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Including Scalable Nutrition Interventions in a Graduation Model Program

Experimental Evidence from Ethiopia

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Abstract

We explore the impact of different models of scalable nutrition services embedded within a light-touch graduation program, implemented at scale in Ethiopia. The graduation program provided poor households enrolled in Ethiopia's national safety net, the Protective Safety Net Program (PSNP), with additional livelihood programming including savings groups, business skills training and linkages to financial services. In addition, extremely poor households received a one-time livelihood grant on an experimental basis, as cash transfers or in-kind poultry grants, at a value much smaller than lump sum transfers in other graduation model programs in recent literature. The experiment compared a core nutrition model of nutrition information and sanitation and hygiene activities to an enhanced model that added more intensive nutrition messaging, supplementary feeding of malnourished children, mental health services, and a male engagement activity. Results show that interaction with health care workers and participation in community health activities increased significantly under the enhanced nutrition model, as did maternal nutritional knowledge. Nevertheless, neither nutrition model led to significant improvements in child dietary diversity or anthropometric outcomes on average. However, cash livelihood grants combined with the enhanced nutrition model reduced childhood stunting.

Keywords: livelihood grants, nutrition sensitive social protection, transfers

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Acronyms

ASTE: average standard treatment effects

BHA: USAID's Bureau of Humanitarian Assistance

CHF: Community Health Facilitators

CLTSH: community-led total sanitation and hygiene

CN: core nutrition service

CPNP: Community-Based Participatory Nutrition Promotion sessions

cRCT: cluster randomized control trial

EN: enhanced nutrition

HDA: Health Development Army

HEWs: health extension workers

IYCF: infant and young child feeding

ODF: Open Defecation Free

ORDA: Organization for Rehabilitation and Development

LMICs: low- and middle-income countries

PSNP: Productive Safety Net Program

TTC: Timed and Targeted Counseling

TUP: Targeting the Extremely poor program

VESAs: Village Economic and Social Associations

WASH: water, sanitation, and hygiene

Introduction

Developing countries spend, on average, 1.5 percent of GDP on social safety net programs and reach over 1 billion people with at least one program (World Bank, 2018). Such programs have multiple goals. They seek to both address current consumption and poverty and to facilitate investments that will reduce future poverty (Das, Do, Ozler 2005). Their success in the first goal is readily apparent; transfers reduce the incidence of absolute poverty (US$1.90 PPP per day) by 36 percent (World Bank, 2018). Impacts on a diverse set of productive investments are also apparent, albeit often less pronounced, partially reflecting their multiple objectives. These range from increased schooling (Baird et al. 2014), enhanced agricultural earnings (Gertler, Martinez, and Rubio-Codina 2012), and additional migration for employment (Ardington, Case, and Hosegood 2009). Another explicit objective for many transfer programs is improved nutrition. Favorable impacts on anthropometric outcomes are commonly noted although, on average, these are small. For example, Manley et al. (2022) found a significant, but modest 1.35 percent average reduction in child stunting from cash transfer programs in a recent meta-analysis of 129 studies.

Graduation model programs expand on the concept of targeted cash or food transfers supporting consumption, by providing an additional lump sum asset or cash transfer designed to promote and sustain poverty alleviation. These graduation programs often include intensive livelihood training or mentoring to support higher earnings as well as measures to promote financial inclusion (Bandiera et al. 2017; Banerjee et al. 2015; Bossuroy et al. 2022). Occasionally, they also include explicit measures to increase women's empowerment or reduce stress. Graduation model programs have been tested in many countries following the publication of results from a six-country study of programs styled after BRAC's Targeting the Extremely poor (TUP) program in Ethiopia, Ghana, Honduras, India, Pakistan, and Peru (Banerjee et al.

2015). Evaluations of these programs have demonstrated their potential to improve economic outcomes, but most of these programs were not designed to include nutrition interventions and generally do not report impacts on nutrition outcomes.

Graduation model programs may be strengthened by including nutrition objectives and explicit nutrition programming for several reasons. Graduation programs are frequently targeted to the extreme poor in low- and middle-income countries (LMICs). Malnutrition is often, but not always, co-located with this poverty. Thus, reducing malnutrition is consistent with the objective of graduation programs to achieve sustainable long-term improvements in wellbeing for participants and their communities and to address outcomes beyond monetary poverty. There is some evidence that transfers must be accompanied with other design features such as nutrition training and access to health services to be effective (Manley et al. 2022; Ahmed et al. 2019). Still, currently little is known about how to design graduation programs in terms of the size of the asset transfer and the approach to nutrition services to successfully achieve improvements in child nutrition.

The current study aims to address this lacuna. It reports the results of a cluster randomized control trial (cRCT) to assess the impact on child nutrition of a 'light-touch' graduation program that includes nutrition interventions of varying intensity, provided to beneficiaries of Ethiopia's Productive Safety Net Program (PSNP), one of the largest social protection programs on the continent.[1] Implemented at scale, the graduation program provided PSNP beneficiaries with additional livelihood programming including savings groups, business skills training and linkages to financial services. In addition, extremely poor households received a one-time livelihood transfer on an experimental basis, either as cash transfers or in-kind poultry

[1] The PSNP provides monthly consumption support for six months per year as payment for participation in labor-intensive public works (80 percent of beneficiaries) or for twelve months as direct support to labor scarce households (20 percent of beneficiaries).

grants. These were at a value much smaller than those studied in Banerjee et al. (2015), which were up to 4 times larger (in 2017 PPP dollars) and had accompanying intensive livelihoods training and technical support.

Child stunting, and infant and young child feeding (IYCF) practices and knowledge were the primary and secondary nutrition outcomes[2] evaluated by this cRCT, which was adequately powered to assess a significant difference in these outcomes. Using this data this paper makes two main contributions to the literature on graduation. First, it documents the contribution of both cash and in-kind livelihood support on nutrition. Second, it indicates whether such grants can be enhanced with the provision of nutritional services. Results show that interaction with health care workers and participation in community health activities increased significantly under the enhanced nutrition model, as did maternal nutritional knowledge. Neither nutrition model led to significant improvements in child stunting on average. However, cash livelihood grants combined with the enhanced nutrition model reduced childhood stunting.

Study Context in Relation to Current Literature

Behavioral change communication (BCC) is a regular component of nutrition interventions. Keats et al. (2021) deem the evidence on the contribution of BCC for effective implementation of breastfeeding promotion and for education on complementary feeding in conjunction with food provision to be strong in food insecure settings but only moderate without food provision in more food secure populations. This implies potential program complementarity with transfer programs (Olney et al. 2022). A few programs that include regular grants during the critical years for child growth as well as packages of services along with nutrition focused BCC have reported significant impacts on child nutrition (Cahyadi et al. 2020; Carneiro et al. 2021).

[2] The pre-analysis plan for the evaluation is linked at the AEA RCT registry for this trial (registry number AEARCTR-0008281): https://www.socialscienceregistry.org/trials/8281.

However, only a few studies have directly assessed the impact of BCC in conjunction with transfers compared to transfers alone (Little et al. 2021; Field and Maffioli 2021; Ahmed, Hoddinott, and Roy 2019). Although ultimately the goal of behavioral change is generally to improve nutritional outcomes, studies often focus on knowledge and behaviors around IYCF which appear more responsive to interventions than do anthropometric indicators. For example, Han, Kim, and Park (2021) look at BCC and food vouchers in Ethiopia and conclude that neither intervention alone influences child feeding practices or chronic child undernutrition, but the combination does.

This is the first study we are aware of to provide systematic evidence on the effectiveness of nutrition BCC delivered at scale as an integral part of a graduation program for extremely poor households on child growth. While the literature on graduation programs regularly examines impacts on food security, relatively few studies look at child nutritional status or diet diversity among transfer recipients. For example, none of the six country studies in the seminal paper by Banerjee et al. (2015) nor those by Bandiera et al. (2017), Blattman, Fiala, and Martinez (2020), or Bosseroy et al. (2022)[3] include evidence on child stunting or underweight[4]. Haushofer and Shapiro (2016) report results on an overall health index in which nutrition is a component but find no impact from either the monthly or the larger lump sum transfer on this composite measure. McIntosh and Zeitlin (2021) show the impact of lump sum transfers on nutritional outcomes and compare the impact to an in-kind nutritional and maternal health intervention in Rwanda with cash transfers and find significant effects on anthropometric outcomes in one sub-arm of the cash component in the study. However, they do not explore the complementarity of cash in health interventions.

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[3] The working paper version, Bosseroy et al. (2021), however, did report on anthropometrics. That paper found no significant effects on height or weight for age of children.

[4] Raza, Van de Poel, and Van Ourti (2018) report reduced wasting after 4 years in the communities Bandiera et al. (2017) studied. However, wasting is a short-term measure generally concentrated among children under 2.

As well as comparing cash transfers to in-kind services, McIntosh and Zeitlin (2021) include a range of transfer allocations to benchmark the size of transfers that might result in improved nutrition. They find that only the largest transfer, which was more than twice as large as the one in the light-touch graduation program studied here, had an impact of 0.1 standard deviations on anthropometry, significant at the 10 percent level.[5] The current study builds on those findings by investigating whether a considerably smaller transfer than provided in several published graduation programs can enhance child nutritional status by exploiting complementarities in scalable nutrition-focused services.

In addition to exploring complementarity within a graduation program, the study's experimental design compares the impact of two models of nutrition investment, an enhanced model of more intensive BCC along with components designed to strengthen male support to investments in child nutrition and support to women's wellbeing, including mental health as well as a less intensive community nutrition program that did not directly support household visits. The goal of the intensive mode of delivery is in keeping with Kim et al. (2020) who report results of trials in Bangladesh, Ethiopia, and Vietnam designed to directly compare intensive interpersonal contact relative to alternate standard nutrition BCC programs. All three of these studies confirmed that the frequency of contact matters for diet diversity and breastfeeding practices. Kim et al. (2019) also modeled dose response for improved height for age with a combination of platforms in a companion study in Ethiopia. The current study – investigating a program that reached over half a million beneficiaries - adds to the literature on nutrition program intensity within the context of an integrated graduation model program.

