of households to change their work arrangements. Is during the pandemic is driven by racial gaps in income and education and not race per se.

We supplement the Pulse's household-level information on adults' work arrangement changes with individual-level data on respondents' changes to telework during the pandemic from the CPS. Table 3 presents the results from implementing a LPM on respondents' changes in work arrangements. Using the CPS data allows us to control for occupation fixed effects which are of particular importance given the observed relationship between workers' occupation and ability to work from home documented in Adams-Prassl et al. (2020). We corroborate that differences in occupation matter as we find that race, income, and education disparities are reduced in magnitude and statistical significance (in the case of race) once we control for occupation-specific fixed effects.

## 3.3 Employment Status

The analysis has centered on the impact of the pandemic on employment at the household level. The investigation is now focused on the effects of COVID-19 on individual respondents' work status during the week before the survey. Figure 3 presents how the employment rate differs across socio-demographic groups over the weeks spanned by the Pulse.

Overall and averaging across all survey weeks available, 63% of respondents aged 18-

Table 2: At Least 1 Adult in the Household Switched to Tele-Work during the Pandemic

| | (1) Tele-Work | (2) Tele-Work | (3) Tele-Work | (4) Tele-Work | (5) Tele-Work | (6) Tele-Work | (7) Tele-Work |
|---|---|---|---|---|---|---|---|
| 𝟙(Black) | -0.071*** | | | 0.026*** | -0.027*** | 0.030*** | 0.019*** |
| | (0.004) | | | (0.004) | (0.004) | (0.004) | (0.004) |
| 𝟙(Hispanic) | -0.089*** | | | 0.011*** | 0.000 | 0.045*** | 0.029*** |
| | (0.004) | | | (0.004) | (0.004) | (0.003) | (0.004) |
| 𝟙(Other Race) | 0.097*** | | | 0.078*** | 0.035*** | 0.040*** | 0.028*** |
| | (0.005) | | | (0.005) | (0.005) | (0.005) | (0.005) |
| 𝟙(Bottom quintile) | | -0.554*** | | -0.555*** | | -0.404*** | -0.419*** |
| | | (0.003) | | (0.004) | | (0.004) | (0.004) |
| 𝟙(Second quintile) | | -0.483*** | | -0.483*** | | -0.355*** | -0.362*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.004) |
| 𝟙(Third quintile) | | -0.365*** | | -0.365*** | | -0.270*** | -0.272*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.004) |
| 𝟙(Fourth quintile) | | -0.181*** | | -0.180*** | | -0.130*** | -0.129*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) |
| 𝟙(Less than HS) | | | -0.479*** | | -0.477*** | -0.321*** | -0.334*** |
| | | | (0.006) | | (0.006) | (0.006) | (0.006) |
| 𝟙(HS) | | | -0.418*** | | -0.415*** | -0.294*** | -0.298*** |
| | | | (0.003) | | (0.003) | (0.003) | (0.003) |
| 𝟙(Some College) | | | -0.266*** | | -0.263*** | -0.179*** | -0.186*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) |
| Household Size | | | | | | | 0.021*** |
| | | | | | | | (0.001) |
| Num. of Children | | | | | | | -0.007*** |
| | | | | | | | (0.002) |
| 𝟙(Female, Respondent) | | | | | | | 0.005** |
| | | | | | | | (0.002) |
| 𝟙(Married, Respondent) | | | | | | | -0.039*** |
| | | | | | | | (0.002) |
| State Avg. Mobility, Retail | | | | | | | -0.061 |
| | | | | | | | (0.094) |
| State Avg. Mobility, Transit | | | | | | | -0.098 |
| | | | | | | | (0.086) |
| State Avg. Mobility, Grocery | | | | | | | 0.055 |
| | | | | | | | (0.085) |
| State Avg. Mobility, Workplaces | | | | | | | -0.050 |
| | | | | | | | (0.070) |
| State Avg. Mobility, Residential | | | | | | | -0.126 |
| | | | | | | | (0.083) |
| Avg. Num. of New Cases, State | | | | | | | 0.010 |
| | | | | | | | (0.010) |
| Constant | 0.280*** | 0.608*** | 0.518*** | 0.601*** | 0.521*** | 0.683*** | 0.657*** |
| | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.011) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 834972 | 834972 | 834972 | 834972 | 834972 | 834972 | 834972 |

65 have worked during the seven days before the survey interview. However, there are noticeable differences in employment rates by education, income quintile, race, marital status, gender, and the number of children that have persisted throughout the COVID-19 pandemic. Table 4 presents the results from estimating a LPM on respondents' employment status during the pandemic.

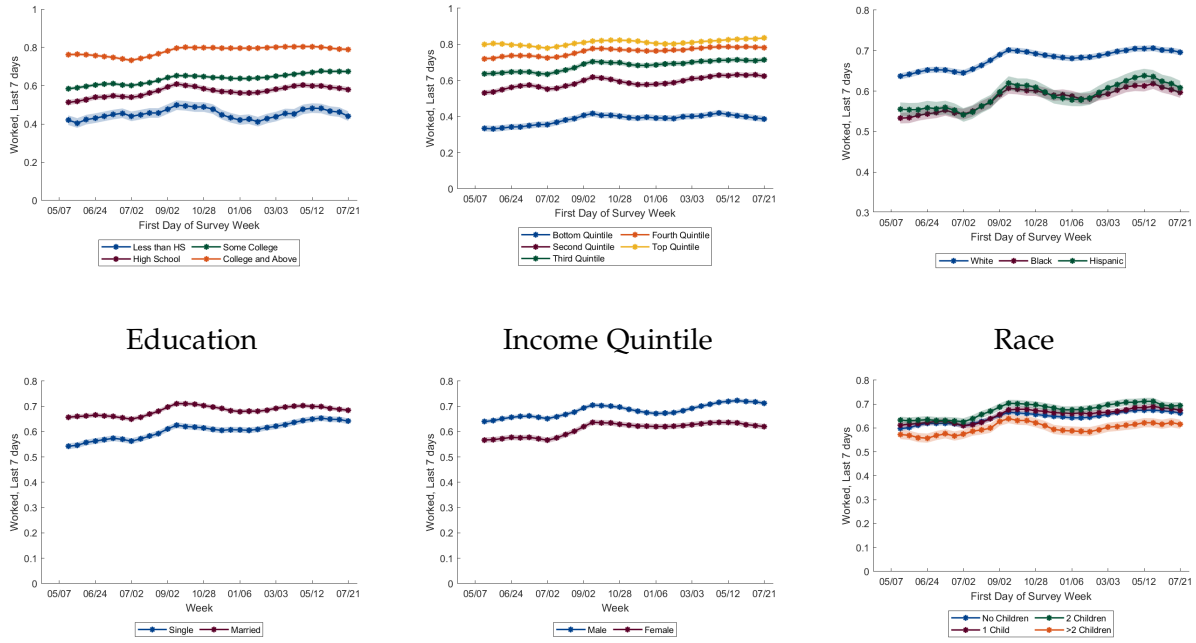
The education panel of Figure 3 shows that the employment rate was higher among workers with a college degree (steadily above 70% throughout all survey weeks) than

Table 3: Individual Switched to Tele-Work during the Pandemic, Aggregating Occupation Code to a 2-Digit Code

| | (1) Tele-Work | (2) Tele-Work | (3) Tele-Work | (4) Tele-Work | (5) Tele-Work | (6) Tele-Work | (7) Tele-Work | (8) Tele-Work | (9) Tele-Work | (10) Tele-Work | (11) Tele-Work | (12) Tele-Work |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1(Black) | -0.061*** | -0.011*** | | | | | -0.017*** | 0.006** | -0.018*** | 0.002 | 0.002 | 0.013*** |
| | (0.003) | (0.002) | | | | | (0.003) | (0.002) | (0.002) | (0.002) | (0.003) | (0.002) |
| 1(Hispanic) | -0.140*** | -0.041*** | | | | | -0.087*** | -0.022*** | -0.040*** | -0.013*** | -0.011*** | 0.004* |
| | (0.002) | (0.002) | | | | | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| 1(Other Race) | 0.070*** | 0.044*** | | | | | 0.071*** | 0.045*** | 0.042*** | 0.032*** | 0.053*** | 0.039*** |
| | (0.003) | (0.003) | | | | | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| 1(Bottom quintile) | | | -0.297*** | -0.141*** | | | -0.273*** | -0.137*** | | | -0.148*** | -0.102*** |
| | | | (0.003) | (0.003) | | | (0.003) | (0.003) | | | (0.003) | (0.003) |
| 1(Second quintile) | | | -0.279*** | -0.139*** | | | -0.258*** | -0.136*** | | | -0.145*** | -0.104*** |
| | | | (0.002) | (0.002) | | | (0.002) | (0.002) | | | (0.003) | (0.002) |
| 1(Third quintile) | | | -0.228*** | -0.124*** | | | -0.212*** | -0.121*** | | | -0.124*** | -0.094*** |
| | | | (0.002) | (0.002) | | | (0.002) | (0.002) | | | (0.002) | (0.002) |
| 1(Fourth quintile) | | | -0.135*** | -0.082*** | | | -0.126*** | -0.080*** | | | -0.073*** | -0.061*** |
| | | | (0.002) | (0.002) | | | (0.002) | (0.002) | | | (0.002) | (0.002) |
| 1(Less than HS) | | | | | -0.416*** | -0.225*** | | | -0.396*** | -0.218*** | -0.324*** | -0.184*** |
| | | | | | (0.002) | (0.002) | | | (0.002) | (0.002) | (0.002) | (0.002) |
| 1(HS) | | | | | -0.356*** | -0.208*** | | | -0.348*** | -0.206*** | -0.296*** | -0.181*** |
| | | | | | (0.002) | (0.002) | | | (0.002) | (0.002) | (0.002) | (0.002) |
| 1(Some College) | | | | | -0.280*** | -0.171*** | | | -0.274*** | -0.168*** | -0.238*** | -0.150*** |
| | | | | | (0.002) | (0.002) | | | (0.002) | (0.002) | (0.002) | (0.002) |
| 1(Female, Respondent) | | | | | | | | | | | 0.038*** | 0.033*** |
| | | | | | | | | | | | (0.001) | (0.002) |
| 1(Married, Respondent) | | | | | | | | | | | 0.007*** | -0.001 |
| | | | | | | | | | | | (0.001) | (0.001) |
| Household Size | | | | | | | | | | | -0.028*** | -0.019*** |
| | | | | | | | | | | | (0.001) | (0.001) |
| Num. of Children | | | | | | | | | | | 0.022*** | 0.017*** |
| | | | | | | | | | | | (0.001) | (0.001) |
| State Avg. Mobility, Retail | | | | | | | | | | | -0.069 | -0.052 |
| | | | | | | | | | | | (0.052) | (0.049) |
| State Avg. Mobility, Transit | | | | | | | | | | | -0.346*** | -0.341*** |
| | | | | | | | | | | | (0.045) | (0.042) |
| State Avg. Mobility, Grocery | | | | | | | | | | | 0.264*** | 0.245*** |
| | | | | | | | | | | | (0.040) | (0.037) |
| State Avg. Mobility, Workplaces | | | | | | | | | | | 0.077 | 0.098** |
| | | | | | | | | | | | (0.049) | (0.046) |
| State Avg. Mobility, Residential | | | | | | | | | | | 0.247*** | 0.252*** |
| | | | | | | | | | | | (0.063) | (0.059) |
| State Avg. Num. of New Cases | | | | | | | | | | | 0.075*** | 0.081*** |
| | | | | | | | | | | | (0.023) | (0.022) |
| Constant | 0.245*** | 0.389*** | 0.402*** | 0.462*** | 0.440*** | 0.475*** | 0.395*** | 0.456*** | 0.439*** | 0.472*** | 0.554*** | 0.557*** |
| | (0.005) | (0.005) | (0.005) | (0.005) | (0.004) | (0.005) | (0.005) | (0.005) | (0.004) | (0.005) | (0.007) | (0.007) |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Month FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Occupation FE | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| *N* | 431669 | 431669 | 431669 | 431669 | 431669 | 431669 | 431669 | 431669 | 431669 | 431669 | 431669 | 431669 |

among workers without a college degree (oscillating between 40% and 50% during the pandemic). We find that respondents without a college degree were less likely than college graduates to report being employed during the week before the interview. Specifically, column 7 of Table 4 shows that respondents without a high school degree were 15.7 percentage points less likely to report having worked during the pandemic than college graduates when we control for other socio-demographic characteristics and household income and composition. We use data from the CPS covering December 2019 up to December 2020 to control for pre-pandemic trends. Column 8 of Table 5 shows that respondents with a high school degree and those with some college were the education groups more adversely impacted than college graduates during the pandemic relative to pre-COVID months in terms of employment.

Figure 3: Respondent Worked in the Last 7 Days




*Notes:* [1] Equally-weighted five-survey week moving averages are presented.

The income gradients documented so far persist when looking at individual respondents' employment status. Focusing on the two extremes of the income distribution, the income panel of Figure 3 shows the employment rate was substantially higher among workers living in households in the top quintile (above 77% during all survey weeks) than for workers living in households in the bottom quintile (around 33-42% during the pandemic). The LPM results presented in Table 4 show that the income gradients persist after controlling for other socio-demographic characteristics, survey week fixed effects and state fixed effects. In particular, Table 4 shows that respondents living in households in the bottom quintile of the income distribution were almost 37.1 percentage points less likely to be employed during the pandemic than respondents in families at the top quintile of the income distribution. Through a pre-and post-pandemic comparison using CPS data from 2019 and 2020, we corroborate that individuals living in households at the bottom two quintiles of the income distribution were more adversely affected by the pandemic than respondents in families at the top of the income distribution.

Racial differences are also persistent when focusing on respondents' work status.

