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Growing Job-Related Income Losses, Increasing Social Inequalities, and Physical and Mental Health Impact During the COVID-19 Pandemic, United States, April – December 2020

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ABSTRACT

Background: The COVID-19 pandemic has led to substantial socioeconomic disruptions and increases in mental health problems in the United States (US) and globally. Whether social inequalities in job losses and resultant physical and mental health problems have worsened over the course of the pandemic are not well studied. Using temporal, nationally representative data, this study examines racial/ethnic and socioeconomic inequalities in job-related income losses and their associated health impact among US adults aged 18-64 years during the pandemic.

Methods: Using April, August, and December 2020 rounds of the US Census Bureau's Household Pulse Survey (N = 56,788 for April; 83,244 for August; and 52,150 for December), social determinants of job-related income losses and associated impacts on self-assessed fair/poor health and depression were analyzed by multivariate logistic regression.

Results: In December, more than 108 million or 55.5% of US adults reported that they or someone in their household experienced a loss of employment income since March 13, 2020. An additional 68 million or 34.6% of adults reported expecting this economic hardship in the next four weeks due to the pandemic. Blacks/African Americans, Hispanics, other/multiple-race groups, low-income, and low-education adults, and renters were significantly more likely to experience job-related income losses. Controlling for covariates, those reporting job-related income losses had 51% higher odds of experiencing fair/poor health and 106% higher odds of experiencing serious depression than those with no income losses in December 2020. The prevalence of fair/poor health varied from 11.6% for Asians with no job/income losses to 28.8% for Hispanics and 32.3% for Blacks with job/income losses. The prevalence of serious depression varied from 6.5% for Asians with no income losses to 21.6% for Non-Hispanic Whites and 21.8% for Blacks with job/income losses.

Conclusion and Implications for Translation: Job-related income losses and prevalence of poor health, and serious depression increased markedly during the pandemic. More than half of all ethnic-minority and socially disadvantaged adults reported job-related income losses due to the coronavirus pandemic, with 20-45% of them experiencing poor health or serious depression.

Keywords: • COVID-19 • Pandemic • Race • Socioeconomic Status • Job and Income Loss • Self-Assessed Health • Mental Health • Disparities; Coronavirus • Unemployment

1. Introduction

The coronavirus disease (COVID-19) pandemic has resulted in widespread social and economic disruptions and public health crises in the United States and globally, leading to massive job losses, increased social isolation, mental health problems, and declines in physical health and overall well-being.[1–8] According to previous research, 42% of US adults reported household job or employment-related income loss during the early stages of the pandemic, with rates of symptoms of anxiety and depressive orders among US adults increasing sharply from 11% during January-June 2019 (the pre-pandemic level) to 41% in January 2021.[7,9,10]

Despite the evidence of substantial increases in unemployment, economic losses, and psychological distress levels, the extent to which racial/ethnic and socioeconomic disparities in job losses and related physical and mental health problems in the US might have worsened over the course of the pandemic are not well documented. Using a large temporal and nationally representative survey, this study addresses this gap in research by examining racial/ethnic and socioeconomic inequalities in job-related income losses (due to job loss, temporary layoffs and furloughs, reduced work hours, and pay cuts) and associated physical and mental health impact among US adults aged 18-64 years during the coronavirus pandemic.

Available data show that the COVID-19 pandemic has intensified health and healthcare inequities among the nation's communities of color and socially disadvantaged and underserved populations, which have experienced a disproportionate burden in terms of increased infection, hospitalization, mortality, and greater health risks.[11–14] Reducing health inequalities remains one of the most important goals of the Healthy People initiative and the US Department of Health and Human Services,[15–17] and our study's primary aim of addressing racial/ethnic and socioeconomic inequalities in job/income losses due to COVID-19 and resultant health impact is consistent with this goal. The study's aim is also compatible with the Presidential Executive Orders on COVID-19 that call for: (1) addressing factors that have contributed to disparities in COVID-19 outcomes and (2) developing evidence-based research and equitable public health response for mitigating the health inequities caused or exacerbated by the COVID-19 pandemic and for preventing such inequities in the future.[18–20]

2. Methods

2.1. Data

We used data from the April, August, and December 2020 rounds of the US Census Bureau's Household Pulse Survey (HPS).[21] The HPS is a national sample household survey in which data on socioeconomic, demographic, self-assessed health, mental health, and health care characteristics during the COVID-19 pandemic are collected in near real-time via email and the internet. All information collected in the survey are based on self-reports. The HPS uses a systematic sample design and is representative of the civilian non-institutionalized population of the United States.

The HPS was developed as a rapid response survey in order to track the social and economic impacts of the COVID-19 pandemic on American households on a weekly or a bi-weekly basis in partnership with seven US federal statistical agencies: Bureau of Labor Statistics, National Center for Health Statistics, United States Department of Agriculture's Economic Research Service, National Center for Education Statistics, Department of Housing and Urban Development, Social Security Administration, Bureau of Transportation Statistics.[22,23]

2.2. Measurement of Job–Related Income Loss, Health Outcomes, and Covariates

To examine temporal trends, we selected independent HPS samples for April (Phase 1, Week 1), August (Phase 2, Week 13), and December (Phase 3, Week 21). We restricted the study sample to those aged 18-64 years, given our primary aim of examining social inequalities in job losses and their resultant health impact. The four binary outcome variables in our study were job-related income loss, expected job/income loss, self-assessed fair/poor health, and serious depression. Job-related income loss was based on the question: *"Have you, or has anyone in*

your household, experienced a loss of employment income since March 13, 2020?" Expected household job loss was based on the question, *"Do you expect that you or anyone in your household will experience a loss of employment income in the next four weeks because of the coronavirus pandemic?"* Self-assessed general health status was based on the question, *"Would you say your health, in general, is excellent, very good, good, fair, or poor?"* The binary health status was defined with two categories: fair/poor health vs. excellent/very good/good health. The depression variable was derived from the question, *"Over the last seven days, how often have you been bothered by... feeling down, depressed, or hopeless? Would you say not at all, several days, more than half the days, or nearly every day?"* Those who reported feeling down, depressed, or hopeless nearly every day of the past week were defined as having serious depression.

