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Anna D'Souza
Eliana Favari
Siddharth Krishnaswamy
Sharad Tandon

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Abstract

This paper investigate the consequences of forced displacement using a panel of households that were surveyed during the Republic of Yemen's conflict both before and after they became displaced. It demonstrates that forced displacement resulted in an immediate but temporary decline in food access. Pre- and post-displacement food access outcomes were indistinguishable within four months of displacement and, for later months, there were no economically large declines in food access. The quick rebound is partially explained by an increase in assistance to displaced households that had worse food access prior to displacement. Households that were slightly better off prior to displacement did not receive an increase in assistance. These are the first estimates that directly address how non-security dimensions of well-being change immediately following forced displacement and demonstrate that, in some contexts, forcibly displaced households are more resilient than is typically assumed.

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Consequences of Forced Displacement in Active Conflict: Evidence from the Republic of Yemen*

By Anna D'Souza†, Eliana Favari‡, Siddharth Krishnaswamy§, and Sharad Tandon**

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†Baruch College, City University of New York, 55 Lexington Ave, New York NY 10010, USA, anna.dsouza@baruch.cuny.edu.

‡World Food Programme, Regional Bureau- Middle East, North Africa, and Eastern Europe, 72 El-Nahda, Maadi as Sarayat Al Gharbeyah, Maadi, Cairo, Egypt, eliana.favari@wrp.org.

§World Food Programme, Regional Bureau- Middle East, North Africa, and Eastern Europe, 72 El-Nahda, Maadi as Sarayat Al Gharbeyah, Maadi, Cairo, Egypt, siddharth.krishnaswamy@wfp.org.

**The World Bank, 1818 H St. NW, Washington, D.C. 20420, USA, standon3@worldbank.org.

Section1. Introduction

Forced displacement has been surging across the world over the past decade and reached 80 million as of 2019 (e.g., UNHCR 2020). Importantly, these populations are centered in and around countries in active and protracted conflict and represent a population with some of the largest welfare deprivations in the world (e.g., UNHCR 2016; etc.). In order to meet the Sustainable Development Goals, humanitarian and development agencies will need to make much greater progress on supporting the well-being of displaced populations during conflict and after peace has been restored (e.g., World Bank 2018).

Although the forcibly displaced exhibit a wide variety of deprivations on average (e.g., UNHCR 2016), there has been limited investigation into the immediate welfare consequences of forced displacement given data scarcity. A number of reports compare post-displacement welfare outcomes of forcibly displaced households relative to hosts (e.g., WFP 2016; World Bank 2017a; OCHA 2018; OCHA 2019b; Sharma and Wai-Poi 2019; etc.), and others investigate long-term consequences of displacement using data collected years after conflict (e.g., Ibanez and Velez 2008; Verwimp and Maystadt 2015; etc.). Furthermore, a large literature investigates violence before and after displacement in origin and destination regions (e.g., Stanley 1987; Engel and Ibanez 2007; Williams 2008; Lozano-Garcia et al. 2010; Bohra-Mishra and Massey 2011; Adhikari 2013; etc.). However, given the difficulty in collecting non-violence welfare data from displaced households leading up to, during, and immediately following displacement, it is difficult to precisely estimate how forced displacement impacts well-being and whether the impacts persist.

This paper investigates the impacts of forced displacement in the Republic of Yemen's conflict using rare data collected during active conflict. The setting is one in which a large, forced displacement crisis began immediately after the conflict escalated in March 2015, where displacement might have been forced by either violence or the humanitarian situation caused by the conflict (e.g., TFPM 2016; OCHA 2018; etc.). Our data are from the World Food Programme, which has been implementing a monthly monitoring survey collecting food security and displacement information that includes both cross-

sectional and panel components. In that survey, a large number of Yemeni households were surveyed in the months leading up to and following displacement. Although the survey misses households without access to mobile phones who are potentially more in need of assistance, the relatively high penetration of mobile phones allows an analysis that is potentially representative of the majority of the population.[1]

The data demonstrate clear patterns that help to better understand the consequences of forced displacement. First, there is a large and immediate decline in food access immediately following displacement. In our preferred specifications, food access metrics worsened between 11 and 20 percent immediately following displacement. However, on average, there was a quick rebound. Within four months of displacement, one cannot reject the hypothesis that there was no change in food access relative to the month before displacement. For later months one can rule out economically meaningful changes at conventional significance levels.

Second, a portion of this quick rebound is explained by an increase in humanitarian assistance following displacement. Specifically, there was a large increase in food assistance among households that had pre-displacement food access measures below thresholds used to target emergency food assistance.[2] Households that were better off prior to displacement did not receive an increase in assistance. Importantly, in-kind food assistance is the largest component of the humanitarian response in the Republic of Yemen (e.g., OCHA 2018; etc.). But only half the displaced sample had pre-displacement food access measures that were below this commonly used threshold, and thus the quick rebound for a large share of households is likely explained by other factors.

However, in order to identify the impact of forced displacement on food access, it is important to rule out two potential confounding factors. First, in the months leading up to displacement, we can rule out economically meaningful changes in food access metrics,[3] which have been shown to be sensitive to a wide variety of economic shocks

[1]See the data section for a description of mobile phone penetration in the Republic of Yemen and a discussion of potential sample selection in the survey.

[2]Specifically, this corresponds to a Food Consumption Score at or below 42, which is a common threshold used by the World Food Programme to target food assistance (e.g., WFP 2018).

[3]The food access metrics that are analyzed here- the Food Consumption Score and the Reduced Coping Strategies Index- are used to target food assistance and classify food emergencies across the

during the Republic of Yemen's conflict (e.g., Tandon and Vishwanath 2020; Tandon and Vishwanath 2021; Favari et al. 2021; etc.). These estimates suggest that well-being was likely not trending leading up to displacement, and the estimates are not picking up some of these changes as opposed to the immediate impacts of forced displacement.

And second, our results are consistent with displacement in fact being forced, as opposed to households being pulled towards better economic opportunities. Average violence was surging leading up to displacement in our data, and a wide variety of other evidence further suggests that violence was a pivotal factor in displacement during this time period (e.g., TFPM 2016; OCHA 2018; D'Souza et al. 2022; etc.); and among households that would be most likely to migrate due to economic conditions (e.g., those with the worst pre-displacement food access), the results show an identical and dramatic initial drop in food access as opposed to an improvement in food access that might have occurred had these households migrated towards better economic opportunities.

Our results contribute to the literature describing the consequences of forced displacement. First, this is the first analysis we are aware of that is able to arguably identify the impact of forced displacement on food access using data immediately before and after households become displaced.[4] Having pre-displacement data collected from households that would later become forcibly displaced allows us to demonstrate that households are not likely migrating due to sharp changes in economic factors, and further allows us to more precisely estimate the immediate impacts of displacement than comparing post-displaced outcomes of the forcibly displaced to host populations.

Second, these results demonstrate that households are surprisingly resilient to displacement in the Republic of Yemen in a critical welfare dimension. In part, this is likely due to a well-targeted increase in humanitarian assistance, which further offers support to a growing body of literature demonstrating that social protection schemes that reach

world. These indicators are used for these purposes in part because they have been shown to be very sensitive to shocks in well-being in many settings across the world (e.g., Headey and Ecker 2012; Vaitla et al. 2015; etc.).

[4]Bohra-Mishra and Massey (2011) use panel data in Nepal on the location of residence to track displacement over time, but do not have panel information on the well-being of households (e.g., food access metrics, expenditure, etc.). Additionally, Hoogeveen et al. (2019) reach forcibly displaced populations primarily after their first displacement and analyze the decision to return.

households either before shocks occur or soon after can help households recover more quickly and avoid especially adverse and irreversible coping strategies (e.g., Bowen et al. 2020; Goldstein et al. 2021; etc.). Additionally, the fact that a significant share of displaced households can recover quickly without receiving increased assistance suggests a larger amount of resilience among forcibly displaced households than is typically assumed (e.g., World Bank 2017a; Tanner et al. 2021), and further corroborates a growing number of reports suggesting that Yemeni households are potentially more resilient than had been reported due to extensive data scarcity (e.g., Vuylsteke 2021).

The rest of paper is organized as follows. Section 2 discusses the conflict and resulting displacement crisis in the Republic of Yemen; section 3 presents the data; section 4 presents the empirical strategy; section 5 estimates the impacts of forced displacement on food access; and section 6 concludes.

Section 2. The Displacement Crisis in the Republic of Yemen

The displacement crisis in the Republic of Yemen began immediately following the escalation of the conflict in March 2015. At that time, a coalition of nine Gulf and North African countries began supporting the internationally recognized government (IRG) against Houthi forces, which had seized control of the capital and were advancing on Aden in the south of the country (e.g., Tandon 2019). The coalition targeted Houthi positions with air strikes and also supported the IRG forces in ground battles along the front lines of the territory that was under control of Houthi forces (e.g., World Bank 2017b).

Immediately following the initial escalation in violence, there was a large surge in displacement. Official estimates of displacement following the escalation of the conflict were close to 10 percent of the total population; and other sources suggest that closer to 30 percent of the population was initially displaced (e.g., World Bank 2017b). But regardless of the exact data source, the initial surge was large.

Since the escalation of violence in March 2015, the amount of violence, measured by numbers of people killed and number of violent incidents, has increased significantly (e.g.,

OCHA 2019a), with evolving geographic concentrations. Initially, much of the violence was focused on the eastern border of the territory held by Houthi forces. However, over time, the violence extended to the southern border, and then, eventually, to both the northern border with Saudi Arabia and the portion of Houthi-held territory that borders the Arabian Sea (e.g., Tandon and Vishwanath 2020). Furthermore, there were reports of Houthi forces targeting civilians and political opponents, and there was also an additional violent secessionist movement taking control of territory from the IRG (e.g., BBC 2019; OCHA 2020).