Table 4: Employment, 2020

| | (1) Employed | (2) Employed | (3) Employed | (4) Employed | (5) Employed | (6) Employed | (7) Employed |
|---|---|---|---|---|---|---|---|
| 𝟙(Black) | -0.093*** | | | -0.012*** | -0.063*** | -0.008*** | -0.002 |
| | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Hispanic) | -0.078*** | | | -0.003 | -0.019*** | 0.016*** | 0.005* |
| | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Other Race) | 0.014*** | | | 0.011*** | -0.014*** | -0.005 | -0.013*** |
| | (0.004) | | | (0.004) | (0.004) | (0.004) | (0.004) |
| 𝟙(Bottom quintile) | | -0.432*** | | -0.429*** | | -0.355*** | -0.371*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.004) |
| 𝟙(Second quintile) | | -0.227*** | | -0.225*** | | -0.165*** | -0.176*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) |
| 𝟙(Third quintile) | | -0.136*** | | -0.135*** | | -0.090*** | -0.097*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) |
| 𝟙(Fourth quintile) | | -0.057*** | | -0.056*** | | -0.031*** | -0.035*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) |
| 𝟙(Less than HS) | | | -0.320*** | | -0.311*** | -0.180*** | -0.157*** |
| | | | (0.005) | | (0.006) | (0.005) | (0.006) |
| 𝟙(HS) | | | -0.214*** | | -0.209*** | -0.124*** | -0.113*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(Some College) | | | -0.147*** | | -0.143*** | -0.088*** | -0.087*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) |
| Age | | | | | | | -0.004*** |
| | | | | | | | (0.000) |
| Household Size | | | | | | | -0.010*** |
| | | | | | | | (0.001) |
| Num. of Children | | | | | | | 0.004*** |
| | | | | | | | (0.001) |
| 𝟙(Female, Respondent) | | | | | | | -0.059*** |
| | | | | | | | (0.002) |
| 𝟙(Married, Respondent) | | | | | | | 0.007*** |
| | | | | | | | (0.002) |
| State Avg. Mobility, Retail | | | | | | | 0.052 |
| | | | | | | | (0.060) |
| State Avg. Mobility, Transit | | | | | | | -0.048 |
| | | | | | | | (0.046) |
| State Avg. Mobility, Grocery | | | | | | | -0.047 |
| | | | | | | | (0.044) |
| State Avg. Mobility, Workplaces | | | | | | | 0.279*** |
| | | | | | | | (0.046) |
| State Avg. Mobility, Residential | | | | | | | -0.026 |
| | | | | | | | (0.052) |
| Avg. Num. of New Cases, State | | | | | | | -0.008 |
| | | | | | | | (0.013) |
| Constant | 0.611*** | 0.782*** | 0.730*** | 0.783*** | 0.744*** | 0.816*** | 1.101*** |
| | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) | (0.010) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 1687394 | 1687394 | 1687394 | 1687394 | 1687394 | 1739544 | 1687394 |

The employment rates of black and Hispanic respondents are very close to each other (oscillating between 55% and 62% throughout all survey weeks), while the employment rate of their white counterparts is above 64% across all survey weeks. Nevertheless, the LPM results presented in Table 4 show that these racial gaps observed during the pandemic become insignificant once we control for household income, education, and other household characteristics. A pre-and post-pandemic comparison shows that even

after controlling for education and household characteristics, the employment rate of non-white individuals has been more adversely impacted by the pandemic than the employment rate of white individuals.

## 3.4 Reasons for Non-Employment

This subsection explores socio-demographic differences in three main reasons reported by individuals aged 18-65 for not working during the week before the survey: (1) feeling sick with COVID-19 symptoms, (2) being laid off, furloughed, or losing employment as employers closed due to COVID-19, and (3) taking care of children, not in school or daycare.

### 3.4.1 Business Responses to COVID-19

As the spread of COVID-19 started accelerating, both the implementation of increasingly strict lockdown measures and demand reductions in significant sectors of the economy that did not fall within the working definition of critical infrastructure provided by the Department of Homeland Security[8], adversely impacted businesses in non-critical (i.e., non-essential) sectors of the economy. While some financially fragile firms did not survive, resulting in mass layoffs, others either laid off or furloughed a share of their workers in response to the COVID-19 shock (Bartik et al. (2020)). Figure 4 presents the differences across socio-demographic groups in the incidence of respondents not working during the week before the survey because respondents were laid off or furloughed as their employers adjusted to the COVID-19 shock. Table 6 presents the results from a LPM on the incidence of respondents experiencing non-employment due to employers' responses to COVID-19.

The education panel of Figure 4 shows that high school dropouts were almost twice as likely to experience a disruption in employment due to a business-related response to the COVID-19 shock as college graduates. This education gap fell during the first nine survey weeks then increased steadily since the end of June 2020. The results presented in column 8 of Table 6 show that upon controlling for race, income, and other household characteristics, respondents without a college degree were significantly more likely to be unemployed due to employers' response to COVID-19 than college graduates. Further-

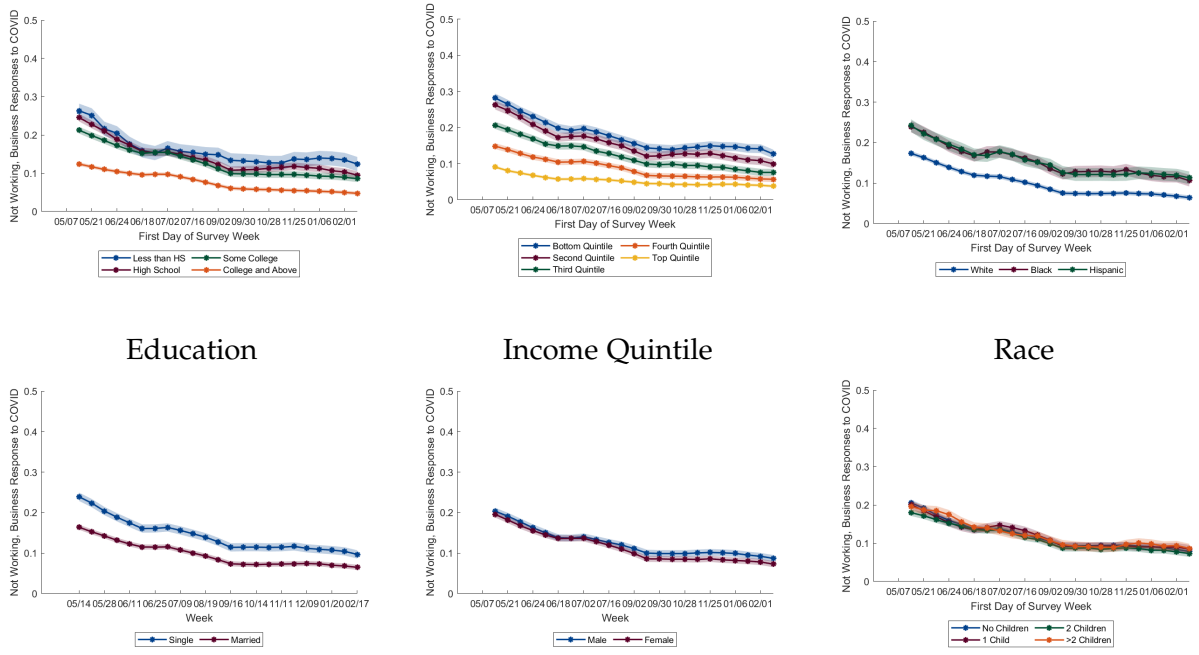
[8]Based on the analysis of Blau, Koebe and Meyerhofer (2020), 194 out of 287 industry categories in the North American Industry Classification System (NAICS) can be categorized as essential.

Table 5: Employment, 2019-2020

| | (1) Employed | (2) Employed | (3) Employed | (4) Employed | (5) Employed | (6) Employed | (7) Employed | (8) Employed |
|---|---|---|---|---|---|---|---|---|
| 𝟙(Black) | -0.063*** | | | -0.002 | -0.037*** | 0.005*** | 0.008*** | 0.010*** |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Hispanic) | -0.020*** | | | 0.033*** | 0.047*** | 0.068*** | 0.069*** | 0.075*** |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Other Race) | -0.031*** | | | -0.020*** | -0.038*** | -0.025*** | -0.024*** | -0.020*** |
| | (0.002) | | | (0.002) | (0.002) | (0.002) | (0.001) | (0.001) |
| 𝟙(Pandemic Month) | -0.019*** | -0.011*** | -0.018*** | -0.005 | -0.011*** | 0.000 | -0.009*** | -0.009** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.004) | (0.004) |
| 𝟙(Pandemic Month)×𝟙(Black) | -0.025*** | | | -0.021*** | -0.022*** | -0.020*** | -0.016*** | -0.015*** |
| | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Pandemic Month)×𝟙(Hispanic) | -0.025*** | | | -0.023*** | -0.028*** | -0.026*** | -0.025*** | -0.025*** |
| | (0.002) | | | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(Pandemic Month)×𝟙(Other Race) | -0.019*** | | | -0.021*** | -0.022*** | -0.023*** | -0.022*** | -0.023*** |
| | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Bottom quintile) | | -0.365*** | | -0.371*** | | -0.308*** | -0.297*** | -0.317*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(Second quintile) | | -0.157*** | | -0.163*** | | -0.115*** | -0.107*** | -0.121*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Third quintile) | | -0.074*** | | -0.079*** | | -0.045*** | -0.040*** | -0.050*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Fourth quintile) | | -0.020*** | | -0.023*** | | -0.004*** | -0.001 | -0.007*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Bottom Quintile) | | -0.028*** | | -0.023*** | | -0.019*** | -0.013*** | -0.013*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) | (0.003) |
| 𝟙(Pandemic Month)×𝟙(Second quintile) | | -0.041*** | | -0.036*** | | -0.032*** | -0.027*** | -0.027*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) | (0.003) |
| 𝟙(Pandemic Month)×𝟙(Third quintile) | | -0.031*** | | -0.029*** | | -0.024*** | -0.021*** | -0.021*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) | (0.003) |
| 𝟙(Pandemic Month)×𝟙(Fourth quintile) | | -0.014*** | | -0.013*** | | -0.010*** | -0.009*** | -0.010*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(Less than HS) | | | -0.291*** | | -0.309*** | -0.213*** | -0.227*** | -0.204*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(HS) | | | -0.146*** | | -0.152*** | -0.095*** | -0.107*** | -0.092*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Some College) | | | -0.112*** | | -0.115*** | -0.080*** | -0.083*** | -0.075*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Less than HS) | | | -0.006* | | 0.004 | 0.008** | 0.007** | 0.009** |
| | | | (0.003) | | (0.003) | (0.004) | (0.003) | (0.003) |
| 𝟙(Pandemic Month)×𝟙(HS) | | | -0.026*** | | -0.022*** | -0.017*** | -0.017*** | -0.017*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(Pandemic Month)×𝟙(Some College) | | | -0.023*** | | -0.021*** | -0.018*** | -0.017*** | -0.016*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(Female, Respondent) | | | | | | | -0.112*** | -0.110*** |
| | | | | | | | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Female) | | | | | | | -0.006*** | -0.006*** |
| | | | | | | | (0.002) | (0.002) |
| 𝟙(Married, Respondent) | | | | | | | 0.001 | 0.024*** |
| | | | | | | | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Married) | | | | | | | 0.018*** | 0.018*** |
| | | | | | | | (0.002) | (0.002) |
| Household Size | | | | | | | | -0.029*** |
| | | | | | | | | (0.000) |
| Num. of Children | | | | | | | | 0.025*** |
| | | | | | | | | (0.000) |
| Age | | | | | | | | -0.002*** |
| | | | | | | | | (0.000) |
| Constant | 0.691*** | 0.801*** | 0.787*** | 0.804*** | 0.801*** | 0.844*** | 0.902*** | 1.044*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Month FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 2141873 | 2141873 | 2141873 | 2141873 | 2141873 | 2141873 | 2141873 | 2141873 |

more, high school graduates (both without a college education and with some college) were the most adversely affected by the pandemic in this regard. We check that the latter is robust using data from the CPS as shown in Column 11 of Table 7, it is robust only for respondents with some college once we control for occupation as presented in Column 12.

Figure 4: Respondent Not Working in the Last 7 Days, Business Response to COVID




*Notes:* [1] Equally-weighted five-survey week moving averages are presented.

Similarly, respondents living in households in the bottom quintile of the income distribution were more than three times more likely than respondents living in homes in the top quintile to experience employment disruption due to a business-related response to the COVID-19 shock. Column 7 of Table 6 shows that this persists even after controlling for education, race, and other household characteristics. Specifically, column 7 of Table 6 shows that the likelihood of non-employment due to employers' response to COVID-19 monotonically decreases with household income. The respondents in households at the bottom quintile of the income distribution were almost 10.6 percentage points more likely to report non-employment due to businesses' responses to the pandemic than respondents in households at the top quintile of the income distribution.

