How Much Has Food Insecurity Risen? Evidence from the Census Household Pulse Survey

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"How Much Has Food Insecurity Risen? Evidence from the Census Household Pulse Survey"

by **Diane Schanzenbach** and **Abigail Pitts**

Introduction

The COVID-19 health emergency has led to a sharp economic slowdown, with soaring unemployment and spikes in need as illustrated by news reports of miles-long lines at food pantries. In this report,[1] we estimate current rates of food insecurity and the extent to which food insecurity rates have increased in national data and by state using the Census's Household Pulse Survey (CHHPS). **We find that food insecurity has doubled overall, and tripled among households with children.** Food insecurity is elevated across all states, with some states experiencing extremely high rates and/or increases in food insecurity. Across the nation, 7% of households reported receiving free food during the prior week.

Household Food Insecurity in the CHHPS

To compare measures collected during the COVID-19 health emergency to prior measures, we must make several adjustments. The CHHPS collects data on food sufficiency that is weighted at the respondent level, and asks about food sufficiency experiences over the past 7 days. On the other hand, the Current Population Survey's Food Security Supplement (CPS-FSS), which is the source of the U.S. Department of Agriculture's annual reports, typically reports food insecurity for households over the past year. We adjust the CHHPS data to estimate food security rates from its measure of food sufficiency, and produce estimates weighted at the household instead of individual level. Unfortunately, we have found no way to adjust for the differences in the recall periods, though we can compare the CHHPS's weekly results to food insecurity estimates from the National Health Interview Survey (NHIS).

As discussed in more detail in our prior work, CHHPS assesses food *sufficiency*, which is related to—but distinct from—the measure of food *security* usually monitored. Food security status in the CPS-FSS is determined by answers to a 10-item scale (18 items for households with children) that assesses a variety of aspects of a household's access to food, ranging from how often the household worried about having enough food to how often a child has gone for a day without eating. By contrast, to measure food sufficiency in the CHHPS, respondents are asked the following question: "In the last 7 days, which of these statements best describes the food eaten in your households?" Respondents are asked to choose one of the following answers:

- "Enough of the kinds of food we wanted to eat"
- "Enough, but not always the kinds of food we wanted to eat"
- "Sometimes not enough to eat"

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[1] The figures in this report were updated on September 9, 2020 to correct for a minor data error.

- "Often not enough to eat"

Fortunately, the CPS-FSS collects information on both food sufficiency and food security. In particular, a question similar to the one asked in the CHHPS about food sufficiency is asked as a screener question prior to asking a subset of respondents the battery of questions designed to measure food security. CPS respondents who report over the past year "often" or "sometimes" not having enough to eat, or "not having enough of the kinds of food" they want to eat, are asked the detailed battery to measure food security.[2] Because the CPS-FSS asks both about food insufficiency and about food insecurity, we can assess how the two concepts are typically related to each other using pooled CPS-FSS data from 2015–18. We use this relationship to map the measures of food sufficiency collected in the CHHPS to food security.

In our earlier work, we compared three different approaches to estimating food insecurity from food insufficiency data. In this report, we adopt what we call the "conditional probability approach," which is based on the share answering each of the four options to the food sufficiency question. In the CPS-FSS, approximately 86–88% of those responding that they "often" did not have enough to eat were deemed food insecure by their responses to the Food Security Supplement, as were 85–86% of those responding they "sometimes" did not. Among those who reported "enough but not always the kinds of food we wanted to eat," 38% of households overall, and 43% of those with children, were food insecure. Even 2–3% of those reporting "enough of the kinds of food we wanted to eat" were determined to be food insecure after answering the full battery of food security questions. To estimate food insecurity from the food sufficiency question, we multiply the share reporting each answer to the food sufficiency question by these percentages, where the probability of being food insufficient conditional on each answer is calculated for the same subgroup (defined by respondent's race, the presence of children, and later in this report, state of residence). We also report results for food insufficiency (coded as those who "sometimes" or "often" did not have enough food or those who have "enough food but not the types" they want) for readers who prefer that metric.