As the violence has evolved, official records suggest new households continued to become displaced at roughly an equal rate to the number of households that returned, leaving the total share of the population that was displaced at any point during the time period under analysis similar to the share displaced after the conflict initially escalated (e.g., OCHA 2019a). Importantly, violence was a pivotal factor in the decision to become displaced. Violence was escalating in districts from which these newly displaced households migrated more so than for households that did not become displaced (e.g., D'Souza et al. 2022); and in interviews with displaced households during the period under analysis, the majority of households reported that violence was the cause of their displacement (e.g., TFPM 2019).

However, in addition to the escalation in violence, the conflict has had economic impacts that might have also forced displacement. First, coalition naval forces have significantly restricted imports in ports that supply regions in the north where Houthi forces have a strong presence. These blockages necessitated the delivery of imports from ports farther away via trucks, which is one of the factors that has led to significantly higher food prices in the country (e.g., ACAPS 2020; etc.).[5] Although it is difficult to precisely gauge the intensity of this disruption to supply chains, reports have suggested that immediately following the escalation of the conflict, imports in Al Hudaydah- the port that supplies nearly the entirety of the north- dropped to 40 percent of pre-conflict

[5]Importantly, domestic food production is unable to replace imported food made more expensive through higher transportation costs given that the country imported approximately 90 percent of its food prior to the conflict (e.g., WFP 2012).

levels (e.g., WFP 2018a).

Second, and related to the tightening of the ports, there have been substantial fuel shortages since the beginning of the conflict (e.g., OCHA 2018). The lack of fuel affects households' ability to attain a minimum level of welfare in a number of ways. For example, households without sufficient access to fuel cannot rely on generators and must rather rely on solar power, which is less reliable[6]; there is limited ability to ship food across the country; and the collection of trash is interrupted, which further contributes to the growing cholera epidemic and other related health issues (e.g., Al Jazeera 2019).

Third, beginning in November 2016, the government began paying public salaries infrequently, if at all. Nearly 30 percent of households relied at least in part on government salaries prior to the conflict, and in the capital, this figure was nearly 50 percent (e.g., World Bank 2017b). Thus, many households lost income that was helping to support them at precisely the time supply chains were disrupted and prices of basic commodities and food items began to rise (e.g., WFP 2018a). In addition, anecdotal evidence suggests that the lack of payment of employees has led to an exodus of public sector employees. This, in turn, has significantly reduced the number and quality of public services provided to the Yemeni people and likely has hampered institutional capacity (e.g., OCHA 2019a).

And lastly, there have been a series of macroeconomic shocks related to the conflict that also caused food and fuel prices to escalate rapidly (e.g., OCHA 2018). In particular, a currency crisis in 2018 rapidly increased both food and fuel prices by nearly 50 percent in three months and significantly worsened the food security situation in the country (e.g., Favari et al. 2021). Aside from rapid increases in prices, there also has been a gradual increase in both food and fuel prices that continues to erode household purchasing power at a time when a large share of households struggles to find stable employment (e.g., ACAPS 2020; Favari et al. 2021).

Combined, these price shocks and the challenge of finding stable employment have resulted in a persistent food emergency. In 2015, only three months after the conflict

[6]These statistics on household satisfaction with electricity are based on authors' calculations using questions added to a monthly WFP survey. Also, from the same survey, access to electricity grids is rare in the country.

escalated, there was a 21 percentage point increase in the share of the population that was experiencing acute food insecurity or worse relative to 2014 (IPC 2015). Furthermore, the Emergency Food Security and Nutrition Assessment estimated that 65 percent of Yemenis had poor or borderline food consumption in 2016, a 57 percentage point increase relative to 2014 (FAO 2017; World Bank 2017). Since 2015, the severity of the food emergency has varied along with variation in the shocks to income and prices described above. And food insecurity worsened each year after 2015, teetering on the edge of famine at the end of 2018 (e.g., IPC 2017; IPC 2018; OCHA 2019a).

However, given the importance of violence to displacement, it is important to note that those who live in close proximity to violence do not have worse well-being on average. There is little correlation between the location of violence and access to food and basic services, and there is little change in well-being in response to a number of sudden increases in violence and violent offensives (e.g., Almoayad et al. 2020; Tandon and Vishwanath 2020; Favari et al. 2022; etc.). One of the reasons for the lack of a relationship is that particular instances of violence have impacts far beyond the location where they take place (e.g, Tandon and Vishwanath 20202), and many of the other shocks described above have much stronger and more robust impacts on the humanitarian situation (e.g., Favari et al. 2021; etc.). Combined, these results suggest that the violence that might be causing households to become displaced does not necessarily result in a worsening humanitarian situation experienced in those locations from which displaced households might be fleeing.

Section 3a. Data

Given the tumultuous environments in which large-scale displacements occur, it is very challenging to find data that assess how well-being responds to shocks in real time. The Republic of Yemen is no exception, where the poor security situation (e.g., Sundberg and Melander 2013), the budgetary problems of the government and the Central Statistical Organization (e.g., World Bank 2017b), and the significant population movement since the last census (conducted in 2004) all make it very difficult to conduct traditional

household surveys (e.g., TFPM 2016). Furthermore, given the large and frequent shocks that could potentially affect welfare and induce displacement (e.g., Favari et al. 2021), high frequency data collection is necessary to differentiate between potential mechanisms affecting displacement.

Given the substantial constraints on traditional data collection and the need for high frequency data, we turn to rare, non-traditional survey data.[7] This paper utilizes the most geographically complete survey covering the Republic of Yemen following the start of the conflict- the mobile Vulnerability and Assessment Mapping Survey (mVAM) conducted by the WFP. The monthly data begin in August 2015, just months after the escalation of violence and the peak in forced displacement. The data provide a rare opportunity to study household decisions during an active conflict, with important implications for governments and humanitarian and development organizations.

The primary purpose of the mVAM is to assess the food security situation in the Republic of Yemen each month. On average, it takes about 20 minutes to complete. The survey is conducted via mobile phone and respondents are reached via random digit dialing (RDD). The survey is stratified by governorate/capital city, where potential respondents continue to be contacted until a sufficient number of completed responses have been met in each governorate (aside from the island of Soccatra).[8] The number of minimum responses per governorate is determined by its share of the total population. The number of respondents surveyed each month is approximately 2400.[9]

The survey is a rolling panel, where the call center initially acquires a list of 2400 phone numbers that answered the survey in the initial month. In the second month, the same 2400 phone numbers are contacted for an identical survey. Of these 2400, approximately 400 on average are not reached and have to be replaced for the second survey via random digit dialing, and approximately 200 do not respond for two months in a row. However,

[7]Hoogeveen et al. (2019) also take a non-traditional data approach, interviewing 500 households face-to-face in Mali after displacement and conducting monthly follow-up interviews over a year to identify factors related to whether households return to their origin regions.

[8]The Republic of Yemen has 333 districts that fall within 20 governorates and one municipality (capital city).

[9]See Appendix 1 for the number of responses by governorate. All appendices are available online at "https://sites.google.com/site/sharadtandon222222/".

those that are not reached will continue to be listed in the bank of possible phone numbers to be tried each month, and the same household is potentially contacted for a number of survey rounds.[10] Regardless of the exact numbers of households in the database of phone numbers, in each survey 20 percent of responses are from new households and the remaining responses are from households surveyed at least once before.

The survey first collects information regarding a household's location, and whether the household has been displaced. If the household is currently displaced, the survey inquires about the month and year of displacement and the origin governorate.[11] Given that households are followed over time, there are households that are displaced more than once, and also households that return to their homes following one or more initial displacements. We then merge the time and location of households with conflict data from the Uppsala Data Program (prior to 2016) and from the Armed Conflict and Event Data (ACLED) (2016 and later).[12] We match the violence data before, during, and after the time of displacement in the origin district.

The survey further collects a full food security module, including the number of times households in the week before the survey have consumed from important food groups, the number of times households have resorted to five common food coping strategies, and whether the household received food assistance in the past 30 days. From these data, we calculate the household Food Consumption Score (FCS) and the reduced Food Coping Strategies Index (rCSI). A higher FCS and a higher number of days consuming particular food items are associated with better food access; and a lower rCSI and a lower number of days relying on negative food coping strategies are associated with better food access.

The entire survey between August 2015 and December 2018 includes 18,078 separate households.[13] This analysis focuses on the households that became displaced after their first interview, which allows us to analyze how indicators of well-being were changing

[10]The WFP is unable to observe whether a phone number exists in the random digit dialing procedure, and thus we are unable to identify the share of non-responses related to active phone numbers.

[11]See Appendix 2 for a summary of the variables reported in each survey.

[12]We use the number of fatalities caused by violent incidents and the number of violent incidents as our main indicators of violence.

[13]Although the mVAM continues through the time this paper was written, the displacement module was removed from the questionnaire.

leading up to displacement and how they evolved after. Specifically, this analysis focuses on the 1,116 households that were interviewed at least once in the six months leading up to displacement and surveyed at least once in the month of displacement or the following year. These displaced households were surveyed an average of 10.4 times over the course of the survey, with a minimum of two interviews and a maximum of 38. Figure 1 reports the number of households surveyed by month surrounding displacement. The highest number of interviews were in the month of displacement (932) and the month before displacement (757), while the number of household interviews declines for months further before or after displacement.[14]

In addition to reflecting a large displacement crisis, the data further illustrate the dire food security situation just prior to displacement. Figure 2 demonstrates that the average FCS of households that later become displaced was stable for the six months prior to displacement and was between 46 and 49, which is significantly below the pre-conflict average; and the average rCSI was between 20 and 21, which also represents a significant increase from prior to the conflict.[15] Furthermore, these averages for displaced households are lower than the average for non-displaced households in the same WFP survey (e.g., WFP 2019), which is consistent with a number of other data sources (e.g., FAO 2017; IPC 2017; World Bank 2017b; etc.).

