ePact
Strengthening evaluation effectiveness and impact

CHILD DEVELOPMENT GRANT PROGRAMME EVALUATION

Quantitative Baseline Report Part II: Technical Compendium

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Oxford Policy Management

itad

ePact, is a consortium led by Oxford Policy Management and co-managed with Itad

In association with:

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Preface

This report presents the *technical compendium* that accompanies the baseline survey findings of the quantitative impact evaluation of the Child Development Grant Programme (CDGP) in Northern Nigeria. The household survey data collection was conducted from August to October 2014 and a final round of data collection is scheduled for August to October 2017. This report was produced by Pedro Carneiro, Giacomo Mason, Lucie Moore and Imran Rasul.

Disclaimer

This assessment is being carried out by ePact. The project manager is Andrew Kardan (andrew.kardan@opml.co.uk) and the project director is Simon Hunt (simon.hunt@opml.co.uk). The remaining workstream team leaders for this evaluation are Kay Sharp (Qualitative Impact Evaluation), Lucie Moore (Quantitative Impact Evaluation) and Aly Visram (Process Evaluation). Claire Hughes is the deputy team leader for the Qualitative Impact Evaluation and Dr Imran Rasul is the technical director for the Quantitative Impact Evaluation workstream.

The other team members for the Quantitative Impact Evaluation Workstream are Lucie Moore, Imran Rasul, Pedro Carneiro and Femi Adegoke. For further information contact (andrew.kardan@opml.co.uk).

The contact point for the client is Simon Narbeth (s-narbeth@dfid.gov.uk).

ePact
6 St Aldates Courtyard
38 St Aldates
Oxford OX1 1BN
United Kingdom
Tel +44 (0) 1865 207300
Fax +44 (0) 1865 207301
Email admin@opml.co.uk
Website www.opml.co.uk
Registered in England: 3122495

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Annex A Original terms of reference (TOR)

Child Development Grants: Cash Transfers Pilot in Northern Nigeria, 2013-2017

Terms of Reference for the Independent Evaluation Component

Background

1. Sixty-four million of Nigeria's extreme poor live in the north of Nigeria.[1]They rely largely on agriculture and herding which are susceptible to climatic shocks and are providing diminishing returns. Poor households often only produce enough food to last one third of the year[2] and rely on seasonal work and migration to earn the money to fill the gap. However, these opportunities coincide with the peak agricultural seasons when households also need to work on their own land. The necessary pursuit of short-term but essential cash to buy food thus prevents poor households from working enough on their own land to be self-sufficient. This perpetuates a cycle of under-production, a dependence on markets for additional food and vulnerability to food prices.

2. According to the Nigeria Demographic and Health Survey (NDHS) 2008, one in four Nigerian children is underweight, and 9% are severely so. Under-nutrition is most severe in northern Nigeria where a third of children under five are underweight, half are stunted, and a fifth are wasted[3].Malnutrition has complex inter-related causes related to food security, caring practices, and health services and health environment[4].In recognition of the need to address malnutrition in Northern Nigeria, DFID has launched a large-scale nutrition programme (complementing their existing health programme) that seeks to reduce the incidence and prevalence of under nutrition in children across five Northern states[5]. This programme is expected to address key issues in health service provision related to nutrition, including the provision of emergency treatment for severe acute malnutrition; and also aims to improve infant and young child feeding practices. The programme does not, however, directly address issues related to food security and the inability to access services due to financial constraints.

3. The Child Development Grants Programme (CDGP) will pilot a cash transfer programme that will focus on removing the food security and financial barriers to improving nutrition. By providing cash to poor women it is expected that the programme will enable them to buy more and better quality food and also to spend money on education and health.

[1] This is calculated using 2004 Nigerian Living Standards Survey and 2010 UN Population Division population projections.

[2] Jennifer Bush, 2010, 'Household Economy Analysis, Millet and Sesame Livelihood Zone, DauraLGA, Katsina State', Save the Children Nigeria and Julius Holt, 2007, Preliminary Livelihoods Zoning: Northern Nigeria, FEWS NET.

[3]Calculated as a weighted average of the prevalence in the northeast and northwest zones using Nigeria DHS 2008 and Census 2006 data.

[4] UNICEF, 1990, 'Strategy for Improved Nutrition of Children and Women in Developing Countries, A UNICEF Policy Review', 1990:1. New York.

[5]DFID, 2011, 'Improving maternal, Newborn and Child Nutrition in Northern Nigeria', DFID.

4. The project will provide a child development grant (CDG) of 3,500 Naira (£14) a month each to 60,000 women with children under the age of 2. The women will also be given nutritional education and advice. 420,000 people will benefit by having improved food security and diet, greater resilience to shocks and better nutrition.

5. There is strong evidence from elsewhere that cash transfers have an impact on food security, but the evidence that they have an impact on nutrition is weaker. So the programme has been designed with an independent evaluation and research component to generate evidence of the impact of the programme on household food security, vulnerability and child nutrition. This will contribute to the longer-term objective of the approach being adopted and expanded by the government of Nigeria with support from other donors.

Programme Objective, Outcome and Outputs

6. This programme is designed to have an impact at two levels: directly on the lives of poor people in the target areas of Zamfara and Jigawa states; and indirectly by informing the scaling up of social protection at state and national level. Key results areas are:

A. Impact

7. The programme will protect 420,000 people from hunger and extreme poverty and promote the expansion of the approach to other areas of Northern Nigeria. Specifically there will be a reduction in stunting and under-5 mortality in the children in the client/target households:

i) A reduction in the prevalence of stunting among 94,000 children in the targethouseholds measured by a change in the height for age z score (HAZ) will fall by 0.2 standard deviations per year and 1 standard deviation by the end of the project.[6]

ii) A reduction in the under–5 mortality rate of 3%–5%.[7]

8. Other targets include the Jigawa and Zamfara state governments expanding the programme using their own resources, and social protection policies and programmes elsewhere in Nigeria being based on the project's approach.

[6] The height (length)-for-age Z score (HAZ) measures the distribution of children's height compared to children of the same age from a reference population (WHO growth standards; expected mean=0, SD 1.0). We expect to see a change of up to 0.2 SD each year, approximately 1.0 SD by the end of the project. Other indicators will be the change in average height gain (expected about 1cm/year increase), prevalence of stunting (1-2% point reduction per year - decrease), birth weight (100/120g increase in birth weight and 4-5% point reduction in low birth weight over 5 years.

[7] The estimate of the likely reduction in infant and child mortality is drawn from estimates that full coverage of nutrition interventions can reduce mortality by up to 25% between birth and 36 months and promoting breastfeeding can reduce under-five mortality by up to 8%. See Bhutta, Z.A. Ahmed, T. Black, R.E. *et al* 2008: 'What works? Interventions for maternal and child under nutrition and survival,' *The Lancet* 371(9610): 417-440, February 2008.

B. Outcome

9. The outcome will be a fully–tested programme that has demonstrated how cash transfers and nutrition education improve the lives of poor families, can be expanded by government and has had a direct and sustainable impact on 60,000 target households. Indicators of progress and targets will be:

i) A reduction of 90% in the number of target households selling productive assets during the hungry season and in other times of economic stress.

ii) 60,000 target households will be more food secure and their diets will be better and more varied.[8]

C. Outputs

10. Outputs will be:

i) A system for identifying, enrolling and providing a regular child development grant to women with children under the age of 2.

ii) A package of complementary social mobilisation, nutrition education, mentoring and awareness raising activity that will support women receiving the grants to improve the nutrition of their children.

iii) Increased government capacity and understanding in Jigawa and Zamfara to manage cash transfer programmes.

iv) Strong evidence of the impact of the programme.

11. The Logical Framework is at annex 1. Elements of the Logical Framework will be refined during the programme's inception phase.

Evaluation

D. Evaluation Components

12. Evaluation of the cash transfer programme will be multidimensional and include discrete and continuous data collection. DFID Nigeria wishes to contract researchers and evaluators to carry out baselines and evaluation in the following 5 areas:

i) Qualitative baseline studies on poverty (during programme inception phase)

ii) A randomized control trial (or similar) to assess and attribute impact.

[8] Food security will be measured using the Household Food Insecurity Access Score (HFIAS) and dietary diversity will be measured using the Index-Member Dietary Diversity Score (IDDS). Baselines and targets will be established following surveys carried during the inception phase.

iii) An evaluation of the implementation of the programme a “process evaluation”.

iv) Continuous-feed data collection.

v) Qualitative evaluation research among beneficiaries, non-beneficiaries and key informants.

13. More detailed descriptions of each monitoring and evaluation area are given below.

E. Tendering process

14. The five areas of work set out above will be divided into two groups for the purposes of tendering.

Group 1

15. Group 1 is focused principally on gathering qualitative ethnographic data and includes the following components:

i) The qualitative baseline studies on poverty (inception phase)

iv) Continuous feed data collection, and,

v) Qualitative evaluation research among beneficiaries, non-beneficiaries and key informants (longitudinal)

Group 2

16. Group 2 is focused primarily on quantitative analysis of impact and providing management information for programme management. It comprises:

ii) A randomized control trial (or similar)

iii) Process evaluation

17. Bidders are expected to bid for all the components within each group. A bidder may bid for both groups.

18. DFID requires that one organisation bids for and leads on both groups. This would better facilitate data sharing and interaction, and would enable coordination to avoid duplication and/or over-burdening of interviewees. DFID also expects the bidding organisation to have the suitable specialist expertise to cover the scope of work outlined within Group 1 & 2

i) Qualitative baseline studies on the nature and experience of poverty in Jigawa and Zamfara states

Purpose

19. To build the evidence case for social protection, contribute to CDGprogramme design, contribute to evaluation design, and contribute to cohort research questions (area v).

Scope of work

20. Conduct a series of qualitative studies focusing on the nature and experience of poverty in Jigawa and Zamfara states. Data collection will be preceded by the development of an appropriate and approved methodology, and it is expected that data analysis will be carried out using suitable qualitative data analysis software.

Key research questions and issues

i) Build understanding of the nature and lived experience of poverty in Jigawa and Zamfara states.

ii) Explore the likely effects of introducing cash transfers to households in these states both at an economic level and in terms of socio-cultural dynamics.

iii) Learn how the contextual realities of kinship, social capital and cultural norms may mediate—amplifying, reducing, refracting—the effects of cash transfers in both beneficiary and non-beneficiary households.

iv) Elicit information on access to food, coping strategies in the face of shocks and crises, and on constraints and opportunities experienced by households in these states.

Design and methodology

21. These studies should employ participatory research methods appropriate to a semi-literate environment. This may include the Household Economy Approach and Cost of Diet assessment method developed by Save the Children, household level case studies, and other qualitative research tools such as in-depth ethnographic interviewing and focus group discussions. A methodological approach should be outlined in proposals submitted to tender, and a complete methodology description, including fully justifiable design details and a description of sample size and strategy, will need to be submitted for approval by DFID Nigeria before beginning data collection.

Data sources

22. Appropriately sized sample (size should be calibrated to data collection methods) of potential programme beneficiaries in Jigawa and Zamfara states.

Outputs and dissemination

23. Deliverables will include:

i) Inception report including full methodology, analytical framework and fieldwork guide,

ii) Study report (including an executive summary) containing key findings and recommendations,

iii) A dissemination workshop accompanied by briefer summary findings presentations and advocacy documents,

24. In addition, the work should be of a quality that it can be published in peer-reviewed journals.

ii) Experimental / Quasi-Experimental Impact Evaluation

Purpose

25. This is designed to quantify the impact of the programme and is a key component of the evaluation strategy. If the evaluation produces strong evidence that the programme has produced the expected outcomes, this will help make the case for expanding the approach. It will also demonstrate that the money has been well-spent. The former is especially relevant in Nigeria.

Scope of work

26. An experiment using randomised sample selection and control groups to provide strong evidence of impact at appropriate levels of statistical confidence and power. Data will be gathered in sample surveys at several times during the life of the programme (baseline, mid-point and endline). Sample size will be determined during an inception phase based on the variation of parameters in the population.

Evaluation questions

27. The questions the evaluation should answer are:

i) Nutrition: Has the programme contributed to reducing stunting in children under the age of five and how does this vary by gender?

ii) Mortality: Has the programme contributed to reducing infant mortality and how does this vary by gender? Assessments should be made of the impact on under–5 mortality, infant mortality and neonatal mortality

iii) Food security and dietary diversity: Has the programme contributed to an improvement in the average Household Food Insecurity Access Score (HFIAS) and in the Index-Member Dietary Diversity Score (IDDS) in target households and how does this vary by gender?

iv) Economic security: Has the programme contributed to a reduction in the percentage of households liquidating productive assets in the hungry season or in the face of economic stress?

v) Well-being: Has the programme contributed to an increase in the percentage of programme clients reporting improvement in child and household well-being due to participation in the CDG programme?

vi) Knowledge, Attitudes and Practices: has the programme contributed to changes in KAPs among men and women related to nutrition and infant and young child feeding. (The process evaluation will focus on the how and the why).

Design and methodology

28. The first choice for the evaluation design of the CDG programme is a randomized control trial (RCT). Other options include quasi-experimental approaches such as double-difference designs, matching procedures and regression discontinuity.

29. It is currently envisaged that transfers will be rolled out gradually as follows: a minimum of 24,000 mothers by 2014; 36,000 by 2015; 48,000 by 2016; and 60,000 by 2017 divided equally between the two states. Two to three LGAs (local government areas) will be selected in each state according to poverty and geographical criteria agreed with the government. Some political compromises, which relate to the mapping of senatorial districts, may be necessary at this stage. Within these LGAs (once selected), random sampling of villages should be possible. Coverage within targeted villages will be high, enrolling all women who are pregnant or have children under two. Random sampling of households within villages has not been considered as an option thus far.

30. Bidders for this work should present specific design options, including their approach to estimating sample size and sampling method, and information on their power calculations and confidence intervals, in their tender proposals. Any evaluation design should include a comparison of mobile and manual delivery methods and may include a comparison of different levels / intensities of complementary inputs (nutrition education, nutrition counselling etc.). Data collection methods should include quantitative surveys as well as anthropometric measurements to measure nutrition indicators.

31. A complete methodology document, including fully justifiable design details, data collection schedule, and a description of sample size and strategy, will need to be submitted for approval by DFID Nigeria before beginning data collection.

Data Sources

32. Programme beneficiaries and a control sample of non-beneficiaries, or beneficiaries enrolled later in the programme (step-wedge design).

Outputs and dissemination

i) Inception report including full methodology and analytical framework,

ii) Short reports presenting findings from each data collection phase,

iii) Mid–term results presentation workshop

iv) Final consolidated report containing key findings and recommendations,

v) Workshop to present final results

vi) Briefer summary findings presentations and advocacy documents,

vii) It will be expected that findings are submitted for publication in peer-reviewed journals at a later date.

iii) Process evaluation

Purpose

33. Process evaluations help identify obstacles to the implementation of a programme. They assess the coherence and validity of the programme design, and in particular by scrutinizing the assumed chains of cause and effect that lead from activity to output, to outcome and impact.

Key questions

34. The evaluation questions in the process evaluation are drawn from the theory of change and the assumed pathways between programme activities, outputs, outcomes, and impact and the logframe. They include:

i) Are woman in programme areas who are pregnant or carers / mothers of under-fives aware of programme objectives? Are they aware of the procedures and requirements?

ii) Are men, traditional and religious leaders and other community opinion-leaders also aware of the programme objectives, procedures and requirements and accepting of them?

iii) How well does the beneficiary targeting and enrolment system work?

iv) How well are the two payment modalities functioning?

v) Are women retaining control of the transfer? Are they retaining control of the mobile phone (as applicable)? Are they confident in its use?

vi) Are women able to go and buy food or alternatively to directly commission the purchase of the food that they require (e.g. via older children)

vii) Have NGO and government field staff (both those directly contracted and sub-contracted) been well trained in their CDGP work? Are they motivated? What kinds of constraints and opportunities emerge in the course of their work?

viii) Assessment of the quality of the complementary nutrition and IYCF

Activities: do clients understand the messages? Are clients able to implement lessons learned in their own homes? If not, why not?

ix) Is routine programme monitoring being carried out effectively by implementing NGOs? Are lessons learned from monitoring being communicated up the programme chain?

Design and methodology

35. The process evaluation should use Programme Theory together with impact pathways/theory of change in its design. A mixed methods approach is favoured, including surveys, Focused Ethnographic Studies, key informant interviewing, focus group discussions and structured observations. Data collection should be carried out twice, once after the programme has been running for a year and a second round in year 3. A methodological approach should be outlined in proposals submitted to tender, and a complete methodology document, including fully justifiable design details and a description of sample size and strategy, will need to be submitted for approval by DFID Nigeria before beginning data collection.

Data Sources

36. Beneficiaries, implementing NGO personnel, other stakeholders.

Outputs and dissemination

i) Inception report including full methodology and analytical framework,

ii) Short reports presenting findings from each data collection phase, including user-friendly and actionable recommendations designed to help NGO staff improve programme implementation,

iii) Round one results presentation workshop

iv) Final consolidated research report containing key findings and recommendations,

v) Final results presentation workshop

vi) Briefer summary findings presentations and advocacy documents,

vii) It will be expected that findings are submitted for publication in peer-reviewed journals at a later date.

iv) Continuous-feed data collection

Purpose

37. The impact evaluation will assess impacts over the lifespan of the programme. The qualitative study described below will gather information that will build understanding and knowledge of these changes. The continuous-feed data collection will complement these approaches by offering real–time snapshots of changes in intra–household dynamics and consumption patterns resulting from participation in the CDG programme, and will support arguments for programme effectiveness without having to wait for endline impact evaluation results.

Scope of work

38. To develop instruments and analyse data collected on the use of cash transfers and the changes taking place in target households. While it is envisaged that information will be collected by the staff of the NGOs implementing the programme, the approach, questionnaires and other instruments used to collect the data will be developed by the contracted team, which will also analyse the data.

Key questions

39. Key questions will focus on what the transfer was used for the previous month, and what kinds of changes have taken place in the household (social, economic, or other) as a result of receiving the transfer. Questions should also be asked about satisfaction with disbursal process and whether clients had any difficulties with the process. Finally, clients should be asked about security: whether receiving the transfer increased their sense of vulnerability.

Design and methodology

40. The principal method of gathering data will be exit interviews administered to recipients who will be asked what they used the cash transfer for in the preceding month, together with simple questions about changes in intra-household dynamics, satisfaction with disbursal procedures, and security.

41. These interviews should take approximately ten minutes, and will be administered to a randomly selected group of clients on paydays (for manual disbursement clients) and other programme-related activities (for mobile disbursement clients). The contracted institution will, in addition to developing, piloting and revising research instruments and analysing data, design a simple protocol for randomly selecting an appropriately-sized sample *in situ*.

Data sources

42. Programme beneficiaries

Outputs and dissemination

i) Research instruments (including training in their use) and analytical framework.

ii) Short, accessible summary write-ups issued after every three rounds of data collection.

iii) The team analysing the surveys should be conscious of the time-sensitive nature of some findings: in the event of complaints about the disbursal process or the security situation, this information should be communicated without delay to NGO staff[9].

[9] The disbursal process will be carried out by a sub-contracted entity (commercial bank / mobile bank agents, or mobile phone company agents), not the implementing NGO itself.

v) Qualitative evaluation research among beneficiaries, non-beneficiaries and key informants:

Purpose

43. This component will investigate the effects of the programme at household level. These will include changes such as perceived changes in nutritional status and morbidity of mothers and children, changes in attitudes towards education, and changes in gender roles within the household over the course of its participation in the CDG programme, as well as community level effects of the CDG programme. This component will also examine changes in knowledge, attitudes and practice related to the complementary nutrition activities included in the programme.

44. This component will provide a longer–term perspective on changes resulting from programme participation, understanding of how programme has been received and viewed by beneficiary HHs and their communities.

Scope of work

45. Carry out qualitative research on a range of questions related to programme effects at the household and community levels. Data collection will be preceded by the development of an appropriate and approved methodology. Data analysis will be carried out using suitable qualitative data analysis software.

Key questions

46. This work will focus on exploring longitudinal changes in the domestic economy, perceived changes in nutritional status and morbidity of mothers and children, changes in attitudes towards education, and changes in gender roles within the household over the course of its participation in the CDG programme. Research will also explore community-level effects over time. Key research questions will include:

i) How are household economic decisions affected by participation in the CDGP? Are consumption patterns changing? Are participating families able to save more and avoid selling productive assets?

ii) In what ways are children benefiting (or not benefiting) from the transfers? Are there differences in the ways girls and boys benefit?

iii) How are resources pooled, shared and distributed? How are these decisions taken? How does this differ between those in a polygamous marriage and those not in a polygamous marriage? How does this differ between junior and senior wives?

iv) Do mothers perceive changes in their own or their children's nutritional status and morbidity patterns?

v) Does participation in the CDG programme change attitudes towards education? If attitudes are changing, is this applicable to girls as well as boys?

vi) How does exposure to complementary health and nutrition activities change knowledge, attitudes and practices towards breastfeeding, IYCF, care of sick and malnourished children, mothers' own nutrition practices, and health-seeking behaviour, hygiene and sanitation practices? These issues should be explored among fathers, mothers and resident senior women in households.

vii) Has participation in the CDGP affected gender roles, decision-making and women's empowerment and self-esteem within beneficiary households? How does this experience differ between those in/ not in polygamous households and between junior and senior wives?

viii) How is the CDG programme received by communities, especially among non-beneficiaries?

ix) What are the community-level social and economic effects of the CDG programme?

Design and methodology

47. An appropriately-sized cohort of beneficiary families (taking into consideration the possibility of sample attrition) will be recruited to participate in a longitudinal household case study exercise, based around qualitative data collection carried out in five rounds (two in year 1, one each in years 2-4). Cohort data collection methods should include in-depth semi-structured interviews, structured observations, life histories and KAP approaches. Non-beneficiaries will not be placed in a cohort, but will be recruited separately for participation in FGDs at each data round. Key informants, including leaders, elders, civil society actors, health and education personnel, and businesspeople, will be interviewed at each data round to explore social and economic effects at the community level.

48. A methodological approach should be outlined in proposals submitted to tender, and a complete methodology document, including fully justifiable design details and a description of sample size and strategy, will be submitted for approval by DFID Nigeria before beginning data collection.

Data sources

49. A cohort of beneficiary Households recruited at inception, together with groups of non–beneficiaries recruited at each data collection round. Key informants should include: leaders, elders, civil society actors, health and education personnel, businesspeople.

Outputs and dissemination

50. Deliverables will include:

i) Inception report including full methodology and analytical framework.

ii) Short reports presenting findings from each data collection phase.

iii) Final consolidated research report containing key findings and recommendations.

iv) Briefer summary findings presentations and advocacy documents.

v) Findings suitable for publication in peer-reviewed journals.

F. Reporting, Personnel and Timing

Reporting

51. Team leaders for the activities in Group 1 and Group 2 will be responsible for the submission of all deliverables, and will report to the DFID Nigeria Social Development Adviser. As mentioned in paragraph 18; *it would be desirable to have one contractor for both groups if possible.*

Profile of Consultancy Teams

Group 1 (areas i, iv and v)

52. This team should be small (2 or 3 technical experts), and be biased towards expertise in qualitative research methods. The Team Leader should have at least ten years' experience of carrying out qualitative social research in the social protection sector, and possess demonstrated skills in research design, data analysis, team management, research coordination and dissemination. A solid track record of appropriate publications would be an asset. At least one consultant should have particular expertise, acquired over the course of not less than ten years, in gender research, and one team member will need experience in applying the Household Economy Approach and Cost of Diet assessments (or similar).At least one team member should be female. Experience of working in Africa is essential, and in Nigeria highly desirable. Opportunities for building up Nigerian research capacity should be maximised.

Group 2 (areas ii and iii)

53. This team should be small (3 or 4 technical experts) and be biased towards expertise in quantitative research methods. The Team Leader should have at least ten years' experience of carrying out robust quantitative programme impact evaluation in the social protection sector, and possess demonstrated skills in research design, data analysis, team management, research coordination and dissemination. A solid track record of appropriate publications would be an asset. At least one member of the team should have at least five years' experience working with mixed-methods approaches and process evaluation. The team should include an economist and a nutritionist, and should include at least one female member. Experience of working in Africa is essential, and in Nigeria highly desirable. Opportunities for building up Nigerian research capacity should be maximised.

Timeframe

Group 1 (components i, iv, and v)

• **Activity**	• **Completed By**
• Consultants identified and contracted	• March 2013
• Contract completed and signed	• April 2013
• Component (i) inception report submitted	• May 2013
• Component (i) inception report agreed and finalised	• June 2013
• Component (i) in-country data collection	• July 2013
• Component (i) draft research report submitted	• September 2013
• Component (i) dissemination workshop	• October 2013
• Component (i) research report finalised	• November 2013
• Component (iv) draft research instruments and analytical framework submitted	• November 2013
• Component (iv) research instruments and analytical framework agreed and finalised	• December 2013
• Component (iv) data analysis	• After each round of data collection, Y1-Y4
• Component (iv) summary reports submitted	• No more than one month after every three rounds of data collection, Y1-Y4
• Component (v) inception report submitted	• December 2013
• Component (v) inception report agreed and finalised	• December 2013
• Component (v) in-country data collection	• Jan 2014 (Y1) • Jan 2015 (Y2) • Jan 2016 (Y3) • Jan 2017 (Y4) • Jan 2018 (Y5) •
• Component (v) short reports submitted	• 3 months after data collection round
• Component (v) draft consolidated final report submitted	• February 2017
• Component (v) draft consolidated final report finalised	• March 2018

Group 2 (components ii and iii)

• **Activity**	• **Completed By**
• Consultants identified and contracted	• March 2013
• Contract completed and signed	• April 2012

• Activity	• Completed By
• Component (ii) inception report submitted	• May 2013
• Component (ii) inception report agreed and finalised	• June 2013
• Component (ii) in-country data collection	• Baseline Y1 – August 2013 • Mid-term Y3 – August 2015 • Endline Y5 – August 2017
• Component (ii) short reports submitted	• 3 months after each data collection round
• Component (ii) mid-term results workshop	• 4 months after mid-term data collection round
• Component (ii) draft consolidated report submitted	• 3 months after endline data collection round
• Component (ii) final results workshop	• 3 months after endline data collection round
• Component (ii) consolidated report finalized	• 4 months after endline data collection round
• Component (iii) inception report submitted	• March 2014
• Component (iii) inception report agreed and finalised	• April 2014
• Component (iii) in-country data collection	• June 2014
• Component (iii) draft first report and briefing materials submitted	• September 2014
• Component (iii) round one results workshop	• September 2014
• Component (iii) first report finalised	• October 2014
• Component (iii) round two data collection	• June 2016
• Component (iii) draft consolidated report submitted	• September 2017
• Component (iii) final results workshop	• September 2017
• Component (iii) consolidated report finalized	• October 2017

Duty of Care

54. The Supplier is responsible for the safety and well-being of their Personnel (as defined in Section 2 of the Framework Agreement) and Third Parties affected by their activities under this contract, including appropriate security arrangements. They will also be responsible for the provision of suitable security arrangements for their domestic and business property.

55. DFID will share available information with the Supplier on security status and developments in-country where appropriate.

