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Original article

COVID-19 Recession: Young Adult Food Insecurity, Racial Disparities, and Correlates

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A B S T R A C T

Purpose: The COVID-19 pandemic has inflicted devastating health, social, and economic effects globally. This study examines the experiences of young adults in the United States with respect to food insecurity during the pandemic and factors associated with higher and lower risk for young adult food insecurity.

Methods: Using the U.S. Census Bureau's Household Pulse Survey, a nationally representative survey collecting information on people's experiences throughout the pandemic, we analyzed prevalence of, and factors associated with young adult food insecurity during the pandemic.

Results: Overall, 13% of young adults aged 18–25 years reported often or sometimes not having enough to eat in the last 7 days at a given time during pandemic, on average, with Black and Hispanic young people facing higher rates of food insecurity (22% and 15%, respectively) than White non-Hispanic peers (11%). Over the observed pandemic period, we find a decline in food insecurity among young adults corresponding with economic policy actions. Factors associated with a higher risk of food insecurity include lower household income, expected job loss, renting as opposed to owning housing, behind on rent or mortgage payment, lack of confidence in an ability to pay next month's rent or mortgage, delayed medical care, and feeling worried or depressed.

Discussion: Our analyses reveal alarming levels of food insecurity among young adults, especially Black and Hispanic young people. Policy actions should include multifaceted and sustained interventions with a focus on supporting historically disenfranchised youth and their communities. These should prevent and address food and housing insecurity and mental health needs holistically.

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IMPLICATIONS AND CONTRIBUTION

This study leverages a nationally representative dataset to provide insights into the prevalence, racial disparities, and correlates of young adult food insecurity during the pandemic. The results underscore the need for policies that address food and housing insecurity and mental health needs holistically with a focus on youth of color.

The COVID-19 pandemic has had a devastating toll on the health and wellbeing of scores of people in the United States and across the world. Even as vaccines reach more Americans every day, communities across the country continue to face myriad health, economic, and social effects of this unprecedented crisis.

Conflicts of interest: The authors have no conflicts of interest to declare.

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Ample evidence underscores that the effects of the pandemic, and its subsequent strains on the economy, have exacerbated pre-existing health and socioeconomic inequalities. The economic recession, which began in February 2020, created historic unemployment highs [1]. However, for many individuals and households, the recession also put in jeopardy their ability to secure their basic needs and cope with a shock as extensive and prolonged as COVID-19.

Although much attention has been paid to the high morbidity and mortality of older populations related to COVID-19 [2], and

related racial disparities [3], comparatively little attention has been paid in research and public discourse to the unique experiences, hardships, and inequities among young people amidst the pandemic. An early analysis has suggested that as we look beyond the direct physical health consequences of COVID-19 to the broader social, economic, and mental health implications, young adults face a much more pronounced set of issues requiring urgent policy action [4–7]. Previous descriptive analysis of the same Household Pulse Survey (HPS) data used for the present study comparing pre-COVID-19 and post-COVID-19 reports of food insecurity underscored that high levels of young adult food insecurity existed prior to the pandemic, as did racial disparities [8]. The study also found that the prevalence of food insecurity increased similarly across observed racial and ethnic groups by approximately 3–4 percentage points from shortly before to during the pandemic.

In this study, we examine young adults' experiences with racial disparities in and correlates of food insecurity during the pandemic. The experience of food insecurity among young people represents a direct adversity and affront to a basic human right and need during a key developmental stage of life, and it is also associated with other negative outcomes across the lifespan [9,10]. Studies of young adults and college students have shown relationships between food insecurity and a range of negative outcomes, including diabetes, hypertension, obesity, disordered eating, less nutritious diets, stress, depression, suicidal ideation, substance use problems, sexual risk behaviors, and lower academic achievements [11–18]. As such, racial disparities in young adult food insecurity can have spillover consequences in multiple other facets of perpetuated disparities and injustices. This study involves analysis of a large, publicly available dataset with a focus on young adults' experiences with food insecurity amidst the pandemic.

As per the National Bureau of Economic Research, the COVID-19 recession began in February 2020. By April 2020, the unemployment rate for individuals aged 20 to 24 years reached a peak of 26%, over three times higher than the rate in January [19]. Young adults aged 18–24 years experienced a substantially larger increase in unemployment after the onset of the pandemic than did older adults aged 25–54 years [20]. While all racial and ethnic groups of young people faced higher unemployment rates after the pandemic, during the summer of 2020, the unemployment rate among White young adults declined while continuing to grow for Hispanic, Black, and Asian young adults. These precarious conditions place young people, especially those who are Black, Indigenous, or people of color (BIPOC), at risk for experiencing increased hardship when meeting their basic needs, such as food and nutrition and the subject of this study's analysis. Previous literature indeed shows strong relationships between food insecurity and unemployment and job or income loss, both before and during the pandemic [21–23]. Yet, the relationships between unemployment, economic hardships, and food insecurity among young adults have had less investigation. Given the disproportionate effects of the pandemic on precarious (e.g., part-time, nonsalaried) jobs disproportionately held by young people—especially BIPOC young adults—this represents an important blind spot we set out to address with this analysis.

Previous research shows significant correlations between food and housing insecurity [8], suggesting the need for more holistic social policies to address these material hardships simultaneously. Because homelessness and housing insecurity disparately affect BIPOC young adults [8,24], we expect that these

adversities contribute to racial/ethnic disparities in food insecurity. The extant literature also documents relationships between food insecurity and negative mental health outcomes [25–28]. This might relate to the stressors that material hardship imposes on mental health; feelings of guilt, shame, and social isolation that can accompany food insecurity; and underlying factors that can contribute to both food insecurity and negative mental health, such as poor access to healthcare, housing, or desirable jobs; community deprivations; and exposure to adverse childhood experiences [25].