Evaluation Design

[5] Plausibly, the 13-month study might be a lower bound since some anthropometric impacts are cumulative (Alderman and Headey 2018).

While the PSNP was initiated in 2005, it did not include a specific nutrition component until the fourth phase (PSNP4) launched in 2015 (Berhane et al. 2020). To date, neither the earlier stages nor the fourth phase of PSNP have shown any acceleration of the national trend in reducing stunting (Berhane et al. 2020; Abay et al. 2023). USAID's Bureau of Humanitarian Assistance (BHA) supported the PSNP4 in selected woredas (districts) through the Strengthen PSNP4 Institutions and Resilience (SPIR) graduation program. In addition to supporting implementation of PSNP4 SPIR also provided additional complementary livelihood, nutrition, gender, and natural resource management activities led by World Vision in partnership with the Organization for Rehabilitation and Development (ORDA) and CARE. SPIR targeted more than 500,000 PNSP clients in 15 of the most vulnerable woredas in Amhara and Oromia regions of Ethiopia and provided community-level programming and capacity building of government staff involved in public service delivery at the woreda (district) and kebele (subdistrict) level.

The trial included three treatment arms and a control group. One treatment arm provided a package of enhanced nutrition (EN) services including support for household-level BCC, recuperative feeding for acutely malnourished children, promotion of male engagement in household tasks, and group therapy for mothers screened for depressive symptoms. A subset of the poorest beneficiaries within this arm also received an additional one-time grant either in cash or as poultry assets as a part of the enhanced livelihood program component. A second treatment arm provided the enhanced livelihood program treatment with a less intensive and less costly core nutrition service (CN). A third treatment arm provided the same enhanced package of nutrition services as the first treatment arm but without the enhanced livelihood program including grants. All three treatment arms also provided a set of core services including promotion of savings and access to credit through Village Economic and Social Associations (VESAs).

Across all treatment arms, as well as the control group, PSNP clients participating in public works were eligible to attend six monthly 2-hour BCC sessions in place of 4 person-days of work over the six-month period. Also in all treatment arms, a water, sanitation, and hygiene (WASH) component included implementation of a community-led total sanitation and hygiene (CLTSH) activity and Open Defecation Free (ODF) public education events, as well as the provision of support to village-level WASH management activities and limited support to improving potable water and sanitation infrastructure (water sources and latrines). In both the CN and EN treatments these services were augmented by IYCF and nutrition BCC discussions in VESAs. Topics covered included optimal IYCF practices, adolescent and maternal nutrition, diversified sources of nutritious foods, and utilization of health and nutrition services.

The EN interventions built upon these core nutrition activities by supporting government health extension staff and volunteers to additionally deliver BCC lessons on IYCF practices and adolescent and maternal nutrition through a Timed and Targeted Counseling (TTC) model at the household level. The TTC model envisions 11 home visits in the first 1,000 days after conception, 4 of which should be during pregnancy, 2 in the first month post-partum, 4 more when the child is between 1 and 12 months and another visit when the child is between 14 and 18 months. Additional services in the EN treatment kebeles were targeted to caregivers of children screened for acute malnutrition based on mid-upper arm circumference or underweight based on weight for age. These Community-Based Participatory Nutrition Promotion sessions (CPNP) included training on complementary feeding and caring practices within two-week intensive feeding sessions.

These activities were coordinated by trained Community Health Facilitators (CHF) who were recruited and assigned to each of the kebeles to support the health extension workers (HEWs) in planning, coordinating, and facilitating health and nutrition activities. The CHF also supported local Health Development Army (HDA) volunteers to conduct household-level counseling related to IYCF and maternal nutrition using the TTC approach. Both husband and wife were encouraged to be present for these counseling sessions to promote male engagement in targeted IYCF and maternal nutrition actions. In addition, local facilitators supported the formation of men's engagement groups and facilitated eight sessions designed to critically reflect on cultural gender norms and explore the positive and perceived negative effects of male involvement in household chores and childcare activities that were typically assigned as women's only tasks.[6] Figure 1 summarizes the key programs by treatment arm. These services were not provided in the control.

Comparatively poor households among the already food insecure PSNP client households in the two enhanced livelihood program treatment arms received a livelihood transfer ($200 equivalent in local currency). The kebeles in these arms of the study were randomly selected to provide either a one-time cash transfer to the subset of relatively poor households or a poultry package of equivalent value. In each of these kebeles the 10 poorest households of the baseline survey sample of 18 households were chosen to receive these transfers through a ranking assessment based on an asset index. The asset index included ownership data on more than 30 asset categories, including consumer durables, productive assets, livestock, and land. It was constructed using principal components analysis, in which the first component maximizes the variation of all variables explained by that component, and therefore gives high weights to variables that are highly correlated with each other (Filmer and Pritchett 2001). These households are the main focus of this study and are deemed extremely poor in subsequent discussion.

Data

[6] Furthermore, women were screened for depression in the midline survey and those with symptoms of depression – roughly 20 percent - were invited to participate in group therapy sessions.

The data were collected over three rounds, with a baseline collected between February and April 2018, a midline survey between July and October 2019, and an endline survey originally planned for 2020, 24 months after the baseline, but delayed an additional 12 months due to COVID-19. Initially, 196 kebeles in Amhara (115 kebeles) and Oromia (81 kebeles) regions were selected for the trial and subsequently randomized into treatment groups. However, two kebeles had no PSNP clients and thus were not eligible for the program. Two other kebeles experienced ongoing civil unrest and were necessarily dropped from the project. Thus, the evaluation sample comprises 192 kebeles. In each kebele, 18 households were randomly sampled, leading to a planned baseline sample of 3,456 households in the study. The inclusion criteria for the sample were that households had to (1) be a PSNP client household, (2) have at least one child aged 0-35 months (the *index* child), and (3) have the mother or primary female caregiver[7] of the 0-35-month-old child as a member of the household. The last criterion enabled measurement of maternal and child diets as well as child-care for nutritionally vulnerable ages in all sample households. The actual baseline sample consisted of 3,314 households.

The endline survey sought to re-interview any baseline household unless it had permanently moved or dissolved by the time of the midline survey. Of the 3,248 households in the endline target sample, 3,094 were located and interviewed, implying an attrition rate of 4.7 percent relative to the target sample, or 6.6 percent relative to the original baseline sample. Nearly half of the attrition (70 households or 2 percent of the target sample) at endline was due to insecurity in one of the operational woredas in Amhara that resulted in a decision not to visit four kebeles. Among the remaining 84 attrited households, 48 had moved out of the study area, 24 were temporarily unavailable, and other households had either dissolved or were unavailable

[7]As 99.1 percent and 97.9 percent of children under 24 months and under 36 months respectively were cared for by their mother, the word mother will used instead of caregiver in the rest of this study, including tables. Similarly, father is used in lieu of primary male caregiver irrespective of biological roles.

for the interview for other reasons; one household refused consent. In total, 3,062 primary female respondents and 2,482 primary male respondents were surveyed. The delay in the endline data collection necessitated by COVID-19 meant that most of the additional midline sample children were older than 24 months by the endline contrary to the initial intent. However, 905 of the baseline index children had younger siblings less than 24 months who were included in the endline sample and contributed to outcome measures for children less than 2 years old at endline. Even so, the sample for the analysis of current feeding practices and contact with healthcare workers is smaller than at the baseline[8].

The endline household interview was conducted in three parts: household-level questions covering household and respondent identification and household demographics; a set of questions for the identified primary male respondent; and a set of questions for the identified primary female respondent. The primary female was the mother of the index child in most cases and the primary male was her partner. A separate, specifically trained team conducted anthropometry measurements.

Analytical Approach

The first step in the analysis was to verify that outcomes and contextual variables were balanced across treatment arms at baseline. Next, we report on the primary outcome of interest, stunting, defined, as is generally done, as a child's height for age being two or more standard deviations below the age and gender specific median. We also include other anthropometric outcomes in this step. The regressions use the following model:

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[8] A supplemental sample of households was added at midline to refresh the age-appropriate sample for aspects of analysis of nutrition such as dietary diversity of children in keeping with IYCF norms. This sample was drawn from the original beneficiary lists that were used for the baseline household sample with the same eligibility criteria as in the baseline, with the exception being that children must be under 2 years old at the time of the survey. The midline survey aimed to add 4 supplemental households in each kebele (another 768 households). As the supplemental sample did not receive any livelihood grants that are the main focus of this paper, that sample is not included in the main body of this study. Results including the supplemental households, however, are presented in Annex Table 3.

$$Y_{i1} = \beta_0 + \beta_1 EN + \beta_2 CN + \beta_3 X_{i0} + \sigma_w + \varepsilon_i, \quad (1)$$

where Y_{i1} is the outcome variable at endline, EN indicates randomized assignment to the enhanced nutrition intervention, and CN indicates randomized assignment to the core nutrition intervention delivered at the community level. X_{i0} is a vector of controls, including child age, child gender, maternal education, and woreda level fixed effects. The anthropometric outcomes are reported for the entire sample. However, in as much as the focus of this analysis is the contribution of livelihood grants to nutrition, we repeat the overall assessment of the EN and CN programs using only the subsample of extremely poor. As any outcome, or absence of impact, reflects the additional services supported through SPIR, we then investigated the impact of the EN and CN models on access to the services provided and on any changes in diets. These secondary results reflect the major inputs into the production of health that the project aspired to influence. We focus on the extremely poor[9], testing the effects of the interventions on recipients of cash and of poultry relative to each other. In the communities that received enhanced nutrition we also compare the impacts of the EN intervention for grant recipients with the results for other extremely poor households. As there are no extremely poor households who did not receive grants in the CN arm of the study, this comparison is not available.