The sample size for the December 2020 HPS was 69,944 for all ages and 52,441 for the 18-64 age group only. There were 291 (0.006%) observations with missing data for the job loss variable, excluding which resulted in an effective sample size of 52,150 for analysis. The sample size for all ages, for the 18-64 age group, and effective sample size for analysis were 109,051, 83,643, and 83,244 for the August HPS and 74,413, 57,086, and 56,788 for the April HPS, respectively.

Based on the social determinants of health framework and previous research, the following covariates of job loss, self-assessed health, and mental health were considered: age, gender, race/ethnicity, marital status, region of residence, educational attainment, household income, housing tenure, and actual or expected job loss (for health outcomes only).[16,24] These variables are measured as shown in Table 1. The other/multiple-race group consisted of American Indians and Alaska Natives (AIANs), Native Hawaiians and Pacific Islanders, and mixed-race individuals.

2.3. Statistical Methods

Multivariate logistic regression was used to examine social inequalities in actual job-related income losses since the early stages of the pandemic and expected job/income losses in the four weeks post-survey.

Logic regression was also used to model inequalities in self-assessed health and serious depression by job-related income losses in each time period after controlling for selected socioeconomic and demographic characteristics. The Chi-square statistic was used to test the overall association between each covariate and prevalence of job-related income losses, self-assessed fair/poor health, and serious depression, whereas the two-sample t-test was used to test the difference in prevalence between any two groups or time periods. To account for the complex sample design of the HPS, SUDAAN software was used to conduct all statistical analyses, including the logistic modeling procedure RLOGIST.[25]

3. Results

3.1. Trends and Disparities in Prevalence and Odds of Job-related Income Loss Due to the Pandemic by Race/Ethnicity and Socioeconomic Factors

In December 2020, more than 108 million or 55.5% of US adults reported that they or someone in their household experienced a loss of employment income since March 13, 2020. An additional 68 million or 34.6% of adults reported expecting this economic hardship in the next four weeks due to the pandemic (data available upon request). Blacks/African Americans (61.5%), Hispanics (64.4%), the other/multiple-race group (60%), adults with low household incomes (66.5%) and low education (67.1%), and renters (63.3%) were significantly more likely to experience job-related income losses in December (Table 1). Similar racial/ethnic and socioeconomic patterns were also observed in April and August 2020, with most racial/ethnic and socioeconomic groups experiencing substantial (absolute and percent) increases in loss of job-related income between August and December (Figure 1). Increases in job/income losses were most pronounced among Blacks, Hispanics, the other/multiple-race group, adults with high school or less education, those with household incomes <$50,000, and renters (Figure 1). Between August and December, Blacks experienced an 11.1% increase in job/income loss (55.4% vs. 61.5%), adults with less than a high school education experienced a 16.8%

Table 1: Unadjusted and Covariate-Adjusted Prevalence and Odds of Experiencing Household Job-Related Income Loss during the COVID-19 Pandemic among US Adults Aged 18-64 Years by Socioeconomic and Demographic Characteristics: The Household Pulse Survey, Phase 3, Week 21, December 9-21, 2020 (N = 52,150)