However, it is difficult to attribute these patterns to the impacts of displacement alone and the difference is difficult to interpret. For example, if large changes in the humanitarian situation were causing a significant amount of migration, it could be the case that households that never became displaced might have been exposed to significant changes in the humanitarian situation that displaced households were able to avoid. Alternatively, even if forced displacement was only driven by violence, the difference in food access between displaced and non-displaced households could still be attributable to pre-displacement characteristics. Violence could tend to be concentrated closer to poorer households, or it might be the case that households without significant assets to lose

[14]Results are qualitatively identical when we include additional observations either a year before or after displacement; however, given the rapid decrease in sample sizes, the precision of the estimates and the power of hypothesis tests decrease significantly.

[15]See Appendix 3 for pre-conflict FCS and rCSI for the population.

might be more likely to become displaced (e.g., a house, etc.).

Section 3b. Data Patterns and Challenges

In order to better identify the evolution of food security indicators following displacement, there are five important data issues to address. First, the data corroborate reports of humanitarian surveys and news reporting and demonstrate that displacement in the Republic of Yemen's conflict is strongly associated with living in close proximity to violence (e.g., TFPM 2016; OCHA 2019). Figure 2 reports the evolution of violence in the district of origin and average food security outcomes in the six months prior to displacement. In the first two panels, both the number of fatalities and the number of violent incidents were escalating leading up to displacement.

In the month before displacement, the number of fatalities was 37 percent higher than the number six months before displacement, and the number of violent incidents was over 28 percent higher. Alternatively, Figure 2 demonstrates that there was little-to-no change in food access outcomes leading up to displacement. The FCS was one percent higher[16] in the month before displacement than six months before displacement, and the rCSI was less than four percent higher.[17,18] Importantly, for both food security measures, the confidence intervals for each monthly estimate overlap the confidence interval of the estimate six months before displacement.

Second, it is important to investigate whether displacement interferes with a household's ability to respond to the survey, i.e., whether food access effects are driven by changes in the composition of respondents rather than by displacement. For example, if we observe food access improving following an immediate drop during the month of displacement, it is possible that the struggling displaced households dropped out of the survey at higher rates as opposed to an actual improvement in post-displacement food security outcomes.

This, however, does not appear to be the case. Table 1 reports results from specifica-

[16] A higher FCS implies better food access.

[17] A higher rCSI implies worse food access.

[18] See Appendix 4 for similar graphs for all remaining food security and other well-being indicators collected in the survey. The patterns are nearly identical to those of the FCS and rCSI.

tions that regress an indicator for responding to a post-displacement round on the violence experienced prior to displacement and all 14 pre-displacement food access variables contained in the WFP survey from the most recent pre-displacement survey to which the household responded.[19] If better-off household were less likely to drop out of the survey and change the composition of the sample, we might expect better pre-displacement food access to be positively associated with the probability of responding to post-displacement rounds, especially for later rounds.

However, there is little correlation between pre-displacement food access indicators and the likelihood of responding to any single post-displacement round. For each of the thirteen rounds after displacement (month of displacement and 12 following months), the table reports the p-value of the hypothesis test of all pre-displacement characteristics jointly equaling zero. Only one of the 13 p-values is statistically significant at the 10 percent level, which is what would be expected if there were no relationship; and the p-values themselves vary between 0.065 and 0.915.

Third, the survey can only be representative of the mobile phone-using population. Although it is difficult to identify exactly how access to mobile phones has changed since the onset of the conflict, all evidence suggests that access has remained high. Approximately 85 percent of the population lived in a household that owned at least one mobile phone prior to the conflict, and this figure was high across the entire country and among vulnerable groups[20]; there is anecdotal evidence that the share with access to mobile phones remained high following the start of the conflict (although some households re-

[19]Specifically, the independent variables for each regression are the number of times the household consumed staples, pulses, vegetables, fruits, proteins, dairy, sugars, and fats in the past week in the most recent pre-displacement survey answered (eight separate variables); the number of times in the past week the household relied on less expensive foods, borrowed to purchase food, reduced the number of meals consumed, limited portion sizes of meals, and restricted consumption in the most recent pre-displacement survey answered (five separate variables); an indicator equaling one if the household received food assistance in the most recent pre-displacement survey; and the number of fatalities from violent incidents and the number of violent incidents in the month before displacement. The specifications do not include the FCS nor the rCSI because they are linear combinations of the above set of variables. The specifications also include month-year indicators and district fixed effects. Each specification includes the entire sample of households used in the baseline specification- 1,116. See Appendix 5 for the coefficient estimates from each of the specifications.

[20]Prior to the escalation of the conflict, the share of households owning at least one mobile phone remained high for the rural population (81 percent), the population living below the poverty line (77 percent), and the population of all governorates (over 60 percent for each). Authors' calculations using the 2014 Household Budget Survey.

ported sharing a mobile phone)[21]; the geographic coverage of the survey reaches the vast majority of the country[22]; and the WFP survey itself demonstrates that the number of mobile phones owned by households has not changed much at the national and governorate levels.[23]

Fourth, it is important to investigate the degree to which sample selection might limit the generalizability of the results. To the degree that we are able to assess in such a data- and evidence-scarce environment, we validate the WFP survey's representativeness of the broader mobile phone-using population by demonstrating that the survey is capturing trends that are independently corroborated by other sources. The timing of displacement is identical to estimates by the Task Force for Population Movement, where there was an initial surge of displacement in March of 2015 followed by a relatively constant rate of displacement as the location and intensity of violence changed across the country (e.g., TFPM 2019; OCHA 2018; etc.).[24] Additionally, we demonstrate that the mobile phone survey does in fact detect large declines in many welfare outcomes and access to basic

[21]Registration for the World Bank's cash transfers program (implemented by UNICEF), which covers approximately one-quarter of the total population and is aimed at relatively poorer households, demonstrates the vast majority of households can be reached via phone (e.g., World Bank 2018c). Evidence from different WFP surveys of food aid beneficiaries suggests that the share of food aid recipients that can be reached via mobile phone has remained very high (e.g., WFP 2018b). And evidence from the WFP mobile phone survey itself suggests that particularly struggling households are well-represented in the sample with approximately one-third of the sample being displaced and over one-third receiving food assistance.

[22]See Appendix 6 for a map presenting the number of respondents by district over the entire course of the WFP survey, where there are only two districts out of 333 that do not have any respondents in any of the surveys. Alternatively, the vast majority of districts are represented in any single month of the survey. For example, in November 2017, the survey reached respondents in 264 of the 333 districts in the country- nearly 80 percent of the total. It is important to note that the districts for which there are zero respondents tend to be less populated and in the east of the country. Only 9.2 percent of the country's 2017 population resided in the 69 districts for which there are zero respondents in the November 2017 survey; and the districts overwhelmingly came from the governorates of Hadramaut and Al Mahrah, where only 39 and 33 percent of districts, respectively, had at least one respondent. Importantly, these governorates are less affected by the conflict and have less displacement than the rest of the country (TFPM 2016) and are not the primary focus of the analysis.

[23]See Appendix 7. The WFP survey began recording the number of working mobile phones owned by each household in March 2016. For each survey, the 95 percent confidence interval for the average number of mobile phones owned by the household is presented and compared to the 95 percent confidence interval prior to the conflict (based on data from the 2014 Household Budget Survey). Despite the large shock to household incomes and energy sources needed to charge mobile phones, the confidence intervals overlap in approximately 78 percent of the governorate-survey observations. In most instances where the two do not overlap, cell phone ownership is lower in the WFP surveys than in the pre-conflict estimate, which is expected given the negative shocks that have occurred since then.

[24]See Appendix 8 for estimates of the timing of the displacement crisis using the mVAM. Specifically, the figure reports the total number of displaced households by month-year of their first displacement, divided by the total number of households interviewed in the survey (18,078).

services that are consistent with the reports of humanitarian and news agencies on the ground.[25] Furthermore, the regions that the WFP survey identifies as receiving the most assistance roughly align with the population-level estimates of the prevalence of food assistance (e.g., Tandon and Vishwanath 2021).

And lastly, our sample is limited to only those displaced households reached both prior to and following displacement (1116 households). It does not include households reached only after displacement (6910 households); and if such households differ from our sample, it would limit the generalizability of our results. Thus, we examine differences in these samples by pooling all displaced households (8026 households) and regressing an indicator for whether the household was reached before and after displacement on averages of all the 14 food security variables collected in the WFP survey.[26,27] Table 2 demonstrates that one cannot reject the hypothesis that there is no joint difference in all food security information between the primary sample and all other displaced households; a test of all coefficients jointly equaling zero has a p-value of 0.352.[28]

Section 4. Empirical Strategy

We estimate how food access indicators were changing leading up to and following displacement. Specifically, we estimate variants of the following baseline specification:

[25] Appendix 3 compares key variables from the WFP survey to population estimates of mobile phone users from the 2014 HBS data. Every single comparable food security indicator dramatically declined since the 2014 HBS survey, consistent with the reports of wide-spread food insecurity (e.g., IPC 2017; FEWNET 2018; etc.). Home ownership declined, the prevalence of renting increased, and the size of households increased, which are all consistent with the widespread issue of internal displacement (e.g., TFPM 2019). And access to services declined dramatically, where essentially no households had access to an electricity network and only 25 percent had access to a water network, which is consistent with the reporting of humanitarian agencies (e.g., OCHA 2018).

