

Supplementary information

Socioeconomic impacts of COVID-19 in low-income countries

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Supplementary Information:

Socioeconomic impacts of COVID-19 in low-income countries

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Supplementary Methods

Ethiopia

ESS 2018/19 established a new baseline for the longitudinal household survey program, drawing a new sample based on the 2018 pre-census cartographic database of enumeration areas (EAs). The sample is a two-stage stratified probability sample that is designed to be representative at the national, urban/rural, and regional-levels. Rural EAs constitute a subsample of the Agricultural Sample Survey (AgSS) 2018 EA sample. Thus, the first stage of sampling in rural areas entailed using simple random sampling (SRS) to select EAs—the primary sampling units—from the sample for the AgSS 2018 EAs. The first stage of sampling for urban areas was selecting EAs directly from the urban EAs within each region using probability proportional to size (PPS) systematically. This is designed to automatically produce a proportional allocation of the urban sample by zone within each region. The second stage of sampling was to use systematic random sampling to select households to be surveyed in each EA. From the rural EAs, ten agricultural households were selected as a subsample of the households selected for the AgSS and two non-agricultural households were selected from the non-agriculture households listed in each EA specified. For urban areas, a total of 15 households are selected per EA regardless of the households' economic activity. The households are selected using systematic random sampling from the total households listed in that specific EA.

Malawi

IHPS 2019 is the fourth follow-up to a national sample of households that had previously been interviewed in 2010, 2013 and 2016. In 2010, a sub-sample of the Third Integrated Household Survey (IHS3) EAs (204 EAs out of 768 EAs) were selected prior to the start of the IHS3 fieldwork with the intention to track and resurvey the sampled IHS3 households in these EAs as part of IHPS 2013. This sub-sample had originally been selected, as part of a two-stage stratified probability sampling design, to be representative at the national, urban/rural, and regional-levels (see <https://bit.ly/ihips2010> for more information). Starting in 2013, IHPS attempted to track all households and individuals that were interviewed in a prior round, as long as they (i) were neither servants nor guests at the time of the IHS3 and (ii) were projected to be at least 12 years of age and were known to be residing in mainland Malawi but excluding those that may be on Likoma Island or that may be residing in prisons, police compounds, and army barracks. Once a split-off individual was located, the new household that he/she may have formed/joined with respect to the prior round was also brought into the IHPS sample (see <https://bit.ly/ihips2013> for more information). Prior to the IHPS 2016, in view of budget constraints, 102 EAs out of the 204 original panel EAs were sub-sampled at random for the purpose of interviewing in the future survey rounds all households and

individuals that can ever be traced back to these original 102 EAs. The selection of these EAs in 2016 also ensured representativeness at the national and urban/rural-levels (see <https://bit.ly/ihips2016> for more information). In 2019, the IHPS conducted the fourth round of data collection on the dynamically-expanding national sample of households following the strict tracking protocols that are outlined above. 2,508 households and 8,995 tracking-eligible individuals from the IHPS 2016 were the targets for the IHPS 2019 interviews, and through tracking, the IHPS 2019 sample grew to 3,181 households, which can be traced back to 2,370 IHPS 2016 households.

Nigeria

GHS-2018/19 is in part linked to the GHS-Panel 2010/11, which was originally designed to be representative at the national and zone-levels, as part of a two-stage stratified probability sample - covering 500 EAs and approximately 5,000 households (see <https://bit.ly/ghs-panel2010> for more information). This sample of households was re-visited in 2012/13 (<https://bit.ly/ghs-panel2012>) and later in 2015/16 (<https://bit.ly/ghs-panel2015>). In 2018/19, the GHS-Panel sample was partially refreshed to counteract the effects of increasing attrition. For the partial refresh of the sample, a new set of 360 EAs were randomly selected, which consisted of 60 EAs per zone. The refresh EAs were selected from the same sampling frame as the original GHS-Panel sample in 2010. A listing of all households was conducted in the 360 EAs and ten households were randomly selected in each EA, resulting in a total refresh sample of approximately 3,600 households (see <https://bit.ly/ghs-panel2018> for more information). In addition to these 3,600 refresh households, a sub-sample of the original 5,000 GHS-Panel households from 2010 were selected to be included in the new sample. This “long panel” sample was designed to be nationally representative to enable continued longitudinal analysis for the sample going back to 2010. The long panel sample consisted of 159 EAs systematically selected across the six geopolitical Zones. The systematic selection ensured that the distribution of EAs across the six Zones (and urban and rural areas within) is proportional to the original GHS-Panel sample. The combined sample of refresh and long panel EAs consisted of 519 EAs and 4,976 households.

Uganda

UNPS 2019/20 is the latest round of a well-established panel survey that was previously implemented in 2009/10, 2010/11, 2011/12, 2013/14, 2015/16, and 2018/19. Starting in 2009/10, the UNPS set out to track and interview 3,123 households that were distributed over 322 Enumeration Areas (EAs), selected out of 783 EAs that had been visited during the Uganda National Household Survey (UNHS) in 2005/06. The distribution of the EAs covered by the 2009/10 UNPS was

such that it included all 34 EAs in Kampala District, and 72 EAs (58 rural and 14 urban) in each of the other regions. Within each stratum, the EAs were originally selected with equal probability with implicit stratification by urban/rural and district, in this order. This allocation allows for reliable estimates at the national, rural-urban, and regional levels (see <https://bit.ly/unps2009> for more information). The sample of households interviewed in 2009/10 were attempted to be tracked and re-interviewed in 2010/11 (<https://bit.ly/unps2010>) and 2011/12 (<https://bit.ly/unps2011>). In 2013/14, the sample was partially refreshed to counteract the effects of increasing attrition, whereby 100 EAs (and all households ever associated with these EAs) were permanently rotated out and replaced by a new cross-section of 100 EAs and up to ten households, selected at random, per EA (<https://bit.ly/unps2013>) in a way that preserves the original allocation of EAs across the survey strata. In 2013/14 sample as in turn tracked and re-interviewed in 2015/16 (<https://bit.ly/unps201516>), 2018/19 (<https://bit.ly/unps2018>) and in 2019/20 - following similar tracking protocols as outlined for Malawi above and allowing dynamic-expansion of the household sample in each round and the addition of newly formed households vis-a-vis the prior waves.