56. The supplier is responsible for ensuring appropriate safety and security briefings for all of their Personnel working under this call-down contract and ensuring that their Personnel register and receive briefing as outlined above. Travel advice is also available on the FCO website and the Supplier must ensure they (and their Personnel) are up to date with the latest position.

57. This Procurement will require the Supplier to operate in or pass through conflict-affected areas and parts of which are insecure. The security situation can be volatile and subject to change at short notice. The Supplier should be comfortable working in such an environment and should be capable of deploying to the areas required within the region in order to deliver the Contract.

58. The Supplier is responsible for ensuring that appropriate arrangements, processes and procedures are in place for their Personnel, taking into account the environment they will be working in and the level of risk involved in delivery of the Contract (such as working in potentially dangerous, fragile or hostile environments etc). The Supplier must ensure their personnel receive the required level of training and safety in the field training prior to deployment.

59. Tenderers must develop their ITT Response on the basis of being fully responsible for Duty of Care in line with the details provided above and the initial risk assessment ,matrix prepared by DFID (see Annex A of this ToR). They must confirm in their ITT response that:

- They fully accept responsibility for Security and Duty of Care.
- They understand the potential risks and have the knowledge and experience to develop an effective risk plan
- They have the capability to manage their Duty of Care responsibilities throughout the life of the contract.

60. If you are unwilling or unable to accept responsibility for Security and Duty of Care as detailed above, your ITT will be reviewed as non-complaint and excluded from further evaluation.

61. Acceptance of responsibility must be supported with evidence of Duty of Care capability and DFID reserves the right to clarify any aspect of this evidence. In providing evidence, interested Suppliers should respond in line with the Duty of Care section in ITT Questionnaire.

Annex A

DUTY OF CARE RISK ASSESSMENT FOR SUPPLIER

Theme	**DFID Risk score – Jigawa and Zamfara State**
OVERALL RATING[10]	4
FCO travel advice*	3
Host nation travel advice	None
Transportation	3
Security	4
Civil unrest	2
Violence/crime	4
Espionage	3
Terrorism	4
War	1
Hurricane	1
Earthquake	1
Flood	1
Medical Services	4
Nature of Project/ Intervention	2

*Zamfara and Jigawa are rated 1 and Kaduna and Kano are rated 4. Access to Jigawa and Zamfara requires travel through Kaduna and Kano, just passing through no overnight stay required.

1	2	3	4	5
Very Low risk	Low risk	Med risk	**High risk**	Very High risk
Low		**Medium**	**High Risk**	

2 the Overall Risk rating is calculated using the MODE function which determines the most frequently occurring value

Annex B Changes to TOR agreed during inception phase

The original TOR suggested a stepped wedge design. However, for this evaluation a step-wedge design is not required and a cluster RCT will be sufficient, as well as being simpler to implement (as it does not require a staggered intervention). Therefore, we propose using a simple cluster RCT, with the control group receiving the intervention after the evaluation endline survey is conducted.

The TOR propose assessing the impact of the CDGP on under-five mortality, infant mortality and neonatal mortality. However, mortality is an extremely challenging variable to measure accurately. Moreover, as the incidence of mortality is relatively low in the target population, it will require prohibitively large samples of children and households to statistically detect any changes in mortality. Therefore, we propose that we do not collect data on mortality, and rather focus on child anthropometrics and dietary diversity as the key nutrition indicators.

The timeline for the quantitative surveys has changed from the original TOR specification. SC/ACF have said they will be able to deliver a settlement list to us by 1 April 2014 and will be able to rollout in evaluation treatment communities at the start of July. This means that we will only be able to conduct our listing survey in May 2014 and our baseline survey in July and August 2014. As this is the height of the rainy season, field work may take longer than we had originally planned, and may be more expensive. There is also an increased risk of loss of data as a result of water damage, which we will minimise by providing appropriate water-proof equipment and training to the field teams. We will only be able to finalise our field work budget once we have received the final settlement list and can finalise our sampling strategy.

Annex C Our team and governance structure

The e-Pact team is led by Simon Hunt, as the evaluation director. He will provide strategic oversight and review, will consolidate the outputs produced by all workstreams, will participate in dissemination activities, and will engage with the policy process as and when necessary. The evaluation director is ultimately responsible for the quality of the technical work produced through this project.

Simon is supported by Andrew Kardan, who is the project manager for this evaluation. The project manager is responsible for the day-to-day management of the project and is the first point of call for DFID. He will also support the team leaders in the delivery, coordination and consolidation of outputs from the different workstreams.

There are three workstreams delivering the evaluation: the quantitative impact evaluation, the qualitative impact evaluation and the PE. The quantitative impact evaluation workstream is managed by Lucie Moore, with technical direction from Dr Imran Rasul. Lucie is responsible for timely delivery of outputs and internal coordination of activities between Oxford Policy Management (OPM) and the Institute for Fiscal Studies (IFS), and is the key contact person for coordination with programme staff on quantitative issues. Imran provides the overall direction on technical matters so as to ensure appropriate and rigorous design, implementation and analysis. Dr Pedro Carnerio will lead the econometric analysis. Femi Adegoke will lead the in-country data collection team. Andreas Kutka leads OPM's computer-assisted personal interviewing (CAPI) data collection and has provides assistance during the programming survey instruments and training of the interviewers. Molly Scott, Giacomo Mason and Gabriel Moreno Sáchica provide research assistance.

Alex Hurrell Ward, Dr Laura Camfield and Professor Orazio Attanasio provide internal quality assurance and peer review.

The major outputs of the evaluation, including the baseline reports are reviewed by the CDG Evaluation Review Group consisting of: Jessica Pettiprez (DFID Nigeria Social Development Advisor); Kristen Hopkins (DFID Nigeria Evaluation Advisor); Patrick Nolen (University of Essex) and Michael Samson (EPRI) and.

The major outputs are also reviewed by SEQAS, DFID's external quality assurance provider.

Annex D Overall evaluation framework and evaluation questions

D.1 Key research hypotheses and evaluation questions

This impact evaluation aims to answer the following research hypotheses:

Hypothesis I: The CDGP intervention, and in particular the provision of a regular transfer of NGN 3,500 (£13.60) on a monthly basis to women, will result in the consumption of larger quantities and more varied types of food, resulting in an increase in dietary intake and consequently a reduction in child malnutrition.

Underlying assumption: Households do not currently meet their food requirements and will use the transfer for food consumption rather than for other purposes. It is also expected that the households will direct the transfer to the most nutritious foods and not only to the basic staple diet. This hypothesis also assumes that the transfer will be a sufficient additional source of income with a limited substitution effect on other livelihood mechanisms. This also assumes that women are able to make decisions about how the transfers are used.

Hypothesis II: The provision of a regular predictable cash transfer will result in a reduction in negative risk-coping behaviour, and in particular a reduction in the distress sale of assets and debt accumulation among beneficiary households.

Underlying assumption: Beneficiary households are currently engaged in detrimental risk-coping behaviour and the transfer will be sufficient to enable them to disengage from this behaviour.

Hypothesis III: Through nutritional advice and counselling the programme will improve the knowledge, attitudes and practices among the targeted men and women in relation to nutrition and general maternal and child care practices.

Underlying assumption: Current knowledge, attitudes and practices are a contributory factor in relation to the poor dietary and health practices of households. The validation of hypothesis III will also depend on the nature and quality of advice and counselling, combined with the availability of good complementary services and support (e.g. health facilities, accessibility of clean water, general hygiene and sanitation practices, etc.).

Hypothesis IV: The cash transfer will result in improved material wellbeing, and will contribute to the relational wellbeing of households through enhanced trust and reciprocal social and economic collaboration.

Underlying assumption: The programme will not negatively impact on existing social networks and sharing practices, and the impact on gender dynamics at the household level will be positive.

Hypothesis V: Provision of a regular cash transfer to women will enhance their ability to make economic choices and result in improved social capital.

Underlying assumption: The beneficiary women will be able to use the cash transfer as they intend and wider cultural norms will be sensitively challenged, while the process will be supported through community sensitisation involving men and community leaders. If the cash transfer is seen as an unearned windfall it may not be controlled by the woman and may be controlled by the man, with benefits divided among the household.

Hypothesis VI: Poor implementation of the programme (i.e. poor targeting, irregular payments, inadequate information dissemination, and an inappropriate behaviour change campaign) will mitigate the potential impacts of the programme.

These hypotheses will be answered through a list of key research questions and through a combination of the research methods, as summarised in Table 1.

Table 1 Research hypotheses and key research questions

Research hypothesis	Key research questions	Methods used to answer the question
Hypothesis I: The provision of a regular transfer of NGN 3,500 each month to pregnant women will result in the consumption of larger quantities and more varied types of food, resulting in an increase in dietary intake, and consequently a reduction in child malnutrition	Has the programme contributed to reducing wasting, being underweight and stunting in children under the age of five? Is there a difference between boys and girls?	Quantitative survey
	Has the programme contributed to an improvement in the average HFIAS and/or IDDS in target households, and how does this vary by gender?	Quantitative survey
	How are household economic decisions affected by participation in the CDGP? Are consumption patterns changing? Are participating families able to reduce their negative coping mechanisms (e.g. avoid selling productive assets, manage debts, not withdraw children from school, etc.)?	Quantitative and qualitative surveys
	In what ways are children benefiting (or not benefiting) from the transfers? Are there differences in the ways girls and boys benefit?	Quantitative and qualitative surveys

	How are resources pooled, shared and distributed? How are these decisions taken? How does this differ between those in a polygamous marriage and those not in a polygamous marriage? How does this differ between junior and senior wives?	Quantitative and qualitative surveys
	Do mothers identify changes in their own or their children's nutritional status and morbidity patterns?	Qualitative survey
Hypothesis II: The provision of a regular cash transfer will result in a reduction in negative risk-coping behaviour, and in particular a reduction in the distress sale of assets among beneficiary households	Has the programme contributed to a reduction in the percentage of households liquidating productive assets in the hungry season or in the face of economic stress?	Quantitative survey
Hypothesis III: Through nutritional advice and counselling, the programme will improve knowledge, attitudes and practices among the targeted men and women in relation to nutrition and general maternal and child care practices	Has the programme contributed to changes in knowledge, attitudes and perceptions among men and women related to nutrition and IYCF?	Quantitative and qualitative surveys
	Are women in programme areas who are pregnant or carers/mothers of under-fives aware of programme objectives? Are they aware of the procedures and requirements?	Quantitative survey and PE

	Are men, traditional and religious leaders and other community opinion-leaders also aware of the programme objectives, procedures and requirements, and accepting/supportive of them?	Quantitative and qualitative surveys
	How does exposure to complementary health and nutrition activities change knowledge, attitudes and practices towards breastfeeding, IYCF, care of sick and malnourished children, a mother's own nutrition practices and health-seeking behaviour, and hygiene and sanitation practices?	Quantitative and qualitative surveys
Hypothesis IV: The cash transfer will result in improved material wellbeing and contribute to the relational wellbeing of households through enhanced trust and reciprocal social and economic collaboration	How is the CDGP received by communities, especially among non-beneficiaries?	Qualitative survey
	What are the community-level social and economic effects of the CDGP?	Quantitative and qualitative surveys
	Has the programme contributed to an increase in the percentage of programme clients reporting improvement in child and household wellbeing due to participation in the CDGP?	Quantitative survey and continuous data feed

Hypothesis V: Provision of a regular cash transfer to women will enhance their ability to make economic choices, and will result in improved social capital	Has participation in the CDGP affected gender roles, decision-making and women's empowerment and self-esteem within beneficiary households? How does this experience differ between those in/not in polygamous households and between junior and senior wives?	Qualitative survey
	Are women able to go and buy food, or alternatively to directly commission the purchase of the food that they require (e.g. via older children)?	Quantitative and qualitative surveys
	Are women retaining control of the transfer? Are they retaining control of the mobile phone (as applicable)? Are they confident in the use of the transfer/phone?	Quantitative and qualitative surveys
Hypothesis VI: The impact of the programme will be mitigated if it is not implemented effectively, i.e. irregular payments and poor information dissemination	How well does the beneficiary targeting and enrolment system work?	Quantitative survey and PE
	How well are the payment modalities functioning?	PE
	Have NGO and government field staff (both those directly contracted and sub-contracted) been well trained in their CDGP work? Are they motivated? What kinds of	PE

	constraints and opportunities emerge in the course of their work?	
	How well was the complementary nutrition advice and mentorship implemented?	PE

Annex E Literature review

E.1 Executive summary

The purpose of this literature review is to support the Situation Analysis for the evaluation of the Child Development Grant (CDG), a conditional cash transfer being implemented in the Northern Nigerian states of Jigawa and Zamfara. Poor households experience significantly higher rates of child stunting and wasting in Northern Nigeria. This review begins with a summary of context-specific factors at the household, community, and individual levels which affect nutrition outcomes for women and children in these states. Nutrition shortfalls are in part explained by insufficient livelihoods; subsistence agriculture is the dominant economic system. Household size and composition also play a role in child and maternal nutrition. In Jigawa and Zamfara, poor households have about 10 members, and polygamy is common in the region. Due to the practice of seclusion, women's income-generating activities are generally confined to their family compounds. Households do not pool these funds, and women generally have limited decision-making power. Within communities in the region, nutrition education and treatment of malnutrition is administered primarily by community-based providers who give both modern and traditional treatments. There is a lack of female healthcare providers, as well as a supply-side constraint of adequate healthcare facilities. Social norms and taboos around food also contribute to poor nutrition in women and children. However, norms that promote family-based support play a very significant role in preventing child deaths due to malnutrition.

Using this context as a point of departure, this review then explores the evidence around the impact of conditional cash transfers (CCTs) on child nutrition. The analysis focuses on the links between income from transfers and food expenditure, health seeking behaviour, and household and community dynamics. Examples are drawn from programmes in Nigeria, West Africa, Sub-Saharan Africa, and socio-cultural contexts that are comparable to Jigawa and Zamfara states. The review of conditional cash transfers currently being implemented in Nigeria raises a number of issues relevant to the ability of these programmes to improve nutrition. Primarily, beneficiaries report constraints related to the value of the transfer in large, polygamous households, the short participation period, and the inadequate healthcare systems. These concerns are echoed in the broader West African context, where there is greater evidence of positive nutrition outcomes with CCTs, though those tend to vary based on gender and household hierarchies. In the literature on Sub-Saharan Africa, a persistent theme is the sometimes contentious interaction between CCTs and informal safety nets. It is also in this context that the distinction between increased health seeking behaviour and improved nutrition outcomes—both desired outcomes of CCTs—becomes more clearly defined. Looking more globally at contexts similar to those encountered in Northern Nigeria reinforces the findings that high quality health services enhance the ability of CCTs to improve child and maternal nutrition. This context also provides insight into social factors (such as stigma and gender or age-based power differentials in households) and priorities for income use which may affect nutrition.

The literature largely suggests that cash transfers have had positive impact in addressing malnutrition in contexts similar to those of the CDG.

E.2 Community Level: Livelihoods, Community Structure and Health Services

This section presents the socio-cultural and livelihood context at the community level, focussing on livelihoods, the organisational structure and health services.

E.3 Livelihoods

Northern Nigeria is part of the sudan-savannah agro-ecological belt (Bush and Noura 2012). While there are manifold different livelihood zones within the region, all of them are characterised by intensive farming of both food and cash crops as well as livestock production (Holt 2007). In this agricultural society, the cultivation of cereals as the staple produce is the most important livelihood (Solivetti 1994). According to Solivetti, agriculture represents more than 80% of the total value of household production (1994: 253). Most agricultural production is consumed by the household themselves and subsistence hence the dominant economic system (Solivetti 1994).

The climatic cycle between the wet and dry seasons determines livelihoods and economic activities. For instance, the months before the dry season are characterised by land preparation, the months after the wet season by the harvest, and the months in between often by other income-generating activities and small-scale farming through irrigation (Hold 2007, Bush 2012, Bush and Noura 2012. Equally, consumption patterns change according to the seasons and available foods, with extreme shortages being experienced during the hunger season (Constantine 2012).

During the dry season, the most important household income stems from cash generated by cash crops. As a rule of thumb, farm land is equally split between farm land for food crops and cash crops (Bush 2012). Another important source of income during the dry season is livestock. Both livestock and its products are consumed and sold for cash income, and represent an important safety net when income is needed (Bush 2012, Bush and Noura 2012). Additionally, older boys and young men often migrate to urban centres after the end of the harvest in search of casual employment (Bush and Noura 2012). Poor labourers typically find work on better-off farms or at construction sites in town (Bush 2012). Land ownership is very pervasive and those without their own farming land mostly rely on these casual harvest and labour jobs to generate a livelihood. Finally, different forms of self-employment, for example in trade, selling firewood or processing agricultural products are pursued. According to Longhurst (1982), 40% of working days of men are spend on occupations other than farming.

E.4 Community Structure

Jigawa and Zamfara states are characterised by the coexistence of post-colonial, Westphalian institutions and traditional Emirates, both with local government representatives on all levels. In practice, these two systems are not parallel but overlapping. For instance, local governments depend on traditional institutions to mobilise people, and employees of traditional institutions are funded by local governments (Constantine 2012, Manoukian 2012).

Traditional Emirates are found to be the most important structure at community level, with traditional community leaders playing a large role in identifying social needs and addressing them (Constantine 2012, Manoukian 2012). The Emirate council is the first point of contact for any mobilisation effort and for the creation of committees (Constantine 2012). Religious leaders, the imams, are custodians of values and their advice tends to be followed (Manoukian 2012). Public and Islamic teachers are also viewed as influential in the community (Manoukian 2012). Finally,

older unmarried women seem to be of significant influence, at least on other women and children and in particular regarding the arrangement of marriages (Barkow 1972).

In both institutions, women do not play any role (Sada, et al 2006, Solivetti 1994). They are effectively excluded from public decision-making, which is related to their very specific role described in the following sections.

E.4.1 Health Services

Health services play an important role for child nutrition, both in terms of nutrition education and treatment of malnutrition. In Jigawa and Zamfara, there are various health actors involved, each of them with different capacities and knowledge.

Clinics provide the most relevant health services and nutrition education at the time of routine visits (Constantine 2012). Both traditional and religious community leaders recommend malnourished children to go to the clinic (Constantine 2012, Manoukian 2012). However, some communities are far away from the next clinic (Constantine 2012), and there are many cases where husbands do not grant permission to their wives to go to the clinic or to pay for clinic services (Sada et al 2006, Manoukian 2012).

Therefore, outreach activities appear to be crucial to provide quality health services. However, it is found to be difficult for clinics to engage regularly in such activities due to a shortage of personnel and distances (Manoukian 2012). According to the Jigawa and Zamfara Rapid Socio-Cultural and Livelihood Assessment, only one third of participants are visited by outreach workers from outside their communities, while they are seen very knowledgeable about malnutrition and its treatment (Constantine 2012, Manoukian 2012). A recent MCS study of maternal and child health confirms that only 10.5% of women in Zamfara ever received antenatal care from a trained health professional in the five years preceding the study (in Longhurst and Cornelius 2013: 40).

The most accessible health providers are hence community-based providers such as community health groups, Traditional Birth Attendants (TBAs) or traditional healers (Constantine 2012, Manoukian 2012). Community health groups are typically organised by the Emirate council and have relative good knowledge about nutrition, and refer to clinics (Constantine 2012). TBAs are accessible to people of all socio-economic status and are increasingly adopting modern practices (Constantine 2012). Traditional healers are often consulted when the clinic cannot be afforded (Manoukian 2012). However, they prescribe a mix of modern and traditional treatments of malnutrition, some of which are potentially harmful[11] (Manoukian 2012). They are not always ready to collaborate with other health services, but often refer patients to clinics when syndromes get worse (Manoukian 2012).

Health service providers are chosen based on accessibility, affordability and cultural acceptability. As discussed in the following sections, women are mostly confined to their homes, which represents a considerable barrier to accessing clinics beyond routine visits and serious cases, and underlines the importance of outreach activities for nutrition education. A lack of female healthcare providers, both in clinics and community groups, seems to be another important supply-side barrier (Hansford and Anjorim 2013).

[11] For instance, it is sometimes recommended to substitute breastfeeding with other liquids for very young infants.

E.5 Household Level: Power and Access

This section unpacks the household, looking at is composition, the roles and responsibilities of its members and women's income.

E.5.1 Household Composition

In Hausaland, the typical household consists of a male head, his wife or wives and children, and married male children with their wife or wives and children. Married women always move to their husband's household (Hill 1972). The size of households depends on income, with wealthier men having more wives and children, and taking care of other relatives (Schildkrout 1982). In Jigawa and Zamfara, very poor households have 7-9 members, poor households about 10 members, middle-income households 15-18 members, and better-off households 20-25 members (Bush 2012: 13, Bush and Noura 2012: 13).

Polygamy is common in the region. According to the Demographic and Health Survey 2008, 41.9% of married women live in polygamous households, while only 27.1% of married men have several wives. Typically, polygamy is more common in wealthier households, rural areas and amongst individuals with lower levels of education (Munro et al 2010). Men often marry a second wife once they are older and have enough income to sustain a larger household (Solivetti 1994). Polygamy provides men with a higher status in their community and often leads to efficiency gains in overall household productivity (Barkow 1972, Munro et al 2010).

Marriage is essentially obligatory and Hausaland a completely married society (Callaway 1984, Solivetti 1994). There are no institutionalised single-person roles and non-married people are socially penalised (Solivetti 1994). Hence, almost all households have married couples and their children as their nucleus. Research from the 1970s suggests that girls were traditionally married at the age of twelve (Callaway 1984: 434, Longhurst 1982: 98, Schildkrout 1982: 58). Today, the average age of marriage appears to be around 16 (British Council 2012, Manoukian 2012: 19). Marriage is arranged by the father of the girl when she reaches reproductive age, and a child is expected within the first year of marriage (Mercy Corps 2013: 0). Therefore, girls have children at a very young age and almost never attend secondary school[12] (British Council 2012). Men marry when they have enough income to sustain a family, which is typically in their twenties or thirties but can be earlier for wealthier individuals (Schildkrout 1982: 59, Solivetti 1994: 258). On average, this means that husbands are far older than their wives (Sada et al 2006). UNDP (2009) argues that this disparity in age ensures that the wife has little power in decision-making in the household.

Since early marriage is almost compulsory, many girls obey but get divorced when they are not happy with the marriage. Callaway (1984) suggests that the majority of women experiences a divorce at some point in their lives, and Jackson (in Munro 2010: 5) estimates that women have on average 2.3 marriages. Divorce is often initiated by women when they are not happy with their first marriage (Solivetti 1994). Both partners can relatively easily secure divorce, although it is even easier for the husband (Adamu 2004, Barkow 1972, Sada et al 2006). Typically, divorced women remarry quickly to avoid facing social isolation (Callaway 1984, Munro 2010). Some authors argue that the ease of divorce gives women a powerful bargaining chip, as men will always try to avoid

[12] Other factors contributing to the lack of female schooling are: Preference of parents to pay school fees and expenses for male brothers who will earn more and are expected to support a family, parents expecting girls to work at home or earn income, seclusion, the general subordinate role attributed to women which does not require them to be educated, and an unsafe school environment, among others (e.g. British Council 2012).

public embarrassment and negotiate with their wives to stay or come back (Sada et al 2006, Solivetti 1994). On the other hand, men keep the older children after divorce, providing an important incentive to avoid such measures (Callaway 1984, Longhurst 1982, Munro 2010, Sada et al 2006). Both parties keep their property after divorce (Munro 2010).

E.5.2 Roles and Responsibilities

With the married couple at its nucleus, household roles and responsibilities are mostly defined by the institution of marriage. In Hausaland, marriage is viewed as a contract between husband and wife (Callaway 1984), more of a socio-economic organisation than an affective relationship (Solivetti 2004). The roles and responsibilities are clearly defined, with the husband solely responsible for the material maintenance of the household. In return, the wife is obedient and secluded, and focusses on reproduction (Adamu 2004, Longhurst 1982, Schildkrout 1982). Correspondingly, 65% of women in North-western Nigeria indicated to not have any say in household decision-making in the NDHS 2008 (in Hansford and Anjorim 2013: 6).

Seclusion means that married women at reproductive age are not allowed to leave the household during the day without permission of their husbands (Hill 1972). At night, women typically visit friends and relatives, and they are usually also granted permission to go to ceremonies or other special occasions (Pittin 2002). Girls and older women beyond reproductive age are not secluded. Solivetti (1994) estimates that between 30 and 70% of women in Hausaland are secluded, with increasing trends. Typically, seclusion is more strictly imposed in urban and richer households (Longhurst 1982, Munro 2010). In poorer households, husbands often cannot fulfil the premise of providing all livelihoods for the household, leading to a situation where the wife engages partly in farming too.

The distribution of power in secluded households is not as clear as it might appear on first sight. As Barkow puts it, “men’s advantages may be more visible than their disadvantages” (Barkow 1972: 322), and seclusion might be a rational choice (Amadu 2004). The worlds of the husband and the wife – the public and the domestic sphere – are so separated that men’s control over women is rather limited, and seclusion may be a way “to enable men to feel in control” (Callaway 1984: 433). While men spend most of their day providing the livelihoods for the household, women have time to engage in their own income-generating activities and build up large networks of social relationships (Callaway 1984). By bringing arguments into the public domain, most commonly if husbands are not able to maintain the household, women have a powerful tool at their hands and can divorce easily (Amadu 2004). On the other hand, they are formally clearly subordinate to men, not consulted by the husband on important decisions (Sada et al 2006) and have almost no role in the public domain (Callaway 1984). The British Council Nigeria argues that women’s influence will always remain limited unless women begin to contribute more to household cash income (British Council 2012: 60). This is however severely hindered by the practice of seclusion where no household income exists and men are solely responsible for the provision of livelihoods for the household[13].

Apart from the married couple and their children, many households also comprise the parents of the husband, his brothers and their families, and in polygamous households co-wives. This means that in practice, women are often more under the control of their mother-in-law or the first wife of the husband than of the husband himself, since these women are in the compound during the day (Barkow 1972). The RSCA undertaken in Zamfara (Constantine 2012) and a study on child feeding

[13] See section 2.3 for more details.

practices in Katsina (Hassan 2013) confirm that these older women have the power to block or initiate behavioural change, underlining their influential role within the household.

E.5.3 Women's Income

The first important resource in an agricultural society is land. In Hausaland, land ownership is very complex and subject to different inheritance processes (Longhurst 1982). Both men and women inherit land from their parents (Bush and Noura 2012), but women generally own much less than men. On average, only 4%-8% of women in Northern Nigeria own land, compared to 41%-52% of men (British Council 2012: 20). This is reinforced by seclusion which makes it difficult for women to participate in inheritance decisions and to cultivate their land.

However, seclusion also charges the husband with the sole responsibility to provide livelihoods for the household, freeing up time for women to engage in income-generating activities on their own. In fact, there is no shared household income and both parties can earn additional incomes as long as they fulfil their basic household responsibilities (Longhurst 1982, Schildkrout 1982), Sada et al 2006). Accounts are completely separate and spent to each partner's priorities (Pittin 2002).

Furthermore, husbands and wives even pay each other for any activities beyond their basic household responsibilities. Hill (1972) observed that "a woman who makes groundnut oil for sale is in business on her own account and there is nothing immodest about buying groundnuts from her husband at the market price, or buying oil from herself with her housekeeping money".
Because of seclusion, women at reproductive age can only work within their compounds (Callaway 1984, Longhurst 1982). Nevertheless, they engage in various income-generating activities related to food processing, preparing snacks and drinks, producing crafts, tailoring, trading and selling livestock products, among others (Longhurst 1982, Munro 2010, Bush and Noura 2012).