[26] The sample excludes the month of displacement (so as to avoid capturing impacts of displacement), but the results are qualitatively identical when the month of displacement is included, when only post-displacement rounds are included, and when only post-displacement rounds well after displacement are included. There were 8,086 displaced households in the total WFP survey, but 60 of the households only responded to a single survey in the month of displacement and were excluded from the specification.

[27] The specifications also include month-year indicators and district fixed effects. The violence data are not included because households that only answered post-displacement rounds do not provide their origin districts.

[28] Alternatively, in specifications not reported, when regressing each food security variable separately on the indicator for whether the displaced household was reached both before and after first displacement, only one variable out of 14 is statistically significant at the five percent level, which is similar to what would be expected by chance.

$$(1) \qquad Food\_Access_{irt} = \sigma_i + \rho_t + \Sigma_{j=2}^{6}[\beta_j Month_{ir,t-j}] + \Sigma_{k=0}^{1}[\gamma_j Month_{ir,t+k}] + \epsilon_{irt}$$

where $Food\_Access_{irt}$ denotes the food access indicator of household i in district r at time t; $Month_{ir,t-j}$ and $Month_{ir,t+k}$ respectively denote indicators equaling one if the observation was from j months before displacement or k months after displacement; σ_i denotes household fixed effects; and ρ_t denotes time (month-year) indicators. The sample is restricted to the 1,116 households that were interviewed at least once in the six months leading up to displacement and at least once in the month of displacement or the following year.[29] We also estimate specifications without household and month-year effects and specifications with a simple post indicator equaling one if the observation came following displacement.

The coefficients of interest are each of the β_j's and γ_k's, which represent the average difference in the dependent variable relative to one month before displacement (the omitted category), while controlling for household and month-year effects. In particular, we want to identify any changes in key variables leading up to, during, and following displacement.

Section 5a. Changes in Food Access Leading up to and Following Displacement

Figure 3 graphically reports key estimates and associated confidence intervals from specification (1). The top panel reports estimates from a specification using the FCS as the dependent variable, and the bottom panel reports estimates from a specification using the rCSI as the dependent variable.

These estimates demonstrate three key patterns. First, there is very little change in food access in the six months leading up to displacement in any of the specifications. All the pre-displacement coefficients are small in magnitude, the signs vary between

[29] We can include more months in the sample, however, the number of households with observations far before or after displacement is significantly smaller and the estimates become increasingly less precise the further away from displacement (though, importantly, the results are qualitatively identical).

specifications, and one cannot rule out that the pre-displacement coefficients are jointly equal to zero in both specifications[30]. Importantly, the estimates are precise enough to rule out large changes in food access just prior to displacement.[31]

Second, there is a large and robust decline in food access immediately following displacement that is precisely estimated. The FCS declined by over 5 points, which represents a decline of 11 percent; and the rCSI increased by over 4 points, which represents a worsening of 20 percent. Given that pre-displacement food access was already extremely poor on average and bordering on thresholds used for defining acute food emergencies (e.g., IPC 2017; etc.), these large declines suggest that displaced households struggled significantly during the month of displacement.

And third, the large average decline in food access following displacement masks a significant amount of heterogeneity in the effect over time. Although there is a large and precisely estimated decline in food access in the month of displacement, for each subsequent month, the magnitude of the estimate declines. In the fourth month following displacement and on, there is no statistical difference in food access in each individual month relative to the month before displacement at conventional significance levels. Importantly, many of the estimates closer to one year after displacement can rule out large declines in food access.[32]

Importantly, these baseline patterns are robust to different estimation strategies. Table 3 re-estimates variants of specification (1). First, we estimate specifications that simply regress food access measures on a post-displacement indicator instead of monthly indicators. The estimates demonstrate that there was a large average decline in food access, but that the decline was smaller than that estimated for the month of displacement in Figure 3. These results are qualitatively identical whether or not household and month-time effects are included (columns 1-4).

Second, we re-estimate the full specification (1) without household or month-year

[30]The p-values for the hypothesis tests are 0.792 and 0.374, respectively, for the top and bottom panel.

[31]For example, the lower boundary of the 95 percent confidence interval on the coefficient for two months prior to displacement demonstrates that one can rule out an increase in the rCSI of 1.34, which is 43 percent of the average increase in the month of displacement estimated in column (8).

[32]For example, one can rule out declines in FCS larger than 2.07, 2.40, 2.79, 3.45, and 2.91 at the 95 percent significance level for 8 to12 months following displacement, respectively.

effects. The magnitude and the precision of the estimates are very similar to the main results, suggesting that the change in food access immediately around displacement is not being driven by the many time-, region-, and household-specific shocks that occurred during the period of analysis.

Importantly, the strong immediate decline and subsequent recovery in food access is being driven by nearly all components of the FCS and rCSI measures. Tables 4 and 5 re-estimate specification (1) and use the individual components of each food access measure as the dependent variables. All patterns described above – the lack of a pre-displacement trend, the strong reduction in food access the month of displacement, and a quick recovery – are evident for all eight components of the FCS and all five components of the rCSI. Additionally, before displacement, households, on average, relied heavily on staple foods and fats, as do many poor households around the world (see Appendix 4). These consumption patterns suggest that households were already extensively relying on negative food coping strategies prior to displacement, which makes it difficult to cut back on consumption in any individual food category or to increase reliance on many typical food coping strategies. However, we find that households reduced the number of days they consumed every food category and increased reliance on every negative food coping strategy.

Section 5b: Why Does the Strong Initial Decline in Food Access Not Persist?

The fact that the decline in food access following displacement was not more persistent contrasts slightly with evidence of long-term impacts of displacement (e.g., Ibanez and Velez 2008). There are, however, several possible reasons why displaced households might experience a partial recovery of food access soon after displacement; we are able to investigate two reasons empirically. First, despite the general escalation of violence and the lack of a change in food access leading up to displacement, if some displaced households move to areas of greater economic opportunity due to serious deprivation (which we measure by poor pre-displacement food access), then their potential gains could offset more persistent losses by other households.

To investigate this possibility, we estimate how the impact of displacement varied by pre-displacement food access, where we restrict the sample to only households that responded to a survey in between two and six months before displacement, and we further restrict the specification to observations from the month before to one year after displacement. Additionally, we estimate the specification separately based on whether households had adequate access to food (FCS at or above 42) in the most recent survey answered between two and six months before displacement.[33] Of the sample that responded to a survey between two and six months before displacement, 50 percent had adequate access.

It does not appear likely that those with the most incentive to migrate for better economic opportunity experienced an increase in food access after displacement. The estimates and the associated confidence intervals from the modified specification are reported in Figure 4 for households with an inadequate FCS two to six months before displacement. Food access, as measured by both the FCS and rCSI, did not increase at any point following displacement relative to pre-displacement food access. Furthermore, for the rCSI, the change in food access is more precisely estimated and is nearly identical to the baseline estimates. For the worst-off households, there is a dramatic decline in food access in the month of displacement, followed by a quick recovery to pre-displacement status.[34]

There is, however, another potential explanation for the relatively quick post-displacement rebound. Given the potential use of displacement status as a categorical target for food assistance, it is possible that households were more likely to receive food assistance following displacement. The vast majority of food assistance delivered in the country is in-kind and inframarginal (e.g., OCHA 2019a), which suggests that the impacts of such assistance would be equivalent to a cash transfer (e.g., Behrman and Deolalikar 1989; Jensen and Miller 2011; etc.). Thus, it is possible that increased food assistance might have helped improve both food access and a variety of other welfare outcomes.

Table 6 investigates this possibility and re-estimates specification (1) using an indica-

[33] Adequate access is defined using a common threshold for emergency food assistance.

[34] Appendix 9 more formally estimates this difference between households with and without adequate access to food prior to displacement. All results in the text are qualitatively identical to these more complete estimations.

tor equaling one if the household received food assistance as the dependent variable. There does not appear to be a uniform increase in food assistance for all displaced households. Column (1) estimates a specification comparing pre- and post-displacement outcomes, and column (2) estimates a month-to-month change in the likelihood. Although the sign of the estimate in column (1) suggests that the likelihood of receiving food assistance increased following displacement, the coefficient is not precisely estimated. Many of the post-displacement coefficients in column (2) suggest that it is possible that the likelihood of receiving food assistance increased, but one cannot reject the hypothesis that all post-displacement coefficients jointly equal zero at conventional significance levels (p-value of 0.143).

One possible reason for the lack of a uniform increase in the likelihood of receiving food assistance was that assistance may have been targeted more towards displaced households with the worst food access. Figure 5 demonstrates that was indeed the case; the top panel reports estimates of the change in food assistance for households with adequate access to food between two and six months before displacement, and the bottom panel reports estimates for those with inadequate access. There is little evidence of any changes in the likelihood of receiving food assistance relative to the month before displacement for households with an adequate pre-displacement FCS. However, there was a strong and slightly delayed increase in the likelihood of receiving food assistance for those with an inadequate pre-displacement FCS. One cannot reject the hypothesis that there was no difference in the month of displacement or in the first month after displacement; but nearly every month after that, the increase in the likelihood of receiving food assistance was large and precisely estimated.[35]

The increase in assistance only for displaced households with particularly poor food access prior to displacement is surprisingly well-targeted in an environment where millions of households are receiving food assistance (e.g., OCHA 2018). The results are consistent with displacement status being used as a categorical target and with house-

[35] Appendix 9c more formally estimates this difference between households with and without adequate pre-displacement food access. All results in the text are qualitatively identical to these more complete estimations.

holds self-selecting, where only those in very dire circumstances might be claiming food assistance. However, it is further important to note that the increase in assistance was persistent and continued for at least the entire year following displacement. Thus, the large amount of food assistance that is reaching displaced households is likely contributing to the quick post-displacement recovery of the worst-off households. Importantly, as food prices continue to rise and as repeated currency crises continue to translate into rapidly rising food prices, this assistance is significantly increasing in value over time.