Supplementary Results

Supplementary Tables 1 – 25 present either (1) biased corrected estimates of population means and population totals or (2) simple regressions to test for heterogenous effects. Supplementary tables 6 – 8, 12, 15, 17 – 18, 21, and 23 are type (1). These tables present estimates of the mean number of households, individuals, adults, or school-aged children using corrected for selection bias using survey weights as described above. We use the sample means and total to make inference about the means and totals in the national-level population of interest (households, individuals, adults, or school-aged children). Standard errors for these estimates are presented in parentheses.

Supplementary Tables 1 – 5, 9 – 11, 13 – 14, 16, 105 – 20, 22, and 24 – 25 are type (2). These tables present results from simple regressions to test for heterogenous effects across 1) countries, 2) rural and urban sectors, 3) pre-COVID-19 wealth, and 4) time. Every regression uses weights to correct for selection bias. Huber-White robust standard errors are reported in parentheses for all of these tables. With the exception of Supplementary Table 11, all estimates use the least squares estimator derived above. Supplementary Table 11 reports results from an ordered logit regression. Tables testing heterogeneity across country use Malawi as the base case. To test differences between the other countries (not Malawi) we conduct Wald tests for equality in the estimated coefficients for each country pair

Supplementary Figures

Supplementary Figure 1. Round-specific response rates for LSMS-support high-frequency phone surveys on COVID-19

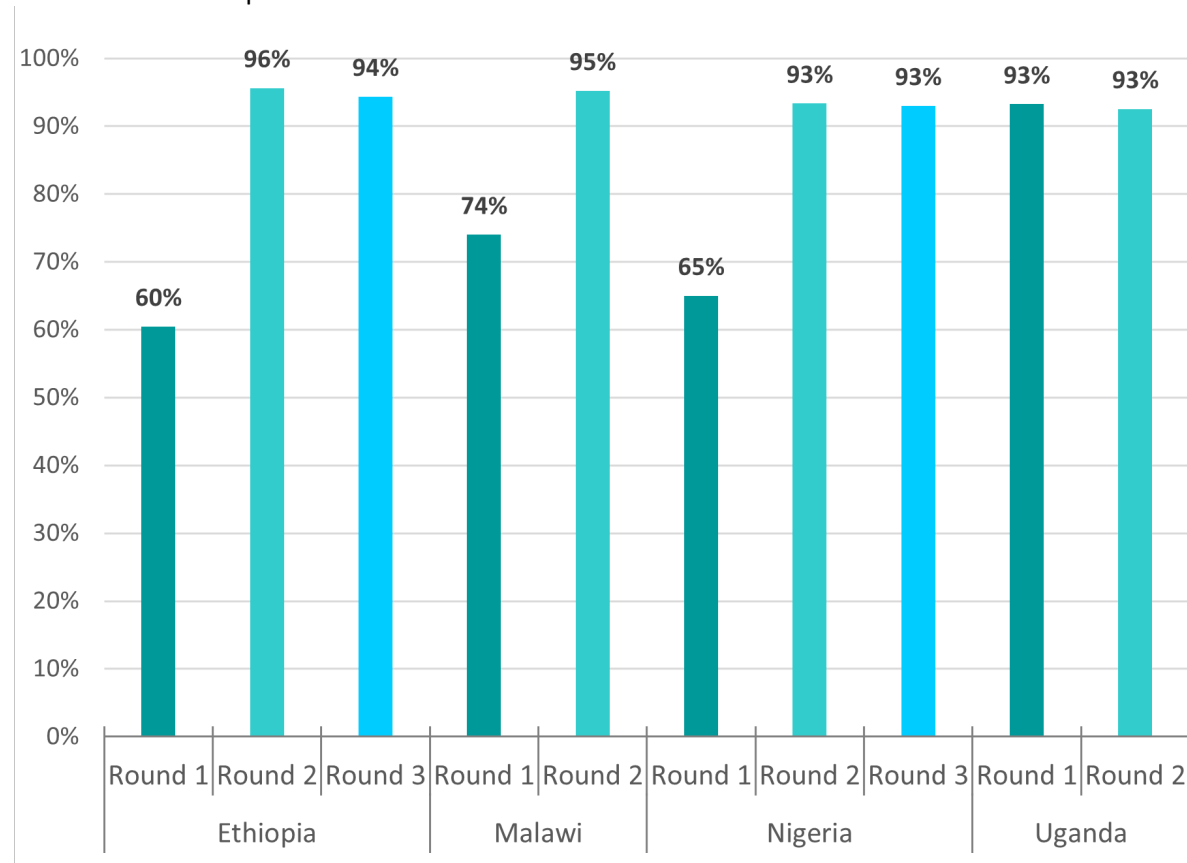
Rows report the response rate, number of attempted interviews, and number of completed interviews for each country in each round, respectively. The total number of households in the pre-COVID-19 surveys is also reported in the bottom row, which does not vary by round. The response rate is calculated

as $\frac{\text{\# of completed interviews}}{\text{\# of attempted interviews}}$.

	Ethiopia			Malawi		Nigeria			Uganda	
	Round 1	Round 2	Round 3	Round 1	Round 2	Round 1	Round 2	Round 3	Round 1	Round 2
Response rate	60%	96%	94%	74%	95%	65%	93%	93%	93%	93%
# of attempted interviews	5,374	3,249	3,241	2,337	1,729	3,000	1,950	1,925	2,421	2,410
# of completed interviews	3,249	3,107	3,058	1,729	1,646	1,950	1,820	1,790	2,257	2,230
Total # of households in pre-COVID-19 survey	6,770			3,181		4,976			3,098	

Supplementary Figure 2. Round-specific response rates for LSMS-supported high-frequency phone surveys on COVID-19

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.