Covariates	Unadjusted		Unadjusted Model 1[1]			Adjusted Model 2[2]			Adjusted[2]	
	Prevalence	SE	OR	95%	CI	AOR	95%	CI	Prevalence	SE
Age (years)										
18-24	58.82	1.71	1.40	1.20	1.63	1.18	0.99	1.40	55.19	1.78
25-34	58.30	0.99	1.37	1.23	1.52	1.30	1.15	1.46	57.47	1.00
35-44	54.77	0.86	1.18	1.08	1.30	1.21	1.09	1.34	55.79	0.84
45-54	56.35	0.90	1.26	1.14	1.39	1.29	1.16	1.43	57.38	0.92
55-64	50.56	0.88	1.00	reference		1.00	reference		51.38	0.94
Gender										
Male	55.41	0.73	1.00	0.93	1.07	1.03	0.96	1.11	55.78	0.70
Female	55.50	0.54	1.00	reference		1.00	reference		55.14	0.55
Race/ethnicity										
Non-Hispanic White	51.64	0.51	1.00	reference		1.00	reference		53.25	0.54
Non-Hispanic Black	61.52	1.38	1.50	1.33	1.69	1.30	1.14	1.48	59.40	1.41
Asian	48.53	1.96	0.88	0.75	1.03	0.97	0.82	1.15	52.61	2.02
Other and multiple race	59.95	2.38	1.40	1.15	1.71	1.22	0.99	1.51	57.99	2.40
Hispanic	64.36	1.24	1.69	1.51	1.89	1.35	1.20	1.51	60.18	1.24
Marital status										
Married	56.67	1.15	1.00	reference		1.00	reference		54.49	0.66
Widowed	54.24	0.77	1.02	0.81	1.28	0.87	0.68	1.10	51.11	2.84
Divorced/separated	53.53	0.86	1.53	1.38	1.7	1.19	1.07	1.33	58.63	1.16
Single	58.15	0.89	1.39	1.28	1.52	1.06	0.96	1.18	55.90	0.93
Geographic region										
Northeast	56.67	1.15	1.14	1.01	1.27	1.19	1.05	1.34	58.51	1.13
South	54.24	0.77	1.03	0.94	1.13	0.95	0.86	1.04	53.26	0.75
Midwest	53.53	0.86	1.00	reference		1.00	reference		54.55	0.87
West	58.15	0.89	1.21	1.09	1.33	1.14	1.03	1.26	57.57	0.85
Education (years of school completed)										
Less than high school (<12)	67.13	2.32	3.13	2.53	3.88	2.09	1.67	2.61	62.50	2.42
High school (12)	60.41	1.03	2.34	2.11	2.59	1.75	1.56	1.95	58.39	1.04
Some college (13-15)	59.26	0.65	2.23	2.06	2.41	1.76	1.61	1.92	58.54	0.65
College degree (16)	46.38	0.66	1.33	1.22	1.43	1.20	1.11	1.30	49.39	0.70
Graduate degree or higher (≥17)	39.50	0.72	1.00	reference		1.00	reference		44.98	0.85
Household income in 2019 ($)										
<25,000	66.48	1.43	3.94	3.34	4.66	2.36	1.96	2.85	61.75	1.56
25,000-34,999	68.45	1.48	4.31	3.63	5.13	2.75	2.26	3.33	65.12	1.62
35,000-49,999	63.94	1.54	3.53	2.97	4.18	2.38	1.98	2.86	61.89	1.63
50,000-74,999	58.35	1.23	2.79	2.4	3.23	2.05	1.75	2.41	58.48	1.29
75,000-99,999	53.20	1.23	2.26	1.95	2.61	1.84	1.58	2.15	55.87	1.34
100,000-149,999	46.66	1.12	1.74	1.51	2.00	1.53	1.32	1.77	51.35	1.29
150,000-199,999	39.30	1.49	1.29	1.09	1.52	1.18	1.00	1.40	45.2	1.68
≥200,000	33.47	1.24	1.00	reference		1.00	reference		41.17	1.63
Unknown	55.92	0.96	2.52	2.21	2.88	1.69	1.39	2.07	53.88	1.49
Housing tenure										
Owner	51.08	0.58	1.00	reference		1.00	reference		54.3	0.81
Renter	63.26	0.89	1.65	1.51	1.8	1.15	1.04	1.27	57.5	1.07

SE= standard error. OR=odds ratio; AOR=adjusted odds ratio; CI=confidence interval. [1]Unadjusted for the effects of other covariates. [2]This logistic regression model includes age, gender, race/ethnicity, marital status, region of residence, education, household income, and housing tenure as covariates. Chi-square statistics for testing the overall association between each covariate and prevalence of job/income losses were statistically significant at P<0.001 except for gender (P=0.92)
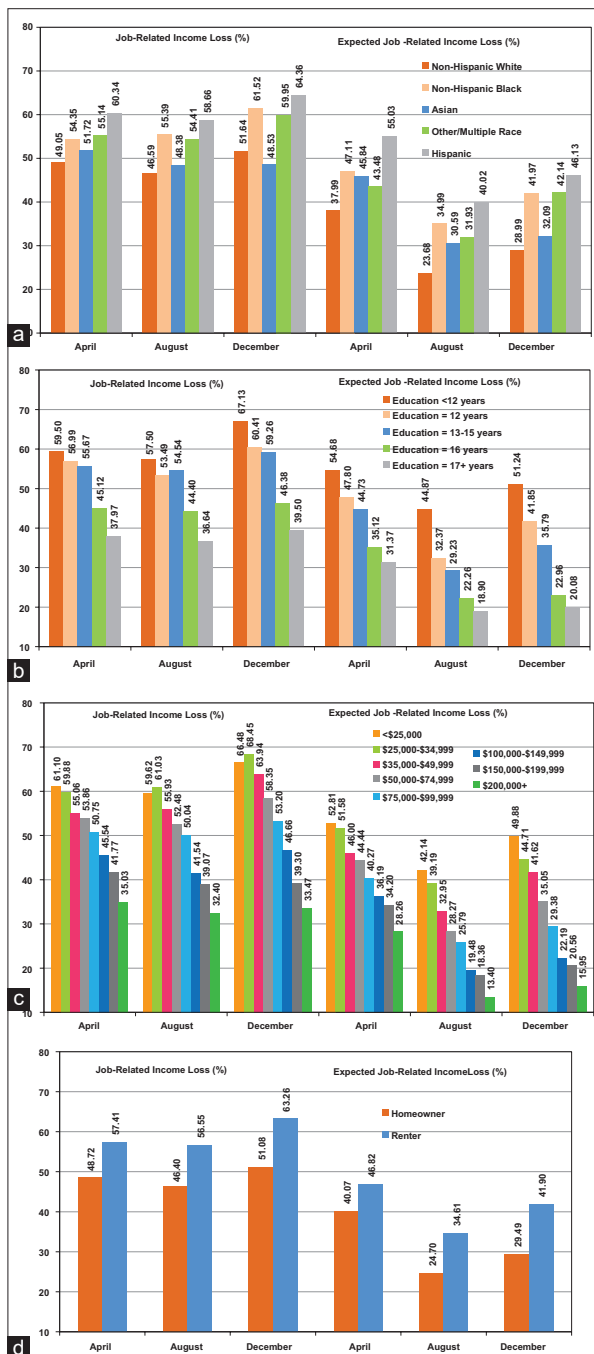
Figure 1: (a-d) Increases in Job-Related Income Loss Since the Pandemic and Expected Job Losses in the Next Four Weeks among Adults Aged 18-64 Years by Race/Ethnicity, Education, Household Income, and Housing Tenure, United States, April, August, and December 2020. (a) Increase by Race/Ethnicity (b) Increase by Education (c) Increase by Household Income, (d) Increase by Housing Tenure **Source:** Data derived from April, August, and December 2020 Household Pulse Survey. **Notes:** Chi-square statistics for testing the overall association between race/ethnicity, education, household income, or housing tenure and actual and expected job-related income losses were statistically significant at P<0.001 for each time period. Differences in job losses by race/ethnicity, education, household income, or housing tenure between August and December and between April and December were statistically significant at P<0.001.