In the context of general concerns with the heightened social and economic hardship that many households have faced over the course of the pandemic, the Federal Government has responded with a series of policy investments through the Coronavirus Aid, Relief, and Economic Security Act, the COVID-related Tax Relief Act, and the American Rescue Plan. For example, the Federal Government has provided three rounds of direct relief payments, called Economic Impact Payments (EIPs), during the COVID-19 crisis, which included payments of up to \$1,200–1,400 per eligible adult and additional payments for qualifying children. These policies have also provided additional economic assistance to eligible individuals and households via increased unemployment compensation, child tax credits, and emergency rental assistance, among other mechanisms. Descriptive analysis of HPS data suggests that at least short-term reductions in food insufficiency, financial instability [29], and adverse mental health symptoms have coincided with these cash transfers and supports, but we lack evidence on the implications for young adults specifically who have faced unique difficulties during the pandemic, especially Black and Hispanic young adults.

Furthermore, previous research suggest that young adults—especially BIPOC and low-income young people—often face particularly acute difficulties to accessing government assistance, safety nets, and tax credits, such as less experience with navigating the significant bureaucracies administering these resources, eligibility hurdles, lack of awareness of resources for which they are eligible, and lack of access to documentation, information, or financial services required to enroll in or receive assistance [30]. Such factors could diminish the extent to which young people's exposure to food insecurity might be allayed by recent policy investments.

This study's analysis builds on previous descriptive analysis of HPS data on young adult food and housing insecurity and racial disparities described above by addressing two research objectives [8]. First, we examine the extent to which policy measures in the form of direct financial assistance have coincided with variations in the prevalence and racial disparities of food insecurity among young people. Second, we examine factors associated with young adult food insecurity that can help improve our understanding of who is most at risk and the circumstances that underlie racial disparities.

Methods

Data

We use the United States Census Bureau's HPS for our analysis. The HPS is a 20-minute online survey designed to rapidly collect data on the impact of the coronavirus epidemic on people's lives. It includes a host of demographic, economic, and health factors (See the Household Plus Survey webpage for more details). Data are representative at the national and state level

and for the 15 largest U.S. metropolitan areas. Households selected to participate in the survey are interviewed once, randomly selected using their address, and e-mailed or texted a link to complete the survey. In Phase 1, a household that completed an interview was included in up to two additional survey weeks (See the Household Pulse Survey Technical Documentation for more details). For our analysis, we examined population trends over time as opposed to longitudinal trends.

Currently, the HPS has three main phases and four subphases, distinguished by data collection approval from the Office of Management and Budget (For more details, see 2021 Household Pulse Survey User Notes for Phase 3.1). In Phase 1, the survey was conducted weekly from April 23, 2020 to July 21, 2020. Phases 2 and 3 were conducted biweekly. The 22nd survey week includes a new question on whether anyone in the household received an EIP in the past seven days. To examine the relationship between EIPs and food insecurity for young adults when stratifying by race and ethnicity, our analysis focused on a pooled cross-section of the biweekly phases covering survey weeks 22–31, encompassing Phase 3 through Phase 3.1. Survey week 22 began on January 6, 2021 and week 31 ended on June 7, 2021.

Measuring food insecurity

Food insecurity represents a multifaceted construct that is only partially captured through most brief, multitopic survey instruments, including the U.S. Census Bureau's HPS that we leveraged for this study. Food insecurity has involved different interpretations and dimensions, including food availability in a given geography, individuals or households' access to food, utilization of food through an adequate diet and clean water, and the stability of food access over time [31]. These interpretations have focused on both households and individuals [30]. The brief food insecurity measure included in the HPS gauges access to food—frequency of not having enough to eat and not having enough of the kinds of food the respondents or their household wanted to eat. As such, we gain a simple snapshot of one dimension of young people's food insecurity.

The HPS solicits responses on food sufficiency in the past seven days, which include the following responses: "Enough of the kinds of food (I/we) wanted to eat;" "Enough but not always the kinds of food (I/we) wanted to eat;" "Sometimes not enough to eat;" and "Often not enough." (Respondents could provide nonresponse by not selecting any of the options) As our analysis focused on examining covariates associated with sufficient levels of sustenance relative to insufficient levels, we transform HPS's question on food sufficiency in the past seven days to a dichotomous indicator, where zero indicates the respondent reported enough food to eat and one indicates the respondent reported often or sometimes not enough to eat.

Analyses

Our analysis identified 21 important covariates associated with the odds of experiencing food insecurity for young adults during the COVID-19 pandemic: receiving an EIP, race and ethnicity, gender, age, marital status, number of adults in the household, number of children in the household, educational attainment, homeownership, rent or mortgage delinquency, confidence in the ability to pay rent or mortgage, income, expected job loss, employment status, Supplemental Nutrition Assistance Program beneficiary status, insurance coverage, delay

in medical treatment, and mental health factors, such as anxiety, worry, and depression. Detailed definitions of the variables and coding are provided in Table A1 (To determine the respondent's racial and ethnic group, we rely on the constructed race and ethnicity survey responses provided by the public data files for the HPS). The analysis also includes an interaction term between EIP and race and ethnic identity of the young adult respondent to examine the stratified association of an EIP on food insecurity by racial or ethnic group. We characterized a respondent as a young adult if they were between the ages of 18 and 25 years (Eighteen years is the minimum age of a survey respondent). Furthermore, we estimated our model results using Poisson regression analysis, with relative risk and 95% confidence intervals (CIs) reported (In addition, *p* values are reported in Table A2). We present adjusted Risk Ratios (aRRs) because these represent the relative risk of reporting food insecurity associated with a given variable after having controlled (or "adjusted") for all other variables in the model. All results employ person-level weights and are nationally representative and adjust for nonresponse.

This study received a nonhuman subjects research determination from the University of Chicago Crown Family School of Social Work and Chapin Hall Institutional Review Board (IRB 20-2166).

Sample characteristics

The young adult sample size of the HPS for phases 13 to 31 consists of 60,843 observations, accounting for about 4% of the total sample. Relative to other age groups, young adults are undersampled given that this age group makes up 14% of the U.S. adult population (We used the U.S. Census Bureau's 2019 population estimates for the number of 18-year-olds to 25-year-olds (34,758,265) and the number of adults aged 18 years and more (255,200,373) in the U.S. population). Nonetheless, the survey provides a substantial pooled cross-section of respondents that we stratify by race, income, age, homeownership, and other meaningful covariates for explaining food insecurity among young adults.