Child age is handled in slightly different ways depending on features of the outcome studied. In the case of anthropometry, age is included to accommodate differences in growth velocity and biological needs of children as well as the cumulative impact of programs (Alderman and Headey 2018). Thus, the anthropometry regression which cover children up to 36 months includes a variable for age in months. In contrast, the diet data covers a smaller sample

[9] The overall impacts of the EN and CN programs on the respective communities are of interest to the SPIR program planners and have been reported in the endline report (Alderman et al. 2021). We also report summary results for the less poor and the extremely poor at the end of this paper.

of children up to 24 months since the module was not administered neither to parents of children above 24 months nor to parents of children less than 6 months for whom exclusive breastfeeding is strongly recommended. In addition, since the timing of TTC implies that contact with service providers should be greatest when a child is under a year old, although some contact is expected after the first birthday as well, we test this by interacting a dummy variable for older children in the regressions that assess access to health services.

All regressions include woreda level fixed effects (σ_w) and adjust standard errors by clustering at the kebele level. The duration of the study ruled out child fixed effects or ANCOVA approaches for anthropometric outcomes since children who were in the baseline were older than 24 months by the endline[10] All models are intent to treat models estimated by OLS, using the randomized assignment for the identification of causal impact. The study design included twice as many kebeles in the EN treatment as in the CN treatment or the control group to allow for interaction of the EN treatment with the enhanced livelihood treatment.

While we present individual outcomes, where appropriate we also report average standard treatment effects (ASTE) estimated for key families of outcomes, following Kling, Liebman, and Katz (2007). These are aggregated summaries of key outcomes of interest in a couple of tables, equivalent to outcomes presented in tables where all variables could be added up into a single measure. The ASTEs serve as summary indices that aggregate information over multiple outcomes and present effect sizes relative to the standard deviation of the control arm. This aggregation improves statistical power to detect effects that go in the same direction within a domain. As this calculation requires that the signs of the coefficients all have the same welfare

[10] As indicated, all the baseline households that were available at the endline were included in the final survey regardless of the ages of their children. In principle, it would be possible to have a child level panel of anthropometric measures using data collected for children up to 60 months. Similarly, we could not use a panel on child health care since this was collected only for children < 24 months and thus did not cover the initial child sample by the endline.

interpretation it is occasionally necessary to redefine the outcome for the purpose of computing an ASTE. We report ASTE for both nutrition programs as well as the two transfers, poultry, or cash. Where the dependent variable is a count item – either knowledge scores or the number of food categories consumed - the total score serves in lieu of the ASTE.

Results

Before presenting the results from the midline and endline surveys, Table 1 shows that the sample is well balanced across treatment arms in baseline characteristics. There are a few differences across treatment arms significant at $p < 0.10$, but these do not appear to be systematic in any direction. Moreover, there are no significant differences in the key anthropometry measures. These summary statistics provide an overview of the context at baseline. Households in the sample are poor; the low average of expenditures is consistent with the mean prevalence of poverty in the sample (below $1.90 per capita per day) of 45 percent. The kebeles are fairly remote at 11-14 km from the nearest town. Households are quite large, averaging 5.7 members. Education levels are low, with only 1 in 5 women and 1 in 3 men having any education. Women's diets are limited, with only 3.4 percent of women meeting the standard for minimum dietary diversity (FAO and USAID 2015). Child diets are also severely limited, with index children aged 6-35 months consuming fewer than 2 food groups per day. Only 1.0 percent of these index children consumed a minimally acceptable diet (WHO and UNICEF 2017). Child malnutrition is a substantial public health problem in these communities: across the different treatment arms 36.2-39.7 percent of index children were stunted and 11.6-16.6 percent were wasted.

As indicated in Table 2a there is no indication that the SPIR program had a measurable impact on anthropometric status on average. Indeed, all the point estimates for the coefficients of

EN in the table are close to zero. Although the sample of children 6-35 months is smaller than anticipated in the original design due to the delay in the endline survey caused by COVID precautions, alternative estimates with a larger sample of children 6-59 months, consistent in size with the original power calculations, also indicate no significant impacts on anthropometry overall.

However, Table 2b, which focuses on a sample restricted to the extremely poor households in each kebele, provides experimental evidence on the impact of program subcomponents. While there was no observed improvement in anthropometry relative to the control among the extremely poor households in the kebeles that received enhanced nutrition but did not receive the livelihood grants, those that received cash transfers and the EN program had significantly higher height for age and reduced stunting. This combination of interventions reduced stunting by 18 percentage points, compared to the 54 percent of the extremely poor in the control group that was stunted. In contrast, cash transfers provided to households in the CN nutrition program did not lead to improvement in these outcomes.[11] We focus on this sample of extremely poor households in the results that follow to inform the mechanisms behind this finding. However, we return to a comparison of ASTE results for the extremely poor and less poor households which had no access to cash or poultry livelihoods support at the conclusion of the presentation of results on livelihood transfers.

Does the limited impact reflect a deviation from the planned implementation of the program components in some treatment arms? The ASTEs reported in Table 3 indicate increased access to nutrition services for the extremely poor households. This improved access is across all the components of the ASTE for the kebeles receiving the EN nutrition program while the ASTE results for the households in CN arm are largely driven by increased participation in nutrition

[11] All extremely poor households in the CN arm of the study received either poultry or cash grants. Thus, we cannot assess the impact of CN on extremely poor household in the absence of livelihood support.

discussions within the VESAs. Unlike the results for stunting, the increase in service access observed in the EN program does not differ between the households receiving livelihood grants and those in the EN arms that were not provided grants. That is, there is no evidence that cash transfers drove increased health service utilization.

Table 3 also indicates increased probabilities of attending community food demonstrations or attending a community BCC session as well as participating in water, sanitation, and hygiene meetings. The WASH activities indicated in columns 6 and 7 were offered in all treatment arms as well as in the control. The EN program, nevertheless, facilitated increases in participation in these activities, while the CN did not. Grants apparently had no complementary impact on participation. Column 8 indicates a substantial increase in the probability of discussing health and nutrition messages for both the EN and CN programs through the VESAs that were facilitated in all treatment arms of the intervention. However, unlike WASH activities, these were not organized in the control arm of the study.

As shown by the ASTE in Table 4, the EN program did not contribute to an increase in a suite of child specific health and nutrition activities. For example, there was no increase in the probability of a child being weighed or having their mid-upper arm circumference (MUAC) measured for all children less than 24 months. The age for which this information was obtained was more restricted than for family access to services in Table 3. Children less than 6 months either were not expected to receive the services, as with vitamin A, or the 6-month recall did not apply fully. Thus, the table covers children 6-23 months. There is suggestive evidence of an increase in participation in recuperative child feeding involving cooking demonstrations in the EN arm mediated by cash transfers. The two-week cooking demonstrations and child feeding were provided to mothers whose children screened as underweight or at risk of malnutrition (based on MUAC) through weight screenings. Thus, they reflect the probability of being weighed – which the program hopes to increase – as well as the probability of being undernourished – which the program desired to decrease – as well as the take up of the CPNP offer. Participation in these recuperative child feeding sessions required mothers to supply the ingredients for the meals being prepared each day, suggesting a plausible pathway for an interaction effect with cash transfers.

Table 5 indicates that there was an insignificant increase in maternal knowledge in the EN treatment areas. The average total increase in the knowledge score in EN kebeles offering grants of 0.154 reported in column 1 measures the sum of the 7 questions on nutritional knowledge. This effect is less than a 4 percent of the mean score for the control population despite the EN arms receiving grants and having increased contact with HEW and HDA workers as well as participation in facilitated discussions on nutrition in the VESA meetings. This compares to the similarly modest effect of 0.226 (6.6 percent) on having attended any school.[12]

The overall EN program also contributed to an increase in the maternal diet diversity score (column 1 of Table 6), which is based on the sum of results in columns 3-12, as well as in the share or women meeting the guideline for minimum diet diversity. The increase in MDD among women receiving poultry of 0.044 is small, yet it is a 77 percent increase over the value in the control communities, reflecting the very poor quality of diets among mothers in the study. However, as in the results on the nutrition knowledge score, there is no significant difference if the EN community was randomized to receive grants or only the enhanced nutrition intervention. Nor was there an increase in the CN communities.

Nevertheless, a similar increase in the diversity of diets for children 6-23 months was not observed on average in the EN arms although this was a key focus of the IYCF training (Table 7). There was also no overall change in the share of children consuming at least five of eight

[12] The interaction of EN and education was neither significantly positive nor negative. Thus, there was no evidence that the program complements education nor substitutes for it.

food groups daily, including breast milk, which is the recommended minimum diet diversity (MDD) for a child of 6–24 months (WHO and UNICEF, 2017). Virtually no child in the sample met this guideline. In addition to MDD, the guideline for a minimal acceptable diet includes minimum meal frequency, defined as proportion of children aged 6–23 months who receive solid, semi-solid, or soft foods at least two (three) times for children aged 6–8 (9–23) months. While over 44 percent of the children in the control group were fed in accord with this guideline, the SPIR nutrition programs by themselves did not lead to any increase in the share who were provided meals at a frequency that is keeping with the recommendation.

However, children in households within the EN arms of the study that were randomized to receive poultry grants did see an increase in the diet diversity score. This was driven, in part, by an increase in the frequency of egg consumption but also milk intake. This was not the case in other households within EN program arms. Despite the higher probability of both egg and dairy consumption among children in kebeles randomized for poultry grants, there is no significant difference between these kebeles and those selected for cash in the nutritional outcomes report in Table 2b. The diet diversity scores, however, do not report quantities consumed nor is the sample designed to assess heterogeneity by child age which maps with the duration of program coverage.