increase (57.5% vs. 67.1%), those with household income <$25,000 experienced an 11.5% increase (59.6% vs. 66.5%), and renters experienced an 11.9% increase in job/income loss (56.6% vs. 63.3%).

Age, race/ethnicity, education, household income, housing tenure, and marital status were independent and significant predictors of recent job/income losses and expected job/income loss (Tables 1 and 2). Compared with those aged 55-64, those under 55 had significantly higher adjusted odds of recent job/income losses because of the pandemic (Table 1). Controlling for education, household income, housing tenure, and other demographic characteristics, Black and Hispanic adults had, respectively, 30% and 35% higher odds of recent job/income losses than non-Hispanic Whites. Educational gradients were consistent and large, with those with less than a high school education having 109% higher adjusted odds of recent job/income loss than those with a graduate degree. Those with household incomes <$25,000 and with incomes $25,000-34,999 had, respectively, 2.4 and 2.8 times higher adjusted odds of recent job/income losses than those with household incomes ≥$200,000.

Racial/ethnic and socioeconomic inequalities were greater and more consistent for expected job/income losses than for recent job/income losses. Compared with non-Hispanic White adults, Asians, Blacks, Hispanics, and other/multiple-race groups had 32 - 57% higher adjusted odds of expected job/income losses. Those with household incomes <$25,000 had 152% higher adjusted odds of expected job/income loss than those with household incomes ≥$200,000. Those with less than a high school education had 190% higher adjusted odds of expected job/income loss than those with a graduate degree (Table 2).

3.2. Increases in Physical and Mental Health Problems During the Pandemic and Joint Effects of Job/Income Loss and Race/Ethnicity

During the pandemic, the prevalence of fair/poor health for the population aged 18-64 increased significantly from 15.1% in April to 17.8% in August and 21.5% in December, whereas the prevalence of serious depression rose from 10.2% in April to 11.6% in August and 15.8% in December. Compared

to those with no job/income losses, those experiencing job/income losses since the pandemic had 92% higher unadjusted odds and 51% higher adjusted odds of fair/poor health and 144% higher unadjusted odds, and 106% higher adjusted odds of serious depression in December (Table 3). The odds of fair/poor health or serious depression associated with actual or expected job/income losses were similar in August but smaller in April (data available upon request). In August, compared to those with no job/income losses, those experiencing job/income losses since the pandemic had 74% higher unadjusted odds (OR=1.74; 95% CI=1.60-1.90) and 51% higher adjusted odds (OR=1.51; 95% CI=1.38-1.66) of fair/poor health and 113% higher unadjusted odds (OR=2.13; 95% CI=1.93-2.36) and 92% higher adjusted odds (OR=1.92; 95% CI=1.73-2.12) of serious depression. In April, compared to those with no job/income losses, those experiencing job/income losses since the pandemic had 29% higher unadjusted odds (OR=1.29; 95% CI=1.14-1.46) but no significantly higher adjusted odds (OR=1.08; 95% CI=0.95-1.23) of fair/poor health and 77% higher unadjusted odds (OR=1.77; 95% CI=1.53-2.05) and 53% higher adjusted odds (OR=1.53; 95% CI=1.32-1.78) of serious depression (data available upon request).

It should be noted that expectation or fear of losing a job or related income in the four weeks following the survey was associated with a substantially increased likelihood of poor health and serious depression in each time period even after controlling for racial/ethnic and socioeconomic factors. For example, after controlling for covariates, compared to those not expecting job/income losses, those who expected job/income losses in the next four weeks, had 83% higher odds (OR=1.83; 95% CI=1.60-2.11) in April, 120% higher odds (OR=2.20; 95% CI=1.97-2.45) in August, and 116% higher odds (OR=2.26; 95% CI=1.91-2.45) of serious depression in December (Table 3).

