The short-term economic effects of COVID-19 and risk-coping strategies of low-income households in Kenya: A rapid analysis using weekly financial household data

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Abstract

This research assesses how low-income households in Kenya coped with the immediate economic consequences of the COVID-19 outbreak. It uses granular financial data from weekly household interviews covering six weeks before the first case was detected in Kenya to five weeks after. Our results suggest that income from work decreased with almost one third and income from gifts and remittances reduced by more than one third since the start of the pandemic. Nevertheless, household expenditures on food remained at pre-outbreak levels after preventive measures were implemented. We do not find evidence that households coped with reduced income through increased borrowing, selling assets or withdrawing savings. Instead, they gave out less gifts and remittances themselves, lent less money to others and postponed loan repayments. Moreover, they significantly reduced expenditures on schooling and transportation, related to the school closures and travel restrictions. Taken together and despite their affected livelihoods, households managed to keep food consumption at par, but this came at the cost of reduced informal risk-sharing and social support between households.

1. Introduction

After its discovery in December 2019 in Wuhan, China, the COVID-19 outbreak has now spread to nearly all countries in the world (World Health Organization, 2020). Lockdown measures, directing people to stay at home and avoid contact with others, have been a widespread policy reaction to contain the spread of the virus as soon as possible (Ritchie et al., 2020). While the health effects of the COVID-19 outbreak are of primary importance at first instance, the socio-economic effects of the outbreak and accompanying policy responses, including lockdowns, are starting to gather traction, especially in low-income countries.

The World Bank estimates that the COVID-19 crisis can push between 40-60 million people into extreme poverty, with the largest burden falling on sub-Saharan Africa (Gerszon Mahler et al., 2020). Another report, using different scenarios, found that under the most extreme scenario in which income and consumption contracts by 20%, between 420 and 580 million people would be pushed into poverty, reversing the decreasing poverty trends for the first time in decades (Sumner et al., 2020). So far, most of these rapid studies rely on macroeconomic data and assumptions on the micro-level effects of the crisis. A detailed picture of the immediate effects of the COVID-19 crisis at the household-level is currently lacking for most low- and middle-income countries.

Most studies initiated to measure the immediate effects of the pandemic lack precise data on pre-COVID-19 household finances and economic wellbeing. In contrast, our study is able to exactly quantify the income and expenditure effects of the COVID-19 crisis at nearly real-time intervals. Since December 2019, we have followed a cohort of 346 low-income households in Western Kenya. After a baseline survey, households were visited on a weekly basis to collect detailed information on each adult's financial transactions in the past week (including incomes, expenditures, loans, remittances and savings) and the health events of all household members (including symptoms, healthcare consultations, health expenditures).

Our granular financial data allow us to assess how households were immediately affected by the preventive response measures, and how they responded and coped financially. Have incomes from business, employment and other sources declined and by how much? Were households forced to withdraw savings or sell assets? Were households able to uphold their food consumption and other expenditures? These questions are of immediate concern to policy-makers seeking an intricate

balance between protecting the health of the population by containing the spread of the virus and implementing policies to protect people's economic wellbeing.

A few recent studies examine the short-term effects of the COVID-19 outbreak in Kenya. For example, a study by the Population Council examined the effects in Nairobi's five largest urban informal settlements and found that 80% of their sample had experienced a decline in income, while respondents also experienced an increase in expenditures and food prices. As a result, two-thirds of their sample had skipped a meal at least once or eaten less in the past two weeks. Very few respondents had received any kind of support from the government or other sources (Population Council, 2020). However, this study did not collect detailed financial transaction records; instead, respondents retrospectively reported changes in income and expenditures. Another diaries study in Kenya conducted follow-up phone interviews with respondents, but the results are more qualitative in nature. Findings from this study show that 88% of their respondents experienced declines in income, with urban people being hit hardest (Zollmann et al., 2020).

Our findings show that households' incomes have decreased sharply by up to one-third in the five weeks after the preventive measures were put in place. We particularly observe a drop in income from work, and a strong decrease in gifts and remittances received. As a response, households have cut down spending to cover for the income deficit. Whereas most households managed to keep food consumption stable, expenditures on education and transport decreased. We also find that households both put less money into their savings, but also withdraw less, suggesting that they are protecting whatever savings they still have. In the first weeks of the crisis, we find little evidence of informal risk-sharing between households: credit and loans, loan repayments, gifts given and received, and harambee contributions all declined.