However, the increase in assistance only reached approximately half the displaced households in the sample. Since better-off households that did not receive additional food assistance also experienced a recovery, there are likely other factors contributing to their surprisingly quick recovery. For example, it is possible that some of the better-off households had more resources (e.g., networks) to rely on after settling in the migration district or that they were generally better able to assimilate. Regardless, even with these potential advantages over relatively worse-off households, other settings have inferred much more persistent adverse outcomes following displacement using different estimation strategies, such as comparing post-displacement outcomes of displaced to host populations (e.g., IPC 2017; etc.) or analyzing the well-being of displaced households long after the conflict has ended (e.g., Ibanez and Velez 2008).

Section 6. Conclusion

Using rare food security and migration data from the ongoing conflict in the Republic of Yemen, we find a sharp, immediate decline in food access after displacement and a return to pre-displacement levels within months, on average. A portion of this rapid improvement is driven by increased food assistance, but there was also a surprising improvement among a subset of the sample that did not receive additional food assistance.

Combined, these results illustrate the consequences of forced displacement during active conflict. However, there are several caveats to this analysis. First, given data constraints, this analysis focuses on food access and not other welfare metrics that could be particularly important to displaced households. Although food security is one of the

most important issues in the Republic of Yemen and in many conflict-affected countries (e.g., OCHA 2018; World Bank 2017a; etc.), there are a number of other welfare dimensions that need to be better tracked. Information on adequacy of housing, access to basic services like health and education, and psychological well-being are all important areas that are unable to be addressed in the above analysis.

Second, the needs of the displaced population without access to mobile phones are not addressed. Although mobile phone penetration is high in the country (even among displaced populations), other survey modalities need to be used to reach this population. Face-to-face interviews that are representative of the entire population are difficult in this setting, but they could at least account for some of this difficult-to-reach population.

And lastly, it is important to note that the consequences of displacement might be very sensitive to the characteristics of different conflicts and contexts. For example, it is unclear whether some of these results generalize to settings in which only part of a country is in conflict, to settings in which households migrate to foreign countries, or to settings in which the pre-conflict baseline was not as poor as in the Republic of Yemen (e.g., WFP 2012). More investigation as to which results are most likely to generalize to other settings is also an important issue to address in future work.

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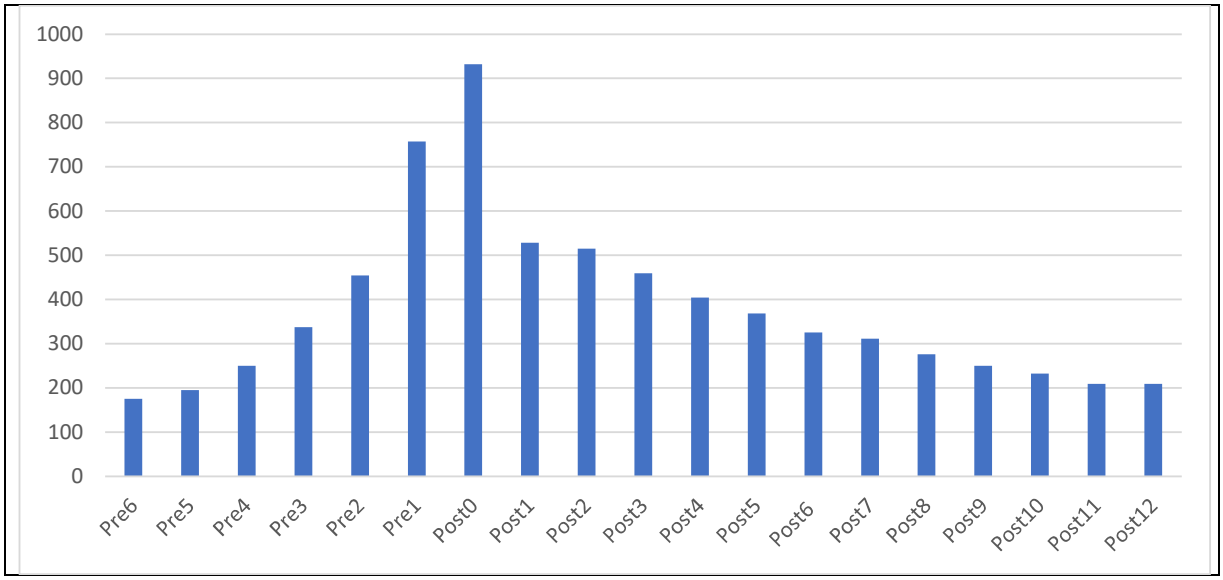
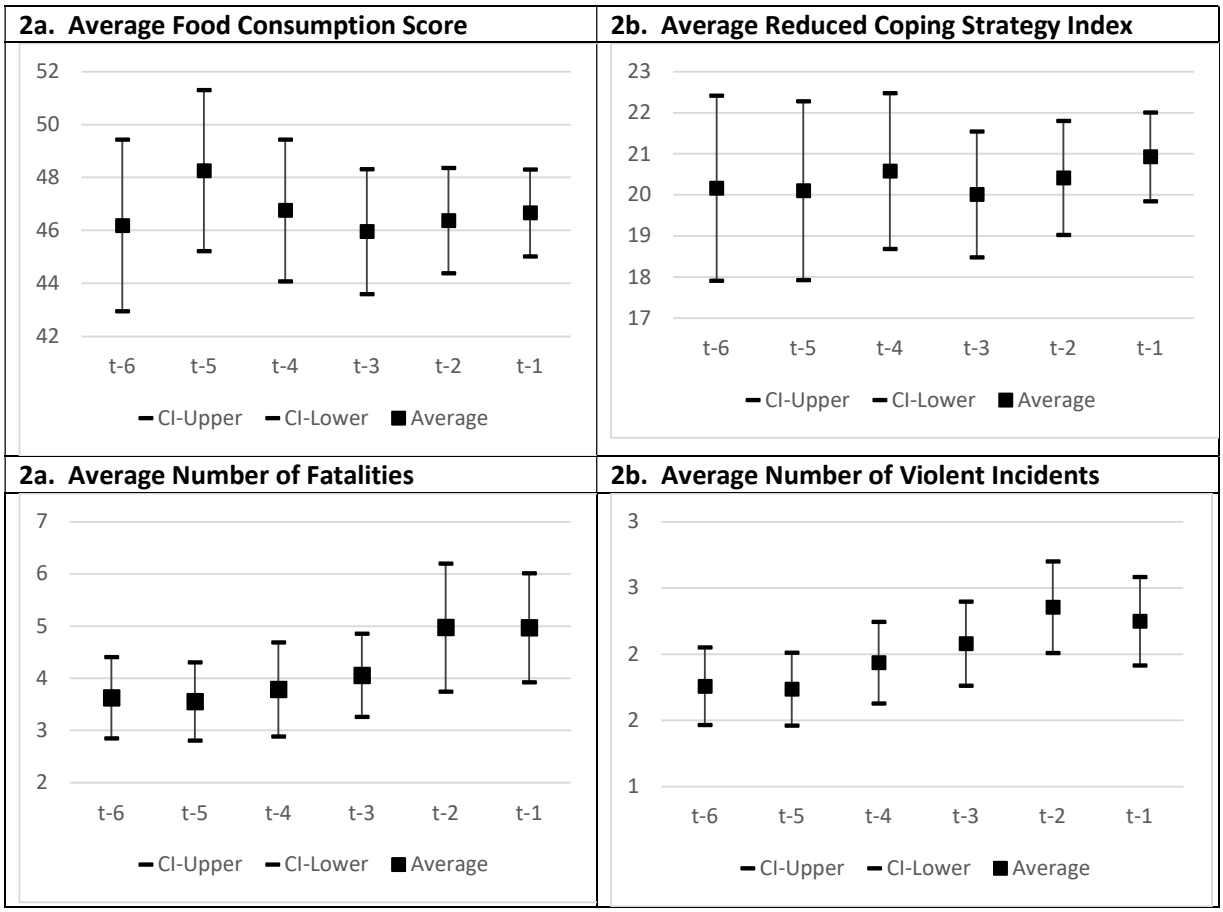
Figure 1. Number of Households Interviewed Each Month Leading up to and Following Displacement