Supplementary Tables

Supplementary Table 1. Knowledge of government actions undertaken to curb the spread of COVID-19

	Stay at home	Restricted travel	Close schools	Lockdown	Close businesses	Limit social gatherings
Ethiopia	0.203 (<0.001) [0.155 - 0.250]	0.167 (<0.001) [0.136 - 0.197]	0.031 (0.191) [-0.016 - 0.078]	0.139 (<0.001) [0.112 - 0.165]	0.059 (<0.001) [0.041 - 0.077]	0.225 (<0.001) [0.175 - 0.275]
Nigeria	0.506 (<0.001) [0.459 - 0.552]	0.319 (<0.001) [0.280 - 0.357]	0.128 (<0.001) [0.077 - 0.179]	0.446 (<0.001) [0.408 - 0.484]	0.332 (<0.001) [0.294 - 0.371]	0.080 (0.003) [0.026 - 0.134]
Uganda	0.025 (0.249) [-0.018 - 0.068]	0.656 (<0.001) [0.623 - 0.688]	0.242 (<0.001) [0.195 - 0.289]	0.705 (<0.001) [0.675 - 0.736]	0.329 (<0.001) [0.296 - 0.362]	0.214 (<0.001) [0.165 - 0.264]
Ethiopia-Nigeria	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethiopia-Uganda	<0.001	<0.001	<0.001	<0.001	<0.001	0.591
Nigeria-Uganda	<0.001	<0.001	<0.001	<0.001	0.898	<0.001
Observations	9,113	9,113	9,113	9,113	9,113	9,113
R-squared	0.157	0.123	0.021	0.178	0.096	0.029

Note: Each column reports results from a single regression of a binary variable equal to 1 if the respondent was familiar with the government action and 0 otherwise. The binary variable is then regressed on indicators for each country, with Malawi as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data are only from the first phone survey round in each country. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 2. Knowledge of actions that can reduce exposure to COVID-19

	Soap reduces risk	Avoid physical greetings	Use masks or gloves	Stay at home	Avoid crowds	Maintain distance of one meter
Ethiopia	0.006 (0.245) [-0.004 - 0.016]	0.459 (<0.001) [0.416 - 0.501]	0.299 (<0.001) [0.247 - 0.351]	0.540 (<0.001) [0.496 - 0.584]	0.295 (<0.001) [0.248 - 0.342]	0.193 (<0.001) [0.153 - 0.234]
Nigeria	-0.013 (0.073) [-0.026 - 0.001]	0.298 (<0.001) [0.247 - 0.348]	0.372 (<0.001) [0.320 - 0.423]	0.544 (<0.001) [0.498 - 0.589]	0.314 (<0.001) [0.268 - 0.360]	0.058 (0.017) [0.010 - 0.106]
Uganda	0.010 (0.017) [0.002 - 0.018]	0.462 (<0.001) [0.420 - 0.504]	0.585 (<0.001) [0.544 - 0.626]	0.617 (<0.001) [0.577 - 0.657]	0.381 (<0.001) [0.338 - 0.424]	0.161 (<0.001) [0.119 - 0.202]
Ethiopia-Nigeria	0.007	<0.001	0.003	0.838	0.218	<0.001
Ethiopia-Uganda	0.340	0.585	<0.001	<0.001	<0.001	0.006
Nigeria-Uganda	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Observations	9,127	9,127	9,128	9,127	9,127	9,128
R-squared	0.006	0.122	0.078	0.160	0.067	0.038

Note: Each column reports results from a single regression of a binary variable equal to 1 if the respondent was familiar with the action and 0 otherwise. The binary variable is then regressed on indicators for each country, with Malawi as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data are only from the first phone survey round in each country. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 3. Change in behavior since COVID-19 outbreak

	Handwashed with soap more often	Avoided physical greetings	Avoided crowds
Ethiopia	0.105 (<0.001) [0.077 - 0.133]	0.029 (0.004) [0.010 - 0.049]	0.220 (<0.001) [0.173 - 0.268]
Nigeria	0.076 (<0.001) [0.044 - 0.108]	-0.012 (0.387) [-0.040 - 0.015]	0.320 (<0.001) [0.276 - 0.364]
Uganda	0.087 (<0.001) [0.058 - 0.116]	0.026 (0.011) [0.006 - 0.046]	0.293 (<0.001) [0.249 - 0.337]
Ethiopia-Nigeria	0.001	<0.001	<0.001
Ethiopia-Uganda	0.005	0.657	<0.001
Nigeria-Uganda	0.235	0.002	0.045
Observations	9,138	9,136	9,088
R-squared	0.016	0.007	0.062

Note: Each column reports results from a single regression of a binary variable equal to 1 if the respondent changed their behavior and 0 otherwise. The binary variable is then regressed on indicators for each country, with Malawi as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data are only from the first phone survey round in each country. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 4. Behavioral change over time in Malawi and Uganda

	Malawi			Uganda		
	Hand washed	Avoided physical greetings	Avoided crowds	Hand washed	Avoided physical greetings	Avoided crowds
Round 2	-0.091 (<0.001) [-0.135 - -0.047]	-0.012 (0.424) [-0.041 - 0.017]	-0.250 (<0.001) [-0.309 - -0.191]	-0.164 (<0.001) [-0.191 - -0.136]	-0.109 (<0.001) [-0.134 - -0.084]	-0.134 (<0.001) [-0.166 - -0.102]
Observations	3,375	3,375	3,221	4,376	4,372	4,340
R-squared	0.015	0.001	0.062	0.068	0.037	0.034

Note: Each column reports results from a single regression of a binary variable equal to 1 if the respondent changed their behavior and 0 otherwise. The binary variable is then regressed on an indicator for phone survey round number, with the first round as the base case. Regressions are run for each country (Malawi and Uganda) separately. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 5. Prevalence of false beliefs about COVID-19 in Uganda versus Malawi