2. COVID-outbreak and response measures in Kenya

In Kenya, the first COVID-19 case was detected on 13 March. The Kenyan government immediately announced measures to contain the spread of the virus. On 15 March, schools were closed, and all private and public workers were directed to work from home if possible. All international flights were suspended as of 25 March, bars and restaurants were closed, and a nationwide curfew between 7PM and 5AM was installed on 27 March. In early April, travel restrictions were put in place to and from the most affected areas, including Nairobi, Mombasa.

Kilifi and Kwala Counties (Were, 2020). As of May 31st, there were 1,888 confirmed cases and 63 deaths on a population of almost 50 million (Ministry of Health, 2020).

Although the health effects of the epidemic so far have been limited, the government's response has had a major impact on the lives and livelihoods of Kenyans. In fact, the fear of the epidemic in combination with harsh preventive measures and faltering global supply chains could have far more dramatic consequences, including deaths, than the virus itself. The latest economic outlook for Kenya estimates that economic growth will contract significantly from 5.6% in 2019 to 1.5% in 2020. In a worst case scenario, economic growth might even turn negative (Chacha et al., 2020).

3. Data and methods

In this paper, we use data from the ongoing Financial and Health Diaries project, a collaborative research study between the Amsterdam Institute for Global Health and Development (AIGHD) and African Population & Health Research Center (APHRC). Weekly data collection has been on-going since December 2019 to measure the impact of a mobile phone-based health insurance scheme in Kakamega county through a cluster-Randomized Controlled Trial (RCT), and free access to public care in Kisumu county through a prospective longitudinal analysis. The study population consists of low-income households with either a pregnant woman or a mother with children below four years old. In Kakamega we randomly selected six villages each in the catchment area of four health facilities, in which the health insurance scheme will be implemented. In Kisumu, we randomly sampled four villages each in the catchment area of two health facilities. In each of the 32 villages, we obtained household lists with households fulfilling the study eligibility criteria, and randomly sampled households until the cluster size (10 households per village) was achieved.[1]

The weekly interviews record all financial transactions (income from work/ social schemes, expenditures, savings, gifts/remittances, loans) and health events (illnesses, injuries, symptoms, healthcare utilization, provider type, treatment, medical costs) – including COVID-19 symptoms – in the past 7 days. Data are collected from all adults in the household, men and women, separately and in private. Diaries data collection was preceded by a household survey, collecting baseline

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[1] As some households drop out of the study and are replaced, our total number of unique households included in this paper is 346.

demographic, socio-economic and health information. In March 2020, data collection changed from in-person to phone-based interviewing in response to the COVID-19 social distancing measures, relying on the built-up rapport and trust between respondents and enumerators to ensure continuously high response rates.[2]

In this paper, we focus on the short-term effects of the COVID-19 response measures on household's economic wellbeing their ability to coper financially with these consequences. We note that these are *indirect* COVID-19 effects, since as of 31 May, only 1 COVID-19 case had been confirmed in Kakamega and none in Kisumu. Neither county had recorded any COVID-19 deaths (Ministry of Health, 2020). As pre-COVID-19 period, we take the weeks between February and mid-March 2020, when the first case was detected in Kenya and the first measures were taken.[3] At the moment of writing, our post-COVID-19 period covers five weeks between 17 March and 20 April.

Our data identify several sources of income, including income from work, gifts/remittances, loans/credits, and money with drawn from savings. We further break down income from work into subcategories: income from business, formal employment, casual work, crop sales and livestock sales. On the expenditure side, we categorize spending into a number of subgroups, including food, education, and transportation. In addition, we observe other money outflows, such as gifts given, money lent out, credit repayments, and savings deposits.

Our main objective is to determine to what extent income and spending levels have changed since the start of the COVID-19 outbreak in Western Kenya. Our unit of observation is the household-interview week (n = 3,806; 346 households observed in eleven weeks). To this end, we aggregate incomes and expenditures over all adult household members.[4] We first present the weekly averages

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[2] Weekly response rates have slightly declined since the switch to phone interviews with 2 to 10 percent dependent on the week. We check for selective response by regressing all household demographic variables from Table 1 on dummies for post-COVID weeks to determine if average household composition changes after the COVID outbreak. Out of 125 estimates, we find 14 significant differences at the 10% level. We are therefore confident that selective household response is not driving our results..

