INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

CGIAR
INITIATIVE ON
Gender Equality

IFPRI Discussion Paper 02282

September 2024

Does Nutrition-Sensitive Social Protection Build Longer-term Resilience?

Experimental Evidence from Bangladesh

Akhter U. Ahmed

M. Mehrab Bakhtiar

John Hoddinott

Shalini Roy

Poverty, Gender, and Inclusion Unit

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

The International Food Policy Research Institute (IFPRI), a CGIAR Research Center established in 1975, provides research-based policy solutions to sustainably reduce poverty and end hunger and malnutrition. IFPRI's strategic research aims to foster a climate-resilient and sustainable food supply; promote healthy diets and nutrition for all; build inclusive and efficient markets, trade systems, and food industries; transform agricultural and rural economies; and strengthen institutions and governance. Gender is integrated in all the Institute's work. Partnerships, communications, capacity strengthening, and data and knowledge management are essential components to translate IFPRI's research from action to impact. The Institute's regional and country programs play a critical role in responding to demand for food policy research and in delivering holistic support for country-led development. IFPRI collaborates with partners around the world.

AUTHORS

Akhter U. Ahmed (a.ahmed@cgiar.org) is a Senior Research Fellow in the Poverty, Gender, and Inclusion (PGI) Unit and Country Representative in Bangladesh of the International Food Policy Research Institute (IFPRI), Dhaka, Bangladesh.

M. Mehrab Bakhtiar (m.bakhtiar@cgiar.org) is a Research Fellow in IFPRI's PGI Unit, Washington, DC.

John Hoddinott (jfh246@cornell.edu) is the H.E. Babcock Professor of Food and Nutrition Economics and Policy at Cornell University, Ithaca, NY, and IFPRI Non-Resident Fellow, Washington, DC.

Shalini Roy (s.roy@cgiar.org) is a Senior Research Fellow in IFPRI's PGI Unit, Washington, DC

Notices

[1] IFPRI Discussion Papers contain preliminary material and research results and are circulated in order to stimulate discussion and critical comment. They have not been subject to a formal external review via IFPRI's Publications Review Committee. Any opinions stated herein are those of the author(s) and are not necessarily representative of or endorsed by IFPRI.
[2] The boundaries and names shown and the designations used on the map(s) herein do not imply official endorsement or acceptance by the International Food Policy Research Institute (IFPRI) or its partners and contributors.
3 Copyright remains with the authors. The authors are free to proceed, without further IFPRI permission, to publish this paper, or any revised version of it, in outlets such as journals, books, and other publications.

Abstract

Evidence shows that cash and in-kind transfer programs increase food security while interventions are ongoing, including during or immediately after shocks. But less is known about whether receipt of these programs can have protective effects for household food security against shocks that occur several years after interventions end. We study the effects of a transfer program implemented as a cluster-randomized control trial in rural Bangladesh from 2012-2014 – the Transfer Modality Research Initiative (TMRI) – on food security in the context of the COVID-19 pandemic. We assess TMRI's impacts at three post-program time points: before the shock (2018), amidst the shock (2021), and after the immediate effects of the shock (2022). We find that TMRI showed protective effects on household food security during and after the pandemic, but program design features "mattered"; positive impacts were only seen in the treatment arm that combined cash transfers with nutrition behavior change communication (Cash+BCC). Other treatment arms – cash only, and food only – showed no significant sustained effects on our household food security measures after the intervention ended, nor did they show protective effects during the pandemic. A plausible mechanism is that investments made by Cash+BCC households in productive assets – specifically livestock – increased their pre-shock resilience capacity.

Keywords: social protection, resilience, shocks, Bangladesh, COVID-19

Acknowledgements

We gratefully acknowledge funding from the United Kingdom's Foreign, Commonwealth & Development Office through the Data and Evidence to End Extreme Poverty (DEEP) research consortium; from the Feed the Future Innovation Lab for Markets, Risk and Resilience (MRR) Innovation Lab, established at UC Davis in 2019 by the generous support of the American people through the United States Agency for International Development (USAID) (cooperative agreement no. 7200AA19LE00004); and from the CGIAR Initiative on Gender Equality. The study builds on earlier research funded by the German Ministry for Economic Cooperation and Development (BMZ), the UK's Department for International Development (DFID), the Swiss Agency for Development and Cooperation (SDC), the United Nations Development Programme (UNDP), the United States Agency for International Development (USAID), the World Food Programme, Cornell University, and the CGIAR Research Program on Policies, Institutions, and Markets. The original intervention was registered at AEARCTR-0000247 and with ClinicalTrials.gov (ID: NCT03810300). The four-year post-program study was registered at AEARCTR-0002977 and analysis of the 2021 and 2022 registered at RIDIE-STUDY-ID-631aada707a31. The initial intervention received ethical approval from the Institutional Review Board of the International Food Policy Research Institute (IFPRI) as did the 2018 and 2021 surveys; the 2022 survey was approved by Cornell University's IRB. All study rounds were reviewed and approved by the Ministry of Food and Disaster Management in Bangladesh. We thank Data Analysis and Technical Assistance (DATA) for careful data collection and Wahid Quabili, Asraul Khan Eitu, Deboleena Rakshit and Sadat Anowar for excellent research assistance, and seminar participants at the from the Africa Gender Innovation Lab at the World Bank, Dickinson College, participants at the MRR Innovation Lab workshop, and Bangladesh Institute of Development Studies for their insightful comments. All errors are our own.

1. Introduction

Social protection programs have become widespread in low- and middle-income countries, with rapid growth of cash transfer programs alongside ongoing extensive coverage of in-kind transfer programs (International Labor Organization 2021; Alderman et al. 2018). Core objectives of these programs include supporting poor and vulnerable people to attain a minimal standard of living and invest in human capital, as well as to build their resilience to cope with crises and shocks. A large robust body of evidence demonstrates that direct cash and in-kind transfers to poor households increase household food consumption and food security while programs are ongoing (Bastagli et al., 2019; Hidrobo et al., 2018; Crosta et al 2024). A growing literature also shows that receiving these programs during or immediately after adverse shocks can protect short-term household consumption and food insecurity (e.g., Abay et al., 2023; Bottan, Hoffmann, and Vera-Cossio, 2021; Carraro & Ferrone, 2020; Dietrich & Schmerzeck, 2019; Londoño-Vélez and Querubín, 2022; Premand & Stoeffler, 2022; Tranchant et al., 2019).

In recent years, there is growing interest in understanding whether cash or in-kind transfer programs can build households' resilience against *future* shocks. In particular, while it may be expected that receiving income transfers during or immediately after an income shock will protect consumption and food security if transfers are substantial and well-implemented (as supported by studies cited above), it is less clear if these programs will lead households to be better prepared

for income shocks that occur several years after programming ends. This issue is important for understanding how to design social protection programs to be "adaptive," particularly in the context of increasingly frequent and compounding shocks, yet relatively little evidence directly addresses it. One exception is a quasi-experimental analysis that uses longitudinal in-person and phone survey data in Bangladesh to show that, in late 2021 during COVID-19 lockdowns, households that reported receipt of a social protection program in 2018 showed higher food security than similar households that did not (Ahmed et al. 2023). Another is an experimental study in Nicaragua that shows that, two years post-program, households that received cash transfers with a productive grant or vocational training were better protected from weather shocks than those receiving cash alone (Macours et al. 2022). Other related evidence comes from recent studies that assess "anticipatory" cash transfers: one-off cash transfers linked to early warning of a specific type of weather shock and provided several days (though not years) before the shock occurs. Pople et al. (2021) show that anticipatory cash transfers in the context of floods in Bangladesh protected households' consumption relative to those receiving no transfers, and Balana et al. (2023) show that anticipatory cash transfers in the context of flooding in Nigeria reduced negative coping strategies, increased pre-emptive climate-adaptive actions, and enhanced investment in productive assets compared to households that received cash after peak flooding occurred.

While existing studies are promising, key knowledge gaps remain. First, studies include programming that occurred from several days to about 3 years prior to the shock, but to our knowledge, scarce evidence exists on programs that occurred many years longer before the shock. Second, evidence is very limited on what design features are promising; with the exception of Macours et al. (2022), most studies do not vary design features. Third, timeframes and measurement are limited for understanding resilience. Barrett et al. (2021) highlight that conceptualizations of resilience should include not only whether a shock causes a welfare indicator to fall and by how much, but also for how long (which implies follow-up at a time point meaningfully "after" the shock), as well as a normative measure that captures the probability of achieving some minimal standard of living (which implies an indicator with a normative threshold for standard of living). Fourth, there is limited understanding of how programs affect pre-shock household attributes – or resilience "capacities" (Barrett et al. 2021) – that may be the mechanisms through which protective effects for future shocks are achieved.

We contribute to addressing these knowledge gaps, drawing on a unique social protection intervention – the Transfer Modality Research Initiative (TMRI) – and considering the large covariate shock of lockdowns associated with the COVID-19 pandemic. TMRI was fielded in rural Bangladesh between 2012 and 2014. We analyze longitudinal data on study participants collected at three time points: 2018 (in-person before the shock, four years after the intervention ended), 2021 (via phone

during the COVID-19 pandemic in Bangladesh, seven years post-intervention), and in 2022 (in-person *after* the immediate effects of the pandemic had begun to recede, eight years post-intervention). TMRI was designed as a cluster-randomized control trial (RCT) with multiple intervention arms: a Control group, Cash only, Food only, and Cash twinned with nutrition Behavior Change Communication (BCC) activities.

Our key outcome variables are two measures of household food security – the Food Insecurity Experience Scale (FIES), a metric used to track global progress towards achieving Sustainable Development Goal 2 (United Nations, 2017); and the Food Consumption Score (FCS), which defines a threshold for an "acceptable" level of food consumption – which allows assessing effects on normative categories of household welfare. Our data also include several indicators that capture potential mechanisms over time (including pre-shock) for any protective effects.