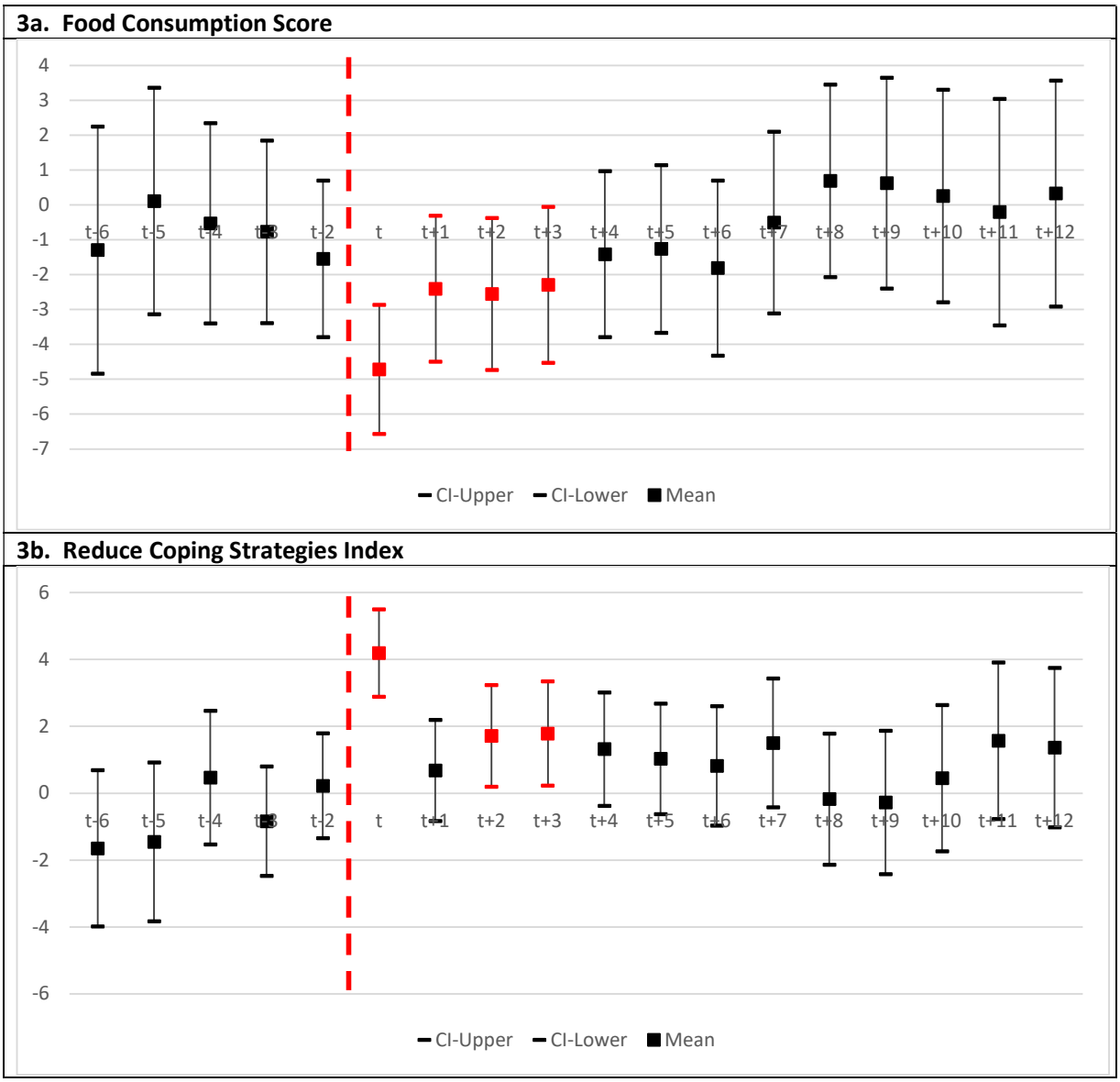
Notes: This figure reports the number of surveys completed in the months leading up to and following displacement of households that had at least one interview prior to displacement.

Figure 2. Summary Statistics- Food Security and Violence



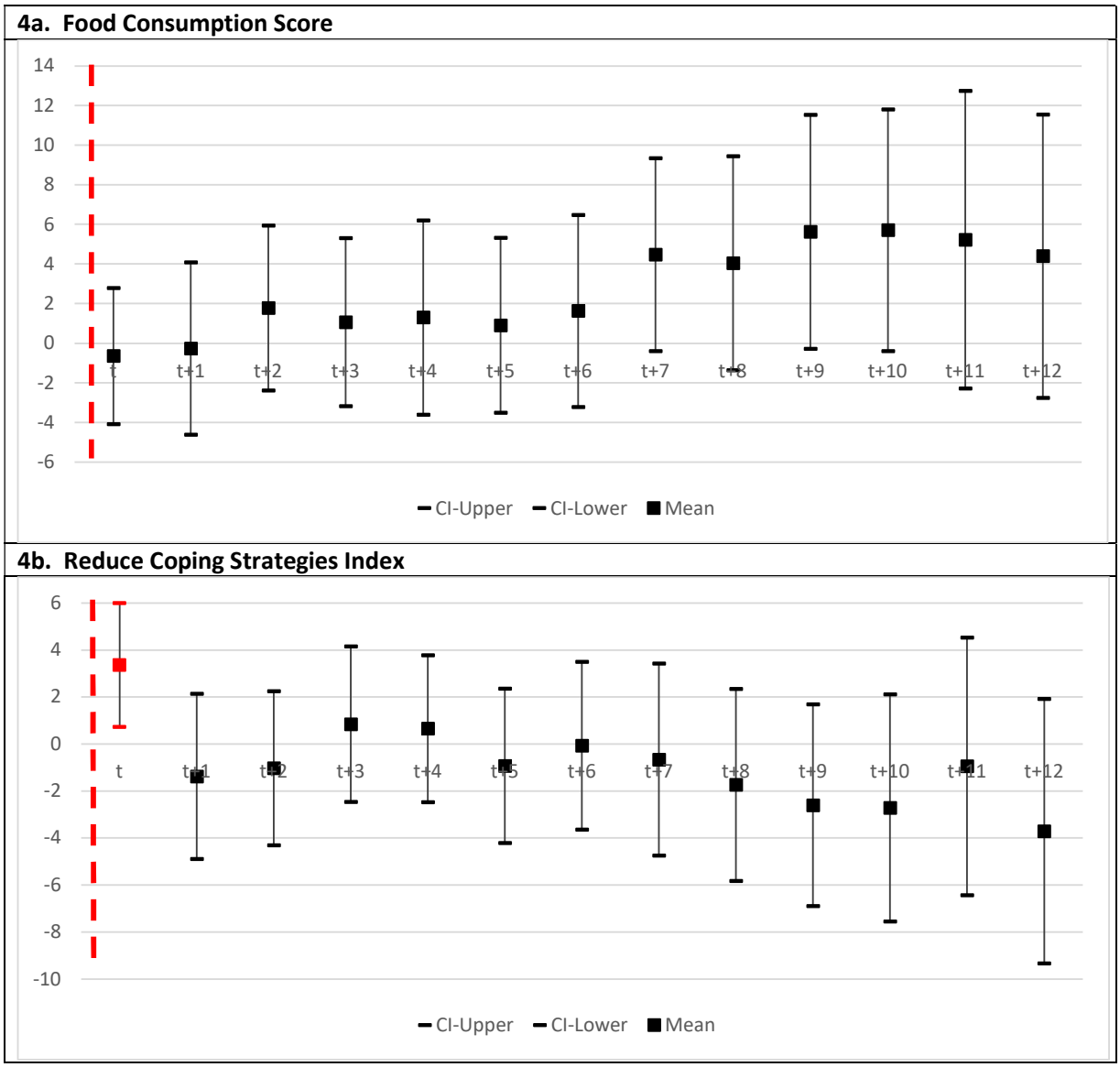
Notes: Summary statistics prior to displacement for households that became displaced after their first interview in the WFP mVAM survey.

Figure 3. Estimates of Month-to-Month Differences in Food Access Relative to the Month Before Displacement



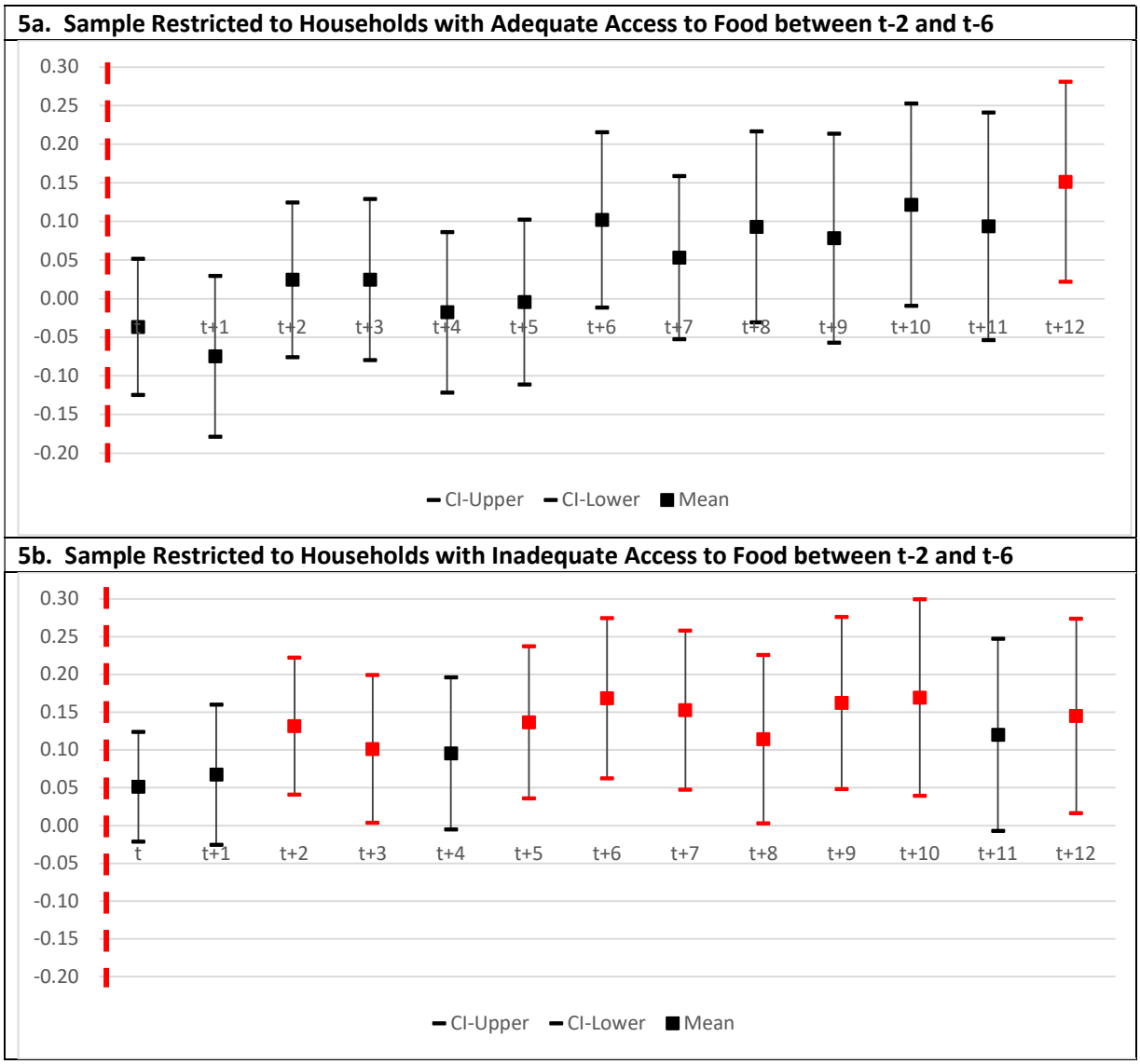
Notes: Figures report the coefficient estimates and the 95 percent confidence intervals from the full baseline specification. Each coefficient estimate represents the change in food access relative to one month before displacement. Estimates that are statistically significant at the 95 percent level are highlighted in red.