Results

Food insecurity trends and summary statistics

Evaluating data on food sufficiency from the HPS, the racial and ethnic gap in food insecurity between Black and White young adults and Hispanic and White young adults substantially fell by the start of 2021 (Figure 1). Based on weighted estimates of survey respondents from the HPS, 56.8%, 8.0%, 6.9%, 4.5%, and 23.8% of young adults are identified as White (non-Hispanic), Black (non-Hispanic), Asian (non-Hispanic), multiracial or other racial groups (non-Hispanic), and Hispanic. The COVID-19 period is particularly unique due to the substantial economic interventions that occurred. These interventions include EIPs, increases in unemployment benefits, rent and mortgage moratoriums, and more, which provide potential confounding factors for studying food insufficiency. Understanding the effects of economic, housing, and health-related policy interventions during the pandemic can inform future policymaking related to both acute and longstanding adversities.

Our analysis includes 21 covariates to test associations with food insecurity. Table 1 provides nationally representative summary estimates of food insecurity and characteristics from the

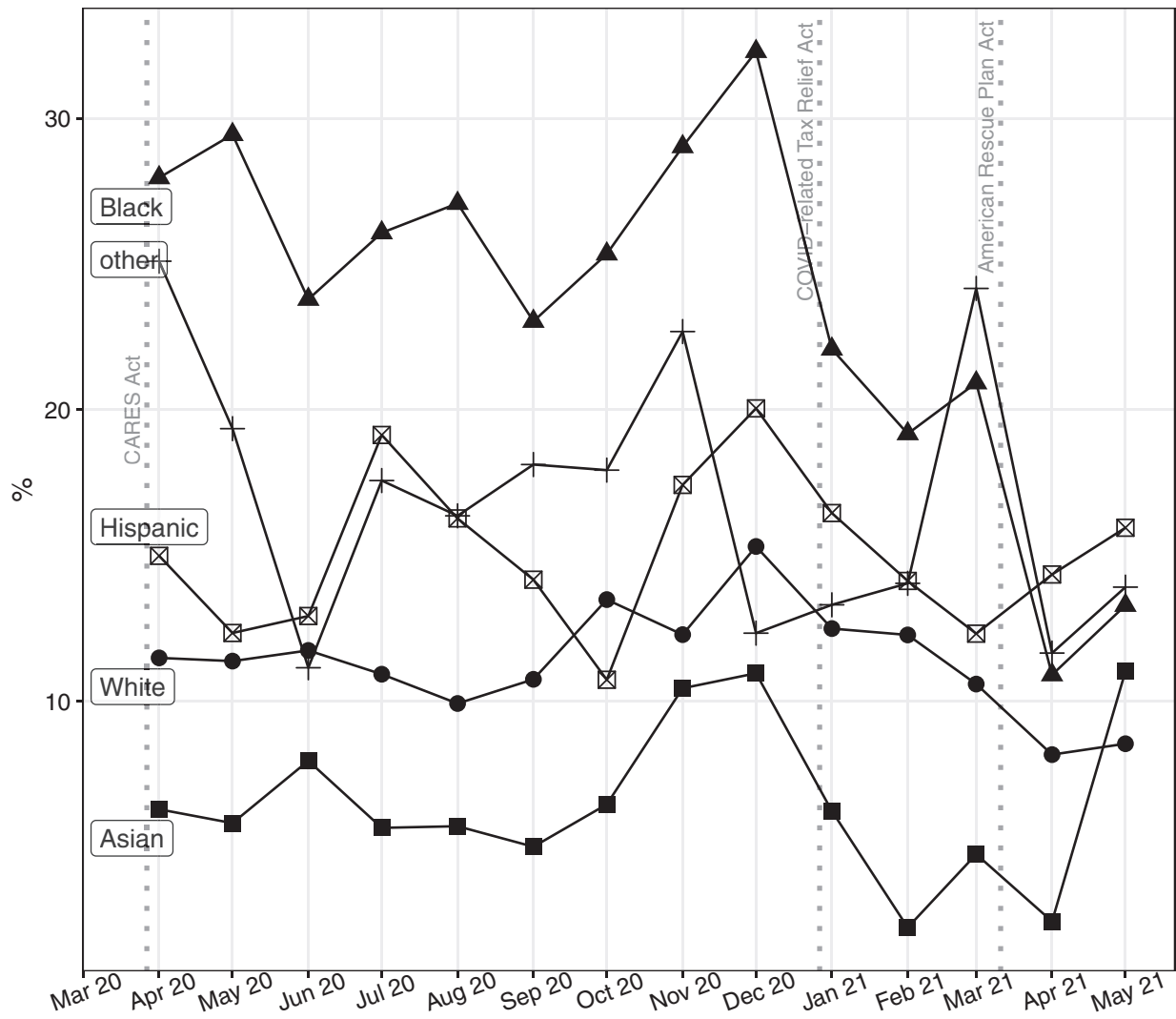


Figure 1. Share of young adults (ages 18–25 years) reporting having not enough food to eat often or sometimes in the past 7 days (mean). Note: Weekly averages rely on person-level weights for survey weeks 1 to 31. Monthly averages are reported. Author's analysis of the Household Pulse Survey. See IRS, RAAS, Economic Impact Payment (EIP) round reports for act dates.

HPS for young adults during our sample period. Black young adults had the highest prevalence of experiencing food insecurity at 17%. Hispanic young adults had the second-highest prevalence of food insecurity at 15%, followed by White young adults at 11% and Asian young adults at 5%. Overall, 12% of young adults aged 18–25 years reported often or sometimes not having enough to eat in the last 7 days at a given time during the pandemic, on average.

For all racial groups, 27% of young adults had a pretax household income of less than \$25,000, where Black young adults had the highest share (38%) in this income group. By comparison, 14% of the overall adult population, and 24% of the overall Black adult population, in the sample reported a pretax household income of less than \$25,000. Furthermore, 54% of the young adults had a pretax income of less than \$50,000. During the survey period, most young adults did not expect someone in their household to experience a job loss due to COVID-19 over the next month, with White young adults having the lowest share of

individuals expecting a loss to occur at 12%, followed by Asian youth at 20%, Black youth at 23%, and Hispanic youth at 23%. A sizeable share of young adults did not work for pay over the past week during each survey round of the study period; most of the Asian young adults (52%) did not work during the pandemic, followed by Black (44%), Hispanic (41%), and White young adults (37%).