Using the RCT design of TMRI to analyze post-program impacts on household food security at each of the three time points, we assess the following: (1) whether cash or food transfer programs delivered more than seven years prior to (but not during) a large covariate shock had a protective effect on household food security during the shock; (2) whether impacts of the pre-shock programs persisted after the immediate effects of the shock began to recede; (3) whether design features of the pre-shock programs mattered – in particular, transfer modality (cash versus food) or presence of complementary "plus" programming; (4) what potential mechanisms

(including pre-shock indicators reflecting resilience capacities) might explain any protective effects.

We find that prior receipt of TMRI showed significant protective effects on household food security during lockdowns associated with COVID-19, but the design features of the pre-shock intervention mattered. In particular, "cash-plus" programming was significantly more effective than cash alone or food alone. Moreover, prior access to social protection – specifically the Cash+BCC arm – had persistent effects that extended past the COVID-19 shock. This persistent effect contrasts with the possibility that the intervention bolstered resilience capacity, but that this capacity was exhausted as the shock unfolded. In terms of mechanisms, evidence indicates that, as of 2018, prior participants in the Cash+BCC treatment arm were more likely to make investments in productive assets, notably livestock, reflecting increased pre-shock resilience capacity; additionally, during the pandemic, they were more likely to have a second income earner in the household (often women) engaged in productive activities like livestock or poultry rearing. Plausibly, the post-intervention but pre-shock effects on livelihoods bolstered household income during the lockdown shock, and also directly contributed to food security by increasing the physical availability of a wider range of foods.

Our findings contribute to a growing literature on medium- to long-term impacts of cash transfer programs on consumption and poverty (Grisolia, 2024), not necessarily in the context of shocks. Existing evidence is mixed. For example, while

some studies of cash transfer programs show sustained post-intervention increases in consumption, assets, or earnings (e.g., Carneiro et al., 2021; Stoeffler et al., 2020), others show impacts fading several years after programming (e.g., Cahyadi, Nur et al., 2020; Handa et al., 2019; Haushofer and Shapiro, 2018). Some evidence suggests that cash transfers may have more sustained post-program impacts when twinned with complementary "plus" programming such as a productive investment grant or nutrition behavior change communication (e.g., Macours et al., 2022; Ahmed et al., forthcoming); our results are consistent with these findings. Our work also contributes to the burgeoning literature on resilience. Barrett et al (2021) report that although there were more than 9,000 published or grey literature studies between 2008 and 2020 alone, little reliable and replicable evidence exists on how governments and their development partners can build resilience among populations vulnerable to shocks and stressors. Our study suggests an evidence-based programmatic approach based on a rigorous trial. Moreover, our paper represents a rare study that bridges the two literatures on the long-term effects of social protection and on resilience.

2. Context, data, outcomes, and methods

2.1 Experimental design: The Transfer Modality Research Initiative

TMRI was a pilot safety net program implemented as a cluster-randomized control trial for two years, from May 2012 to April 2014, in two regions of rural Bangladesh:

the northwest region (the "North") and the coastal southern region. This study focuses on the North which had a higher prevalence of poverty when TMRI began but was more agroecologically suited to crop cultivation and livestock-rearing (Ahmed, Hoddinott, Roy, and Sraboni, 2024). TMRI was implemented in poor sub-districts in the North. Within these localities, villages were randomly selected and in each village, a census was conducted and a list of households was constructed that met the following criteria: (1) were considered poor (determined by poverty indicators[1]); had a child aged 0-24 months (the "index child") in February-March 2012 at the time of the census; and (3) were not receiving benefits from any other social safety net interventions. In each village, 10 households meeting these three conditions were randomly selected. They were indeed poor – our baseline data show that in the control group, 76 percent of households were considered extremely poor with per capita consumption below the 1.90USD/day in 2012 PPP.

Treatment was randomized at the village level. In this study, we focus on the treatment groups who received: (1) cash transfers ("Cash"), (2) food transfers ("Food"), or (3) cash transfers along with nutrition BCC ("Cash+BCC"). The mother of the index child was the designated beneficiary – both the cardholder for receiving

[1] IFPRI developed a poverty scoring mechanism to identify poor households based on a set of poverty indicators such as housing characteristics, ownership of consumer durables, land ownership, and other indicators of household livelihoods. The village census collected information on these indicators, which was used to construct a poverty score for each household.

transfers and the target participant in BCC activities. Participants in the "Cash" arm received a monthly payment of 1,500 Taka (approximately 19 USD) per household. Beneficiaries in the "Food" arm received a monthly food ration of 30 kilograms (kg) of rice, 2 kg of *mosoor* pulse (a lentil), and 2 liters of micronutrient-fortified cooking oil. These quantities were chosen so that the initial value of the food ration was equal to the value of the cash transfer in the "Cash" treatment arms. The nutrition BCC was intensive and included three components focused on education and behavior change at the household and community level: (1) weekly group BCC trainings led by community nutrition workers (CNWs) – some with beneficiaries only and some that invited other family members to attend along with beneficiaries, (2) twice-a-month visits by CNWs to the beneficiaries' homes, and (3) monthly group meetings between program staff and influential community leaders. Training covered the following topics: basic nutrition, control and prevention of micronutrient deficiencies, infant and young child feeding practices, health care, maternal nutrition, and hygiene. Implementation fidelity in all treatment arms was high. Monitoring data shows that beneficiaries assigned to BCC interventions attended on average 48 sessions per year. Of note, there was no explicit focus on livelihoods or income generation in any of the BCC components. Discussions included the importance of fruits, vegetables, and animal source foods and how access to these could be facilitated through homestead gardens or livestock- or poultry-rearing, but the emphasis was on how to acquire nutritious foods for the child rather than on building livelihoods more

generally. There was also no broader discussion of resource management or allocation of transfers to uses such as savings, assets, or debt repayment. Ahmed, Hoddinott, Roy, and Sraboni (2024) provide additional details on the design and implementation of the TMRI.

2.2 Context

The period 2014 to 2019 saw rapid growth in the Bangladesh economy, with annual GDP per capita growth rates averaging 6.9 percent and never dropping below 6.1 percent. However, during the COVID-19 pandemic, Bangladesh experienced three major nationwide lockdowns, with profound implications on various aspects of life, including the economy, food security and daily living.

The first lockdown began on March 26, 2020, and was extended multiple times before concluding on May 30, 2020. This initial lockdown phase included the closure of non-essential businesses, suspension of public transportation, and strict stay-at-home directives. Educational institutions were closed, and international borders were tightly controlled. As the first response to the emerging pandemic, this lockdown aimed to curb the initial spread of the virus. The second lockdown, commencing on April 5, 2021, and lasting until May 27, 2021, was implemented in response to a resurgence of COVID-19 cases. This lockdown was more stringent than the first, with all non-essential services halted and stronger enforcement measures, including military deployment, to ensure compliance. The third lockdown, which started on July 23, 2021, and ended on August 5, 2021, followed a similar pattern of

strictness but was shorter in duration due to mounting public pressure and economic concerns. These sequential lockdowns were critical in managing the pandemic's spread, although they posed significant challenges for the population and the economy. No further lockdowns took place after this lockdown and normal economic activity resumed by the start of 2022.

Ahmed et al. (2023) document the effects of the pandemic on household food security across urban and rural Bangladesh. They show that pre-pandemic, approximately 30 percent of rural households were mildly food insecure, and 14.9 percent were either moderately or severely food insecure. The onset of the pandemic was associated with a dramatic increase in food insecurity, with the prevalence of moderate-to-severe food insecurity tripling to a combined 45.1 percent. By January 2021, with restrictions on movement and economic activity largely ended and the initial waves of the pandemic in retreat, the prevalence of moderate or severe food insecurity returned largely to pre-pandemic levels. This improvement remained in September-October 2021 despite the strict national lockdown imposed in July-August 2021 to arrest the spread of the Delta variant of COVID-19. When asked what aspect of the pandemic had had the largest impact, both rural and urban households reported that income loss and unemployment were the dominant adverse effect (64-67 percent in rural areas; 76-78 percent in urban areas). Disruptions in access to food (Shortages in food supply; Shops being closed; Travel restrictions; Social

distancing) were reported by 17.3 percent of rural households at the start of the pandemic but became less important over time.

2.3 Data

At baseline, the TMRI sample used in this paper consisted of 2,000 households living in 200 villages, evenly divided among three treatment arms and a control group. As part of the initial evaluation, they were surveyed in 2012 (baseline), 2013, and 2014 (endline). Each was conducted in March and April. Four surveys were fielded post-intervention: a second survey in 2014, March and April 2018 (four years post-program), a phone survey in November 2021 and an in-person survey in June and July 2022 (eight years post-program). The 2021 survey was timed to occur shortly after the end of the third lockdown and the 2022 survey occurred after economic activities had fully returned. The timing of these surveys, as detailed in Figure 1, allows us to contextualize these findings within the broader spectrum of the COVID-19 pandemic's impact in Bangladesh.

Appendix Figure A1 shows participant flow. In 2018, we interviewed 1,812 households who had been interviewed at baseline; 78 attrited between 2018 and 2021 and additional 85 households were lost between 2021 and 2022. This yields a sample of 1,649 households interviewed in all four rounds, and 1,635 households that have complete food security data for years 2018, 2021, and 2022. Appendix Table A1 shows that attrition in 2018, 2021, and 2022 is not correlated with treatment

status and Appendix Table A2 shows baseline balance across a wide range of household characteristics.

