



# Economic Shocks, Food Insufficiency and Mental Health during the COVID-19 Pandemic

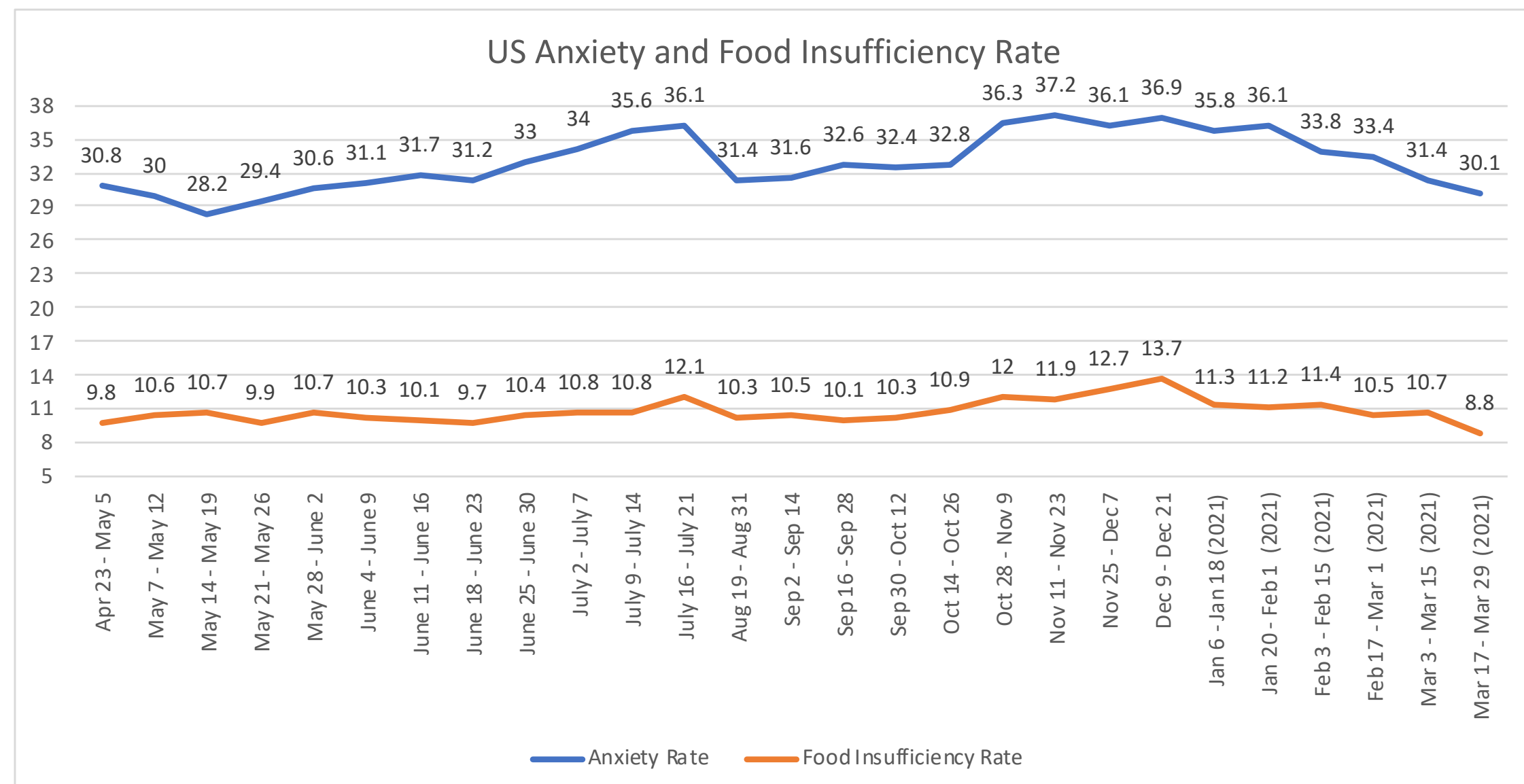


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## Introduction

- The COVID-19 pandemic and the associated economic collapse created unprecedented challenges for Americans, including for their mental health, job opportunities, and food security.
- We employ weekly household-level Household Pulse Survey data from April 23, 2020 to March 29, 2021 to investigate the effects of food insufficiency and economic shocks, defined as income loss and unemployment, on the mental health of adults during the COVID-19 pandemic.
- We identify specific disadvantaged groups and test for heterogeneous effects by using subsample regression analyses.