Previous work has shown that such in-kind assistance in combination with BCC has a different impact on egg consumption than equivalent cash in these villages (Alderman et al. 2022). This is consistent with market imperfections that make consumption decisions not separable from production decisions, a special case of agricultural household models, albeit not a rare one. As the short run response to an in-kind grant may differ from longer term behavior, the key results on the dietary impact in the endline are compared to the previous midline results using the published specification. These are reported in Annex 1.

The diet diversity tables for both mothers and for children include a dummy variable for religious fasting days in Orthodox households. These indicate a significant reduction in the probability of consuming dairy, meat, and eggs with little corresponding increase in other food groups among adult women. Fasting among Orthodox households did not affect dairy consumption by children in keeping with previous evidence (D'Haene et al., 2020). This likely reflects the fact that cows provide milk according to their own biology and the milk is not easily stored. In contrast, the timing of animal purchases or slaughtering is at the household's discretion.

In Table 8, we provide a summary of ASTEs or aggregate impact for each family of outcomes by receipt of EN and CN for the extremely poor and less poor samples. These do not focus on the nature of livelihood grants but are relevant for understanding the overall impact of SPIR on nutrition. Results show that the only significant difference in program response between the extremely poor and the less poor is in the results on stunting. While this may be partially due to the significant complementarity of cash transfers and the EN intervention, it also reflects the unexpected – but statistically insignificant - increase in stunting among the less poor. The marginally significant differences between overall EN and CN ASTE results among the extremely poor in columns 5 and 6 were not observed in tables 6 and 7. This is because the tests in Table 8 include extremely poor households who were not randomized for grants. This adds a subsample that was no less responsive than the EN response among grant recipients and in so doing increases the sample size. In each case where the EN results differed from CN results for the extremely poor, including the substantial ASTE results on access to health care, they also differed for the less poor.

Concluding Discussion

The livelihood cash grants were designed to encourage asset formation and had no intrinsic features specifically tied to access to or utilization of enhanced health and nutrition services. There was, however, complementarity of cash and enhanced nutrition for the anthropometric outcomes, even though this was not seen in diet diversity. This leaves a puzzle as to the actual mechanism of the complementarity of cash and nutritional services. Plausibly the recipients of cash were able to purchase more food. The diet diversity index does not measure changes in quantities only the probability that a food group was included in the daily diet. Also, cash recipients were more likely to participate in the CPNP recuperative child feeding sessions, perhaps drawing upon the cash to provide the expected food inputs in this two-week program. Thus, the overall results provide a basis for tempered nutritional outcome expectations for this additional support to extremely poor households, valued at well over one year of transfers in the PSNP, when combined with enhanced nutrition programming.

The grant of poultry did enhance the EN program in regard to the inclusion of eggs in a child's diet, but this was not sufficient to have a significant impact on height for age. The challenge to the advocacy of household poultry production as a means to foster better child nutrition may hinge on the ability to sustain flocks. The susceptibility of the birds to illness was noted by Passarelli et al. (2022) in a similar program in Ethiopia. However, the final SPIR survey did not report on the number of birds that died. The survey did ascertain the number of birds sold in the previous 12 months; poultry grant recipients sold, on average, two more birds than their neighbors. Due to the delay in data collection necessitated by COVID the time between surveys was greater than the 12 months recall so there is a possibility that sales in this period partially accounts for the convergence of flock size between in-kind grant recipients and their counterparts. Nevertheless, the potential to enhance consumption of animal source foods with these transfers did not prove to be sustainable (Annex 1).

The clearest evidence of the impact of the EN treatment distinct from the complementarity with grants was shown in the increase of contact between mothers of young children and service providers despite the challenges of COVID as well as the improvement in women's IYCF knowledge. Within the EN kebeles, the overall probability of any mother meeting with a HEW or member of the HDA in the previous 3 months increased from the pre-COVID midline (Figure 2). Still, even though the contact in EN communities was 28 percent above the 43 percent rate of contact for mothers in the control it was not sufficient to improve anthropometric indicators of child nutrition status. This likely reflects the fact that the frequency of contact with health service providers (either HEWs or HDA volunteers) still fell well short of intent. Although the TTC model envisions 11 home visits in the first 1,000 days after conception, the endline survey revealed that approximately only a quarter of mothers of children under 12 months in the EN communities reported a home visit in the last 3 months and this probability declined for older children.

This contrasts with an average of 2 visits in the last 3 months in Kim et al. (2020) and likely accounts for the larger impact measured in that study. However, there is a positive association of HAZ and program participation for children whose household reported having received a home visit recently. This hints at the possibility that more frequent service provision might have more favorable impacts, but it does not give any indication as to how this intensification may be achieved. As the current study cannot assess the determinants of home visits by HEW or HDA volunteers, this can be considered a limitation of the study and an area for future research.

Restricting the sample in Table 2a to the 598 young children in the households that reported they had contact with a HEW or HDA in the preceding three months – a selected subsample that is potentially biased towards larger impacts – finds an increase in HAZ of 0.286 (SE=0.163) and a reduction of stunting of -0.082 (SE=0.045). Both these increases are significant at 10 percent level, while lower statistical power than the results in Table 2a is expected as the regressions are filtered to have a smaller sample. A further restriction of the sample to the 253 households where the HEW or a HDA visited at the household indicated much larger point estimates of improvements in HAZ and reduction in stunting, 0.616 (SE=0.275) and -0.165 (SE=0.072) respectively, with both of these estimates significant at 5 percent level. While the unknown nature of the selectivity into this subsample, possibly due to better trained staff and supervisors or more motivated mothers or both, makes these results only suggestive at best, they may provide guidance for future inclusion of nutrition within the PSNP.

Drilling down further, results indicate that contact with HEW or HDA workers in the EN program was concentrated among households with children less than a year old. The increase for all extremely poor households with these young infants is 25 percentage points higher than the 47 percent share of contact for corresponding households with children in that age group in the control group (results not shown). While the net increase in contact with a HEW or HDA when the youngest child was less than twelve months was significant at $p < 0.01$, the overall increase for the extremely poor households within the EN communities for children 12-23 months is only 0.030 [SE=0.0820.189-0.116] and not significant.

While the less intensive CN intervention led to increased participation in community events relative to the control, it did not lead to increased contact with government health staff or volunteers, nor increased women's IYCF knowledge or dietary diversity. Even though women in the CN arm reported the inclusion of nutrition topics in VESAs similar to those in EN, all the increases in contact with health service providers in the EN program were larger than those in CN at $P < 0.1$. This difference likely explains the absence of an impact on mother's knowledge score or her diet diversity in the CN program, outcomes that were influenced by the EN arm of the study.

Despite the increased nutritional knowledge amongst women as well as changes in their diets, there was not a clear impact on dietary diversity for young children in the EN program. This remains extremely low. Hirvonen et al. (2021) document late introduction of solid and semi-solid foods in Ethiopia which is linked to lower length for age of young children. In the current study, 26 percent of the children 6-8 months consumed no other food than breastmilk in the previous day indicated in the list of 25 foods in the appropriate IYCF module for diet diversity.

Thus, in conclusion, the success in enhancing coverage of nutrition services to low-income mothers in remote areas can be considered a partial achievement of the SPIR program. It remains, however, a challenge to maximize the nutritional impact of this service delivery. Livelihood grants make a modest contribution to the challenge, but in the longer run, it is a larger task to build upon this contribution.

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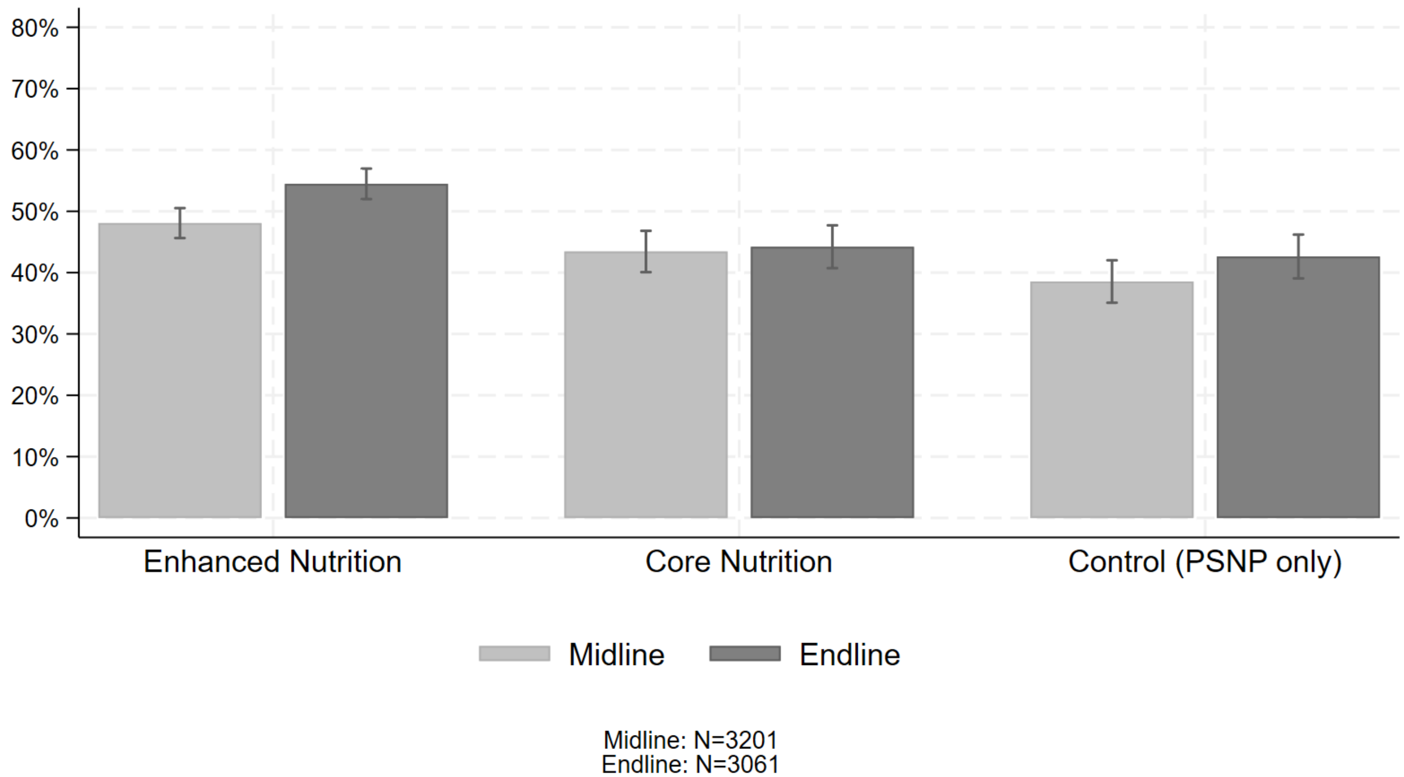
Figure 1: Programming by treatment arm