2.4 Outcomes

Our outcome measure is the Food Insecurity Experience Scale (FIES), a metric developed by the Food and Agriculture Organization (FAO) to assess and monitor food insecurity at various levels, from individual to global scales (including being one of the measures used to monitor progress towards Sustainable Development Goal 2). The FIES has been validated for use across the world and has been employed in numerous studies to assess the prevalence and determinants of food insecurity in different contexts (Ballard, Kepple, & Cafiero, 2023; Cafiero, Viviani, & Nord, 2018; Smith, Rabbitt, & Coleman-Jensen, 2017). It consists of eight questions that progress from milder forms of food insecurity, such as whether the household had concerns about not having sufficient food, to more acute forms, such as experiencing hunger without eating, or not eating for an entire day.[2] As such, it captures both the breadth

[2] The questions are, "In the last four weeks: (1) Did you worry that your household would not have enough food to eat? (2) Did you or any household member eat less than you thought you should because there was not enough food? (3) Were you or any household member not able to eat healthy and nutritious foods because of a lack of resources? (4) Did your household run out of food? (5) Did you or any household member only eat a few kinds of foods due to a lack of resources? (6) Were you or any household member hungry but did not eat because there was not enough food? (7) Did you or any household member skip a

and severity of food insecurity experiences. Responses are coded to generate an index score ranging from 0 (if respondent answered no to all eight questions) to 8 (if respondent answered yes to all eight questions), with higher scores indicating more severe levels of food insecurity. Scores between 4 and 8 indicate experiences of severe constraints on food access and can be classified as having experienced "moderate-to-severe food insecurity."

We assess the robustness of our findings by considering a second measure, the Food Consumption Score (FCS). The FCS is a metric developed by the World Food Programme (WFP) to provide a rapid assessment of the quantity and variety of foods consumed by the household. (Wiesmann, Bassett, Benson, and Hoddinott (2009) demonstrate that the FCS is correlated with caloric availability at the household level.) The FCS is based on the frequency of consumption of different food groups over the previous seven days, weighting these by the nutrient value of these food groups.[3] The FCS ranges from 0 to 112. A higher score indicates better dietary diversity and food consumption, reflecting a more nutritionally balanced diet and

meal because of a lack of resources? (8) Did you or any household member go a whole day and night without eating anything at all because there was not enough food?

[3] The FCS is calculated by summing the number of days that the household consumed the corresponding food group (staples, pulses, vegetables, fruit, meat, fish and eggs, milk and dairy, sugar and honey, oils and fats), multiplying the number of days by the food group's weighted frequencies, and summing across categories to obtain a single proxy indicator.

greater food security. In Bangladesh, a score of 42 out of 112 is considered the "acceptable" threshold for food consumption (Coleman et al, 2023).

2.5 Methods

We estimate the following intent-to-treat regression model, using ordinary least squares and accounting for the cluster-randomized study design:

$$Y_{it} = \beta_0 + \beta_F * Food_i + \beta_C * Cash_i + \beta_B * Cash\_BCC_i + \delta * Y_{i1} + \varepsilon_{it} \quad (1)$$

where Y_{it} denotes the outcome for household *i*, at time $t \in$ (2018, 2021, 2022). When this outcome is dichotomous, we estimate a linear probability model. Y_{i1} denotes baseline (2012) outcomes, β_0 is a constant term, and ε_{it} is a term for unobservables which we assume to be normally distributed. $Food_i$, $Cash_i$, and $Cash\_BCC_i$ are all dummy variables for a household being assigned to Food, Cash, or Cash+BCC respectively; corresponding coefficients, β_F , β_C and β_B, reflect treatment impacts of these arms relative to the control group. To test whether β_F , β_C and β_B are statistically different from each other, we conduct Wald tests of equality and report the p-values.

All estimated impacts of TMRI treatment arms are relative to the control group. We note that, because TMRI's control group was also followed over time, we can assess whether households would have been protected from shocks over the longer term even in the absence of intervention – through both their own efforts and larger macroeconomic forces that "raise all boats" (Banerjee, Duflo, and Sharma, 2021). This point is particularly important as the Bangladesh economy has grown

rapidly in the last 15 years (World Bank, 2024), with increases in GDP per capita ranging from 3.4 (2020) to 7.9 (2019) percent per annum.

3. Results: Impacts on food security

3.1 Descriptive statistics

Appendix Table A2 provides basic descriptive statistics for our sample at baseline. Control households were small in size, around 4.8 members. Few (< six percent) were female headed. Adults had low levels of schooling (mean grade attainment was 1.4 grades for men and 2.3 grades for women). They own little land, 15.4 decimals or 0.154 acres. Approximately 64 percent of household consumption goes on food. For every three Taka of assets owned, control households held one taka of debt.

3.2 Impacts on the Food Insecurity Experience Scale

We begin by summarizing trends in household food insecurity using the control means in columns (1), (2), and (3) of Table 1. Food insecurity declines slightly between 2018 and 2021; this is consistent with the national level results reported in Ahmed et al (2023). Post-pandemic, it declines sharply with the percentage of control households that were moderately or severely food insecure falling from 47 percent in 2018 to 28 percent in 2022.

Point estimates in columns (1), (2), and (3) show the impact of TMRI on FIES four, seven (just after the third COVID-19 lockdown), and eight years (the aftermath of the pandemic) after program end. In 2018, households that had been in the

Cash+BCC treatment arm reported a 0.68 decrease in the FIES index, a 21 percent reduction in food insecurity compared to control households. This effect persisted in 2021 and 2022, with the magnitude of the point estimates implying that, relative to the control group, Cash+BCC households were 15.4 and 24.3 percent less food insecure. Columns (4), (5), and (6) show that past receipt of the Cash+BCC treatment reduced the incidence of moderate or severe food insecurity for Cash+BCC households by 13.6 percentage points (29.1 percent) post-intervention (2018), 16.2 percentage point (34.8 percent) during the pandemic (2021), and 12.5 percentage points (44.8 percent) post-pandemic (2022).[4]

We might worry that, particularly in the context of a phone survey that takes place just after a lockdown, respondents might overstate food insecurity. Table 2 reports the impact of the TMRI arms on our alternative measure of food security, the FCS in 2021, the overall score, whether the household had low FCS, as well as

[4] Appendix Table A5 reports estimates of the impact of these treatment arms for the eight individual questions that make up the FIES in 2018, 2021, and 2022. Appendix Table A3 shows that the results for the FIES are robust to using a Poisson estimator. The Poisson regression results, appropriate for count data like FIES, show that the Cash + BCC arm reduced the expected count of food insecurity experiences by approximately 21 percent in 2018 (e^{-0.234} – 1 = -0.209), 15.5 percent in 2021 (e^{-0.168} – 1 = -0.155), and 27 percent in 2022 (e^{-0.316} – 1 = -0.270). Appendix Table A4 shows that the results for moderate and severe food insecurity are robust to using a probit estimator instead of a linear probability model.

impacts on individual FCS components in 2021. (Results for 2018 and 2022 are found in Appendix Table A6.) Table 2 shows a large and statistically significant impact of Cash+BCC on FCS just after the end of the third lockdown. Relative to the control group, Cash+BCC households reported a 11.0-point increase compared to control households, a 17 percent difference. The results in column (2) imply that in the aftermath of the third Covid-19 lockdown, while 10.0 percent of control households had a low FCS score, only 3.7 percent of Cash + BCC household did so. By contrast, neither Cash nor Food had protective impacts on FCS during the pandemic. These results are consistent with what we see for the FIES results; a large impact of the Cash+BCC arm and little, or no impact of the cash or Food treatment arms. Appendix Table A6 shows that the positive impact of Cash+BCC on FCS persisted after the pandemic ended.

Table 2 also reports impacts on the individual food groups that comprise the FCS, specifically the number of days households consumed different food groups over the past week. In the control group, households consumed cereals and oils and fats daily (as did all treatment groups, which is why we do not present impact estimates for them). Consumption patterns for other food groups were more varied. For example, in the aftermath of the third lockdown, households in the control group consumed fruits and vegetables on an average of 6.6 days a week, pulses/legumes on 2.9 days, milk or dairy products on 1.7 days, and meat, fish, or eggs on 4.9 days. Table 2 shows that Cash+BCC households were more likely to consume from

healthier food groups, including animal-source foods, pulses/legumes, fruits, and vegetables. Specifically, compared to control households, Cash+BCC households had an increased frequency of consumption for fruits and vegetables by 0.2 days, pulses/legumes by 0.8 days, dairy by 0.7 days and meat/fish/eggs by nearly one day.

4. Mechanisms

We consider three plausible mechanisms that could account for these results. Cash+BCC households could have been less likely to contract Covid-19, or to have had household members (particularly income-generating adults) die from Covid – a health mechanism – for example, due to sustained knowledge and receptivity to public health messaging (Hoddinott et al. 2018). Secondly, Cash+BCC households might have been more likely to receive public or private assistance during the pandemic – for example, due to sustained increases in social capital (Roy et al. 2022). Third, Cash+BCC households may have built up resilience capacity, such as income generating resources (Ahmed et al., forthcoming), prior to the pandemic which meant that they were better placed to weather the economic consequences of the lockdowns – an economic mechanism. We consider these in turn.

4.1 Mechanisms (1): Health mechanisms

The 2021 phone survey included a module on whether any household member experienced symptoms consistent with COVID-19, whether they had been tested for COVID-19, and whether they had died from COVID-19. It also asked whether

household members undertook protective actions such as avoiding gatherings where large numbers of people would congregate, practicing social distancing and wearing masks.

Table 3 reports on COVID-related symptoms, testing and mortality. Relatively few control households reported that anyone in the household had tested for Covid-19 (4.4 percent) and even fewer (0.2 percent) reported that a household member had tested positive for Covid. There is no impact of any treatment arm on these outcomes. It is also possible that household members could have had Covid-19 but not been tested for it. Columns (3), (4), and (5) report the impact of the Cash+BCC, Cash, and Food treatment arms on whether any member had experienced three or more Covid-like symptoms, four or more Covid-like symptoms and the number of Covid-like symptoms any household member may have experienced. No treatment arm had any impact on these outcomes. Lastly, we asked about deaths of household members since the start of the pandemic. Column (6) shows that 4.2 percent of control households reported that at least one household member had died, but there is no differential impact on this outcome by treatment status.