Most (95%) young adults lived in a household with two or more adults, where Black young adults had the lowest share at 90%. Asian and Hispanic youth had similar shares at 97% and White youth had the second-lowest share at 95%. Most young adults completed high school or had some level of a college education. Asian young adults had the highest share of individuals with an associate, bachelor's, or graduate degree at 28%, followed by White, Black, and Hispanic young adults at 21%, 17%, and 16%, respectively. Finally, homeownership rates materially varied when stratified by race. For Asian young adults, 63% owned with or without a mortgage, followed by White young

Table 1
Descriptive characteristics of young adults in the sample (weighted estimates) (N = 26,043)

Characteristics	White (non-Hispanic) (n = 16,127, 56.8%)		Black (non-Hispanic) (n = 1,683, 8.0%)		Asian (non-Hispanic) (n = 2,064, 6.9%)		Other (non-Hispanic) (n = 1,668, 4.5%)		Hispanic (n = 4,501, 23.8%)		Overall (N = 26,043, 100%)	
	n	%	n	%	n	%	n	%	n	%	n	%
Food insecurity (past 7 days)												
Enough food to eat	11,183	89.5%	920	82.6%	1,432	94.7%	1,077	84.1%	2,785	85.2%	17,397	88.1%
Often or sometimes not enough to eat	1,161	10.5%	218	17.4%	86	5.3%	194	15.9%	430	14.8%	2,089	11.9%
Received an economic impact payment (past 7 days)												
No	9,715	75.5%	893	74%	1,025	62%	972	74%	2,267	67%	14,872	72%
Yes	3,361	24.5%	330	26%	613	38%	348	26%	1,028	33%	5,680	28%
SNAP recipient												
No	11,588	93.60%	859	77.70%	1,400	91.30%	1,095	86.60%	2,782	87.20%	17,724	90.50%
Yes	608	6.40%	263	22.30%	96	8.70%	151	13.40%	388	12.80%	1,506	9.50%
Income												
Less than \$25,000	2,569	24.2%	305	37.5%	253	22.5%	269	26.9%	680	31.4%	4,076	26.7%
\$25,000–\$34,999	1,217	12.9%	116	17.4%	123	11.8%	122	13.4%	377	18.5%	1,955	14.4%
\$35,000–\$49,999	1,142	12.4%	88	11.5%	113	11.2%	100	10.8%	337	15.4%	1,780	12.8%
\$50,000–\$74,999	1,248	14.1%	93	13.4%	155	14.5%	128	15.6%	330	13.6%	1,954	14.0%
\$75,000–\$99,999	838	10.8%	60	9.1%	107	9.6%	71	8.7%	177	7.9%	1,253	9.9%
\$100,000–\$149,999	942	12.5%	45	7.9%	130	12.2%	94	11.9%	171	7.5%	1,382	11.1%
\$150,000–\$199,999	417	5.3%	12	1.2%	82	7.2%	39	5.7%	69	3.0%	619	4.7%
\$200,000 and more	531	7.9%	16	2.0%	97	11.0%	41	7.0%	55	2.8%	740	6.5%
Expected household job loss due to COVID												
No	14,047	87.7%	1,258	77.3%	1,683	79.6%	1,371	83.2%	3,444	76.6%	21,803	83.5%
Yes	1,778	12.3%	381	22.7%	349	20.4%	285	16.8%	959	23.4%	3,752	16.5%
Work for pay or profits (past 7 days)												
No	4,871	37.2%	692	44.2%	900	52.1%	659	43.6%	1,637	41.0%	8,759	40.0%
Yes	10,954	62.8%	949	55.8%	1,131	47.9%	998	56.4%	2,763	59.0%	16,795	60.0%
2 + Adults in Household												
No	2,290	5.3%	379	10.1%	241	3.2%	242	4.9%	429	3.3%	3,581	5.0%
Yes	13,837	94.7%	1,304	89.9%	1,823	96.8%	1,426	95.1%	4,072	96.7%	22,462	95.0%
Educational attainment												
Less than high school	146	1.6%	14	0.8%	20	1.5%	17	2.1%	88	3.6%	285	2.0%
Some high school	880	10.3%	95	7.3%	106	9.9%	113	8.5%	280	9.6%	1,474	9.8%
High school graduate	2,600	28.8%	406	39.8%	231	22.0%	369	32.9%	1,020	35.8%	4,626	31.0%
Some college	6,745	38.4%	715	35.5%	774	38.2%	708	40.6%	1,911	35.1%	10,853	37.5%
Associate's degree	987	5.1%	112	6.1%	83	3.2%	74	4.0%	340	6.2%	1,596	5.3%
Bachelor's degree	4,224	14.1%	284	8.6%	726	21.6%	337	10.1%	755	8.6%	6,326	12.7%
Graduate degree	545	1.8%	57	1.8%	124	3.6%	50	1.8%	107	1.2%	883	1.8%
Housing owned or rented												
Owned	1,324	17.5%	102	15.9%	241	25.2%	145	16.0%	357	15.7%	2,169	17.5%
Owned with mortgage	3,221	37.9%	208	26.4%	422	37.7%	277	36.4%	816	33.2%	4,944	36.0%
Rented	5,246	42.6%	493	54.1%	511	36.5%	522	44.4%	1,289	48.7%	8,061	44.5%
Occupied without payment of rent	204	1.9%	26	3.6%	16	0.6%	28	3.2%	58	2.4%	332	2.1%

Note: Summary statistics are weighted using person-level weights and use survey weeks 22–31 with sample size N = 26,043.

adults at 55%, Hispanic young adults at 49%, and Black young adults at 42%.

While [Table 1](#) presents information about the sample's characteristics by subgroups, [Table A3](#) presents weighted prevalence estimates of food insecurity by subgroups. This table shows prevalence rates of food insecurity by different racial/ethnic groups and by characteristics within those groups (e.g., household income level, expected job loss, and housing situation). In general, this table shows higher rates of food insecurity across racial/ethnic groups corresponding with lower levels of income and education, a lack of paid work, single adult households, and tenant-based housing situations. Notably, however, within these categories, Black and Hispanic young adults still report higher rates of food insecurity than their White non-Hispanic counterparts. For example, among young adults not working for pay or profits in the past 7 days, 12%, 26%, 7%, and 20% of White non-Hispanic, Black, Asian, and Hispanic respondents reported food insecurity, respectively. Among young adults renting housing (vs. owning), 15%, 23%, 6%, and 24% of

White non-Hispanic, Black, Asian, and Hispanic respondents reported food insecurity, respectively.