	Public works	WASH	Credit/savings	Grants	Nutritional	Men's engagement
Treatment 1	✓	✓	✓	✓	Enhanced	✓
Treatment 2	✓	✓	✓	✓	Core	✗
Treatment 3	✓	✓	✓	✗	Enhanced	✓
Control	✓	✓	✗	✗	✗	✗

Source: authors

Figure 2: Mother had contact with a HEW in the last 3 months, by survey round



Source: authors

Table 1: Balance in baseline characteristics

	N	Mean and standard deviation			p-value		
		Enhanced Nutrition	Core Nutrition	Control	EN vs Control	CN vs Control	EN vs CN
Log of total monthly consumption expenditure per adult equivalent	3,275	6.136 (0.728)	6.120 (0.731)	6.092 (0.705)	0.589	0.975	0.803
Distance to nearest town (x0.1km)	3,299	0.136 (0.083)	0.114 (0.069)	0.142 (0.067)	0.422	0.037	0.080
Household size	3,314	5.742 (1.979)	5.808 (1.956)	5.747 (1.924)	0.808	0.710	0.725
Mother's age	3,286	30.767 (7.548)	30.717 (6.774)	30.522 (7.129)	0.647	0.935	0.898
Mother has some education	3,282	0.195 (0.396)	0.223 (0.417)	0.197 (0.398)	0.472	0.307	0.321
Father's age	2,813	38.284 (9.475)	38.160 (9.072)	37.874 (9.234)	0.548	0.987	0.825
Father has some education	2,812	0.344 (0.475)	0.345 (0.476)	0.335 (0.472)	0.864	0.922	0.997
Number of food groups (out of 10) mother consumed during the previous day	3,296	2.094 (1.171)	1.958 (1.118)	2.040 (1.286)	0.156	0.070	0.059
Mother met the Minimum Dietary Diversity for Women (MDD-W)	3,296	0.031 (0.174)	0.033 (0.180)	0.040 (0.197)	0.479	0.919	0.819
Child's age in months	3,314	18.561 (10.543)	19.073 (10.260)	18.501 (10.096)	0.602	0.258	0.315
Child is male	3,301	0.505 (0.500)	0.525 (0.500)	0.507 (0.500)	0.500	0.332	0.350
Child is stunted (HAZ<-2SD)	3,179	0.370 (0.483)	0.398 (0.490)	0.362 (0.481)	0.685	0.317	0.378
Child is wasted (WHZ<-2SD)	3,158	0.134 (0.341)	0.166 (0.372)	0.114 (0.319)	0.756	0.209	0.312
Child's weight was measured in past 3 months	3,296	0.271 (0.445)	0.271 (0.445)	0.273 (0.446)	0.980	0.987	0.999
Child's height was measured in past 3 months	3,296	0.240 (0.427)	0.238 (0.426)	0.262 (0.440)	0.753	0.786	0.952
Number of food groups (out of 7) child consumed during the previous day	3,296	1.634 (0.817)	1.681 (0.814)	1.718 (0.880)	0.099	0.646	0.303
Child met the minimum meal frequency for 6-23 months old children	1,430	0.429 (0.495)	0.449 (0.498)	0.445 (0.498)	0.568	0.657	0.578

Notes: Estimates from the DFSA SPIR baseline survey sample. Standard deviations are in parentheses. P-value is from the test of difference of means between the treatment arms. Standard errors are clustered at the kebele level.

Table 2a: Anthropometrics, children 6-35 months of age, full sample

	(1) Height-for-age z-score (HAZ)	(2) Proportion stunted (HAZ<-2SD)	(3) Weight-for-height z-score (WHZ)	(4) Proportion wasted (WHZ<-2SD)	(5) Weight-for-age z-score (WAZ)	(6) Proportion underweight (WAZ<-2SD)	(7) Mid-upper arm circumference (MUAC)	(8) Proportion of severe acute malnutrition (MUAC<11.5 cm)
Enhanced Nutrition (EN)	0.075	-0.023	0.073	-0.005	0.096	-0.025	0.044	-0.008
	(0.126)	(0.036)	(0.091)	(0.023)	(0.099)	(0.029)	(0.094)	(0.012)
Core Nutrition (CN)	0.080	-0.003	0.159	-0.027	0.152	-0.021	0.022	-0.006
	(0.160)	(0.043)	(0.101)	(0.023)	(0.112)	(0.034)	(0.093)	(0.013)
Test: EN = CN	0.967	0.562	0.353	0.262	0.567	0.895	0.786	0.849
Mean of control	-1.853	0.486	-0.499	0.114	-1.357	0.314	13.681	0.031
N	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140

Notes: Estimates from the DFSA SPIR endline survey sample for all children of age 6 to 35 months. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects, child's sex and age in months, and whether child's mother has any education. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors.

Table 2b: Anthropometrics, children 6-35 months of age, extremely poor households

	(1) Height-for-age z-score (HAZ)	(2) Proportion stunted (HAZ<-2SD)	(3) Weight-for-height z-score (WHZ)	(4) Proportion wasted (WHZ<-2SD)	(5) Weight-for-age z-score (WAZ)	(6) Proportion underweight (WAZ<-2SD)	(7) Mid-upper arm circumferenc e (MUAC)	(8) Proportion of severe acute malnutrition (MUAC<11.5 cm)
EN x Poultry	0.256	-0.070	0.119	0.007	0.224	-0.028	0.323**	-0.012
	(0.263)	(0.071)	(0.172)	(0.033)	(0.158)	(0.055)	(0.143)	(0.019)
EN x Cash	0.431*	-0.179***	0.017	0.005	0.257	-0.060	0.170	-0.011
	(0.235)	(0.055)	(0.140)	(0.042)	(0.167)	(0.052)	(0.127)	(0.020)
EN without grants	-0.244	0.007	0.046	0.013	-0.082	-0.041	-0.085	-0.015
	(0.151)	(0.049)	(0.152)	(0.034)	(0.140)	(0.046)	(0.132)	(0.017)
CN x Poultry	0.182	-0.095	0.073	-0.002	0.154	-0.089	0.140	-0.000
	(0.261)	(0.059)	(0.177)	(0.032)	(0.187)	(0.064)	(0.146)	(0.021)
CN x Cash	-0.043	-0.011	0.113	-0.021	0.068	-0.038	-0.078	-0.002
	(0.196)	(0.055)	(0.133)	(0.029)	(0.148)	(0.048)	(0.130)	(0.023)
Average effect of EN with grants	0.345*	-0.125**	0.067	0.006	0.241*	-0.044	0.245**	-0.011
	(0.197)	(0.052)	(0.129)	(0.031)	(0.135)	(0.044)	(0.111)	(0.016)
Average effect of CN with grants	0.072	-0.054	0.093	-0.011	0.112	-0.064	0.033	-0.001
	(0.182)	(0.049)	(0.128)	(0.026)	(0.140)	(0.047)	(0.116)	(0.018)
Test: EN with grants = CN with grants	0.207	0.152	0.842	0.534	0.360	0.664	0.050**	0.551
Test: EN with grants = EN without grants	0.002***	0.006***	0.887	0.834	0.020**	0.942	0.005***	0.801
Test: EN x Poultry = EN x Cash	0.567	0.134	0.567	0.952	0.858	0.586	0.320	0.943
Test: CN x Poultry = CN x Cash	0.431	0.162	0.829	0.541	0.650	0.416	0.150	0.927
Mean of control	-1.990	0.543	-0.438	0.087	-1.395	0.353	13.638	0.029
N	637	637	637	637	637	637	637	637

Notes: Estimates from the DFSA SPIR endline survey for children of age 6 to 35 months from the subsample of extremely poor households. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects, child's sex and age in months, and whether child's mother has any education. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors. Sample of poor households is determined by ranking households within kebeles based on land and asset index constructed at baseline where 10 poorest households out of 18 in each kebele are classified as 'poor'.