	Africans immune	Not affect children	Survive warm weather	Common flu
Uganda	-0.057 (0.009) [-0.100 - -0.014]	-0.056 (0.001) [-0.089 - -0.023]	0.007 (0.785) [-0.045 - 0.060]	-0.293 (<0.001) [-0.340 - -0.246]
Observations	3,662	3,651	3,152	3,621
R-squared	0.005	0.008	0.000	0.150

Note: Each column reports results from a single regression of a binary variable equal to 1 if the respondent stated that they thought a false belief was in fact true and 0 if they knew it was false. The binary variable is then regressed on an indicator for Uganda, with Malawi as the base case. The questions about false beliefs were only asked in the first phone survey round in Uganda and only asked in the second round in Malawi. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 6. Estimated population counts in accordance with response to false beliefs about COVID-19

Panel A: Malawi

Response	Africans immune	Not affect children	Survive warm weather	Common flu
Yes	2,372,739 (264,328)	1,333,154 (211,726)	2,550,250 (267,776)	3,140,407 (296,737)
No	5,711,152 (281,989)	5,620,943 (244,100)	4,798,198 (279,246)	4,550,404 (293,239)
Don't Know	871,254 (173,078)	738,656 (163,452)	1,291,835 (179,043)	1,007,683 (184,135)
Observations	731	679	764	723

Panel B: Uganda

Response	Africans immune	Not affect children	Survive warm weather	Common flu
Yes	3,271,887 (346,188)	1,661,419 (242,429)	6,115,156 (451,666)	1,307,071 (237,573)
No	14,205,739 (383,993)	14,780,783 (278,064)	11,799,655 (493,215)	15,115,205 (311,635)
Don't Know	1,109,367 (205,851)	831,381 (147,278)	3,629,792 (357,983)	1,137,212 (220,189)
Observations	947	880	1,080	881

Note: Each column reports the estimated total number of people living in households that respond “yes,” “no,” or “don’t know” to whether a series of statements were true. The questions about false beliefs were only asked in the first phone survey round in Uganda and only asked in the second round in Malawi. Standard errors are in parentheses.

Supplementary Table 7. Estimated total number of households that report pre-COVID-19 income and average household-level incidence of income receipt, by source

Panel A: All Countries

	Farm income	Business income	Wage income	Remittances	Other income sources
Total	42,981,192 (485,956)	26,311,170 (569,716)	16,744,745 (495,376)	38,397,352 (538,663)	14,900,607 (515,539)
Mean	0.730 (0.008)	0.447 (0.010)	0.284 (0.008)	0.652 (0.009)	0.253 (0.009)
Observations	9,155	9,155	9,155	9,155	9,155

Panel B: Ethiopia

	Farm income	Business income	Wage income	Remittances	Other income sources
Total	12,545,457 (283,973)	4,207,898 (249,049)	4,740,819 (243,303)	0 (0)	3,865,377 (254,336)
Mean	0.634 (0.014)	0.213 (0.013)	0.240 (0.012)	0.000 (0.000)	0.195 (0.013)
Observations	3,249	3,249	3,249	3,249	3,249

Panel C: Malawi

	Farm income	Business income	Wage income	Remittances	Other income sources
Total	3,243,256 (32,910)	1,584,694 (68,720)	1,210,010 (64,491)	3,600,947 (8,046)	1,054,078 (63,054)
Mean	0.893 (0.009)	0.436 (0.019)	0.333 (0.018)	0.991 (0.002)	0.290 (0.017)
Observations	1,729	1,729	1,729	1,729	1,729

Panel D: Nigeria

	Farm income	Business income	Wage income	Remittances	Other income sources
Total	21,167,000 (380,014)	16,985,522 (444,969)	8,020,662 (403,349)	26,334,226 (127,001)	9,433,393 (427,423)
Mean	0.785 (0.014)	0.630 (0.017)	0.298 (0.015)	0.977 (0.005)	0.350 (0.016)
Observations	1,950	1,950	1,950	1,950	1,950

Panel E: Uganda

	Farm income	Business income	Wage income	Remittances	Other income sources
Total	6,025,480 (124,336)	3,533,057 (128,328)	2,773,255 (125,664)	8,462,181 (10,362)	547,760 (64,285)
Mean	0.709 (0.015)	0.416 (0.015)	0.326 (0.015)	0.995 (0.001)	0.064 (0.008)
Observations	2,227	2,227	2,227	2,227	2,227

Note: Each column reports the estimated total number of households that reported pre-COVID-19 income from each source and the average household-level incidence of pre-COVID-19 income receipt from each source. Data are only from the first phone survey round in each country. Standard errors on the estimates are in parenthesis.

Supplementary Table 8. Estimated total number of households that report income loss due to COVID-19 pandemic and average household-level incidence of income loss, by source

	Any type of income loss	Farm income reduced	Business income reduced	Wage income reduced	Remittances reduced	Other income sources reduced
Total	255,883,744 (3,063,207)	165,565,824 (3,217,413)	138,102,432 (1,853,860)	48,224,504 (1,873,248)	35,687,436 (1,307,032)	33,068,730 (1,710,006)
Mean	0.773 (0.009)	0.637 (0.012)	0.856 (0.011)	0.527 (0.020)	0.707 (0.026)	0.522 (0.027)
Observations	9,153	5,624	3,849	3,447	1,687	1,574

Note: Each column reports the estimated total number of households that report loss of income and the average household-level incidence of reporting a loss of income. The estimates are based on the pooled data from 4 countries. Reporting loss of income from a given source is conditional on receiving income from that source prior to the COVID-19 pandemic. Data are only from the first phone survey round in each country. Standard errors on the estimates are in parenthesis.

