

Online Appendix to “Food Insecurity During the First Year of the COVID-19 Pandemic in Four African Countries”

Differential Attrition

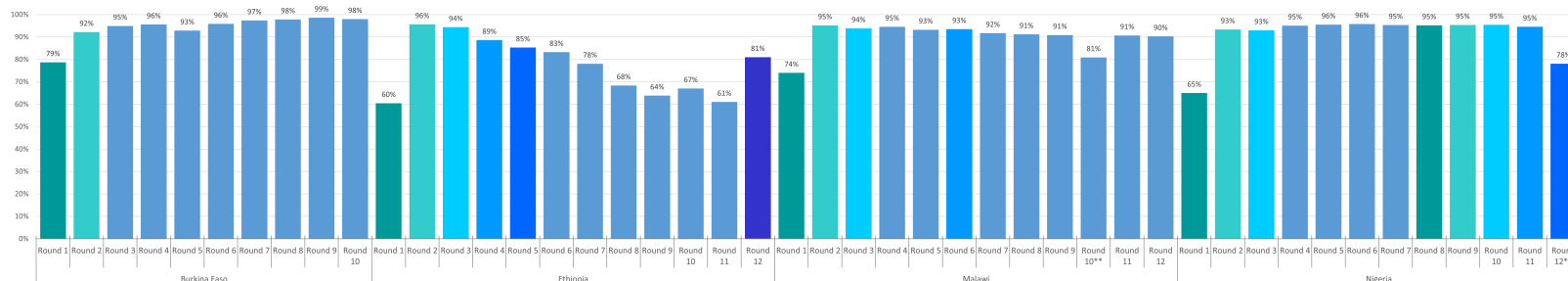
The top panel of Figure [A2](#) shows that the share of urban respondents was fairly stable over the period of interest. Ethiopia had the highest share of urban respondents at around 70 percent. In the other three countries, the share of urban respondents clustered around 40 percent, with Burkina Faso being the lowest. Ethiopia’s share of urban respondents increased only slightly during the survey period. Nigeria’s and Malawi’s shares of urban respondents remained very consistent, other than a slight decline in urban respondents for Malawi in May 2021. Burkina Faso also had a slight decrease in the share of urban respondents in June 2020, however the share increased to just under 40 percent in August 2020 and remained steady throughout the rest of the survey period.

The bottom panel of Figure [A2](#) shows the share of female-headed household respondents was consistent across the period of interest. Ethiopia had the highest share of female-headed household respondents at about 30 percent. The other countries clustered around 20 percent, with Burkina Faso being the lowest. The share of female-headed household respondents was above 20 percent for Malawi, there was a slight increase in the share in May 2021 before decreasing in June 2021. In Nigeria and Burkina Faso the share of respondents was just below 20 percent, and remained consistent throughout the survey period.

Additional Tables and Figures

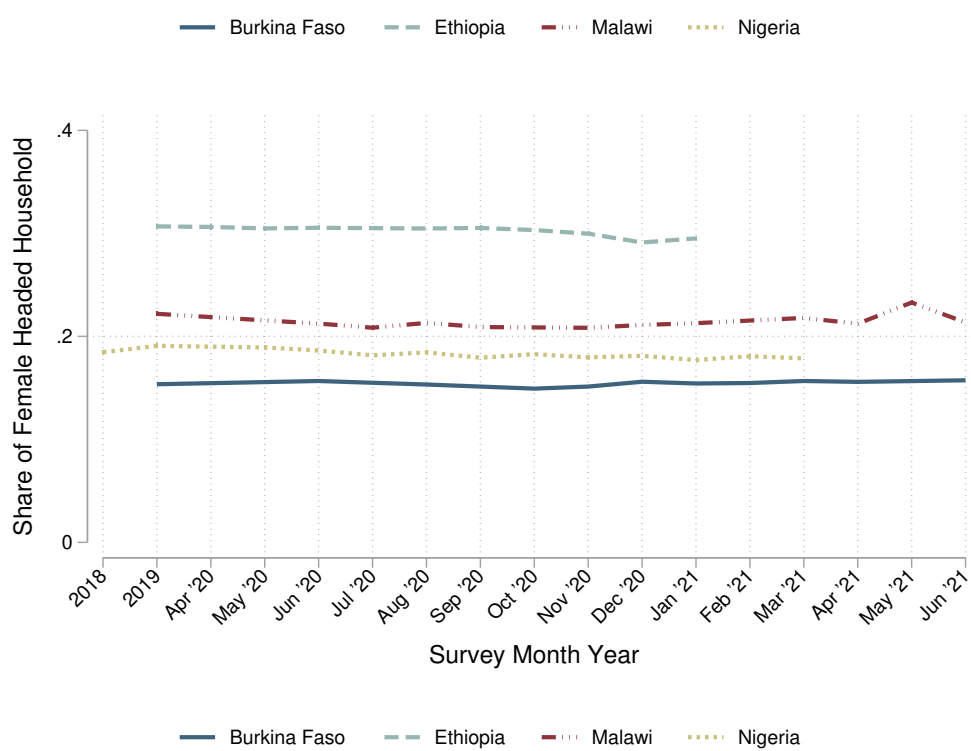
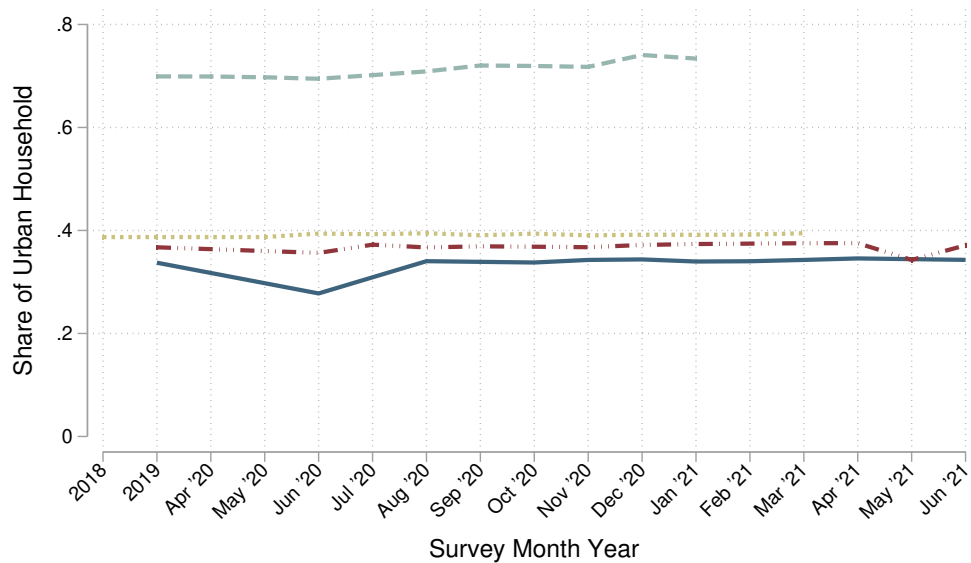
- Figure [A1](#) presents the percentage response rates for LSMS-supported high frequency phone surveys on COVID-19, for each round.
- Tables [A1](#) through [A4](#) shows survey questions used to measure food insecurity in each country included in this study.
- Figures [A3](#) and [A4](#) show robustness checks for different ways of standardizing the FIES score.
- Figures [A5](#) through [A11](#) show event study results that disaggregate estimates of differential trends in food insecurity associated with the COVID-19 pandemic by survey wave.
- Tables [A5](#) through [A8](#) show tabular results with additional information corresponding to Figures [4](#) and [5](#) in the main manuscript.