Table 3: Mother's access to healthcare, extremely poor households

	(1) Average Standardized Treatment Effect: Access to healthcare	(2) Has had contact with a HEW or a HDA in past 3 months	(3) Has been visited by a HEW or a HDA at home in past 3 months	(4) Has attended a food demonstration in her community in last 3 months	(5) Has attended a BCC session in past 3 months	(6) Has attended a community led total sanitation and hygiene (CLTSH) event	(7) Has participated in a Open Defecation Free (ODF) event	(8) Has discussed nutrition topics at VESA meetings in past 12 months
EN x Poultry	0.570***	0.151***	0.109**	0.093***	0.192***	0.154***	0.098*	0.386***
	(0.094)	(0.053)	(0.045)	(0.036)	(0.038)	(0.051)	(0.054)	(0.048)
EN x Cash	0.535***	0.141***	0.094**	0.116***	0.149***	0.163***	0.144**	0.333***
	(0.107)	(0.042)	(0.037)	(0.037)	(0.046)	(0.056)	(0.060)	(0.056)
EN without grants	0.500***	0.132***	0.101***	0.132***	0.155***	0.112**	0.137***	0.289***
	(0.070)	(0.036)	(0.032)	(0.028)	(0.032)	(0.045)	(0.049)	(0.032)
CN x Poultry	0.225***	-0.016	0.025	-0.005	0.009	0.053	0.107*	0.249***
	(0.078)	(0.050)	(0.038)	(0.021)	(0.036)	(0.053)	(0.054)	(0.035)
CN x Cash	0.301***	0.081*	0.063	0.023	0.073*	0.055	0.042	0.258***
	(0.073)	(0.046)	(0.039)	(0.028)	(0.040)	(0.049)	(0.055)	(0.042)
Average effect of EN with grants	0.552***	0.146***	0.102***	0.105***	0.170***	0.158***	0.121**	0.359***
	(0.076)	(0.038)	(0.032)	(0.028)	(0.033)	(0.044)	(0.047)	(0.040)
Average effect of CN with grants	0.262***	0.031	0.044	0.009	0.041	0.054	0.075*	0.253***
	(0.060)	(0.038)	(0.031)	(0.020)	(0.030)	(0.042)	(0.045)	(0.030)
Test: EN with grants = CN with grants	0.000***	0.005***	0.086*	0.000***	0.000***	0.017**	0.302	0.011**
Test: EN with grants = EN without grants	0.549	0.726	0.989	0.408	0.691	0.312	0.751	0.102
Test: EN x Poultry = EN x Cash	0.790	0.868	0.768	0.624	0.416	0.889	0.476	0.439
Test: CN x Poultry = CN x Cash	0.404	0.107	0.413	0.280	0.175	0.982	0.290	0.838
Mean of control		0.399	0.159	0.063	0.109	0.307	0.336	0.046
N	1,662	1,662	1,662	1,662	1,662	1,662	1,662	1,662

Notes: Estimates from the DFSA SPIR endline survey for the subsample of extremely poor households. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects and whether mother has any education. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors. Sample of poor households is determined by ranking households within kebeles based on land and asset index constructed at baseline where 10 poorest households out of 18 in each kebele are classified as 'poor'.

Table 4: Child's health history, extremely poor households

	(1) Average Standardized Treatment Effect: Access to health and nutrition services	(2) Received dose of Vitamin A in past 6 months	(3) Child's weight was measured in past 3 months	(4) Child's height was measured in past 3 months	(5) Child's MUAC was measured in past 3 months	(6) Child identified as severely or moderately underweight in past 6 months	(7) Child participated in a 2-week cooking demonstration and feeding session (CPNP)
EN x Poultry	0.059	0.101	-0.003	0.025	-0.010	0.014	0.016
	(0.119)	(0.089)	(0.084)	(0.063)	(0.085)	(0.057)	(0.047)
EN x Cash	0.106	-0.033	-0.036	0.033	0.002	0.029	0.138**
	(0.118)	(0.095)	(0.101)	(0.066)	(0.076)	(0.072)	(0.061)
EN without grants	-0.012	-0.069	-0.020	0.003	-0.079	0.028	0.043
	(0.104)	(0.087)	(0.071)	(0.056)	(0.064)	(0.061)	(0.048)
CN x Poultry	-0.130	-0.166	-0.064	-0.018	-0.104	-0.005	-0.007
	(0.111)	(0.103)	(0.089)	(0.064)	(0.084)	(0.054)	(0.035)
CN x Cash	-0.074	-0.097	-0.119	-0.081	-0.123	0.118	0.042
	(0.122)	(0.102)	(0.082)	(0.059)	(0.077)	(0.078)	(0.052)
Average effect of EN with grants	0.083	0.033	-0.019	0.029	-0.004	0.022	0.078*
	(0.097)	(0.073)	(0.074)	(0.053)	(0.065)	(0.053)	(0.044)
Average effect of CN with grants	-0.102	-0.132	-0.091	-0.049	-0.113*	0.056	0.017
	(0.097)	(0.082)	(0.070)	(0.051)	(0.065)	(0.056)	(0.038)
Test: EN with grants = CN with grants	0.070*	0.044**	0.377	0.132	0.135	0.572	0.128
Test: EN with grants = EN without grants	0.364	0.233	0.990	0.637	0.270	0.923	0.461
Test: EN x Poultry = EN x Cash	0.732	0.234	0.768	0.917	0.901	0.848	0.062*
Test: CN x Poultry = CN x Cash	0.670	0.574	0.587	0.354	0.843	0.102	0.278
Mean of control		0.505	0.308	0.143	0.363	0.176	0.055
N	341	341	341	341	341	341	341

Notes: Estimates from the DFSA SPIR endline survey for children aged 6-13 months from the extremely poor subsample. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects, child's gender and age in months, and whether mother has any education. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors. Sample of poor households is determined by ranking households within kebeles based on land and asset index constructed at baseline where 10 poorest households out of 18 in each kebele are classified as 'poor'.

Table 5: Mother's IYCF knowledge, extremely poor households

	(1) Female IYCF knowledge score (0-7)	(2) Knows how long after birth should a baby start breastfeeding	(3) Knows until what age a baby should be exclusively breastfed	(4) Knows what to do if a mother thinks her baby is not getting enough breast milk	(5) Knows which foods are rich in vitamin A	(6) Knows the common problem with gruels given as first foods to babies	(7) Knows how often a baby 6-23 months old should eat animal source foods	(8) Knows how often a child should be fed when sick
EN x Poultry	0.245*	0.012	0.036	0.009	0.054	-0.003	0.069**	0.067*
	(0.128)	(0.034)	(0.023)	(0.048)	(0.041)	(0.044)	(0.033)	(0.035)
EN x Cash	0.066	0.027	-0.003	-0.078*	0.086*	0.018	0.006	0.010
	(0.117)	(0.028)	(0.027)	(0.039)	(0.045)	(0.030)	(0.037)	(0.045)
EN without grants	0.161*	0.046*	0.026	-0.061	0.091***	-0.002	0.006	0.055
	(0.097)	(0.026)	(0.022)	(0.038)	(0.035)	(0.034)	(0.029)	(0.036)
CN x Poultry	0.001	0.002	-0.014	-0.023	0.036	0.024	-0.001	-0.023
	(0.121)	(0.033)	(0.029)	(0.049)	(0.050)	(0.042)	(0.034)	(0.037)
CN x Cash	0.079	0.026	0.012	-0.039	0.124***	-0.072**	-0.026	0.053
	(0.107)	(0.031)	(0.028)	(0.041)	(0.043)	(0.035)	(0.047)	(0.041)
Average effect of EN with grants	0.154	0.019	0.016	-0.035	0.070**	0.008	0.037	0.038
	(0.102)	(0.026)	(0.021)	(0.037)	(0.035)	(0.032)	(0.030)	(0.033)
Average effect of CN with grants	0.039	0.014	-0.001	-0.031	0.079**	-0.023	-0.013	0.015
	(0.097)	(0.026)	(0.023)	(0.037)	(0.038)	(0.032)	(0.034)	(0.032)
Test: EN with grants = CN with grants	0.207	0.812	0.430	0.916	0.810	0.279	0.085*	0.465
Test: EN with grants = EN without grants	0.941	0.274	0.624	0.468	0.540	0.744	0.196	0.645
Test: EN x Poultry = EN x Cash	0.186	0.651	0.154	0.072*	0.528	0.600	0.071*	0.211
Test: CN x Poultry = CN x Cash	0.521	0.490	0.427	0.755	0.106	0.023**	0.588	0.096*
Mean of control	3.967	0.865	0.841	0.278	0.596	0.292	0.715	0.380
N	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693

Notes: Estimates from the DFSA SPIR endline survey for the subsample of extremely poor households. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects and whether mother has any education. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors. Sample of poor households is determined by ranking households within kebeles based on land and asset index constructed at baseline where 10 poorest households out of 18 in each kebele are classified as 'poor'.