These findings are consistent with the use of protective measures reported in Appendix Table A7. This shows that there was no difference in the number of protective measures taken by households between the treatment groups and the control group, nor were there any differences between treatment control groups. When we disaggregate by type of protective measure, a few differences arise (for

example, the Cash + BCC treatment arm were more likely to report using masks and avoiding places of worship), but the vast majority of coefficients on treatment status are small in magnitude and not statistically significant.

4.2 Mechanisms (2): Access to assistance

As part of the phone survey fielded in 2021, we assessed whether past access to any of the TMRI treatments affected access to social assistance, either from government or from NGOs during the pandemic. Appendix Table A8 shows that no treatment arm affected access to these forms of assistance during the third lockdown.

4.3 Mechanisms (3): Economic mechanisms

As part of the phone survey in 2021, we asked whether the household had a main income earner and a second income earner, and if each had worked during the work prior to the interview. In nearly all cases, the main income earner was the male household head, and the secondary earner was his female spouse (82.8 percent). In the control arm, 89.7 percent of main earners had worked the previous week, as had 73.8 percent of second earners (Table 4).

TMRI treatment status had no impact on labor supply of main income earners (Table 4, column 1). By contrast however, the Cash+BCC households were 7.7 percentage points more likely to have a secondary income earner compared to control households. This came largely through an increase in self-employment, specifically poultry or cattle raising which was 8.3 percentage points higher than the

control group (Table 4, column 6). There was no equivalent effect on the likelihood that (male) main earners were engaged in this activity.

To understand why this might have come about, consider Table 5. This shows the impact of the TMR treatment arms on asset holdings (inverse hyperbolic sine transformed) at endline (2014) and four years post-program (2018). At endline, all treatment arms led to increased asset holdings, but the impact of Cash+BCC was higher than the other treatment arms. Four years post-program, in 2018, Cash+BCC households had higher levels of asset holdings compared to control households, specifically livestock and cash savings. Asset holdings in the Cash and the Food treatment arms were still higher than the control group, but this was largely due to higher levels of cash savings.

Given limits on the number of questions we could ask during the phone surveys, we do not have information on household incomes during the pandemic. We did, however, ask households if they perceived that the main earner's current income, and the household's secondary earner's income, had increased, decreased, or stayed the same compared to the immediate pre-pandemic period and compared to six months prior to the survey (a point in time coinciding with the start of the second lockdown). Appendix Table A9 shows that Cash + BCC households reported a greater likelihood that the main earner experienced an increase in income compared to the start of the second lockdown (column 6). Appendix Table A9 also shows that in Cash + BCC households, the likelihood that the second earner (nearly

all women) had higher income, relative to the control group both pre-pandemic (column 3) and before the start of the second lockdown (column 6), by 14.7 and 14.2 percentage points respectively.

During the 2021 phone survey, we also asked whether respondents perceived that they had experienced difficulties in physical access to food.[5] As Table 6 shows, among control group households, virtually all (87.6 percent during the first lockdown and 88.3 percent) reported at least some difficulty in obtaining access to food, a result consistent with evidence from national data that food insecurity was universal in the beginning of the pandemic (Ahmed et al, 2023). However, during the lockdown experienced just prior to the phone survey (July-August 2021), households in the Cash+BCC group experienced significantly fewer challenges in accessing food compared to those in the control group. The likelihood of encountering moderate or

[5] We asked, "Since the start of the COVID-19 pandemic, there have been times when the Government of Bangladesh has required shops and offices to close, stopped or restricted travel from cities to rural areas, or has limited the ability of people to work outside their homes. Such restrictions are referred to as lockdowns. One such lockdown occurred just after the start of the pandemic, in [April and May, 2020]. The most recent lockdowns happened in [July and August, 2021]. We would like you to think about how your household was affected by these two lockdown periods and by the pandemic more generally. … During [these] time[s], how problematic was it for your household to access enough food? (from your own production, by purchasing food, or through transfers from government, NGOs or others)." Responses were on a scale: "Faced no problem; minor problems; moderate problems; severe problems".

severe difficulties in accessing food was 11.1 percent lower for Cash+BCC households, and the probability of facing severe food access problems was reduced by 11.7 percent (columns (5) and (6)). Cash+BCC reduced these likelihoods during the first lockdown too, but these estimates are imprecisely measured. By contrast, the Cash and the Food treatment arms did not reduce the likelihood that households experienced difficulties in accessing food during either lockdown.

Appendix Table A10 shows the impact of TMRI treatments on the number of income generating activities (IGAs) undertaken by households *after* the pandemic had ended. Relative to the control group, Cash + BCC households reported an additional 0.47 IGAs relative to the control group, with this driven larger by greater adult women engagement in livestock and poultry raising. (Note that there is also an increase in IGAs in Cash households, but this is driven more by adult men.)

5. Conclusion

Our findings address the knowledge gaps described in the introduction. We find that a social protection intervention, the TMRI, delivered prior to (but not during) a shock minimized the impact of a large covariate shock – the economic disruptions arising from lockdowns initiated to slow the spread of COVID-19 – on household food security. However, the form of the pre-shock transfer modality "matters". Cash+ programming was more effective than cash alone or food alone in making

households resilient. Past access to social protection, specifically the Cash+BCC arm, had persistent effects that extended past the COVID-19 shock.

Lastly, we can identify the mechanism underlying these findings. Participants in the Cash+BCC treatment made larger investments in productive assets, notably livestock (Ahmed et al, 2024) at the end of the original intervention, and these effects persisted post-intervention (Ahmed et al, forthcoming). When the pandemic struck, they were more likely to have a second income earner in the household, often women, who were engaged in productive activities like livestock or poultry rearing (Table 4). This bolstered household income (Appendix Table A9);[6] which in turn plausibly led to the consumption of a wider range of nutrient-rich foods (Table 2). Consequently, food insecurity in the aftermath of the third lockdown was reduced (Table 1).

Put differently, in the language of the literature on resilience, we find the following. Past participation in TMRI – specifically the Cash+BCC arm – resulted in households being more *resilient* to the malign effects of the pandemic on household food security. A plausible mechanism for this was that Cash+BCC households built up holdings of livestock (and savings) in the post-intervention, pre-pandemic period; thus, they had higher *resilience capacity*. This created higher income generating

[6] It may have also directly contributed to food security by increasing the physical availability of a wider range of foods.

capacity and (speculatively) greater ability to self-provision. Cash+BCC households were more likely to be food secure across all three rounds. Their resilience has a *normative quality*.

Our study has strengths. We have data collected at multiple time points: post-program and pre-shock (2018); in the aftermath of a severe COVID-19 related lockdown (2021); and post-shock (2022). Attrition is low and not correlated with treatment status. We have two complementary measures of food security that show similar results. We have data on welfare outcomes and the mechanisms that underlie these. We can rule out alternative explanations relating to the health impacts of COVID-19 and access to social assistance during the pandemic.

Our study has limitations, three that we highlight here. First, it would have been helpful to have multiple phone surveys covering the three lockdowns (and their aftermath) that Bangladesh experienced during the COVID-19 pandemic. Our 2021 results are a snapshot of one point in time, though we note that they are consistent with other studies such as Ahmed et al (2023). Second, because phone surveys must be short, we do not have detailed income or consumption data during the pandemic. We have qualitative measures of income, but not quantitative measures. Third, our surveys across the three rounds vary between in-person (2018, 2022) and phone administration (2021). Within each round, the same survey administration was used for all arms, thus program impacts should be valid, however measures derived from phone and in-person surveys may not be directly comparable to each other.

Mindful of these limitations, these results are consistent with the growing consensus in the literature that the design features of social safety nets – such as the type of transfer and the inclusion of complementary programs – are influential in determining their long-term success in combating food insecurity, including in the context of shocks. Although the COVID-19 pandemic and associated lockdowns had some unique features relative to other types of shocks, our findings align with the notion that, if correctly designed, social protection programs can be protective, preventative, and promotional (Devereux and Sabates-Wheeler, 2004). They also point to the potential of integrated social protection strategies in empowering households – especially women – to diversify income sources and invest in nutritionally beneficial activities. This aspect of the TMRI program resonates with the growing consensus on the importance of designing social safety nets that go beyond temporary relief to enable longer-term economic resilience and nutritional well-being.

References

Abay, K., G. Berhane, J. Hoddinott and K. Tafere, 2023. COVID-19 and Food Security in Ethiopia: Do Social Protection Programs Protect? *Economic Development and Cultural Change* 71(2): 373-402.

Ahmed, A.U., M. Bakhtiar, D. Gilligan, J. Hoddinott and S. Roy. 2023. Private transfers, public transfers, and food insecurity during the time of COVID-19: Evidence from Bangladesh, *Applied Economics Perspectives and Policy,* 45(4): 1901-1921.

Ahmed, A.U., J. Hoddinott, S. Roy, and E. Sraboni, 2024. Transfers, nutrition programming, and economic well-being: Experimental evidence from Bangladesh. *World Development* 173(January): 106414.

Ahmed, A. U., M. Hidrobo, J. Hoddinott, B. Kolt, S. Roy, and S. Tauseef, forthcoming, Sustainable poverty reduction through social assistance: Modality, context, and complementary programming in Bangladesh, *American Economics Journal: Applied Economics*.

Alderman, Harold; Gentilini, Ugo; Yemtsov, Ruslan. 2018. *The 1.5 Billion People Question: Food, Vouchers, or Cash Transfers?* Washington, DC: World Bank.

Balana, B., Adeyanju, D., Clingain, C., Andam, K.S., de Brauw, A., Yohanna, I., Olarewaju, O. and Schneider, M., 2023. *Anticipatory cash transfers for climate resilience: Findings from a randomized experiment in northeast Nigeria*. Intl Food Policy Res Inst.