[3] While our data allows us to go back further in time (to December 2019), there is a large peak in expenditures and income in the financial data during the first weeks of January due to the Christmas and New Year holidays, which would arbitrarily increase the averages over the pre-COVID-19 period, affecting our main results.

[4] We conduct several data edits to account for missing values and outliers. In case one person in a household was not interviewed during a week (due to absence or inability to pick up the phone), we impute their financial transactions in the household-level total with the average of the observed weeks. In case of outliers, which we define as a value higher than the 99th percentile during an interview week, we also replace them with the average over the other weeks. These data transformations have very little effect on our main findings.

in graphical format. We then test for significant differences between the mean of the pre-COVID-19 period and weekly post-COVID-19 periods using household-level fixed effects regressions, with standard errors clustered at the household level.

4. Results

Table 1 presents baseline household demographic information . The majority of households (70 percent) lives in Kakamega County. Households have an average of five members with three members under 18. Household heads are relatively young (37 years on average) and 24 percent of heads are female. Nearly all heads are married and the majority has received some basic education. The most common occupation of the head is casual labor (38 percent), operating an informal business (21 percent) or formal employment (19 percent). Almost 16 percent of heads were not earning any income at the time of the baseline. The main livelihood activities are equally divided when looking at all members of the household.

Figure 1 shows the trends in money flowing in and flowing out of the households. Both panels show a decreasing trend since mid-March, suggesting that both cash inflows and outflows of households in our sample were affected by the outbreak. Zooming in on the various sources of income, especially income from work (e.g. revenue from informal business, wage work) as well as gifts and remittances have gone down since the start of the COVID-19 crisis (Figure 2). Indeed, our formal analysis (Table 2) shows that weekly income has significantly declined with as much as Ksh 666 towards the end of April, compared to a pre-COVID-19 average of Ksh 2,036 weekly earnings (Column 1).[5] Thus, five weeks into the pandemic, household income had already decreased with one third.

Gifts and remittances account for a significant share of households' income sources, comprising about 22 percent of household income before the pandemic hit (Column 2). Gifts and remittances have also decreased considerably by Ksh 330 one month after the first case was detected, implying a decrease of 38% compared to pre-COVID-19 remittances levels of Ksh 852 per week. This could be due to the crisis severely affecting urban wage workers, who are the main source of remittances

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[5] The exchange rate on March 15 was USD 0.973 for Ksh 100

for families in the countryside: in our data 50% of all remittances are received from a relative outside the community.

In response to these reductions in income, households might resort to several risk-coping strategies. However, we do not observe significant changes in loans, loan repayments or harambee contributions to generate additional cash (Table 2 Columns 3-5). If anything, the amount borrowed since the start of the epidemic decreased slightly. Perhaps surprisingly, households have reacted to the crisis by withdrawing *less* money from their savings, with significant declines in the last three weeks of our study period, amounting to a decrease of Ksh 199 in the final week. This could indicate that households are not yet willing to utilize all their savings at this stage in the crisis, but rather prepare for worse times ahead.

Table 3 breaks down total income from work into several sub-categories. Results show that most of the decline in income from work is due to decreasing income from (informal) business (Column 1), formal employment (Column 2) and, to some extent, income from crop sales (Column 3) and casual labor (Column 5). These first two categories also make up the largest share of total income underscoring that households have been affected in their main livelihoods. The insignificant results in Column 4 shows that households have not resorted to increased livestock sales in order to raise additional income.

On the outflow side, we observe a sharp and increasing drop in household expenditures of up to Ksh 569 in the final study week, compared to a pre-COVID-19 average of Ksh 2,414 (Table 4 Column 1), i.e. a 24 percent decrease in weekly consumption over a one-month period. Gifts and remittances have also decreased significantly with 36 percent compared to pre-outbreak levels (Column 2). Other strategies to cope with the reductions in income are to reduce lending to others (Column 3), postpone repayment of outstanding loans and credit (Column 4) and reduce harambee contribution (Column 5). Also, households have deposited significantly less savings, especially immediately after the first COVID-19 case was detected as well as in the last study week (Column 6).