## Relevant Literature

- Being food insecure and unemployed was linked to an increased risk of mental health problems (Mandal and Roe, 2007; Wei et al., 2018; Fang et al., 2021).
- On the other hand, depression increases the likelihood of family food insecurity (Casey et al., 2004; Noonan et al., 2016). People with more health disorders are more likely to earn less and to be unemployed (Case et al., 2005).
- The feeling of having insufficient resources to cope with demands could influence individual's decision-making through attention, cognitive control, and mental load (de Bruijn & Antonides, 2021).

## Methods and Data

- **Endogeneity:** Numerous studies show unemployed, or food insecure individuals have worse mental health. However, mental health has an impact on food security and employment as well.
- **Econometric Model:** To correct for endogeneity, we employ IV estimation with endogenous indicator variables (LPM-IV).

$$\text{First Stage: } y_{2i} = z_{1i}\Pi_1 + z_{2i}\Pi_2 + v_i$$

$$\text{Second Stage: } y_{1i} = \hat{y}_{2i}\beta_1 + z_{1i}\beta_2 + u_i$$

$y_{1i}$  is the dependent variable here: an indicator of anxiety.

$y_{2i}$  is a set of endogenous variables, food insufficiency and economic shocks.

$z_{1i}$  is a set of exogenous covariates (e.g., education, income,...)

$z_{2i}$  is a set of instrumental variables.

- **Instruments** for food insufficiency and economic shocks: neighboring states' same and last month average food insufficiency rate; neighboring states' same and last month average unemployment rate.

### Summary Statistics for selected variables

Dependent Variable	All		Anxiety=yes		Anxiety=no		t-test	
	Mean	Std	Mean	Std	Mean	Std	t-test	p-value
Anxiety	0.33	0.47						
<b>FI and Economic Shocks</b>								
Food Insufficiency	0.10	0.30	0.17	0.38	0.06	0.24	62.78	<0.001
Income loss	0.48	0.50	0.59	0.49	0.43	0.49	70.36	<0.001
Unemployment	0.11	0.31	0.15	0.35	0.09	0.29	31.06	<0.001
<b>Household Characteristics</b>								
Household size	3.01	1.54	2.99	1.54	3.02	1.54	-4.67	<0.001
Number of Children	0.80	1.12	0.78	1.11	0.81	1.12	-5.80	<0.001
Income <\$25,000	0.11	0.31	0.14	0.35	0.09	0.28	29.32	<0.001
Income \$25,000-\$49,000	0.21	0.41	0.24	0.43	0.20	0.40	22.41	<0.001
Income \$50,000 - \$99,999	0.30	0.46	0.30	0.46	0.30	0.46	0.637	0.524
Income \$100,000-\$199,999	0.23	0.42	0.19	0.39	0.25	0.43	-36.84	<0.001
Income >\$200,000	0.08	0.27	0.06	0.23	0.09	0.29	-41.69	<0.001
<b>Respondent Characteristics</b>								
Age	42.27	12.38	39.99	12.13	43.37	12.36	-57.23	<0.001
Age square	1939.87	1072.30	1746.11	1024.70	2033.96	1082.23	-58.13	<0.001
Male	0.51	0.50	0.44	0.50	0.55	0.50	-43.49	<0.001
Married	0.52	0.50	0.45	0.50	0.56	0.50	-45.86	<0.001
Hispanic	0.15	0.36	0.16	0.36	0.15	0.36	2.30	0.02
White	0.76	0.43	0.78	0.42	0.76	0.43	9.42	<0.001
Black	0.12	0.33	0.12	0.33	0.13	0.33	-5.92	<0.001
Asian	0.06	0.23	0.04	0.20	0.06	0.24	-23.74	<0.001
Other	0.06	0.23	0.07	0.25	0.05	0.22	11.16	<0.001
Less than high school	0.02	0.13	0.02	0.13	0.02	0.13	0.690	0.49
High school graduate or equivalent	0.29	0.45	0.28	0.45	0.29	0.46	-4.197	<0.001
Some college or Associates degree	0.30	0.46	0.33	0.47	0.29	0.45	21.16	<0.001
Bachelor's or graduate degree	0.39	0.49	0.37	0.48	0.40	0.49	-16.27	<0.001

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## Results

- Food insufficiency has a larger negative impact on mental health than either income loss or unemployment.
- Even when we include Supplemental Nutrition Assistance Program (SNAP) participation and unemployment insurance application as control variables, the negative effect of food insufficiency on mental health persists.
- Based on subgroup regressions, we find males, mortgage payers and non-metro area populations have higher probabilities of reporting anxiety disorder when they are food insufficient, compared to their counterparts.