Figure A1: Round-Specific Response Rates for LSMS-Supported High-Frequency Phone Surveys on COVID-19



Note: The figure presents the percentage response rates for LSMS-supported high frequency phone surveys on COVID-19, for each round. Percentage response rates are calculated as the number of completed interviews over the number of attempted interviews. Later survey rounds (e.g. Round 2, Round 3) only attempt to contact respondents with completed interviews from prior round. ** signifies a survey round in which only Fielded Youth Aspirations and Employment Module were implemented. In Malawi, Round 10, this means there were only 1,136 had an eligible persons while in Nigeria, round 12, there were only 1,238 had an eligible persons.

Figure A2: Changes in Share of Urban/Rural and Male/Female Headed Households Over Time



Note: The figure presents the share of urban households by country and wave as well as the share of female headed household by country and wave. All values are computed using survey weights.

Table A1: Food Insecurity Experience Scale (FIES) Questions in Burkina Faso

FIES	Pre-COVID-19 Surveys		COVID-19 Surveys	
	Question	Recall	Question	Recall
FS1	Have you or other members of your household worried about not having enough food, due to lack of resources?	12 month	You or other members of your household have been worried about not having enough food due to lack of money or other resources?	30 day
FS2	Have you or other household members been unable to eat healthy, nutritious food due to lack of money or other resources?	12 month	You or other members of your household were unable to eat healthy and nutritious food due to lack of money or other resources?	30 day
FS3	Have you or other household members eaten with little variety due to lack of money or other resources?	12 month	you or other members of your household have eaten not enough varied food due to lack of money or other resources?	30 day
FS4	Have you or other household members had to skip a meal because you did not have enough money or other resources to buy food?	12 month	You or other members of your household have had to skip a meal because you did not have enough money or other resources to buy food?	30 day
FS5	Have you or other household members eaten less than you think you should because of a lack of money or other resources?	12 month	You or other members of your household ate less than you thought you should have eaten due to lack of money or other resources?	30 day
FS6	Has your household ran out of food because there was not enough money or other resources?	12 month	Your household run out of food because there was not enough money or other resources?	30 day
FS7	Have you or other members of your household been hungry but not eaten because there was not enough money or other resources to buy food?	12 month	You or other members of your household felt hungry but did not eat because there was not enough money or other resources to buy food?	30 day
FS8	Did you or other members of the household go an entire day without eating because of lack of money or other resources?	12 month	You or other members of your household go a whole day without eating due to lack of money or other resources?	30 day

Table A2: Food Insecurity Experience Scale (FIES) Questions in Ethiopia

Pre-COVID-19 Surveys		COVID-19 Surveys		
FIES	Question	Recall	Question	Recall
FS1	Did you worry that your household would not have enough food?	7 day	Was there a time when you or any other adult in your household were worried about not having enough food to eat because of lack of money or other resources?	30 day
FS2	How many days have you or someone in your household had to rely on less preferred foods?	7 day	Was there a time when you, or any other adult in your household, were unable to eat healthy and nutritious/preferred foods because of a lack of money or other resources?	30 day
FS3	How many days have you or someone in your household had to limit the variety of foods eaten?	7 day	Was there a time when you, or any other adult in your household, ate only a few kinds of foods because of a lack of money or other resources?	30 day
FS4	How many days have you or someone in your household had to limit portion size at meal-times?	7 day	Was there a time when you or others in your household had to skip a meal because there was not enough money or other resources to get food?	30 day
FS5	How many days have you or someone in your household had to reduce number of meals eaten in a day?	7 day	Was there a time when you or others in your household ate less than you thought you should because of a lack of money or other resources?	30 day
FS6	How many days have you had no food of any kind in your household?	7 day	Was there a time when your household ran out of food because of a lack of money or other resources?	30 day
FS7	How many days have you or someone in your household had to restrict consumption by adults for small children to eat?	7 day	Was there a time when you or others in your household were hungry but did not eat because there was not enough money or other resources for food?	30 day
FS8	How many days have you or someone in your household had to go a whole day and night without eating anything?	7 day	Was there a time when you or others in your household went without eating for a whole day because of a lack of money or other resources?	30 day

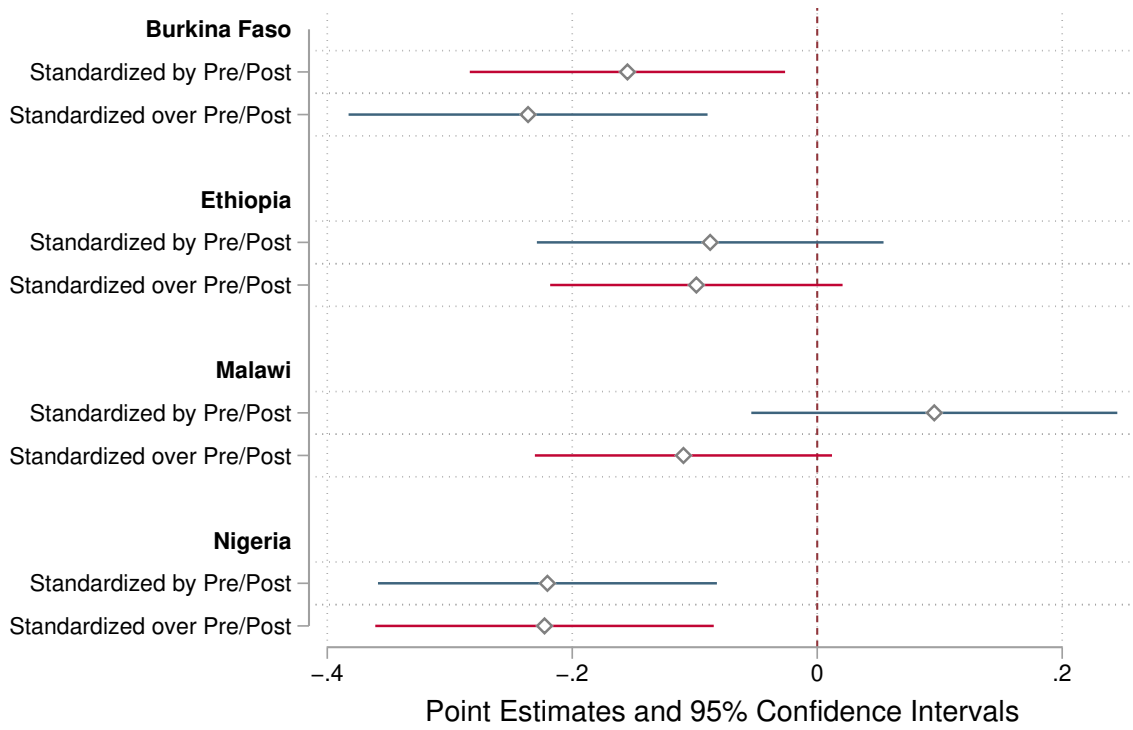
Table A3: Food Insecurity Experience Scale (FIES) Questions in Malawi