Physical and mental health problems associated with actual and expected job/income losses became more pronounced during the pandemic (Figure 2). During April-December, those with job-related income losses experienced greater increases in fair/

Table 2: Unadjusted and Covariate-Adjusted Prevalence and Odds of Expecting Household Job-Related Income Loss in the Next Four weeks due to the COVID-19 Pandemic among US Adults Aged 18-64 Years by Socioeconomic and Demographic Characteristics: The Household Pulse Survey, Phase 3, Week 21, December 9-21, 2020 (N = 52,086)

Covariates	Unadjusted		Unadjusted Model 1[1]			Adjusted Model 2[2]			Adjusted[2]	
	Prevalence	SE	OR	95%	CI	AOR	95%	CI	Prevalence	SE
Age (years)										
18-24	33.00	1.78	1.02	0.86	1.22	0.80	0.66	0.96	29.04	1.60
25-34	35.47	1.07	1.14	1.01	1.29	1.07	0.94	1.22	34.98	1.04
35-44	34.99	0.88	1.12	1.00	1.25	1.12	1.00	1.26	35.95	0.87
45-54	36.38	0.94	1.19	1.06	1.33	1.20	1.06	1.35	37.36	0.98
55-64	32.49	0.86	1.00	reference		1.00	reference		33.59	0.93
Gender										
Male	35.51	0.76	1.08	1.00	1.17	1.12	1.04	1.22	35.85	0.71
Female	33.72	0.55	1.00	reference		1.00	reference		33.40	0.56
Race/ethnicity										
Non-Hispanic White	28.99	0.49	1.00	reference		1.00	reference		30.90	0.54
Non-Hispanic Black	41.97	1.46	1.77	1.56	2.01	1.45	1.27	1.66	38.84	1.42
Asian	32.09	1.98	1.16	0.96	1.39	1.32	1.09	1.60	36.68	2.10
Other and multiple race	42.14	2.43	1.78	1.46	2.18	1.52	1.24	1.88	39.90	2.33
Hispanic	46.13	1.37	2.10	1.87	2.36	1.57	1.40	1.78	40.66	1.24
Marital status										
Married	30.77	0.57	1.00	reference		1.00	reference		33.27	0.66
Widowed	34.55	2.89	1.19	0.92	1.53	0.95	0.71	1.27	32.24	2.97
Divorced/separated	43.17	1.25	1.71	1.53	1.91	1.25	1.11	1.41	38.09	1.18
Single	37.01	0.96	1.32	1.2	1.45	1.09	0.97	1.22	35.04	0.92
Geographic region										
Northeast	36.82	1.19	1.36	1.19	1.54	1.38	1.21	1.57	38.60	1.16
South	33.45	0.76	1.17	1.05	1.3	1.03	0.92	1.15	32.41	0.73
Midwest	30.07	0.84	1.00	reference		1.00	reference		31.85	0.89
West	38.66	1.00	1.47	1.31	1.64	1.32	1.17	1.48	37.64	0.94
Education (years of school completed)										
Less than high school (<12)	51.24	2.49	4.18	3.39	5.16	2.52	2.02	3.15	43.63	2.43
High school (12)	41.85	1.09	2.86	2.55	3.21	2.10	1.85	2.38	39.37	1.05
Some college (13-15)	35.79	0.64	2.22	2.02	2.43	1.79	1.62	1.98	35.86	0.63
College degree (16)	22.96	0.56	1.19	1.08	1.31	1.10	1.00	1.21	25.91	0.65
Graduate degree or higher (≥17)	20.08	0.61	1.00	reference		1.00	reference		24.19	0.77
Household income in 2019 ($)										
<25,000	49.88	1.57	5.24	4.28	6.41	2.90	2.33	3.62	43.66	1.61
25,000-34,999	44.71	1.71	4.26	3.45	5.25	2.55	2.03	3.21	40.68	1.79
35,000-49,999	41.62	1.60	3.76	3.06	4.61	2.38	1.91	2.97	39.09	1.66
50,000-74,999	35.05	1.32	2.84	2.34	3.46	2.02	1.66	2.47	35.45	1.37
75,000-99,999	29.38	1.20	2.19	1.80	2.67	1.76	1.44	2.14	32.42	1.36
100,000-149,999	22.19	0.94	1.50	1.24	1.82	1.31	1.08	1.59	26.57	1.22
150,000-199,999	20.56	1.37	1.36	1.08	1.72	1.26	1.00	1.58	25.84	1.69
≥200,000	15.95	1.09	1.00	reference		1.00	reference		21.84	1.51
Unknown	36.84	1.00	3.07	2.57	3.68	1.96	1.54	2.50	34.80	1.49
Housing tenure										
Owner	29.49	0.56	1.00	reference		1.00	reference		33.43	0.83
Renter	41.90	0.98	1.72	1.57	1.90	1.14	1.03	1.28	36.28	1.07

SE= standard error. OR=odds ratio; AOR=adjusted odds ratio; CI=confidence interval. [1]Unadjusted for the effects of other covariates. [2]This logistic regression model includes age, gender, race/ethnicity, marital status, region of residence, education, household income, and housing tenure as covariates. Chi-square statistics for testing the overall association between each covariate and prevalence of expected job/income losses were statistically significant at P<0.001 for age (0.032) and gender (P=0.057)

Table 3: Unadjusted and Adjusted Prevalence and Odds of Fair/Poor Health and Serious Depression by Household Job-Related Income Loss and Race/Ethnicity during the COVID-19 Pandemic among US Adults Aged 18-64 Years: The Household Pulse Survey, Phase 3, Week 21, December 9-21, 2020 (N = 44,158)