Ballard, T.J., Kepple, A.W. and Cafiero, C., 2013. The food insecurity experience scale: development of a global standard for monitoring hunger worldwide. Rome: FAO, 61.

Bandiera, O., Burgess, R., Das, N., Gulesci, S., Rasul, I., & Sulaiman, M., 2017. Labor markets and poverty in village economies. *Quarterly Journal of Economics*, 132(2), 811–870.

Banerjee, A., E. Duflo, and G. Sharma, 2021. Long-term Effects of the Targeting the Ultra Poor Program. *American Economic Review: Insights,* 3(4): 471-486.

Barrett, C., K. Ghezzi-Kopel, J. Hoddinott, N. Homami, E. Tennant, J. Upton, and T. Wu, 2021. A Scoping Review of the Development Resilience Literature: Theory, Methods and Evidence, World Development 146: 105612.

Bastagli, F., Hagen-Zanker, J., Harman, L., Barca, V., Sturge, G., Schmidt, T., & Pellerano, L. 2019. *Cash transfers: What does the evidence say? A rigorous review of impacts and the role of design and implementation features*. London: Overseas Development Institute.

Blattman, C., Fiala, N., & Martinez, S. (2020). The Long-Term Impacts of Grants on Poverty: Nine-Year Evidence from Uganda's Youth Opportunities Program. *American Economic Review: Insights*, 2(3), 287–304.

Bottan, N., Hoffmann, B. and Vera-Cossio, D.A., 2021. Stepping up during a crisis: The unintended effects of a noncontributory pension program during the Covid-19 pandemic. *Journal of Development Economics*, 150, p.102635.

Cafiero, C., Viviani, S. and Nord, M., 2018. Food security measurement in a global context: The food insecurity experience scale. *Measurement*, 116, pp.146-152.

Cahyadi, Nur, Hanna, R., Olken, B. A., Prima, R. A., Satriawan, E., & Syamsulhakim, E., 2020. Cumulative Impacts of Conditional Cash Transfer Programs: Experimental Evidence from Indonesia. *American Economic Journal: Economic Policy*, 12(4): 88–110.

Carneiro, P., Kraftman, L., Mason, G., Moore, L., Rasul, I., & Scott, M., 2021. The Impacts of a Multifaceted Prenatal Intervention on Human Capital Accumulation in Early Life. *American Economic Review*, 111(8): 2506–2549.

Carraro, A., & Ferrone, L., 2020. How Effective are Cash Transfers in Mitigating Shocks for Vulnerable Children? Evidence on the impact of the Lesotho Child Grant Programme on multiple deprivations (WP-2020-12; Innocenti Working Paper).

Coleman, F., A. Ahmed, A. Quisumbing, S. Roy, and J. Hoddinott, 2023. Diets of Men and Women in Rural Bangladesh are Equitable but Suboptimal, *Current Developments in Nutrition*, 7(7).

Crosta, T., Karlan, D., Ong, F., Rüschenpöhler, J. and Udry, C., 2024. Unconditional Cash Transfers: A Bayesian Meta-Analysis of Randomized Evaluations in Low and Middle Income Countries.

Devereux, S., & Sabates-Wheeler, R., 2004. *Transformative Social Protection*. IDS Working Paper 232, Institute of Development Studies.

Dietrich, S. and Schmerzeck, G., 2019. Cash transfers and nutrition: The role of market isolation after weather shocks. Food Policy, 87, p.101739.

Grisolia, F., 2024. *Can cash transfers really be transformative? A literature review of the sustainability of their impacts.* Discussion paper/University of Antwerp. Institute of Development Policy and Management; Université d'Anvers. Institut de politique et de gestion du développement.-Antwerp.

Handa, S., Tembo, G., Natali, L., Angeles, G., & Spektor, G., 2019. In search of the holy grail: Can unconditional cash transfers graduate households out of poverty in Zambia?

Haushofer, J. and Shapiro, J., 2018. The long-term impact of unconditional cash transfers: experimental evidence from Kenya. Busara Center for Behavioral Economics, Nairobi, Kenya.

Hidrobo, M., Hoddinott, J., Kumar, N., & Olivier, M., 2018. Social Protection, Food Security, and Asset Formation. *World Development*, 101.

Hoddinott J., Ahmed, A., Karachiwalla, N.I., & Roy, S. 2018. Nutrition behaviour change communication causes sustained effects on IYCN knowledge in two cluster-randomised trials in Bangladesh. *Maternal and Child Nutrition*. Jan; 14(1): e12498.

International Labour Office. World Social Protection Report 2020–22: Social Protection at the Crossroads – in Pursuit of a Better Future. Geneva: ILO, 2021.

Londoño-Vélez, J., and P. Querubín, 2022. The impact of emergency cash assistance in a pandemic: Experimental evidence from Colombia. *Review of Economics and Statistics* 104(1): 157-165.

Macours, K., Premand, P., & Vakis, R., 2022. Transfers, Diversification and Household Risk Strategies: Can Productive Safety Nets Help Households Manage Climatic Variability? *Economic Journal*, 132(647), 2438–2470

Pople, A., Hill, R., Dercon, S. and Brunckhorst, B., 2021. Anticipatory Cash Transfers in Climate Disaster Response (No. 2021-07). Centre for the Study of African Economies, University of Oxford.

Premand, P., & Stoeffler, Q., 2020. Do Cash Transfers Foster Resilience? Evidence from Rural Niger (9473; World Bank Policy Research Working Paper).

Roy, S., Hidrobo, M., Hoddinott, J., Koch, B., & Ahmed, A. 2022. Can transfers and complementary nutrition programming reduce intimate partner violence four years post-program? Experimental evidence from Bangladesh. *Journal of Human Resources* Jun, 0720-11014R2.

Smith, M.D., Rabbitt, M.P. and Coleman-Jensen, A., 2017. Who are the world's food insecure? New evidence from the Food and Agriculture Organization's food insecurity experience scale. *World Development*, 93: 402-412.

Stoeffler, Q., Mills, B., & Premand, P., 2020. Poor Households' Productive Investments of Cash Transfers: Quasi-experimental Evidence from Niger. *Journal of African Economies*, 29(1): 63–89.

Tranchant, J. P., Gelli, A., Bliznashka, L., Diallo, A. S., Sacko, M., Assima, A., Siegel, E. H., Aurino, E., & Masset, E., 2019. The impact of food assistance on food insecure populations during conflict: Evidence from a quasi-experiment in Mali. *World Development*, 119: 185–202.

United Nations, 2017. Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313). United Nations: New York.

Wiesmann, D., Bassett, L., Benson, T. and Hoddinott, J., 2009. Validation of the world food programmes food consumption score and alternative indicators of household food security. Intl Food Policy Res Inst, Washington DC.

World Bank, 2024. *World Bank National Accounts Data*, accessed January 24, 2024. https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2022&locations=BD&start=2007.

Table 1: Impacts on household food insecurity, by year

	Food Insecurity Experience Scale (FIES)			Moderate or Severe Food Insecurity (based on FIES)		
	(1)	(2)	(3)	(4)	(5)	(6)
	2018	2021	2022	2018	2021	2022
Cash + BCC	-0.685***	-0.454**	-0.565**	-0.136***	-0.162***	-0.125***
	(0.243)	(0.197)	(0.220)	(0.050)	(0.053)	(0.042)
Cash	-0.243	0.052	-0.275	-0.047	-0.018	-0.066
	(0.207)	(0.194)	(0.231)	(0.046)	(0.056)	(0.044)
Food	-0.043	-0.102	0.067	-0.036	-0.102*	0.021
	(0.203)	(0.183)	(0.246)	(0.044)	(0.053)	(0.048)
Control mean	3.28	2.94	2.32	0.47	0.46	0.28
p: Cash=Cash+BCC	0.06	<0.01	0.16	0.06	<0.01	0.10
p: Food=Cash+BCC	<0.01	0.04	<0.01	0.03	0.21	<0.01
p: Cash=Food	0.30	0.36	0.14	0.80	0.10	0.04

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. OLS coefficients are reported. Standard errors are clustered at the village level. The outcome variable for the first three columns is the raw Food Insecurity Experience Scale (FIES), which ranges from 0 to 8. A higher number indicates higher food insecurity. The outcome variable for columns (4) to (6) is a dummy variable equaling one if the household is moderately or severely food insecurity, defined as a raw FIES score greater than 4. Baseline food insecurity levels are controlled for. Sample size is 1,635.

Table 2: Impact on Food Consumption Score and its components, 2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			Number of days consumed in last seven days						
	FCS	Low FCS	Staples	Vegetables, fruit	Pulses, legumes	Milk, dairy	Meat, fish, eggs	Oils, fats	Sugar
Cash + BCC	11.042***	-0.063***	-	0.233**	0.805***	0.766***	0.958***	-	0.228
	(1.673)	(0.022)		(0.079)	(0.157)	(0.224)	(0.159)		(0.151)
Cash	2.478	-0.020	-	0.068	0.246	0.100	0.128	-	0.035
	(1.859)	(0.026)		(0.089)	(0.196)	(0.222)	(0.175)		(0.158)
Food	2.133	-0.033	-	0.099	0.190	0.230	0.017	-	0.014
	(1.727)	(0.024)		(0.088)	(0.172)	(0.218)	(0.173)		(0.163)
Control mean	64.7	0.10	7.0	6.6	2.9	1.7	4.9	6.95	6.0
p: Cash=Cash+BCC	<0.01	0.03	-	0.01	<0.01	<0.01	<0.01	-	0.16
p: Food=Cash+BCC	<0.01	0.07	-	0.03	<0.01	0.02	<0.01	-	0.14
p: Cash=Food	0.85	0.55	-	0.66	0.76	0.56	0.53	-	0.89

Notes: The outcome variable is the Food Consumption Score (FCS). A higher FCS indicates better diversity and frequency of food group consumption. For columns (4) to (6), the outcome variable is the low Food Consumption Score, defined as FCS below 42. For additional notes, see Table 1.