Unmarried girls and older women also work on cash crop farms, and as mentioned before, some very poor women also engage in cultivation since their husbands are not able to completely sustain them and strict seclusion (Bush and Noura 2012). Secluded women primarily access markets through their children, but sometimes also through their husbands or older women (Amadu 2004, Bush and Noura 2012, Munro 2010, Barkow 1972). The dependence of women on their children to engage in income-generating activities may contribute to poor public school attendance in Hausaland.

Women's income is completely separate from the household income and spent on women's own priorities (Munro 2010). Sometimes, women contribute to family expenses and their children's needs, but most of their income is spent on private needs such as social networks, their parents and kin, decoration and jewellery, and most importantly, the dowry of their daughters (Sada et al 2006, Schildkrout 1982). However, the income women have at their disposal is only around one quarter of men's income (Longhurst 1982).

E.6 Individual Level: Nutrition Beliefs, Practices and Malnutrition

This section looks at the individual level and identifies nutrition beliefs, practices and their impacts. Primary sources of information are the recent RSCAs in Jigawa and Zamfara (Constantine 2012, Manoukian 2012) and a distributional study by Klouda (2010) on Jigawa, Zamfara and Yobe.

E.6.1 Nutrition Beliefs and Practices

In Jigawa and Zamfara, most people understand nutrition both through modern medical interpretations and local traditional beliefs (Constantine 2012, Manoukian 2012). The most immediate causes of malnutrition such as insufficient consumption of food by the mother and the child, insufficient breastfeeding or poor hygiene practices are recognised (Constantine 2012, Manoukian 2012, Hassan 2013). However, the more underlying multiple causes of malnutrition related to poverty, health services, household dynamics and others were rarely mentioned by participants in the two RSCA's in Jigawa and Zamfara (Constantine 2012, Manoukian 2012). On the other hand, the importance of household dynamics was implicitly recognised. Improving income-generating opportunities for both men and women was the most prominent solution to malnutrition proposed by participants (Constantine 2012, Manoukian 2012).

The most important issue related to nutrition practices is the gender differential in food consumption. Men often eat protein and micronutrient-rich foods such as eggs or meat outside the house, while their wives depend primarily on the cereals and tubers brought by their husbands (Manoukian 2012). The practice of seclusion hence leads to a deficient diet for women and mothers. Second, there are some foods that are forbidden or proscribed for certain groups due to traditional local beliefs. For instance, in Jigawa, it is a taboo for pregnant mothers to eat eggs, cat, snake, fish, goat, chicken, wild weeds, peanuts peanut oil, pepper or sugar. If food choices are constrained, these taboos can further lead to deficient diets. There are other food taboos for lactating mothers, babies and babies being weaned in Jigawa (Manoukian 2012). For instance, lactating mothers are not supposed to eat mango, peanut and beans, and infants are forbidden to eat goat milk, fish, meat, eggs and salt. There are similar taboos in Zamfara, but these are less strictly observed (Constantine 2012). For example, pregnant women are told to avoid sugar and sometimes infants are not supposed to drink water and artificial milk.

In terms of child feeding, both the NDHS 2008 and the two RSCA's (Constantine 2012, Manoukian 2012) found very low levels of exclusively breastfed children until the age of six months, as recommended by health practitioners. In Zamfara, only 4% of infants were found to be exclusively breastfed up to 6 months of age (Constantine 2012: 15), in Jigawa this percentage dropped to 0%.Interestingly, a study in Katsina (Hassan 2013) found that only the mother's occupation is significantly related to child feeding knowledge, but not the fathers'. This finding could be interpreted as further evidence underlining the importance of independent income of mothers for child nutrition.

E.6.2 Malnutrition

According to the NDHS 2008 (382), 53.4% of children under five years of age in Jigawa are stunted and 34.4% are wasted. In Zamfara, 54% of children under five years of age are stunted and 11.3% are wasted. Similarly, 18.6% of adult women of child bearing age are found to be underweight in the North-Western states which include Jigawa and Zamfara (NDHS 2008: 182). These data show that malnutrition is a serious problem in both states.

Poor households experience significantly more child and maternal malnutrition in Northern Nigeria (Ajieroh 2009). Furthermore, statistical evidence from the region shows that women with lower incomes are much more likely to have malnourished children (Ajieroh 2009). On the national level, access to health services is highly correlated with malnutrition, pointing to the effect that low access to health services due to seclusion might have (Agee 2010). Accordingly, Longhurst and Cornelius (2013) argue that many elements of Hausa culture related to women's roles and responsibilities contribute strongly to the particularly bad nutrition situation in the region. Omilola (2010) supports the conclusion that early arranged marriages, low education, and low access to

health services for secluded women are among the key causes of child and maternal malnutrition in Northern Nigeria.

Finally, a recent study on the distribution of child deaths[14] by Klouda (2010) further underlines the importance of women's position within society and a household. In Jigawa, Zamfara and Yobe, 20% of women with multiple child deaths account for over 80% of all the deaths, indicating a strongly skewed distribution. Even in an environment of poverty, most women do not have child deaths, and most child deaths cluster around women with lack of family-based social support (Klouda 2010). Indicators of such a lack of family-based social support were that women reported to have no one to turn to for support and/or to look after the children, little respect from relatives, in-laws, husbands and others, and no or little general support form own relatives and in-laws (Klouda 2010: 13). This finding is the same for monogamous and polygamous households. Therefore, immediate social factors determining the specific position of each individual women seem to be key determinants of child nutrition and mortality. Further investigation is needed though to confirm the important findings of this stand-alone study.

E.7 Cash Transfers in Nigeria

There are 4 major conditional cash transfers (CCTs)—the earliest of which began operating in 2007—currently being implemented in Nigeria: In Care of the People (COPE), which focuses on income-related sources of risk; three in Kano, Bauchi and Katsina which aim to stop girls from dropping out of school, and focus on the attitudes and behaviours that sustain social sources of vulnerability (for further details, refer to Table 1 in the Appendix). None of these programmes have a direct nutrition component, and all target children over age 5. In addition, a number of pilot cash transfer programmes are being implemented throughout the country.

Cash transfer programmes are relatively new in Nigeria, and empirical evidence of their effectiveness is limited, with evaluations focusing on outputs such as the number of households reached or the effectiveness of service delivery rather than impacts and longer term outcomes. Much of the evidence of the impact of these programmes is based on anecdotal reporting and ad hoc processes of data collection (Holmes and Akinrimisi 2012, Holmes et al 2012). Despite this, across the 4 states where COPE is operating, beneficiary reports provide evidence of improved food consumption and diversified diets beyond staple grains. Additionally, a World Bank study by Fiszbein and Schady (2009) suggest that CCTs in countries like Nigeria, and similar contexts, have shown increased use of health services, which would have implications for improving child nutrition.

E.7.1 Income and Consumption

Size and value of the transfer

Generally, COPE beneficiaries have reported that the value of the transfer ($10-33 per month, depending on the number of children in the household) is very low compared with the need of households, especially in the context of increasing prices and variations in state-level services (Holmes et al 2012). As a result, although household incomes may be higher, consumption is not necessary smoother, and therefore, nutrition is not necessarily improved. Beneficiaries in Adamawa state reported that the transfer amount was insufficient to cover a family's basic needs. This was found to be particularly true for large, polygamous households in the north, and even smaller families requested that the transfer amount be raised, with suggestions between 10,000

[14] Malnutrition is a leading cause of child deaths (FMOH in Hansford and Ajorim 2013).

and 18,200 Naira (roughly $63-115) (Gavrilovic et al 2011, Holmes and Akinrimisi 2012, World Bank 2009).

It should be noted that transfer size does have diminishing returns (World Bank 2013, Baird et al 2010, Filmer and Schady 2009), and is ultimately not the only significant determinant of programme effectiveness. In Nigeria, short participation periods have also restricted potential impact of CTs (Gavrilovic et al 2011). In mapping the effectiveness of cash transfer programs in the region, Holmes and Akinrimisi (2012) suggest that COPE graduation rates suffer not only because of the small value of the transfer within the household, but also because the one year participation period is too short.

Distinct, but related, to the size of the transfer, is its actual value within the household. Save the Children (2012) have estimated that amongst the poorest households in Nigeria, the total resources—income, agricultural assets, etc.—are 210% of their annual food energy needs (compared with over 750% for middle income households). Large shocks which reduce that number to lower than 100% mean that a household is unable to purchase all of their staple food needs. At the individual household level then, CTs become more valuable depending on that particular household's shortfall, and should figure accurately into a particular household's resource-food expenditure calculation. Transfers aimed at reducing child malnutrition could effectively do so by using a household's baseline to explore how much cash is needed to achieve dietary diversity, with an amount appropriate to local incomes.

Income and demand for food

As the CTs in Nigeria have only indirect goals to impact malnutrition, here we supplement the discussion with a brief review of the role of income more generally as a determinant of demand for food and nutrition status in Nigerian households.

Evidence suggests that generally, in both rural and urban areas of Nigeria, household economic status has significant and positive effect on child nutrition, though with very limited effect (Ajieroh 2009, Babatunde 2010). One study found that a unit increase in household wealth index is associated with only about 0.0002 to 0.0006 increases in height-for-age Z-scores (Ajieroh 2009). Households receiving remittances have regular, substantial infusions of cash, and tend to have significantly higher incomes than non-remittance receiving households. Calorie supply in these households is higher, and the prevalence and depth of undernourishment is slightly lower. Dietary quality and dietary diversity are higher in receiving households, though the difference is not statistically significant. The prevalence of stunting, underweight, and wasting in children age 0-60 months is lower in remittance-receiving households—14.3 to 28.1, 13.2 to 30.7, 7.9 to 19.3 % respectively (Babatunde 2010). While it is clear that increased income benefitted young children, it is unclear what share of the observable improvements in anthropometric patterns could be attributed to increased consumption of food produced at home, food purchased at the market, and out-of-home meals/snacks.

Not only do the size and regularity of the income affect child nutrition, the source also determines impact. While no relation has been found between the income of fathers and the nutritional status of children in rural Nigeria, the income of mothers has been significantly related to wasting (Odunayo and Oyewole 2006).

However, income alone—from mothers or other sources—may not be enough to improve child nutrition status. A simulation of the potential role of CCTs in achieving health and education outcomes found that even a transfer set at 40% of the average national poverty line (a relatively larger transfer) was ineffective in achieving those outcomes in settings where beneficiaries could not fulfil conditionalities (Kakwani and Soares 2005). This leads to a discussion of the role of basic services in promoting improved child nutrition among CT beneficiaries in Nigeria.

E.7.2 Health Seeking Behaviour

The weakness of interventions in rural Nigeria aimed at improving child nutrition "reflect weaknesses in the overall health system to reach out to rural communities in the north" (Longhurst and Cornelius 2013). The quality of health services and the infrastructure to utilise them is, therefore, a key concern which must be considered in the Nigerian context, as international evidence that CCTs improve access to services is greater than the evidence that CCTs improve actual health outcomes (Holmes, Magoronga and Akinrimisi 2012). Jigawa State officials have stated that COPE, was modelled after CCTs in in Latin America, requiring adults to attend training sessions, ensure their children's attendance in school, and use local health services. These conditions were set in place in order to establish linkages with other programmes relevant to child health (ibid). However, the question remains whether those linkages are viable enough to support desired improvements in child nutrition. Fiszbein and Schady (2009) also question the premise of promoting increased utilisation of health services as the most effective means of improving child nutrition through cash transfers in settings such as northern Nigeria. For example, might it be more effective to provide more extensive nutrition training to mothers, or use another method?

While the priority of social protection is to support the demand-side deficit in terms of accessing basic services, including direct and the indirect costs associated with accessing health, there is also an urgent need for improvements on the supply side, particularly if social protection is conditional on service utilisation. Poor quality service delivery and the often large distances rural people must travel to reach these services are reflected in the poor child outcomes in Nigeria (Hagen-Zanker and Holmes 2012, Longhurst and Cornelius 2013). Lack of compliance with conditions which might improve child nutrition may in fact be due to beneficiaries' inability, rather than unwillingness, to access the relevant services. CCTs in this context must therefore consider which aspects of design and implementation make the programme and its desired health outcomes sustainable.

E.7.3 Household and Community Dynamics

As mentioned previously, maternal income is a determinant of wasting in young children in the rural Nigerian context. Other maternal characteristics, such as educational attainment did not indicate any significant effects on child nutrition. However, controlling for household wealth, the independent effect on child nutrition of mothers introducing income into the household is positive on height-for-age in rural North Central and North West, areas with the nation's highest levels of malnutrition (Ajieroh 2009, Hagen-Zanker and Holmes 2012). This suggests a uniquely effective role of mothers in translating increased income into improved nutrition status for young children. While COPE beneficiaries report that the transfer has not created major changes in male-female relationships, it is unclear how relationships and related feeding practices between women in polygamous households have been affected (Holmes and Akinrimisi 2012).

There are combinations of attitudes and behaviours specific to northern Nigeria which may increase the likelihood of CCTs improving child nutrition. Existing structures that support child nutrition may be enhanced by specific elements within the design of a CCT. Such aspects may include those that take advantage of strong social cohesion, commitment to ensuring that malnourished children receive care, and responsiveness to a context in which income increase is a higher status marker than educational attainment. (Ajieroh 2009, Longhurst and Cornelius 2013).

E.7.4 Conclusion

In the Nigerian context, there are a number of important factors in assessing the effectiveness of a CCT in achieving expected nutrition outcomes. First is the size of transfer, and its low value, particularly in large, polygamous households. Additionally, a short programme participation period limits the effectiveness of transfer and reduces beneficiaries' sense that they can achieve the desired outcomes of the project. The availability of complementary services has also proved problematic, with weak infrastructure a main hindrance to improving and assessing outcomes of existing cash transfers, particularly in rural areas. The northern Nigerian context does provide a potential climate for success in improving child nutrition through CCTs, through attitudes and behaviors at the household and community level. As current evidence of impact remains weak, the potentially positive experience of existing CCTs in Nigeria in improving child nutrition requires a longitudinal view—Longhurst and Cornelius suggest that they may indirectly improve the nutrition status of children by improving girls' education and, over time, increasing local incomes.

E.8 Cash Transfers in West Africa

In the West African context, CTs have the potential to play a major role in the reduction of child poverty, helping to improve child nutrition and health, particularly in areas where the provision of basic services is already adequate (Holmes and Barrientos 2009, UNICEF 2009). As in Nigeria, the emergence of cash transfers in West Africa is a fairly recent phenomenon. It is therefore challenging to draw lessons from their experience, as empirical evidence of the links between cash transfer and child nutrition is mixed and limited. This lack of research into connections between CTs and child nutrition is particularly prevalent, even in more recent studies (Olivier de Sardan 2013, Grittner 2012). Qualitative and quantitative data from such simulations and programme evaluations suggest that transfers that target children can have a particularly significant positive impact on children in low-income, West African countries (Grittner 2012, Pereznieto 2009).

E.8.1 Cash Transfers and Consumption

Food expenditure

One of the most prominent transfer programmes in the region is Ghana's Livelihood Empowerment Against Poverty (LEAP) cash transfer, which has been implemented since 2008. Strongly influenced by Brazil's Bolsa Familia, LEAP supports selected households with a monthly cash transfer, the size of which depends on the number of people living in the household. Transfers to people with disabilities or over the age of 65 are unconditional. Other beneficiaries must meet conditions of child school attendance, not allowing child labour, family enrolment in the National Health Insurance Scheme, and registering the births of children in the household (Abebrese 2011). The programme has expanded to cover 100 districts nationwide and over 64,000 beneficiary households since its start in 2008 (Daidone and Davis 2013). Beneficiaries report using the cash for food, resulting in fewer skipped meals of school-aged children, but there is limited data on the impact on child nutrition and younger children in beneficiary households (Gbedemah et al 2010, UNICEF 2009).

Impacts on child nutrition

To date, cash transfers have had a mixed impact on the nutritional status of children within beneficiary households.

In Niger, cash transfer recipients had less diverse diets than food transfer recipients. This is the result of using a significant proportion of their transfer to purchase grains in bulk—the cheapest

form of calories available. This choice was reflected in data on food consumption of children 6-24 months old, indicating that income improved the quantity but not the quality of food received by young children (Hoddinott et al2013).

Conversely, CT beneficiaries in Senegal not only fed young children more meals per day, but the cash improved diet diversification and management of children's health. However, analysis of the Coping Strategy Index utilized by this research was limited, and it is not clear exactly how the nutrition impacts of the transfer fit into the larger picture of household spending (IFAN, 2011). Similarly, Concern Worldwide found that, over the course of three years, a programme in Niger integrating cash transfers, community participation and nutrition actions positively impacted households' wellbeing, leading to a substantial drop in acute malnutrition (Sahel resilience report). Positive impacts may also be tempered by exogenous shocks such as seasonal changes in food security and the escalation of malaria and diarrheal diseases (Save the Children 2009, Bailey and Hedlund 2012). This was the case in Niger, where an unconditional cash transfer was coupled with nutrition education and food distribution initially reduced the global acute malnutrition rate from 21.3% to 13.6%. Another pilot cash transfer also achieved initial improvements in weight-for-height z-scores. However, in both cases, malnutrition rates increased during a dramatic increase in malaria and childhood illness. This suggests that the scale and overall impact of cash transfers in improving diet alone may not be sufficient to protect children's nutritional status from deteriorating in the face of extraordinary health concerns (ibid). It is important to note that these programmes were seasonal cash transfers and therefore seasonal stress is a factor.

Income, demand for food, and child nutrition outcomes

Nutrient elasticities with respect to income in West Africa can be briefly summarized. Increased income in poor households in the region *generally* corresponds with improved nutritional status of young children, both in terms of weight-for-age and height-for-age (Behrman and Deolaliker 1987, FFH 1998). This impact appears to be independent of the source of the income; credit, conditional and unconditional cash transfers, and voucher schemes have all been shown to result in households consuming diets of a better quality and greater diversity, specifically increasing the amount of fresh foods, animal proteins and fats (Bailey and Hedlund 2012). [15]

E.8.2 Health Seeking Behaviour

In West Africa, there is evidence that cash transfers promote an increase in health seeking behaviour. These results with respect to health outcomes, however, are mixed—in part because of supply-side constraints and limited studies from which to draw conclusions (Grittner 2012, Bailey and Hedlund 2012). In Ghana, LEAP provided an improved but limited increase in access to healthcare among pregnant women and decreased illness and health visits for children age 0-60 months (Gbedemah et al 2010, Handa and Park 2013). In Burkina Faso, evaluation of health utilisation for beneficiaries of the Nahouri Cash Transfer Pilot Project (NCTPP) children age 5 and younger showed 0.43 more visits to health clinics for routine preventative care during the previous year compared to children in control households, a 49% increase compared to the mean in the control group. This impact depended more on the conditionality of the transfer than on the gender of the adult recipient (the unconditional transfer had no corresponding impact) (Akresh et al 2012). Bailey and Hedlund (2012) suggest that in West Africa, cash alone is unlikely to have a major impact on child malnutrition. Rather, implementation of cash and health programmes could

[15] As mentioned in section 5.1.2., this is not observed among the poorest beneficiary households. It is important to note that this is more likely to happen when CTs are targeted according to MUAC measurements (and) in a food crisis context, as was observed to have happened in a programme in southern Niger in the 2005 food crisis.

overlap. For instance, outcomes could be improved by providing transfers at health centres, increasing access to existing health services, and subsidising the cost of transport.

Throughout the region, health services are poor and infrastructure is weak. UNICEF (2009) has questioned the appropriateness of demand-side approaches in addressing child poverty and nutrition in Ghana. While the evidence on impact varies, there is consensus that alignment with other programs to address the supply and quality of health services would improve CCT outcomes.

E.8.3 Household and Community Dynamics

As a result of weak social protection mechanisms in the region, most people in West Africa turn to informal, kinship networks (ODI 2009). This has implications for the impact of attitudes and behaviours at the household level which address malnutrition. The example of LEAP is particularly well documented. An ex ante simulation of impact was conducted with the expectation that food expenditures would increase significantly, slightly improving child morbidity, and significantly increasing curative care of children (Osei, Handa and Park 2013). Evidence suggests that LEAP beneficiaries actually had reduced monthly expenditure on food consumption because informal transfers to beneficiary households stopped once they became enrolled in LEAP (Ayerakwa et al 2013, Daidone and Davis 2013).

CARE and UNHCR have also voiced concern that transfers may negatively impact child nutrition by creating incentives which inadvertently influence the care environment. For example, mothers may purposefully neglect their children in order to be eligible (Bailey and Hedlund 2012).

Household dynamics have also been shown to influence heterogeneous, gendered impacts of increased income on child nutrition status. Using a non-cooperative bargaining model, Haddad and Hoddinott (1994) found that while improvements in access to public services are gender neutral in their effects, boys do relatively better in terms of height-for-age as a result of increasing female income shares in Cote d'Ivoire. The study also found that a child's relationship to the household head (i.e. child of a junior or senior wife) is relevant in determining the extent of child wasting and stunting. These results indicate that the concept of the unitary household[16] is inconsistent with empirical evidence of how cash transfers affect different members within a household.[17] Elsewhere, it has been suggested that increased investment in caretakers, rather than household heads, would be particularly beneficial in addressing malnutrition (Abebrese 2011).

E.8.4 Conclusion

There is evidence that cash transfers have the potential to improve child nutritional status in the West African context. However unintended impacts, such as the withdrawal of community and family support, have left beneficiaries less well- off than control groups. Households which, prior to becoming beneficiaries, received cash or in-kind support from their families/communities may be worse off after becoming beneficiaries because people now perceive them as no longer needing support. Meanwhile, the CT amount may not be an adequate substitute for the support the community/family members were providing, leaving the families worse off. This was observed in studies of decreased food expenditure among LEAP beneficiaries, which resulted from the

[16] This refers to a model of household behaviour in which the household behaves as if there were one decision maker (Haddad and Hoddinott 1994).

[17] It should be noted that boys in the study tended to have lower baseline anthropometric measures than girls, especially in rural areas. The authors suggest that the inequality of outcome between boys and girls could possibly be explained by mothers attempting to compensate for boys' relatively weaker status.

weakening of informal and kinship networks. This suggests that the value of the transfers has been insufficient to cover the shortfall families face in meeting their basic needs and child nutrition may suffer as a result. Spending on food did, however, account for the majority of transfer expenditures. Nutrition outcomes of CT beneficiaries in West Africa have been positive, but limited by poor infrastructure and weak services. Despite this, there is evidence of increased health seeking behaviour for children age 0-60 months, though the connection between increased access to services and improved nutrition outcomes is unclear. Finally, positive outcomes of increased income do not appear to be evenly distributed across all household members, and are governed by the gender of the adult beneficiary, as well as his/her relationship to the household head.

E.9 Cash Transfers in Sub-Saharan Africa

Since 1970, Sub-Saharan Africa (SSA) has seen a massive increase in the absolute number of malnourished people, and currently has an under-nutrition rate of 30%, triple the global rate (Cook and Kabeer 2009, Devereux and Cipryk 2009). Cash transfer programs are being implemented throughout SSA, and evidence suggests that even in low-capacity households, predictable and regular transfers can have a large impact on smoothing consumption and result in more diverse diets (Holmes 2007). Targeting rural children for cash transfers aimed at improving nutrition is near perfect targeting in countries such as Cameroon, Gambia, Mozambique, and Zambia (Kakwani et al 2006). One note on limitations of the available data: there are often problems with data collection, particularly surrounding the collection of children's anthropometric data and small sample sizes in evaluating pilot programmes (Longley et al 2012).

E.10 Cash Transfers and Consumption

Food expenditure

Throughout SSA, there is evidence that cash transfers increase spending on food in beneficiary households. The Kenya Cash Transfer for Orphans and Vulnerable Children, Malawi Food and Cash Transfer (FACT), and Zambia Social Cash Transfer Scheme (SCTS) have increased food spending by 25%, 60%, and 70% respectively (Adato and Basset 2009). Some households increased spending primarily on maize or other staple grains, buying more food but not better food (Devereux et al 2006, Harvey and Savage 2006, Kardan et al 2010). In programs such as the Mchinji SCTS in Malawi, this increase in food spending reduced underweight and stunting, created greater dietary diversity, and increased consumption of complex, high quality proteins among children under age five (Miller 2009). In Ethiopia, these consumption and nutrition outcomes have been accompanied by improvements in child-caring practices and increased uptake of social services among Productive Safety Net Programme (PSNP) beneficiaries (Kebele 2006).

Impacts on child nutrition

In Lesotho, Swaziland and Uganda, children in households that received cash improved nutritional status and were more likely than children in households receiving both food and cash to experience immediate and sustained improvements in dietary diversity, including dairy, meat and eggs (Devereux and Mhlanga 2008, Bailey 2013, Gilligan 2013, Devereux and Jere 2008). As a result of improved diet, children suffered fewer skipped meals, and under five nutrition improved significantly, though rates of malnutrition have remained high (Maliro 2011; Miller, Tsoka, and Reichert 2010). The Dowa Emergency Cast Transfer DECT programme in central Malawi, where there is a high prevalence of polygamous households, has narrowed food consumption gaps between male- and female-headed households, and decreased admissions rates of children to

nutrition treatment centres[18] (Devereux et al 2007). Evidence from the HSNP program in Kenya finds beneficiary households spend more on food and health care, and engage in fewer negative coping strategies. An evaluation two years into the programme found no impact on overall beneficary households' dietary diversity. However, **poorer** HSNP households did have improved diversity. The evaluation found no significant impact on child nutrition (Merttens et al 2013).

Anthropometric data support evidence that cash transfers are improving child nutrition in SSA. Height-for-age and weight-for-height survey data from South Africa, Malawi, and Zambia show improved nutrition outcomes, particularly when children are beneficiaries of cash transfers for two-thirds or more of the first three years of life (Aguero et al 2007, Arnold et al 2011, Case 2001, Gaarder et al 2010, GTZ 2006, Kukrety 2007, Manley et al 2013, Slater and Farrington 2009, Sridhar and Duffield 2006, Yablonki and O'Donnell 2009).

Impacts differ across age groups. Very young children can suffer from coping strategies adopted by CT beneficiary households (Bailey 2013, Devereux and Jere 2008). A review of cash transfers in Uganda showed that children aged 6-35 months in beneficiary households experienced a low but significant increase in malnutrition of roughly 5 percentage points (though *food* transfers had a positive spillover effect on children under age 3). Meanwhile, cash beneficiary children age 35-53 months and 61-83 months experienced a significant reduction in prevalence of severe wasting (Gilligan 2013).

Size of the transfer has been shown to affect the level of impact in Sub-Saharan Africa. For example, an unconditional cash transfer programme in Mozambique showed little or no impact on nutrition, probably because of the low value of the transfer (£1.2 to £2.4 per month, less than a third of household expenditure) and short duration of the programme (Arnold et al 2011). In a study of beneficiary and community perspectives on the Basic Social Subsidy Programme (PSSB) in Mozambique, beneficiaries felt strongly that the value of the transfer (£3.10-$9.03 per month) is so low that they have to have other survival strategies, despite the fact that the criteria for eligibility for PSSB is that there are no economically active household members and that the household has no other sources of income (Selvester et al 2012). Devereux et al (2006) link impact of cash transfers to the scale of the programme and size of the individual transfer.