Pre-COVID-19 Surveys			COVID-19 Surveys		
FIES	Question	Recall	Question	Recall	
FS1	Did you worry that your household would not have enough food?	7 day	You or any other adult in your household were worried about not having enough food to eat because of lack of money or other resources?	30 day	
FS2	How many days have you or someone in your household had to rely on less preferred and/or less expensive foods?	7 day	You, or any other adult in your household, were unable to eat healthy and nutritious/preferred foods because of a lack of money or other resources?	30 day	
FS3		7 day	You, or any other adult in your household, ate only a few kinds of foods because of a lack of money or other resources?	30 day	
FS4	How many days have you or someone in your household had to reduce number of meals eaten in a day?	7 day	You, or any other adult in your household, had to skip a meal because there was not enough money or other resources to get food?	30 day	
FS5	How many days have you or someone in your household had to limit portion size at meal-times?	7 day	You, or any other adult in your household, ate less than you thought you should because of a lack of money or other resources?	30 day	
FS6	How many days have you or someone in your household had to borrow food or rely on help from a friend or relative?	7 day	Your household ran out of food because of a lack of money or other resources?	30 day	
FS7	How many days have you or someone in your household had to restrict consumption by adults in order for small children to eat?	7 day	You, or any other adult in your household, were hungry but did not eat because there was not enough money or other resources for food?	30 day	
FS8		7 day	You, or any other adult in your household, went without eating for a whole day because of a lack of money or other resources?	30 day	

Table A4: Food Insecurity Experience Scale (FIES) Questions in Nigeria

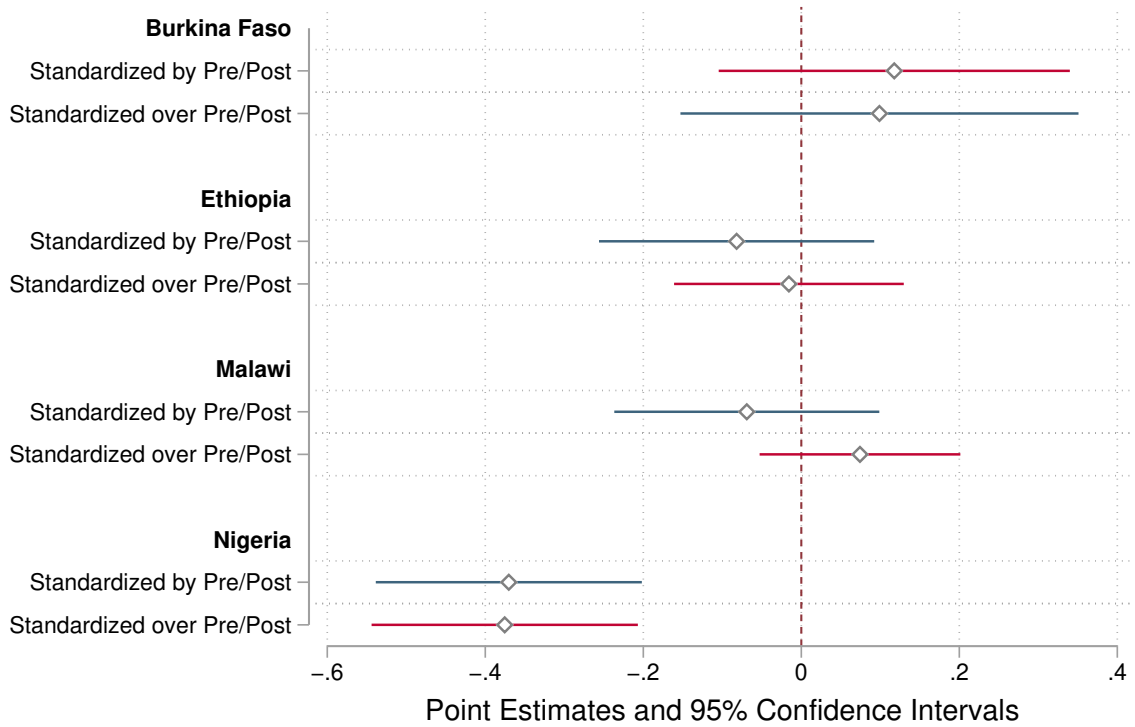
Pre-COVID-19 Surveys		COVID-19 Surveys		
FIES	Question	Recall	Question	Recall
FS1	You or any other adult in your household worried about not having enough food to eat because of lack of money or other resources?	30 day	You or any other adult in your household were worried about not having enough food to eat because of lack of money or other resources?	30 day
FS2	You, or any other adult in your household, were unable to eat healthy and nutritious/preferred foods because of a lack of money or other resources?	30 day	You, or any other adult in your household, were unable to eat healthy and nutritious/preferred foods because of a lack of money or other resources?	30 day
FS3	You, or any other adult in your household, ate only a few kinds of foods because of a lack of money or other resources?	30 day	You, or any other adult in your household, ate only a few kinds of foods because of a lack of money or other resources?	30 day
FS4	You, or any other adult in your household, had to skip a meal because there was not enough money or other resources to get food?	30 day	You, or any other adult in your household, had to skip a meal because there was not enough money or other resources to get food?	30 day
FS5	You, or any other adult in your household, restricted consumption in order for children to eat?	30 day	You, or any other adult in your household, ate less than you thought you should because of a lack of money or other resources?	30 day
FS6	You, or any other adult in your household, borrowed food, or relied on help from a friend or relative?	30 day	Your household ran out of food because of a lack of money or other resources?	30 day
FS7	You, or any other adult in your household, restricted consumption in order for children to eat?	30 day	You, or any other adult in your household, were hungry but did not eat because there was not enough money or other resources for food?	30 day
FS8	You, or any other adult in your household, went without eating for a whole day because of a lack of money or other resources?	30 day	You, or any other adult in your household, went without eating for a whole day because of a lack of money or other resources?	30 day