Table 6: Non-Employment During the Pandemic: Business Response to COVID-19

| | (1) Bus. Resp. | (2) Bus. Resp. | (3) Bus. Resp. | (4) Bus. Resp. | (5) Bus. Resp. | (6) Bus. Resp. | (7) Bus. Resp. |
|---|---|---|---|---|---|---|---|
| 𝟙(Black) | 0.052*** | | | 0.027*** | 0.043*** | 0.025*** | 0.024*** |
| | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Hispanic) | 0.049*** | | | 0.024*** | 0.034*** | 0.021*** | 0.020*** |
| | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Other Race) | 0.008** | | | 0.010*** | 0.018*** | 0.015*** | 0.014*** |
| | (0.004) | | | (0.004) | (0.004) | (0.004) | (0.004) |
| 𝟙(Bottom quintile) | | 0.134*** | | 0.126*** | | 0.106*** | 0.100*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) |
| 𝟙(Second quintile) | | 0.111*** | | 0.105*** | | 0.087*** | 0.083*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.003) |
| 𝟙(Third quintile) | | 0.080*** | | 0.076*** | | 0.062*** | 0.060*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) |
| 𝟙(Fourth quintile) | | 0.041*** | | 0.039*** | | 0.031*** | 0.031*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) |
| 𝟙(Less than HS) | | | 0.084*** | | 0.072*** | 0.031*** | 0.029*** |
| | | | (0.005) | | (0.005) | (0.005) | (0.005) |
| 𝟙(HS) | | | 0.075*** | | 0.070*** | 0.038*** | 0.035*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(Some College) | | | 0.060*** | | 0.056*** | 0.034*** | 0.032*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) |
| Household Size | | | | | | | 0.005*** |
| | | | | | | | (0.001) |
| Num. of Children | | | | | | | -0.007*** |
| | | | | | | | (0.001) |
| 𝟙(Female, Respondent) | | | | | | | -0.015*** |
| | | | | | | | (0.002) |
| 𝟙(Married, Respondent) | | | | | | | -0.018*** |
| | | | | | | | (0.002) |
| State Avg. Mobility, Retail | | | | | | | -0.049 |
| | | | | | | | (0.060) |
| State Avg. Mobility, Transit | | | | | | | -0.010 |
| | | | | | | | (0.052) |
| State Avg. Mobility, Grocery | | | | | | | -0.080* |
| | | | | | | | (0.047) |
| State Avg. Mobility, Workplaces | | | | | | | -0.123*** |
| | | | | | | | (0.044) |
| State Avg. Mobility, Residential | | | | | | | -0.037 |
| | | | | | | | (0.053) |
| Avg. Num. of New Cases, State | | | | | | | -0.018** |
| | | | | | | | (0.008) |
| Constant | 0.176*** | 0.108*** | 0.140*** | 0.104*** | 0.131*** | 0.091*** | 0.090*** |
| | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.009) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 |

The race panel of Figure 4 shows that black and Hispanic workers were more than 1.3 times as likely not to be working due to a business reduction in response to the pandemic. Column 7 of Table 6 shows that these racial disparities persist after controlling for education, income, and other household characteristics. Specifically, Column 7 of Table 6 shows that blacks and Hispanics were 2.4 and 2 percentage points more likely to experience non-employment due to employers' response to the pandemic than their white counterparts. We corroborate the robustness of these disparities using data from

Table 7: Non-Employment During the Pandemic: Business Response to COVID-19, Controlling for Occupation

| | (1) Bus. Resp. | (2) Bus. Resp. | (3) Bus. Resp. | (4) Bus. Resp. | (5) Bus. Resp. | (6) Bus. Resp. | (7) Bus. Resp. | (8) Bus. Resp. | (9) Bus. Resp. | (10) Bus. Resp. | (11) Bus. Resp. | (12) Bus. Resp. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1(Black) | 0.042*** | 0.033*** | | | | | 0.020*** | 0.020*** | 0.035*** | 0.032*** | 0.017*** | 0.020*** |
| | (0.002) | (0.002) | | | | | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| 1(Hispanic) | 0.050*** | 0.031*** | | | | | 0.028*** | 0.019*** | 0.034*** | 0.028*** | 0.020*** | 0.018*** |
| | (0.002) | (0.002) | | | | | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| 1(Other Race) | 0.023*** | 0.025*** | | | | | 0.020*** | 0.022*** | 0.026*** | 0.026*** | 0.020*** | 0.022*** |
| | (0.002) | (0.002) | | | | | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| 1(Bottom quintile) | | | 0.143*** | 0.109*** | | | 0.135*** | 0.104*** | | | 0.123*** | 0.104*** |
| | | | (0.003) | (0.003) | | | (0.003) | (0.003) | | | (0.003) | (0.003) |
| 1(Second quintile) | | | 0.093*** | 0.069*** | | | 0.087*** | 0.065*** | | | 0.076*** | 0.065*** |
| | | | (0.002) | (0.002) | | | (0.002) | (0.002) | | | (0.002) | (0.002) |
| 1(Third quintile) | | | 0.055*** | 0.039*** | | | 0.051*** | 0.037*** | | | 0.043*** | 0.036*** |
| | | | (0.002) | (0.002) | | | (0.002) | (0.002) | | | (0.002) | (0.002) |
| 1(Fourth quintile) | | | 0.024*** | 0.017*** | | | 0.022*** | 0.016*** | | | 0.017*** | 0.015*** |
| | | | (0.001) | (0.001) | | | (0.001) | (0.001) | | | (0.001) | (0.001) |
| 1(Less than HS) | | | | | 0.086*** | 0.037*** | | | 0.073*** | 0.029*** | 0.036*** | 0.003 |
| | | | | | (0.003) | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) |
| 1(HS) | | | | | 0.050*** | 0.016*** | | | 0.045*** | 0.013*** | 0.020*** | -0.002 |
| | | | | | (0.001) | (0.002) | | | (0.001) | (0.002) | (0.002) | (0.002) |
| 1(Some College) | | | | | 0.046*** | 0.024*** | | | 0.043*** | 0.023*** | 0.026*** | 0.012*** |
| | | | | | (0.001) | (0.002) | | | (0.001) | (0.002) | (0.001) | (0.002) |
| 1(Female, Respondent) | | | | | | | | | | | 0.013*** | 0.010*** |
| | | | | | | | | | | | (0.001) | (0.001) |
| 1(Married, Respondent) | | | | | | | | | | | -0.005*** | 0.002 |
| | | | | | | | | | | | (0.001) | (0.001) |
| Household Size | | | | | | | | | | | 0.004*** | 0.001** |
| | | | | | | | | | | | (0.001) | (0.001) |
| Num. of Children | | | | | | | | | | | -0.002*** | -0.001 |
| | | | | | | | | | | | (0.001) | (0.001) |
| State Avg. Mobility, Retail | | | | | | | | | | | -0.018 | -0.020 |
| | | | | | | | | | | | (0.046) | (0.045) |
| State Avg. Mobility, Transit | | | | | | | | | | | -0.211*** | -0.222*** |
| | | | | | | | | | | | (0.037) | (0.037) |
| State Avg. Mobility, Grocery | | | | | | | | | | | 0.074** | 0.086*** |
| | | | | | | | | | | | (0.031) | (0.030) |
| State Avg. Mobility, Workplaces | | | | | | | | | | | -0.014 | -0.022 |
| | | | | | | | | | | | (0.039) | (0.038) |
| State Avg. Mobility, Residential | | | | | | | | | | | -0.008 | -0.009 |
| | | | | | | | | | | | (0.049) | (0.049) |
| State Avg. Num. of New Cases | | | | | | | | | | | -0.027 | -0.029 |
| | | | | | | | | | | | (0.018) | (0.018) |
| Constant | 0.211*** | 0.189*** | 0.173*** | 0.171*** | 0.191*** | 0.187*** | 0.169*** | 0.168*** | 0.182*** | 0.181*** | 0.157*** | 0.166*** |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.005) | (0.006) |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Month FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Occupation FE | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| $N$ | 470913 | 470913 | 470913 | 470913 | 470913 | 470913 | 470913 | 470913 | 470913 | 470913 | 470913 | 470913 |

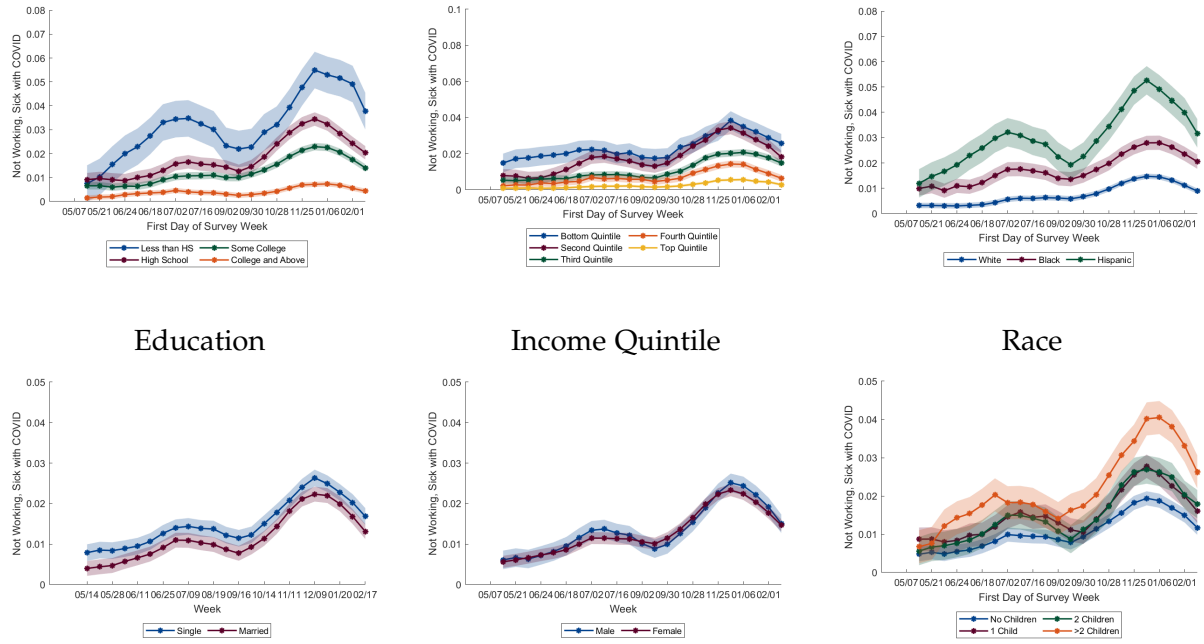
the COVID module of the CPS in Column 11 of Table 7. Furthermore, Column 12 shows that these racial disparities persist after controlling for occupation.

The socio-demographic disparities documented in terms of the incidence of employment disruptions stemming from a business' responses to the economic crisis induced by the pandemic are consistent with the findings of Adams-Prassl et al. (2020), Angelucci et al. (2020) and Montenovo et al. (2020) that also documented the extent to which workers at the bottom of the income distribution, without a college degree and who are either black or Hispanic have been severely hit by the COVID-19 pandemic in terms of job and earnings losses primarily associated with the relatively low remotability of their careers as social distancing measures were increasingly adopted to slow the spread of the virus.

### 3.4.2 Exhibiting COVID-19 Symptoms

As the virus spreads within and across communities, it is expected for workers to become more likely to contract the virus, especially if they are not able to adopt self-protective behavior that not only limits their exposure to the virus but also reduces the probability of infection when the risk of exposure is inevitably high. Figure 5 presents the differences across socio-demographic groups in the incidence of respondents not working during the week before the survey because respondents were exhibiting symptoms related to COVID-19. Table 8 presents the results obtained upon implementing a LPM on respondents' incidence of non-employment due to being sick with COVID-19 symptoms.

Figure 5: Respondent Not Working in the Last 7 Days, Sick with COVID symptoms




Education | Income Quintile | Race

Marital Status | Gender | Number of Children

*Notes:* [1] Equally-weighted five-survey week moving averages are presented.

In terms of education, there are noticeable differences between high school dropouts and college graduates. While less than 0.6% of respondents with a college degree reported not working due to being sick with COVID-19 during the week before the survey throughout the pandemic, the percentage of high school dropouts not working because they were feeling sick with COVID-19 oscillated between 0.75% and 3% during the pandemic (peaking around mid-June and reaching its highest towards mid-November). This

persists when controlling for respondents' race, household income, and other household characteristics as the probability of non-employment due to COVID-19 symptoms is 0.7 higher for respondents without a high school diploma than for college graduates. Furthermore, the results presented in Column 7 of Table 8 show that this probability decreases monotonically with the respondent's education.

We observe similar gaps with respect to race as Hispanic respondents were more than four times as likely not to be working due to exhibiting COVID-19 symptoms as their white counterparts. Similarly, black respondents were more than twice as likely as their white counterparts not to be working for this same reason. These persist when controlling for respondents' education, household income, and other household characteristics, as suggested in the results presented in Column 7 of Table 8. The results indicate that the probability of non-employment due to COVID-19 symptoms is 0.5 percentage points higher for black respondents and 1.5 percentage points higher for Hispanics relative to their white counterparts.

The peak observed for high school dropouts, Hispanic and black respondents coincides with the spike in cases recorded around June 10th as various states started easing social distancing measures upon the implementation of their reopening plans. Similarly, the rapid pickup in the incidence of an employment disruption due to COVID-19 symptoms observed for these respondents starting in mid-October coincides with the spike in nationwide cases observed on October 15th when around 44 states announced a substantial increase in new caseloads compared to mid-September. Furthermore, the spike observed towards mid-November for these respondents is close to the time when the US reported around 100,000 cases in a single day, around November 4th and ultimately leads to the second peak captured close to January, further fueled by the spread of the Delta variant.[9]

We also find evidence of an income gradient in the incidence of non-employment associated with sickness due to COVID-19 symptoms, with respondents in households in the bottom two quintiles being relatively more likely to report this type of non-employment during the pandemic than respondents in households at the top of the income distribution. The results presented in Column 7 of Table 8 show that respondents in households at the bottom of the income distribution were 1.3 percentage points more likely to report this type of non-employment than respondents in households at the top quintile of the income distribution. Thus, overall, the results show that the likelihood

[9] https://www.ajmc.com/view/a-timeline-of-covid19-developments-in-2020

Table 8: Non-Employment During the Pandemic: Sick with COVID-19 Symptoms

| | (1) Sick | (2) Sick | (3) Sick | (4) Sick | (5) Sick | (6) Sick | (7) Sick |
|---|---|---|---|---|---|---|---|
| 𝟙(Black) | 0.009*** | | | 0.005*** | 0.007*** | 0.005*** | 0.005*** |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Hispanic) | 0.021*** | | | 0.018*** | 0.017*** | 0.016*** | 0.015*** |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Other Race) | 0.002* | | | 0.002* | 0.003*** | 0.003** | 0.002* |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Bottom quintile) | | 0.020*** | | 0.016*** | | 0.011*** | 0.013*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) |
| 𝟙(Second quintile) | | 0.015*** | | 0.011*** | | 0.007*** | 0.008*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) |
| 𝟙(Third quintile) | | 0.008*** | | 0.006*** | | 0.003*** | 0.004*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) |
| 𝟙(Fourth quintile) | | 0.004*** | | 0.003*** | | 0.002*** | 0.002*** |
| | | (0.000) | | (0.000) | | (0.000) | (0.000) |
| 𝟙(Less than HS) | | | 0.025*** | | 0.019*** | 0.015*** | 0.013*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(HS) | | | 0.013*** | | 0.010*** | 0.007*** | 0.007*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Some College) | | | 0.008*** | | 0.006*** | 0.004*** | 0.004*** |
| | | | (0.000) | | (0.000) | (0.000) | (0.000) |
| Household Size | | | | | | | 0.001*** |
| | | | | | | | (0.000) |
| Num. of Children | | | | | | | 0.001 |
| | | | | | | | (0.000) |
| 𝟙(Female, Respondent) | | | | | | | -0.001 |
| | | | | | | | (0.001) |
| 𝟙(Married, Respondent) | | | | | | | 0.001 |
| | | | | | | | (0.001) |
| State Avg. Mobility, Retail | | | | | | | 0.003 |
| | | | | | | | (0.020) |
| State Avg. Mobility, Transit | | | | | | | -0.057*** |
| | | | | | | | (0.018) |
| State Avg. Mobility, Grocery | | | | | | | 0.047*** |
| | | | | | | | (0.016) |
| State Avg. Mobility, Workplaces | | | | | | | -0.094*** |
| | | | | | | | (0.017) |
| State Avg. Mobility, Residential | | | | | | | 0.002 |
| | | | | | | | (0.019) |
| Avg. Num. of New Cases, State | | | | | | | -0.004 |
| | | | | | | | (0.004) |
| Constant | 0.002 | -0.006*** | -0.003* | -0.005*** | -0.004** | -0.007*** | -0.017*** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.003) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 |

of this type of non-employment decreases with household income.