Table 5 presents results from selected consumption groups. A major concern is whether families have been able to uphold their food consumption since the lockdown measures were put in place. In our sample we observe that, despite the decline in income, families still spend the same amount of money on food as before the crisis struck (Figure 3 and Table 5 Column 1). On the other hand,

households are spending much less on education and transportation, in line with the school closures and travel restrictions (Columns 2-3). This may have given households some room in their budget to maintain food consumption at par. Whereas spending on communication has started to decline (Column 4), we do not observe a significant change in spending on recreation, ceremonies or funerals (Column 5), nor on other consumption groups – including short-term business and agricultural investments.[6]

5. Discussion

This paper uses a unique high-frequency high-detail dataset to estimate the immediate short-run economic effects of the COVID-19 outbreak on rural households in Kenya, and their strategies to cope with declining incomes. Our results suggest that income from work has decreased with almost one third in the five weeks following the first confirmed case in Kenya. By the end of the study period, there were still no cases confirmed in our study counties Kisumu and Kakamega, suggesting that the decline in income was mainly due to the lockdown measures and recent economic downturn. In addition, gifts and remittances – a major source of weekly income for our low-income households – have reduced by more than one third since the start of the pandemic, further affecting households' liquidity position.

We do not find evidence that households coped with reduced cash inflows through increased borrowing or withdrawing savings. Instead, households reduced the gifts and remittances given to others; they also lent out less money, postponed loan repayments, and deposited less new savings. At the same time, households significantly reduced expenditures, especially on schooling and transportation, both of which are related to the preventive measures such as school closures and travel restrictions. Taken together, these risk-coping strategies enabled households to keep their food consumption at par, at least in the short-run one month after the response measures were implemented. But this came at the cost of reduced informal risk-sharing between households.

Few other studies have such a detailed picture of household finances before and after the onset of the current pandemic, especially in a low-income country. An exception is a comparable diaries study in Bangladesh, which follows 60 households on a daily basis. Findings from this study show a 75% drop in daily earnings in the week after the lockdown was declared in Bangladesh

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[6] Results available upon request.

(Hrishipara Daily Diaries, 2020); which is a stronger decline than our findings, potentially due to the (peri-)urban nature of their sample compared with our rural mostly self-employed population.

Our findings on income effects provide depth to the emerging results from one-time phone surveys across the African continent and other low- and middle-income regions. In Senegal, 86% of respondents reported a below-average income during the early stages of the pandemic in the country (Le Nestour et al., 2020). In a nine-country study, BRAC International (2020) reported on findings from phone interviews with their volunteers and programme participants. They find that income loss is common across the study sites, ranging from 47% of respondents in Myanmar to 93% in Liberia reporting that their income 'reduced a lot', or 'completely stopped'. The biggest losses were reported to those engaged in small businesses or casual work, similar to our findings. In contrast, their findings show a strong negative effect on food consumption with most respondents in Liberia, Philippines, Uganda, and Rwanda reporting 'a lot' less food consumption than before the COVID-19 crisis. A major disadvantage of these surveys is that they lack data collected pre-COVID-19; hence, they rely on retrospective self-reports of changes in income or food consumption. Moreover, an advantage of our detailed data is that we can precisely assess the financial coping strategies of households dealing with the economic downturn.

What do our findings imply for the current government relief measures in Kenya? If the crisis and preventive measures persist, household income could continue to decline; while households are currently able to maintain food spending, this could become more difficult in the near future. Income levels need to be protected to avoid food insecurity and further suffering. Our findings on reduced gifts, remittances, and informal borrowing and lending also suggest that most households were in it alone – at least during the initial stages of the pandemic. Whereas in other times rural households rely on informal credit (Udry, 1994) or support from their social networks in case of need – especially when dealing with idiosyncratic shocks such as illness or injury (De Weerdt & Dercon, 2006; Fafchamps & Lund, 2003; Geng et al., 2018), these informal risk-sharing arrangements appeared to falter when households throughout the region were affected. Previous research suggests that households may sell productive assets to smooth consumption in the face of covariate shocks (Nguyen et al., 2019; Rosenzweig & Wolpin, 1993), but five weeks in the pandemic, we find no evidence that households in our sample resorted to selling assets such as livestock.