Figure A3: Urban-Rural Differences in Food Insecurity for Different Standardizations



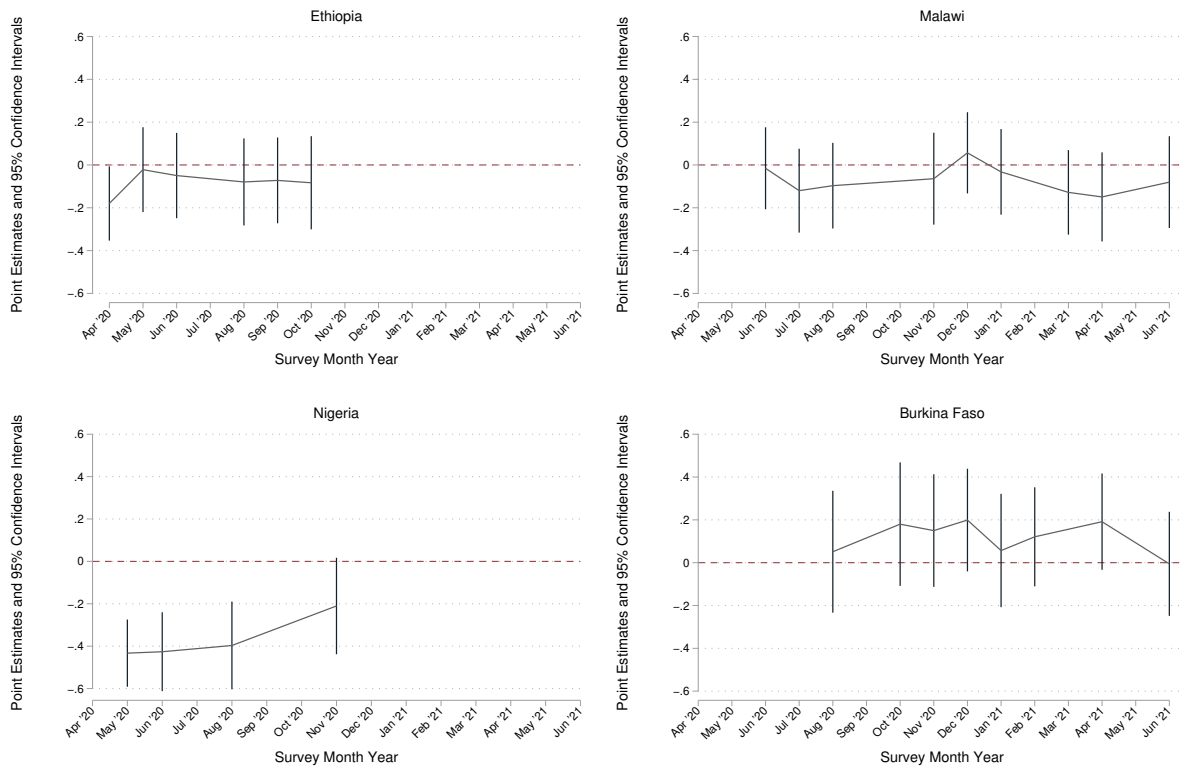
Note: This figure reports coefficients and 95% confidence intervals when estimating differences between urban and rural households before and during the pandemic for two different standardization methods. Standardized by Pre/Post is our preferred method and is presented in the main body of the paper. This method standardizes the FIES score, by country, for pre-outbreak data and then standardizes post-outbreak data separately. Standardized over Pre/Post standardizes the FIES score by country only, without regard to whether or not the data was collected pre- or post-outbreak. This analysis uses data from before and after the COVID-19 outbreak.

Figure A4: Female-Male Headed Household Differences in Food Insecurity for Different Standardizations



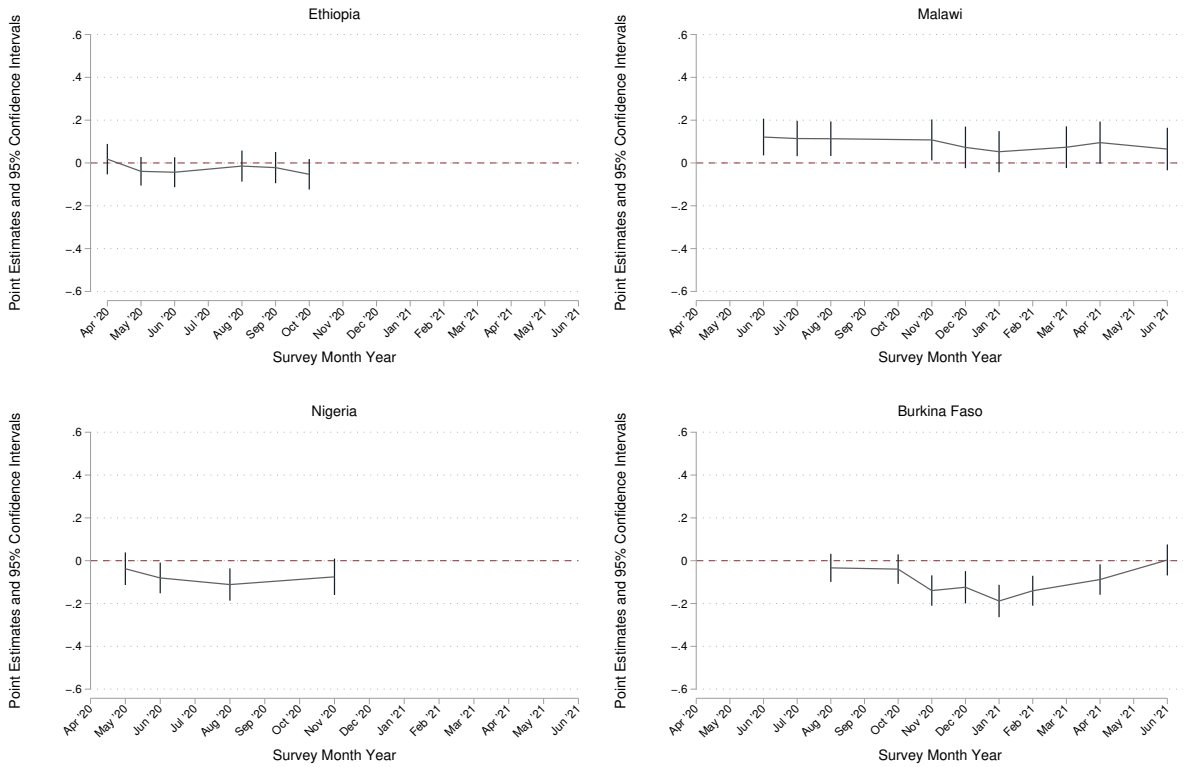
Note: This figure reports coefficients and 95% confidence intervals when estimating differences between female-headed and male-headed households before and during the pandemic for two different standardization methods. Standardized by Pre/Post is our preferred method and is presented in the main body of the paper. This method standardizes the FIES score, by country, for pre-outbreak data and then standardizes post-outbreak data separately. Standardized over Pre/Post standardizes the FIES score by country only, without regard to whether or not the data was collected pre- or post-outbreak. This analysis uses data from before and after the COVID-19 outbreak.