Supplementary Table 9. Income loss due to the COVID-19 pandemic, by source

	Farm income reduced	Business income reduced	Wage income reduced	Remittances reduced	Other income sources reduced
Ethiopia	-0.314 (<0.001) [-0.369 - -0.258]	0.016 (0.622) [-0.049 - 0.081]	-0.240 (<0.001) [-0.320 - -0.160]	-0.260 (<0.001) [-0.364 - -0.157]	-0.299 (<0.001) [-0.404 - -0.194]
Nigeria	-0.001 (0.981) [-0.048 - 0.047]	0.011 (0.668) [-0.039 - 0.060]	-0.005 (0.907) [-0.088 - 0.078]	-0.086 (0.052) [-0.172 - 0.001]	-0.029 (0.601) [-0.137 - 0.079]
Uganda	-0.133 (<0.001) [-0.182 - -0.085]	0.075 (0.003) [0.026 - 0.124]	0.074 (0.071) [-0.006 - 0.154]	0.028 (0.494) [-0.052 - 0.107]	0.116 (0.107) [-0.025 - 0.258]
Ethiopia-Nigeria	<0.001	0.853	<0.001	0.001	<0.001
Ethiopia-Uganda	<0.001	0.048	<0.001	<0.001	<0.001
Nigeria-Uganda	<0.001	0.002	0.044	0.007	0.034
Observations	5,624	3,849	3,447	1,687	1,574
R-Squared	0.080	0.004	0.056	0.037	0.075

Note: Each column reports results from a single regression of a binary variable equal to 1 if the household lost income from that source and 0 otherwise. Reporting loss of income from a given source is conditional on receiving income from that source prior to the COVID-19 pandemic. The binary variable is then regressed on indicators for each country, with Malawi as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data are only from the first phone survey round in each country. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 10. Income loss due to the COVID-19 pandemic, by income source and urban/rural residence

	Farm income reduced	Business income reduced	Wage income reduced	Remittances reduced	Other income sources reduced
Urban	-0.019 (0.448) [-0.068 - 0.030]	0.024 (0.277) [-0.019 - 0.067]	-0.016 (0.637) [-0.084 - 0.051]	-0.016 (0.724) [-0.103 - 0.072]	-0.137 (0.003) [-0.227 - -0.047]
Ethiopia	0.001 (0.960) [-0.046 - 0.049]	0.009 (0.716) [-0.040 - 0.059]	-0.004 (0.927) [-0.087 - 0.079]	-0.083 (0.066) [-0.172 - 0.006]	-0.017 (0.754) [-0.124 - 0.090]
Nigeria	-0.132 (<0.001) [-0.181 - -0.084]	0.072 (0.004) [0.022 - 0.121]	0.076 (0.066) [-0.005 - 0.156]	0.029 (0.469) [-0.050 - 0.108]	0.157 (0.034) [0.012 - 0.301]
Uganda	-0.314 (<0.001) [-0.369 - -0.258]	0.011 (0.743) [-0.056 - 0.078]	-0.234 (<0.001) [-0.323 - -0.145]	-0.256 (<0.001) [-0.366 - -0.145]	-0.281 (<0.001) [-0.390 - -0.173]
Observations	5,624	3,849	3,447	1,687	1,574
R-Squared	0.081	0.005	0.056	0.038	0.091

Note: Each column reports results from a single regression of a binary variable equal to 1 if the household lost income from that source and 0 otherwise. Reporting loss of income from a given source is conditional on receiving income from that source prior to the COVID-19 pandemic. The binary variable is then regressed on indicators for each country, with Malawi as the base case, along with an indicator equal to 1 if the household was located in an urban area, as opposed to a rural area. Data are only from the first phone survey round in each country. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 11. Change in business revenue loss over time

	Business Revenue Loss
Round 2	-1.010 (<0.001) [-1.229 - -0.790]
Round 3	-1.026 (<0.001) [-1.289 - -0.764]
Ethiopia	0.032 (0.783) [-0.193 - 0.256]
Nigeria	-0.145 (0.179) [-0.356 - 0.067]
Uganda	-0.569 (<0.001) [-0.746 - -0.392]
Ethiopia-Nigeria	0.084
Ethiopia-Uganda	<0.001
Nigeria-Uganda	<0.001
Round 2-Round 3	0.907
Observations	7,242
Pseudo R-Squared	0.030

Note: The table reports the result from a single ordered logit regression in which the dependent variable equals 1 if revenue is higher than the previous period, equal to 2 if revenue is the same as in the previous period, equal to 3 if revenue is less than the previous period, and 4 if they received no revenue. The ordinal variable is then regressed on indicators for each country, with Malawi as the base case, and indicators for each phone survey round, with round 1 as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country or wave indicator equals the coefficient on an indicator for a different country or round. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 12. Estimated total number of adults that are (i) moderately or severely food insecure and (ii) severely food insecure and average incidence of (i) moderate or severe food insecurity and (ii) severe food insecurity among the adult population

<i>Panel A: Total</i>					
	All Countries	Ethiopia	Malawi	Nigeria	Uganda
Moderate or	98,282,848	22,398,190	6,232,031	62,767,288	6,885,341
Severe	1,588,851	844,457	150,580	1,191,869	285,413
Severe	35,599,120	4,354,358	2,167,532	27,992,446	1,084,782
	1,351,319	470,315	123,643	1,144,950	110,423
Observations	8,713	3,051	1,646	1,820	2,196

<i>Panel B: Mean</i>					
	All Countries	Ethiopia	Malawi	Nigeria	Uganda
Moderate or	0.598	0.436	0.676	0.757	0.330
Severe	(0.010)	(0.016)	(0.016)	(0.014)	(0.014)
Severe	0.217	0.085	0.235	0.338	0.052
	(0.008)	(0.009)	(0.013)	(0.014)	(0.005)
Observations	8,713	3,051	1,646	1,820	2,196

Note: Each column in Panel A reports the estimated total number of adults who are moderately or severely food insecure, or just severely food insecure. Each column in Panel B reports the average incidence of (i) moderate or severe food insecurity and (ii) severe food insecurity among the adult population. In both panels, food insecurity is measured using the FIES. Data come from the most recent round of phone survey data available. This is round 3 in Ethiopia, round 2 in Malawi, Nigeria, and Uganda. Standard errors on the estimates are in parenthesis.