Additionally, early and regular access to the cash transfers is required for an effective and sustained impact on children's nutritional status. Cash transfers such as the South Africa Child Support Grant and Old Age Pension play an important role in enabling caregivers in the household to access food of sufficient nutritional quality and variety to meet the child's needs. However, there is evidence that limited or late access to the grant reduces impact on child development (Aguero, et al 2007, UNICEF 2008).

Regularity of transfers also enables beneficiaries to weather seasonal variations in food security and maintain levels of consumption of diverse foods throughout the year (Miller et al 2011).

Income, demand for food, and child nutrition outcomes

The broader literature on the connection between income and demand for food in SSA suggests that cash transfers in the region have been particularly successful in promoting demand for food in poor households. The majority of cash distributed goes towards buying food, particularly in hunger gap seasons, with positive, measurable impacts on child nutrition (Mattinen and Ogden 2006, Miller et al 2011, Hochfeld and Plagerson 2011).

[18] This coincided with a period of falling maize prices and in the absence of a control group panel survey of non-beneficiaries it is impossible to disentangle the effects of DECT cash transfers from the effects of falling maize prices on household income and food consumption.

Generally, however, increased household income is not necessarily associated with improved child nutrition. Increased income, even from cash transfers, does not always get spent on food; programmes impact households' economic production and investment in education (Seidenfeld and Handa 2011). In the African context, recovery from malnutrition has a stronger association with the mother's education than with household income, or participation in an intervention which emphasises child rearing and feeding practices (Ajao et al 2010, Vella et al 1994). In rural Chad, caregivers' total income was not related to child height-for-age scores, but reported *use* of caregiver income was positively associated with height status of children (Begin et al 1999). This suggests that expenditure, rather than absolute or proportional increase in household income, may be a more appropriate determinant of child nutrition. A study on income and child nutrition in developing countries found that per capita household consumption figures have a positive relationship with the nutritional status of preschool aged children as measured by weight-for-age, even with no change in community or household infrastructure (Haddad et al 2003).

E.10.1 Health Seeking Behaviours

Improved health seeking behaviour for children under five has been observed among beneficiaries of cash transfers in Sub-Saharan Africa. However, improved child nutritional status has not been distinctly attributed to this behaviour (GTZ 2007, Maliro 2011,World Bank 2013). Pridmore and Carr-Hill (2010) observe that CCTs to increase the uptake of maternal and child health services are promising but have only been shown to reduce stunting in middle-income countries. This is perhaps in part because of the value of transfer needed to reduce child undernutrition and inadequate health services in low-income countries.

Weak health services are a problem throughout Africa (Aguero et al 2007, Arnold et al 2011). For example, a feasibility study for a CCT scheme in Chipata, Zambia concluded that there are major supply-side constraints when it comes to health services, both in quality and quantity in rural areas. Long distances and poor transportation infrastructure can ultimately affect nutrition outcomes by making health seeking behaviour prohibitively difficult or expensive (Schubert and Slater 2006). This is a factor that has affected discussions of targeting CTs in the region; while rural populations tend to be highly vulnerable, they also live in resource-poor environments which limit the capacity of social protection instruments to alleviate poverty (Low et al 1999).

E.10.2 Household and Community Dynamics

Household level

Improving women's status within their community and household improves children's nutritional status (Pridmore and Carr-Hill 2010). At the household level, evidence also supports the assertion that money directed to women beneficiaries has a positive effect on their status and the anthropometric scores of children in their care, especially female children (Barrientos and deJong 2004, Duflo 2000, Patel and Hochfeld 2011, Thakur et al 2009).

While there are few reports of gendered conflicts over control of the cash transfer, the transfer alone has not been found to significantly change gender relations (Devereux and Mhlanga 2008, Patel and Hochfeld 2011). In some cases, intra-household tensions arose between spouses around how the money should be used, particularly if there were children with no biological connection to the household head living in the household (ODI 2013). How the cash transfers are shared among members of polygamous households depends on the relation to the household

head in some instances (e.g. junior or senior wife), and the age of children in the respective households in other instances (Berhane et al 2011).

Bouis (1994) makes an important distinction between household expenditure on food and family consumption as a result of increased income. A study in Kenya found that while calories available to a family increased rapidly with income, actual calorie intake did not increase at a comparable rate. This was attributed to under-estimating food eaten outside of the house and meals served to non-household members, suggesting that not all newly available calories in the household go towards meeting family (or children's) nutritional needs.

Community level

It has been argued that cash transfers can "crowd out" traditional coping mechanisms such as inter-household loans of food, labour, or cash because "modern safety nets substitute rather than build upon previous methods" (Ellis 2006, ODI 2013). Recipients of the Zimbabwe Emergency Cash Transfer ZECT and DECT seldom shared the cash itself, but did share the food purchased with the cash (Harvey and Savage 2006). Beneficiaries of the South Africa Child Support Grant spoke about the transfer as a "gift" rather than a "right", but still viewed the grant as offering a dignified way to provide for one's household and alleviate the stigma of poverty (Hochfeld and Plagerson 2011). These attitudes may have positive effects on women's standing in the community and, ultimately, the nutrition status of children in their household.

Conclusion

Cash transfers have positively affected child nutrition in Sub-Saharan Africa. What remains unclear are the pathways linking increased household income, maternal empowerment, access to health services, and child nutritional status. As a result, most CT programs have been shown to achieve increased service utilisation without achieving consistent, uniform improvements in nutrition outcomes. Small amounts, limited coverage, and poor infrastructure limit effectiveness of CTs, particularly in rural areas. Evidence suggests that in contexts where women's status is improved by receiving transfers, children's nutrition status improves, but these benefits are not evenly distributed within households. Although CTs may be seen to compete with informal safety nets, these traditional mechanisms have limited coverage. Therefore, social protection mechanisms can ideally complement rather than substitute them, especially for households whose ability to meet their children's nutritional needs through traditional means has become exhausted (Ellis 2006).

E.11 Cash Transfers in Comparable Socio-Cultural and Livelihoods Contexts

This section provides a summary of the experience of countries with socio-cultural and livelihoods contexts comparable to Northern Nigeria in promoting child nutrition through cash transfers. These are countries or regions which have profiles of community, household and individual characteristics similar to Northern Nigeria, as discussed in Sections 1-3 of this document. This section includes evidence from cash transfers implemented in rural communities in Bangladesh, north India, Indonesia, and MENA region countries.[19] It should be noted that there is limited age-disaggregated analysis of poverty-targeted or child-focused programmes, including cash transfers (Marcus et al 2011).

[19] MENA countries are suitable for comparison in that there are similar cultural norms as Northern Nigeria, and these countries also have high rates of stunting and wasting in children under five (Marcus et al 2011).

E.11.1 Cash Transfers and Consumption

Food expenditure and impacts on child nutrition

Cash transfers have had positive, significant per capita impacts on calorie and food expenditure and protein consumption. Anecdotal information and significant, but weak statistical analysis suggest that children experience improvements in their height-for-age scores, though evidence of benefit to very young children is mixed (Manley et al 2013). In Bangladesh, participation in the Rural Maintenance Program increased household food consumption by 35kcals per person per day, but participation by an adult female did not lead to increased caloric intake by preschool-age children in any of the programme's four components (Ahmed et al 2009). Conversely, in the Bangladesh Chars Livelihood Programme (CLP), nutritional surveys in 2009 found that children of earlier recruits into the cash and asset transfer programme were, on average, less stunted and underweight than later recruits (Arnold et al 2011).

CT beneficiaries in rural Yemen not only consumed higher value foods, but also reported feeding infants and young children a wider variety of foods. These households also consumed an average of 100 kcals less per day than food transfer beneficiaries, but had more diverse and nutritious diets (Schwab et al 2013). The subjective assessment of families of whether they are eating "better" may depend on the manner in which households consider food quality versus quantity when determining the criteria of whether or not they are meeting their food needs. Results also varied by duration of participation period. Similarly, in assessing income as a determinant of child malnutrition in Bangladesh, Seaman et al (2008) found that by minimizing food quality, the poorest households increase the food intake by approximately 300 additional kcals per person per day, but that nutrition status would be unlikely to improve without a combination of nutrition education and increased income.

Research participants agreed that the Social Welfare Fund in Yemen was useful, but that the amount of the transfer was too low. Beneficiaries could use it to meet some short-term resource demands but it is not transformational. For instance, a household with 6 people receives the equivalent of $0.60 per day, enough to buy 6 pieces of bread, which is unlikely to have significant impact on child nutrition. Moreover, beneficiaries felt that the amount of the transfer to be too low to justify conditionalities. They proposed that complementary CT programs such as cash or vouchers specifically for use at health services would be more effective in increasing health seeking behaviour, given the unmet needs in beneficiary households (Bagash et al 2012).

Income, demand for food, and child nutrition outcomes

In the MENA region, cash transfer beneficiaries reported that food purchase was often a secondary use of the money received, coming after education costs and repaying debts for food (Bagash et al 2012, Jones and Shaheen 2012).

For households that do increase food spending when income increases, nutrient elasticities with respect to total household expenditure vary across countries. Values range from very low in rural Indonesia (0.0-0.1) to fairly high in rural Bangladesh (0.6-0.8) (Behrman and Deolaliker 1987). These elasticities are affected by price factors, as well as foods families grow and consume at home, cultural contexts, and other non-price factors.

E.11.2 Health Seeking Behaviour

Studies indicate that in rural conditions where basic services infrastructure coverage is higher than average, local rates of stunting are lower, and quality of services appears to be more critical than quantity when addressing malnutrition (Jones and Shaheen 2012).

E.11.3 Household and Community Dynamics

Household level
Cash transfers sometimes cause intra-household tensions between those who receive the cash and those who control it, typically the household head (Bagash et al 2012). In some cases there is conflict between young mothers and their husbands or mothers-in-law (ODI 2013, Gaarder et al 2010). Transfers have been seen to improve relations between wives in polygamous households, which may have positive impact on child nutrition, particularly for the children of the wife with a lower status (Jones and Shaheen 2012). In female-headed households, spending tends to be more focused on non-food needs. For example, some young divorced women targeted by the Social Welfare Fund in Yemen reported that while they would like to spend the money on their children, the household head or influential females in the home often appropriated towards the purchase of household items (Bagash et al 2012). In some instances, beneficiary families made greater health investments in infant girls, with weak but positive evidence of improving health status in the short and medium term (Sinha and Yoong 2009).

Community level
Although participating in cash transfer programmes improves poor women's status within their households, it does not necessarily improve their standing in the community (Ahmed et al 2009). In the West Bank, some CT beneficiary households were worse-off because informal support from within the family was withdrawn once they began receiving the transfer (ODI 2013). This may be due to shame associated with poverty and receiving aid. Family members of beneficiary women reported trying to stop their wives and mothers from going to collect the transfer because of the stigma (Jones and Shaheen 2012). Socio-cultural blocks to accessing transfer benefits could therefore have impacts on the nutritional status of children in those households.

E.11.4 Conclusion

Programmes promoting nutritional wellbeing of children under five are common in countries with socio-cultural and livelihoods contexts similar to northern Nigeria. Targeting the poorest households in these contexts could make significant contributions to reducing chid malnutrition, particularly where health services are adequate (Marcus et al 2011, Pereznieto et al 2011). Although transfers have the potential to improve child nutrition, social factors—stigma, emphasis on debt repayment, lack of financial control—affect access to transfers and expenditure choices. Additionally, the increased purchase of low-quality food with cash transfer funds indicates the important role of nutritional education in improving child health outcomes. This may be particularly so in households using the cash transfer to augment a diet based around subsistence agriculture.

E.12 Final Conclusions and Recommendations

Overall, there is a growing body of evidence that cash transfers have had mixed, but generally positive impact in addressing malnutrition in contexts similar to those of the CDG. With regards to an approach to contextualizing the implementation of the Child Development Grant in Jigawa and Zamfara states, there are a number of key issues.

First is the size and value of the transfer, and whether the amount represents a reasonably significant value within the household to affect consumption patterns. Second is the issue of timing. This refers to the duration of programme participation (current CTs in Nigeria are viewed as too short to achieve their goals), as well as ensuring that children benefit from the transfer during the early months when stunting is preventable or reversible. In the Northern Nigeria, timing concerns

also include how a cash transfer improves nutritional outcomes in the context of livelihoods that are highly affected by seasonality.

Third, the usefulness of addressing malnutrition through cash transfers also requires an assessment of the role of available health services. Transfers in contexts where basic services are weak or inaccessible have been shown to have limited success in improving nutrition outcomes. In the implementation context of the CDG, it could therefore be relevant to explore the role of community-based providers in assisting beneficiaries to achieve improved nutrition.

A fourth wider theme considers how the cash transfer can work with, rather than against, existing support structures in target communities. Practically this involves sensitivity to the financial, psychosocial, and nutrition effects of the presence or withdrawal of community support to beneficiaries.

At the household level, issues of power and control are central to understanding the observed and potential impact of the cash transfer on nutritional status. Female incomes in the implementation context are not pooled, and evidence suggests that this dynamic increases the likelihood that CT funds will be used to meet children's needs. However, relations between women of different ranks (rather than male-female tensions) could affect children's nutrition by influencing spending as well as attitudes within the household. Women's position within society and the household are potentially of particular importance in the context of Jigawa and Zamfara states, as the prevalence of child mortality is highest among women who lack social support. Further investigation is needed into whether the social standing of women is a key determinant of child nutrition and mortality, though evidence from the PRINNN/MNCH study suggests this is the case.

Finally, the behaviour of the poorest and most vulnerable beneficiaries of cash transfers is often incongruous with the desired behaviours and therefore produces negative nutrition outcomes. Of particular relevance is the tendency of very poor beneficiaries to increase the quantity but not the quality of food consumed. In Jigawa and Zamfara states, especially disadvantaged households may adopt such coping strategies, which are especially noted in areas where subsistence agriculture is prevalent. This behaviour may be a result of the combination of economic, attitude, education, or social factors.

Table 2 Summary of cash transfer programmes currently being implemented in Nigeria

CCT	Dates	Location	Number of beneficiaries	Conditions	Transfer amount	Objective
Subsidy Reinvestment and Empowerment Program, Maternal and Child Health	2012-2015	Nationwide	500 participating primary health care facilities	ante-natal care at least 4 visits to hospital; delivery by skiled birth attendants; immediate postnatal care visit	N5,000 to participating mothers; N750 to traditionl birth attendants for every pregnant woman they encourage to register for ante-natal care; N750 to TBAs for every pregnant woman they mobilize for delivery with a skilled birth attendant	reduce maternal and newborn deaths all over Nigeria by concentrating on rural and under-developed communities ; increasing equity and access for the poorest and training more frontline health workers to be able to provide a wide-range of family planning mehtods
COPE (In Care of People)	2007-ongoing	All states	22,000	Adult members attend training sessions, keep their children in school, and utilise health services	Ranges from $10 to $33 per month, depending on the number of children in the household	To break the intergenerational transfer of poverty and reduce the vulnerability of the poor to existing socio-economic risks, and to improve the capacity to contribute to economic development
3 Pilot CCT for girls' education	2011-2014 pilot	Kano, Katsina, and Bauchi	19,000	Girls' 80% school attendance	Kano: $32 or $16 every two months	To reduce girls' dropout as a result of early marriage, specifically in the transition period from primary to secondary school

Source: Longhurst and Cornelius 2013

Table 3 List of cash transfer programmes reviewed

Transfer Name	Country
Apni Beti Apna Dhan	Northern India
Basic Social Subsidy Programme (PSSB)	Mozambique
Cash and Food Aid, IFPRI/WFP	Uganda
Cash and Food Aid, SCUK	Swaziland
Cash and Food Transfer Pilot Project (CFTPP)	Lesotho
Cash Transfer for Orphans and Vulnerable Children	Kenya
Cash Transfer Pilot Project	Sri Lanka
Catholic Relief Services Drought Emergency Response	Kenya
Chars Livelihood Programme	Bangladesh
Child Support Grant (CSG)	South Africa
Dowa Emergency Cash Transfer (DECT)	Malawi
Family Hope Programme (PKH)	Indonesia
Food and Cash Transfer (FACT)	Malawi
The Hunger Safety Nets Programme (HSNP)	Kenya
In Care of the People (COPE)	Nigeria
Kalomo Pilot Scheme	Zambia
KwaYulu-Natal Child Support Grant	South Africa
Livelihood Empowerment Against Poverty (LEAP)	Ghana
Mchinji Social Cash Transfer	Malawi
Monze Cash Transfer	Zambia
Nahouri Cash Transfer Pilot Project (NCTPP)	Burkina Faso
Old Age Pension	South Africa
Transfer Name	Country

Palestinian National Cash Transfer Programme	West Bank; Gaza
Productive Safety Net Programme (PSNP)	Ethiopia
Rural Maintenance Programme	Bangladesh
Social Cash Transfer Scheme (SCTS)	Zambia
Social Welfare Fund	Yemen
Zimbabwe Emergency Cash Transfer (ZECT)	Zimbabwe

Also un-named programmes, credit and income data from: Chad, Somalia, Uganda, Mali, Cape Verde, Sierra Leone, Cote d'Ivoire, and Niger.

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Annex F Literature review summary

Author	Year	Intervention type	Transfer amount	Transfer amount (share of baseline income)	Intervention name	Country	Period evaluated	Methodology	Outcome variable	Effect size
Paxson and Schady	2010	Unconditional cash transfer (UCT)	US$15 per month per household	10%	Bono de Desarrollo Humano	Ecuador	2004–2007	Cluster RCT	HAZ, Height	Not significant (NS)
Agüero, Carter and Woolard	2007	UCT	US$25 using exchange rate, US$50 PPP		Child Support Grant	South Africa	18 months	Propensity score matching (PSM)	HAZ	HAZ effect size <0.1
Miller, Tsoka and Reichert	2009	UCT	US$14 per month per HH		Malawi Social Cash Transfer	Malawi	March 2007–April 2008	Cluster RCT	Underweight	(0–3 years underweight – **13pp**)
Rivera, Barquera and Ramırez-Silva	2008	Conditional cash transfer (CCT)	US$25 per month per household	20–25%	Oportunidades	Mexico		Cluster RCT	HAZ, Height, WHZ	(0–6mnth Height **+1.1cm**) (6–12mnth Height NS)
Leroy, Garcıa-Guerra, Garcıa, Dominguez, Rivera and Neufeld	2008	CCT	US$25 per month per household	20–25%	Oportunidades	Mexico		PSM	HAZ, Height, WHZ, Weight	(0–6mnth HAZ **+0.41SD**) (0–6mnth WHZ **+0.46SD**) (0–6mnth Height **+1.53 cm**) (0–6mnth Weight **+0.76 kg**) (6–12mnth HAZ NS) (6–12mnth WHZ NS) (6–12mnth Height NS) (6–12mnth Weight NS) (12–24mnth HAZ NS) (12–24mnth WHZ NS) (12–24mnth Height NS) (12–24mnth Weight NS)
Barber and Gertler	2008	CCT	US$25 per month per household	20–25%	Oportunidades	Mexico	1998–1999	Cluster RCT	Birthweight (BW), Low birth weight (LBW)	(**+127.3g** higher birthweight) (**-4.6 pp** low birthweight)

Rivera, Stores-Alvarez, Habicht, Shamah and Villalpando	2004	CCT	US$25 per month per household	20–25%	Oportunidades	Mexico	1998–1999	Cluster RCT	Height	(0–6mnth at baseline Height **+1.1cm**)
Gertler	2004	CCT	US$25 per month per household	20–25%	Oportunidades	Mexico	1997–1999	Cluster RCT	Height, Stunting	(Height **+0.96cm**) (Stunting NS)
Fernald, Gertler and Neufeld	2008	CCT	US$25 per month per household	20–25%	Oportunidades	Mexico	1998–2003	Cluster RCT	HAZ, stunting, BMI	(HAZ **+0·20SD**) (Stunting **–0·10%**) (BMI**–2·85**)
Fernald, Gertler and Neufeld	2009	CCT	US$25 per month per household	20–25%	Oportunidades	Mexico	1998–2007	Cluster RCT	HAZ, BMI	NS
Maluccio and Flores	2005	CCT	US$19 per month for food per household, plus school subsidy	18–20%	Red de Protección Social	Nicaragua	2000–2002	Cluster RCT	HAZ, Stunting, Wasting, Underweight	(0–5 year stunting **-5.3%**) (0–5 year wasting NS) (0–5 year underweight –**6%**) (0–5 year HAZ +**0.17SD**)
Attanasio, Gómez, Heredi and Vera-Hernández	2005	CCT	US$15 per month for food per household, plus school subsidy	24–30%	Familias en Acción	Colombia	2002 (one year)	Matched clusters	HAZ, BW	(0–24mnth HAZ **+0.16SD**) (24–48mnth HAZ NS) (>48mnth HAZ NS)
Morris, Flores, Olinto and Medina	2004	CCT		3–10%	Programa de Asignación Familiar	Honduras	1998–2000	Cluster RCT	HAZ, WHZ	(0–60mnth HAZ NS) (0–60mnth WHZ NS)
Morris, Olinto, Flores, Nilson, and Figueiró	2004	CCT		8%	Bolsa Alimentação	Brazil	2001	Matched individuals	HAZ, WAZ	(0–24mnth HAZ NS) (24–48mnth HAZ NS) (>48mnth HAZ NS) (0–7years WAZ -0.13SD)
Fitzsimons, Malde, Mesnard and Vera-Hernández	2013	Information			Mai Mwana	Malawi	2005–2010	Cluster RCT	HAZ, WAZ, WHZ	NS
Alderman	2007	Information			Community-based growth promotion	Uganda	Two years	Difference in differences (non-experimental)	WAZ	(0–12mnth **+0.4SD** WAZ)

Linnemayr and Alderman	2011	Information			Nutrition Enhancement Program	Senegal	2004–2006	Combines ex-post adjustments, such as propensity score matching, with the randomised treatment plan	WAZ	(0–36mnth **+0.1SD** WAZ) (Older children NS)
Penny, Creed-Kanashiro, Robert, Narro, Caulfield and Black	2005	Information			Peru government programme in urban areas	Peru	18 months	Cluster RCT	Stunting	(18 months Stunting – **11pp**)

Annex G Detailed methodology

This report relates to the **quantitative impact evaluation**, and presents our baseline findings. More details on the **quantitative impact evaluation** questions and method are outlined below. Please see the CDGP evaluation inception report for details regarding the other components.

G.1 Overview of quantitative impact evaluation

The quantitative impact evaluation is designed to generate robust evidence of the impact of the programme on household food security and vulnerability and child nutrition. The current evidence regarding the effect of cash transfers on child and maternal nutrition is mixed (see the literature review table in Annex F) and to our knowledge there is no evidence regarding the effect of cash transfers on nutrition in Northern Nigeria. The quantitative impact evaluation also aims to rigorously test the difference in key outcomes as a result of 'high' and 'low' intensity delivery of a behavioural change communication (BCC) intervention. The 'low intensity' BCC is delivered through posters, radio messages, text messages and theatre. The 'high intensity' BCC is delivered thought support groups and one-to-one BCC, in addition to all the components of the 'low intensity' BCC.

The quantitative impact evaluation is a key component of the evaluation strategy. If the evaluation produces strong evidence that the programme has produced the expected outcomes, this will help make the case for expanding and scaling-up the approach.

The key evaluation questions that the quantitative impact evaluation will address by the end of the evaluation are:

1. Has the programme contributed to reducing wasting, being underweight and stunting in children under the age of five? Is there a difference in the impact of the programme on boys and girls?

2. Has the programme contributed to an improvement in the average food security and dietary diversity, and how does this vary by gender?

3. How are household economic decisions affected by participation in the CDGP?

4. How are consumption patterns changing as a result of the CDGP?

5. Are participating families able to improve their coping mechanisms (e.g. avoid selling productive assets, better manage debts, etc.) as a result of the CDGP?

6. Has the programme contributed to changes in knowledge, attitudes and perceptions among men and women related to nutrition and infant and young child feeding (IYCF)?

7. Has the programme contributed to a change in breastfeeding practices, IYCF practices, care of sick and malnourished children, mothers' own nutrition practices, and health-seeking behaviour, hygiene and sanitation practices?

G.2 A cluster randomised controlled trial design

The quantitative impact evaluation is a cluster randomised controlled trial (RCT) that will measure the impact of the CDGP. A randomised evaluation provides the best way to measure the degree to which any observed changes in target households are causally related to the CDGP. In order to attribute any changes observed in beneficiary households to the CDGP, we need to observe both

households that are subject to the intervention ('treated households') and households that are not subject to the intervention but that were similar to the treated households in all respects prior to the intervention ('control households'). In an RCT, after determining who is eligible to receive the intervention, people are randomly allocated to be among those who receive one of the alternative treatments being evaluated or to be a part of the control group.

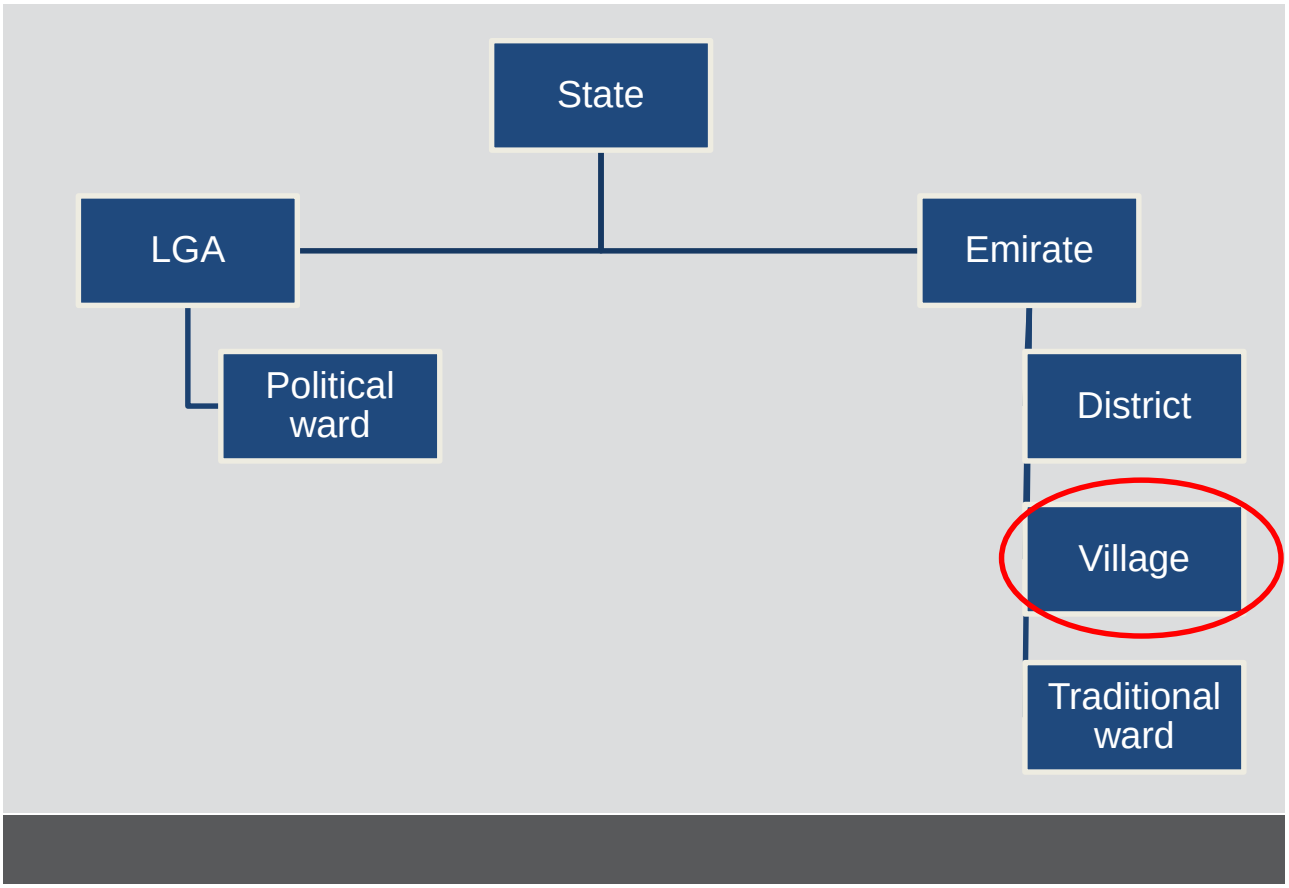
Randomisation is considered the most rigorous way of determining treatment and control groups because it ensures that treatment and control groups are similar and balanced in terms of both known and unknown factors at the start of the evaluation. Thus, any differences observed at the end of the programme can be attributed to the intervention. In this evaluation, we use a cluster randomised controlled methodology, as opposed to an individual RCT. We do this because randomising across individuals might create tension within clusters because some individuals would be invited to participate in the CDGP and others are not. The clustered approach also minimises spillovers between treatment and control households (spillovers refers to a situation in which the control group receives partial treatment as a result of treatment households passing on either cash or information provided by the intervention).