Model estimates

We provided Poisson regression model estimates in terms of relative risk to examine factors associated with food insecurity for young adults. We denoted adjusted relative risk estimates by aRR, presented 95% CIs, and *p* values. Estimates rely on person-level weights and are nationally representative. Our analysis included the interview week and state of residence to control for time and regional effects. Results of the regression analysis, provided as a forest plot in [Figure 2](#) and detailed in [Table A2](#), revealed that the following characteristics had a strong statistical association with an increase in the relative risk of young adults experiencing food insecurity: race and ethnic identity, the interaction between race and ethnic identity and EIP, homeownership status, mortgage or rent delinquency, expected job loss, delayed medical care due to COVID, and mental health

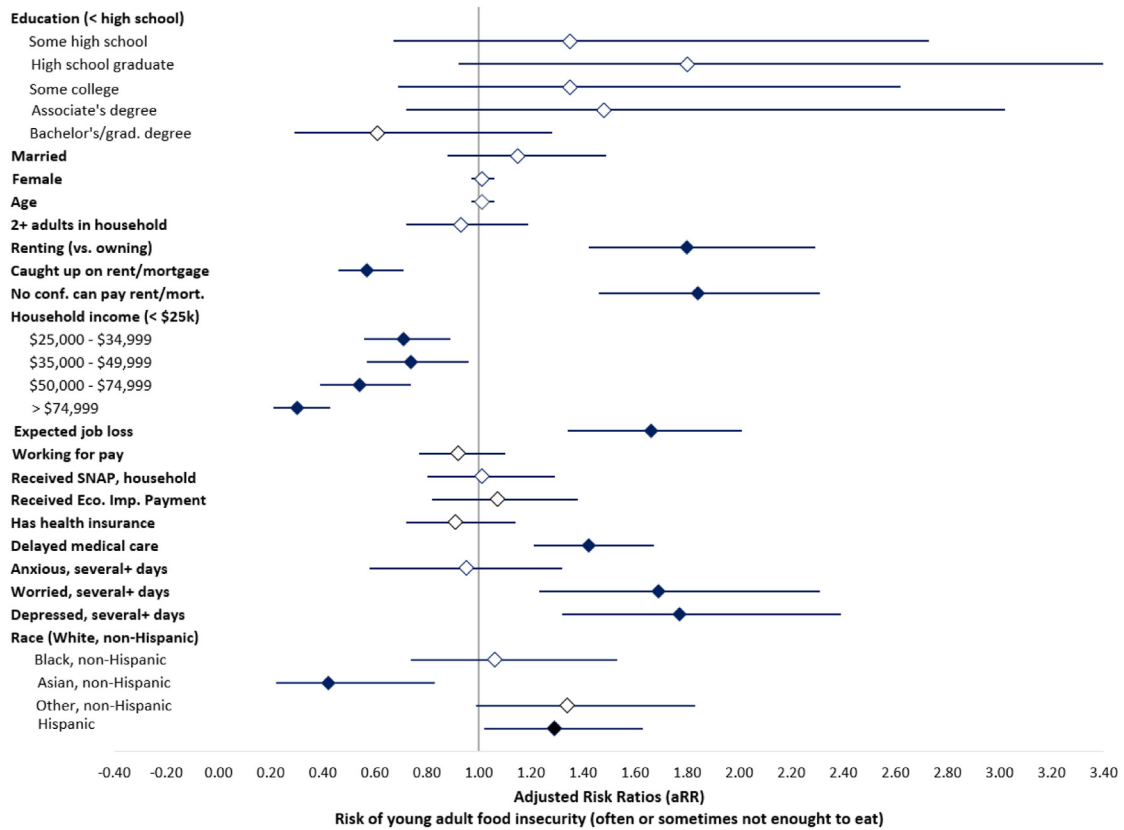


Figure 2. Poisson regression forest plot. Note: This figure shows the results of multivariate Poisson regression estimating the relationships between individual and household characteristics and reporting food insecurity. The diamonds represent the adjusted risk ratios (aRR), and the dark lines represent the 95 percent confidence interval around those estimates. aRR's to the left of 0 represent lower risk of reporting food insecurity, and those to the right of 0 represent higher risk. The reference group for each estimate is in parentheses. For example, regarding household income, we estimate the reduced risk of reporting food insecurity associated with having a higher level of income relative to having a household income of less than \$25,000 (the reference group). Adjusted RRs means the figure presents RRs having controlled for all other variables in the model. We provide a list of variables included in Table A1, along with the regression results in Table A2, as an appendix.

indicators (Covariates with p values less than 5% are assumed to have a strong statistical association with food insecurity) (Table A2 includes sharpened False Discovery Rate (FDR) q values to adjust for multiple inference [0]).

We observed a positive association between food insecurity and racial and ethnic identity when comparing young adults identifying as White to young adults identifying as other non-Hispanic (aRR = 1.341; CI: 0.985–1.825; $p = .06$) or Hispanic (aRR = 1.29; CI: 1.024–1.626; $p = .03$). Renters had a higher association with food insecurity (aRR = 1.801; CI: 1.419–2.285; $p < .01$) when compared to homeowners with a mortgage or loan. Young adults with no confidence in the ability to pay next month's rent or mortgage had a higher risk (aRR = 1.838; CI: 1.460–2.314; $p < .01$) and those with an expected household job loss had a higher risk of food insecurity (aRR = 1.662; CI: 1.377–2.006; $p < .01$). Young adults who indicated delayed medical care due to COVID had a higher association with food insecurity (aRR = 1.421; CI: 1.205–1.674; $p < .01$) than those who did not. When examining mental health indicators, young adults who felt worried for several days or more in the past seven days (aRR = 1.689; CI: 1.234–2.310; $p < .01$) and felt depressed for several days or more in the past seven days (aRR = 1.774; CI: 1.317–2.390; $p < .01$) had a higher association with food insecurity.