Supplementary Table 13. Prevalence of food insecurity

	Moderate or Severe Food Insecurity	Severe Food Insecurity
Ethiopia	-0.241 (<0.001) [-0.286 - -0.195]	-0.151 (<0.001) [-0.182 - -0.119]
Nigeria	0.081 (<0.001) [0.038 - 0.123]	0.102 (<0.001) [0.065 - 0.140]
Uganda	-0.346 (<0.001) [-0.388 - -0.304]	-0.183 (<0.001) [-0.211 - -0.155]
Ethiopia-Nigeria	<0.001	<0.001
Ethiopia-Uganda	<0.001	0.002
Nigeria-Uganda	<0.001	<0.001
Observations	8,713	8,713
R-squared	0.162	0.158

Note: Each column reports results from a single regression of the prevalence of either moderate or severe food insecurity or just severe food insecurity. Food insecurity is measured using the FIES. The FIES variable is regressed on indicators for each country, with Malawi as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data come from the most recent round of phone survey data available. This is round 3 in Ethiopia, round 2 in Malawi, Nigeria, and Uganda. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 14. Changes in food insecurity in Nigeria, pre- and post-pandemic onset

	Moderate or Severe Food Insecurity	Severe Food Insecurity
Year	0.265 (<0.001) [0.225 - -0.306]	0.200 (<0.001) [0.168 - -0.232]
Observations	3,638	3,638
R-squared	0.086	0.083

Note: Each column reports results from a single regression of the prevalence of either moderate or severe food insecurity or just severe food insecurity, comparing 2019 (pre-pandemic) estimates with 2020 (post-pandemic onset) estimates. Food insecurity is measured using the FIES. Pre-pandemic data comes from a post-planting visit between July and September of 2019. Post-pandemic data comes from the Nigeria COVID phone surveys conducted between May and August of 2020. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 15. Estimated population concerned about health and finances

Panel A: Concerned about household health

	All Countries	Ethiopia	Malawi	Nigeria	Uganda
Total	257,414,816 (3,083,491)	71,449,632 (1,858,111)	17,517,492 (189,537)	137,937,232 (2,295,302)	30,510,464 (623,196)
Mean	0.779 (0.009)	0.707 (0.018)	0.933 (0.010)	0.821 (0.014)	0.716 (0.015)
Observations	8,849	3,058	1,646	1,948	2,197

Panel B: Concerned about household finances

	All Countries	Ethiopia	Malawi	Nigeria	Uganda
Total	292,328,256 (2,431,731)	81,848,456 (1,526,779)	17,919,304 (164,040)	157,232,592 (1,785,593)	35,327,904 (510,836)
Mean	0.884 (0.007)	0.810 (0.015)	0.954 (0.009)	0.935 (0.011)	0.829 (0.012)
Observations	8,850	3,058	1,646	1,949	2,197

Note: Each column reports the estimated total number of households using a coping strategy in response to COVID-19-related income loss and average household-level incidence of using a coping strategy. Adoption of a strategy is condition on experiencing a COVID-19 related loss of income per Supplementary Table 8. Data come from the most round of phone survey data available. This is round 3 in Ethiopia and Nigeria, round 2 in Malawi, and round 1 in Uganda.

Supplementary Table 16. Prevalence of food insecurity as it relates to health and financial concerns

	Moderate or Severe Food Insecurity	Severe Food Insecurity
Concerned about household health	0.038 (0.206) [-0.021 - 0.097]	0.011 (0.455) [-0.018 - 0.041]
Concerned about household finances	0.200 (<0.001) [0.139 - 0.261]	0.044 (0.002) [0.017 - 0.072]
Ethiopia	-0.206 (<0.001) [-0.251 - -0.160]	-0.142 (<0.001) [-0.175 - -0.109]
Uganda	-0.313 (<0.001) [-0.356 - -0.269]	-0.175 (<0.001) [-0.204 - -0.147]
Ethiopia-Uganda	<0.001	0.002
Observations	6,893	6,893
R-squared	0.087	0.064

Note: Each column reports results from a single regression of the prevalence of either moderate or severe food insecurity or just severe food insecurity. Food insecurity is measured using FIES. The FIES variable is regressed on indicators whether or not the respondent is concerned about the health impacts of COVID-19 and the financial impacts of COVID-19. Also included are indicators for each country, with Malawi as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data come from the most recent round of phone survey data available. This is round 3 in Ethiopia, round 2 in Malawi and in Uganda. Nigeria is not included because questions about concerns were not asked in the same rounds as questions about food insecurity. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 17. Estimated total number of households that report suffering a shock and average household incidence of suffering a shock

	All Countries	Ethiopia	Malawi	Nigeria	Uganda
Total	24,885,908 (594,983)	5,177,274 (276,409)	1,167,996 (66,812)	15,045,319 (466,172)	3,495,319 (128,117)
Mean	0.423 (0.010)	0.261 (0.014)	0.325 (0.019)	0.558 (0.017)	0.411 (0.015)
Observations	8,721	3,058	1,646	1,790	2,227

Note: Each column reports the estimated total number of households that reported suffering a COVID-19-related shock and average household-level incidence of suffering a shock. Data comes from the most recent wave (round) of data available. This is round 3 in Ethiopia and Nigeria, round 2 in Malawi, and round 1 in Uganda. Standard errors on the estimates are in parenthesis.

Supplementary Table 18. Estimated total number of households using a coping strategy in response to COVID-19-related income loss and average household-level incidence of using a coping strategy

	Any Coping Strategy	Relied on Saving	Sale of Assets	Reduced Food Consumption	Reduced Non-Food Consumption	Received Assistance from Friends and Family	Received Any Assistance
Total	33,171,234 (578,286)	12,219,426 (473,945)	3,462,072 (284,763)	21,370,172 (518,857)	6,491,568 (354,462)	8,084,976 (422,270)	4,270,560 (313,064)
Mean	0.564 (0.010)	0.294 (0.011)	0.083 (0.007)	0.514 (0.012)	0.156 (0.009)	0.194 (0.010)	0.073 (0.005)
Observations	8,721	5,595	5,595	5,595	5,595	5,595	8,719

Note: Each column reports the estimated total number of households using a coping strategy in response to COVID-19-related income loss and average household-level incidence of using a coping strategy. Adoption of a strategy is condition on experiencing a COVID-19 related loss of income per Supplementary Table 8. Data come from the most round of phone survey data available. This is round 3 in Ethiopia and Nigeria, round 2 in Malawi, and round 1 in Uganda. Standard errors on the estimates are in parenthesis.