Unsurprisingly, the socio-demographic groups more adversely affected during the pandemic in terms of economic inactivity due to falling sick with the virus are the ones facing higher limitations in making the necessary adjustments in their work arrangement to work from home safely. This is aligned with the evidence presented by Papageorge et al. (2020) and Angelucci et al. (2020), both centering the relevant discussion on individuals' ability to adopt self-protective measures. While the observed patterns are argued

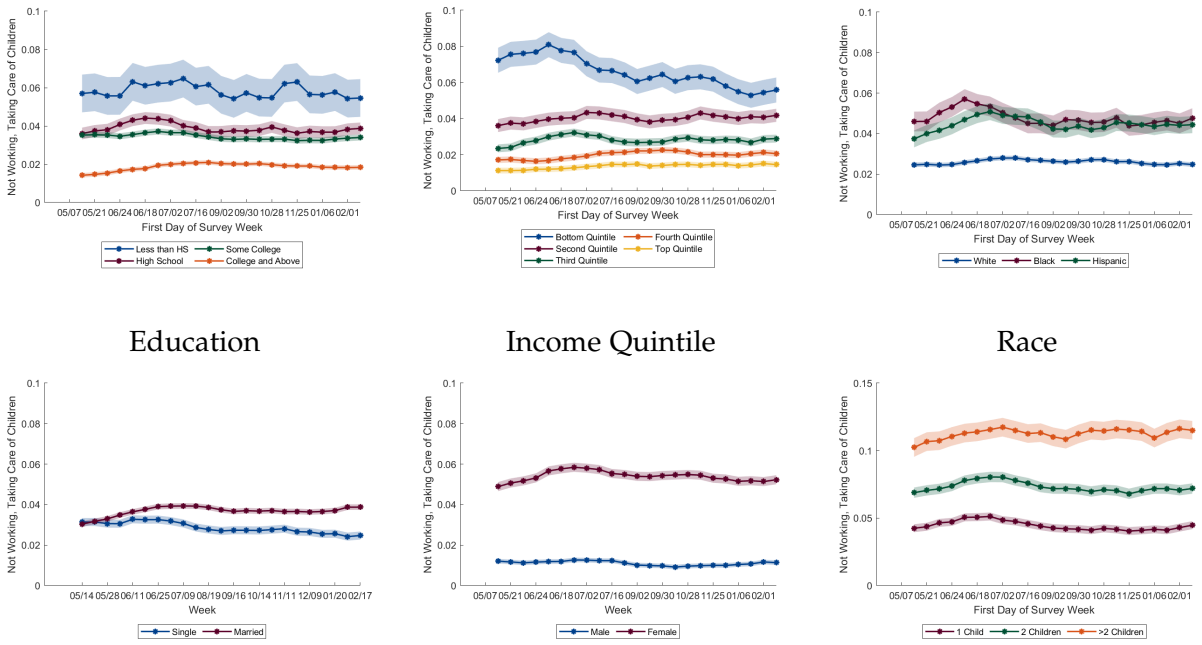
to display underlying differences in the adoption of work-related protective measures, there is also evidence that some socio-demographic groups are also limited in their ability to adopt necessary non-work protective behavior by facing a higher risk of evictions and utility disconnections in the US (Jowers et al. (2021)). Similarly, focusing on the case of NYC at the start of the pandemic, the findings of Almagro et al. (2020) suggest that housing crowding and exposure at home are both significant drivers of racial gaps in COVID-19 infections. Another impediment to these groups' ability to adhere to non-work-related protective behavior involves the types of public places frequented by these groups. For instance, using mobility data within a SEIR epidemiological model, Chang et al. (2020) find that the points of interest visited by individuals of disadvantaged racial and socioeconomic groups tend to be more crowded. The latter, combined with the smaller reduction in mobility observed among these groups, can help explain their relatively high transmission rates observed in the data.

### 3.4.3 Meeting Child Care Needs

As schools closed in response to the rising number of cases in the country, the pandemic placed a significant burden on parents' time constraints. Figure 6 presents the differences across socio-demographic groups in the incidence of respondents not working during the week before the survey because they were taking care of children in the household who were not going to school or daycare. While it is not possible to distinguish respondents who were already not working because they were taking care of children before the pandemic from those who were working before the pandemic and who had to stop doing so to take care of children who suddenly were no longer attending school or going to daycare, the observed changes in non-employment due to childcare potentially captures, to some extent, employment disruptions due to the burden placed by the pandemic on parents' time constraint due to the unavailability of daycare and the closure of schools.

Concerning education, we find that respondents without a high school degree were more likely to report not working due to child care needs than respondents of higher educational attainment, as shown in Figure 6. Similarly, we can also observe that this type of non-employment is more likely among respondents living in households at the bottom of the income distribution and among non-white respondents. Column 7 of Table 9 shows that the education gradient persists upon controlling for other socio-demographic characteristics and household income. Specifically, we find that individuals without a high school diploma were 1.4 percentage points more likely to report this type of non-

Figure 6: Respondent Not Working in the Last 7 Days, Taking Care of Children not in School or in Daycare




*Notes:* [1] Equally-weighted five-survey week moving averages are presented.

employment than college graduates. Furthermore, the income gradient observed persists upon controlling for the additional covariates, with respondents in households at the bottom of the income distribution being approximately 4.4 percentage points more likely to report not working during the pandemic due to child care needs. On the other hand, the results suggest that the racial disparities observed in Figure 6 are not robust once we control for household composition and the respondent's gender and marital status.

So far, the main employment gaps observed related to the pandemic have been predominantly in terms of respondents' education, income, and race. However, employment gaps associated with the care of children in the household who are not in school or daycare exhibit a substantial gender gap that has been documented in Alon et al. (2020), Adams-Prassl et al. (2020) and Montenovo et al. (2020). While 4%-5% of women report not working to take care of children during the pandemic, only around 1% of men report having not worked due to childcare needs. This implies that women are more than four times as likely not to be working to take care of children in the household as their male

Table 9: Non-Employment During the Pandemic: Taking Care of Children not in Daycare or School

| | (1) Child Care | (2) Child Care | (3) Child Care | (4) Child Care | (5) Child Care | (6) Child Care | (7) Child Care |
|---|---|---|---|---|---|---|---|
| 𝟙(Black) | 0.021*** | | | 0.012*** | 0.018*** | 0.011*** | 0.003* |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Hispanic) | 0.020*** | | | 0.011*** | 0.013*** | 0.009*** | -0.000 |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Other Race) | 0.003* | | | 0.003* | 0.005*** | 0.004** | 0.002 |
| | (0.002) | | | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(Bottom quintile) | | 0.053*** | | 0.049*** | | 0.043*** | 0.044*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) |
| 𝟙(Second quintile) | | 0.027*** | | 0.023*** | | 0.018*** | 0.019*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) |
| 𝟙(Third quintile) | | 0.015*** | | 0.013*** | | 0.009*** | 0.011*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) |
| 𝟙(Fourth quintile) | | 0.006*** | | 0.005*** | | 0.003*** | 0.004*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) |
| 𝟙(Less than HS) | | | 0.042*** | | 0.037*** | 0.022*** | 0.014*** |
| | | | (0.003) | | (0.003) | (0.003) | (0.002) |
| 𝟙(HS) | | | 0.021*** | | 0.018*** | 0.008*** | 0.011*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Some College) | | | 0.017*** | | 0.015*** | 0.009*** | 0.011*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) |
| Household Size | | | | | | | -0.003*** |
| | | | | | | | (0.000) |
| Num. of Children | | | | | | | 0.034*** |
| | | | | | | | (0.001) |
| 𝟙(Female, Respondent) | | | | | | | 0.037*** |
| | | | | | | | (0.001) |
| 𝟙(Married, Respondent) | | | | | | | 0.008*** |
| | | | | | | | (0.001) |
| State Avg. Mobility, Retail | | | | | | | 0.066*** |
| | | | | | | | (0.025) |
| State Avg. Mobility, Transit | | | | | | | -0.019 |
| | | | | | | | (0.024) |
| State Avg. Mobility, Grocery | | | | | | | -0.005 |
| | | | | | | | (0.021) |
| State Avg. Mobility, Workplaces | | | | | | | -0.015 |
| | | | | | | | (0.020) |
| State Avg. Mobility, Residential | | | | | | | 0.021 |
| | | | | | | | (0.025) |
| Avg. Num. of New Cases, State | | | | | | | 0.001 |
| | | | | | | | (0.004) |
| Constant | 0.027*** | 0.010*** | 0.017*** | 0.008** | 0.014*** | 0.005 | -0.036*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.004) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 | 1347969 |

counterparts. This gender gap persists when controlling for race, education, household income, and other household characteristics, as presented in column 7 of Table 9. Specifically, we find that female respondents were 3.7 percentage points more likely to report this non-employment relative to their male counterparts.

Since the Pulse information on non-employment due to child care needs does not permit disentangling how much of such non-employment is driven by the increased

pressure imposed on parents' time constraints by the closure of schools and daycare, the CPS data can be used to compare the incidence of this type of non-employment before and during the pandemic. Table 10 present the LPM results using data from the CPS during 2019-2020, suggesting that this non-employment significantly increased more for women than for men during the pandemic. This is attuned with the gender gaps observed in the US and UK in Adams-Prassl et al. (2020) who find that women were spending more time caring for children in the US, suggesting that mothers assumed a higher burden of the increased child care needs imposed by the pandemic. Adams-Prassl et al. (2020) argue that part of the gender differences observed in job losses can be explained by women being less likely to start working from home during the pandemic in the US as the demand for her time at home increased. Similar evidence is documented in other countries. For instance, in the case of the UK, Sevilla and Smith (2020) find that part of the gender differences in experiencing employment disruptions during the COVID-19 pandemic can be explained by the increased demand for child care.[10] Similarly, we find that the racial and income gradients (though not the education gradient) documented during the pandemic related to non-employment due to child care are robust once we control for pre-pandemic trends in this type of non-employment.

# 4 Consumption

Besides having an impact on employment, the mandated halt of non-essential activities to contain the virus can also be expected to alter the consumption patterns of households. Blundell et al. (2020) argue that for households that spend a higher share of their total expenditures on goods and services in sectors that have been affected by lockdowns such as leisure and hospitality – consisting of spending on holidays, hotels, restaurants, and personal care – while not facing severe reductions in their income are expected to save some amount of money during the pandemic automatically. In this regard, Baker et al. (2020) find a significant decrease in spending on air travel, restaurants, and public transportation as well as a substantial increase in grocery and food delivery spending as states issued stay-at-home orders. Thus, we can expect these households to be more

[10] Boca et al. (2020) present contrasting evidence when focusing on Italy. They find that while both mothers and fathers were spending more time in childcare during the start of the pandemic in Italy, mothers were facing most of the burden of the additional childcare generated by the COVID-19 crisis. Nonetheless, mothers were not significantly more likely to stop working during the pandemic because they were more likely to have kept their jobs by working from home.

Table 10: Not in the Labor Force, Taking Care of House or Family, 2019-2020

| | (1) Not in LF | (2) Not in LF | (3) Not in LF | (4) Not in LF | (5) Not in LF | (6) Not in LF | (7) Not in LF | (8) Not in LF |
|---|---|---|---|---|---|---|---|---|
| 𝟙(Black) | -0.006*** | | | -0.015*** | -0.010*** | -0.016*** | -0.007*** | -0.012*** |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Hispanic) | 0.046*** | | | 0.037*** | 0.032*** | 0.029*** | 0.029*** | 0.015*** |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Other Race) | 0.034*** | | | 0.032*** | 0.034*** | 0.032*** | 0.031*** | 0.023*** |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month) | 0.005*** | 0.002 | 0.006*** | 0.001 | 0.005*** | 0.002 | 0.002 | 0.002 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(Pandemic Month)×𝟙(Black) | 0.004*** | | | 0.003** | 0.003** | 0.003* | 0.003* | 0.002 |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Hispanic) | 0.003* | | | 0.002 | 0.003** | 0.002 | 0.003* | 0.002 |
| | (0.001) | | | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Other Race) | 0.003* | | | 0.003* | 0.003* | 0.003* | 0.003* | 0.003* |
| | (0.002) | | | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(Bottom quintile) | | 0.050*** | | 0.047*** | | 0.036*** | 0.051*** | 0.063*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Second quintile) | | 0.035*** | | 0.031*** | | 0.023*** | 0.033*** | 0.041*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Third quintile) | | 0.015*** | | 0.013*** | | 0.008*** | 0.015*** | 0.021*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Fourth quintile) | | 0.002*** | | 0.001* | | -0.001 | 0.001 | 0.004*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Bottom Quintile) | | 0.005*** | | 0.005*** | | 0.005*** | 0.004** | 0.005*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(Pandemic Month)×𝟙(Second quintile) | | 0.008*** | | 0.007*** | | 0.008*** | 0.007*** | 0.007*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(Pandemic Month)×𝟙(Third quintile) | | 0.006*** | | 0.006*** | | 0.006*** | 0.005*** | 0.006*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Fourth quintile) | | 0.003** | | 0.003** | | 0.003** | 0.003** | 0.003** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Less than HS) | | | 0.067*** | | 0.058*** | 0.045*** | 0.061*** | 0.048*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(HS) | | | 0.028*** | | 0.026*** | 0.018*** | 0.034*** | 0.030*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Some College) | | | 0.003*** | | 0.003*** | -0.002*** | 0.009*** | 0.004*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Less than HS) | | | 0.002 | | 0.001 | -0.001 | 0.000 | -0.000 |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(Pandemic Month)×𝟙(HS) | | | 0.001 | | 0.001 | -0.001 | 0.001 | 0.000 |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Some College) | | | 0.000 | | -0.000 | -0.001 | -0.000 | -0.000 |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) | (0.001) |
| 𝟙(Female, Respondent) | | | | | | | 0.104*** | 0.103*** |
| | | | | | | | (0.000) | (0.000) |
| 𝟙(Pandemic Month)×𝟙(Female) | | | | | | | 0.001 | 0.002* |
| | | | | | | | (0.001) | (0.001) |
| 𝟙(Married, Respondent) | | | | | | | 0.068*** | 0.063*** |
| | | | | | | | (0.000) | (0.001) |
| 𝟙(Pandemic Month)×𝟙(Married) | | | | | | | -0.001 | 0.000 |
| | | | | | | | (0.001) | (0.001) |
| Household Size | | | | | | | | 0.007*** |
| | | | | | | | | (0.000) |
| Num. of Children | | | | | | | | 0.019*** |
| | | | | | | | | (0.000) |
| Age | | | | | | | | -0.001*** |
| | | | | | | | | (0.000) |
| Constant | 0.070*** | 0.050*** | 0.054*** | 0.054*** | 0.056*** | 0.050*** | -0.059*** | -0.054*** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Month FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 2138904 | 2138904 | 2138904 | 2138904 | 2138904 | 2138904 | 2138904 | 2138904 |

likely to spend additional income differently than households more adversely affected by the pandemic in terms of income losses while devoting a higher share of expenditures to necessities. The information available in the Pulse is conducive to investigating differences in households' experience of food insufficiency during the pandemic and the use of the stimulus payment granted under the CARES Act.