Table 3: Health mechanisms: Impact of treatment on COVID-related outcomes, 2021

	(1)	(2)	(3)	(4)	(5)	(6)
	Any household member tested for COVID	Any household member with confirmed Covid-19	Any household member with 3 or more Covid-like symptoms	Any household member with 4 or more Covid-like symptoms	Number of Covid-19 like symptoms	Death of HH member
Cash + BCC	-0.006	-0.002	-0.021	-0.016	-0.097	-0.011
	(0.015)	(0.002)	(0.025)	(0.021)	(0.124)	(0.012)
Cash	-0.001	-0.000	-0.020	-0.015	-0.064	0.004
	(0.017)	(0.003)	(0.025)	(0.021)	(0.125)	(0.013)
Food	0.005	0.005	-0.020	-0.022	-0.113	0.002
	(0.015)	(0.005)	(0.025)	(0.019)	(0.114)	(0.013)
Control mean	0.044	0.002	0.059	0.044	0.291	0.042
p: Cash=Cash+BCC	0.76	0.31	0.98	0.96	0.78	0.23
p: Food=Cash+BCC	0.47	0.07	0.96	0.72	0.87	0.28
p: Cash=Food	0.73	0.30	0.97	0.69	0.64	0.90

Notes: See Table 1.

Table 4: Economic mechanisms: Impact on main earner's and second main earner's income-generating activities in 2021

	(1)	(2)	(3)	(4)	(5)	(6)
	HH has a main earner who worked last week	Main earner is self- employed	Main earner self-employed: poultry or cattle	HH has a 2nd earner who worked last week	2nd earner is self-employed	2nd earner self-employed: poultry or cattle
Cash + BCC	0.032	0.015	-0.005	0.077**	0.077**	0.083**
	(0.022)	(0.041)	(0.020)	(0.032)	(0.038)	(0.040)
Cash	0.007	-0.075*	-0.014	0.056*	0.006	0.018
	(0.021)	(0.043)	(0.018)	(0.032)	(0.036)	(0.036)
Food	0.022	-0.017	-0.003	0.062*	0.038	0.066*
	(0.022)	(0.043)	(0.019)	(0.034)	(0.036)	(0.037)
Control mean	0.897	0.526	0.066	0.738	0.648	0.538
p: Cash=Cash+BCC	0.22	0.03	0.65	0.46	0.05	0.08
p: Food=Cash+BCC	0.64	0.42	0.89	0.62	0.29	0.63
p: Cash=Food	0.46	0.17	0.54	0.85	0.35	0.15

Notes: See Table 1.

Table 5: Economic mechanisms: Impact on asset holdings (IHS transform), 2014 and 2018

	2014					2018				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total	Livestock	Tools, equipment	Cash Savings	Durables	Total	Livestock	Tools, equipment	Cash Savings	Durables
Cash + BCC	0.74	1.74	0.33	2.08	0.31	0.32	0.84	0.11	0.68	0.15
	(0.07)***	(0.24)***	(0.08)***	(0.23)***	(0.05)***	(0.08)***	(0.27)***	(0.12)	(0.20)***	(0.07)**
Cash	0.51	1.01	0.06	1.74	0.19	0.18	0.48	0.03	0.46	0.06
	(0.07)***	(0.26)***	(0.09)	(0.22)***	(0.05)***	(0.08)**	(0.31)	(0.12)	(0.20)**	(0.06)
Food	0.42	1.01	0.11	1.21	0.14	0.15	0.10	-0.07	0.31	0.01
	(0.07)***	(0.26)***	(0.08)	(0.25)***	(0.05)***	(0.09)*	(0.32)	(0.12)	(0.21)	(0.07)
Mean of Control	10.30	7.30	7.64	6.91	9.11	10.69	7.81	6.18	7.85	9.55
P-value: Cash=Cash+BCC	<0.01	<0.01	<0.01	0.11	0.02	0.08	0.21	0.51	0.22	0.14
P-value: Food=Cash+BCC	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.01	0.15	0.05	0.04

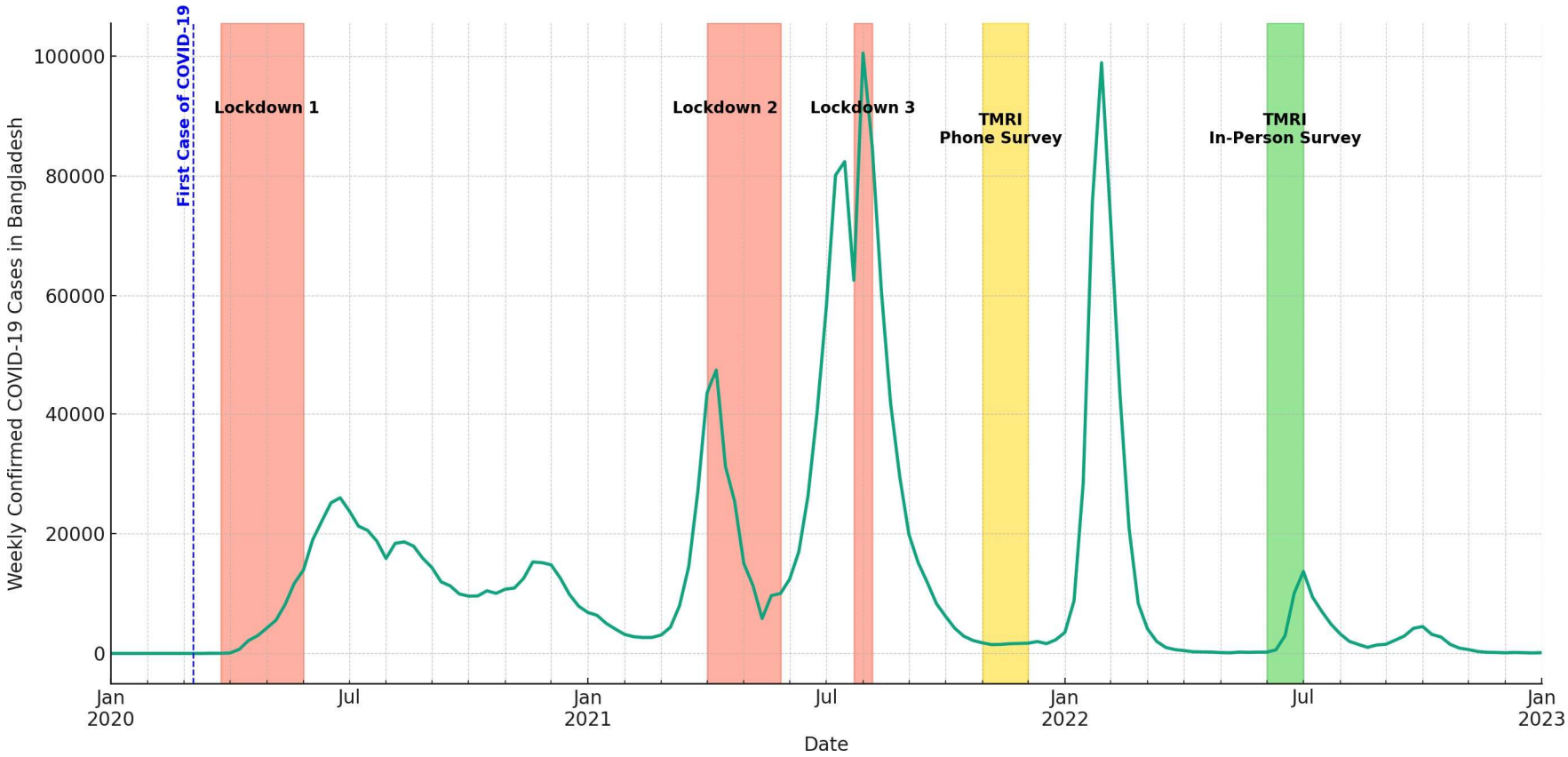
Notes: See Table 1.

Table 6: Economic mechanisms: Impact on reported severity of problems with accessing enough food during the 2020 and 2021 lockdowns

	First national lockdown (April - May 2020)			Most recent national lockdown (July - August 2021)		
	(1)	(2)	(3)	(4)	(5)	(6)
	Minor/Moderate/ Severe	Moderate/Severe	Severe	Minor/Moderate/ Severe	Moderate/Severe	Severe
Cash + BCC	-0.001	-0.047	-0.099*	-0.024	-0.111**	-0.117**
	(0.028)	(0.043)	(0.057)	(0.029)	(0.056)	(0.047)
Cash	0.048**	0.052	0.020	0.003	-0.019	0.027
	(0.023)	(0.042)	(0.057)	(0.028)	(0.055)	(0.056)
Food	0.044*	0.031	0.027	0.027	0.019	0.013
	(0.024)	(0.043)	(0.057)	(0.028)	(0.051)	(0.055)
Control mean	0.878	0.716	0.457	0.885	0.689	0.362
p: Cash=Cash+BCC	0.05	0.02	0.04	0.34	0.11	<0.01
p: Food=Cash+BCC	0.08	0.07	0.03	0.08	0.02	<0.01
p: Cash=Food	0.85	0.60	0.90	0.37	0.48	0.80

Notes: See Table 1.

Figure 1: Covid-19 and survey timeline



Online Appendix

Table A.1: Correlates of sample attrition, by round and intervention arm

	(1)	(2)	(3)
	Attrited - 2018	Attrited - 2021	Attrited - 2022
Cash + BCC	0.034	0.020	0.014
	(0.021)	(0.029)	(0.019)
Cash	0.004	-0.030	0.002
	(0.019)	(0.026)	(0.017)
Food	0.010	-0.026	0.018
	(0.021)	(0.026)	(0.019)
Control mean	0.082	0.142	0.082
Number of obs	2,000	2,000	2,000
p: Cash=Cash+BCC	0.15	0.08	0.48
p: Food=Cash+BCC	0.28	0.10	0.84
p: Cash=Food	0.77	0.87	0.35

Notes: OLS coefficients reported. Standard errors are clustered at the village level.