The Kenyan government has announced several economic response measures, including tax relief, reduction of VAT, and a reduction of income and business tax (Were, 2020). However, since most of our households are employed in the informal sector, or operate their own small businesses, these relief measures will not be relevant. The most relevant measure seems to be the cash transfer to supporting the elderly, orphans and other vulnerable members. As part of this measure, the *Inua Jamii* programme distributed 8,000 shilling to more than 1 million beneficiaries during the week of 20 April.[7] Yet, the latest figures show that 36% of Kenyans still live below the poverty line of US$1.90 per day, amounting to more than 19 million citizens (Awiti et al., 2018). In order to protect consumption and food security of all the poor and vulnerable, safety net measures need to be expanded. Mobile money transfers can play a major role in this regard, but challenges such as a lack of centralized household registries remain an issue (Chacha et al., 2020). At the other end, the food supply chain should be protected to keep down food inflation and ensure households are able to purchase food at their preferred markets.

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[7] The Star Kenya: https://www.the-star.co.ke/news/2020-04-19-inua-jamii-beneficiaries-to-get-sh8000-each-from-monday/

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Figures and Tables

Figure 1, Average cash inflow (left) and outflow (right), with linear trend
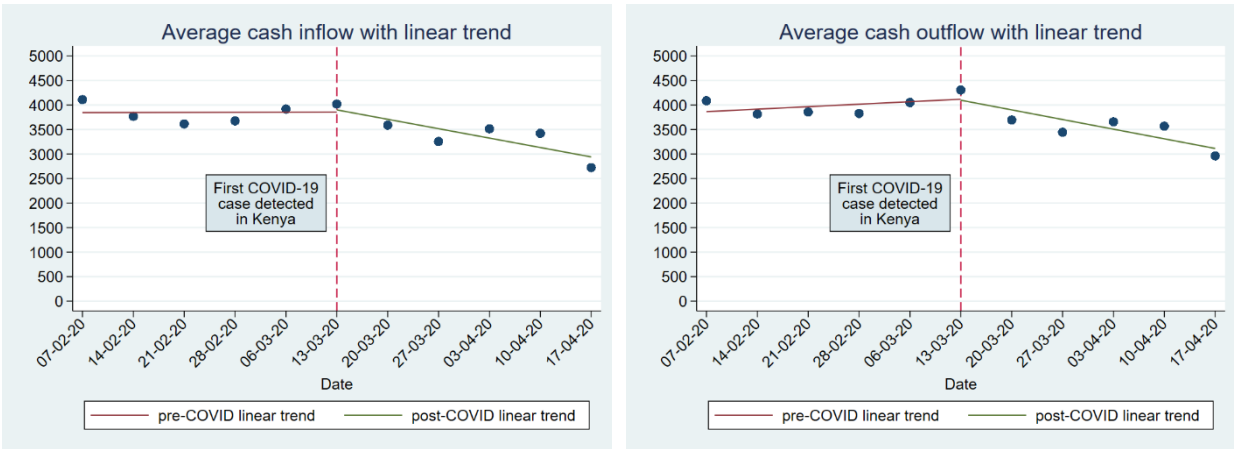