Table 2: Estimates of OLS and IV-LPM models of Anxiety

Dep. Var Anxiety	(1) OLS	(2) IV-LPM (Baseline model)	(3) IV-LPM (Add Assistance Program Variables)
Food Insufficiency	0.235*** (0.004)	1.747*** (0.294)	1.714*** (0.339)
Income Loss	0.106*** (0.003)	0.874*** (0.222)	-0.125 (0.519)
Unemployment	0.046*** (0.005)	-0.909*** (0.318)	-0.481 (0.736)
Household size	-0.002 (0.001)	-0.066*** (0.017)	0.008 (0.036)
Number of kids	-0.011*** (0.001)	0.032* (0.016)	-0.032 (0.035)
Income 25,000-49,999	0.013*** (0.003)	0.061*** (0.023)	0.045* (0.024)
Income 50,000-99,999	0.000 (0.004)	0.175*** (0.049)	0.128*** (0.040)
Income 100,000-199,999	-0.029*** (0.004)	0.221*** (0.064)	0.114*** (0.036)
Income >200,000	-0.049*** (0.006)	0.242*** (0.071)	0.069 (0.044)
Age	-0.0003 (0.001)	-0.017*** (0.003)	-0.013*** (0.002)
Age square	-0.00005*** (0.00001)	0.0001*** (0.00003)	0.0001*** (0.00003)
Male	-0.077*** (0.002)	-0.059*** (0.004)	-0.067*** (0.011)
Married	-0.034*** (0.002)	0.002 (0.011)	0.016 (0.018)
Hispanic	-0.040*** (0.004)	-0.070*** (0.009)	-0.054*** (0.019)
Black	-0.077*** (0.004)	-0.159*** (0.027)	-0.162*** (0.036)
Asian	-0.093*** (0.006)	-0.043*** (0.014)	-0.105*** (0.029)
Other Race	0.008 (0.005)	-0.061*** (0.019)	-0.042*** (0.015)
HS degree or GED	-0.001 (0.013)	0.113*** (0.030)	0.087*** (0.031)
Some college/AA degree	0.041*** (0.014)	0.200*** (0.041)	0.192*** (0.047)
Bachelors'/Graduate degree	0.042*** (0.013)	0.304*** (0.060)	0.249*** (0.053)
Residential Mobility	0.001 (0.003)	0.002 (0.002)	0.005*** (0.002)
Stay-at-home order	0.009 (0.010)	0.018*** (0.007)	0.039*** (0.011)
Non-essential business	-0.004 (0.006)	-0.003 (0.013)	-0.002 (0.014)
Time trend	0.003*** (0.0001)	-0.002 (0.001)	-0.001 (0.001)
Unemployment Insurance			0.140 (0.206)
SNAP			0.002 (0.044)
Constant	0.369*** (0.021)	0.112 (0.088)	0.306*** (0.050)
F-Statistics		52.628	6.935
Hansen-J Statistics		0.534	1.508
Observations	1,039,923	1,039,923	539,731

Notes: All estimation results are adjusted by sampling weights. Standard errors are clustered at state level. \*\*\*, \*\*, and \*, denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4: Heterogenous Effects of LPM with Instruments

VARIABLES	Mortgage	Rent	Male	Female	Non-MSA	MSA
Food Insufficiency	2.371*** (0.386)	1.105*** (0.310)	2.090*** (0.434)	1.528*** (0.272)	1.814*** (0.356)	1.320** (0.585)
Income loss	0.822** (0.382)	0.608** (0.258)	0.958** (0.448)	0.608*** (0.160)	0.743** (0.343)	0.284 (0.633)
Unemployment	-0.827** (0.378)	-0.359* (0.193)	-1.072 (0.684)	-0.624** (0.292)	-0.502 (0.360)	-0.139 (0.271)
Observations	624,097	325,793	479,698	644,514	720,207	404,005

Notes: All estimation results are adjusted by sampling weights. Standard errors are clustered at state level. \*\*\*, \*\*, and \*, denote significance at the 1%, 5%, and 10% levels

## Conclusions

- This study analyzes the effect of food insufficiency and economic shocks on mental health disorders during the pandemic and compares the magnitudes of these shocks on mental health.
- We find larger impacts of food insufficiency than income or job loss on mental health, even after controlling for assistance program variables.
- Our subgroup analysis shows increasing attention could be paid to male's mental health.
- The government may provide incentives or subsidized insurance to support rural health care access during the crisis to alleviate the effect of hunger and economic shocks.

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