Figure A5: Event Study—Female-Male Headed Household Differences in Food Insecurity



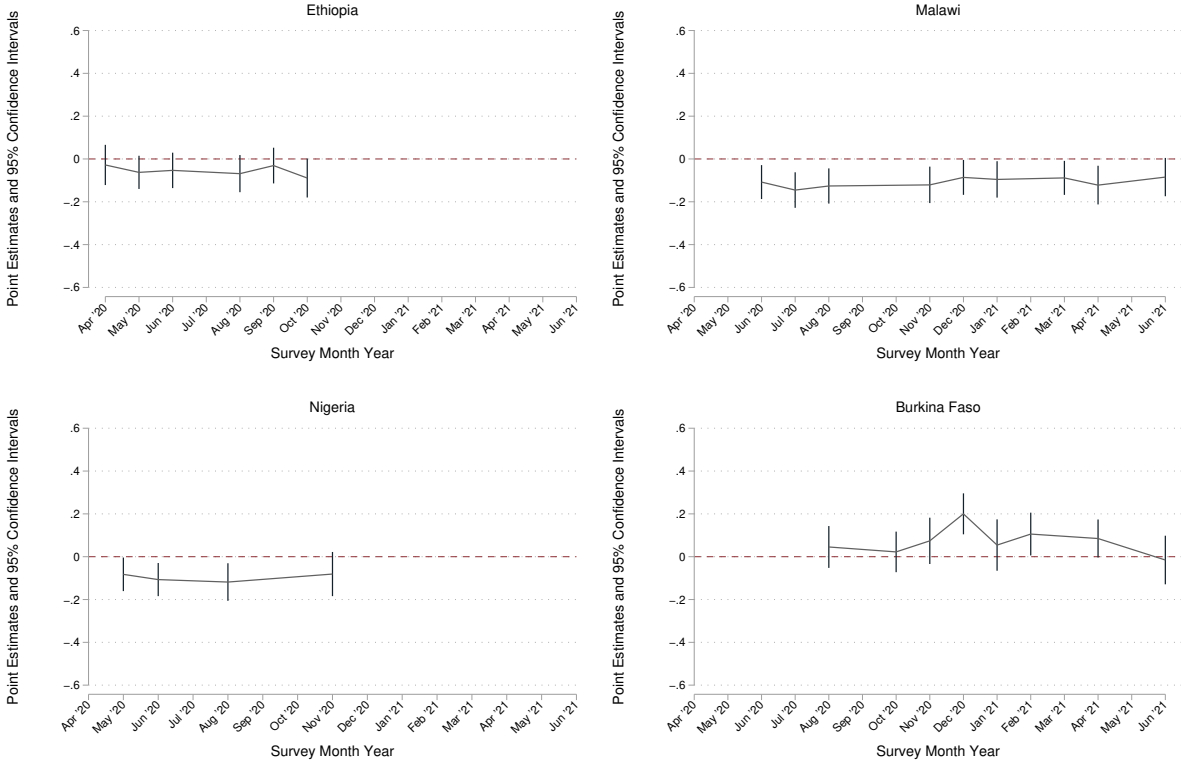
Note: This figure disaggregates estimates of differential trends in food insecurity, as measured with the standardized raw FIES score, by country and wave. When the coefficient is positive, this implies that female-headed households experienced a larger increase in the given measure of food insecurity since before the pandemic, relative to male-headed households. When the coefficient estimate is negative, the implies that male-headed households experienced a larger increase in food insecurity. This analysis uses data from before and after the COVID-19 outbreak.

Figure A6: Event Study—Urban-Rural Differences in Mild Food Insecurity



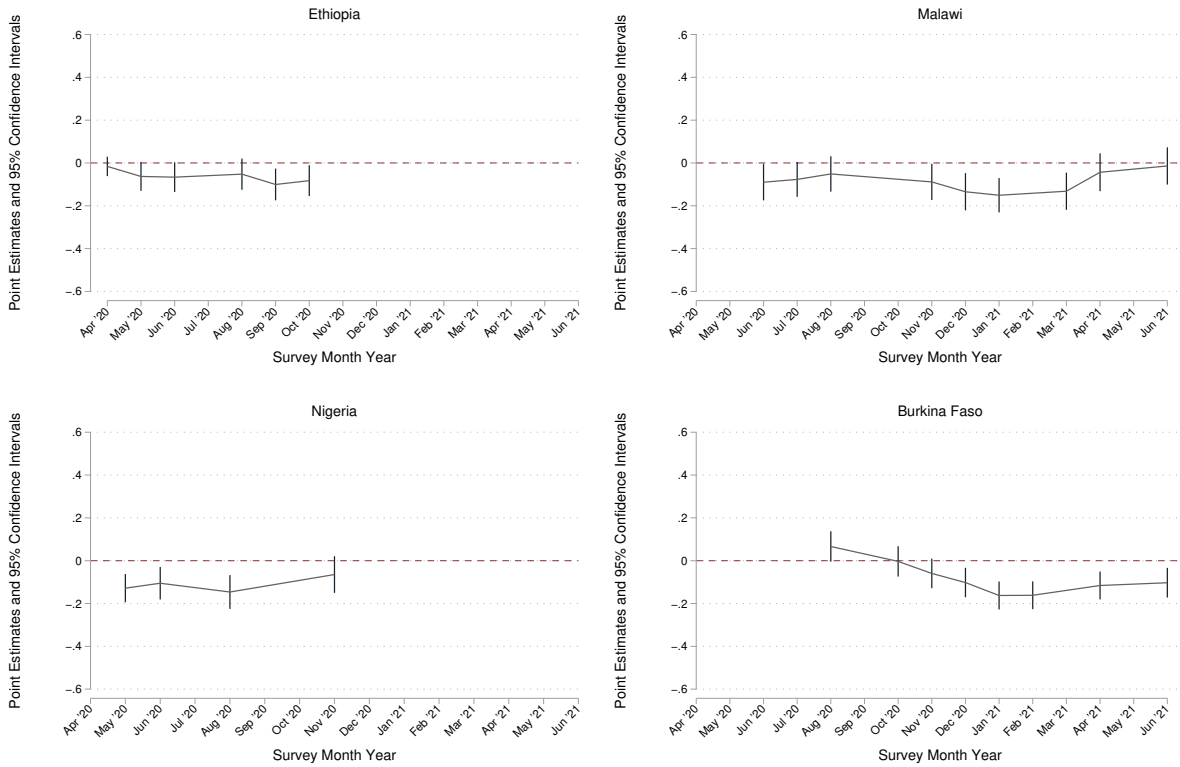
Note: This figure disaggregates estimates of differential trends in food insecurity, as measured with a binary indicator measuring mild food insecurity, by country and wave. When the coefficient is positive, this implies that households in urban areas experienced a larger increase in the given measure of food insecurity, since before the pandemic, relative to rural households. When the coefficient estimate is negative, this implies that households in rural areas experienced a larger increase in food insecurity. This analysis uses data from before and after the COVID-19 outbreak.