Two other issues of comparability are worth noting. The CHHPS data are collected and weighted based on individual respondents, and not at the household level like the CPS-FSS is. To make the CHHPS and CPS-FSS comparable, we can either reweight the CPS-FSS by individuals or reweight the CHHPS to households. We choose to present the estimates at the household level, weighting the microdata by a weight calculated as the person weight divided by the number of adults in the unit.[3] Adjusting for the difference in reference period is more difficult. The CHHPS asks respondents to reflect on the past 7 days, while the CPS-FSS asks about food access over the prior year. Below, we introduce another source of food security data derived from the National Health Interview Survey (NHIS) which collects information on the past month. We would expect that, all else equal, more households would report food insecurity over longer periods of time than shorter periods of time.

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[2] There are other ways that households can be screened into the CPS-FSS. Households that report on a different question that they ran short of money for food and households that report an income below 185% of the federal poverty line are also asked the CPS-FSS. Households that are not screened into the CPS-FSS are assumed to be food secure.

[3] We thank Shawn Bucholtz for the suggestion on how to proxy household-level weights from the CHHPS microdata.

As a result, our estimates of the increase in food insecurity during the COVID-19 health crisis may be understated.

Rates of food insufficiency and food insecurity averaged across the first 3 waves of CHHPS are displayed in Table 1, below.[4] Column (1) displays food insufficiency, overall, by race/ethnicity, and for respondents with children. Although we calculated these rates from the microdata, the estimates in this column can also be drawn from the Food Security Tables (2b and 3b) released weekly by the Census Bureau. Overall, 44% of respondents reported food insufficiency, as did 50% of those with children. Column (2) uses the microdata to calculate food insufficiency among households, by weighting the responses with a proxy household weight constructed as the person weight divided by the number of adults in the household. The difference between respondent- and household-weighted food insufficiency is less than a percentage point, with rates among households lower than those among respondents for most groups. Column (3) calculates food insecurity for respondents according to the method described above, and column (4) calculates food insecurity for households and is our preferred measure going forward.

Twenty-three percent of households overall experienced food insecurity in the first 3 waves of the CHHPS, which was collected from April 23–May 19. Blacks and Hispanics had higher rates than whites, at 36% and 32% respectively, versus 18% for whites. Among households with children, 30% overall were food insecure; 41% of households with a black respondent and 36% of those with a Hispanic respondent were food insecure. Note that food insecurity was statistically higher in both weeks 2 and 3 compared with week 1, and was not statistically different between weeks 2 and 3.

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[4] Microdata available here. Citation: Fields, J.F., Hunter-Childs, J., Thersine, A., Sisson, J., Parker, E., Velkoff, V., Logan, C., and Shin, H. Design and operation of the 2020 Household Pulse Survey, 2020. U.S. Census Bureau. Forthcoming.

Table 1. Food Insufficiency and Food Insecurity Weighted by Respondent vs. Household

	Respondent-Weighted Food Insufficiency	Household-Weighted Food Insufficiency	Respondent-Weighted Food Insecurity	Household-Weighted Food Insecurity
	(1)	(2)	(3)	(4)
Panel A: Overall				
Overall	43.9%	43.0%	22.8%	23.0%
White	38.3%	37.8%	19.1%	18.1%
Black	56.2%	55.5%	33.1%	35.7%
Hispanic	55.5%	55.2%	29.5%	32.3%
Panel B: With Children in the Household				
Overall	49.9%	49.3%	28.9%	29.5%
White	44.5%	44.1%	24.7%	23.9%
Black	58.3%	57.9%	37.8%	40.9%
Hispanic	58.1%	57.4%	33.8%	35.5%

Source: Authors' calculations from CPS-FSS 2015–18; Census Household Pulse Survey microdata.

How Much Has Food Insecurity Increased?