This study has two treatment groups and one control group. The first treatment group (Treatment 1) will be offered the unconditional cash transfer and 'low intensity' IYCF training. The second treatment group (Treatment 2) will be offered the unconditional cash transfer and 'high intensity' IYCF training. The control group will receive no intervention for the duration of the evaluation, but can receive the intervention after the endline survey without affecting the evaluation. Having two separate treatment groups and one control group enables us to measure the impact of the unconditional cash transfer and 'low intensity' IYCF training as well as the additional effect of providing 'high intensity' IYCF training.

The unit of randomisation is the village. This unit was chosen in consultation with SC and ACF. We have chosen to randomise by village because there are clear boundaries between traditional wards that will both minimise disputes about who is eligible for the CDGP and minimise spillovers between treatment and control households. This is shown below in Figure 1.

However, it was found that the villages were on average too large to use for our data collection for the evaluation. Therefore, as described in more detail in Section 3.6, we sampled one traditional ward per village for the purpose of our data collection (even though all households in treated villages will eventually actually receive the programme support). Similarly, for control villages, one traditional ward was also chosen to be sampled.

Figure 1 Unit of randomisation



G.3 Evaluation timing and linking with the CDGP rollout

This section outlines the key steps in the evaluation and their sequencing. It is intended to give an overview of how the evaluation sampling and data collection link with the rollout of the CDGP.

The table below outlines the timeline for the evaluation. Each activity in the table is described in more detail below.

Table 4 Evaluation timeline

Date	CDGP Activity	Evaluation Activity
Apr 2013 – Mar 2014	CDGP design phase	
Apr 2014 – July 2014	CDGP pilot phase	
Jan 2014 – May 2014		Pre-test listing and baseline survey instruments
July 2014		Randomly select a sample of evaluation villages and a sample of one traditional ward per village
July 2014 – Sep 2014		Listing training and field work
Aug 2014 – Oct 2014		Baseline training and field work
Aug 2014 – Oct 2014		Randomisation of villages
Aug 2014 – Feb 2015	CDGP enrolment in evaluation areas in treatment villages[20]	
Mar 2015 – Dec 2017	CDGP expansion to non-evaluation areas in treatment villages	
Mar 2014 – Apr 2017		Pre-test endline survey instruments
Aug 2017 – Oct 2017		Endline fieldwork
Nov 2017 onwards	CDGP rollout in control traditional wards (dependent on receipt of further funding)	

CDGP design phase

The key aspects of the CDGP were designed over a one-year period, starting in April 2013. As part of these design activities, strategies, systems and interventions were designed to:

i) sensitise beneficiaries and the wider community to the programme;

ii) target, enrol and register pregnant women;

iii) deliver cash transfers;

iv) provide mechanisms to register and respond to complaints;

v) improve the nutrition status of pregnant women and young children through BCC, especially BCC relating to maternal and IYCF practices;

vi) monitor programme activities through an internal monitoring, evaluation and learning system.

CDGP pilot phase

The programme's implementation strategies and systems were trialled during a four-month pilot phase, which provided cash transfers to 500 pregnant women in 15 traditional wards in Zamfara and Jigawa (six and nine traditional wards, respectively). The objectives of the pilot phase were to:

[20] As described in more detail below, the village was too large an area to use for data collection for the evaluation. Therefore, the evaluation conducted data collection in one randomly chosen part of each village. See Section 3.6 for more detail.

i) assess the effectiveness of the proposed implementation strategies and systems;

ii) identify any risks or challenges; and

iii) modify and/or further develop the strategies and systems in preparation for rollout to 60,000 women.

Pre-test listing and baseline survey instruments

While the CDGP implementers was designing and piloting the programme, the evaluation team designed and tested the data collection tools. This process is outlined in more detail in Annex K.

Select a sample of evaluation villages and a sample of one traditional ward per village

We selected the sample of villages to be used in the evaluation from a list of all villages in the five LGAs where the programme could operate. The list was provided to the evaluation team by the programme implementers. Before selecting the sample, we excluded villages that were part of the CDGP pilot. After sampling the villages, we sampled one traditional ward per village for our data collection. As mentioned above we did this because the villages were on average too large to use for our data collection for the evaluation. The programme's budget does not allow them to cover additional villages beyond those included in the CDGP pilot and those in the evaluation treatment sample so the remaining villages are not included in the CDGP.

Listing training and fieldwork

The listing training took place in the second half of July 2013 and the fieldwork started on 03 August 2014. The aim of the listing was to make a list of every household in the evaluation areas. We also collected information on all households from within each traditional ward in order to inform our actual procedure for sampling households to be included in the baseline survey. As discussed in more detail in Section 3.6, most of the households sampled contained at least one pregnant woman, while the remaining households contained at least one woman deemed likely to become pregnant in the next two years[21]. We also collected a proxy wealth measure of all households, which we used to check that our randomisation of villages into Treatment 1 villages, Treatment 2 villages and control villages resulted in groups that were 'balanced' (i.e. Treatment 1 villages, Treatment 2 villages and control villages are similar/not systematically different prior to intervention). For reasons discussed below, the listing was conducted in three tranches. A tranche was made up of approximately one-third of the evaluation villages. We did the listing for Tranche 1 villages first, then Tranche 2 villages, and then finally Tranche 3 villages.

Sampling households

Once the listing in a village was complete, we selected a sample of listed households for the baseline survey.

Baseline training and fieldwork

The baseline training took place in the first half of August 2013 and the fieldwork started mid-August 2014 and ran until the end of October 2014. The baseline teams followed behind the listing teams and interviewed a sample of households selected from the listing data.

[21] We determined who was likely to become pregnant by examining the factors correlated with being pregnant using the Nigeria 2013 Demographic Health Survey data. We then collected data on these factors in our listing survey and used this data to estimate the probability that a woman would become pregnant in the next two years. We then sampled women most likely to become pregnant based on this prediction model.

Randomisation of villages

We conducted the randomisation of the villages into Treatment 1 villages, Treatment 2 villages and control villages in three tranches. We did this so the CDGP implementation would not need to wait for the entire baseline data collection to be completed before the programme implementation could begin. Once we had conducted the randomisation in the first tranche of villages, and finished the baseline data collection in those villages in the first tranche, the programme was able to begin implementation. In particular, the programme could then begin the enrolment of beneficiaries in Treatment 1 and Treatment 2 villages within Tranche 1. Conducting the randomisation and rollout by tranche was desirable because if there was a long delay between the household listing and the programme rollout, some pregnant women in the evaluation sample would no longer be pregnant by the time the programme implementation and enrolment began, and so would not receive the cash transfer while pregnant, as is intended in the programme design.

Hence a key advantage of carrying out the randomisation in three tranches was that it reduced the time between the listing and when the CDGP enrolled women in the programme. In addition to conducting the randomisation in three tranches, to further mitigate the problem of a delay, it was agreed that in evaluation treatment areas when the programme began the enrolment the programme would enrol all women who were pregnant at the time of the evaluation listing, even if they had given birth by the time the enrolment began.

The ‘balance’ of the Treatment 1, Treatment 2 and control villages is described in more detail in Section 3.8.

CDGP enrolment in evaluation areas in treatment villages

The CDGP enrolment in evaluation areas of treatment villages began after the baseline teams had finished the baseline survey. This enrolment was also conducted in tranches following the listing and baseline survey. In other words, once we had carried out the randomisation in Tranche 1, and the baseline survey teams had completed tranche one villages, the programme could then begin implementation and the enrolment of beneficiaries in the Treatment 1 and Treatment 2 villages in Tranche 1.

CDGP expansion to non-evaluation areas in treatment villages

The programme will first cover the evaluation traditional wards in Treatment 1 and Treatment 2 villages. Once this has been completed the programme will continue to enrol newly pregnant women in those evaluation traditional wards, but it will also expand to the remaining traditional wards in Treatment 1 and Treatment 2 villages. As at the date of this report this had not begun. The programme will run until December 2017. As mentioned above, the programme’s budget does not allow them to cover additional villages beyond those included in the CDGP pilot and those in the evaluation treatment sample so there is no expansion of the CDGP to villages outside the evaluation sample.

Pre-test endline survey instruments

We will pre-test our endline data collection tools from March to April 2017, in preparation for the endline data collection later that year.

Endline fieldwork

The endline fieldwork is scheduled for August to October 2017. The survey will take place at the same time of year as the baseline, to ensure that any differences detected are not the result of seasonal effects.

CDGP rollout in control villages

Dependent on whether further funding is received, the programme will be rolled out all remaining villages in the five LGAs, including control villages, from November 2017.

G.4 Data

The quantitative impact evaluation will collect data using the following surveys:

i) **Listing survey:**

- **When:** administered before the baseline household survey
- **Sample:** survey respondents will be all households in the evaluation settlements
- **Purpose:** used to identify households eligible to be sampled for the panel survey

ii) **Community survey:**

- **When:** administered at baseline and at endline
- **Sample:** survey respondents will be focus groups of elders in the evaluation traditional ward
- **Purpose:** to measure village characteristics (infrastructure, mobile phone coverage, health facilities)

iii) **Market prices survey:**

- **When:** administered at baseline and at endline
- **Sample:** survey respondents will be traders
- **Purpose:** to measure the availability and prices of foods

iv) **Household panel survey:**

- **When:** administered at baseline and endline, to the same set of households
- **Sample:** respondents will be all households in the evaluation sample
- **Purpose at baseline:** to measure the pre-intervention situation with regard to sthe dimensions that are expected to change (final and intermediate outcomes)
- **Purpose at endline:** to measure the post-intervention situation and hence the impact of the programme

G.5 Sampling strategy

The evaluation sample comprises 210 villages that are representative of the five LGAs (Tsafe and Anka in Zamfara, and Buji, Kiri Kasama and Gagarawa in Zamfara) in which the programme will operate. This includes 70 Treatment 1 villages, 70 Treatment 2 villages and 70 control villages.

As discussed earlier, while the unit of randomisation has been selected to be the village, the villages are too large to use as sampling units for the evaluation. Therefore, for the purpose of the evaluation we randomly sampled one traditional ward in each of the treatment and control villages. If the sampled traditional ward was too small (defined as containing less than 200 households in total), we also sampled a neighbouring traditional ward. If the sampled traditional ward was too large (defined as containing more than 200 households in total), we divided the traditional ward into equal parts and listed one part.

For the baseline and endline survey, within each village, we sampled 26 households, making a total sample size of 5,460 households. We sampled households that contained at least one pregnant woman, and households that contained at least one woman who was not currently pregnant but who it was likely would become pregnant during the period of the evaluation. We first sampled all households with pregnant women (up to a maximum of 26 households with pregnant women) and where there were fewer than 26 households with pregnant women we made up the remainder of the sample with households with women likely to become pregnant during the evaluation period.

For each household, the baseline survey comprised a woman questionnaire administered to the sampled woman, a man questionnaire administered to the sampled woman's husband, and a child questionnaire administered to the woman but about one of her children under five (if she had any). If the woman had more than one child under five we randomly selected the child.

The sampling strategy is outlined in more detail in Annex H.

All statistics presented in this report are unweighted and therefore representative of the households sampled at baseline. We reiterate this point throughout the report. The effect of this is that households in small villages are over represented. If the characteristics of these households, and their inhabitants, are different from those living in larger villages, then the estimates presented in this report are skewed towards those types of household/people and it will be problematic for the CDGP to use these statistics as a guide to the characteristics of their beneficiaries. However, as the programme's budget does not allow them to cover additional villages beyond those included in the CDGP pilot and those in the evaluation treatment sample, the baseline survey does cover all the programme villages (excluding the 15 pilot villages) and thus provides a robust measure of the impact of the programme.

We do not attempt to construct sampling weights in order to reconstruct statistics that would be representative of all households with pregnant women in sampled LGAs. In order to do so, additional and reliable information would be required regarding the set of all potential villages in the five LGAs that could have been potentially been included in the evaluation sample, and the number of households in non-sampled traditional wards in the same villages that were actually included in the evaluation sample. Accurate and reliable information does not exist for both dimensions and we prefer not to make what would be strong and unverifiable assumptions regarding those dimensions.

G.6 Sample size

As discussed above, we randomly sampled 26 households per village. Where there were fewer than 26 households with pregnant women, we made up the remainder of the sample with households with women likely to become pregnant during the evaluation period.

Our final sample size is as shown below:

- 5,436 households[22]
- 5,436 women
  - 3,692 pregnant
  - 1,744 likely to become pregnant
- 5,416 husbands
- 4,180 children under five

There were 20 households (0.4% of households) in which the husband was not present and the wife was not willing to speak on his behalf. For these households we have incomplete information.

G.7 Balance tests

Balance tests aim to verify whether the randomisation strategy outlined above has led to the selection of control and treatment groups that have the same average characteristics before commencement of the programme. This will be of key importance when evaluating the effect of the intervention because it means any differences we observe at endline can be attributed to the programme. In the tables shown in Annex P, we calculate the mean values of all indicators in each treatment arm (Control, Treatment 1, and Treatment 2), reported in the first three columns. Then we test whether these means differ across treatment arms in a significant way. We perform these tests first in relation to all women included in the listing, then only in relation to the women that are sampled for the baseline, and finally in relation to certain relevant characteristics of communities included in the survey. We also include a joint test of orthogonality to account for the fact that 5% of the individual indictor level tests will be significant by chance. The results show that our sampled women and traditional wards had very similar characteristics to each other pre-intervention.

G.8 Risks of the study and mitigation strategies

This section outlines the risks of the study and how these are being mitigated. The key risks surrounding this evaluation are:

1. **The risk that the rollout of the intervention in the evaluation treatment areas does not take place straight after the baseline survey**. As discussed in Section G.3, if the CDGP is not rolled out in the evaluation treatment communities immediately after the baseline survey, then there is a risk that a significant proportion of the women identified as pregnant by the evaluation listing survey, who are then included in the evaluation sample, will not end up receiving the intervention. This would mean that a proportion of our treatment group are not in fact treated and this would compromise the statistical power of the evaluation. To overcome this risk we have applied two approaches: first we broke the evaluation sample up into three tranches and carried out the randomisation in each tranche so that the CDGP could start implementation as soon as the baseline team had finished in each tranche; second, the CDGP agreed to enrol women who were listed by the evaluation team as

[22] In total 24 (0.44%) households are not included in the analysis for the following reasons: three (0.05%) households were not interviewed because there were security concerns so the survey team had to leave the community; one (0.02%) household was not interviewed because the terrain was deteriorating due to rain so the survey team had leave the community; five (0.09%) households were not interviewed because replacement households were exhausted; and 15 (0.27%) households were dropped during data cleaning because the information was not complete

pregnant even if they had given birth by the time the enrolment began. At the time of writing this report (March 2015), the CDGP had begun enrolling women in all evaluation treatment traditional wards and was enrolling all women who were pregnant at the time of the listing survey, even if they had given birth by the time enrolment began.

2. **The risk that either the treatment or the control group benefit from another programme that is not offered to the other group.** It is unlikely that such an eventuality will manifest itself because we have randomised which villages receive the CDGP and which do not. If another programme begins operations in CDGP LGAs, this will not affect the evaluation of the CDGP, as long as the other programme operates across both CDGP treatment villages and CDGP control villages.

3. **The risk that the control group receives the intervention before the endline survey**. This could be a result of spillovers from existing implementation areas or errors in rolling out the intervention too quickly in control areas. As discussed above, in order to evaluate and attribute the impacts of the CDGP on treated households, it is necessary to observe a control group of households that are similar to treated households in all respects other than being a recipient of the CDGP. If the control group do in fact receive the intervention, then it will not be possible to attribute any observed changes in the treatment group to the CDGP. In this evaluation there are two ways in which it could come about that the control group is treated:

   – If treated households share the information or cash received from the intervention (spillovers). We have tried to minimise this risk by randomising at the village level so there are clear boundaries and a distance between units of randomisation, making the interaction between treatment and control households less likely. However, we cannot eliminate spillovers altogether and they may occur through household interactions or the wider effects on the economy that the cash transfer may have.

   – If the programme is rolled out in control villages before the end of the evaluation. We can minimise this risk by maintaining a close working relationship with SC and ACF. However, as the intervention includes group education on nutrition, which is going to be delivered in the communities. However if the group education is delivered at health facilities then it is not possible to mitigate the risk of the control group receiving this part of the treatment; however, we intend to measure and control for this as best as possible in our analysis, by comparing control households who have and have not received the BCC intervention. As at March 2015, we are currently having discussions with SC and ACF about potential programme rollout in control villages as our analysis of the CDGP MIS shows there is one control village where households are receiving the cash transfer. This requires further investigation between e-Pact, SC and ACF, and will be reported on in detail in the final evaluation report.

4. **The risk of an anticipation effect in the control group**. In this evaluation it is planned that the intervention will be rolled out in the control group after the evaluation's endline survey is conducted. As the control group is intended to act as a counterfactual to the treatment group (i.e. is intended to show what would have happened in the treatment group in the absence of the intervention) it is important that the control group do not know when the intervention is going to be rolled out in their area, or they might change their behaviour in anticipation of the programme starting. For example, some women may try to become pregnant in order to be eligible for the programme when it commences, or some households may increase their spending in anticipation of a boost in income. This risk can

be mitigated by ensuring that the rollout plan of the programme is not shared outside of SC, ACF, e-Pact and DFID.

Annex H Detailed sampling strategy

Our sampling procedure is outlined in detail here:

1. Take list of all villages in the five LGAs where the CDGP is operating
2. Drop the 15 villages used in the CDGP pilot
3. Drop villages with less than 150 households
4. Randomly sample 210 villages
5. Select one traditional ward per village using probability proportional to size within village
6. Select one replacement traditional ward per village to be used only in the case where the original sampled traditional ward is not accessible for security reasons
7. Send listing team to selected traditional wards
8. Replace traditional ward if listing teams find security problems when they arrive
9. Team to meet with traditional leaders and estimate size of traditional ward
10. If traditional ward contains:
    a. 0–200 households, list whole traditional ward
    b. 200–400 households, divide into two roughly equal sized parts
    c. 400–800 households, divide into four roughly equal sized parts
    d. 800+ households divide into eight roughly equal sized parts
11. If the situation of 10b, 10c, or 10d arises, randomly select one ‘part’ using random number table and list all households in randomly selected ‘part’
12. The supervisor counts number of households that have been listed
13. If listing contains 0–100 households then:
    a. ‘Mapper’ must make a list of all neighbouring, contiguous traditional wards
    b. Randomly select an additional traditional ward using random number table
    c. List this traditional ward following steps 8, 9 as 10, as stated above
14. If listing contains 100+ households continue to next step
15. Sample 26 households per village. If there are more than 26 households with at least one pregnant woman in the village, use simple random sampling to sample 26 households with at least one pregnant woman. If there are less than 26 households with at least one pregnant woman in the village, sample all households with at least one pregnant woman

and make up the rest of the sample in that village with households containing at least one woman determined to be ‘likely to become pregnant’

16. Baseline team conducts woman questionnaire with sampled women, man questionnaire with sampled women’s husbands, and one child questionnaire per household with a randomly selected child under five

Annex I Sample size and power calculations

I.1 Overview

The quantitative impact evaluation workstream will measure the impact of the CDGP on several outcomes relating to nutrition and food security. To obtain credible estimates of programme impacts it is important to ensure that the sample chosen is large enough to capture the expected changes in the various indicators that will be measured. The purpose of the power calculations is to determine the sample size needed to detect expected changes in outcomes over the course of the evaluation.

In this section we show the power calculations conducted **before data collection**, which were used to determine the optimal required sample size of the survey. In Annex M we show the size of the changes in key outcomes that we expect to be able to detect with our chosen sample based on the findings from our baseline data collection.

For this evaluation, we propose to sample a mix of households that contain at least one pregnant woman and households that contain at least one woman who is not currently pregnant but may become pregnant over the course of the evaluation.

As the intervention is only available to women who are currently pregnant, the majority of our sample will consist of households that contain at least one pregnant woman. From this sample, we will be able to estimate the causal effect of the programme on women, men and children in households that receive the intervention.

In addition to sampling pregnant women, we also propose to sample women who are not pregnant at baseline, but who may become pregnant over the course of the evaluation. This will enable us to measure the effect of the intervention on the women, men and children in households in which at least one woman does become pregnant during the evaluation period. As these women will become pregnant at different times throughout the evaluation, they will be exposed to the intervention for different periods of time. This will enable us to examine how the impact of the programme varies with length of exposure. This information will be useful in determining the optimal future policy should this programme be scaled up. Including women who are not pregnant at baseline will also enable us to examine whether there is any evidence that this group of women accelerate pregnancy in order to obtain the grant.

In order to estimate the required sample size and sampling strategy, we used the following process:

1. Define the key outcome indicator;
2. Estimate the likely effect size (i.e. change in an outcome indicator as a result of an intervention) for the key outcome indicator, by reviewing the relevant literature;
3. Estimate the sample size needed in order to detect the likely effect size by carrying out power calculations in Stata;
4. Estimate the feasible number of eligible households per cluster; and
5. Decide on the sampling strategy.

This process is outlined in detail in this annex.

I.2 Power calculations

Step 1: Define key outcome indicators

Since the extremely high prevalence of stunting in Northern Nigeria is one of the main concerns that the CDGP is aiming to address, HAZ scores are one of the most important indicators that this workstream will measure. Therefore, we have based the power calculations detailed below on the measurement of changes in child HAZ.[23]

HAZ scores give an indication of the difference between a child's actual height and what would be expected for a well-nourished child of the same age and sex. They are measured in SDs and calculated as follows:

$$HAZ = \frac{\text{measured height - median height in reference population for same age and sex}}{\text{standard deviation of reference population}}$$

The reference population used here is the 2006 WHO Multicentre Growth Reference Study, which combines observations from a range of different ethnic groups from six countries to construct a universal growth standard. An HAZ of 0 means that the child's height is normal for their age and sex. According to global convention a score of less than -2 indicates stunting and a score of less than -3 indicates severe stunting.

Step 2: Estimate the likely effect size of the intervention for key outcome indicators.

The DFID business case states that it is expected that the CDGP will result in a change of up to 0.2 SD each year in HAZ and approximately 1.0 SD by the end of the project for children in target households. Effect sizes for other indicators stated in the business case are a change in average height gain (1 cm increase per year), prevalence of stunting (1–2 percentage point reduction per year), birth weight (100/120 g increase over five years) and incidence of low birth weight (4–5 percentage point reduction over five years).

In order to predict the likely size of the effect that the CDGP may have on HAZ, we conducted a review of other impact evaluations of unconditional and conditional cash transfer programmes and nutrition education interventions. The results of this literature review are shown in Annex F.

The results of the literature review suggest that a change in HAZ of 1.0 SD for children in target households by the end of the project, as suggested in the business case, may be overambitious. Therefore, we have conducted our power calculations with the aim of detecting a 0.2 SD change in HAZ for children in target households in the three years between baseline and endline. This is the expected change between Treatment Group 1 and the control group. Similarly, we aim to detect a 0.2 SD change in HAZ between Treatment Group 1 and Treatment Group 2.

Step 3: Estimate the sample size needed in order to detect the likely effect size

The target sample for the detection of HAZ changes is women who are pregnant at the time of the baseline survey. HAZ measurements will then be taken from their children at the end of the evaluation period. Given that the women in our sample will be pregnant at baseline (in May/June 2014), their children are expected to be aged 30–34 months at endline (in May/June 2017).[24]

[23] Since WAZ and WHZ scores have the same distribution as HAZ, the sample size calculations mean we will also be able to detect the same effect size for WAZ and WHZ.

[24] We have assumed that we will sample women who are three to seven months pregnant because we assume that mothers who are less than three months pregnant will not self-report as pregnant and that we will not

The tables below show the results of power calculations carried out in Stata using the sampsi and sampclus commands. We have estimated the required sample size per cluster assuming 150, 180 and 210 clusters. As we have two treatment groups and one control group, this translates to 50, 60 and 70 clusters per treatment type. All calculations are based on a power of 0.8 and a significance level of 0.05.

The columns in the tables below are defined as follows:

1. Column 1 shows the size of the change in the mean HAZ score to be detected, by the end of the intervention.

2. Column 2 breaks down the results by three possible values for the intra-cluster correlation (ICC). The ICC is a measure of how strongly people in the same cluster resemble each other. Although it can be difficult to measure, failure to account for this correlation at all can cause required sample sizes to be underestimated. This is because if people living in the same area are very much alike due to similarities in their surroundings and experiences, each additional observation contributes less unique information. A higher ICC indicates that people in the same cluster are more similar.

3. The number of children at endline needed per cluster to pick up each mean change in the HAZ given the value of the ICC is shown in column 3. In some cases it is not possible to detect particular mean differences at this power and significance level for any sample size, given the ICC. Where this applies, the minimum number of clusters necessary is reported instead.

4. Column 4 shows the total sample of pregnant women across all 50 clusters in three treatment arms under each per cluster sample requirement. We aim to sample more pregnant women at baseline than the number of children required at endline by the sample size calculations, in order to account for miscarriages, still births, infant mortality and some attrition in the sample (as a result of not being able to relocate households at endline, etc.).

Table 5 50 clusters (settlements) per treatment type

Change in mean to be detected	ICC	Required sample of children at endline per cluster	Minimum number of pregnant women to survey at baseline
0.1	0.05	Min. number of clusters: 79	-
0.1	0.1	Min. number of clusters: 158	-
0.1	0.15	Min. number of clusters: 236	-
0.2	0.05	13	13 x 50 x 3 = 1950
0.2	0.1	34	34 x 50 x 3 = 5100
0.2	0.15	Min. number of clusters: 59	-
0.3	0.05	5	5 x 50 x 3 = 750
0.3	0.1	5	5 x 50 x 3 = 750
0.3	0.15	7	7 x 50 x 3 = 1050

sample women who are more than seven months pregnant because this would not give the CDGP team enough time to enrol the mother after the baseline survey is complete. Assuming mothers are three to seven months pregnant in May 2014, their children will be 30 to 34 months old in May 2017.