Figure A7: Event Study—Female-Male Headed Household Differences in Mild Food Insecurity



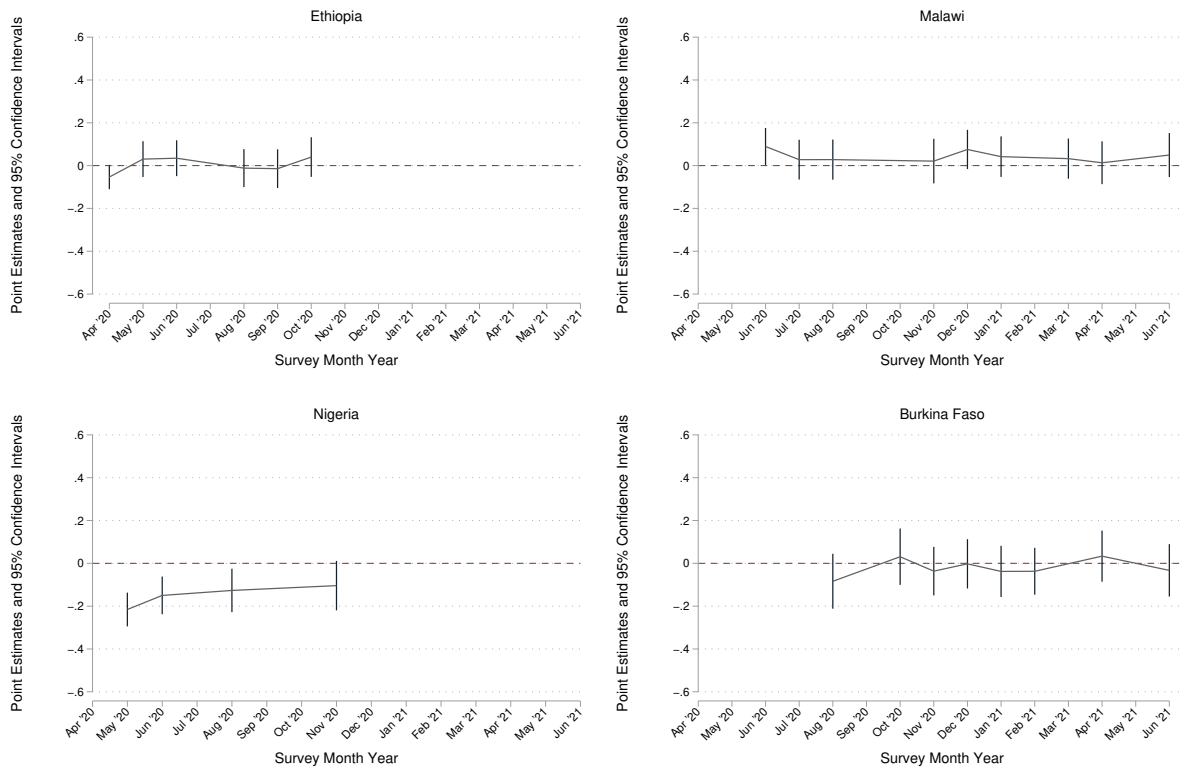
Note: This figure disaggregates estimates of differential trends in food insecurity, as measured with a binary indicator measuring mild food insecurity, by country and wave. When the coefficient is positive, this implies that female-headed households experienced a larger increase in the given measure of food insecurity since before the pandemic, relative to male-headed households. When the coefficient estimate is negative, the implies that male-headed households experienced a larger increase in food insecurity. This analysis uses data from before and after the COVID-19 outbreak.

Figure A8: Event Study—Urban-Rural Differences in Moderate Food Insecurity



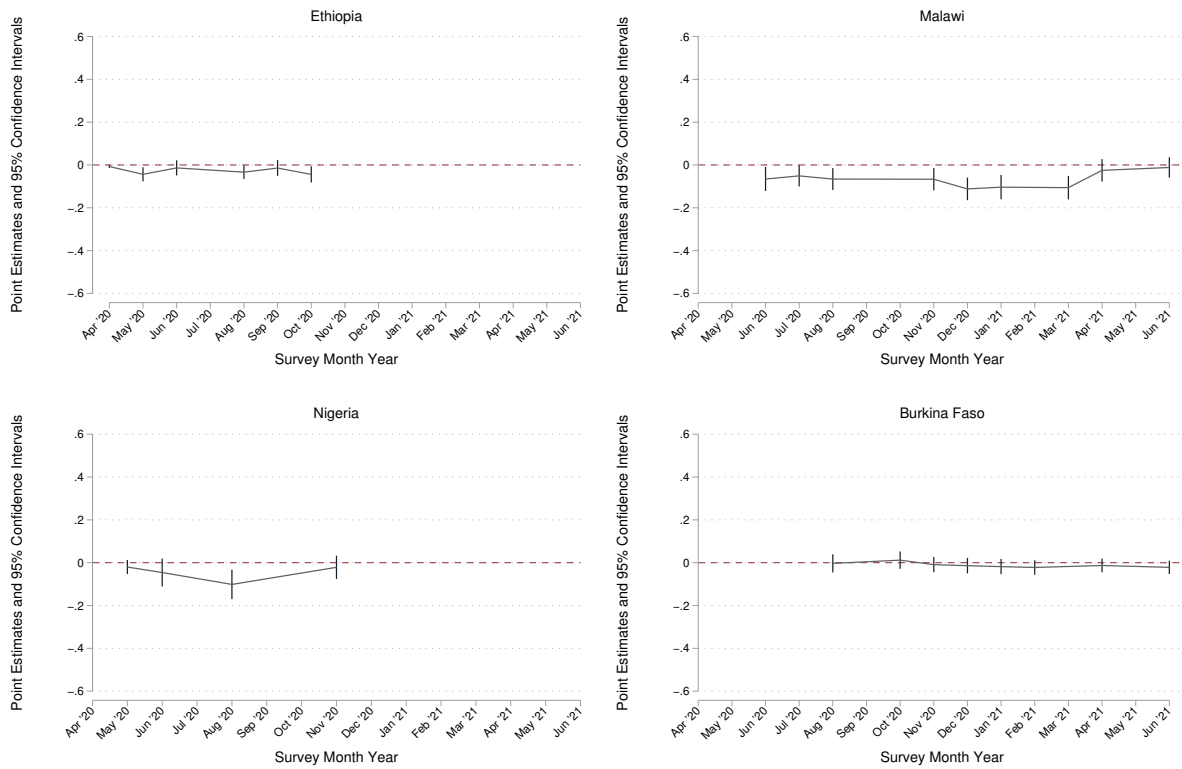
Note: This figure disaggregates estimates of differential trends in food insecurity, as measured with a binary indicator measuring moderate food insecurity, by country and wave. When the coefficient is positive, this implies that households in urban areas experienced a larger increase in the given measure of food insecurity, since before the pandemic, relative to rural households. When the coefficient estimate is negative, this implies that households in rural areas experienced a larger increase in food insecurity. This analysis uses data from before and after the COVID-19 outbreak.