In order to estimate the extent of the increase in food insecurity during the COVID-19 health emergency, we compare prior estimates of food insecurity from other sources to the measures in CHHPS. The estimates for households overall are displayed in Figure 1. The blue line represents the share of households over time found to be food insecure over the past year according to the CPS-FSS data, and reported in the annual USDA reports on food security status. In December 2018, the last available data, 11.1% of households experienced food insecurity over the prior year.[5] Note that food insecurity increased by 3.5 percentage points with the onset of the Great Recession in 2008, and continued to remain elevated for many years. The orange line presents food insecurity over the past month from the NHIS. The NHIS asks the same 10 questions that the CPS-FSS asks, but with a reference period of a month.[6] As one would expect, food insecurity measured on a monthly basis in NHIS is lower, by 2–3 percentage points, than it is when collected with an annual lookback period in the CPS-FSS. In 2018, food insecurity in the NHIS was 8.8%.

Next, we estimate what food insecurity was likely to be on the eve of the COVID-19 health emergency. Food insecurity rates vary with the unemployment rate, and unemployment continued to improve between 2018 and when the economy peaked in February 2020. We take two approaches to estimating the usual relationship between unemployment and food insecurity. First, we estimate a model using the NHIS and correlating national monthly food insecurity rates with (seasonally adjusted) monthly unemployment rates from 2011–18. Second, we estimate a separate model using annual, state-level data on food insecurity and unemployment from 2004–18 and

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[5] December 2019 data are expected to be released in September 2020.

[6] The NHIS does not ask additional questions for households with children like the CPS-FSS does.

include state-level fixed effects. Both models produce nearly identical estimates of the relationship between unemployment and food insecurity, with a 1 percentage point increase in unemployment rate predicting a 0.70–0.79 percentage point increase in food insecurity. We use this relationship and the change in unemployment to predict likely food insecurity levels in February 2020.[7] Monthly food insecurity likely hit a low of 8.5% in February 2020, as represented by the orange square in Figure 1. The estimate using annual food insecurity from the CPS-FSS is 10.8%.

We can compare this predicted rate in February 2020 to food insecurity from the CHHPS, which was 23.0% over the April 23–May 19 period and is represented by the green circle. **The post-COVID estimates are 2.7 times those estimated for February 2020. There was a large increase in unemployment, from 3.9% in February to 14.7% in April. Based on the change in unemployment rate, the expected food insecurity rate in April would have been 17.3%—in other words, the increase in unemployment explains more than half of the increase in food insecurity.** Furthermore, the Bureau of Labor Statistics reports that the official unemployment rate is understated due to a large number of workers reporting they were "not at work for other reasons" and were not classified as unemployed. Recoding these workers as unemployed would raise the March unemployment rate to 20.5%, and as a result fully 92% of the increase in food insecurity would be explained by the increase in unemployment rate. Some of the remaining unexplained increase in food insecurity may be due to the sharp increase in food prices.