Supplementary Table 19. Strategies to cope with income lost due to COVID-19 pandemic

	Relied on Saving	Sale of Assets	Reduced Food Consumption	Reduced Non- Food Consumption	Received Assistance from Friends and Family	Received Any Assistance
Ethiopia	0.056 (0.041) [0.002 - 0.110]	-0.027 (0.015) [-0.049 - -0.005]	0.126 (<0.001) [0.082 - 0.169]	0.149 (<0.001) [0.115 - 0.183]	-0.020 (0.209) [-0.052 - 0.011]	-0.020 (0.107) [-0.044 - 0.004]
Nigeria	0.090 (<0.001) [0.044 - 0.137]	0.070 (<0.001) [0.042 - 0.098]	0.592 (<0.001) [0.551 - 0.633]	0.125 (<0.001) [0.097 - 0.153]	0.143 (<0.001) [0.105 - 0.181]	0.018 (0.208) [-0.010 - 0.045]
Uganda	0.228 (<0.001) [0.177 - 0.279]	-0.017 (0.116) [-0.039 - 0.004]	0.182 (<0.001) [0.138 - 0.226]	0.179 (<0.001) [0.144 - 0.214]	0.141 (<0.001) [0.101 - 0.182]	0.061 (<0.001) [0.033 - 0.088]
Ethiopia-Nigeria	0.205	<0.001	<0.001	0.224	<0.001	0.002
Ethiopia-Uganda	<0.001	0.236	0.026	0.187	<0.001	<0.001
Nigeria-Uganda	<0.001	<0.001	<0.001	0.008	0.955	0.002
Observations	5,595	5,595	5,595	5,595	5,595	8,719
R-Squared	0.015	0.025	0.217	0.012	0.031	0.011

Note: Each column reports results from a single regression of a binary variable equal to 1 if the respondent stated that the household relied on that strategy to cope with the loss of income and 0 if they did not. The binary variable is regressed on indicators for each country, with Malawi as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data come from the most recent round of phone survey data available. This is round 3 in Ethiopia and Nigeria, round 2 in Malawi, and round 1 in Uganda. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 20. Strategies to cope with income lost due to pandemic across rural/urban sector

	Relied on Saving	Sale of Assets	Reduced Food Consumption	Reduced Non-Food Consumption	Received Assistance from Friends and Family	Received Any Assistance
Urban	0.016 (0.473) [-0.028 - 0.061]	-0.061 (<0.001) [-0.084 - -0.038]	0.088 (<0.001) [0.047 - 0.129]	0.017 (0.366) [-0.020 - 0.053]	0.046 (0.038) [0.002 - 0.089]	0.014 (0.205) [-0.008 - 0.036]
Ethiopia	0.053 (0.062) [-0.003 - 0.108]	-0.014 (0.212) [-0.036 - 0.008]	0.108 (<0.001) [0.064 - 0.151]	0.146 (<0.001) [0.111 - 0.181]	-0.030 (0.073) [-0.062 - 0.003]	-0.022 (0.085) [-0.047 - 0.003]
Nigeria	0.088 (<0.001) [0.040 - 0.136]	0.077 (<0.001) [0.048 - 0.106]	0.581 (<0.001) [0.539 - 0.623]	0.123 (<0.001) [0.094 - 0.151]	0.137 (<0.001) [0.099 - 0.175]	0.016 (0.257) [-0.012 - 0.043]
Uganda	0.226 (<0.001) [0.175 - 0.277]	-0.009 (0.399) [-0.031 - 0.012]	0.171 (<0.001) [0.127 - 0.215]	0.177 (<0.001) [0.142 - 0.212]	0.135 (<0.001) [0.095 - 0.176]	0.059 (<0.001) [0.032 - 0.087]
Observations	5,595	5,595	5,595	5,595	5,595	8,719
R-Squared	0.015	0.035	0.223	0.012	0.033	0.011

Note: Each column reports results from a single regression of a binary variable equal to 1 if the respondent stated that the household relied on that strategy to cope with the loss of income and 0 if they did not. The binary variable is regressed on indicators for each country, with Malawi as the base case, along with an indicator equal to 1 if the household was located in an urban area, as opposed to a rural area. Data come from the most recent round of phone survey data available. This is round 3 in Ethiopia and Nigeria, round 2 in Malawi, and round 1 in Uganda. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 21. Estimated total number of households without access to basic necessities and average household-level incidence of lack of access

	Unable to Access Medicine	Unable to Access Staple	Unable to Access Soap
Total	7,464,224 (284,507)	13,937,058 (502,246)	4,075,418 (276,591)
Mean	0.297 (0.011)	0.303 (0.011)	0.124 (0.008)
Observations	4,603	6,793	5,298

Note: Each column reports the estimated total number of households without access to basic necessities and average household-level incidence of lack of access. Inability or ability to access a basic necessity is conditional on the household needing the item or attempting to purchase the item. Note that the question regarding soap was not asked in Ethiopia. Data are only from the first phone survey round in each country. Standard errors on the estimates are in parenthesis.