## 4.1 Food Insufficiency

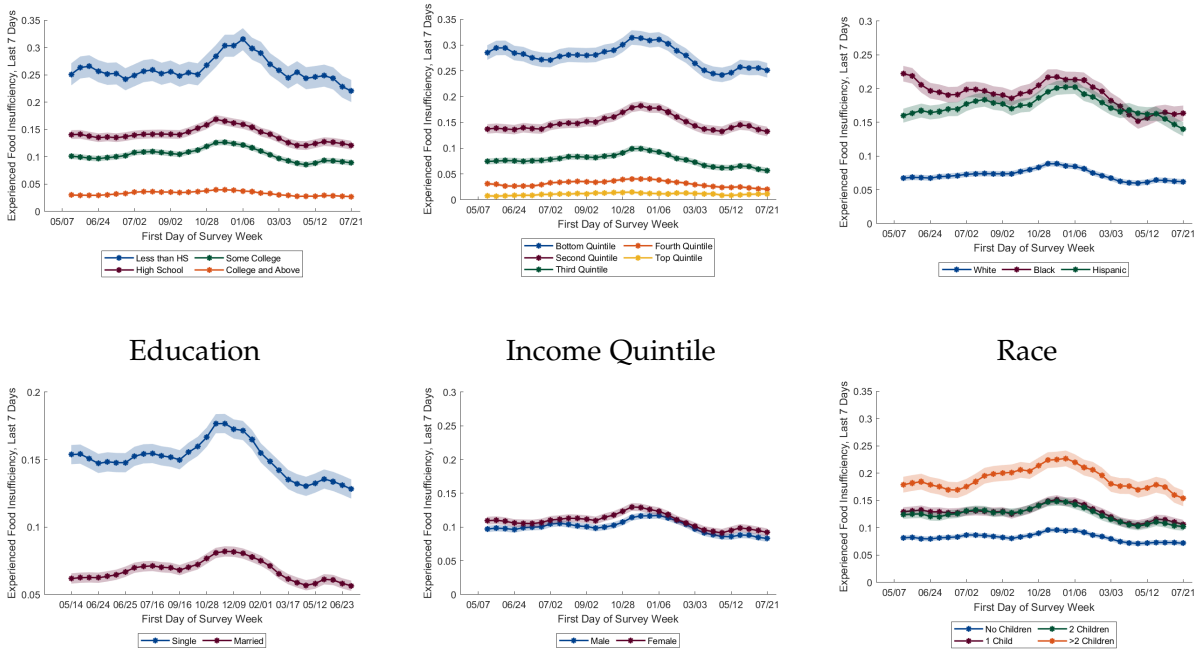
Across the 21 weeks of the pandemic covered in the Pulse, an overall 10% of households reported sometimes or often not having had enough to eat during the week before the survey.[11] Nevertheless, this masks substantial gaps presented in Figure 7 with respect to respondents' education, race, marital status, household income, and the number of children. Table 11 presents the results from implementing a LPM on households' experience of food insufficiency during the pandemic.

Pertaining respondents' education, while around 25% of high school dropouts' households have not had enough to eat during the COVID-19 crisis, less than 4% of college graduates' households have experienced food insufficiency throughout the pandemic. Thus, households of high school dropouts are more than six times as likely to have faced food insufficiency during the pandemic than households of respondents with a college degree or higher. A considerably wider gap is observed in terms of household income as households in the bottom quintile of the income distribution are more than 20 times as likely not to have enough to eat as households in the top quintile of the distribution. There is also a racial gap between white respondents' and non-white respondents' households, slightly wider compared to black respondents' households than to Hispanics' households during the first months of the pandemic, with both Hispanics' and black respondents' households being more than twice as likely of experiencing food insufficiency during the pandemic than white respondents' households.

Figure 8 shows how the incidence of food insufficiency has changed between 2018 and 2020. As in Ziliak (2020), we use pre-pandemic data from the December Food Security Supplement of the Current Population Survey corresponding to 2018 and 2019, which asks respondents a set of questions related to food security that can be used in a similar way as the questions asked in the Pulse questionnaire to identify the incidence with which households face hardships in this regard. Ziliak (2020) provides a detailed

[11] Note that this definition of food insufficiency is the more restrictive version of the one used in Ziliak (2020) who also uses the Pulse data to examine food hardship during the pandemic.

Figure 7: Sometimes or Often Did Not Have Enough to Eat in the Last 7 Days (Household-Level)




*Notes:* [1] Equally-weighted five-survey week moving averages are presented.

comparison between the CPS and Pulse data, showing that this supplement from the CPS and the Pulse data aligns relatively well in terms of most relevant socioeconomic characteristics. Table 8 presents the results from running a linear regression on the incidence of food insufficiency in the household over pooled data obtained from the CPS and the December week of the Pulse survey. We find that households of non-white respondents, of respondents without a college degree and living at households in the lower quintiles of the income distribution, were more adversely impacted by the pandemic in terms of food insufficiency when compared to their observed incidence of food insufficiency before the onset of the pandemic.

## 4.2 Sources of Spending Income

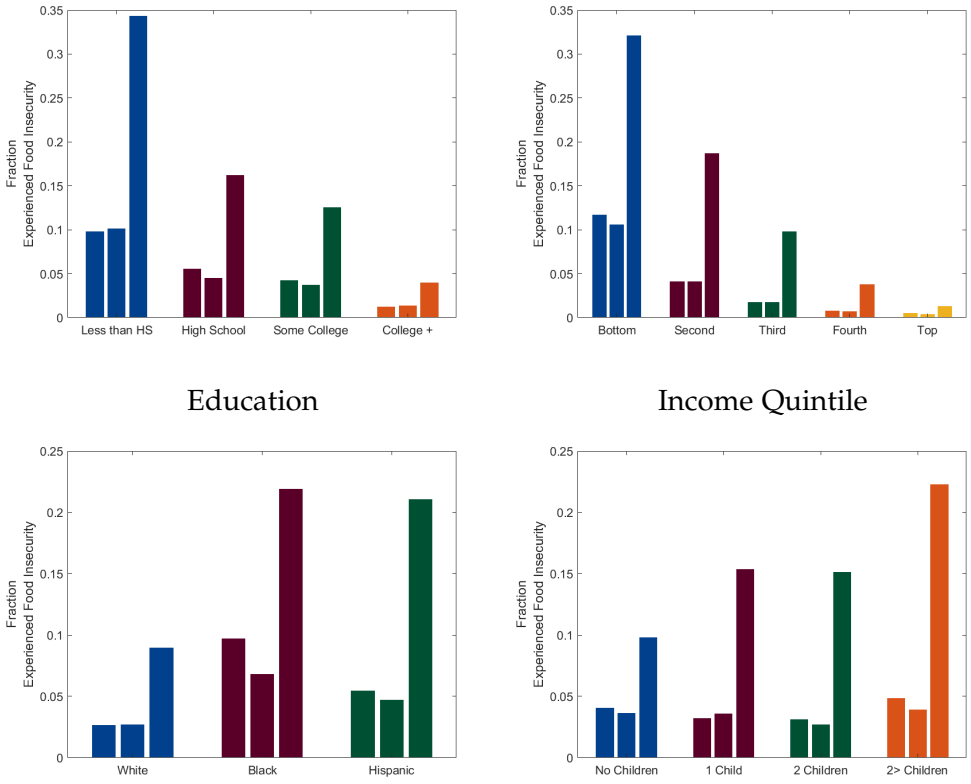
As households become vulnerable to declines in employment income during the pandemic, Blundell et al. (2020) have emphasized the role of safety nets to help mitigate the shocks experienced by households, arguing that these have been crucial policy levers used in the UK in response to the pandemic. In the case of the US, Moffitt and Ziliak

Table 11: Households' Probability of Experiencing Food Insufficiency During the Pandemic

| | (1) Food Ins. | (2) Food. Ins. | (3) Food Ins. | (4) Food Ins. | (5) Food Ins. | (6) Food Ins. | (7) Food Ins. | (8) Food Ins. |
|---|---|---|---|---|---|---|---|---|
| 𝟙(Black) | 0.117*** | | | 0.074*** | 0.102*** | 0.072*** | 0.060*** | 0.060*** |
| | (0.004) | | | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| 𝟙(Hispanic) | 0.103*** | | | 0.062*** | 0.070*** | 0.049*** | 0.034*** | 0.035*** |
| | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Other Race) | -0.012*** | | | -0.008*** | 0.002 | -0.002 | -0.010*** | -0.010*** |
| | (0.003) | | | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Bottom quintile) | | 0.275*** | | 0.255*** | | 0.219*** | 0.202*** | 0.196*** |
| | | (0.004) | | (0.004) | | (0.004) | (0.004) | (0.004) |
| 𝟙(Second quintile) | | 0.148*** | | 0.132*** | | 0.105*** | 0.097*** | 0.092*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.003) | (0.003) |
| 𝟙(Third quintile) | | 0.075*** | | 0.065*** | | 0.046*** | 0.044*** | 0.041*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(Fourth quintile) | | 0.023*** | | 0.018*** | | 0.009*** | 0.009*** | 0.008*** |
| | | (0.001) | | (0.001) | | (0.001) | (0.001) | (0.001) |
| 𝟙(Less than HS) | | | 0.230*** | | 0.204*** | 0.120*** | 0.101*** | 0.096*** |
| | | | (0.007) | | (0.007) | (0.007) | (0.007) | (0.007) |
| 𝟙(HS) | | | 0.113*** | | 0.103*** | 0.050*** | 0.043*** | 0.038*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) | (0.002) |
| 𝟙(Some College) | | | 0.077*** | | 0.069*** | 0.036*** | 0.029*** | 0.026*** |
| | | | (0.001) | | (0.001) | (0.001) | (0.001) | (0.001) |
| Household Size | | | | | | | 0.011*** | 0.011*** |
| | | | | | | | (0.001) | (0.001) |
| Num. of Children | | | | | | | 0.016*** | 0.016*** |
| | | | | | | | (0.001) | (0.001) |
| 𝟙(Employed) | | | | | | | -0.030*** | -0.027*** |
| | | | | | | | (0.002) | (0.002) |
| 𝟙(Female, Respondent) | | | | | | | -0.009*** | -0.008*** |
| | | | | | | | (0.002) | (0.002) |
| 𝟙(Married, Respondent) | | | | | | | -0.031*** | -0.032*** |
| | | | | | | | (0.002) | (0.002) |
| State Avg. Mobility, Retail | | | | | | | -0.058 | -0.057 |
| | | | | | | | (0.076) | (0.076) |
| State Avg. Mobility, Transit | | | | | | | 0.092 | 0.090 |
| | | | | | | | (0.069) | (0.069) |
| State Avg. Mobility, Grocery | | | | | | | -0.084 | -0.083 |
| | | | | | | | (0.070) | (0.070) |
| State Avg. Mobility, Workplaces | | | | | | | 0.026 | 0.025 |
| | | | | | | | (0.060) | (0.060) |
| State Avg. Mobility, Residential | | | | | | | -0.016 | -0.018 |
| | | | | | | | (0.069) | (0.069) |
| Avg. Num. of New Cases, State | | | | | | | 0.002 | 0.002 |
| | | | | | | | (0.008) | (0.008) |
| 𝟙(Switch to Tele-Work) | | | | | | | | -0.015*** |
| | | | | | | | | (0.002) |
| Constant | 0.093*** | 0.013* | 0.046*** | 0.005 | 0.028*** | -0.010 | -0.008 | -0.001 |
| | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.007) | (0.010) | (0.010) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $N$ | 833043 | 833043 | 833043 | 833043 | 833043 | 833043 | 833043 | 833043 |

(2020) and Bitler, Hoynes and Schanzenbach (2020) provide an overview of the types of social assistance programs that constitute the US safety net, highlighting the role of Unemployment Insurance (UI) and the Supplemental Nutrition Assistance Program (SNAP) as primary stabilizers for income losses incurred by households during economic downturns. The Pulse data allows investigating the different sources of spending income used by households. Figure 9 shows the share of households by socio-demographic groups relying on regular (pre-pandemic) income, credit cards, borrowing from family

Figure 8: Sometimes or Often Did Not Have Enough to Eat (Dec. 2018, Dec. 2019, Dec. 2020)