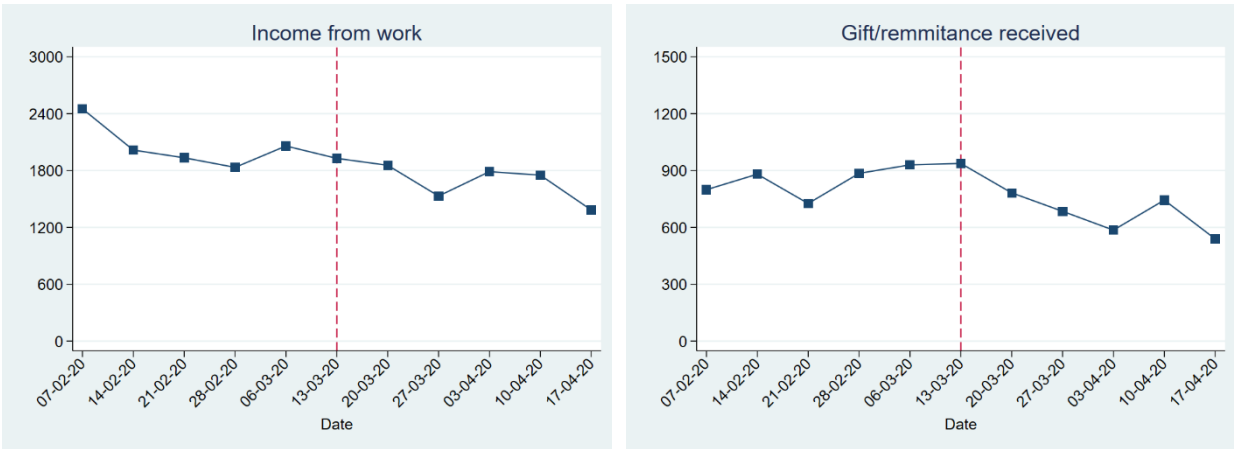*Figure 2, Trends in selected inflow variables, income from work (left) and gifts/remittances (right)*

Figure 3, Trends in weekly expenditures for selected sub-groups: Food, education, and transportation

Table 1, Baseline characteristics of households in the sample

	Mean
County	
Kakamega	0.704
Kisumu	0.296
Household composition	
# of household members	5.072
# of members age 0-5 years	1.380
# of members age 6-12 years of age	1.084
# of members age 13-18 years of age	0.554
# of members age 19-64 years of age	1.991
# of members age 65 and over	0.064
Characteristics of the head	
Age in years	37.261
Female head	0.243
Head is married	0.916
Educational status	
No schooling	0.035
Incomplete primary	0.328
Complete primary	0.319
Incomplete secondary	0.093
Complete secondary or higher	0.226
Main occupation	
None	0.157
Own business	0.214
Farm owner	0.058
Casual labor (including casual farm work)	0.383
Wage work	0.188
Livelihood activity	
Any member in household engaged in own business	0.284
Any member in household engaged in own farm work	0.070
Any member in household engaged in casual labor	0.449
Any member in household engaged in wage work	0.249
Observations	346

Table 2, Change in weekly cash inflow variables after 17 March, compared to the period 4 February - 16 March

	(1)	(2)	(3)	(4)	(5)	(6)
	Income from work	Gift/ remittance received	Money borrowed	Loan/credit repayment received	Harambee contribution received	Savings withdrawn
17 March - 23 March	-187.1	-83.7	-60.3**	42.2	7.8	-20.2
	(117.1)	(63.6)	(23.4)	(47.2)	(5.1)	(73.8)
24 March - 30 March	-524.0***	-189.4***	26.9	-31.7	3.9	-15.3
	(101.7)	(61.2)	(43.9)	(28.3)	(4.1)	(57.8)
31 March - 6 April	-354.9**	-296.7***	199.8	10.2	2.8	-195.1**
	(157.2)	(57.5)	(228.8)	(23.2)	(4.2)	(88.7)
7 April - 13 April	-354.2***	-130.0**	-50.3**	35.8	88.0	-211.0***
	(117.2)	(60.3)	(23.8)	(40.1)	(89.2)	(63.9)
14 April - 20 April	-666.1***	-329.9***	-3.5	-39.1	-28.6	-198.8***
	(117.6)	(64.2)	(32.6)	(27.0)	(27.4)	(70.0)
Mean between 4 February - 16 March	2036.1	858.3	94.8	138.3	18.8	699.1
Household FE	YES	YES	YES	YES	YES	YES
Observations	2,995	2,995	2,995	2,995	2,995	2,995

Note: Table presents estimates from household fixed-effects (FE) regressions, with standard errors clustered at the household level. * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 3, Change in weekly income after 17 March, by source of income, compared to the period 4 February - 16 March