**Figure 1. Predicted vs. Actual Food Insecurity, All Households**

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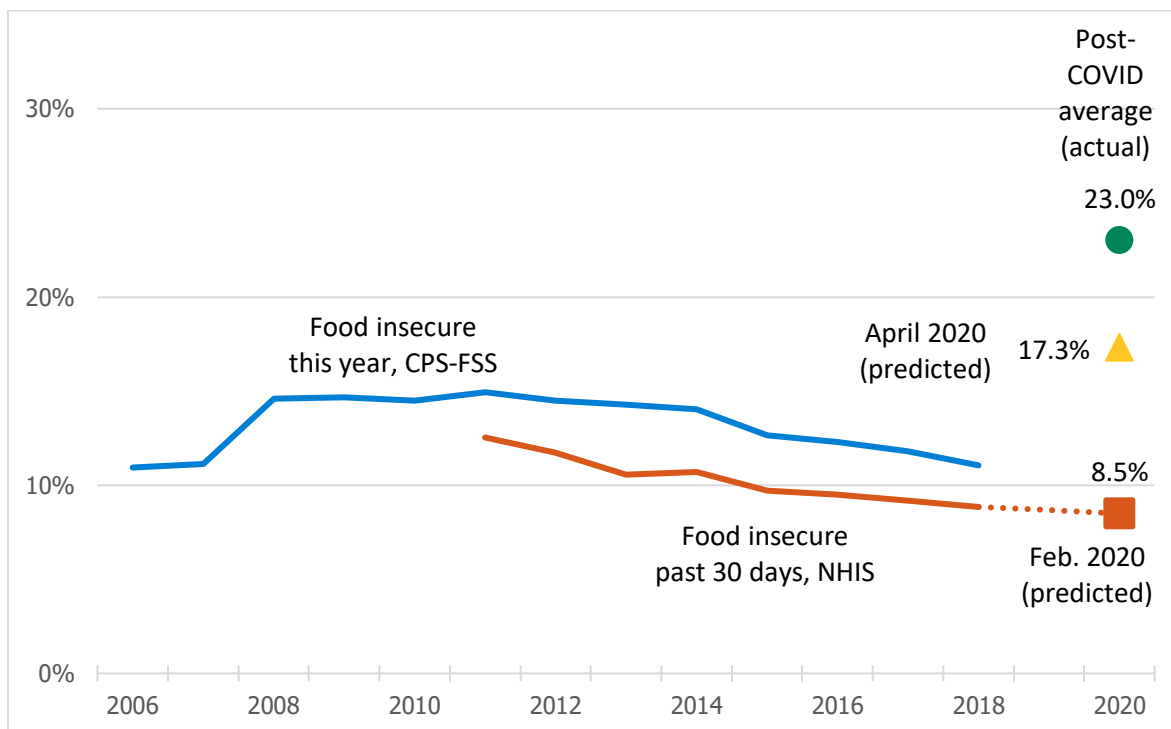
[7] The NHIS estimate is 0.79, while the CPS-FSS estimate is 0.70. March 2020 predicted food insecurity only differs in the 3rd decimal place if we use one rate or the other.

Source: Authors' calculations from CHHPS, CPS-FSS, and NHS.

Figure 2 repeats the exercise for households with children, who always have a higher rate of food insecurity than do households overall. We predict that the February 2020 likely level of food insecurity was 9.4%. **During the COVID-19 health emergency, the rate of food insecurity for households with children more than tripled to 29.5%.** Approximately half of this increase can be explained by the increase in the unemployment rate, and 65% could be explained if the unemployment rate were adjusted to include as unemployed workers reporting they were "not at work for other reasons." Low-income families have been hit particularly hard during this period, between loss of subsidized school meals due to school closures, particularly elevated unemployment rates among women, and delays in some relief payments such as the slow rollout of the Pandemic Electronic Benefit Transfer (P-EBT) program that provides resources to replace missed school meals, as well as delayed unemployment insurance payments in many states.

Figure 2. Predicted vs. Actual Food Insecurity, Households w/Children
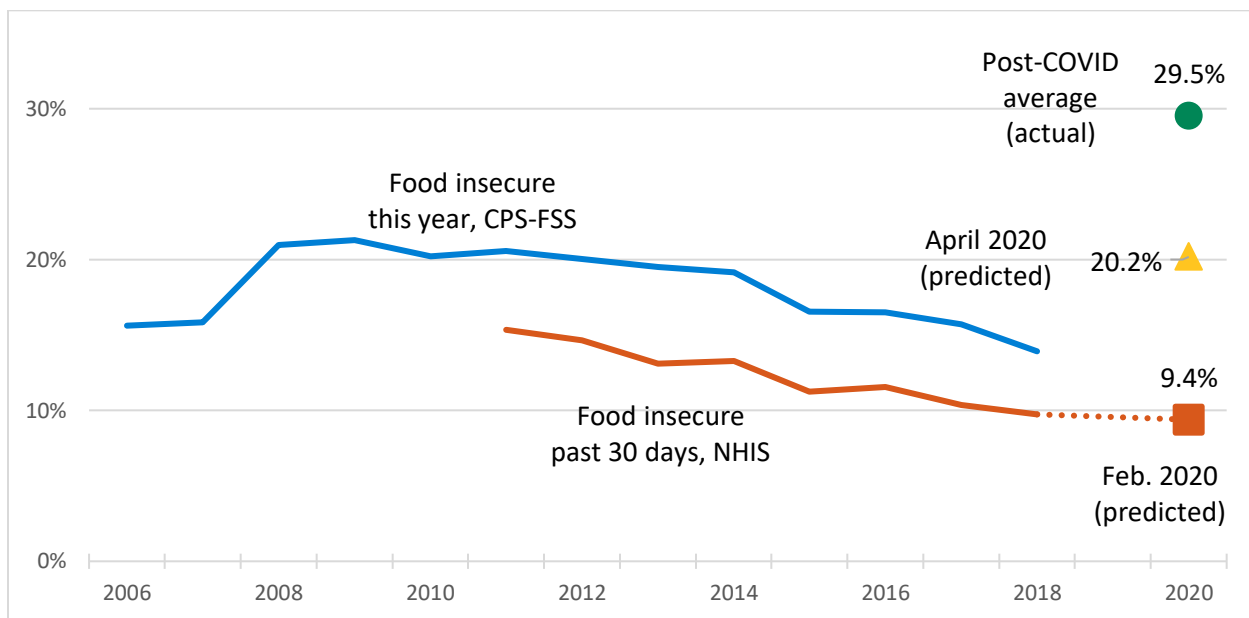
Source: Authors' calculations from CHHPS, CPS-FSS and NHS.