0.4	0.05	3	3 x 50 x 3 = 450
0.4	0.1	3	3 x 50 x 3 = 450
0.4	0.15	3	3 x 50 x 3 = 450

Table 5 above shows that, at 50 clusters per treatment type, we need to sample between 13 and 34 pregnant women per cluster, depending on the ICC, in order to detect a mean change of 0.2 SD in HAZ.

Table 6 60 clusters (settlements) per treatment type

Change in mean to be detected	ICC	Required sample of children at endline per cluster	Minimum number of pregnant women to survey at baseline
0.1	0.05	Min. number of clusters : 79	-
0.1	0.1	Min. number of clusters : 158	-
0.1	0.15	Min. number of clusters : 236	-
0.2	0.05	10	10 x 60 x 3 = 1800
0.2	0.1	18	18 x 60 x 3 = 3240
0.2	0.15	319	319 x 60 x 3 = 57420
0.3	0.05	4	4 x 60 x 3 = 720
0.3	0.1	4	4 x 60 x 3 = 720
0.3	0.15	5	5 x 60 x 3 = 900
0.4	0.05	2	2 x 60 x 3 = 360
0.4	0.1	2	2 x 60 x 3 = 360
0.4	0.15	2	2 x 60 x 3 = 360

Table 6 above shows that, at 60 clusters per treatment type, we need between 10 and 18 pregnant women per cluster, depending on the ICC, in order to detect a mean change of 0.2 SD in HAZ.

Table 7 70 clusters (settlements) per treatment type

Change in mean to be detected	ICC	Required sample of children at endline per cluster	Minimum number of pregnant women to survey
0.1	0.05	Min. number of clusters: 79	-
0.1	0.1	Min. number of clusters : 158	-
0.1	0.15	Min. number of clusters : 236	-
0.2	0.05	8	8 x 70 x 3 = 1680
0.2	0.1	12	12 x 70 x 3 = 2520
0.2	0.15	31	31 x 70 x 3 = 6510
0.3	0.05	3	3 x 70 x 3 = 630
0.3	0.1	3	3 x 70 x 3 = 630
0.3	0.15	4	4 x 70 x 3 = 840

0.4	0.05	2	2 x 70 x 3 = 420
0.4	0.1	2	2 x 70 x 3 = 420
0.4	0.15	2	2 x 70 x 3 = 420

Table 7 shows that there is little to be gained from visiting 70 clusters since detecting a change of 0.1 remains impossible.

Given that we cannot accurately predict the ICC, we will choose our sample size to be sufficient in the case of an ICC of 0.1, although our experience from other surveys in Nigeria and Kenya indicates that the ICC is likely to be in the range of 0.03 to 0.05. This means that our sample size calculations are conservative and we may be able to detect a change in HAZ that is smaller than 0.2 SD.

Together, tables 12 to 14 present us with three options that give the same statistical power:

1. Option one: 50 clusters per treatment type, with 34 pregnant women per cluster (making a total of 5,100 pregnant women)

2. Option two: 60 clusters per treatment type, with 18 pregnant women per cluster (making a total of 3,240 pregnant women)

3. Option three: 70 clusters per treatment type, with 12 pregnant women per cluster (making a total of 2,520 pregnant women)

Step 4: Estimate the feasible number of eligible households per cluster

The next step of the sample size calculations is to see which of the sample sizes shown in the tables above are likely to be feasible. To estimate the likely number of pregnant and non-pregnant women we use the following data sources:

1. 2008 NDHS;
2. 2010 and 2011 Living Standards Measurement Survey (LSMS); and
3. Operational Research and Impact Evaluation (ORIE).

These data sources are summarised in Table 8.

Table 8 Data sources for summary statistics

	NDHS	LSMS	ORIE
Survey dates	June–October 2008	August–October 2010 and February–April 2011	June 2013
Panel or cross-section	Cross-section	Panel	Cross-section
Sample	34,070 households; covers 36 states plus Federal Capital Territory (FCT)-Abuja	5,000 households from 36 states plus FCT-Abuja	3,400 households from Jigawa, Zamfara, Kebbi and Katsina

Representative	Nationally representative	Survey representative at the national level but not at the state level, so Jigawa/Zamfara-level estimates sensitive to weighting assumptions	Representative of ORIE LGAs but not at the state level
Sample used	5,031 observations from 930 households in Jigawa, and 4,537 observations from 854 households in Zamfara	904 observations from 130 households in Jigawa, and 586 observations from 90 households in Zamfara	9,793 observations in 858 households in Jigawa, and 10,806 observations from 861 observations in Zamfara

From these data sources, we have constructed estimates of household size and composition, household structure and polygamy, and incidence of pregnancy. Below, we combine these with the population estimates from the SC/ACF settlement list to estimate the likely number of pregnant women per cluster.

Table 9 Household size and composition

	NDHS			LSMS			ORIE	
	Nigeria	Jigawa	Zamfara	Nigeria	Jigawa	Zamfara	Jigawa	Zamfara
Household size	4.42	**5.41**	**5.27**	5.62	6.89	6.54	11.41	12.55
25th percentile	1.87	3.04	2.96	2.45	3.93	4.18	6	6
75th percentile	5.93	7.09	6.91	7.41	9.39	8.25	13	15
Children under five per household	0.88	**1.27**	**1.26**	0.89	1.5	1.19	3.18	3.28
Adult males per household	1.21	**1.24**	**1.27**	1.53	1.63	1.57	2.45	2.78
Adult females per household	1.27	**1.36**	**1.3**	1.65	1.61	1.65	2.76	3.08
Observations	34,070	930	854	4,998	130	90	858	861

Table 9 above shows that the number of household members recorded is very sensitive to the way in which a household is defined. The NDHS definition centres on persons eating out of a common pot, whereas the ORIE definition is based on recognising a common household head. We intend to use the NDHS definition of household size.

Table 10 Polygamy

	NDHS			LSMS			ORIE	
	Nigeria	Jigawa	Zamfara	Nigeria	Jigawa	Zamfara	Jigawa	Zamfara
% of currently married men with more than one wife	21.28%	**25.45%**	**27.91%**	22.33%	31.30%	41.86%	27.39%	38.62%

Observations	7,250	279	215	3,609	131	86	1603	1704
Number of wives per polygamous male	2.17	**2.13**	**2.1**	2.2	2.05	2.19	2.11	2.07
Observations	1,543	71	60	808	41	36	439	658
% of wives in polygamous unions who live in same house as husband.	89.72%	**93.10%**	**95.28%**					
Observations	8210	406	360					

Table 10 shows that approximately one-quarter of married men are in polygamous relationships and most wives in polygamous unions live in the same house as the husband, so it will be possible to find more than one pregnant woman per household.

Table 11 Incidence of pregnancy

	NDHS			LSMS			ORIE	
	Nigeria	Jigawa	Zamfara	Nigeria	Jigawa	Zamfara	Jigawa	Zamfara
% of individuals in the sample who are women aged 15–49	22.33%	20.83%	20.78%	23.08%	22.77%	18.86%	20.96%	20.87%
Observations	156,809	5,031	4,537	28,075	584	891	9,793	10,806
% of women aged 15–49 who are currently pregnant	10.62%	**13.35%**	**17.19%**	8.92%	5.56%	9.52%	14.20%	13.03%
Observations	33,385	1,019	867	3,902	144	105	1,993	2,203
% women somewhat likely to become pregnant in next two years	49.23%	**69.58%**	**63.32%**	64.96%	82.64%	84.62%	73.16%	75.66%
% of women highly likely to become pregnant in next two years	17.73%	**22.18%**	**22.03%**					
Observations	33,385	1,019	867	3,881	144	104	1,889	2,112

Table 11 shows that approximately 13% to 17% of women aged 15–49 are likely to self-report as pregnant at any one time. In the table, women are considered **somewhat likely** to become pregnant if they are aged 15–40, married and not currently pregnant, and women are considered **highly likely** to become pregnant if, in addition, they explicitly state that they would like another child within two years.

Table 12 Population composition in CDGP settlement

	Jigawa			Zamfara		
	Buji	Gagarawa	Kiri Kasama	Anka	Tsafe	
Average values per settlement						
Number of households	111	115	148	147	244	
Adult population (people aged 15 and above)	287	297	382	377	626	
Number of women aged 15–49 currently pregnant	**17**	**17**	**22**	**28**	**46**	
Number of women aged 15–49 highly likely to become pregnant in two years	28	29	37	35	59	
Estimated totals per LGA						**Overall total**
Total population	115145	104100	276195	329225	666999	1491664
Number of women aged 15–49 currently pregnant	3202	2895	7680	11760	23826	49363
Number of women aged 15–49 highly likely to become pregnant in two years	5320	4810	12760	15071	30534	68495
Total number of target women	**8522**	**7704**	**20441**	**26832**	**54360**	**117859**
Observations	192	168	346	426	519	1651

As we have not yet received the final version of the settlement listing, these estimates may change. Moreover, the population estimates in the settlement list are considered to be an overestimation of the true populations and thus the estimates presented here may also overestimate the number of people and households. The results suggest that we can expect to find between 111 and 244 households per settlement and between 17 and 46 pregnant women per cluster.

Step 5: Decide the sampling strategy

To decide the sampling strategy, we need to decide the optimal number of clusters, and the number of each type of household to sample per cluster. This section explains why we will best be able to decide the optimal feasible number of clusters and total number of household per cluster after we have received the final settlement listing from SC/ACF, and we will best be able to decide the optimal feasible number of each type of household after we have reviewed the data from our listing survey.

As shown in Step 3, we are considering three options. Each option gives a statistical power of 80% for an ICC of 0.1:

1. Option one: 50 clusters per treatment type, with 34 pregnant women per cluster (making a total of 5,100 pregnant women[25]);

2. Option two: 60 clusters per treatment type, with 18 pregnant women per cluster (making a total of 3,240 pregnant women); and

3. Option three: 70 clusters per treatment type, with 12 pregnant women per cluster (making a total of 2,520 pregnant women).

Given that we have not yet received the final settlement list from SC/ACF, we are not able to determine which of the above options are feasible. Once we have received this list, we will decide on the optimal feasible number of clusters to be included in the evaluation. In the current estimates, there is an average of 26 pregnant women per cluster. If this turns out to be the case, then Option One may not be feasible and so we would then choose between Option Two and Option Three.

As discussed earlier, we intend to sample both households with at least one pregnant woman and households with women who may become pregnant over the course of the evaluation. The current estimates suggest that the average number of pregnant women per cluster is roughly in line with the number we wish to sample. If this is in fact the case, and we will only know once we have conducted our listing, then we would propose the following sampling strategy:

1. Survey all pregnant women found in every cluster;
2. Calculate the number of non-pregnant women required to make up total feasible sample size;
3. Find the proportion of non-pregnant women that needs to be sampled to deliver this number, calculated as:

$$\text{proportion to sample} = \frac{\text{required sample size}}{\text{total number of likely pregnant women}}$$

We propose to make a final decision on the number of households with pregnant and non-pregnant women to be sampled per cluster after reviewing the listing data, which will contain more accurate estimates regarding the composition of each cluster.

[25] We intend to sample more pregnant women at baseline than the number of children required at endline by the sample size calculations, in order to account for miscarriages, still births, infant mortality and some attrition in the sample (as a result of not being able to relocate households at endline, etc.).

Annex J Estimating impact

As described in Chapter 3, the cluster randomised control trial design enables us to estimate the causal impact of the components of the CDGP. In particular, the design allows us to measure the difference between delivering BCC using the low and high intensity modes of implementation, when done in conjunction with the cash transfer.

We will start with the intention to treat (ITT) estimates, comparing the outcomes of individuals in villages receiving different arms of the programme to individuals in control villages. This is the simplest possible comparison, which measures the impact of programme availability on outcomes. These could be either direct impacts, through the take-up of the programme by at least part of the population in the village, or indirect impacts, which are the result of spillovers from those who have taken up the programme to those who have not (but who are still in the sample). For example, there are likely to be spillovers from the BCC campaign from those receiving it to those not receiving it but living in the same area, since information can easily spread from the first to the second group. Finally, the ITT parameter will account for the fact that the programme may have induced fertility increases in some women—or at least, a change in the timing of births.

Since the offer of each treatment arm is randomised across villages, and, as we show above, there is a balance in observable variables across villages in different treatment arms, it is not necessary to use baseline data to obtain unbiased estimates of programme impacts. However, it is standard practice to control for these variables when estimating programme impacts, as a way to improve the precision of the impact estimator. Therefore, we will proceed accordingly.

Formally, the ITT parameters will be estimated from the following regression:

$$y_{iv} = \alpha + \theta_1 T_{1v} + \theta_2 T_{2v} + \boldsymbol{X}_{iv}\boldsymbol{\beta} + \varepsilon_{iv};$$

where y_{iv} is a particular outcome for child i in village v. T_{1v} is an indicator variable that takes value 1 if pregnant women in village v have access to the cash transfer but not to the intensive BCC services, and T_{2v} is an indicator variable that takes value 1 if pregnant women in village v have access to both the cash transfer and the intensive BCC services. Finally, α is a constant, $\boldsymbol{X}$ is a vector of child, household and community control variables (as measured at baseline), and ε_{iv} is an error term. θ_1 and θ_2 measure the ITT for the cash transfer only, and the cash transfer plus BCC arms of the pilot, respectively. $\theta_2 - \theta_1$ measures the impact of the BCC programme in a context where cash transfers are already in place.

Standard errors for all estimators will be clustered at the village level, to account for any spatial correlation induced by, for example, common shocks to women and children living within the same village. This is especially important in a setting such as ours, where the randomisation is carried out not at the individual level, but at the cluster level, where the cluster is the village.

We will consider binary and continuous outcomes. In the case of binary outcomes, we will use both linear probability models, as well as non-linear models, such as probit and logit. For continuous outcomes we will use standard linear regression (Ordinary least squares: OLS) methods. If the degree of clustering severely affects the precision of our estimates we may also consider feasible generalised least squares (GLS) estimators, which are more efficient than OLS estimators. In addition, in the case of continuous outcomes (such as anthropometrics, expenditure or earnings) we will estimate quantile regressions, which will allow us to measure programme impacts along the whole distribution of each outcome. This is especially important if impacts are concentrated in one section of the distribution.

It is important to take into account that the take-up of the programme may be imperfect. To start with, our follow-up sample will include pregnant women in the village, and in villages where there are not enough of such women to achieve our target sample size we will also sample women who are likely to become pregnant. However, even if we estimate programme impacts only for the subsample of pregnant women, not all of them may have taken up the programme. Imperfect take-up is a common feature of social protection programmes, in developed and developing countries, and occurs for a variety of reasons, such as lack of information, costs of registration, or stigma.

In these circumstances, it is standard to also report estimates of the following equation:

$$y_{iv} = \pi + \tau_1 P_{1iv} + \tau_2 P_{2iv} + \boldsymbol{X}_{iv}\boldsymbol{\gamma} + \mu_{iv};$$

where P_{1iv} and P_{2iv} are now individual level indicators of whether individual i did or did not take up each of the versions of the CDGP programme. Since the take-up decision is now an individual choice, which is potentially correlated with the error term μ_{iv} (because, for example, women who are more concerned about the health of their children are more likely to both take up the CDGP transfer and BCC and to engage in other positive health behaviours towards their children), one usually estimates τ_1 and τ_2 using the method of instrumental variables, where P_{1iv} and P_{2iv} are instrumented by T_{1v} and T_{2v}, respectively, at least in the case of continuous outcomes. In the case of discrete outcomes, again one will present both linear probability instrumental variables models, and bivariate probit/logit models. Standard errors will be clustered at the village level.

While θ_1 and θ_2 measure the impact of programme availability in a variety of outcomes, τ_1 and τ_2 measure the impact of programme participation. Both are useful parameters. Nevertheless, there exist three major difficulties with interpreting the instrumental variables estimates of τ_1 and τ_2 as the impacts of programme participation. In the presence of any of these difficulties, these parameters become hard to interpret.

First, as we pointed out above, fertility is a choice variable, which may respond to the availability of the programme. Even if this is an unintentional consequence of the CDGP, given the amount of the cash transfer, and the fact that it is conditional on becoming pregnant, it is possible that it will induce women to have more children, or to change the timing of births. If that is the case, then we should not restrict the regression to the sample of pregnant women only. Furthermore, if we do not condition sample selection on pregnancy, τ_1 and τ_2 may confound the direct impact of the cash transfer and BCC on outcomes with the indirect impact of becoming pregnant and delivering a new child (and increasing family size) on these same outcomes. One potential way to try to avoid these interpretation issues is to restrict the sample to women who were pregnant at baseline and their children. But if even those women were induced to change fertility and became pregnant again between the baseline and the follow-up surveys, then the interpretation problem in this regard would remain. In sum, these estimates could be interpretable as the impact of programme participation under the assumption of no fertility effects, but not otherwise.

Second, the impacts of the cash transfer and the BCC could spill over to households that live in a programme village, but who did not enrol in the programme, either by choice, or because they were ineligible. Even in the absence of the fertility effects of the programme, the interpretability of τ_1 and τ_2 as the impacts of programme participation requires an assumption that there are no spillover effects. The reason is that, in the absence of that assumption, all village inhabitants are affected by the programme, regardless of whether they directly participate in it or not, and with this design one cannot distinguish between programme impacts on participants and on non-participants. This distinction would only be possible if eligibility for the programme did not depend on a choice, such as becoming pregnant (one could potentially estimate some indirect impacts on individuals who would never be eligible, such as older women who are past their fertility age).

Finally, suppose there were no impacts of the programme on fertility, nor any spillover effects on non-participants. If the impact of each arm of the CDGP varies across individuals, we still need to be careful about the interpretation of instrumental variables estimates. In such a case, one can only estimate the average impact of the programme for the subset of potentially eligible women who take up the programme when it is made available, or treatment on the treated (in contrast to, for example, the average treatment effect, which we would not be able to estimate, and which measures the average impact of the programme in the whole population of eligible women, including those who never take it up).

We will estimate the impacts of the programme on a variety of outcomes. Our survey is very detailed, allowing us to examine not only the final impacts on the health status of women and children, but the potential mechanisms leading to these final impacts. In addition, if women and children become healthier as a result of the programme then several other dimensions of their lives could be affected, such as the labour supply of mothers, or the motor, cognitive, or socio-emotional development of children.

We start by listing the multiple measures of health for women and children which are available to us. In terms of women's health status we basically only know height, weight (allowing us to calculate BMI), and MUAC. We will consider as outcome variables both the continuous health measures generated from these variables, as well as discrete variables indicating whether a woman is particularly at risk (for example, extremely underweight). In addition, we know their fertility history, which is important to measure programme impacts on fertility.

The child data is slightly richer. It includes height, weight, age and MUAC, allowing us to compute a variety of age-specific anthropometric variables, which again can be used as continuous variables, or discrete variables identifying specific risk groups. Beyond that, it also includes illness episodes, with special attention to diarrhoea.

In terms of other child outcomes that could potentially be affected by health, we will examine the impact of the programme on the cognitive, social and emotional development of children, as well as school attendance. These variables can, however, also be directly affected by increased resources in the home, and increased investments in children—even in the absence of changes in health.

In terms of women's outcomes, we will assess programme impacts on work activities and income. Since we also have data on men, and work activities of men and women could take the form of substitution (if, for example, wives work to compensate for the low employment of husbands, as in the added-worker model), or could be complementary (if, for example, the leisure times of both spouses are complementary in their utility functions), we will also assess the impact of the programme on the work activities and income of men.

In terms of potential mechanisms through which the programme could affect the lives of women and children, we will consider: income and wealth; crop production; income volatility; savings and borrowing; assets and expenditure; food security; women's and men's knowledge and health practices; decision-making power in the household; access to health care; and dietary diversity.

Since we are studying many outcomes and potential mechanisms simultaneously it is important to account appropriately for this when conducting tests of hypotheses. One way to address this is to construct indices of variables, and to use these indices instead of the individual variables. Another way to address this issue is to use the individual variables but to adjust the critical values used in the hypotheses tests. There are several methods for doing this, such as, for example, the one proposed by Romano and Wolf (2005). We will implement both types of methodologies.

It is likely that programme impacts will vary according to child, mother, household, and village characteristics. It is important to assess some of this heterogeneity. It is only possible to do so for child, mother and household characteristics if we follow the same families over time. Since we follow communities over time, it will always be possible to study impact heterogeneity according to village characteristics.

Of special interest will be the following variables measured at baseline: children's and mother's baseline health status; children's socio-emotional development; children's gender and age; maternal education and literacy; income and wealth; crop production; income volatility; savings and borrowing; assets and expenditure; food security; women's and men's knowledge and health practices; decision-making power in the household; access to health care; dietary diversity; household structure (e.g. monogamous and polygamous families); and village facilities.

Annex K Data collection

The data for the listing and baseline surveys evaluation was collected by OPM's in-house data collection team, who are based in our OPM Abuja office. The data was collected electronically using a tablet-based CAPI system.

K.1 Pre-testing of the paper survey instruments

Two separate rounds of pre-testing took place in the process of developing the English version of the instruments before the training. Technical staff from OPM led all the pre-testing rounds. Most of the enumerators who participated in the initial pre-testing were later selected as field work supervisors. The pre-testing took place in Hausa communities in Nasarawa and Niger states.

K.2 Questionnaire translation

After the survey instruments were finalised in English, they were translated into Hausa. To ensure that no meaning was lost during translation, the translations were carried out in everyday spoken language, as opposed to formally grammatical correct language. Furthermore, the translation was back-translated into English by an independent person for validation purposes and harmonised to convey the correct meanings

K.3 Programming and pre-testing of the electronic (CAPI) survey instruments

After the survey instruments were finalised, they were programmed electronically using CSPro. Two separate rounds of pre-testing took place to test the CAPI version of the instruments before the training, again in Hausa communities in Nasarawa state.

K.4 Field personnel

The supervisory team comprised: an OPM project manager, an OPM field manager, an OPM data manager, an OPM deputy data manager, LGA coordinators, and fieldwork supervisors. Their responsibilities are defined below. The supervisory team were supported by an IT support team who worked across teams to quickly resolve any issues related to the tablets used for data collection.

- The OPM project manager (Femi Adegoke) had overall responsibility for the whole data collection process, including the security and safety of the field teams.
- The OPM field manager (Ekundayo Arogundade) was in the field for the duration of the fieldwork and managed the field teams. She was responsible for ensuring the implementation of the quality control processes.
- The OPM data manager (Juste Nitiema) had overall responsibility for programming and implementing the CAPI data collection. We used CSPro software and ASUS tablets for data collection. Juste was supported by the OPM deputy data manager (Babatunde Akano).
- The OPM survey administrator (Bukunola Adekolu) coordinated financial disbursements to teams and coordinated logistics centrally. She was supported by the OPM Abuja administration team.

- There were two LGA coordinators for each of the five LGAs. They were responsible for coordinating the logistics of their teams in their LGAs. They also were responsible for establishing and maintaining good relationships with district authorities and the communities visited. Furthermore, they conducted the market and community questionnaires and collected the data from the tablets daily, as well as compiling field reports and progress updates.

- The fieldwork supervisors were tasked with maintaining good relationships with the communities visited, and executing quality control procedures. This included conducting re-visit 'back-checks', by re-asking a subset of questions from the baseline to verify the baseline data, as well as sitting in on 'live' interviews to assess interviewer performance and to coach interviewers to improve where required. The supervisors, who were selected from among the best interviewers, were responsible for ensuring the quality of their teams' work.

The listing and baseline surveys were conducted by two separate field team teams.

- There were 11 listing and 11 baseline teams. The baseline teams consisted of three or four interviewers, one anthropometric enumerator and one supervisor. The list teams consisted of two or three listers, and one mapper/ supervisor. Each team was accompanied by a driver and a dedicated vehicle for the whole duration of the fieldwork.

- All listers, baseline interviewers and anthropometric enumerators were female, could speak Hausa fluently and had experience of conducting a survey in Northern Nigeria. The mappers were all male and all had previous experiencing of drawing and using enumeration area maps. Over and above educational qualifications, the team were recruited on the basis of interest, physical fitness, personality, intelligence, enthusiasm and adaptability, among other qualities.

K.5 Training of the field teams, and pilot

There were separate training sessions for the baseline and listing teams, both held in Abuja due to reasons of insecurity, OPM consultants could not travel to Northern Nigeria to conduct the training. The listing training spanned five days, including a one-day pilot, and the baseline training spanned 13 days, including two one-day pilots, and was followed by a one-day course that was specially prepared for the LGA coordinators. Anthropometric enumerators were given separate training over the last five days of the training programme and were given specialist training through a combination of parallel and joint sessions with the interview and supervisory teams. Anthropometric methods were standardised following methods recommended in the FANTA Project[26]. The training included lectures and role-plays. 'Live pilots' were conducted in Hausa-speaking communities in Nasarawa state.

In order to ensure quality we trained 15% more people than was required for the fieldwork and selected the best performing ones for the field work.

The main thrust of the training was to clearly define and explain roles and responsibilities, and to familiarise the field team with the questionnaire and fieldwork strategy. Five OPM consultants were present for the full duration of the field team training. Three OPM consultants were also present at

[26] Cogill, B. (2003) 'Anthropometric Indicators Measurement Guide', Washington DC: FANTA Project, FHI 360.

the initial stages of the fieldwork implementation. This ensured that the fieldwork training and implementation was fully in line with the intended evaluation design framework.

This training on roles and responsibilities covered the following: the research objectives; interviewing principles and techniques; the role of interviewers – confidentiality, neutrality, questionnaire administration, probing, call-backs and substitution; household identification and finding strategy; respondent selection; logistics; and quality control

During the training on the questionnaire the teams were briefed on each question in each relevant questionnaire. Special emphasis was laid on the following: introducing the questionnaires, general concepts and procedures (format, response types, skips, order, respondents, consent forms, etc.), introduction to the respondent, problems around translation (ensuring consistency), ethical issues and procedures for calculating key information (time taken for…, value of …, etc.).

During the briefing/ training sessions the team was split into groups and they administered mock interviews in Hausa. In addition to improving their general interview skills, this permitted the identification of those specific terms and concepts that were likely to pose challenges in communication, especially to the less educated respondents.

As part of the training pilot interviews were conducted by the whole team of fieldwork supervisors and enumerators during two full working days in Keffi, Nasarawa state. This was done to allow the team to familiarise themselves with the instruments, assess their reliability (i.e. consistency and clarity in terms of yielding the desired data, language composition, etc.) and to test the exercise's planned logistics. Each interviewer conducted at least two household pilot interviews across the two days. In most cases they were accompanied by supervisors during the interviews. Feedback was discussed in a plenary session the following day as part of the training, to identify corrections and improvements. The exercise was useful in polishing the team's fieldwork logistics and interviewing skills. All the training requirements were reemphasised in an additional session after the pilot exercise.