Table 6: Mother's dietary diversity, extremely poor households

	(1) Women's Dietary Diversity Score, WDDS (1-10)	(2) Meets Minimum Dietary Diversity for Women, MDD-W	(3) Mother consumed tubers and grains	(4) Mother consumed pulses	(5) Mother consumed nuts and seeds	(6) Mother consumed dairy	(7) Mother consumed meat, fish, poultry	(8) Mother consumed eggs	(9) Mother consumed green leafy vegetables	(10) Mother consumed vitamin A rich fruits and vegetables	(11) Mother consumed other vegetables	(12) Mother consumed other fruits
EN x Poultry	0.257**	0.044**	-0.001	0.010	0.102**	-0.006	0.012	0.023	0.021	0.014	0.075	0.007
	(0.121)	(0.022)	(0.014)	(0.027)	(0.048)	(0.031)	(0.020)	(0.022)	(0.019)	(0.023)	(0.058)	(0.016)
EN x Cash	0.151	0.020	-0.028	-0.029	0.027	0.018	0.025	-0.012	0.033	0.024	0.096*	-0.003
	(0.131)	(0.023)	(0.020)	(0.047)	(0.040)	(0.028)	(0.015)	(0.016)	(0.027)	(0.029)	(0.054)	(0.014)
EN without grants	0.171	0.037	-0.011	-0.025	0.027	0.025	0.016	0.018	0.021	-0.002	0.080*	0.021
	(0.111)	(0.023)	(0.013)	(0.025)	(0.032)	(0.027)	(0.015)	(0.016)	(0.018)	(0.022)	(0.042)	(0.014)
CN x Poultry	0.099	0.031	-0.029	-0.034	-0.022	0.005	0.023	0.008	0.026	0.029	0.075	0.017
	(0.138)	(0.027)	(0.019)	(0.036)	(0.039)	(0.028)	(0.016)	(0.016)	(0.020)	(0.030)	(0.055)	(0.026)
CN x Cash	-0.033	0.016	-0.017	-0.066**	0.027	0.048	0.004	-0.010	0.001	0.011	-0.039	0.008
	(0.128)	(0.026)	(0.016)	(0.031)	(0.042)	(0.033)	(0.014)	(0.014)	(0.022)	(0.030)	(0.051)	(0.018)
Average effect of EN with grants	0.203**	0.032	-0.015	-0.009	0.064*	0.006	0.019	0.005	0.027	0.019	0.086*	0.002
	(0.103)	(0.019)	(0.013)	(0.030)	(0.036)	(0.025)	(0.015)	(0.015)	(0.019)	(0.021)	(0.046)	(0.012)
Average effect of CN with grants	0.034	0.024	-0.023	-0.050*	0.002	0.026	0.014	-0.001	0.013	0.020	0.019	0.013
	(0.107)	(0.022)	(0.014)	(0.026)	(0.033)	(0.026)	(0.013)	(0.013)	(0.018)	(0.024)	(0.044)	(0.017)
Test: EN with grants = CN with grants	0.120	0.674	0.618	0.219	0.084*	0.379	0.704	0.678	0.458	0.953	0.132	0.509
Test: EN with grants = EN without grants	0.773	0.807	0.786	0.633	0.284	0.445	0.839	0.452	0.744	0.349	0.900	0.136
Test: EN x Poultry = EN x Cash	0.467	0.328	0.215	0.432	0.154	0.433	0.516	0.140	0.667	0.751	0.745	0.521
Test: CN x Poultry = CN x Cash	0.411	0.615	0.581	0.439	0.300	0.191	0.234	0.280	0.251	0.623	0.062*	0.734
Mean of control	2.606	0.057	0.979	0.568	0.207	0.109	0.036	0.045	0.052	0.086	0.494	0.031
N	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693

Notes: Estimates from the DFSA SPIR endline survey for the subsample of extremely poor households. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects, whether mother has any education, and whether the day before the survey was a fast day. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors. Sample of poor households is determined by ranking households within kebeles based on land and asset index constructed at baseline where 10 poorest households out of 18 in each kebele are classified as 'poor'.

Table 7: Child's dietary diversity, children 6-23 months of age, extremely poor households

	(1) Number of food groups (of 8) consumed	(2) Child meets meet minimum dietary diversity	(3) Child meets minimum meal frequency	(4) Child consumed breast milk	(5) Child consumed grains, roots or tubers	(6) Child consumed legumes or nuts	(7) Child consumed dairy	(8) Child consumed fish or meat	(9) Child consumed eggs	(10) Child consumed vitamin A rich fruits or vegetables	(11) Child consumed other fruits or vegetables
EN x Poultry	0.375**	0.039	0.131**	-0.003	0.016	0.065	0.159***	0.011	0.140**	-0.014	0.000
	(0.181)	(0.030)	(0.061)	(0.028)	(0.064)	(0.061)	(0.057)	(0.023)	(0.059)	(0.019)	(0.002)
EN x Cash	-0.066	-0.008	0.020	0.015	-0.024	-0.097**	0.067	-0.011	-0.041*	0.005	0.020
	(0.117)	(0.012)	(0.068)	(0.017)	(0.068)	(0.044)	(0.063)	(0.012)	(0.025)	(0.026)	(0.019)
EN without grants	-0.043	-0.012	0.044	0.002	-0.051	-0.073	0.098	-0.001	-0.009	-0.008	-0.001
	(0.119)	(0.015)	(0.054)	(0.019)	(0.047)	(0.050)	(0.078)	(0.020)	(0.029)	(0.022)	(0.002)
CN x Poultry	0.153	-0.008	0.113	0.023	0.068	-0.083*	0.150*	0.016	-0.033	0.015	-0.003
	(0.120)	(0.011)	(0.077)	(0.015)	(0.060)	(0.048)	(0.077)	(0.022)	(0.046)	(0.026)	(0.004)
CN x Cash	0.136	0.037	0.044	-0.053	0.015	0.006	0.075	0.013	0.026	0.055	-0.002
	(0.131)	(0.030)	(0.075)	(0.039)	(0.051)	(0.063)	(0.081)	(0.025)	(0.040)	(0.037)	(0.003)
Average effect of EN with grants	0.152	0.015	0.075	0.006	-0.004	-0.017	0.112**	0.000	0.049	-0.004	0.010
	(0.123)	(0.018)	(0.051)	(0.020)	(0.054)	(0.043)	(0.053)	(0.015)	(0.035)	(0.018)	(0.010)
Average effect of CN with grants	0.145	0.014	0.079	-0.014	0.042	-0.039	0.113*	0.014	-0.004	0.035	-0.002
	(0.106)	(0.018)	(0.062)	(0.023)	(0.046)	(0.045)	(0.068)	(0.018)	(0.035)	(0.026)	(0.003)
Test: EN with grants = CN with grants	0.953	0.977	0.948	0.406	0.425	0.635	0.979	0.422	0.158	0.179	0.304
Test: EN with grants = EN without grants	0.113	0.071*	0.569	0.817	0.399	0.262	0.833	0.925	0.063*	0.881	0.305
Test: EN x Poultry = EN x Cash	0.014**	0.092*	0.165	0.428	0.593	0.011**	0.097*	0.282	0.002***	0.462	0.307
Test: CN x Poultry = CN x Cash	0.897	0.100*	0.443	0.030**	0.387	0.178	0.341	0.931	0.242	0.301	0.693
Mean of control	2.283	0.011	0.674	0.978	0.859	0.174	0.185	0.011	0.054	0.022	0.000
N	353	353	353	353	353	353	353	353	353	353	353

Notes: Estimates from the DFSA SPIR endline survey for children aged 6-23 months from the subsample of extremely poor households. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects, child's gender and age in months, whether mother has any education, and whether the day before the survey was a fast day. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors. Sample of poor households is determined by ranking households within kebeles based on land and asset index constructed at baseline where 10 poorest households out of 18 in each kebele are classified as 'poor'.

Table 8: Summary by family of outcome

	(1) Height-for-age z-score (HAZ)	(2) Proportion stunted (HAZ<-2SD)	(3) ASTE: Mother's access to healthcare	(4) ASTE: Child's health and services	(5) Mother's IYCF knowledge score (0-7)	(6) Mother's Dietary Diversity Score (1-10)	(7) Child's total food groups consumed (0-8)
Extremely poor							
Enhanced Nutrition (EN)	0.087	-0.069	0.526***	0.039	0.157**	0.188**	0.027
	(0.166)	(0.045)	(0.048)	(0.083)	(0.069)	(0.073)	(0.103)
Core Nutrition (CN)	0.078	-0.055	0.265***	-0.101	0.041	0.031	0.155
	(0.186)	(0.051)	(0.055)	(0.095)	(0.080)	(0.084)	(0.118)
Mean of control	-1.990	0.543	-0.000	-0.000	3.967	2.606	2.290
N	637	637	1,662	341	1,693	1,693	355
Less poor							
Enhanced Nutrition (EN)	0.009	0.054	0.597***	0.145	0.156	0.150	0.168
	(0.176)	(0.051)	(0.059)	(0.107)	(0.083)	(0.079)	(0.132)
Core Nutrition (CN)	0.084	0.078	0.294***	-0.007	-0.090	-0.079	0.157
	(0.205)	(0.059)	(0.068)	(0.119)	(0.095)	(0.091)	(0.149)
Mean of control	-1.650	0.402	0.000	-0.000	3.960	2.739	2.200
N	503	503	1,238	251	1,256	1,256	260
Extremely poor: EN = CN	0.957	0.764	0.000***	0.105	0.089*	0.030**	0.229
Less poor: EN = CN	0.662	0.622	0.000***	0.126	0.002***	0.003***	0.930
EN: Extremely poor = less poor	0.746	0.074*	0.183	0.421	0.992	0.689	0.394
CN: Extremely poor = less poor	0.981	0.054*	0.617	0.516	0.235	0.287	0.992

Notes: Estimates from the DFSA SPIR endline survey sample. Columns (1) and (2) are restricted to children aged 6-35 months only, columns (4) and (7) are restricted to children aged 6-23 months only. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects and whether child's mother has any education; columns (1), (2), (4) and (7) additionally control for child's sex and age in months; columns (6) and (7) control for whether the day preceding the survey was a fast day. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors.

Annex 1: Testing the persistence of results of poultry ownership: midline and endline

Annex table 1 compares the midline results from Alderman et al. (2022) with the endline impact a year and a half later. The specification replicates the earlier results using the full sample including a supplementary sample added at midline to refresh the sample of children less than 24 months. Thus, the specification differs slightly from the results presented in the main text. The opportunity to return to the initial results indicates that the significant increase in egg consumption for all households eligible for poultry grants that was observed at midline is no longer apparent. This is likely driven by the fact that at midline – less than 6 months after the grants were distributed – poultry recipients had 7.5 more birds than household that did not receive the transfer including those who had a cash grant of equivalent value. Two years after the grants were disbursed this difference had declined to only 1.5 birds, although the increase in poultry owned remained statistically significant (column 8). However, the coefficient of the interaction of enhanced nutrition and poultry in column 6 reproduces the result in Table 7 despite the slight differences in sample and specification.