An alternative approach that we *do not recommend* to estimate the increase in food insecurity during the COVID-19 health emergency is to use the variable collected in CHHPS that asks respondents to assess their food sufficiency for the period before March 13, 2020. As we discussed in more detail in our previous work, respondents do not appear to reliably answer that question. Across the three waves, 17.8% of households report they remember being food insecure prior to March 13, which is implausible and much higher than the 8.5% predicted for March or the 11.1% measured in December 2018.

State-Level Estimates

The COVID-19 crisis has not impacted everywhere in the U.S. equally, and as demonstrated by disparate food insecurity rates by state. CHHPS contains respondents from all 50 states, so we can do the same exercise of translating food insufficiency into food insecurity in all 50 states using an analogous conditional means approach with the CPS-FSS. In this case, we calculate a state-specific mapping from food insufficiency to food insecurity using CPS-FSS 2015–18. Table 2 shows the household food insecurity rates at various points in time for all 50 states and the U.S. overall, plus the share of households reporting receipt of free food (e.g., from food pantries, a school or children's program, etc.).[8] Column (1) displays food insecurity rates over the past year from the December 2018 CPS-FSS.[9] Column (2) shows our estimate of food insecurity in February 2020 at the labor market peak and on the eve of the COVID-19 crisis. Column (3) reports the household food insecurity rate in April and May, pooled across the first three waves of CHHPS. Column (4) shows the ratio of food insecurity in the CHHPS (column 3) to what food insecurity likely was in February (column 2). In the U.S. overall, according to the CPS-FSS, food insecurity during COVID-19 is 2.12 times what it was prior to the onset of the national health emergency.

We find that food insecurity rates are dramatically elevated in every state, though there is substantial heterogeneity. Mississippi and Louisiana have the highest estimates of food insecurity during COVID-19, at 31.6% and 30.1%, respectively. Vermont, with 14.1% food insecure, is the only state with a food insecurity rate below 15%. Vermont and Oklahoma saw the smallest increases in food insecurity so far during COVID-19, both with less than a 50% increase (though from very different base levels). In two states, food insecurity more than tripled: Georgia and Rhode Island.

Column (5) reports the share of households responding that they received free food from any source over the prior 7 days—e.g., from food pantries, a school or children's program, from neighbors, and so on.[10] Across the U.S., 7.3% of households reported receiving free food in the prior week. More than 1 in 10 households reported receiving free food in Hawaii and New Mexico.

Table 2. Food Insecurity and Emergency Food Use, by State

	Food Insecurity: Dec. 2018	Predicted Food Insecurity: Feb. 2020	Food Insecurity: April–May 2020	Ratio: Feb. vs. April-May	Received Free Food, Prior 7 Days
	(1)	(2)	(3)	(4)	(5)
U.S. Total	11.1%	10.8%	23.0%	2.12	7.3%
Alabama	14.2%	13.4%	24.1%	1.80	6.5%
Alaska	11.6%	11.1%	18.1%	1.63	6.6%

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[8] Food insufficiency rates by state are available from the authors upon request.