	(1)	(2)	(3)	(4)	(5)	(6)
	Business income (revenue)	Income from employment (salary)	Income from farming (crop sales)	Income from livestock sales	Income from casual labour	Other income
17 March - 23 March	-120.9	56.4	-11.7	-24.8	-23.4	49.6
	(100.4)	(133.5)	(25.6)	(23.0)	(18.2)	(38.7)
24 March - 30 March	-219.9**	-233.3***	-51.3***	-21.8	-47.4**	7.7
	(92.0)	(57.6)	(14.1)	(22.1)	(19.5)	(12.0)
31 March - 6 April	-300.9***	-12.0	-23.3	-6.4	-85.1***	51.6
	(111.8)	(117.4)	(24.3)	(28.6)	(21.9)	(41.8)
7 April - 13 April	-106.1	-79.5	-57.9***	-24.8	-33.8	12.4
	(114.3)	(82.6)	(13.7)	(22.5)	(29.7)	(21.7)
14 April - 20 April	-249.3***	-312.9***	-41.0*	-26.5	-39.5	6.0
	(91.5)	(73.1)	(24.6)	(23.8)	(38.5)	(11.9)
Mean between 4 February - 16 March	1254.5	470.3	108.6	26.1	186.2	27.7
Household FE	YES	YES	YES	YES	YES	YES
Observations	2,995	2,995	2,995	2,995	2,995	2,995

Note: Table presents estimates from household fixed-effects (FE) regressions, with standard errors clustered at the household level. * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 4, Change in weekly outflow variables after 17 March, compared to the period 4 February - 16 March

	(1)	(2)	(3)	(4)	(5)	(6)
	Expenditures	Gift/ remittance given	Money lent out	Loan/credit repayment given	Harambee contribution	Savings deposited
17 March - 23 March	-31.2	-2.2**	-60.9**	-108.8***	4.9	-117.8**
	(169.1)	(0.9)	(24.7)	(31.9)	(5.2)	(53.0)
24 March - 30 March	-266.2**	-2.4	-59.8*	-136.1***	1.2	-170.2***
	(111.1)	(1.6)	(30.8)	(29.9)	(3.9)	(46.8)
31 March - 6 April	-286.6*	-2.8*	-93.6***	-144.5***	-1.9	-99.5
	(161.5)	(1.6)	(30.7)	(34.8)	(2.3)	(76.2)
7 April - 13 April	-285.3**	-2.8*	-19.9	-164.3***	-4.8***	-65.8
	(132.7)	(1.5)	(35.8)	(29.1)	(1.7)	(52.4)
14 April - 20 April	-568.7***	-3.5**	-104.3***	-188.4***	-4.4**	-240.3***
	(127.6)	(1.6)	(30.0)	(33.5)	(1.7)	(51.1)
Mean between 4 February - 16 March	2413.5	4.1	203.6	518.8	6.7	654.5
Household FE	YES	YES	YES	YES	YES	YES
Observations	2,995	2,995	2,995	2,995	2,995	2,995

Note: Table presents estimates from household fixed-effects (FE) regressions, with standard errors clustered at the household level. * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 5, Change in weekly expenditures for selected sub-groups after 17 March, by category, compared to the period 4 February - 16 March

	(1)	(2)	(3)	(4)	(5)
	Food	Education	Transportation	Communication	Recreation/ ceremonies/ offerings/ funerals
17 March - 23 March	-5.0	-82.1***	-7.9	-2.5	13.7
	(45.5)	(15.9)	(18.2)	(4.6)	(16.4)
24 March - 30 March	28.4	-71.2***	-35.2***	-2.4	-11.3
	(46.2)	(14.1)	(12.1)	(4.8)	(9.0)
31 March - 6 April	-21.9	-76.0***	-35.5***	-4.1	18.3
	(50.1)	(11.6)	(13.2)	(5.5)	(24.4)
7 April - 13 April	48.9	-68.6***	-43.1***	-12.0***	303.1
	(50.5)	(13.0)	(14.0)	(3.6)	(324.1)
14 April - 20 April	-58.6	-70.8***	-61.3***	-9.1**	-103.9
	(46.5)	(10.6)	(13.6)	(4.5)	(89.4)
Mean between 4 February - 16 March	939.9	109.6	132.8	52.9	77.4
Household FE	YES	YES	YES	YES	YES
Observations	2,995	2,995	2,995	2,995	2,995

Note: Table presents estimates from household fixed-effects regressions, with standard errors clustered at the household level. * $p<0.1$; ** $p<0.05$; *** $p<0.01$.