Annex Table 1: Testing the persistence of results of poultry ownership: midline and endline

	Midline (Food Policy 2022)					Endline				
	(1) Child consumed eggs	(2) Primary female consumed eggs	(3) Total number of poultry owned by household, midline	(4) Child consumed eggs	(5) Primary female consumed eggs	(6) Child consum ed eggs	(7) Primary female consumed eggs	(8) Total number of poultry owned by household, midline	(9) Child consumed eggs	(10) Primary female consumed eggs
Assigned to poultry transfer	0.122*** (0.046)	0.071*** (0.022)	7.560*** (0.496)			-0.009 (0.044)	0.010 (0.014)	1.479*** (0.275)		
Assigned to cash grant	0.033 (0.034)	-0.008 (0.012)	0.358 (0.269)			0.032 (0.036)	-0.005 (0.012)	0.226 (0.200)		
Enhanced Livelihood (excluding poultry	0.012 (0.021)	-0.005 (0.010)	0.714*** (0.223)			0.020 (0.022)	-0.001 (0.009)	0.480*** (0.172)		

and cash)										
Enhanced Nutrition	0.049***	0.012	0.289	0.039**	0.007	0.002	0.017*	0.084	0.003	0.012
	(0.019)	(0.010)	(0.221)	(0.019)	(0.009)	(0.021)	(0.009)	(0.162)	(0.018)	(0.008)
Interaction of Enhanced Nutrition and poultry	-0.011	-0.029				0.131*	0.001			
	(0.069)	(0.027)				(0.076)	(0.024)			
Interaction of Enhanced Nutrition and cash	-0.007	0.025				-0.081*	-0.021			
	(0.047)	(0.022)				(0.042)	(0.018)			
Predicted baseline expenditure	0.081	0.042	0.263	0.099	0.053					
	(0.067)	(0.034)	(0.548)	(0.069)	(0.034)					
Interview was conducted on a day after fasting	-0.024	-0.069***		-0.016	-0.068***	-0.033	-0.056***		-0.034*	-0.054***
	(0.027)	(0.014)		(0.029)	(0.014)	(0.022)	(0.010)		(0.020)	(0.010)
Mother has some education	0.031	0.010	-0.011	0.013	0.001	0.030	0.007	-0.022	0.020	0.007
	(0.028)	(0.013)	(0.163)	(0.027)	(0.012)	(0.026)	(0.010)	(0.149)	(0.025)	(0.010)
Father has some education	0.002	0.003	0.086	0.005	0.001	0.036	0.020**	0.200	0.038*	0.018**
	(0.021)	(0.011)	(0.160)	(0.020)	(0.010)	(0.022)	(0.009)	(0.163)	(0.022)	(0.008)
Household size	0.009	0.005	0.154**	0.008	0.005	0.004	-0.003	0.093**	0.005	-0.004**
	(0.009)	(0.004)	(0.064)	(0.009)	(0.004)	(0.004)	(0.002)	(0.037)	(0.004)	(0.002)
Child age in months	0.003**			0.003**						
	(0.002)			(0.002)						
Male child	0.012			0.008						
	(0.018)			(0.019)						
Baseline value of outcome	0.064	0.005		0.059	0.007					
	(0.084)	(0.028)		(0.090)	(0.030)					
Total number of poultry owned by household, baseline			0.180***					0.121***		
			(0.033)					(0.028)		
Total number of poultry owned by household, midline				0.007***	0.005***				0.016***	0.011***
				(0.003)	(0.001)				(0.004)	(0.002)
Endline Index Child's age (months)						0.006**			0.006**	
						(0.003)			(0.003)	
Endline Index Child is male						0.002			0.006	
						(0.019)			(0.018)	
Constant	-0.619	-0.208	0.497	-0.768	-0.252	0.006	0.111***	2.072***	-0.113***	0.075***
	(0.418)	(0.216)	(3.751)	(0.475)	(0.217)	(0.058)	(0.041)	(0.408)	(0.042)	(0.021)
R^2	0.06	0.04	0.40	0.06	0.04	0.07	0.03	0.08	0.09	0.05
N	1,009	3,114	3,114	974	3,013	722	3,704	3,080	721	3,695
Mean of control	0.041	0.039	1.814	0.041	0.039	0.044	0.04	1.971	0.044	0.04

Notes: Estimates from the DFSA SPIR endline and midline survey samples; the midline results are from Alderman et al 2022, Food Policy. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors. Where primary female's/male's education is missing, it is replaced with 0 and respectively controlled for.

Annex Table 2: Balance in baseline characteristics, extremely poor sample

	N	Mean and standard deviation			p-value		
		Enhanced Nutrition	Core Nutrition	Control	EN vs Control	CN vs Control	EN vs CN
Log of total monthly consumption expenditure per adult equivalent	1,880	6.095 (0.754)	6.107 (0.725)	6.077 (0.719)	0.960	0.795	0.873
Distance to nearest town (x0.1km)	1,897	0.136 (0.085)	0.115 (0.071)	0.140 (0.069)	0.414	0.050	0.094
Household size	1,907	5.434 (1.970)	5.534 (1.942)	5.405 (1.865)	0.825	0.558	0.625
Mother's age	1,901	30.576 (7.814)	30.380 (7.204)	30.128 (7.128)	0.417	0.916	0.696
Mother has some education	1,899	0.194 (0.395)	0.227 (0.419)	0.222 (0.416)	0.244	0.464	0.338
Father's age	1,474	37.519 (9.436)	37.265 (8.703)	36.856 (9.074)	0.401	0.957	0.707
Father has some education	1,473	0.335 (0.472)	0.329 (0.471)	0.358 (0.480)	0.799	0.737	0.894
Number of food groups (out of 10) mother consumed during the previous day	1,897	1.947 (1.082)	1.800 (1.028)	1.955 (1.229)	0.367	0.075	0.103
Mother met the Minimum Dietary Diversity for Women (MDD-W)	1,897	0.018 (0.132)	0.017 (0.128)	0.035 (0.183)	0.319	0.388	0.884
Child's age in months	1,907	18.829 (10.633)	18.973 (10.370)	18.009 (10.026)	0.553	0.438	0.804
Child is male	1,901	0.522 (0.500)	0.512 (0.500)	0.522 (0.500)	0.836	0.725	0.745
Child is stunted (HAZ<-2SD)	1,826	0.376 (0.485)	0.399 (0.490)	0.371 (0.484)	0.754	0.480	0.521
Child is wasted (WHZ<-2SD)	1,813	0.124 (0.330)	0.173 (0.379)	0.118 (0.323)	0.370	0.114	0.143
Child's weight was measured in past 3 months	1,897	0.247 (0.432)	0.291 (0.455)	0.271 (0.445)	0.286	0.345	0.282
Child's height was measured in past 3 months	1,897	0.224 (0.417)	0.254 (0.436)	0.264 (0.441)	0.271	0.672	0.471
Number of food groups (out of 7) child consumed during the previous day	1,897	1.595 (0.792)	1.628 (0.719)	1.673 (0.876)	0.256	0.886	0.541
Child met the minimum meal frequency for 6-23 months old children	793	0.433 (0.496)	0.402 (0.492)	0.392 (0.489)	0.367	0.702	0.518

Notes: Estimates from the DFSA SPIR baseline survey sample. Standard deviations are in parentheses. P-value is from the test of difference of means between the treatment arms. Standard errors are clustered at the kebele level.

Annex Table 3: Summary by family of outcome
Including the supplemental sample

	(1) Height-for-age z-score (HAZ)	(2) Proportion stunted (HAZ<-2SD)	(3) ASTE: Mother's access to healthcare	(4) ASTE: Child's health and services	(5) Mother's IYCF knowledge score (0-7)	(6) Mother's Dietary Diversity Score (1-10)	(7) Child's total food groups consumed (0-8)
Extremely poor							
Enhanced Nutrition (EN)	-0.041	-0.027	0.471***	0.084	0.162**	0.185***	-0.060
	(0.138)	(0.039)	(0.041)	(0.077)	(0.063)	(0.065)	(0.098)
Core Nutrition (CN)	0.088	-0.019	0.197***	-0.117	0.010	-0.004	-0.006
	(0.152)	(0.043)	(0.047)	(0.087)	(0.072)	(0.074)	(0.110)
Mean of control	-1.911	0.514	-0.000	-0.000	3.928	2.633	2.364
N	916	916	2,069	393	2,107	2,107	407
Less poor							
Enhanced Nutrition (EN)	-0.107	0.064	0.638***	0.182	0.174	0.261	0.138
	(0.153)	(0.043)	(0.054)	(0.101)	(0.074)	(0.072)	(0.125)
Core Nutrition (CN)	0.069	0.063	0.304***	-0.017	-0.055	0.021	0.100
	(0.182)	(0.051)	(0.063)	(0.114)	(0.086)	(0.085)	(0.143)
Mean of control	-1.602	0.395	-0.000	0.000	3.935	2.648	2.219
N	698	698	1,510	287	1,531	1,531	300
Extremely poor: EN = CN	0.341	0.838	0.000***	0.011**	0.013**	0.003***	0.591
Less poor: EN = CN	0.249	0.987	0.000***	0.034**	0.002***	0.001***	0.750
EN: Extremely poor = less poor	0.748	0.132	0.001***	0.401	0.886	0.415	0.175
CN: Extremely poor = less poor	0.936	0.178	0.074*	0.419	0.494	0.799	0.554

Notes: Estimates from the DFSA SPIR endline survey sample, including an additional sample of households with a child aged 0-24 months that was added at the time of the midline survey. Since these households' poverty status was not classified based on asset data from the baseline survey, we predicted the variable that determines whether they belong to the extremely poor or to the less poor subsample using their characteristics reported in the midline survey. Columns (1) and (2) are restricted to children aged 6-35 months only, columns (4) and (7) are restricted to children aged 6-23 months only. Standard errors (in parentheses) are clustered at the kebele level. All models control for woreda level fixed effects, supplemental sample indicator, and whether child's mother has any education at baseline (or midline for the supplemental sample); columns (1), (2), (4) and (7) additionally control for child's sex and age in months; columns (6) and (7) control for whether the day preceding the survey was a fast day. Asterisks indicate significance at the 10, 5 and 1 percent level and are calculated with respect to the standard errors.

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