Covariates	Unadjusted		Unadjusted Model 1[1]			Adjusted Model 2[2]			Adjusted[2]	
	Prevalence	SE	OR	95%	CI	AOR	95%	CI	Prevalence	SE
Self-Assessed Fair/Poor Health										
Job-related income loss[3]										
Yes	26.28	0.65	1.92	1.74	2.13	1.51	1.36	1.68	24.01	0.58
No	15.63	0.52	1.00	reference		1.00	reference		17.87	0.58
Expected Job-related income loss[4]										
Yes	29.80	0.87	2.03	1.83	2.26	1.46	1.31	1.63	25.14	0.72
No	17.28	0.48	1.00	reference		1.00	reference		19.26	0.54
Job-related income loss X Race/ethnicity										
Non-Hispanic White, Job/Income Loss	23.45	0.77	2.35	1.66	3.31	1.30	0.92	1.84	23.72	0.74
Non-Hispanic White, No Job/Income Loss	13.83	0.54	1.23	0.87	1.74	0.84	0.60	1.19	17.36	0.66
Non-Hispanic Black, Job/Income Loss	32.30	2.06	3.65	2.50	5.35	1.38	0.93	2.05	24.71	1.69
Non-Hispanic Black, No Job Loss	18.35	1.74	1.72	1.15	2.58	0.71	0.46	1.08	15.17	1.53
Asian, Job/Income Loss	23.96	3.05	2.41	1.51	3.85	1.67	1.02	2.73	27.97	3.33
Asian, No Job/Income Loss	11.55	1.74	1.00	reference		1.00	reference		19.68	2.48
Other/multiple race, Job/Income Loss	35.06	2.92	4.14	2.72	6.28	1.90	1.24	2.92	30.37	2.54
Other/multiple race, No Job/Income Loss	19.87	2.45	1.90	1.21	2.98	1.14	0.71	1.83	21.61	2.64
Hispanic, Job/Income Loss	28.84	1.68	3.11	2.14	4.50	1.20	0.82	1.74	22.36	1.36
Hispanic, No Job/Income Loss	22.87	2.09	2.27	1.51	3.41	1.04	0.69	1.56	20.26	1.73
Serious Depression										
Job-related income loss[3]										
Yes	20.70	0.60	2.44	2.17	2.75	2.06	1.82	2.33	19.35	0.55
No	9.66	0.42	1.00	reference		1.00	reference		10.70	0.48
Expected Job-related income loss[4]										
Yes	24.26	0.82	2.49	2.21	2.79	2.16	1.91	2.45	22.26	0.74
No	11.42	0.39	1.00	reference		1.00	reference		12.05	0.44
Job-related income loss X Race/ethnicity										
Non-Hispanic White, Job/Income Loss	21.64	0.70	3.98	2.59	6.11	3.11	1.96	4.96	21.68	0.70
Non-Hispanic White, No Job/Income Loss	9.17	0.43	1.45	0.94	2.24	1.35	0.84	2.15	11.04	0.53
Non-Hispanic Black, Job/Income Loss	21.84	2.02	4.03	2.49	6.51	2.44	1.44	4.12	18.01	1.75
Non-Hispanic Black, No Job Loss	10.89	1.66	1.76	1.03	3.01	1.29	0.73	2.28	10.63	1.59
Asian, Job/Income Loss	16.09	2.56	2.76	1.58	4.84	2.30	1.27	4.16	17.19	2.69
Asian, No Job/Income Loss	6.49	1.30	1.00	reference		1.00	reference		8.52	1.78
Other/multiple race, Job/Income Loss	22.32	2.32	4.14	2.52	6.80	2.62	1.54	4.46	19.05	1.98
Other/multiple race, No Job/Income Loss	13.79	2.15	2.31	1.33	4.00	1.75	0.97	3.15	13.79	2.14
Hispanic, Job/Income Loss	18.28	1.56	3.22	2.02	5.15	1.89	1.13	3.16	14.68	1.33
Hispanic, No Job/Income Loss	11.51	1.62	1.87	1.11	3.16	1.25	0.72	2.17	10.38	1.45