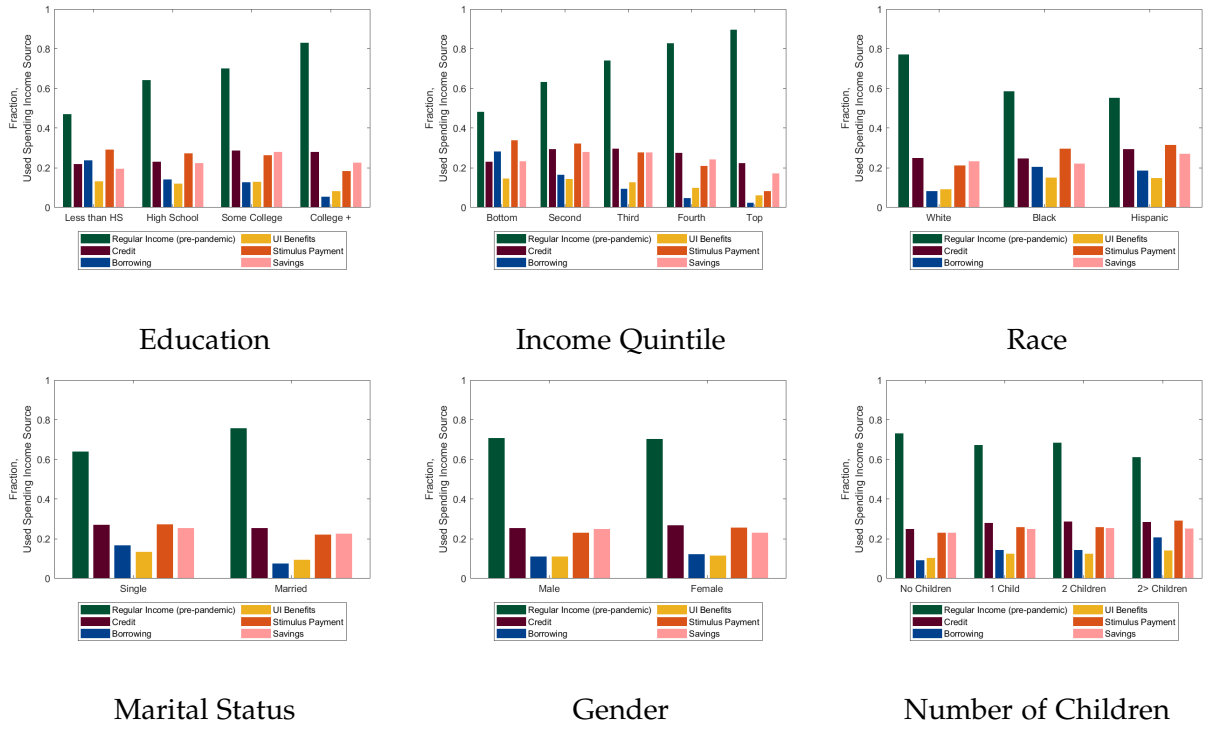



*Notes:* First bar corresponds to the fraction of households reporting food insufficiency in December 2018 and the second bar to the fraction of households reporting food insufficiency in December 2019 from the CPS. The third bar corresponds to the average across the 2 weeks of the Pulse collected in December 2020.

and friends, UI benefits, stimulus payments, and savings to meet their expenses during the pandemic.

Those groups facing a higher incidence of earnings losses in the household during the pandemic relied less on regular income and more on borrowing from family and friends, unemployment insurance benefits and the stimulus payment for spending than households that have been relatively less adversely affected in terms of employment income losses. It is noticeable that the use of regular pre-pandemic income decreases with household income. Nonetheless, the way households adjust to the loss of regular income varies as we move from the top of the distribution to the bottom. While the reliance on credit cards and savings seems to be prevalent among households in the bottom four quintiles, households in the bottom quintile seem to rely on borrowing from

Figure 9: Income Sources Used for Spending




Education | Income Quintile | Race

Marital Status | Gender | Number of Children

*Notes:* [1] Averages across weeks are reported. [2] Respondents are allowed to list multiple income sources so that spending source categories are not mutually exclusive.

family and friends and on the stimulus payment to a greater extent than households in the third and fourth quintiles. This suggests that their immediate family and friend networks served as a buffer for reductions in pre-pandemic income sources for low-income households.

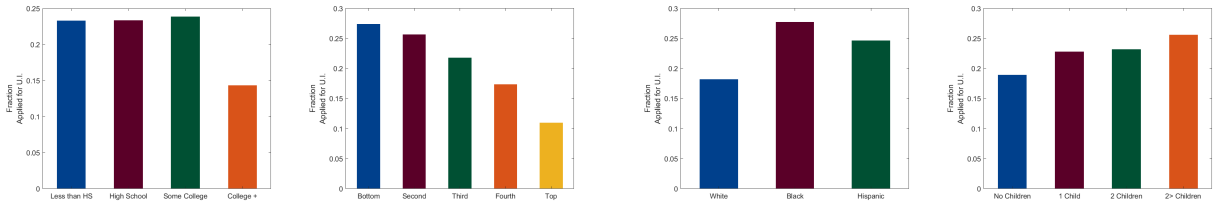
### 4.2.1 Use of Social Insurance Programs

Given the emphasis given to social insurance programs like UI and the groups of households reporting a higher share of employment income losses, it could have been expected that these socio-demographic groups would exhibit a higher reliance on UI benefits than their better-off counterparts. However, the gaps are quite narrow, especially among education groups without a college degree and among households in the bottom three quintiles of the income distribution. This is attuned with the criticism raised by Moffitt and Ziliak (2020) and Bitler, Hoynes and Schanzenbach (2020) that social insurance programs in the US have not been successful in responding to unmet household needs,

as evidenced by the relatively high incidence of food insufficiency among households in more disadvantaged socio-demographic groups due to delays, coverage gaps, and magnitude of the benefits, mainly related to UI. To investigate this, we check for differential patterns in individuals' decision to apply and, ultimately, in the receipt of UI benefits, for which the Pulse has information on since the start of Phase 2.

**Applying for Unemployment Insurance** The four panels of Figure 10 show that there exist differences with respect to respondents' education and race and their households' income and the number of children in their decision to apply for U.I. Table 12 presents the LPM results to assess the robustness of these differences to additional individual and household characteristics.

Figure 10: Respondent has Applied for UI since March 13th, 2020




Education | Income Quintile | Race | Num. of Children

*Notes:* Averages across all available weeks are reported.

Overall, we find that (1) non-white respondents were significantly more likely than their white counterparts to apply for U.I. during the pandemic, (2) respondents without a college degree were significantly more likely to apply for U.I. during the pandemic compared to college graduates, and (3) the probability of applying for U.I. during the pandemic monotonically decreases with household income. Furthermore, we find that the number of children in the household also increases the probability of applying for U.I., but having at least one adult in the household who switched to remote work during the pandemic reduces it.

**Receipt of Unemployment Insurance** The four panels in Figure 11 present differences with respect to respondents' education and race and their households' income, and the number of children in the receipt of U.I. conditional on applying for these benefits. It is noticeable that the gradients observed in the receipt of these benefits do not align

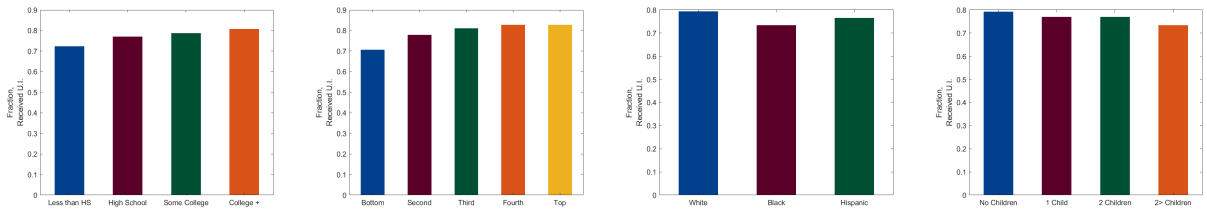
Table 12: Applied for Unemployment Insurance Benefits

| | (1) UI Apply | (2) UI Apply | (3) UI Apply | (4) UI Apply | (5) UI Apply | (6) UI Apply | (7) UI Apply | (8) UI Apply |
|---|---|---|---|---|---|---|---|---|
| 𝟙(Black) | 0.099*** | | | 0.071*** | 0.088*** | 0.070*** | 0.057*** | 0.058*** |
| | (0.004) | | | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| 𝟙(Hispanic) | 0.076*** | | | 0.047*** | 0.057*** | 0.043*** | 0.028*** | 0.029*** |
| | (0.004) | | | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| 𝟙(Other Race) | 0.008* | | | 0.014*** | 0.027*** | 0.025*** | 0.017*** | 0.018*** |
| | (0.005) | | | (0.005) | (0.005) | (0.005) | (0.005) | (0.005) |
| 𝟙(Bottom quintile) | | 0.183*** | | 0.167*** | | 0.135*** | 0.117*** | 0.101*** |
| | | (0.004) | | (0.004) | | (0.004) | (0.005) | (0.005) |
| 𝟙(Second quintile) | | 0.163*** | | 0.151*** | | 0.121*** | 0.111*** | 0.098*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) | (0.004) |
| 𝟙(Third quintile) | | 0.120*** | | 0.113*** | | 0.089*** | 0.086*** | 0.076*** |
| | | (0.003) | | (0.003) | | (0.003) | (0.003) | (0.003) |
| 𝟙(Fourth quintile) | | 0.072*** | | 0.068*** | | 0.054*** | 0.054*** | 0.049*** |
| | | (0.002) | | (0.002) | | (0.002) | (0.002) | (0.002) |
| 𝟙(Less than HS) | | | 0.120*** | | 0.100*** | 0.050*** | 0.039*** | 0.027*** |
| | | | (0.007) | | (0.007) | (0.007) | (0.007) | (0.007) |
| 𝟙(HS) | | | 0.106*** | | 0.098*** | 0.059*** | 0.057*** | 0.046*** |
| | | | (0.003) | | (0.003) | (0.003) | (0.003) | (0.003) |
| 𝟙(Some College) | | | 0.106*** | | 0.100*** | 0.073*** | 0.068*** | 0.061*** |
| | | | (0.002) | | (0.002) | (0.002) | (0.002) | (0.002) |
| Household Size | | | | | | | 0.010*** | 0.011*** |
| | | | | | | | (0.001) | (0.001) |
| Num. of Children | | | | | | | 0.012*** | 0.011*** |
| | | | | | | | (0.002) | (0.002) |
| 𝟙(Female, Respondent) | | | | | | | -0.007*** | -0.007*** |
| | | | | | | | (0.002) | (0.002) |
| 𝟙(Married, Respondent) | | | | | | | -0.048*** | -0.050*** |
| | | | | | | | (0.002) | (0.002) |
| State Avg. Mobility, Retail | | | | | | | 0.039 | 0.036 |
| | | | | | | | (0.099) | (0.099) |
| State Avg. Mobility, Transit | | | | | | | -0.186** | -0.190** |
| | | | | | | | (0.089) | (0.089) |
| State Avg. Mobility, Grocery | | | | | | | -0.007 | -0.005 |
| | | | | | | | (0.086) | (0.086) |
| State Avg. Mobility, Workplaces | | | | | | | -0.051 | -0.053 |
| | | | | | | | (0.074) | (0.074) |
| State Avg. Mobility, Residential | | | | | | | -0.026 | -0.031 |
| | | | | | | | (0.086) | (0.086) |
| Avg. Num. of New Cases, State | | | | | | | -0.006 | -0.006 |
| | | | | | | | (0.011) | (0.011) |
| 𝟙(Switch to Tele-Work) | | | | | | | | -0.037*** |
| | | | | | | | | (0.002) |
| Constant | 0.141*** | 0.047*** | 0.088*** | 0.038*** | 0.072*** | 0.014* | 0.036*** | 0.060*** |
| | (0.007) | (0.008) | (0.007) | (0.007) | (0.007) | (0.007) | (0.012) | (0.012) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 833958 | 833958 | 833958 | 833958 | 833958 | 833958 | 833958 | 833958 |

with the ones observed in Figure 10, but are instead reversed. Table 13 presents the LPM results to assess the robustness of these differences to additional individual and household characteristics.

Contrary to what we find for the decision to apply for U.I., we find that (1) non-white respondents were significantly less likely than their white counterparts to report receiving U.I. benefits during the pandemic conditional on applying for U.I., (2) only re-

Figure 11: Respondent has Received UI Benefits Conditional on Applying for UI since March 13th, 2020




Education Income Quintile Race Num. of Children

*Notes:* Averages across all available weeks are reported.

spondents with some college were less likely to receive U.I. benefits during the pandemic conditional on applying for U.I. compared to college graduates, and (3) the probability of receiving U.I. conditional on applying for it during the pandemic monotonically increases with household income.

### 4.2.2 Use of Economic Impact Payment

As aforementioned, Blundell et al. (2020) argue that the pandemic is expected to alter households' consumption patterns disparately. A way to assess this within the context of the US using the data available in the Pulse is to investigate the differences in the spending use made by households of the stimulus payments made to eligible individuals during the earlier months of the pandemic. Among families reporting at least one household member receiving a stimulus check, there are differences in households' use of the check for spending on necessities such as food, housing, and utilities and for savings. Figure 12 shows the share of households reporting the receipt of a stimulus check by socio-demographic groups that use this transfer for (1) food purchases, (2) other purchases, (3) housing and utilities, (4) debt repayment, (5) charitable donations, and (6) savings.