We found the following factors reduce the relative risk of young adults reporting food insecurity: racial and ethnic identity, racial and ethnic identity for young adults receiving an EIP, mortgage or rent delinquency status, and income. When comparing young adults identifying as White to young adults identifying as Asian, Asian young adults had a lower risk of food insecurity (aRR = 0.424; CI: 0.217–0.827; $p = .01$). When comparing young adults identifying as Hispanic who received an EIP in the past seven days with young adults who identify as non-Hispanic that did not receive an EIP in the past seven days, Hispanic young adults receiving EIP had a lower risk of food insecurity (aRR = 0.409; CI: 0.233–0.718; $p < .01$). Young adults caught up on their rent or mortgage had a lower risk of food insecurity (aRR = 0.57; CI: 0.459–0.706; $p < .01$). Young adults with higher incomes had a lower risk of food insecurity when compared to young adults making \$25,000 or less.

Discussion

This study found alarming levels of food insecurity reported by young adults during the pandemic, with the greatest hardships experienced by Black and Hispanic young people. On average, from the pandemic period of August 19, 2020 to June 7,

2021, 12.9% of young adults reported often or always having too little food to eat during the past week. The rates of food insecurity were higher for Hispanic (15%) and especially Black (22%) young adults. This is consistent with prior studies of U.S. adults and college students showing similar racial/ethnic inequalities in food insecurity [21,30].

While only observational, our analysis of time series data indicates a significant spike of young adult food insecurity early in the pandemic, particularly among Black and Hispanic young people, followed by significant reductions seemingly in response to major policy actions that injected unprecedented levels of economic assistance into society to provide a much-needed relief. These results suggest that economic assistance actions such as direct cash transfers may serve as effective policy interventions to bolster young people's food security in response to economic shocks and reduce racial disparities that tend to widen in response to such shocks without adequate intervention. At the same time, the time series data also suggest that reductions in food insecurity among Black and Hispanic young adults in response to short-term economic assistance are likewise short-lived without repeated or sustained investments over time. This finding implies a greater need to pilot and evaluate the effects of sustained unconditional cash transfers and economic assistance over extended periods.

A growing body of international research underscores the potential value of ongoing, unconditional direct cash transfers to young people to support their health development and well-being [32]. Moreover, even as policy investments corresponded with improvements in young adult food security and reductions of disparities, high prevalence (12.9%) of young adult food insecurity and market disparities nonetheless remained. This suggests that more robust economic supports are needed, as are policy actions to improve access to existing programs and resources, to further improve the health and welfare of young people and close racial gaps.

In addition to direct cash transfers to support young people's agency and material wellbeing, specific policies and programs could be further expanded, strengthened, adapted, and targeted for young adults at risk for food and housing insecurity, reducing barriers, and wait times for access. For example, eviction moratoriums enacted during the pandemic reduced evictions and allowed for redirection of household resources to other basic needs such as food consumption [33]. Yet, these moratoriums have since expired and they also were not designed to improve housing security among young people who often face "informal evictions" from (i.e., getting kicked out of) households in which someone else's name is on the lease or mortgage. Research shows that housing vouchers and cash-based eviction prevention programs are effective for reducing housing insecurity and homelessness [34,35] but their supply falls well short of the need. An estimated one in four eligible renter households receive federal rental assistance due to funding limitations [36]. While the Supplemental Nutrition Assistance Program (formerly food stamps) reaches a larger share of those eligible, the benefit levels are relatively modest, averaging \$1.40 per person per meal in 2019, and inadequately meet low-income people's nutritional needs [37]. Expanding and enhancing such policies and programs in collaboration with young people with lived experience of food and housing insecurity and a focus on reducing racial disparities could extend their impacts.

This study's multivariate regressions illuminated individual and household level factors associated with an increased and

decreased risk for young adult food insecurity. The findings made clear that hardships such as food insecurity, housing insecurity, and mental health difficulties are deeply intertwined. This underscores the need for a multidimensional policy approach to the intersecting and compounding challenges many young people face. We also found that economic factors, such as expected job loss and lower income, were strongly associated with food insecurity.

The strong correlations of low income and expected job loss with food insecurity reinforce similar findings in the literature [38]. This again points to a need for economic policy strategies to counter this precarity with a more robust social safety net, for example, in the form of a guaranteed basic income and more robust food assistance to smooth food consumption through economic shocks. Preventative policy actions could further include greater investments in evidence-based education and career development programs to support adequately paying job opportunities to strengthen young people's broader economic security and reduce structural inequalities.

Notably, in the multivariate regression, the respondent's level of education was not significantly associated with food insecurity, possibly because the effect of education on food insecurity was captured by other variables such as income. Economists have previously highlighted the "education premium" by which higher levels of education translate to higher income over time [39]. As such, for the purpose of reducing food insecurity, education may still be important to strengthening young people's economic position but it may also take time (beyond young adulthood) for this education premium to result in lower food insecurity, underscoring the need for adequate social safety nets during young adulthood irrespective of participation in post-secondary education.

The strong relationship between food insecurity and negative mental health outcomes further suggests that actions to improve young people's food security and reduce related life stressors could contribute to greater young adult mental health. Our analysis cannot speak to causality or directionality between these variables, but broader literature on unconditional direct cash transfers to address food and other economic insecurities among young people shows positive effects of these safety nets on bolstering mental health, and these effects may be larger when combining financial and mental health supports [40,41].

Although Black and Hispanic young people have experienced significantly higher rates of food insecurity compared to their White non-Hispanic peers, only Hispanic identity remained significantly associated with a higher risk for food insecurity after controlling for other variables; Black identity did not. This suggests that the disparities in food insecurity between Black and White non-Hispanic young adults are explained by racial disparities in other variables included in this analysis. Indeed, marked racial disparities underly the characteristics associated with lower or higher probability of food insecurity. For example, Black young adults in this study were about half as likely as White young adults to have household incomes of \$75,000 or more or to have a Bachelor's degree, they were more likely to rent (vs. own) housing and face housing insecurity and they were more likely to report job and income losses during the pandemic [8].