A detailed fieldwork manual was provided to each team and served as an in-field reference to remind the team of all issues covered during the training. It included sections on: the background and objectives of the study; fieldwork protocols; fieldwork organisation and logistics; general guidance for filling the questionnaire using the tablets; definitions of key terms; and question by questions guidelines for each section of the three main instruments. The manual was finalised during the training.

K.6 Fieldwork organisation and execution

The listing team was trained in July 2014 and deployed throughout the study areas at the start of August 2013. The baseline team was trained in August 2014 and deployed throughout the study areas at the end of August 2013.

During the listing fieldwork the mappers drew maps of each of the sampled traditional wards to enable the baseline and follow-up survey teams to identify sampled households. The listers electronically collected basic household information to identify the household as well as the nature of its composition.

During the baseline fieldwork, one household roster, one man, one woman and one child questionnaire were administered per household. Each child questionnaire was answered by the child's mother or main caregiver. As was specified above, the anthropometric modules of both the children's and women's questionnaires were completed by the anthropometric enumerators.

In an effort to minimise any inconvenience on the part of the respondent, and at the same time improve the quality of the data collected, survey teams were trained to schedule interviews according to the preferences of the respondent. On some occasions this meant that some interviews were conducted over two or more sessions, either on the same day or on the following day, so that interviews could be conducted without rushing through the questionnaire and guaranteeing that the right respondent was available to respond to corresponding sections of the questionnaire.

K.6.1 Collecting anthropometric data

Collecting accurate anthropometric data is challenging. In this survey we invested considerable time and effort to ensure that the anthropometric data we collected was of the highest quality. The key measures we took were:

- having dedicated anthropometric enumerators who were rigorously trained;
- using high quality equipment;
- implementing an innovative multiple measurement procedure; and
- using a bespoke event calendar to better measure age.

Firstly, all anthropometric data was collected by a dedicated anthropometric enumerator, whose sole responsibility was to collect quality anthropometric data. In this way, we were able to ensure that all anthropometric measurements were made by someone who had previous experience of using such equipment and whose sole responsibility was to take accurate measurements. Having a dedicated anthropometric enumerator also avoided the need for an excessive number of anthropometric kits and eliminated the hurried feeling interviewers typically report when taking anthropometric measurements at the end of a long household interview before rushing off to the next household.

We also implemented an innovative multiple measurement procedure to try to improve accuracy. In summary, we took measurements twice for each person and for each variable (height and weight and MUAC) and if the two measurements were not ‘close’ to each other we took the measurement a third time. In the analysis we use the mean of the two closest measurements as the actual value (called this the ‘final’ value). We also calculated the Z-scores in the field, using the ‘final’ values. If WAZ was smaller than -2 or larger than 2, or if HAZ was smaller than -2 or larger than 2, but WHZ was within two SD, then we re-measured age.

The process steps are outlined below.

1. Take a first measurement (of height, weight, MUAC) (1);
2. Take a second measurement (2);
3. Take a third measurement if 1 and 2 are significantly different (MUAC 5 mm, height 5 mm, weight 0.1 kg) (3);
4. Calculate a fourth measurement equal to the mean of the two measurements closest together (4);
5. Calculate WAZ, HAZ, WHZ using ‘correct’ reading (4);

6. IF WAZ not ok (<> two SD), HAZ not ok (<> two SD), WHZ ok (within two SD), then re-measure age; and

7. Recalculate Z-scores using new age and (4) to determine malnourishment status of child.

The determination of the ages of children can be particularly difficult in this context. Thus, a bespoke event calendar was developed for use in this survey. An event calendar is typically used in such contexts to determine the age of the child by asking the child's mother and other members of the household to recall major events that occurred around the time of the child's birth. Such events include religious celebrations, a change in season, local elections and significant events, such as the death of an Emir or a plane crash. By knowing the date of a number of significant events that occurred in and around the local community, an interviewer is able to triangulate the month and year in which a child was born. For this survey, an event calendar was produced specifically for Northern Nigeria and was tailored to each community by asking respondents to the community questionnaire to inform the survey team of any significant community-level events – such as when the village flooded. Some households had a vaccination card and even birth certificates, but experience revealed that age determination by event calendar was more accurate as vaccination cards were typically issued to children many months after they were actually born, especially for children not born in a health facility. Birth certificates were even more unreliable as they are typically issued much later due to the administrative and financial costs associated with getting one.

The anthropometric equipment selected for this baseline survey included:

- SECA 213 – Portable stadiometer;
- SECA 417 – Measuring board for mobile use;
- Tanita WB100s – professional weight scales; and
- Standard 5 kg weight used for daily calibration of the weight scale.

K.7 Data cleaning and analysis

The data were sent daily from the field to the OPM Abuja office where they were checked in Stata for completeness and logical inconsistencies. Any problems found were communicated immediately to the field teams and so could be rectified while the teams were still in the field.

After the baseline collection phase ended, the data underwent further cleaning at University College London (UCL). Here:

1. The correct naming and labelling for the variables was checked;

2. Information from the different modules (listing, community, women, children, and men) was merged together;

3. The IDs for the interviewed women and men were retraced in the main household questionnaires and certified;

4. Additional relevant indicator variables were created and labelled;

5. The data were further cross-checked in their entirety for completeness and consistency; and

6. The tables and figures in this report were produced.

Annex L Ethics, confidentiality and datasets

L.1 Ethical principles

We have ensured that the evaluation fully meets DFID's Ethical Principles for Evaluation and Research, particularly in relation to ensuring strict evaluation independence and safe data handling (see above). We have also obtained ethical approval through the Nigeria National Health Research Ethics Committee (http://nhrec.net/nhrec/) and the UCL Research Ethics Committee system (http://ethics.grad.ucl.ac.uk/).

L.2 Community entrance strategy

We made preliminary visits prior to the start of fieldwork visits, to pay courtesy calls and obtain permissions at state, and LGA levels. When arriving in communities the teams first sought permission to undertake the surveys from the village head. The village heads then usually assigned the team a guide or guides to show them around the village and ensure their safety.

L.3 Obtaining consent

In order to ensure that people were fully aware of what the research was about, why we were doing it, and what participating in it would involve, interviewers were trained to provide a summary explanation that covered the following:

- why we are doing this evaluation;
- what is involved in participating: how much time respondents will be expected to participate for, and what they will be asked to do or what kinds of information they will be asked to provide;
- the benefits and risks;
- terms for withdrawal: explaining that people can drop out at any time for any reason;
- usage and confidentiality of the data;
- funding source and sponsoring institutions; and
- contact details for researchers, and how to make a complaint if needed.

We obtained informed oral consent from each person we interviewed.

L.4 Open data

The data generated by the project will be the property of DFID. However, e-Pact has exclusive rights of usage over the data for purposes of academic publication and research for a period of up to one year from the date of completion of the project and the delivery of the endline report.

During this period DFID will not publish the full data set and will not share data with any third parties for the purposes of academic research and publication. DFID may release limited data for programmatic purposes. While releasing limited data DFID will consult with the evaluation team, to ensure that the evaluation team's exclusive rights to academic research are protected and the

released data are used for purposes other than academic research and publication, ensuring that the academic research rights of the evaluation team are protected. At the end of the one-year period, or after an earlier period mutually agreed between DFID and the evaluation team, the evaluation team will make the anonymised data set publicly available. The evaluation team will duly acknowledge DFID's financial support in any publications that result from the use of the data.

Table 13 All listed women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont= T1	Cont= T2	T1=T2
Number of Women	12046	13332	13381			
Household PPI Score (0–100)	27.26	27.07	26.53	0.889	0.469	0.525
	(12.22)	(12.75)	(11.92)			
Age in Years	28.62	28.26	28.02	0.229	0.037 **	0.324
	(9.23)	(9.1)	(9.07)			
Age of Youngest Biological Child in Months	16.16	15.95	15.87	0.559	0.341	0.735
	(12.61)	(12.45)	(12.29)			
Currently Pregnant (Yes, No, Don' Know)	0.17	0.18	0.17	0.608	0.674	0.323
	(.38)	(.38)	(.38)			
Number of Living Biological Children	3.28	3.24	3.14	0.587	0.056	0.176
	(2.86)	(2.83)	(2.51)			
Number of Biological Children Under Five	1.3	1.29	1.3	0.705	0.986	0.712
	(.78)	(.77)	(.76)			
% Currently Married	0.83	0.82	0.84	0.454	0.789	0.253
	(-)	(-)	(-)			
% Monogamous Marriage	0.39	0.4	0.38	0.378	0.703	0.183
	(-)	(-)	(-)			
% Polygamous Marriage	0.45	0.42	0.46	0.083 *	0.490	0.008 ***
	(-)	(-)	(-)			

Notes: All tests of equality are based on OLS regressions, including State fixed effects. Robust standard errors are calculated. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.

Table 14 Sampled women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont= T1	Cont= T2	T1=T2
Number of Women	2651	2765	2767			
Household PPI Score (0–100)	28.45	28.86	28.22	0.768	0.772	0.581
	(12.48)	(13.5)	(12.49)			
Age in Years	21.97	22.32	21.93	0.359	0.798	0.271
	(3.67)	(4.21)	(3.69)			
Age of Youngest Biological Child in Months	19.63	19.12	19.90	0.45	0.643	0.277
	(10.23)	(10.43)	(10.33)			
Currently Pregnant (Yes, No, Don't Know)	0.59	0.61	0.61	0.45	0.466	0.969

	(.49)	(.49)	(.49)			
Number of Living Biological Children	2.58	2.54	2.46	0.578	0.100*	0.309
	(2.06)	(2.01)	(2.08)			
Number of biological Children Under Five	1.38	1.35	1.36	0.172	0.389	0.575
	(.68)	(.66)	(.65)			
% Currently Married	1.00	1.00	1.00	-	-	-
	(-)	(-)	(-)			
% Monogamous Marriage	54.4%	56.9%	53.2%	0.220	0.477	0.061*
	(-)	(-)	(-)			
% Polygamous Marriage	45.6%	43.1%	46.8%	0.220	0.477	0.061*
	(-)	(-)	(-)			
Notes: All tests of equality are based on OLS regressions including state fixed effects. Robust standard errors are calculated. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 15 Village-level randomisation

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont= T1	Cont= T2	T1=T2
Number of villages+	68	70	70			
Number of Observations	195.0	208.9	208.7	0.163	0.176	0.98
	(52.1)	(64.9)	(65.1)			
Number of Households	122.5	129.9	128.8	0.189	0.253	0.859
	(29.1)	(36.1)	(35.1)			
Number of Women	177.3	190.7	191.3	0.145	0.156	0.972
	(49.7)	(60.5)	(64.7)			
Number of Women Per Household	1.45	1.47	1.48	0.638	0.49	0.8
	(.24)	(.23)	(.23)			
Number of Pregnant Women	26.1	28.3	27.8	0.175	0.276	0.739
	(8.8)	(12.4)	(11.1)			
Number of Pregnant Women Per Household	0.22	0.22	0.22	0.887	0.947	0.823
	(.07)	(.07)	(.07)			
Number of Households Without Women	17.67	18.16	17.36	0.848	0.82	0.7
	(9.6)	(12.71)	(9.58)			
PPI Mean within villages	27.47	27.37	26.00	0.875	0.558	0.713
	(5.31)	(6.11)	(4.60)			
PPI Standard Deviation within villages	11.20	11.38	11.33	0.547	0.659	0.847
	(1.77)	(1.76)	(1.69)			
PPI Coefficient of Variation within villages	0.42	0.43	0.43	0.497	0.486	0.995

	(.08)	(.07)	(.08)			
Age of Listed Women	28.6	28.3	28.1	0.262	0.12	0.645
	(1.9)	(1.8)	(1.9)			
Age of Youngest Child of Listed Women (in months)	16.2	16.0	15.9	0.593	0.394	0.76
	(2.2)	(1.8)	(1.7)			
Average Number of Living Biological Children per Listed Woman	3.28	3.25	3.16	0.674	0.131	0.325
	(.45)	(.51)	(.49)			
Distance to Health Facility (km)	10.74	12.41	7.68	0.576	0.199	0.06*
	(16.75)	(17.99)	(10.37)			

Notes: All tests of equality are based on OLS regressions including state fixed effects. Robust standard errors are calculated.
Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.

+ The evaluation is taking place in a total of 210 villages. There are two pairs of villages that are contiguous to each other and to avoid creating tension between the communities they were assigned the same treatment status. Hence for these tables we have 210-2=208 units of randomisation.

Table 16 Women at baseline

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont= T1	Cont= T2	T1=T2
Number of Women	1762	1840	1834			
Age	25.23	24.86	24.73	0.176	0.069*	0.630
	(7.16)	(6.52)	(6.86)			
BMI	21.36	21.52	21.37	0.286	0.934	0.324
	(3.10)	(3.24)	(3.17)			
% Currently Attending School	2.7%	3.6%	3.2%	0.323	0.541	0.642
	(-)	(-)	(-)			
% Ever Attended School	16.7%	16.9%	18.2%	0.974	0.573	0.625
	(-)	(-)	(-)			
% Completed Primary Education	42.2%	48.6%	42.9%	0.365	0.969	0.386
	(-)	(-)	(-)			
% Currently Pregnant	67.2%	68.0%	67.7%	0.645	0.791	0.822
	(-)	(-)	(-)			
% Cultivated Any Land in Past 12 months	4.4%	3.5%	5.7%	0.460	0.436	0.170
	(-)	(-)	(-)			
% Looking After Any Animal	70.1%	65.2%	66.8%	0.109	0.252	0.601
	(-)	(-)	(-)			
% Did Paid/Unpaid Work in Last 12 months	72.4%	69.5%	71.0%	0.472	0.722	0.696
	(-)	(-)	(-)			
	951	870	864	0.596	0.585	0.943

Total Weekly Payment For Work Activities (NGN)	(4048)	(1917)	(2257)			
% Has Biological Children	81.6%	80.9%	80.5%	0.567	0.455	0.853
	(-)	(-)	(-)			
Age at First Marriage (years)	15.23	14.95	14.84	0.165	0.047**	0.536
	(6.16)	(3.74)	(3.77)			
% Visited Health Facility in Past Six Months	37.4%	36.1%	38.2%	0.560	0.736	0.359
	(-)	(-)	(-)			
% Ever Heard Of Any Contraceptive Method	64.6%	61.4%	60.5%	0.286	0.086*	0.675
	(-)	(-)	(-)			
% Has Access To Mobile Phone	65.7%	64.2%	65.2%	0.674	0.861	0.794
	(-)	(-)	(-)			
% Thinks Baby Should Receive Something other than Breast Milk in First Day After Birth	54.7%	46.1%	52.0%	0.038**	0.514	0.130
	(-)	(-)	(-)			
% Has Seen Anybody For Antenatal Care During the Pregnancy	43.9%	43.6%	41.8%	0.835	0.529	0.737
	(-)	(-)	(-)			
Notes: All tests of equality are based on OLS regressions including state fixed effects. Robust standard errors are calculated. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 17 Children at baseline

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont= T1	Cont= T2	T1=T2
Number of children	1362	1401	1400			
Index child: age (months)	33.38	34.05	32.65	0.241	0.235	0.022**
	(13.69)	(14.02)	(14.38)			
% Female	50.4%	50.6%	49.9%	0.928	0.796	0.709
	(-)	(-)	(-)			
% Given deworming meds in last six months	14.5%	12.4%	13.2%	0.251	0.460	0.604
	(-)	(-)	(-)			
% Received all basic vaccinations	4.3%	4.6%	3.2%	0.864	0.335	0.365
	(-)	(-)	(-)			
% Received none of the basic vaccinations	20.8%	21.4%	21.8%	0.890	0.723	0.873
	(-)	(-)	(-)			
% Had diarrhoea in last two weeks	31.3%	26.3%	29.3%	0.031**	0.377	0.160
	(-)	(-)	(-)			
IYCF indicators+						
Child ever breastfed	100%	99.1%	98.3%	0.078*	0.005***	0.292
	(-)	(-)	(-)			

Age-appropriate breastfeeding	41.9% (-)	43.4% (-)	37.4% (-)	0.687	0.309	0.163
Early initiation of breastfeeding (immediately)	28.9% (-)	27.6% (-)	26.0% (-)	0.901	0.549	0.630
Early initiation of breastfeeding (24h)	66.1% (-)	59.6% (-)	61.9% (-)	0.151	0.274	0.596
Exclusive breastfeeding among children under six months	10.4% (-)	19.6% (-)	6.0% (-)	0.143	0.548	0.027 **
Predominant breastfeeding among children under six months	72.9% (-)	70.6% (-)	70.1% (-)	0.976	0.837	0.919
Continued breastfeeding at one year (12–15 months)	91.8% (-)	88.7% (-)	94.2% (-)	0.557	0.671	0.259
Continued breastfeeding at two years (20–23 months)	18.5% (-)	22.8% (-)	15.2% (-)	0.518	0.510	0.200
Milk feeding frequency	3.4% (-)	5.0% (-)	3.1% (-)	0.388	0.875	0.296
Introduction of solid, semi-solid or soft foods (6–8 months)	55.6% (-)	42.9% (-)	42.9% (-)	0.745	0.599	0.903
Consumption of iron-rich/fortified foods (6–23 months)	20.6% (-)	20.5% (-)	20.3% (-)	0.989	0.928	0.935
Minimum meal frequency (6–23 months)	36.6% (-)	38.5% (-)	36.0% (-)	0.487	0.938	0.529
Minimum dietary diversity (6–23 months)	17.2% (-)	19.7% (-)	12.6% (-)	0.339	0.187	0.033 **
Minimum acceptable diet (6–23 months)	6.1% (-)	6.7% (-)	3.1% (-)	0.636	0.153	0.064 *
Diet						
MDD (WHO)	2.69 (0.99)	2.66 (0.98)	2.64 (0.97)	0.782	0.434	0.652
IDDS (FAO)	3.16 (1.21)	3.13 (1.19)	3.11 (1.16)	0.796	0.417	0.606
ASQ						
ASQ communication skills	35.16 (18.98)	36.95 (19.44)	34.20 (19.33)	0.143	0.447	0.025**
ASQ motor skills	32.55 (19.46)	35.35 (19.49)	32.88 (19.27)	0.031 **	0.800	0.056*
Anthropometrics						

WHZ	-0.27	-0.32	-0.25	0.436	0.711	0.273
	(1.15)	(1.23)	(1.21)			
HAZ	-2.48	-2.44	-2.51	0.584	0.715	0.398
	(1.47)	(1.49)	(1.50)			
WAZ	-1.60	-1.62	-1.60	0.772	0.975	0.832
	(1.16)	(1.19)	(1.18)			
% Wasted (WHZ<-2SD)	6.8%	8.0%	7.5%	0.338	0.464	0.759
	(-)	(-)	(-)			
% Stunted (HAZ<-2SD)	65.1%	64.1%	65.6%	0.641	0.830	0.520
	(-)	(-)	(-)			
% Underweight (WAZ<-2SD)	34.2%	34.6%	33.8%	0.929	0.841	0.810
	(-)	(-)	(-)			
% Malnourished (MUAC<125mm)	7.1%	7.4%	10.1%	0.770	0.009 ***	0.027 **
	(-)	(-)	(-)			

Notes: All tests of equality are based on OLS regressions including state fixed effects. Robust standard errors are calculated.
Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.

Annex M Definition and calculation of key indicators

M.1 PPI

The PPI (Chen, Schreiner, & Woller, 2008) is a scorecard that can be used to predict the likelihood that a household's expenditure is below various poverty lines. Its advantages lie mainly in its simplicity: it is based on a list of 10 indirect measures that are highly correlated with per capita expenditure, and all these indicators are categorical (non-negative integers). This makes the PPI relatively easy and inexpensive to use when compared to direct survey measures of expenditure.

Table 18 PPI scorecard

Item		Points
1. How many members does the household have?		
	Eight or more	0
	Six or seven	6
	Five	11
	Four	14
	Three	19
	Two	30
	One	38
2. Are all household members aged six to 18 currently attending school?		
	No	0
	No members aged six to 18	7
	Yes	9
3. What is the main flooring material of the house?		
	Earth/mud or dirt/straw	0
	Wood, tile, plank, concrete, or other	4
4. What is the main roofing material of the house?		
	Mud/mud bricks	0
	Thatch (grass or straw)	3
	Wood/bamboo, corrugated iron sheets, cement/concrete, roofing tiles, or other	6
5. What is the main source of drinking water for the household?		
	Unprotected well/rain water, or untreated pipe-borne water	0
	Vendor, truck, protected well, river, lake, or pond	4
	Treated pipe-borne water, borehole/hand pump, or other	6
6. What type of toilet is used by the household?		
	Pail/bucket, covered or uncovered pit latrine, ventilated improved pit latrine, other, or none	0
	Toilet on water, or flush to sewer or septic tank	5
7. Does any member of the household own a television?		
	No	0
	Yes	15
8. Does any member of the household own a stove?		
	No	0
	Yes	7
9. Does any member of the household own a mattress/bed?		
	No	0
	Yes	5
10. Does any member of the household own a radio?		
	No	0
	Yes	5

M.2 Definition of IYCF indicators

Table 19 Definition of IYCF indicators

Indicator	Numerator	Denominator	Note	Source
Proportion of children ever breastfed	Children aged 0–23 months that were ever breastfed	All children aged 0–23 months		(WHO, 2008, p. 40)
Age-appropriate breastfeeding	Infants aged 0–5 months who received only breast milk during the previous day and children aged 6–23 months who received breast milk, as well as solid, semi-solid, or soft foods, during the previous day	All children aged 0–23 months		(WHO, 2008, p. 41)
Early initiation of breastfeeding (<1h)	Proportion of children born in the last 24 months who were put to the breast within one hour of birth	All children aged 0–23 months		(WHO, 2008, p. 33)
Early initiation of breastfeeding (<24h)	Proportion of children born in the last 24 months that were put to the breast within 24 hours of birth	All children aged 0–23 months		(WHO, 2008, p. 33)
Exclusive breastfeeding among children aged < 6 months	Infants aged 0–5 months who received only breast milk during the previous day	All infants aged 0–5 months	Note that ORS and other medicines are allowed under exclusive breastfeeding. Nothing else is allowed, e.g. no water	(WHO, 2008, p. 34)
Continued breastfeeding at one year (aged 12–15 months)	Children aged 12–15 months who received breast milk during the previous day	All children aged 12–15 months		(WHO, 2008, p. 34)
Continued breastfeeding at two years (aged 20–23 months)	Children aged 20–23 months who received breast milk during the previous day	All children aged 20–23 months		(WHO, 2008, p. 40)
Milk feeding frequency: Proportion of non-breastfed children (6–23 months) who received at least two milk feedings during previous day	Currently non-breastfed children aged 6–23 months who received at least two milk feedings during the previous day	All children aged 6–23 months who were currently not breastfed		(WHO, 2008, p. 43)
Introduction of solid, semi-solid or soft foods (6–8 months)	Infants aged 6–8 months who received solid, semi-solid, or soft foods during the previous day	Infants aged 6–8 months		(WHO, 2008, p. 35)
Consumption of iron-rich or iron-fortified foods (aged 6–23 months)	Children aged 6–23 months who received an iron-rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was fortified in the home with a product that included iron during the previous day	All children aged 6–23 months		(WHO, 2008, p. 39)

Minimum meal frequency (aged 6–23 months)	Breastfed children aged 6–23 months who received solid, semi-solid, or soft foods the minimum number of times or more during the previous day and non-breastfed children aged 6–23 months who received solid, semi-solid or soft foods or milk feeds the minimum number of times or more during the previous day	All children aged 6–23 months	Minimum is defined as: two times for breastfed children aged 6–8 months, three times for breastfed children aged 9–23 months, and four times for non-breastfed children aged 6–23 months	(WHO, 2008, p. 36)
Minimum dietary diversity (≥ 4 food groups) (aged 6–23 months)	Children aged 6–23 months who received foods from >= 4 food groups during the previous day	All children aged 6–23 months		(WHO, 2008, p. 35)
Minimum acceptable diet (aged 6–23 months)	Breastfed children aged 6–23 months who had at least the minimum dietary diversity and the minimum meal frequency during the previous day, and non-breastfed children aged 6–23 months who received at least two milk feedings and had at least the minimum dietary diversity (not including milk feeds) and the minimum meal frequency during the previous day	All children aged 6–23 months		(WHO, 2008, p. 37)
Predominant breastfeeding under six months	Children aged 12–15 months who received only breast milk, ORS, vitamins and/or mineral supplements, water, and water-based drinks during the previous day	All children aged 0–5 months		(WHO, 2008, p. 41)
Median duration of breastfeeding	The indicator estimates the age in months when 50% of children 0–35 months did not receive breast milk during the previous day. Details regarding the calculation of this index can be found in WHO 2008, Annex 5.			(WHO, 2008, p. 42)

Annex N Standard errors, design effects and ICCs

The purpose of this annex is to present estimates of the precision with which the quantitative impact evaluation will be able to identify the impact of the CDGP interventions. It is important to emphasise that these are estimates that rely on a variety of assumptions (explicitly laid out below). As previously explained, the aim of the quantitative impact evaluation is to estimate the effect of the CDGP intervention as a package, in treatment villages, versus the effects of no intervention, in control villages. The following paragraphs will give an estimate of the size of the effect of the intervention that this study will be able to detect.

Following standard results from theory on statistical testing, it is possible to identify, before the implementation of a survey, the sample size needed to test certain hypotheses on expected differences in means (or proportions) between two groups in a sample. In the present case, this could be to test whether the proportion of children malnourished in CDGP intervention areas before the intervention is statistically significantly different from the proportion after the CDGP intervention (SMART 2012b).

The needed sample size will depend on the difference in the values to be tested, the standard errors of the estimators, the required power of the test (i.e. the probability of correctly rejecting the hypothesis of no difference between values) and the required significance level of the test (i.e. the probability of falsely rejecting the hypothesis of no difference). Conversely, using a given sample size, a given estimate (mean or proportion) of an indicator, a required power of the test, and a significance level, it is possible to find the minimal difference to the given estimate that a statistical test will be able to identify (SMART, 2012b; Grosh and Munoz, 1996). In the context of a treatment versus control comparison, this is the minimum change in the outcome variable at which a statistically significant impact will be measured.

In addition to these standard procedures, clustered sampling needs to be taken into account in the present context. Because households and individuals within villages are likely to have similar characteristics, and hence indicators will be correlated within these clusters, the standard errors of estimators will be larger than under simple random sampling (SMART, 2012b, p. 16 ff.). The factor by which standard errors using the clustered sampling method are inflated over standard errors using simple random sampling is called the design effect (DEFF), which for each indicator i is generally defined as follows:

$$DEFF_i = 1 + (m - 1)\rho_i;$$

where m is the cluster size and ρ_i is the ICC for indicator i, a measure of how much indicators are correlated with each other within clusters. When estimating the size of the detectable effect, inflated standard errors, and therefore the DEFF, need to be taken into account as well.

As can be seen, the size of the DEFF will generally depend on two factors: cluster size and the ICC. The formula above assumes constant cluster sizes. In the present context, however, cluster sizes vary. In some villages, more children were interviewed than in others. In such instances, the DEFF should be defined differently so as to accommodate the varying cluster sizes.

There are several proposals in the literature setting out how this can be achieved, e.g. ESSEduNet (2013), Gabler et al. (2006), and Eldridge et al. (2006). We follow the approach suggested by Hemming et al. (2011), who recommend a procedure to adapt the DEFF to varying cluster sizes and who have developed a command to implement this procedure in Stata (Hemming and Marsh, 2013).