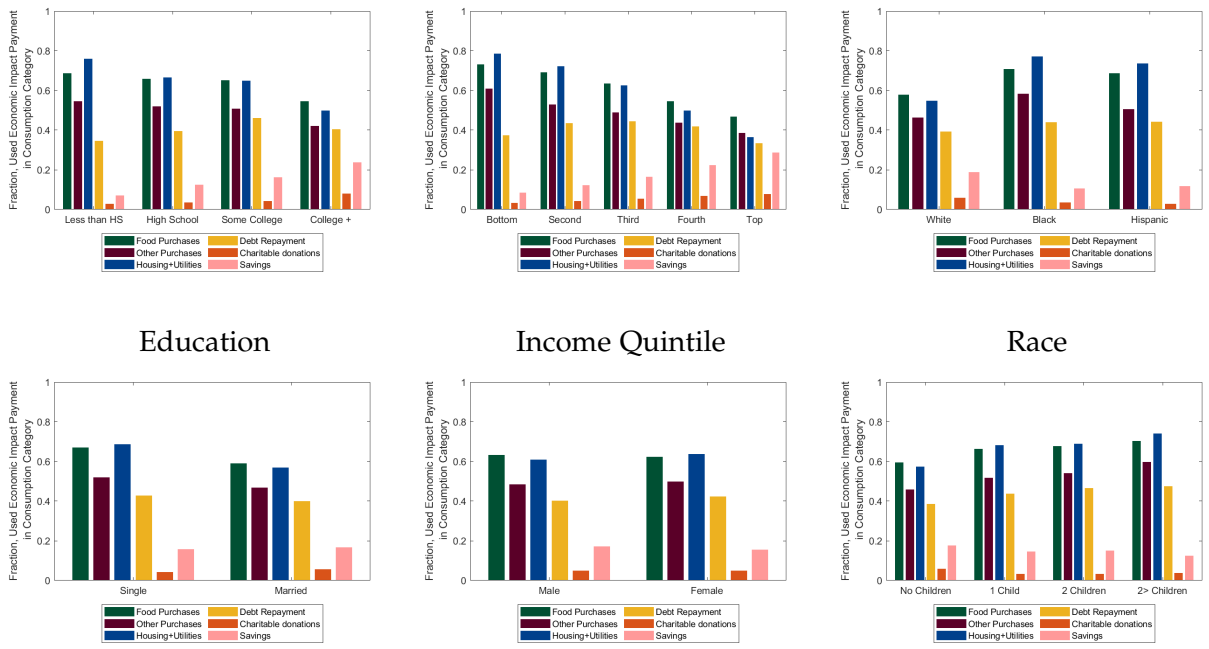
Overall, we find that socio-demographic groups with a higher share of households experiencing employment income losses during the pandemic also display a higher percentage of households using the stimulus payment to cover food expenditures and utilities than socio-demographic reporting a relatively lower incidence of employment income losses. These gaps are also evident in the share of households saving this additional income as this share increases monotonically with household income and respondents'

Table 13: Receipt of Unemployment Insurance Benefits, Conditional on Applying for UI

| | (1) UI Rec. | (2) UI Rec. | (3) UI Rec. | (4) UI Rec. | (5) UI Rec. | (6) UI Rec. | (7) UI Rec. | (8) UI Rec. |
|---|---|---|---|---|---|---|---|---|
| 𝟙(Black) | -0.060*** | | | -0.041*** | -0.057*** | -0.034*** | -0.032*** | -0.032*** |
| | (0.008) | | | (0.009) | (0.008) | (0.008) | (0.009) | (0.009) |
| 𝟙(Hispanic) | -0.047*** | | | -0.035*** | -0.039*** | -0.031*** | -0.020** | -0.020** |
| | (0.008) | | | (0.008) | (0.008) | (0.007) | (0.008) | (0.008) |
| 𝟙(Other Race) | 0.002 | | | 0.005 | 0.003 | 0.010 | 0.014 | 0.013 |
| | (0.010) | | | (0.010) | (0.010) | (0.010) | (0.010) | (0.010) |
| 𝟙(Bottom quintile) | | -0.104*** | | -0.092*** | | -0.087*** | -0.082*** | -0.089*** |
| | | (0.010) | | (0.010) | | (0.010) | (0.011) | (0.012) |
| 𝟙(Second quintile) | | -0.029*** | | -0.020** | | -0.020** | -0.017* | -0.023** |
| | | (0.009) | | (0.009) | | (0.009) | (0.010) | (0.010) |
| 𝟙(Third quintile) | | -0.001 | | 0.005 | | 0.004 | 0.003 | -0.002 |
| | | (0.009) | | (0.009) | | (0.009) | (0.009) | (0.010) |
| 𝟙(Fourth quintile) | | 0.012 | | 0.014* | | 0.014* | 0.011 | 0.008 |
| | | (0.008) | | (0.008) | | (0.008) | (0.008) | (0.009) |
| 𝟙(Less than HS) | | | -0.069*** | | -0.055*** | -0.026** | -0.017 | -0.022 |
| | | | (0.014) | | (0.014) | (0.013) | (0.014) | (0.014) |
| 𝟙(HS) | | | -0.020*** | | -0.013** | 0.002 | 0.007 | 0.002 |
| | | | (0.006) | | (0.006) | (0.006) | (0.006) | (0.006) |
| 𝟙(Some College) | | | -0.007* | | -0.002 | 0.007 | 0.012*** | 0.009* |
| | | | (0.004) | | (0.004) | (0.004) | (0.004) | (0.005) |
| Household Size | | | | | | | -0.013*** | -0.013*** |
| | | | | | | | (0.003) | (0.003) |
| Num. of Children | | | | | | | 0.002 | 0.001 |
| | | | | | | | (0.004) | (0.004) |
| 𝟙(Female, Respondent) | | | | | | | 0.008 | 0.008 |
| | | | | | | | (0.005) | (0.005) |
| 𝟙(Married, Respondent) | | | | | | | 0.032*** | 0.032*** |
| | | | | | | | (0.006) | (0.006) |
| State Avg. Mobility, Retail | | | | | | | 0.299 | 0.299 |
| | | | | | | | (0.231) | (0.231) |
| State Avg. Mobility, Transit | | | | | | | 0.071 | 0.067 |
| | | | | | | | (0.211) | (0.211) |
| State Avg. Mobility, Grocery | | | | | | | 0.072 | 0.076 |
| | | | | | | | (0.215) | (0.215) |
| State Avg. Mobility, Workplaces | | | | | | | -0.397** | -0.398** |
| | | | | | | | (0.160) | (0.160) |
| State Avg. Mobility, Residential | | | | | | | 0.031 | 0.029 |
| | | | | | | | (0.211) | (0.211) |
| Avg. Num. of New Cases, State | | | | | | | -0.016 | -0.016 |
| | | | | | | | (0.027) | (0.027) |
| 𝟙(Switch to Tele-Work) | | | | | | | | -0.018*** |
| | | | | | | | | (0.005) |
| Constant | 0.654*** | 0.669*** | 0.648*** | 0.676*** | 0.663*** | 0.674*** | 0.704*** | 0.715*** |
| | (0.023) | (0.025) | (0.024) | (0.025) | (0.024) | (0.024) | (0.034) | (0.034) |
| Survey Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *N* | 135917 | 135917 | 135917 | 135917 | 135917 | 147336 | 135917 | 135917 |

education and is higher for white respondents' households than for their non-white counterparts. This is consistent with the patterns observed in the previous subsection suggesting that the share of households relying on the stimulus payment as a spending income source is higher for those groups more adversely affected by the pandemic in terms of earnings and job security. A similar pattern can be observed with respect to education and between white respondents' households and non-white respondents' households.

Figure 12: How was the Economic Impact Payment Spent?




Education | Income Quintile | Race

Marital Status | Gender | Number of Children

*Notes:* [1] Averages across weeks are reported. [2] Information on the spending use made of the stimulus payment was collected only during weeks 7-12 of the Pulse. [3] Other purchases include: clothing, recreational goods, household items (for example, appliances), household supplies and personal care items. [4] Debt repayment includes payments towards credit card balances, student loans, and other loans.

# 5 Conclusion

Throughout the analysis implemented in this paper, we assess how the unequal impact of COVID-19 on employment relates to similar disparities in its effect on household consumption, especially on food insecurity and income buffers. Using data from the Pulse survey, supplemented with data from the CPS and state-level information on average mobility and COVID-19 cases, we present evidence of a comparable unequal impact of the pandemic on the education disruptions faced by school-aged children, food insecurity and households' reliance on social insurance programs and other forms of government assistance to compensate for the losses in regular income sources generated by the pandemic.

Focusing on employment, we find that employment income losses tend to be concentrated among households in the bottom quintiles of the income distribution and of respondents who are non-white and without a college degree. These gradients are re-

flective of the disparities we observe in the observed impact on non-employment due to business responses to the pandemic, due to sickness associated with the virus, and with the increased demand for child care at home generated by the containment measures set in place at the early stage of the COVID-19 crisis. Furthermore, we find that the gaps we observe in employment are related to individuals' ability to work from home during the pandemic, which displays similar differences across socio-demographic groups. Besides differences in workers' ability to switch to telework during the crisis, we find that differences in the adverse impact of the pandemic on employment can be partly attributed to the relatively high incidence of non-employment related to sickness associated with COVID-19 among non-white respondents. This is, in turn, reflects the documented unequal spread of the virus across racial groups.

In terms of consumption, we find similar disparities in food insufficiency. Specifically, we observe that households of blacks and Hispanics, of respondents without a college degree and living in households at the lower quintiles of the income distribution were significantly more likely to report not having enough to eat during the pandemic. Similarly, we find that these socio-demographic groups relied significantly more on borrowing from family and friends and the economic impact payment (EIP), which is aligned with the disparities observed in employment income losses. Furthermore, despite there existing similar differences in the demand for U.I. benefits, we find that these do not necessarily translate to disparities in the receipt of U.I., thereby limiting the extent to which we document similar disparities in households' reliance on U.I. as a buffer for the losses incurred in employment income during the pandemic.

Overall, we find that socio-demographic groups with a higher share of households experiencing employment income losses during the pandemic also displayed a higher incidence of food insecurity and relied more heavily on alternative income sources to meet spending needs during the pandemic. Thus, the provision of adequate financial assistance for those groups more adversely impacted by the pandemic in terms of earnings losses is of particular importance given the pervasiveness with which observed employment disparities have translated into disparities in households' access to different income sources as buffers to mitigate the brunt of the pandemic shock, which has ultimately affected households' propensity to experience food insecurity during the pandemic.

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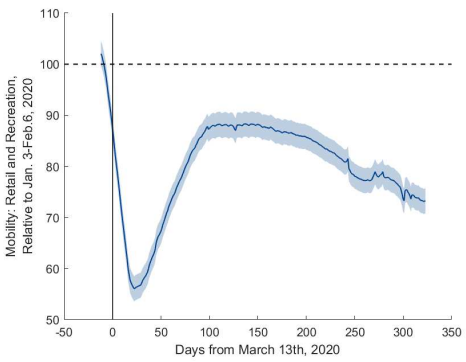
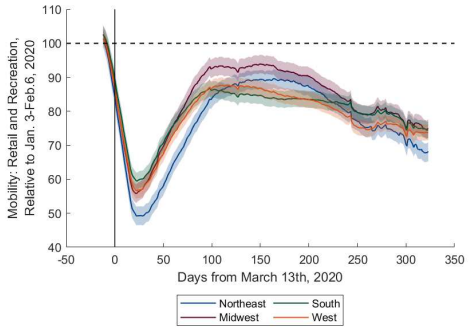
# A Appendix: Supplemental Graphs

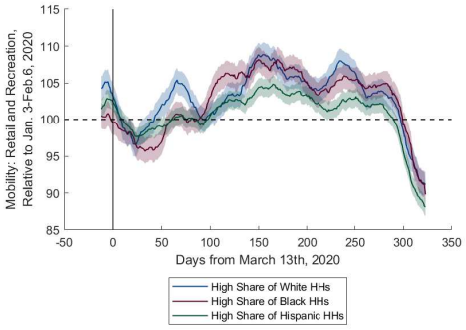
Figure 13: Changes in Retail Mobility Relative to January 3-February 6, 2020, Overall [Data from Google Mobility Reports]



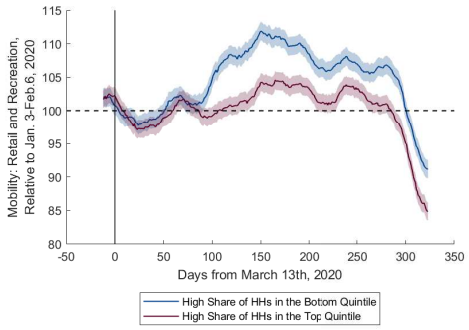

Overall



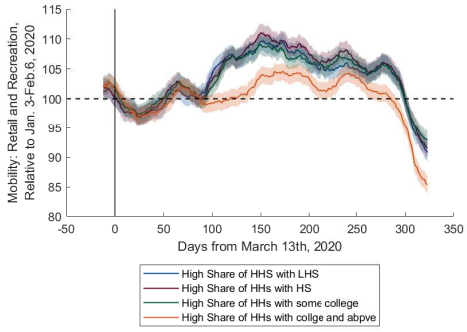

By Census Bureau-Designated Region




By Race



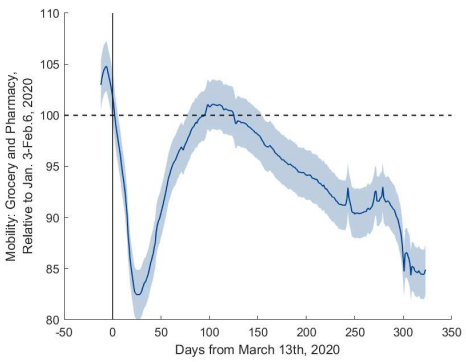

By Income



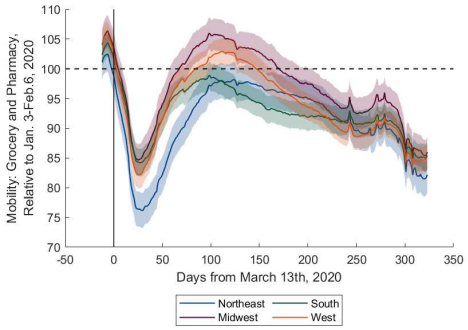

By Education

*Notes:* [1] Each day's baseline is the median day-value during the 5-week period spanning January 3rd, 2020 - February 6th, 2020. [2] The mobility index has been changed to a 100-based scale, so that the reference period used by Google assumes a value of 100 as in Bargain and Aminjonov (2020). Thus, mobility values lower than 100 imply decreases in a particular type of mobility relative to the reference period. [3] 30-day moving average presented [4] March 13th, 2020 pinpoints the date in which COVID-19 is officially declared a national emergency in the US.