SE= standard error. OR=odds ratio; AOR=adjusted odds ratio; CI=confidence interval. [1]Unadjusted for the effects of other covariates. [2]Adjusted by logistic regression for age, gender, race/ethnicity, marital status, region of residence, education, household income, and housing tenure. [3]Loss of employment income since March 13, 2020. [4]Expect job-related income loss in the next 4 weeks due to pandemic. All Chi-square tests for differences in the unadjusted and adjusted prevalence of fair/poor health and serious depression were statistically significant at P<0.001
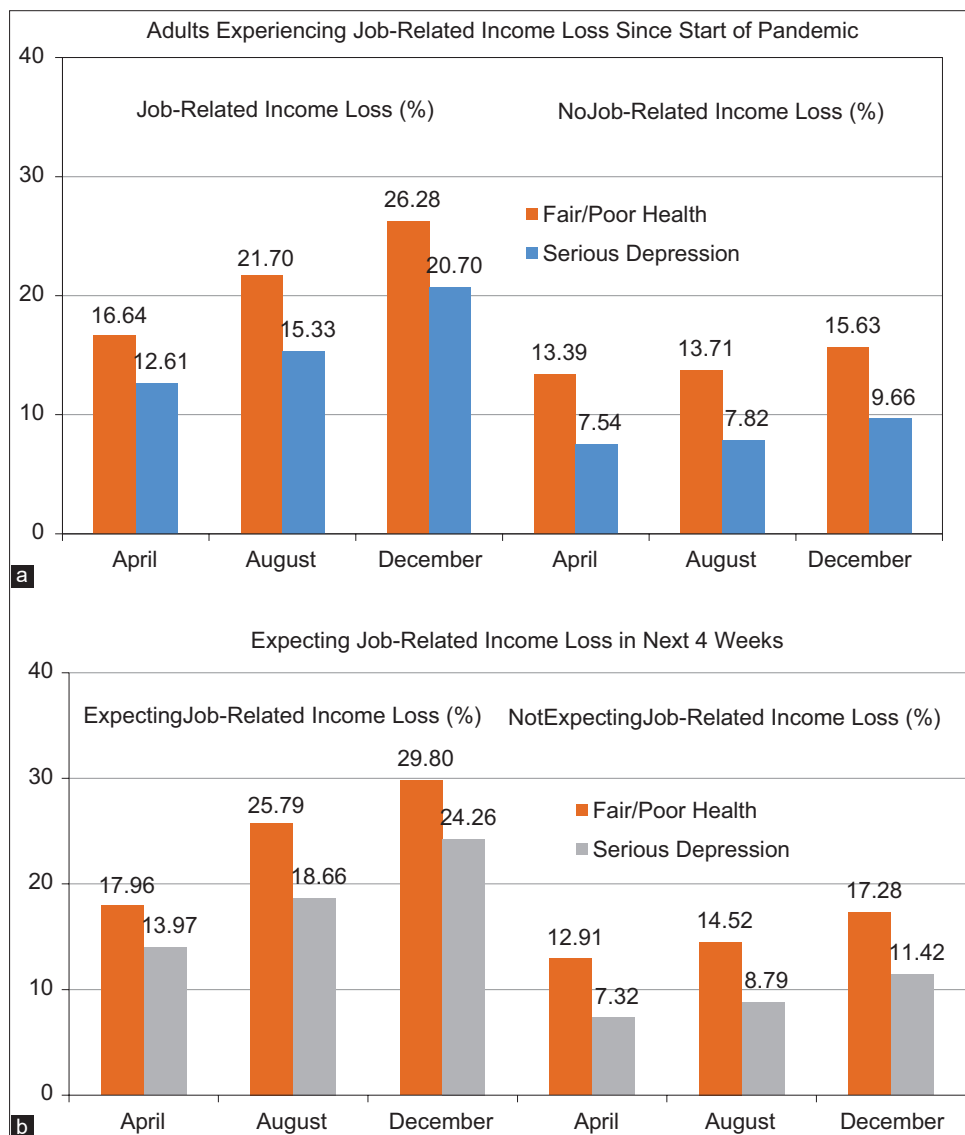
Figure 2: (a, b) Increases in Fair/Poor Health and Serious Depression by Job-Related Income Loss During the Pandemic among Adults Aged 18-64 Years, United States, April, August, and December 2020
Source: Data derived from April, August, and December 2020 Household Pulse Survey
Notes: Chi-square statistics for testing the overall association between actual or expected job-related income losses and fair/poor health or serious depression were statistically significant at P<0.001 in each time period. Temporal increases in job income loss-specific fair/poor health and serious depression prevalence between August and December and between April and December were statistically significant at P<0.001

poor health and serious depression than those with no job-related income losses (Figure 2). Stratifying by race/ethnicity and socioeconomic status (SES) provides a fuller range of inequalities in overall health status and depression. In December, the prevalence of fair/poor health varied from 11.6% for Asians with no job/income losses to 28.8% for Hispanics and 32.3% for Blacks experiencing job/income losses.

The prevalence of serious depression varied from 6.5% for Asians with no job/income losses to 21.6% for Non-Hispanic Whites and 21.8% for Blacks with job/income losses (Table 3).

Between April and December, the prevalence of serious depression associated with job/income loss increased from 12.5% to 21.6% for non-Hispanic Whites, from 12.9% to 21.8% for Blacks, from 14.0% to 16.1% for Asians, from 12.4% to 22.3% for the other/multiple race group, and from 12.5% to 18.3% for Hispanics (data available upon request). Between April and December, the prevalence of serious depression associated with job/income loss increased from 13.0% to 22.6% for those without a high school education, from 21.2% to 29.3% for those with household income <$25,000, and from 16.2% to 22.9% for renters (data available upon request). Between April and December, the prevalence of fair/poor health associated with job/income loss increased from 28.0% to 45.2% for those without a high school education, from 30.5% to 43.4% for those with household income <$25,000, and from 19.9% to 31.4% for renters (data available upon request).

In December, compared to Asian adults with no job-related income losses, non-Hispanic Whites, Blacks, Hispanics, and the other/multiple-race group experiencing job-related income losses had 2.4 to 4.1 times higher odds of experiencing fair/poor health and 2.8 to 4.1 times higher odds of serious depression (Table 3). Even after controlling for covariates, compared to Asian adults with no job-related income losses, non-Hispanic Whites, Blacks, Hispanics, and the other/multiple-race group experiencing job-related income losses had, respectively, 3.1, 2.4, 1.9, and 2.6 times higher odds of serious depression (Table 3).

4. Discussion

In this study, we have analyzed trends in actual and expected household job/income losses and resultant physical and mental health inequalities in the US by major social determinants over the 9-month course of the COVID-19 pandemic. Job-related income losses increased substantially since the beginning of the pandemic in March 2020. In December 2020, more than 108 million or 55.5% of US adults aged 18-64 reported household job/income losses, with Hispanics, Blacks, the other/multiple-race group, low-income, and low-education adults, and renters substantially more likely to experience the economic hardship of job/income losses. Job-related income losses due to the pandemic were associated with a 58%-64% increase in the prevalence of poor health and serious depression, particularly among ethnic-minority and socially disadvantaged groups, for whom the prevalence of poor health and serious depression in December 2020 ranged from 20% to 45%. These estimates of poor health and serious depression are substantially greater than those reported for the general US population prior to the pandemic.[9]

Although prevalence estimates of job and economic losses and physical and mental health status have been previously reported using the HPS,[6,7] no study, to our knowledge, has directly examined inequalities in overall health and mental health outcomes according to actual or expected job/income losses during the course of the pandemic. Additionally, our study makes a unique contribution to the COVID-19 literature by examining increases in depression and poor overall health among racial/ethnic and SES groups as a result of growing/mounting job and economic losses over the 9-month course of the pandemic.