[9] Recall that the NHIS with its 30-day lookback period had lower rates of food insecurity than did the CPS-FSS with its annual lookback period. We cannot calculate state-level food insecurity with the NHIS.

[10] These numbers can be further broken down by source of free food. Overall, 1.8% of households reported receiving food from a food pantry over the past week, and 3.4% received food from a school or children's program. State-level results by source of free food available upon request.

Arizona	11.4%	11.2%	24.1%	2.16	5.8%
Arkansas	11.9%	12.1%	25.9%	2.15	9.5%
California	10.2%	9.1%	21.8%	2.40	8.6%
Colorado	10.0%	9.6%	20.1%	2.09	6.0%
Connecticut	13.5%	13.4%	22.8%	1.70	6.4%
Delaware	9.2%	10.2%	21.6%	2.13	4.6%
D.C.	10.8%	8.8%	21.1%	2.39	5.8%
Florida	10.5%	10.2%	24.6%	2.42	7.3%
Georgia	7.9%	7.1%	23.6%	3.32	5.4%
Hawaii	7.8%	8.0%	18.4%	2.30	12.5%
Idaho	9.0%	9.4%	16.6%	1.76	8.3%
Illinois	9.0%	8.2%	24.0%	2.92	6.3%
Indiana	14.8%	14.4%	22.6%	1.57	7.4%
Iowa	6.6%	7.0%	19.2%	2.73	6.8%
Kansas	12.5%	13.1%	20.8%	1.59	7.9%
Kentucky	14.6%	15.3%	25.8%	1.69	8.3%
Louisiana	13.6%	12.5%	30.1%	2.41	9.3%
Maine	13.1%	13.1%	22.0%	1.68	6.2%
Maryland	10.5%	9.7%	21.8%	2.24	6.1%
Massachusetts	8.1%	8.3%	20.0%	2.41	5.9%
Michigan	12.1%	11.4%	24.4%	2.13	7.1%
Minnesota	7.2%	8.9%	17.8%	1.99	9.2%
Mississippi	15.2%	14.3%	31.6%	2.21	8.4%
Missouri	10.1%	10.3%	23.3%	2.25	8.6%
Montana	10.1%	9.5%	17.8%	1.87	6.1%
Nebraska	10.1%	10.6%	19.4%	1.83	7.8%
Nevada	13.9%	13.2%	25.6%	1.93	7.7%
New Hampshire	6.1%	7.0%	16.9%	2.41	5.1%
New Jersey	9.1%	9.6%	25.2%	2.63	5.4%
New Mexico	15.7%	14.9%	27.6%	1.86	11.6%
New York	10.5%	10.1%	22.9%	2.27	7.1%
North Carolina	12.9%	11.7%	24.0%	2.04	6.4%
North Dakota	8.6%	9.7%	17.2%	1.77	8.7%
Ohio	13.9%	12.9%	23.0%	1.78	7.7%
Oklahoma	16.8%	16.7%	24.0%	1.44	8.6%
Oregon	8.9%	9.3%	19.8%	2.14	7.5%

Pennsylvania	11.0%	10.3%	21.3%	2.06	5.8%
Rhode Island	7.8%	6.7%	22.1%	3.32	5.3%
South Carolina	11.1%	11.1%	22.4%	2.02	9.7%
South Dakota	9.8%	10.1%	18.3%	1.82	9.4%
Tennessee	12.5%	12.5%	23.1%	1.84	5.9%
Texas	13.3%	12.4%	26.8%	2.17	8.2%
Utah	8.2%	8.4%	17.4%	2.07	8.8%
Vermont	9.7%	9.6%	14.1%	1.47	8.5%
Virginia	9.4%	10.0%	22.5%	2.25	5.0%
Washington	9.8%	10.1%	18.6%	1.83	5.8%
West Virginia	16.6%	15.5%	24.2%	1.57	6.3%
Wisconsin	8.1%	7.9%	16.9%	2.14	8.5%
Wyoming	11.1%	12.3%	18.8%	1.53	7.3%

Source: Authors' calculations from CHHPS and CPS-FSS.