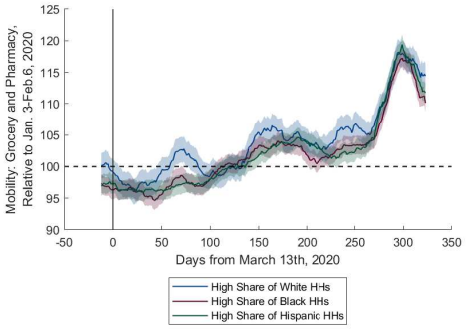
Figure 14: Changes in Grocery Store Mobility Relative to January 3-February 6, 2020, Overall [Data from Google Mobility Reports]



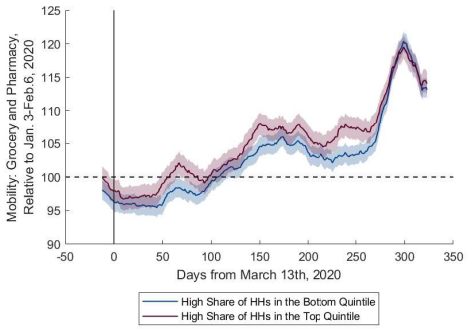

Overall



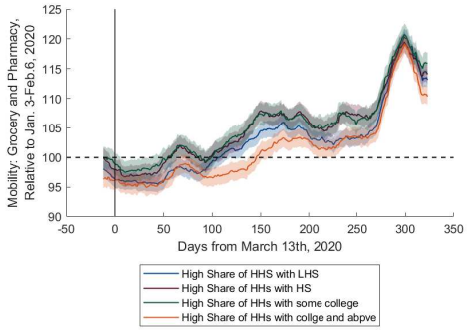

By Census Bureau-Designated Region




By Race



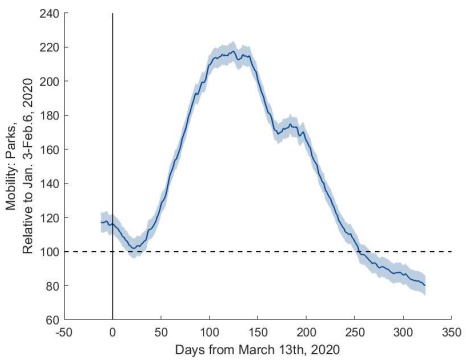

By Income



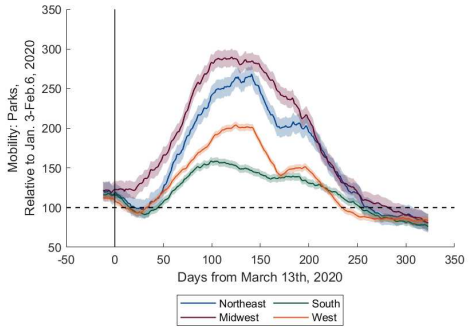

By Education

*Notes:* [1] Each day's baseline is the median day-value during the 5-week period spanning January 3rd, 2020 - February 6th, 2020. [2] The mobility index has been changed to a 100-based scale, so that the reference period used by Google assumes a value of 100 as in Bargain and Aminjonov (2020). Thus, mobility values lower than 100 imply decreases in a particular type of mobility relative to the reference period. [3] 30-day moving average presented [4] March 13th, 2020 pinpoints the date in which COVID-19 is officially declared a national emergency in the US.

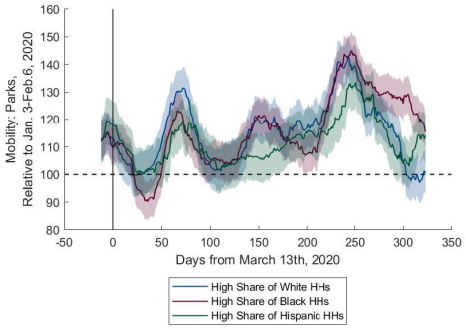
Figure 15: Changes in Parks Store Mobility Relative to January 3-February 6, 2020, Overall [Data from Google Mobility Reports]



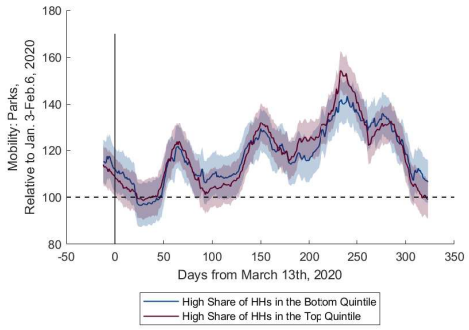

Overall



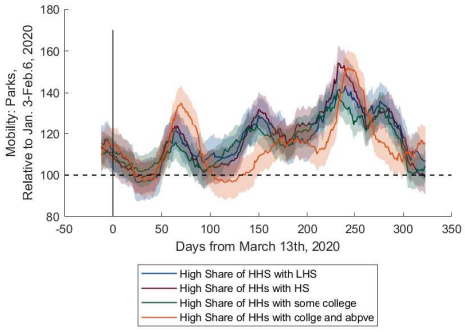

By Census Bureau-Designated Region




By Race



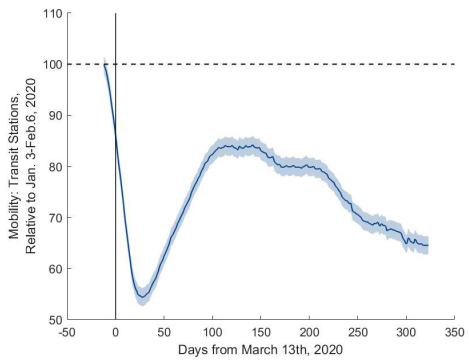

By Income



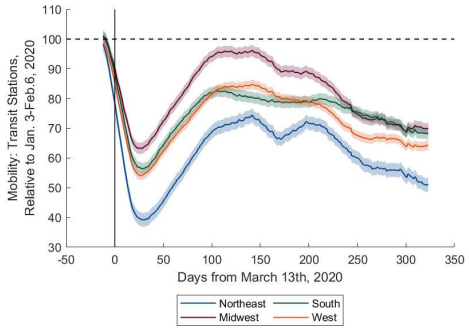

By Education

*Notes:* [1] Each day's baseline is the median day-value during the 5-week period spanning January 3rd, 2020 - February 6th, 2020. [2] The mobility index has been changed to a 100-based scale, so that the reference period used by Google assumes a value of 100 as in Bargain and Aminjonov (2020). Thus, mobility values lower than 100 imply decreases in a particular type of mobility relative to the reference period. [3] 30-day moving average presented [4] March 13th, 2020 pinpoints the date in which COVID-19 is officially declared a national emergency in the US.

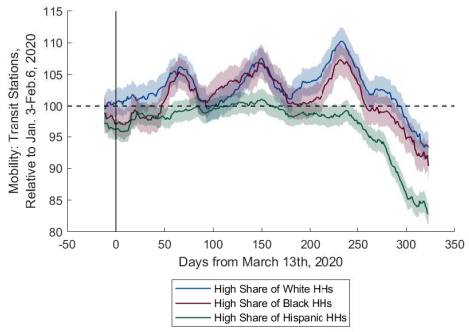
Figure 16: Changes in Transit Station Mobility Relative to January 3-February 6, 2020, Overall [Data from Google Mobility Reports]



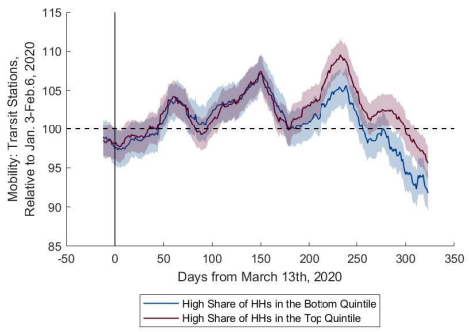

Overall



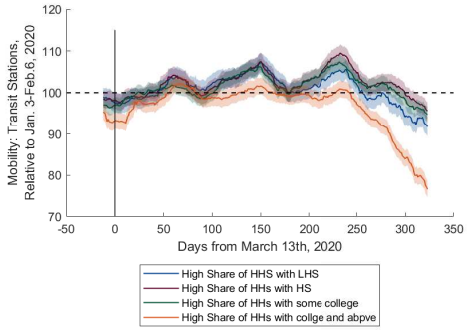

By Census Bureau-Designated Region




By Race



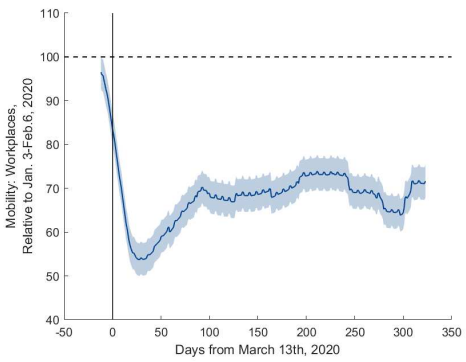

By Income



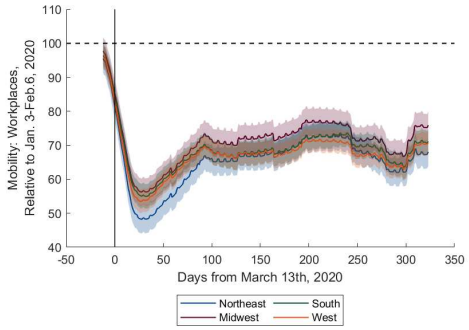

By Education

*Notes:* [1] Each day's baseline is the median day-value during the 5-week period spanning January 3rd, 2020 - February 6th, 2020. [2] The mobility index has been changed to a 100-based scale, so that the reference period used by Google assumes a value of 100 as in Bargain and Aminjonov (2020). Thus, mobility values lower than 100 imply decreases in a particular type of mobility relative to the reference period. [3] 30-day moving average presented [4] March 13th, 2020 pinpoints the date in which COVID-19 is officially declared a national emergency in the US.

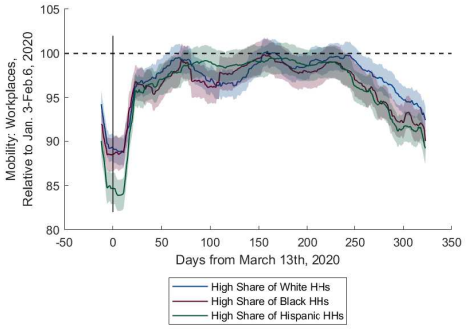
Figure 17: Changes in Workplace Mobility Relative to January 3-February 6, 2020, Overall [Data from Google Mobility Reports]



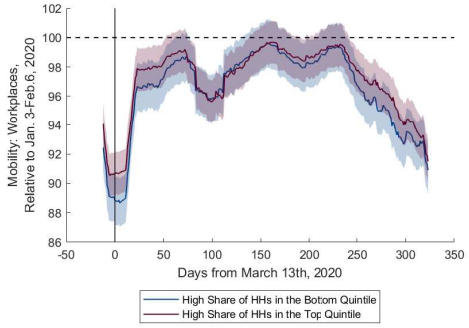

Overall



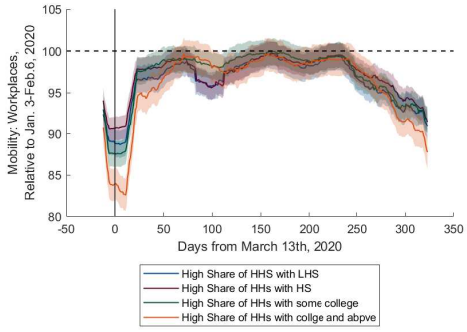

By Census Bureau-Designated Region




By Race



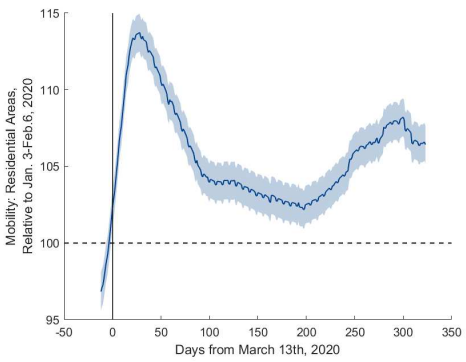

By Income



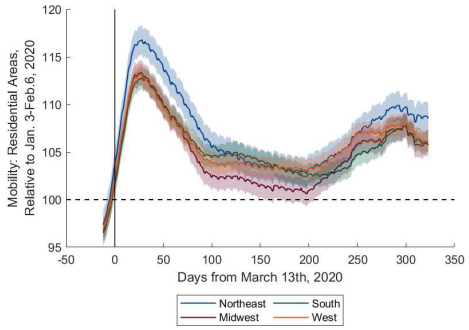

By Education

*Notes:* [1] Each day's baseline is the median day-value during the 5-week period spanning January 3rd, 2020 - February 6th, 2020. [2] The mobility index has been changed to a 100-based scale, so that the reference period used by Google assumes a value of 100 as in Bargain and Aminjonov (2020). Thus, mobility values lower than 100 imply decreases in a particular type of mobility relative to the reference period. [3] 30-day moving average presented [4] March 13th, 2020 pinpoints the date in which COVID-19 is officially declared a national emergency in the US.

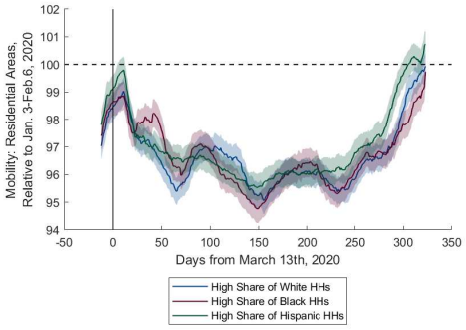
Figure 18: Changes in Residential Area Mobility Relative to January 3-February 6, 2020, Overall [Data from Google Mobility Reports]



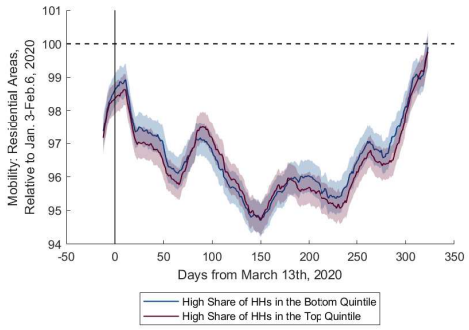

Overall



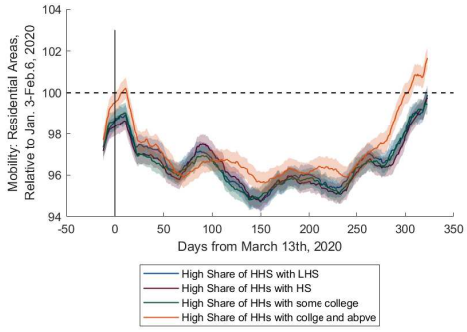

By Census Bureau-Designated Region




By Race




By Income




By Education

*Notes:* [1] Each day's baseline is the median day-value during the 5-week period spanning January 3rd, 2020 - February 6th, 2020. [2] The mobility index has been changed to a 100-based scale, so that the reference period used by Google assumes a value of 100 as in Bargain and Aminjonov (2020). Thus, mobility values lower than 100 imply decreases in a particular type of mobility relative to the reference period. [3] 30-day moving average presented [4] March 13th, 2020 pinpoints the date in which COVID-19 is officially declared a national emergency in the US.