Figure 4. Estimates of Month-to-Month Differences in Food Access Relative to the Month Before Displacement for Households with Inadequate Pre-Displacement Food Access



Notes: Figures report the coefficient estimates and the 95 percent confidence intervals from a variant of the baseline specification that restricts the sample to only households that responded to a survey between two and six months before displacement. Furthermore, the estimates above restrict the sample to only surveys that took place between one month before displacement and one year after displacement, and further restrict the sample to only households that had an inadequate Food Consumption Score in the most recent survey between two and six months before displacement. Each coefficient estimate represents the change in food access relative to one month before displacement. Estimates that are statistically significant at the 95 percent level are highlighted in red.

Figure 5. Estimates of Month-to-Month Differences in Food Access Relative to the Month Before Displacement for Households with Inadequate Pre-Displacement Food Access



Notes: Figures report the coefficient estimates and the 95 percent confidence intervals from a variant of the baseline specification that restricts the sample to only households that responded to a survey between two and six months before displacement. Furthermore, the estimates above restrict the sample to only surveys that took place between one month before displacement and one year after displacement. Lastly, the specifications estimate the change separately for households based on the most recent Food Consumption Score between months t-2 and t-6. Each coefficient estimate represents the change in food access relative to one month before displacement. Estimates that are statistically significant at the 95 percent level are highlighted in red.

Table 1. P-values of a test of All Pre-Displacement Characteristics Jointly Having No Impact on the Probability of Answering Post-Displacement Survey Rounds

Post-Displacement Round	P-value
Post 0	0.750
Post 1	0.522
Post 2	0.324
Post 3	0.915
Post 4	0.216
Post 5	0.130
Post 6	0.228
Post 7	0.315
Post 8	0.065*
Post 9	0.591
Post 10	0.420
Post 11	0.745
Post 12	0.168

Notes: Each cell reports a p-value from a test of all pre-displacement characteristics jointly equaling zero in specifications estimating the probability of responding to each post-displacement round. An indicator for whether the household responds to each post-displacement round (13 separate variables) is regressed on the most-recently reported food security information for each households from the 6 months prior to displacement. Each specification has 1,116 observations and all specifications include district and time (month-year) fixed effects; *** denotes statistical significance at the 1 percent level; ** denotes significance at the 5 percent level; and * denotes significance at the 10 percent level.

Table 2. Differences between Displaced Households Based on When they were First Reached

	Indicator for Reaching Displaced Household Before and After Displacement
Share of Months Household Received Food Assistance	0.003
	[0.013]
Average Number of times in the week before the survey the household consumed:	
Staples	-0.001
	[0.003]
Pulses	-0.002
	[0.002]
Veg	0.004*
	[0.002]
Fruits	-0.010***
	[0.003]
Proteins	0.005
	[0.003]
Dairy	-0.000
	[0.002]
Sugars	-0.001
	[0.002]
Fats	-0.001
	[0.002]
Average Number of times in the week before the survey the household:	
Relied on Less Expensive Foods	0.002
	[0.002]
Borrowed to Purchase Food	-0.002
	[0.002]
Reduced Number of Meals	0.000
	[0.002]
Limited Portion Size	-0.002
	[0.002]
Restricted Consumption	0.000
	[0.002]
P-value from test of all food security coefficients jointly equaling zero	0.352
Observations	8,026

Notes: This table regresses an indicator equaling one if the displaced household was reached both before and after their first displacement on averages of all the food security variables contained in the monthly WFP survey. Observations during the month of displacement are dropped. The sample is restricted to all 8,086 displaced households captured in the WFP survey, less the 60 households that only responded to a single survey in the month of displacement. All specifications include district and time (month-year) fixed effects. *** denotes statistical significance at the 1 percent level; ** denotes statistical significance at the 5 percent level; and * denotes statistical significance at the 10 percent level.

Table 3. Robustness Checks for Change in Food Access Following Displacement

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Food Consumption Score	Food Consumption Score	Reduced Coping Strategies Index	Reduced Coping Strategies Index	Food Consumption Score	Reduced Coping Strategies Index
Post Displacement	-2.446***	-4.178***	2.453***	3.391***	-	-
	[0.652]	[0.802]	[0.494]	[0.567]		
Month t-6	-	-	-	-	-0.476	-0.761
					[1.813]	[1.195]
Month t-5	-	-	-	-	1.594	-0.825
					[1.696]	[1.182]
Month t-4	-	-	-	-	0.095	-0.349
					[1.532]	[1.023]
Month t-3	-	-	-	-	-0.707	-0.915
					[1.341]	[0.838]
Month t-2	-	-	-	-	-0.290	-0.512
					[1.156]	[0.770]
Month t	-	-	-	-	-5.178***	4.346***
					[0.881]	[0.613]
Month t+1	-	-	-	-	-3.667***	1.164
					[1.049]	[0.745]
Month t+2	-	-	-	-	-3.716***	2.409***
					[1.050]	[0.767]
Month t+3	-	-	-	-	-3.114***	2.300***
					[1.078]	[0.802]
Month t+4	-	-	-	-	-2.064*	1.854**
					[1.186]	[0.858]
Month t+5	-	-	-	-	-2.477**	1.942**
					[1.239]	[0.871]
Month t+6	-	-	-	-	-3.221***	1.784*
					[1.219]	[0.939]
Month t+7	-	-	-	-	-0.794	2.543**
					[1.309]	[0.987]
Month t+8	-	-	-	-	0.912	-0.679
					[1.396]	[0.999]
Month t+9	-	-	-	-	1.647	-0.041
					[1.512]	[1.054]
Month t+10	-	-	-	-	-0.281	0.766
					[1.474]	[1.109]
Month t+11	-	-	-	-	-0.922	1.450
					[1.606]	[1.169]
Month t+12	-	-	-	-	0.911	0.445
					[1.631]	[1.193]
Constant	46.618***	46.101***	20.507***	22.079***	46.673***	20.933***
	[0.647]	[2.351]	[0.462]	[1.580]	[0.837]	[0.550]
Household and Month-Year Fixed Effects	N	Y	N	Y	N	N
P-value of all pre-displacement coefficients jointly equaling zero	-	-	-	-	0.809	0.918
P-value of all post-displacement coefficients jointly equaling zero	0.000**	0.000***	0.000***	0.000***	0.000***	0.001***
Observations	7,186	7,186	7,186	7,186	7,186	7,186

Notes: This table estimates how food access changed following displacement in the district of origin and the district of migration for households that became displaced in the monthly WFP household survey. Each column regresses either the Food Consumption Score (FCS) or the Reduced Coping Strategies Index (rCSI) on a post-displacement indicator. The sample is restricted to 6 months before displacement, the month of displacement, and the 12 months following displacement. *** denotes statistical significance at the 1 percent level; ** denotes significance at the 5 percent level; and * denotes significance at the 10 percent level.