Figure A9: Event Study—Female-Male Headed Household Differences in Moderate Food Insecurity



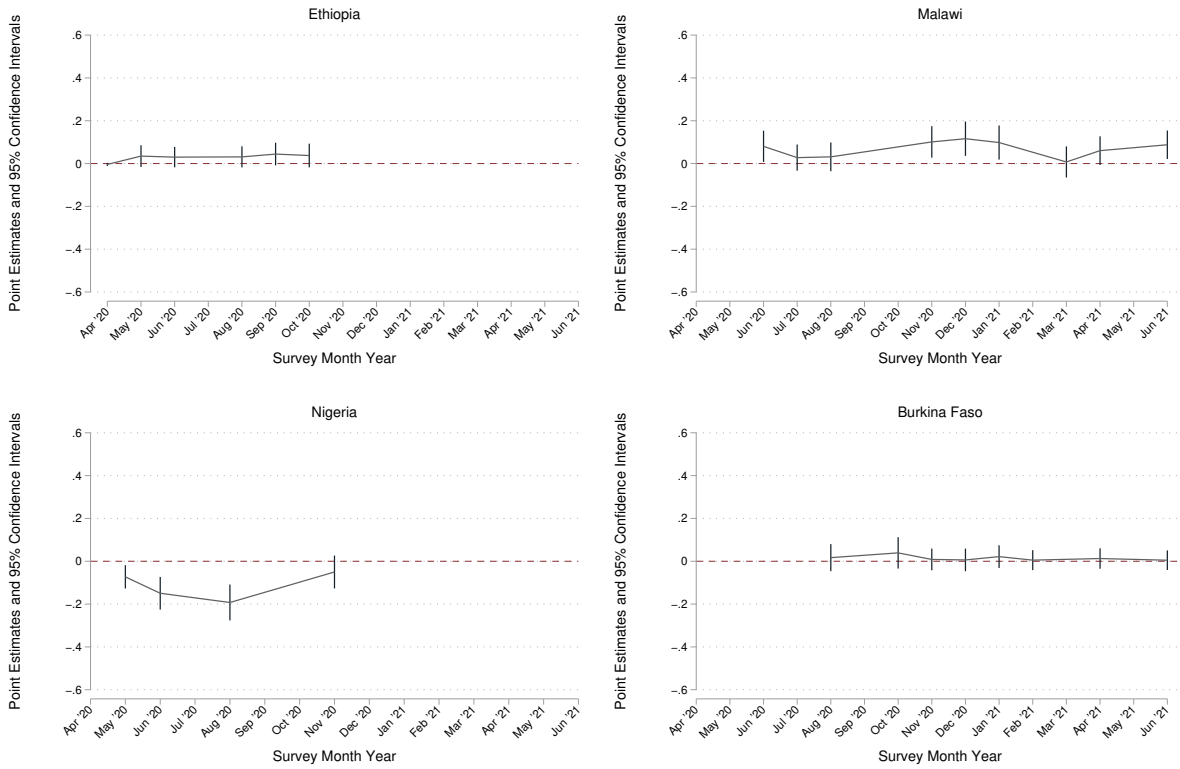
Note: This figure disaggregates estimates of differential trends in food insecurity, as measured with a binary indicator measuring moderate food insecurity, by country and wave. When the coefficient is positive, this implies that female-headed households experienced a larger increase in the given measure of food insecurity since before the pandemic, relative to male-headed households. When the coefficient estimate is negative, the implies that male-headed households experienced a larger increase in food insecurity. This analysis uses data from before and after the COVID-19 outbreak.

Figure A10: Event Study—Urban-Rural Differences in Severe Food Insecurity



Note: This figure disaggregates estimates of differential trends in food insecurity, as measured with a binary indicator measuring severe food insecurity, by country and wave. When the coefficient is positive, this implies that households in urban areas experienced a larger increase in the given measure of food insecurity, since before the pandemic, relative to rural households. When the coefficient estimate is negative, this implies that households in rural areas experienced a larger increase in food insecurity. This analysis uses data from before and after the COVID-19 outbreak.

Figure A11: Event Study—Female-Male Headed Household Differences in Severe Food Insecurity



Note: This figure disaggregates estimates of differential trends in food insecurity, as measured with a binary indicator measuring severe food insecurity, by country and wave. When the coefficient is positive, this implies that female-headed households experienced a larger increase in the given measure of food insecurity since before the pandemic, relative to male-headed households. When the coefficient estimate is negative, the implies that male-headed households experienced a larger increase in food insecurity. This analysis uses data from before and after the COVID-19 outbreak.