Table A2: Baseline (2012) summary statistics by treatment arm

	Means				P-val of diff.		
	Cash	Food	Cash+BCC	Control	Cash - Control	Food - Control	Cash+BCC - Control
Household size	4.69	4.68	4.82	4.83	0.16	0.12	0.94
Number of children age 0-4	1.23	1.23	1.27	1.29	0.07	0.09	0.55
Number of children age 5-14	1.04	1.08	1.10	0.99	0.42	0.15	0.19
Head's years schooling	1.49	1.23	1.43	1.43	0.78	0.26	1.00
Main female's years schooling	2.30	2.14	2.10	2.37	0.76	0.30	0.25
Female-headed household	0.06	0.08	0.08	0.06	0.95	0.28	0.43
Total owned land in decimals	14.1	14.7	13.7	15.4	0.65	0.81	0.53
Monthly food consumption per capita (Taka)	875	869	898	850	0.51	0.61	0.54
Monthly non-food consumption per capita (Taka)	493	503	464	480	0.67	0.41	0.56
Monthly total consumption per capita (Taka)	1,369	1,373	1,363	1,331	0.55	0.49	0.73
Total assets (Taka)	21,412	23,041	19,883	22,674	0.66	0.91	0.28
Loans (Taka)	7,361	8,066	6,718	7,732	0.70	0.79	0.27
Net assets (Taka)	14,051	14,974	13,165	14,942	0.74	0.99	0.47

Notes: Adapted from Ahmed et al (2024).

Table A3: Impacts on household food insecurity using Poisson regression, by year

	Food Insecurity Experience Scale (FIES)		
	(1)	(2)	(3)
	2018	2021	2022
Cash + BCC	-0.234***	-0.168**	-0.292***
	(0.087)	(0.073)	(0.108)
Cash	-0.077	0.017	-0.125
	(0.065)	(0.065)	(0.106)
Food	-0.013	-0.035	0.008
	(0.062)	(0.063)	(0.104)
Control mean	3.281	2.939	2.330
Number of obs	1,635	1,635	1,635
p: Cash = Cash+BCC	0.07	<0.01	0.12
p: Food = Cash+BCC	<0.01	0.04	<0.01
p: Cash = Food	0.30	0.36	0.21

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Poison regression coefficients are reported. Standard errors are clustered at the village level.

Table A4: Impacts on household food insecurity using Probit regression, by year

	Moderate or Severe Food Insecurity (based on FIES)		
	(1)	(2)	(3)
	2018	2021	2022
Cash + BCC	-0.137***	-0.162***	-0.137***
	(0.050)	(0.052)	(0.043)
Cash	-0.046	-0.017	-0.059
	(0.045)	(0.053)	(0.042)
Food	-0.035	-0.100*	0.010
	(0.043)	(0.051)	(0.041)
Control mean	0.467	0.465	0.279
Number of obs	1,635	1,635	1,635
p: Cash=Cash+BCC	0.06	<0.01	0.05
p: Food=Cash+BCC	0.03	0.21	<0.01
p: Cash=Food	0.80	0.10	0.08

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. Marginal effects for probit regressions are reported. Standard errors are clustered at the village level.

Table A5: Impact of treatment on household Food Insecurity Experience Scale (FIES) components, by year

2018

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Worried about food	Didn't eat healthy	Ate few kinds	Skipped meal	Ate less	Ran out of food	Hungry but didn't eat	Didn't eat whole day
Cash + BCC	-0.092*	-0.119**	-0.175***	-0.143**	-0.071	-0.045	-0.014	-0.026
	(0.038)	(0.040)	(0.050)	(0.049)	(0.037)	(0.047)	(0.027)	(0.014)
Cash	-0.031	-0.050	-0.047	-0.043	-0.029	-0.039	0.004	-0.008
	(0.031)	(0.036)	(0.040)	(0.045)	(0.035)	(0.044)	(0.026)	(0.016)
Food	-0.006	0.019	-0.015	-0.022	0.006	-0.006	-0.001	-0.017
	(0.029)	(0.033)	(0.038)	(0.044)	(0.038)	(0.045)	(0.028)	(0.015)
Control mean	0.804	0.697	0.677	0.482	0.222	0.230	0.120	0.049
p: Cash=Cash+BCC	0.12	0.100	0.013	0.040	0.210	0.877	0.487	0.168
p: Food=Cash+BCC	0.02	<0.01	<0.01	0.012	0.038	0.357	0.647	0.453
p: Cash=Food	0.40	0.048	0.420	0.638	0.308	0.402	0.856	0.514

2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Worried about food	Didn't eat healthy	Ate few kinds	Skipped meal	Ate less	Ran out of food	Hungry but didn't eat	Didn't eat whole day
Cash + BCC	-0.007	-0.124*	-0.102	-0.188**	-0.013	-0.026	0.009	-0.002
	(0.042)	(0.053)	(0.060)	(0.057)	(0.019)	(0.015)	(0.021)	(0.004)
Cash	0.042	-0.005	-0.015	-0.018	0.022	-0.008	0.035	-0.000
	(0.038)	(0.048)	(0.057)	(0.058)	(0.026)	(0.019)	(0.025)	(0.005)
Food	0.006	0.033	-0.006	-0.103	-0.017	-0.022	0.012	-0.005
	(0.038)	(0.046)	(0.057)	(0.056)	(0.022)	(0.016)	(0.026)	(0.003)
Control mean	0.856	0.697	0.648	0.567	0.076	0.042	0.049	0.005
p: Cash=Cash+BCC	0.21	0.02	0.11	<0.01	0.17	0.25	0.35	0.59
p: Food=Cash+BCC	0.74	<0.01	0.08	0.12	0.82	0.72	0.92	0.32

p: Cash=Food	0.29	0.36	0.85	0.13	0.15	0.38	0.46	0.15

2022

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Worried about food	Didn't eat healthy	Ate few kinds	Skipped meal	Ate less	Ran out of food	Hungry but didn't eat	Didn't eat whole day
Cash + BCC	-0.082	-0.090	-0.082	-0.088	-0.058	-0.097**	-0.065**	-0.002
	(0.050)	(0.047)	(0.043)	(0.050)	(0.034)	(0.034)	(0.022)	(0.009)
Cash	-0.068	-0.066	-0.062	0.004	-0.023	-0.047	-0.012	-0.000
	(0.049)	(0.049)	(0.044)	(0.053)	(0.035)	(0.037)	(0.025)	(0.009)
Food	0.005	-0.019	0.002	0.037	0.016	0.011	-0.008	0.022
	(0.051)	(0.050)	(0.047)	(0.053)	(0.035)	(0.037)	(0.027)	(0.011)
Control mean	0.567	0.474	0.496	0.318	0.154	0.188	0.108	0.015
p: Cash=Cash+BCC	0.79	0.62	0.645	0.05	0.22	0.07	<0.01	0.83
p: Food=Cash+BCC	0.11	0.16	0.08	<0.01	0.01	<0.01	<0.01	0.03
p: Cash=Food	0.17	0.36	0.19	0.51	0.20	0.06	0.86	0.04

Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. OLS coefficients are reported. Standard errors are clustered at the village level. Regression results for the eight binary (yes/no) questions that comprise the Food Insecurity Experience Scale (FIES) are reported. Sample size is 1,635.

Table A6: Impacts on household Food Consumption Score (FCS), by year

	Food Consumption Score (FCS)			Low Food Consumption Score (FCS<42)		
	(1)	(2)	(3)	(4)	(5)	(6)
	2018	2021	2022	2018	2021	2022
Cash + BCC	13.027***	11.042***	7.306***	-0.253***	-0.068***	-0.069***
	(1.452)	(1.673)	(1.378)	(0.036)	(0.024)	(0.023)
Cash	1.781	2.478	2.441*	-0.047	-0.016	-0.035*
	(1.371)	(1.859)	(1.380)	(0.029)	(0.022)	(0.018)
Food	2.765*	2.133	0.024	-0.055*	-0.028	-0.008
	(1.412)	(1.727)	(1.425)	(0.029)	(0.021)	(0.018)
Control mean	53.787	64.742	63.780	0.306	0.098	0.093
Number of obs	1,635	1,635	1,635	1,635	1,635	1,635
p: Cash=Cash+BCC	<0.01	<0.01	<0.01	<0.01	0.028	0.10
p: Food=Cash+BCC	<0.01	<0.01	<0.01	<0.01	0.070	<0.01
p: Cash=Food	0.44	0.85	0.10	0.75	0.55	0.13

* p < 0.10, ** p < 0.05, *** p < 0.01. OLS coefficients are reported. Standard errors are clustered at the village level. The outcome variable for the first three columns is the raw Food Consumption Score (FCS). A higher FCS indicates better diversity and frequency of food group consumption. For columns (4) to (6), the outcome variable is the low Food Consumption Score, defined as FCS below 42. For each regression, the baseline value of the outcome variable is controlled for.