Supplementary Table 22. Lack of access to basic necessities by consumption quintile

	Unable to Access Medicine	Unable to Access Staple	Unable to Access Soap
Quintile 2	0.000 (0.992) [-0.086 - 0.087]	-0.082 (0.084) [-0.175 - 0.011]	-0.071 (0.072) [-0.148 - 0.006]
Quintile 3	-0.002 (0.959) [-0.086 - 0.082]	-0.157 (<0.001) [-0.242 - -0.072]	-0.114 (0.002) [-0.184 - -0.043]
Quintile 4	-0.028 (0.480) [-0.105 - 0.049]	-0.122 (0.004) [-0.206 - -0.039]	-0.096 (0.009) [-0.169 - -0.024]
Quintile 5	-0.107 (0.002) [-0.175 - -0.038]	-0.221 (<0.001) [-0.298 - -0.143]	-0.137 (<0.001) [-0.208 - -0.067]
Quintiles 1-2	0.992	0.084	0.072
Quintiles 1-3	0.959	<0.001	0.002
Quintiles 1-4	0.480	0.004	0.009
Quintiles 1-5	0.002	<0.001	<0.001
Quintiles 2-3	0.949	0.044	0.114
Quintiles 2-4	0.457	0.268	0.368
Quintiles 2-5	0.001	<0.001	0.013
Quintiles 3-4	0.480	0.262	0.465
Quintiles 3-5	<0.001	0.018	0.272
Quintiles 4-5	0.003	<0.001	0.079
Observations	4,604	6,792	5,297
R-squared	0.010	0.029	0.021

Note: Each column reports results from a single regression of a binary variable equal to 1 if the respondent answered “yes” to a question about the inability to access a basic necessity. Inability or ability to access a basic necessity is conditional on the household needing the item or attempting to purchase the item. The binary variable is regressed on indicators for each country, with Malawi as the base case, and each pre-COVID-19 household annual per capita consumption quintile, with the lowest consumption quintile as the base case. Note that the question regarding soap was not asked in Ethiopia. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data are only from the first phone survey round in each country. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 23. Estimated total number of school-aged children in households without educational engagement

	All				
	Countries	Ethiopia	Malawi	Nigeria	Uganda
Total	68,465,008 (1,797,619)	31,681,834 (614,013)	6,116,277 (156,190)	24,741,134 (1,489,912)	5,925,768 (313,951)
Observations	6,190	1,911	1,193	1,417	1,669

Note: Each column reports the estimated total number of school-aged children living in households that report their children have not been engaged in any sort of educational activity since schools closed. Data are only from the first phone survey round in each country. Standard errors are in parenthesis.

Supplementary Table 24. Prevalence of engagement in educational activity by consumption quintile

	Education Activity
Quintile 2	0.013 (0.774) [-0.076 - 0.102]
Quintile 3	0.056 (0.194) [-0.029 - 0.142]
Quintile 4	0.110 (0.009) [0.027 - 0.193]
Quintile 5	0.194 (<0.001) [0.114 - 0.274]
Quintiles 1-2	0.774
Quintiles 1-3	0.194
Quintiles 1-4	0.009
Quintiles 1-5	<0.001
Quintiles 2-3	0.282
Quintiles 2-4	0.013
Quintiles 2-5	<0.001
Quintiles 3-4	0.143
Quintiles 3-5	<0.001
Quintiles 4-5	0.014
Observations	6,316
R-squared	0.019

Note: The table reports the result from a single regression of a binary variable equal to 1 if the household has a school-aged child that has been engaged in some educational activity since schools closed and 0 otherwise. The question is asked conditional on the household containing a school-aged child. The binary variable is regressed on indicators for each country, with Malawi as the base case, and each pre-COVID-19 household annual per capita consumption quintile, with the lowest consumption quintile as the base case. The second panel reports p-values for Wald tests of the simple linear hypothesis that the coefficient on one country indicator equals the coefficient on an indicator for a different country. Data are only from the first phone survey round in each country. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.

Supplementary Table 25. Engagement in educational activities over time*Panel A: Ethiopia*

	Education Activity	Listened to Education Programs on Radio	Used Mobile Learning Apps	Watched Educational TV Programs	Meeting with Lesson Teacher
Round 2	0.130 (<0.001) [0.077 - 0.183]	-0.110 (0.088) [-0.236 - 0.016]	-0.043 (0.128) [-0.099 - 0.012]	-0.070 (0.049) [-0.140 - -0.000]	0.119 (0.002) [0.045 - 0.192]
Round 3	0.121 (<0.001) [0.068 - 0.175]	-0.117 (0.064) [-0.241 - 0.007]	0.037 (0.328) [-0.037 - 0.112]	-0.051 (0.177) [-0.126 - 0.023]	0.041 (0.187) [-0.020 - 0.103]
Observations	3,742	2,228	2,228	2,228	2,228
R-Squared	0.023	0.009	0.012	0.006	0.017

Panel B: Malawi

	Education Activity	Listened to Education Programs on Radio	Used Mobile Learning Apps	Watched Educational TV Programs	Meeting with Lesson Teacher
Round 2	0.054 (0.074) [-0.005 - 0.113]	-0.053 (0.488) [-0.204 - 0.098]	-0.058 (0.053) [-0.116 - 0.001]	0.087 (0.044) [0.003 - 0.172]	0.343 (<0.001) [0.232 - 0.455]
Observations	2,355	516	516	516	516
R-Squared	0.004	0.003	0.017	0.031	0.141

Panel C: Nigeria

	Education Activity	Listened to Education Programs on Radio	Used Mobile Learning Apps	Watched Educational TV Programs	Meeting with Lesson Teacher
Round 2	-0.012 (0.718) [-0.077 - 0.053]	0.267 (<0.001) [0.193 - 0.340]	0.123 (<0.001) [0.069 - 0.178]	0.141 (<0.001) [0.079 - 0.204]	0.168 (<0.001) [0.102 - 0.234]
Round 3	-0.113 (0.001) [-0.179 - -0.047]	0.291 (<0.001) [0.217 - 0.365]	0.182 (<0.001) [0.119 - 0.245]	0.242 (<0.001) [0.173 - 0.311]	0.304 (<0.001) [0.233 - 0.376]
Observations	4,045	2,515	2,515	2,515	2,515
R-Squared	0.010	0.076	0.042	0.049	0.072

Note: Each column in each panel reports results from a single regression of a binary variable equal to 1 if the school-aged children in the household have engaged in the educational activity. The question is asked conditional on the household containing a school-aged child. Each panel reports results for a single country. Uganda is excluded as there is only one round of data. All rounds of all available data for a country are included in each regression. P-values, calculated using Huber-White robust standard errors, are in parentheses. 95% confidence intervals are reported in brackets.