Black and Hispanic young adults face multifaceted structural disparities that expose them to a higher risk for food insecurity. Immediate solutions such as direct financial, food, and housing assistance can help respond to the current and inequitable crisis

of young adult food insecurity but broader policy actions to eliminate disparities in housing, income, employment, and healthcare, thus bolstering social determinants of health, are essential to prevent these inequalities in the first place. Notably, even within certain subpopulations (e.g., young adults who did not work for pay in the past week), Black and Hispanic young adults reported higher rates of food insecurity than White non-Hispanic young adults. This underscores the compounding effects of multiple disadvantages Black and Hispanic young people face due to systemic racism and the need for multifaceted policy strategies that address multiple risk and protective factors simultaneously.

Limitations

This study had several limitations, mainly related to gaps in the HPS survey contents and the public use data available. The HPS questionnaires did not collect information on several characteristics associated with higher levels of vulnerability among youth and young adults related, for example, to sexual orientation, gender identity, family circumstances, and systems involvement. The public use data also did not include variables that would allow for disaggregation by small population racial/ethnic groups, such as American Indian or Alaska Native populations, or by rural/urban location.

Furthermore, the HPS did not clearly define the meaning of “household” for respondents. This meaning can have particularly important implications for young adults who commonly live with their families or who live independently but in apartments, houses, or other residential situations with other nonrelative adults (e.g., with roommates, in apartment shares, or in college dormitories). This measurement obscurity makes it impossible for us to provide a nuanced understanding of the nature of young people’s housing arrangements when they report living in households with other adults. Given that more than nine of 10 young adults reported living in households with other adult household members, this information gap poses important challenges for interpretation. In addition, because the Census Bureau administered the HPS through an online survey, the data could reflect biases related to access to technology and propensity to respond to an online survey. Indeed, the Census Bureau published a nonresponse bias report for the HPS data collected during 2020, which highlighted potential sources of error, including both coverage and nonresponse [42].

Although the literature represents food insecurity as a multidimensional construct, we lack detailed information on young people’s individual food insecurity (especially for young people who live in households with others) and about the availability and nutritional quality of food they eat. The brief food insecurity measure included in the HPS only gauged access to food—frequency of not having enough to eat and not having enough of the kinds of food the respondent or their household wanted to eat—and therefore only provided a simple snapshot of one dimension of food insecurity.

Finally, these data did not include a longitudinal cohort to support more robust analysis of predictive factors for young adult food insecurity or an experimental design to support more robust analysis of the effects of policy interventions on young adult food insecurity. As such, the analyses reported in this article are only observational and these should inform future longitudinal and experimental research to test associations and assumptions raised by the present study. Despite these

limitations, the study provides timely and policy relevant insights into the unique experiences of young adults amidst COVID-19 based on a large-scale, nationally representative, repeated cross-sections survey.

Conclusion

Our analyses reveal alarming levels of food insecurity among young adults, especially BIPOC young people. These adversities have important implications for young people’s healthy development and positive transitions to adulthood. Food insecurity places significant survival-related stressors and uncertainties on young people at a time when they should be able to focus on forming and pursuing aspirations, education and skills development, career pathways, family and friendships, and broader wellbeing. Moreover, stark racial disparities in food insecurity among young adults expose the potential for widening social and health disparities.

The findings show significant correlations of education, household income, economic hardship, housing situations and insecurity, and access to healthcare with young adult food insecurity and racial/ethnic disparities in these factors also appear to explain disparities in food insecurity. Tackling young adult food insecurity and its inequalities therefore warrants a focus on multifaceted social policies and safety nets that bolster these social determinants of health. These might include expanding and evaluating substantial, ongoing (multiyear) financial assistance (e.g., direct cash transfers/basic income) and low-barrier housing resources (such as housing vouchers, rental assistance, and supportive housing) combined with youth-centered supportive services, especially to populations of young people with the greatest levels of need and racial disparities. Given the strong relationship between food insecurity and mental health, policy intervention that combine financial assistance (e.g., unconditional cash transfers) with optional evidence-based mental health supports could help counter a growing young adult mental health crisis. Every day that young people experience food insecurity and related stressors represents a missed opportunity to fully support their pathways into healthy adulthood.

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Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jadohealth.2022.09.008>.

References

- [1] National Bureau of Economic Research (NBER). US business cycle expansions and contractions. 2021. Available at: <https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions>. Accessed January 2, 2022.
- [2] Centers for Disease Control and Prevention (CDC). National center for health statistics – COVID-19 Death data and resources. 2021. Available at:

- https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm. Accessed March 10, 2021.
- [3] The COVID Tracking Project. The COVID racial data Tracker. 2021. Available at: <https://covidtracking.com/race>. Accessed January 2, 2022.
 - [4] Raifman MA, Raifman JR. Disparities in the population at risk of severe illness from COVID-19 by race/ethnicity and income. *Am J Prev Med* 2020; 59:137–9.
 - [5] Blustein DL, Duffy R, Ferreira JA, et al. In: *Unemployment in the time of COVID-19: A research agenda*, vol 119. Elsevier; 2020:103436.
 - [6] Cohen RIS, Bosk EA. Vulnerable youth and the COVID-19 pandemic. *Pediatrics* 2020;146.
 - [7] Power E, Hughes S, Cotter D, Cannon M. Youth mental health in the time of COVID-19. *Irish J Psychol Med* 2020;37:301–5.
 - [8] Morton M, Daniels G. *Untold stories: Young adult & racial dimensions of COVID-19*. Chicago, IL: Chapin Hall at the University of Chicago; 2021.
 - [9] Gundersen C, Ziliak JP. Food insecurity and health outcomes. *Health Aff* 2015;34:1830–9.
 - [10] Lee T-H, Kuo J-H, Liu C-Y, et al. Trajectory of food insecurity and its association with longitudinal mental health and sleep outcomes in Adolescents from Economically disadvantaged families. *Nutrients* 2021;13:1696.
 - [11] Bruening M, Van Woerden I, Todd M, Laska MN. Hungry to learn: The prevalence and effects of food insecurity on health behaviors and outcomes over time among a diverse sample of university freshmen. *Int J Behav Nutr Phys activity* 2018;15:1–10.
 - [12] Martinez SM, Grandner MA, Nazmi A, et al. Pathways from food insecurity to health outcomes among California University students. *Nutrients* 2019;11:1419.
 - [13] Nagata JM, Palar K, Gooding HC, et al. Food insecurity is associated with poorer mental health and sleep outcomes in young adults. *J Adolesc Health* 2019;65:805–11.
 - [14] Nagata JM, Palar K, Gooding HC, et al. Food insecurity and chronic disease in US young adults: Findings from the national longitudinal study of Adolescent to adult health. *J Gen Intern Med* 2019;34:2756–62.
 - [15] Nagata JM, Palar K, Gooding HC, et al. Food insecurity, sexual risk, and substance use in young adults. *J Adolesc Health* 2021;68:169–77.
 - [16] Camelo K, Elliott M. Food insecurity and academic achievement among college students at a public university in the United States. *J Coll Student Development* 2019;60:307–18.
 - [17] Darling KE, Fahrenkamp AJ, Wilson SM, et al. Physical and mental health outcomes associated with prior food insecurity among young adults. *J Health Psychol* 2017;22:572–81.
 - [18] Pryor L, Lioret S, Van Der Waerden J, et al. Food insecurity and mental health problems among a community sample of young adults. *Soc Psychiatry Psychiatr Epidemiol* 2016;51:1073–81.
 - [19] U.S. Bureau of Labor Statistics. *Current population survey (household data) table A-10. Selected unemployment indicators, Seasonally adjusted*. 2021. Available at: <https://fred.stlouisfed.org/release/tables?rid=50&eid=3029&od=2020-04-01>. Accessed January 2, 2022.
 - [20] Inanc H. Breaking down the numbers: What does COVID-19 mean for youth unemployment. *Mathematica Policy Res* 2020:1–22.
 - [21] Owens MR, Brito-Silva F, Kirkland T, et al. Prevalence and social determinants of food insecurity among college students during the COVID-19 pandemic. *Nutrients* 2020;12:2515.
 - [22] Niles MT, Bertmann F, Belarmino EH, et al. The early food insecurity impacts of COVID-19. *Nutrients* 2020;12:2096.
 - [23] Milovanska-Farrington S. Job loss and food insecurity during the Covid-19 pandemic. *J Econ Stud* 2022. <https://doi.org/10.1108/JES-08-2021-0400>.
 - [24] Morton MH, Dworsky A, Matjasko JL, et al. Prevalence and correlates of youth homelessness in the United States. *J Adolesc Health* 2018;62:14–21.
 - [25] Jones AD. Food insecurity and mental health status: A global analysis of 149 countries. *Am J Prev Med* 2017;53:264–73.
 - [26] Pourmotabbed A, Moradi S, Babaei A, et al. Food insecurity and mental health: A systematic review and meta-analysis. *Public Health Nutr* 2020; 23:1778–90.
 - [27] Pryor L, Lioret S, Van Der Waerden J, et al. Food insecurity and mental health problems among a community sample of young adults. *Soc Psychiatry Psychiatr Epidemiol* 2016;51:1073–81.
 - [28] Fang D, Thomsen MR, Nayga RM. The association between food insecurity and mental health during the COVID-19 pandemic. *BMC public health* 2021;21:1–8.
 - [29] Cooney P, Shaefer HK. Material hardship and mental health following the COVID-19 relief Bill and American Rescue plan Act. *Ann Arbor: Univ Mich* 2021.
 - [30] Myers AM, Painter MA. Food insecurity in the United States of America: An examination of race/ethnicity and nativity. *Food Security* 2017;9:1419–32.
 - [31] Pinstrup-Andersen P. Food security: Definition and measurement. *Food security* 2009;1:5–7.
 - [32] Morton M, Chávez R, Kull M, et al. Developing a direct cash transfer program for youth experiencing homelessness: Results of a mixed methods, multi-stakeholder design process. Chicago, IL: Chapin Hall at the University of Chicago: Chapin Hall at the University of Chicago; 2020.
 - [33] An X, Gabriel SA, Tzur-Ilan N. More than shelter: The effects of rental eviction moratoria on household well-being. 2021. SSRN 3801217.
 - [34] Kim H, Burgard SA, Seefeldt KS. Housing assistance and housing insecurity: A study of renters in southeastern Michigan in the wake of the great recession. *Soc Serv Rev* 2017;91:41–70.
 - [35] Evans WN, Sullivan JX, Wallskog M. The impact of homelessness prevention programs on homelessness. *Science* 2016;353:694–9.
 - [36] Gartland E. *Chart Book: Funding limitations create Widespread Unmet need for rental assistance*. Washington, D.C.: Center on Budget and policy Priorities. Available at: <https://www.cbpp.org/research/housing/funding-limitations-create-widespread-unmet-need-for-rental-assistance>. Accessed January 2, 2022.
 - [37] Carlson S, Llobrera J, Keith-Jennings B. More adequate SNAP benefits would help Millions of Participants Better Afford food. Washington, D.C.: Center on Budget and policy Priorities. Available at: https://www.cbpp.org/research/food-assistance/more-adequate-snap-benefits-would-help-millions-of-participants-better#_edn1. Accessed January 2, 2022.
 - [38] Bauer A, Garman E, McDaid D, et al. Integrating youth mental health into cash transfer programmes in response to the COVID-19 crisis in low-income and middle-income countries. *The Lancet Psychiatry* 2021;8: 340–6.
 - [39] Burbidge JB, Magee L, Robb AL. The education premium in Canada and the United States. *Canadian Public Policy/Analyse de politiques*; 2002:203–17.
 - [40] Zimmerman A, Garman E, Avendano-Pabon M, et al. The impact of cash transfers on mental health in children and young people in low-income and middle-income countries: A systematic review and meta-analysis. *BMJ Glob Health* 2021;6:e004661.
 - [41] McQuire J, Kaiser C, Bach-Mortensen AM. A systematic review and meta-analysis of the impact of cash transfers on subjective well-being and mental health in low-and middle-income countries. *Nat Hum Behav* 2022;1–12.
 - [42] Peterson S, Toribio N, Farber J, Hornick D. *Nonresponse bias report for the 2020 household Pulse survey*. Washington, DC: U.S. Census Bureau; 2021.