Table 4. Change in Components of Food Access Measures- Food Consumption Score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Number of Days in Past Week Households Consumed (Components of FCS):							
VARIABLES	Staples	Pulses	Veg	Fruits	Proteins	Dairy	Sugars	Fats
Month t-6	-0.320	0.020	-0.052	0.223	-0.108	-0.041	-0.118	-0.459**
	[0.207]	[0.235]	[0.234]	[0.146]	[0.183]	[0.223]	[0.218]	[0.209]
Month t-5	-0.286	0.089	-0.048	0.146	0.043	0.106	-0.172	-0.355*
	[0.174]	[0.210]	[0.204]	[0.133]	[0.189]	[0.212]	[0.205]	[0.189]
Month t-4	-0.297*	-0.180	-0.060	0.238*	0.087	0.062	0.068	-0.391**
	[0.161]	[0.174]	[0.185]	[0.126]	[0.159]	[0.191]	[0.187]	[0.174]
Month t-3	-0.234*	-0.134	0.244	0.279**	0.046	-0.142	0.072	-0.135
	[0.140]	[0.160]	[0.174]	[0.117]	[0.147]	[0.162]	[0.169]	[0.149]
Month t-2	-0.175	-0.043	-0.016	0.030	-0.169	-0.050	-0.177	-0.199
	[0.124]	[0.138]	[0.142]	[0.094]	[0.122]	[0.152]	[0.157]	[0.140]
Month t	-0.241**	-0.149	-0.254**	-0.172**	-0.450***	-0.277**	-0.482***	-0.401***
	[0.105]	[0.114]	[0.120]	[0.071]	[0.096]	[0.118]	[0.128]	[0.114]
Month t+1	-0.112	-0.089	-0.052	-0.063	-0.189*	-0.247*	-0.035	-0.056
	[0.128]	[0.133]	[0.144]	[0.086]	[0.109]	[0.135]	[0.152]	[0.123]
Month t+2	-0.117	-0.054	-0.224	-0.150*	-0.361***	-0.069	0.072	-0.190
	[0.119]	[0.137]	[0.146]	[0.084]	[0.111]	[0.139]	[0.141]	[0.137]
Month t+3	0.044	0.006	-0.156	-0.228***	-0.310***	-0.166	-0.169	-0.053
	[0.122]	[0.141]	[0.145]	[0.084]	[0.116]	[0.152]	[0.159]	[0.139]
Month t+4	0.057	0.072	0.124	-0.050	-0.318**	-0.139	-0.070	0.089
	[0.126]	[0.153]	[0.153]	[0.096]	[0.125]	[0.154]	[0.163]	[0.143]
Month t+5	0.094	0.102	0.241	0.024	-0.223*	-0.271*	-0.082	-0.010
	[0.130]	[0.154]	[0.164]	[0.092]	[0.125]	[0.161]	[0.170]	[0.155]
Month t+6	0.185	-0.024	0.057	-0.034	-0.388***	-0.142	-0.059	-0.028
	[0.132]	[0.163]	[0.174]	[0.104]	[0.134]	[0.167]	[0.171]	[0.171]
Month t+7	0.060	0.274	0.060	0.021	-0.226	-0.188	0.141	0.054
	[0.141]	[0.168]	[0.172]	[0.108]	[0.141]	[0.170]	[0.179]	[0.176]
Month t+8	0.241*	0.242	0.155	-0.107	-0.223	0.027	0.131	0.234
	[0.139]	[0.173]	[0.198]	[0.110]	[0.146]	[0.190]	[0.188]	[0.178]
Month t+9	0.304*	0.205	0.123	0.072	-0.161	-0.073	0.047	0.159
	[0.158]	[0.196]	[0.191]	[0.132]	[0.161]	[0.194]	[0.203]	[0.196]
Month t+10	0.327**	0.021	0.090	0.055	-0.225	0.021	0.240	0.129
	[0.159]	[0.196]	[0.213]	[0.128]	[0.158]	[0.215]	[0.215]	[0.207]
Month t+11	0.331**	0.063	0.097	0.087	-0.315*	-0.124	0.496**	0.424*
	[0.168]	[0.195]	[0.226]	[0.131]	[0.171]	[0.227]	[0.222]	[0.217]
Month t+12	0.502***	0.187	0.079	0.022	-0.328*	-0.085	0.520**	0.003
	[0.154]	[0.203]	[0.229]	[0.133]	[0.173]	[0.201]	[0.212]	[0.224]
Constant	5.689***	3.443***	2.940***	1.198***	2.382***	2.652***	4.704***	5.517***
	[0.181]	[0.202]	[0.206]	[0.132]	[0.178]	[0.215]	[0.233]	[0.227]
P-value of all pre-displacement coefficients jointly equaling zero	0.321	0.805	0.572	0.173	0.562	0.902	0.587	0.158
P-value of all post-displacement coefficients jointly equaling zero	0.008***	0.531	0.192	0.057*	0.001***	0.644	0.000***	0.005***
Observations	7,186	7,186	7,186	7,186	7,186	7,186	7,186	7,186

Notes: This table estimates how food access changed following displacement in the district of origin and the district of migration for households that became displaced in the monthly WFP household survey. Each column regresses components of the Food Consumption Score (FCS) on monthly indicators, with month t-1 excluded. The sample is restricted to 6 months before displacement, the month of displacement, and the 12 months following displacement. All specifications include household and time (month-year) fixed effects; *** denotes statistical significance at the 1 percent level; ** denotes significance at the 5 percent level; and * denotes significance at the 10 percent level.

Table 5. Change in Components of Food Access Measures- Reduced Coping Strategies Index

	(1)	(2)	(3)	(4)	(5)
	Number of Days Households Relied On (Components of rCSI):				
VARIABLES	Reduce Number of Meals	Limit Portion Size	Restrict Consumption	Rely on Less Expensive Foods	Borrow to Purchase Food
Month t-6	-0.232	-0.106	-0.300	0.056	-0.231
	[0.224]	[0.254]	[0.235]	[0.238]	[0.221]
Month t-5	-0.359	-0.083	-0.283	0.166	-0.161
	[0.223]	[0.253]	[0.223]	[0.236]	[0.214]
Month t-4	-0.163	-0.119	-0.078	0.191	0.397**
	[0.200]	[0.206]	[0.194]	[0.202]	[0.189]
Month t-3	-0.166	-0.133	-0.266	0.229	0.018
	[0.174]	[0.177]	[0.170]	[0.176]	[0.156]
Month t-2	-0.054	0.136	0.012	0.089	0.011
	[0.152]	[0.158]	[0.158]	[0.152]	[0.144]
Month t	0.523***	0.511***	0.445***	0.569***	0.624***
	[0.133]	[0.131]	[0.134]	[0.136]	[0.116]
Month t+1	0.245	-0.035	0.023	0.098	0.156
	[0.158]	[0.160]	[0.153]	[0.157]	[0.133]
Month t+2	0.195	0.069	0.185	0.155	0.366**
	[0.152]	[0.150]	[0.160]	[0.153]	[0.142]
Month t+3	0.161	0.098	0.139	0.258	0.422***
	[0.147]	[0.155]	[0.160]	[0.162]	[0.143]
Month t+4	0.145	0.108	0.055	0.077	0.414***
	[0.167]	[0.169]	[0.172]	[0.168]	[0.156]
Month t+5	0.190	-0.001	0.004	0.266	0.284*
	[0.171]	[0.166]	[0.165]	[0.172]	[0.169]
Month t+6	0.186	-0.218	0.073	0.120	0.258
	[0.180]	[0.181]	[0.183]	[0.179]	[0.172]
Month t+7	0.184	0.088	0.081	-0.053	0.524***
	[0.192]	[0.184]	[0.188]	[0.189]	[0.186]
Month t+8	-0.086	-0.273	-0.092	-0.039	0.251
	[0.189]	[0.191]	[0.195]	[0.197]	[0.188]
Month t+9	-0.037	-0.072	-0.176	-0.084	0.225
	[0.207]	[0.193]	[0.212]	[0.212]	[0.193]
Month t+10	0.013	-0.225	0.019	-0.208	0.409**
	[0.209]	[0.207]	[0.221]	[0.219]	[0.204]
Month t+11	0.120	0.166	0.155	0.166	0.328
	[0.220]	[0.222]	[0.242]	[0.235]	[0.208]
Month t+12	0.343	-0.086	0.032	0.148	0.435**
	[0.226]	[0.231]	[0.232]	[0.241]	[0.215]
Constant	2.388***	3.470***	2.808***	2.692***	1.654***
	[0.212]	[0.235]	[0.235]	[0.225]	[0.207]
P-value of all pre-displacement coefficients jointly equaling zero	0.692	0.761	0.0420	0.834	0.170
P-value of all post-displacement coefficients jointly equaling zero	0.034**	0.001***	0.068*	0.002***	0.000***
Observations	7,186	7,186	7,186	7,186	7,186

Notes: This table estimates how food access changed following displacement in the district of origin and the district of migration for households that became displaced in the monthly WFP household survey. Each column regresses components of the Reduced Coping Strategies Index (rCSI) on monthly indicators, with month t-1 excluded. The sample is restricted to 6 months before displacement, the month of displacement, and the 12 months following displacement. All specifications include household and time (month-year) fixed effects; *** denotes statistical significance at the 1 percent level; ** denotes significance at the 5 percent level; and * denotes significance at the 10 percent level.

Table 6. Change in Food Assistance Following Displacement

VARIABLES	(1) Indicator for Food Assistance in Past 30 Days	(2) Indicator for Food Assistance in Past 30 Days
Post Displacement	0.022	
	[0.016]	
Month t-6	-	-0.007
		[0.034]
Month t-5	-	-0.081**
		[0.033]
Month t-4	-	-0.039
		[0.031]
Month t-3	-	-0.052**
		[0.026]
Month t-2	-	-0.020
		[0.022]
Month t	-	0.009
		[0.019]
Month t+1	-	0.022
		[0.023]
Month t+2	-	0.063***
		[0.024]
Month t+3	-	0.048*
		[0.025]
Month t+4	-	0.035
		[0.026]
Month t+5	-	0.035
		[0.027]
Month t+6	-	0.093***
		[0.030]
Month t+7	-	0.079***
		[0.028]
Month t+8	-	0.074**
		[0.033]
Month t+9	-	0.086**
		[0.034]
Month t+10	-	0.081**
		[0.037]
Month t+11	-	0.091**
		[0.039]
Month t+12	-	0.095**
		[0.038]
Constant	0.133***	0.233***
	[0.029]	[0.028]
P-value of all pre-displacement coefficients jointly equaling zero	-	0.103
P-value of all post-displacement coefficients jointly equaling zero	0.170	0.143
Observations	7,186	7,186

Notes: This table estimates how food assistance changed following displacement in the district of origin and the district of migration for households that became displaced in the monthly WFP household survey. Each column regresses an indicator for whether a household received food assistance on a post-displacement indicator. The sample is restricted to 6 months before displacement, the month of displacement, and the 12 months following displacement. All specifications include household and time (month-year) fixed effects; *** denotes statistical significance at the 1 percent level; ** denotes significance at the 5 percent level; and * denotes significance at the 10 percent level.