Table A.7: Impact of treatment on protective behavior against COVID in 2021, by intervention arm

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Num of protective measures	Avoided gatherings	Avoided place of worship	Avoided public transport	Practised soc. distancing	Avoided shaking hands	Used masks
Cash + BCC	0.028	-0.025	-0.062**	-0.014	0.009	0.045	0.076***
	(0.164)	(0.046)	(0.031)	(0.041)	(0.044)	(0.060)	(0.026)
Cash	0.225	0.092	-0.086***	0.079	0.021	0.080	0.039
	(0.202)	(0.056)	(0.030)	(0.052)	(0.052)	(0.065)	(0.028)
Food	-0.091	-0.025	-0.035	-0.035	0.016	-0.014	0.001
	(0.162)	(0.046)	(0.031)	(0.036)	(0.046)	(0.062)	(0.030)
Control mean	1.773	0.156	0.186	0.108	0.110	0.367	0.846
Number of obs	1,635	1,635	1,635	1,635	1,635	1,635	1,635
p: Cash=Cash+BCC	0.33	0.03	0.32	0.09	0.81	0.58	0.17
p: Food=Cash+BCC	0.46	0.99	0.29	0.60	0.87	0.33	0.01
p: Cash=Food	0.12	0.03	0.04	0.03	0.93	0.15	0.20

Table A8: Impacts on access to social protection programs, 2021

	Government			NGO		
	(1)	(2)	(3)	(4)	(5)	(6)
	Any Assistance	Any Cash	Any In-Kind	Any Assistance	Any Cash	Any In-Kind
Cash + BCC	-0.010	0.014	-0.078*	-0.025	0.003	-0.012
	(0.018)	(0.029)	(0.046)	(0.037)	(0.006)	(0.015)
Cash	-0.008	-0.010	0.025	0.029	0.019**	-0.010
	(0.022)	(0.032)	(0.045)	(0.044)	(0.009)	(0.017)
Food	-0.012	-0.011	-0.058	-0.037	0.010	-0.015
	(0.021)	(0.030)	(0.046)	(0.035)	(0.007)	(0.015)
Control mean	0.932	0.817	0.462	0.166	0.007	0.029
Number of obs	1,635	1,635	1,635	1,635	1,635	1,635
p: Cash=Cash+BCC	0.93	0.46	0.02	0.18	0.08	0.91
p: Food=Cash+BCC	0.93	0.41	0.66	0.68	0.37	0.74
p: Cash=Food	0.88	0.97	0.06	0.08	0.35	0.70

* p < 0.10, ** p < 0.05, *** p < 0.01. OLS regression coefficients are reported. Standard errors are clustered at the village level.

Table A9: Impact of treatment on self-assessed changes in income, 2021

Main earner

	Compared to Pre-pandemic period:			Compared 6 months ago:		
	(1)	(2)	(3)	(4)	(5)	(6)
	Decreased	Same	Increased	Decreased	Same	Increased
Cash + BCC	0.012	-0.037	0.025	-0.011	-0.080**	0.091**
	(0.047)	(0.035)	(0.036)	(0.044)	(0.033)	(0.037)
Cash	0.031	-0.033	0.002	-0.009	-0.054	0.063*
	(0.042)	(0.038)	(0.034)	(0.046)	(0.034)	(0.036)
Food	-0.010	-0.017	0.027	-0.006	-0.030	0.036
	(0.037)	(0.040)	(0.031)	(0.042)	(0.035)	(0.035)
Control mean	0.553	0.251	0.197	0.504	0.235	0.262
Number of obs	1,629	1,629	1,629	1,625	1,625	1,625
p: Cash=Cash+BCC	0.70	0.92	0.55	0.95	0.43	0.49
p: Food=Cash+BCC	0.62	0.63	0.94	0.91	0.13	0.18
p: Cash=Food	0.31	0.71	0.44	0.96	0.47	0.50

Second earner

	Compared to Pre-pandemic period:			Compared 6 months ago:		
	(1)	(2)	(3)	(4)	(5)	(6)
	Decreased	Same	Increased	Decreased	Same	Increased
Cash + BCC	-0.063	-0.084	0.147***	-0.081*	-0.060	0.142***
	(0.044)	(0.051)	(0.046)	(0.045)	(0.054)	(0.047)
Cash	-0.010	-0.064	0.073*	0.018	-0.064	0.046
	(0.041)	(0.050)	(0.044)	(0.047)	(0.052)	(0.046)
Food	0.000	-0.068	0.068	0.003	-0.055	0.053
	(0.048)	(0.048)	(0.042)	(0.048)	(0.052)	(0.044)
Control mean	0.327	0.437	0.236	0.383	0.390	0.227
Number of obs	1,350	1,350	1,350	1,317	1,317	1,317
p: Cash=Cash+BCC	0.170	0.676	0.124	0.035	0.939	0.055
p: Food=Cash+BCC	0.170	0.739	0.092	0.079	0.918	0.059

p: Cash=Food	0.813	0.915	0.908	0.761	0.853	0.889

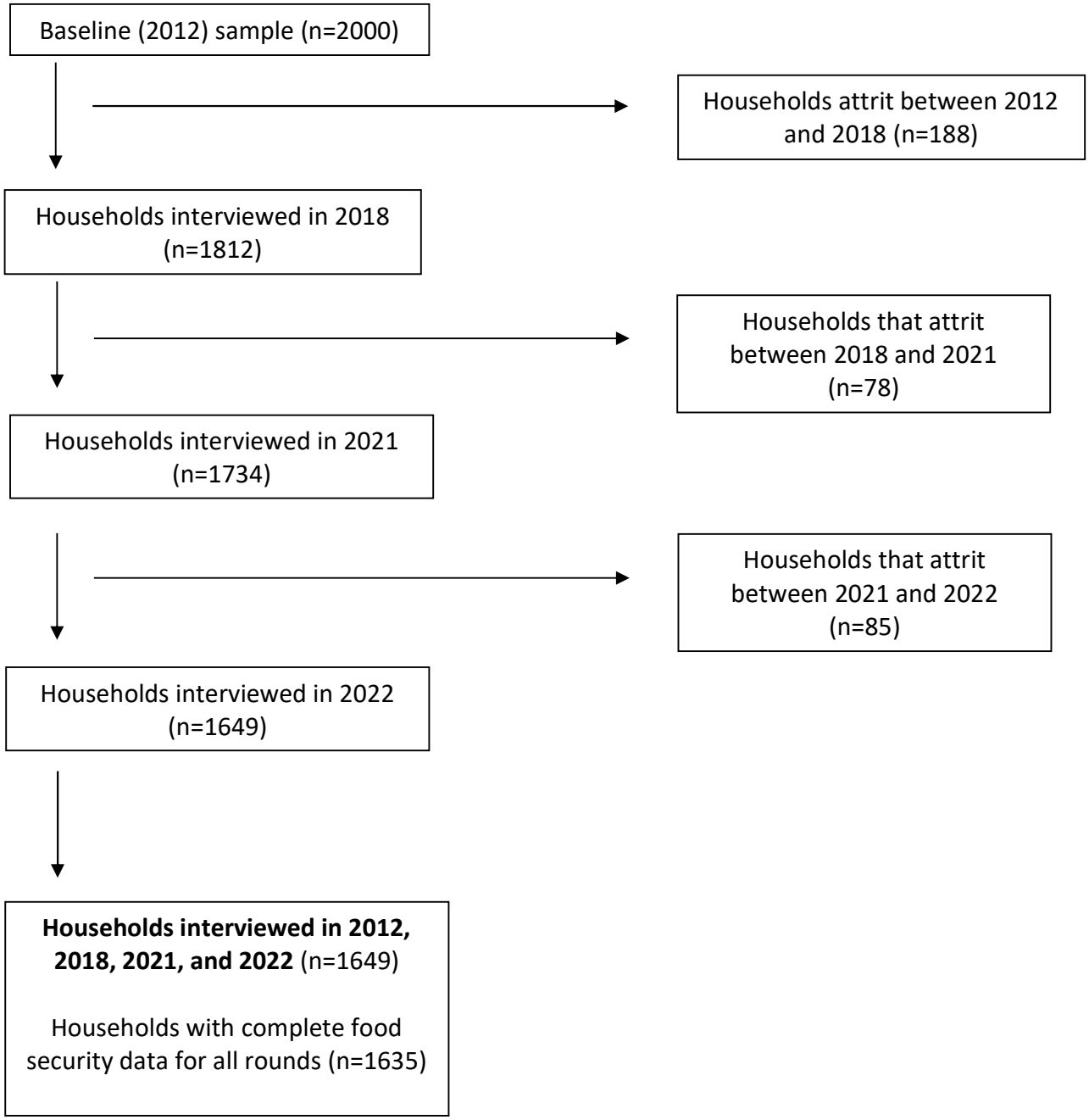
Notes: * p < 0.10, ** p < 0.05, *** p < 0.01. OLS coefficients are reported. Standard errors are clustered at the village level.

Table A10: Impact on number of income-generating activities (IGAs), 2022

	All adults		Adult men		Adult women	
	(1)	(2)	(3)	(4)	(5)	(6)
	Total IGAs	Poultry or livestock	Total IGAs	Poultry or livestock	Total IGAs	Poultry or livestock
Cash + BCC	0.468**	0.230*	0.207*	0.060	0.255**	0.166**
	(0.198)	(0.117)	(0.112)	(0.054)	(0.119)	(0.082)
Cash	0.398***	0.210*	0.235**	0.097*	0.164*	0.114
	(0.149)	(0.112)	(0.096)	(0.055)	(0.088)	(0.075)
Food	0.220	0.093	0.092	0.037	0.126	0.054
	(0.135)	(0.106)	(0.089)	(0.052)	(0.079)	(0.071)
Control mean	2.716	1.384	1.548	0.430	1.174	0.96
p: Cash=Cash+BCC	0.73	0.87	0.82	0.48	0.46	0.52
p: Food=Cash+BCC	0.20	0.22	0.32	0.65	0.27	0.15
p: Cash=Food	0.21	0.27	0.15	0.25	0.66	0.40

* p < 0.10, ** p < 0.05, *** p < 0.01. OLS coefficients reported. Standard errors are clustered at the village level. Sample size is 1,635.

Figure A1: Participant flow diagram



ALL IFPRI DISCUSSION PAPERS

All discussion papers are available **here**

They can be downloaded free of charge

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
www.ifpri.org

IFPRI HEADQUARTERS
1201 Eye Street, NW
Washington, DC 20005 USA
Tel.: +1-202-862-5600
Fax: +1-202-862-5606
Email: ifpri@cgiar.org