Our analysis indicates that more than 40% of adults who experienced household job/income losses since the start of the pandemic were still not employed in December 2020. Although our depression measure captures the most serious form of the disorder, it is important to point that nearly 30 million or 35% of those experiencing household job/income losses since the start of the pandemic reported moderate to serious levels of depression (experiencing symptoms more than half the days or nearly every day during the past 7 days) in December 2020, compared with 13 million or 19% of adults without job/income losses.

The COVID-19 pandemic has affected ethnic-minority and socially disadvantaged groups in terms of increased mortality, incidence, and hospitalization,[11–14] and the evidence presented here shows a similarly marked increase in poor physical health and depression overall and those

associated with job/income losses. Our findings show particularly heightened risks of poor health and serious depression during the pandemic. They are consistent with previous research indicating substantially increased risks of adverse health and behavioral outcomes (such as all-cause mortality, reduced life expectancy, cardiovascular disease, poor self-assessed physical and mental health, suicide, smoking, heavy drinking, poor diet, physical inactivity, and reduced health care access) associated with unemployment and the related income loss.[26–30]

4.1. Limitations

This study has limitations. HPS does not collect information on a range of factors that could help explain the rising prevalence of physical and mental health problems associated with job/income losses during the pandemic, including stress, social and physical isolation, lack of social support or connectedness, loss of self-identity and sense of control, unhealthy diet, lack of physical inactivity, smoking, alcohol, and other substance use.[4,26] Nevertheless, the analysis of temporal data indirectly sheds light on the significance of these factors, which are central to understanding how certain ethnic-minority and socially disadvantaged groups have remained vulnerable to an increased likelihood of experiencing poor health and psychological distress as the pandemic has continued to affect their social and economic well-being disproportionately.

Second, ethnic detail in the public use file is limited as we are unable to identify AIANs and specific Asian/Pacific Islander and Hispanic subgroups who may be at greater risk of job losses and adverse health impact. HPS also lacks information on immigrant groups who may be vulnerable to economic hardships and adverse health outcomes during the pandemic. Third, HPS is a cross-sectional survey; causality cannot be inferred especially for the association of SES with self-assessed health and mental health. However, education disparities in physical and mental health are less likely to be affected by reverse causality as formal education is generally attained by age 25 by most individuals and is fairly stable over the life course[31] and self-assessed health and mental health were measured at the time of or the week preceding the survey. Household income was measured as of 2019, and job/income losses in HPS were measured since the beginning of the pandemic in March 2020 and most likely preceded the health measures in temporality. Fourth, the respondents in HPS are more likely to be women and non-Hispanic Whites and have higher education, compared with the American Community Survey.[32] This might have resulted in an underestimate of the magnitude of racial/ethnic and SES disparities in job/income losses, overall health, and mental health. However, we addressed disproportionate sampling of demographic characteristics by using survey weights, which rakes the demographics of the interviewed persons to education attainment/sex/age distributions and ethnicity/race/sex/age population distributions.[22] Lastly, ethnic-minorities and adults with lower SES have significantly lower broadband internet and computer access in the US and are less likely to have participated in the internet-based HPS, which might have contributed to an underestimate of social inequalities in job/income losses and health outcomes shown here.[33]

5. Conclusion and Implications for Translation

Analysis of temporal, nationally representative census data revealed that job-related income losses and the prevalence of poor health and serious depression increased markedly during the course of the pandemic. More than half of all ethnic-minority and socially disadvantaged adults reported job-related income losses due to the coronavirus pandemic, with 20-45% of them experiencing poor health or serious depression. Prevalence of poor overall health and serious depression increased much more rapidly (by 50% to 120%) among those experiencing recent job losses since the early stages of the pandemic, compared with those who experienced no job/income losses (10% to 25%). Those affected by mounting job and economic losses during the pandemic are in critical need of social and economic aid and would benefit from increased access and improved response to mental health and other social services.

The study findings indicate the continuing need to monitor changes in physical and mental health prevalence and disruptions to mental health

services during the ongoing pandemic and promote and expand access to evidence-based primary and community-based health services, psychosocial support, and social care.[4,34]

Compliance with Ethical Standards

Key Messages

▶ In December 2020, more than 108 million or 54% of US adults reported that they or someone in their household experienced a loss of employment income since March 13, 2020. A further 68 million (35%) adults reported expecting a loss of employment income in the next four weeks due to the pandemic.

▶ In December 2020, the prevalence of fair/poor health varied from 11.6% for Asians with no job/income losses to 28.8% for Hispanics and 32.3% for Blacks experiencing job/income losses. The prevalence of serious depression varied from 6.5% for Asians with no job/income losses to 21.6% for Non-Hispanic Whites and 21.8% for Blacks with job/income losses.

▶ More than half of all ethnic-minority and socially disadvantaged adults in the US reported job-related income losses due to the COVID-19 pandemic, with 20-45% of them experiencing poor health or serious depression.

▶ Prevalence of poor overall health and serious depression increased much more rapidly (by 50% to 120%) among those experiencing job losses since the early stages of the pandemic, compared with those who experienced no job/income losses (10% to 25%).

▶ Individuals and families affected by mounting job and economic losses during the pandemic are in critical need of social and economic aid and would benefit from increased access and improved response to health services, psychosocial support, and social care during the pandemic and beyond.

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