Table A5: The Coronavirus and Standardized Raw FIES Score

	Urban-Rural	Female-Male
Panel A: Burkina Faso		
COVID	-0.085 (0.046)	-0.205*** (0.047)
Urban	0.378*** (0.061)	
COVID × Urban	-0.155* (0.066)	
Female		0.065 (0.098)
COVID × Female		0.118 (0.11)
Observations	17974	17974
R ²	0.061	0.051
Baseline Mean	-0.256	-0.009
Panel B: Ethiopia		
COVID	0.100 (0.064)	0.089 (0.056)
Urban	-0.038 (0.065)	
COVID × Urban	-0.087 (0.072)	
Female		0.258** (0.085)
COVID × Female		-0.082 (0.089)
Observations	21008	21008
R ²	0.110	0.114
Baseline Mean	0.012	-0.063
Panel C: Malawi		
COVID	-0.393*** (0.052)	-0.355*** (0.053)
Urban	-0.494*** (0.068)	
COVID × Urban	0.096 (0.076)	
Female		0.346*** (0.079)
COVID × Female		-0.069 (0.086)
Observations	16102	16102
R ²	0.047	0.036
Baseline Mean	0.095	-0.092
Panel D: Nigeria		
COVID	0.304*** (0.046)	0.307*** (0.043)
Urban	0.255*** (0.067)	
COVID × Urban	-0.220** (0.071)	
Female		0.470*** (0.082)
COVID × Female		-0.370*** (0.086)
Observations	9235	9235
R ²	0.227	0.233
Baseline Mean	-0.068	-0.080

Note: Dependent variable is the standardized raw FIES score weighted using household survey weights. Baseline Mean represents the pre-pandemic mean of the outcome variable in the comparison area — e.g., rural areas in the first column and male headed households in the second column. Each regression includes round fixed effects and a set of indicator variables to control for when household skip or refuse to answer a specific FIES question. Robust standard errors clustered at the household-level are reported in parentheses (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).

Table A6: The Coronavirus and Mild Food Insecurity

	Urban-Rural	Female-Male
Panel A: Burkina Faso		
COVID	0.047* (0.023)	-0.025 (0.022)
Urban	0.229*** (0.028)	
COVID × Urban	-0.094** (0.029)	
Female		0.003 (0.042)
COVID × Female		0.071 (0.042)
Observations	17974	17974
R ²	0.039	0.019
Baseline Mean	0.530	0.685
Panel B: Ethiopia		
COVID	0.318*** (0.027)	0.322*** (0.023)
Urban	-0.051 (0.028)	
COVID × Urban	-0.025 (0.030)	
Female		0.124*** (0.036)
COVID × Female		-0.055 (0.037)
Observations	21008	21008
R ²	0.130	0.130
Baseline Mean	0.359	0.312
Panel C: Malawi		
COVID	0.121*** (0.024)	0.167*** (0.025)
Urban	-0.231*** (0.038)	
COVID × Urban	0.091* (0.040)	
Female		0.178*** (0.036)
COVID × Female		-0.109** (0.037)
Observations	16102	16102
R ²	0.059	0.045
Baseline Mean	0.666	0.574
Panel D: Nigeria		
COVID	0.258*** (0.024)	0.254*** (0.023)
Urban	0.090** (0.034)	
COVID × Urban	-0.075* (0.035)	
Female		0.159*** (0.037)
COVID × Female		-0.097* (0.038)
Observations	9235	9235
R ²	0.091	0.096
Baseline Mean	0.591	0.594

Note: Dependent variable is mild food insecurity weighted using household survey weights. Baseline Mean represents the pre-pandemic mean of the outcome variable in the comparison area — e.g., rural areas in the first column and male headed households in the second column. Each regression includes round fixed effects and a set of indicator variables to control for when household skip or refuse to answer a specific FIES question. Robust standard errors clustered at the household-level are reported in parentheses (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).

Table A7: The Coronavirus and Moderate Food Insecurity

	Urban-Rural	Female-Male
Panel A: Burkina Faso		
COVID	-0.138*** (0.020)	-0.189*** (0.021)
Urban	0.151*** (0.028)	
COVID × Urban	-0.079** (0.029)	
Female		0.064 (0.048)
COVID × Female		-0.021 (0.052)
Observations	17974	17974
R ²	0.059	0.051
Baseline Mean	0.248	0.341
Panel B: Ethiopia		
COVID	0.237*** (0.027)	0.215*** (0.024)
Urban	0.016 (0.023)	
COVID × Urban	-0.062* (0.028)	
Female		0.053 (0.029)
COVID × Female		0.004 (0.034)
Observations	21008	21008
R ²	0.133	0.134
Baseline Mean	0.139	0.131
Panel C: Malawi		
COVID	0.343*** (0.025)	0.316*** (0.024)
Urban	-0.086*** (0.026)	
COVID × Urban	-0.087** (0.033)	
Female		0.063 (0.033)
COVID × Female		0.043 (0.039)
Observations	16102	16102
R ²	0.123	0.113
Baseline Mean	0.193	0.160
Panel D: Nigeria		
COVID	0.290*** (0.024)	0.284*** (0.022)
Urban	0.128*** (0.034)	
COVID × Urban	-0.112*** (0.034)	
Female		0.216*** (0.040)
COVID × Female		-0.152*** (0.042)
Observations	9235	9235
R ²	0.332	0.337
Baseline Mean	0.373	0.375

Note: Dependent variable is moderate food insecurity weighted using household survey weights. Baseline Mean represents the pre-pandemic mean of the outcome variable in the comparison area — e.g., rural areas in the first column and male headed households in the second column. Each regression includes random fixed effects and a set of indicator variables to control for when household skip or refuse to answer a specific FIES question. Robust standard errors clustered at the household-level are reported in parentheses (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).

Table A8: The Coronavirus and Severe Food Insecurity

	Urban-Rural	Female-Male
Panel A: Burkina Faso		
COVID	-0.046*** (0.011)	-0.056*** (0.0097)
Urban	0.015 (0.015)	
COVID × Urban	-0.011 (0.016)	
Female		-0.003 (0.023)
COVID × Female		0.014 (0.024)
Observations	17974	17974
R ²	0.014	0.014
Baseline Mean	0.051	0.051
Panel B: Ethiopia		
COVID	0.082*** (0.013)	0.067*** (0.011)
Urban	0.007* (0.0035)	
COVID × Urban	-0.026* (0.010)	
Female		0.004 (0.0036)
COVID × Female		0.028 (0.015)
Observations	21008	21008
R ²	0.025	0.027
Baseline Mean	0.000	0.000
Panel C: Malawi		
COVID	0.089*** (0.012)	0.059*** (0.011)
Urban	0.000 (.)	
COVID × Urban	-0.067*** (0.019)	
Female		0.000 (3.8e-09)
COVID × Female		0.068** (0.022)
Observations	16102	16102
R ²	0.034	0.035
Baseline Mean	0.000	0.000
Panel D: Nigeria		
COVID	0.083*** (0.014)	0.091*** (0.012)
Urban	0.020 (0.017)	
COVID × Urban	-0.047* (0.022)	
Female		0.073** (0.028)
COVID × Female		-0.116*** (0.031)
Observations	9235	9235
R ²	0.092	0.094
Baseline Mean	0.083	0.083

Note: Dependent variable is severe food insecurity weighted using household survey weights. Baseline Mean represents the pre-pandemic mean of the outcome variable in the comparison area — e.g., rural areas in the first column and male headed households in the second column. Each regression includes random fixed effects and a set of indicator variables to control for when household skip or refuse to answer a specific FIES question. Robust standard errors clustered at the household-level are reported in parentheses (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$).