According to this approach, the DEFF with varying cluster sizes can be defined as follows:

$$DEFF_i^{var} = 1 + \{(cv^2 + 1)\bar{m} - 1\}\rho_i.$$

Here, cv is the coefficient of variation of cluster size, defined as the ratio of the standard deviation of cluster sizes to the mean cluster size, $\bar{m}$ (Eldridge et al., 2006, p. 1,293). The other terms are defined as before. When the sample size is known, the number of clusters is fixed, but when the number of individuals might vary across clusters, which is the case in the present survey, the detectable difference, compared to simple random sampling, between two groups will be inflated by the square root of this DEFF (Hemming et al., 2011, p. 3).

For the following results we use the Stata command 'clustersampsi', developed by Hemming and Marsh (2013), in order to estimate the minimal detectable difference of indicators used in the CDGP survey for individuals in the treatment group. For example, we want to estimate the minimal difference in stunting prevalence in treatment and control areas that we will be able to statistically detect after the implementation of the CDGP.

For this exercise, we will assume that indicators will stay at baseline level in control areas, even after CDGP has been rolled out. In addition, we will assume that cluster sizes and ICCs will be the same. The ICC is estimated using the ANOVA estimator, implemented by 'l1way' in Stata, and allowing for varying cluster sizes and weights. The significance level is always set at 0.05%, and power at 80%.

Clusters are villages, of which there were 140 in the treatment group. The average cluster size and the coefficient of variation of cluster size vary depending on the indicator analysed, and are hence presented below. For comparison purposes, the DEFF calculated using the approach outlined in Kish (1965), which is implemented using the Stata 'estat eff' command, is presented as well. Note also that for proportions of malnutrition the minimal detectable difference downwards, i.e. for a decreasing proportion, is reported. For the other indicators, the minimal difference detectable for an increasing outcome is reported in the table.

Table 20 shows the sampling parameters for seven key indicators: four for child malnourishment and three for IYCF practices. Taking stunting, for example, with an ICC of 0.03, an average cluster size of 19, a coefficient of variation of cluster size of about 0.17, and a DEFF of 1.57 – the present sample will be sufficient to detect a decrease in stunting by more than six percentage points, from 65 to 58.4. Similarly, it will be sufficient to detect a decrease in underweight by 6.6 percentage points, from 34.2 to 27.6, and by three percentage points in wasting, from 7.4 to 4.4. The remaining estimates can be interpreted in an analogous way.

Table 20 DEFF and minimum detectable differences for clusters at the village level

Indicator	Estimate	Average cluster size	Variation of cluster size	ICC at baseline	DEFF	Detectable difference	Altern. DEFF
% Stunted (6–59) – HAZ < -2SD	65.0%	19	0.17	0.030	1.57	6.6% (65.0 to 58.4)	1.67
% Underweight (6–59) – WAZ < -2SD	34.2%	19	0.17	0.038	1.71	6.6% (34.2 to 27.6)	1.72
% Wasted (6–59) – WHZ < -2SD	7.4%	19	0.17	0.020	1.37	3.0% (7.4 to 4.4)	1.43
% Malnourished (6–59) – MUAC<125	8.2%	20	0.17	0.013	1.25	3.0% (8.2 to 5.2)	1.22
Exclusive breastfeeding among children aged < six months	11.5%	1	1.29	0.363	1.41	24.6% (11.5 to 38.1)	1.21

Proportion of children with minimum dietary diversity (≥ four food groups) (aged 6–23 months)	16.2%	4	0.57	0.060	1.24	10.9% (16.2 to 27.1)	1.19
Proportion of children receiving minimum acceptable diet (aged 6–23 months)	5.2%	4	0.57	0.107	1.43	8.3% (5.2 to 13.5)	1.16
Notes: clusters are villages							

Annex O Cross-reference of key indicators

This annex cross-references key indicators from the baseline study with other surveys in Nigeria. While comparisons are useful in triangulating findings and validating results, they must be interpreted carefully. There are four important considerations that must be taken into account when interpreting the cross-reference tables below. These are:

1. The population base for a particular indicator may be different across surveys.
    - For example, the CDGP, DHS, and SMART surveys calculate child anthropometric indicators for all children 0–5 years old, whereas the ORIE baseline report reports child anthropometric indicators for all children 0–2 years old.
2. The season in which the cross-referenced survey was conducted.
    - As a number of key indicators, such as household food security, or even underweight and wasting, vary by season so estimates from different sources may vary.
    - The CDGP baseline survey was conducted between mid-August and the end of October 2014, the ORIE baseline survey was conducted in June 2013, the SMART 2012 was conducted between August and October 2012, the NDHS 2013 was conducted between April and May 2013, the NDHS 2008 was conducted between June and October 2008, and the Multiple Indicator Cluster Survey (MICS) 2011 was conducted between February and March 2011.
3. The year in which the cross-reference survey was conducted.
    - Comparisons from the CDGP baseline to the DHS 2008 must be made carefully as the context must certainly have changed within this time gap.
4. The level of disaggregation.
    - Some surveys are specifically designed to provide disaggregated results for particular levels. For example, the General Household Survey (GHS) was designed only to provide estimates for North West Nigeria, whereas the NDHS 2008 disaggregates results by state.

Overall, the results presented in the CDGP baseline report are designed to provide a baseline description across the evaluation areas only. This includes five LGAs in the states of Jigawa and Zamfara. Hence, the present estimates are not designed to be separately representative of the two mentioned states. Any extrapolation of these results to each of these states, or indeed the rest of Northern Nigeria, must be made with care.

With that said, the comparisons presented in this annex are made to place the CDGP results within the wider context of evidence that already exists for the region.

O.1 Household demographics

Table 21 presents comparisons of indicators on household demographics, as measured by the present study and other reference surveys. In summary, we find:

- Female headship rates are generally low in Nigeria. However, the level measured by the CDGP, similarly to ORIE, was distinctly lower than in rural Nigeria as a whole (NDHS 2008) and in North West Nigeria (GHS 2010/11). This finding is partly due to the baseline study design, which focuses on households that contain at least one woman that is pregnant or likely to become pregnant during the evaluation period: it's likely that households with fertile women will be led almost exclusively by men.

- Educational attainment among household heads in the present study was found to be in line with figures for males in North West Nigeria (NDHS 2008), but lower than those for males in Nigeria as a whole (NDHS 2013).

- Finally, the demographic dependency ratio measured was somewhat lower than that in ORIE and than what the GHS 2010/11 found for North West Nigeria as a region.

Table 21 Comparison of household demographics to other studies

Study	% of household heads that are female	% of households heads that have no formal education	Average household dependency ratio
CDGP	0.1	49.2	128.3
ORIE	0.9	66.8	145.5
NDHS 2008	18.6	48.8	-
	Household headship rates for rural Nigeria	*Educational attainment for male respondents in North West Nigeria*	
NDHS 2013	-	37.8	-
		Male respondents in Nigeria	
GHS 2010/11	4.0	-	150.5
	North West Nigeria		*North West Nigeria*

O.2 Household characteristics

Overall, the results of the present survey were similar to the findings of other studies regarding housing characteristics in the region (Table 22). In summary:

- Households in the present survey were significantly more likely to have earth as *flooring material* than those in earlier studies, and less likely to use cement than what was found NDHS 2008 for rural Nigeria as a whole.

- However, households were less likely to *cook indoors* and were significantly more likely to use wood as *cooking fuel* than in the NDHS 2008, and even more than households in ORIE.

- Households in the present survey were less likely to own a radio than households in previous studies. Mobile phone ownership is lower than what was found in ORIE, but still higher than the DHS/GHS figures: it is likely that this is due to an increase in utilisation of mobile phones in the region since the earlier surveys were conducted. Furthermore, motorbike ownership is in line with ORIE, while bicycles are less common than in any of the other studies.

Table 22 Comparison of housing characteristics to other studies

Study	Base population	Flooring material		Cooking indoors	Cooking fuel		Assets/transport			
		Earth	Cement		Kerosene	Wood	Radio	Mobile	Bike	Motor-bike
CDGP		77.4	22.4	12.9	0.4	95.4	54.2	58.3	16.6	41.5
ORIE		61.2	37.3	22.6	1.4	91.4	72.5	72.4	36.4	45.3
NDHS 2008	*(Rural Nigeria as a whole)*	45.5	38.5	37.7	11.3	82.5	69.4	35.1	29.3	24.9
GHS 2010/11	*(North West Nigeria)*	21.6	-	-	-	-	62.0 (Access: 84.6)	46.0	27.0	31.3

O.3 Water, sanitation and hygiene

Table 23 shows that the present survey found similarly low levels of safe drinking water availability and sanitation infrastructure as comparative studies. In summary:

- The NDHS 2008 found that on average 50% of all households used *improved drinking water* sources in North West Nigeria, with significant variance across states (ranging from 28% in Zamfara to 80% in Jigawa). For North West Nigeria, the GHS 2010/11 found levels that lay within this range (61%). ORIE found significantly lower figures, while the present study actually suggests that the population of the CDGP has better access to drinking water than reported in other studies, particularly in Jigawa state.

- The above result could partly explain the relatively low percentage of households using *appropriate treatment techniques* for drinking water, when compared to the 2008 NDHS: this study found that, on average, only 12% of households in North West Nigeria were using appropriate treatment techniques for drinking water.

- The GHS 2010/11 found that, on average, 86% of all households used some type of pit latrine (including covered, uncovered, and ventilated improved pit latrine) in North West Nigeria, while 7% did not use any sanitation facilities at all. These figures are similar to the CDGP figures for Zamfara, while Jigawa seems to have a much higher proportion of an absence of toilet facilities.

Table 23 Comparison of water and sanitation infrastructure to other studies

Study	Base population	Drinking water		Sanitation	
		Improved Source	Appropriate treatment	Pit latrine	No facilities
CDGP		63.3	7.3	79.0	18.0
Jigawa		95.1		62.9	32.7
Zamfara		38.5		91.4	6.5
ORIE		40.2	10.8	78.2	17.7
NDHS 2008	*(North West Nigeria)*	49.5	11.9	-	-
Jigawa		79.4	3.1	-	-
Zamfara		27.6	3.3	-	-
MICS 2011					
Jigawa		64.9	1.6	-	48.1
Zamfara		44.2	6.6	-	9.8
GHS 2010/11	*(North West Nigeria)*	60.9	-	86.0	7.1

O.4 Maternal characteristics and decision-making

Comparisons with the NDHS 2008 report indicate that the results presented are representative of the general situation in the region

Table 24). In summary:

- For North West Nigeria, the *median age at first marriage* for women was found to be 15 years, which is very close to the estimate of the present survey.
- The level of *educational attainment* in the relevant states of North West Nigeria was found to be very similar (perhaps slightly lower) to both NDHS 2008 and ORIE.
- *Economic activity* measures indicate that women in the CDGP tend to be on average more economically active than in other study populations, with less than 30% not having worked in the 12 months preceding the interview.
- *Decision-making* regarding cash earning was more skewed away from women in the CDGP. For instance, 66% of married women in North West Nigeria were found in the NDHS 2008 to make decisions alone regarding their cash earnings, while just 50.6% did so in the CDGP.

Table 24 Comparison of maternal characteristics and decision-making with other studies

Study	Base population	General characteristics			Decision-making (proportions)
		Median age at first marriage	Proportion not having any formal education	Proportion not economically active (NDHS 2008: not employed in 12 months preceding survey)	Women deciding mainly alone regarding cash earnings
CDGP	*(Women 12–49 years who are pregnant or are likely to give birth during study period)*	15	81.1	29.1	50.6 (81.5 including jointly with household head)
ORIE	*(Mothers 15–49 years who had given birth within 35 months prior to survey)*	15	86.6	30.6	60.5
NDHS 2008	*(Women 20–49 in North West Nigeria for ages, 15–49 years for other indicators, married women for decision-making only)*	15.3	74.2	46.6	66.4
Jigawa		-	84.6	49.9	55.0
Zamfara		-	87.9	55.6	82.3

O.5 Knowledge of family planning

The NDHS 2008 report indicated that only 45% of all women aged 15-49 years in the region had *heard of any method of contraception*. While the ORIE results are close to the regional average and lie within the range found in these states, women surveyed in the CDGP seem to be significantly more knowledgeable about contraceptive methods, especially in Zamfara.

Table 25 Comparison of results on knowledge of family planning methods

Study	Base population	Proportion who have ever heard of any method of family planning
CDGP	*(Women 12–49 years who are pregnant or are likely to give birth during study period)*	62.1
Jigawa		54.3
Zamfara		68.2

ORIE	*(Mothers aged 15–49 years who had given birth within 35 months prior to survey)*	42.2
NDHS 2008	*(North West Nigeria, currently married women aged 15–49 years)*	45.1
Jigawa		43.1
Zamfara		47.5

O.6 Antenatal care, place of delivery, and postnatal care

Utilisation of health services before, during and after pregnancy seems to be slightly better than in comparable surveys (Table 26). In summary:

- According to the NDHS 2008 report, the proportion of women in the relevant states in North West Nigeria that did not receive antenatal care varied, between 79% in Jigawa and 86% in Zamfara. The NDHS 2013 report indicated a slightly lower figure of 59%: this figure is closer to the CDGP estimate, although still higher.
- The NDHS 2008 also reported that 90% of live births *were delivered at home* in North West Nigeria, and only 8% at a health facility: estimates from ORIE and CDGP are very close to this finding.
- Finally, the utilisation of postnatal care in North West Nigeria was similarly reported as being very low: 80% of women were identified as not receiving any postnatal check-up according to the NDHS 2008 report. The figures for CDGP are slightly more comforting, with around three-quarters or the surveyed women having received a check-up.

Table 26 Comparison of antenatal care, place of delivery, and postnatal care across studies

Study	Base population	Antenatal care	Place of delivery		Postnatal care
		Proportion of mothers not receiving any antenatal care	Home	Health facility	Proportion of mothers not receiving postnatal check-ups
CDGP	*(Women 12–49 years who have at least one child aged 0–35 months)*	54.6	89.6	9.8	69.9
Jigawa		39.8	85.9	13.5	58.4
Zamfara		67.7	92.9	6.6	74.7
ORIE	*(Mothers aged 15–49 years to children aged 0–35 months)*	57.5	90.7	9.0	85.7

NDHS 2008	*(North West Nigeria, women aged 15–49 years who have given birth in the five years prior to the survey)*	67.1	90.1	8.4	80.1
Jigawa		78.7	95.5	4.5	69.5
Zamfara		85.5	92.3	6.5	84.0
NDHS 2013	*(North West Nigeria, women aged 15–49 years who have given birth in the five years prior to the survey)*	59.0		11.5 (at last birth)	-
MICS 2011	*(Women aged 15–49 years who have given birth in the two years prior to the survey)*				
Jigawa		56.6	89.5	10.1	-
Zamfara		80.3	84.6	7.7	-

O.7 IYCF practices

Other sources report similar breastfeeding practices in Northern Nigeria (

Table 27). In summary:

- The NDHS 2008 indicated that breastfeeding was nearly universal (98%) and that almost 60% of all children under the age of five in North West Nigeria were put to the breast within one day of their birth. This is very much consistent with the findings in the CDGP baseline, and very similar to ORIE.

- The NDHS 2008 indicates that exclusive breastfeeding among Nigerian children (country-wide) aged 0–5 months was generally rare (13%), and this is also reflected in the estimates for the present study.

- An estimated 47% of all children aged 6–23 months in North West Nigeria received food the minimum times or more: this is significantly higher than for the CDGP population (37%), although not as low as the figure found in ORIE.

- In addition, 34% of children aged 6–35 months in North West Nigeria were estimated to have consumed iron-rich foods within the 24 hours preceding the survey. Again, this is significantly higher than the estimate for the consumption of iron-rich food in the present survey (20%), although also in this case the estimates are not as low as the ones in ORIE. It is to be noted that this difference might partly be explained by a diverging definition of this indicator.

Table 27 Comparison of breastfeeding and complementary feeding with other studies

Study	Base population	Breastfeeding			Complementary feeding	
		Proportion of children ever breastfed	Proportion put to breast within one day	Exclusive breastfeeding of children aged *0–5 months*	Minimum meal frequency (6–23 months)	Consumption of iron-rich or iron-fortified foods*
CDGP		99.5	65.0	11.4	36.9	20.4
Jigawa		99.6	70.1	4.6	32.8	19.6
Zamfara		99.4	60.7	19.0	41.3	21.3
ORIE		99.7	62.2	7.2	23.3	13.6
NDHS 2008	*(North West Nigeria, children under the age of five for breastfeeding, 6–35 months and living with mother for iron foods; Nigeria in total for exclusive breastfeeding)*	98.1	56.1	13.1	46.8	33.6
Jigawa		98.7	51.1	-	45.9	31.0
Zamfara		98.7	39.9	-	42.7	40.3
MICS 2011	*(North West Nigeria)*	-	-	6.2		
Jigawa	*(Last-born children in the two years preceding the survey for breastfeeding indicators)*	96.6	50.9	6.4	21.3	-
Zamfara		89.2	46.0	4.5	24.9	-

Note: NDHS 2008 includes eggs as food here, while ORIE and CDGP do not.

O.8 Child anthropometric analysis

Recent studies on nutrition in Nigeria have given similar but somewhat diverging and varying measures of malnutrition among children in Northern Nigeria (Table 28). In summary:

- Comparing anthropometric estimates with the NDHS and MICS, we can see that children in the CDGP are relatively less likely to be underweight and wasted, but significantly more at risk of stunting. Given that the latter measure reflects longer-term growth impairment and

the former two are more short-term, it might be possible that CDGP children suffer from worse chronic malnutrition but have been interviewed in a season where short-term feeding needs were more satisfied.

- Results from the CDGP are close to the ORIE findings: however, differences between Jigawa and Zamfara are less pronounced than in ORIE, at least for stunting.

Table 28 Comparison of anthropometric estimates with other studies

		Mean Z-score			Prevalence			
Study	Base population	LAZ/HAZ	WAZ	WHZ/LHZ	Stunting	Underw.	Wasting	Severe wasting
CDGP								
Jigawa	*(Children aged 0–59 months)*	-2.5	-1.8	-0.5	65.2	39.7	9.9	2.9
Zamfara		-2.5	-1.5	-0.1	64.8	29.6	5.4	1.7
Total		-2.5	-1.6	-0.3	65.0	34.2	7.4	2.2
Jigawa	*(Children aged 0–35 months)*	-2.5	-1.8	-0.7	66.5	44.2	14.1	4.4
Zamfara		-2.5	-1.6	-0.3	68.0	33.4	8.2	3.1
Total		-2.5	-1.7	-0.5	67.3	38.3	10.9	3.7
ORIE								
Jigawa	*(Children aged 0–35 months)*	-2.4	-1.9	-0.7	64.4	46.0	14.4	4.9
Zamfara		-2.0	-1.5	-0.6	51.0	34.3	16.7	6.1
Total		-2.2	-1.7	-0.6	57.5	41.2	16.2	5.8
NDHS 2008	*(Children aged 0–59 months, North West Nigeria)*	-	-	-	52.6	35.1	19.9	10.6
NDHS 2013	*(Children aged 0–59 months)*							
Jigawa		-2.2	-1.7	-0.6	59.0	44.1	17.0	7.8
Zamfara		-2.2	-1.6	-0.5	55.9	37.0	16.2	6.1
MICS 2011	*(Children aged 0–59 months)*							
Jigawa		-2.4	-1.8	-0.5	58.8	43.8	14.3	6.6
Zamfara		-2.4	-1.9	-0.7	61.7	47.5	17.5	6.7

Annex P Balance test tables

The tables in this section are aimed at verifying whether the randomisation strategy has led to the selection of control and treatment groups that have the same average characteristics before the programme is implemented. This will be of key importance when evaluating the effect of the intervention. In the remaining tables, we calculate the mean values of the indicators considered in the main report in each treatment arm: control; Treatment 1 (T1); and Treatment 2 (T2). These means are reported in the first three columns. Then we test whether these means differ across treatment arms in a significant way. This test is performed by running regressions, using each indicator as a dependent variable, and testing the coefficient of the treatment indicator; if this coefficient is significant, there may be an imperfect balance of the indicator across treatment groups in the sample. Stars are used to indicate where statistically significant differences in characteristics are found (i.e. there is an imbalance in the sample).

We perform these tests for all the indicator presented in the baseline report. The results show that on the vast majority of characteristics, our sampled households have very similar characteristics to each other pre-intervention.

It is important to note that, even in the case of perfect randomisation, we would expect to see approximately 5% of the indicators (i.e. one in twenty) being significantly different at the 5% level, purely by the effect of chance. A complementary approach that is recommended to overcome the issue that 5% of tests will show imbalance is to test whether the samples are balanced when all indicators are tested jointly. To do this, we set up a simple and straightforward multiple hypothesis testing procedure. We test for joint orthogonality between the treatment group and a list of the most relevant baseline pre-treatment indicators included in the main report (see table notes for details). This is carried out by regressing the treatment dummy on the indicators and subsequently testing the joint significance of the coefficients; if the randomisation procedure has produced treatment arms that are jointly well-balanced in terms of these characteristics, we expect to detect no significance.

To ensure robustness, we run and test three different specifications: linear probability and probit (both pairwise on binary treatment dummies for each treated arm versus the control group), plus a multinomial logit regression that considers the three arms at the same time. We show the p-values for the appropriate test for each specification – F-test for the linear model, chi-square test for Probit and Multinomial Logit. In each case, the null hypothesis is that all the coefficients tested are jointly insignificant. We also run all estimation routines twice, one without variables referring to the child and one on the set of those variables. This is because the number of surveyed children is significantly lower than the number of surveyed households, women, and husbands or household heads.

The results indicate that randomisation successfully gave rise to treatment arms that look broadly similar, also when testing for joint orthogonality between treatment status and a number of relevant indicators.

Table 29 All listed women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Number of Women	12046	13332	13381			
Household PPI Score (0–100)	27.26	27.07	26.53	0.889	0.469	0.525
	(12.22)	(12.75)	(11.92)			
Age in Years	28.62	28.26	28.02	0.229	0.037**	0.324
	(9.23)	(9.1)	(9.07)			
Age of Youngest Biological Child in Months	16.16	15.95	15.87	0.559	0.341	0.735
	(12.61)	(12.45)	(12.29)			
Currently Pregnant	0.17	0.18	0.17	0.608	0.674	0.323
Number of Living Biological Children	3.28	3.24	3.14	0.587	0.056	0.176
	(2.86)	(2.83)	(2.51)			
Number of Biological Children Under Five	1.3	1.29	1.3	0.705	0.986	0.712
	(.78)	(.77)	(.76)			
% Currently Married	0.83	0.82	0.84	0.454	0.789	0.253
% Monogamous Marriage	0.39	0.4	0.38	0.378	0.703	0.183
% Polygamous Marriage	0.45	0.42	0.46	0.083*	0.490	0.008***
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 30 Sampled women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T2	Cont=T3	T2=T3
Number of Women	2651	2765	2767			
Household PPI Score (0–100)	28.45	28.86	28.22	0.768	0.772	0.581
	(12.48)	(13.5)	(12.49)			
Age in Years	21.97	22.32	21.93	0.359	0.798	0.271
	(3.67)	(4.21)	(3.69)			
Age of Youngest Biological Child in Months	19.63	19.12	19.90	0.45	0.643	0.277
	(10.23)	(10.43)	(10.33)			
Currently Pregnant	0.59	0.61	0.61	0.45	0.466	0.969
Number of Living Biological Children	2.58	2.54	2.46	0.578	0.100*	0.309
	(2.06)	(2.01)	(2.08)			
Number of biological Children Under Five	1.38	1.35	1.36	0.172	0.389	0.575
	(.68)	(.66)	(.65)			
% Currently Married	1.00	1.00	1.00	-	-	-
% Monogamous Marriage	54.4%	56.9%	53.2	0.220	0.477	0.061
% Polygamous Marriage	45.6%	43.1%	46.8%	0.220	0.477	0.061
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 31 Village-level randomisation

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T2	Cont=T3	T2=T3
Number of villages+	68	70	70			
Number of Observations	195.0	208.9	208.7	0.163	0.176	0.98
	(52.1)	(64.9)	(65.1)			
Number of Households	122.5	129.9	128.8	0.189	0.253	0.859
	(29.1)	(36.1)	(35.1)			
Number of Women	177.3	190.7	191.3	0.145	0.156	0.972
	(49.7)	(60.5)	(64.7)			
Number of Women Per Household	1.45	1.47	1.48	0.638	0.49	0.8
	(.24)	(.23)	(.23)			
Number of Pregnant Women	26.1	28.3	27.8	0.175	0.276	0.739
	(8.8)	(12.4)	(11.1)			
Number of Pregnant Women Per Household	0.22	0.22	0.22	0.887	0.947	0.823
	(.07)	(.07)	(.07)			
Number of Households Without Women	17.67	18.16	17.36	0.848	0.82	0.7
	(9.6)	(12.71)	(9.58)			
PPI Mean within villages	27.47	27.37	26.00	0.875	0.558	0.713
	(5.31)	(6.11)	(4.60)			
PPI Standard Deviation within villages	11.20	11.38	11.33	0.547	0.659	0.847
	(1.77)	(1.76)	(1.69)			
PPI Coefficient of Variation within villages	0.42	0.43	0.43	0.497	0.486	0.995
	(.08)	(.07)	(.08)			
Age of Listed Women	28.6	28.3	28.1	0.262	0.12	0.645
	(1.9)	(1.8)	(1.9)			
Age of Youngest Child of Listed Women (in months)	16.2 (2.2)	16.0 (1.8)	15.9 (1.7)	0.593	0.394	0.76
Average Number of Living Biological Children per Listed Woman	3.28	3.25	3.16	0.674	0.131	0.325
	(.45)	(.51)	(.49)			
Distance to Health Facility (km)	10.74	12.41	7.68	0.576	0.199	0.06**
	(16.75)	(17.99)	(10.37)			

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
+ The evaluation is taking place in a total of 210 villages. There are two pairs of villages that are contiguous to each other and to avoid creating tension between the communities they were assigned the same treatment status. Hence for these tables we have 210-2=208 units of randomisation.

P.1 Community and Household Characteristics

Table 32 Community Balance

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Number of Communities	68	71	73			
% communities covered by any mobile network	0.971	0.944	0.915	0.434	0.147	0.520
• % MTN	0.853	0.859	0.803	0.943	0.399	0.380
• % GLO	0.603	0.634	0.465	0.763	.094*	.043**
• % Air-Tel	0.765	0.718	0.690	0.525	0.324	0.710
• % Eti Salat	0.485	0.486	0.408	0.991	0.367	0.358
% communities where there is:						
• a place where a mobile phone can be purchased	0.176	0.183	0.169	0.880	0.916	0.817
• a place where mobile credit can be purchased	0.706	0.746	0.775	0.549	0.362	0.706
% communities where there is:						
• a formal financial institution (bank, credit union)	0	0	0.014	.	0.319	0.319
• a microfinance institution	0.000	0.014	0.000	0.320	.	0.319
• a moneylender	0.162	0.169	0.155	0.857	0.939	0.794
• a primary school	0.721	0.732	0.789	0.837	0.355	0.441
• a market	0.088	0.157	0.085	0.244	0.939	0.211
% communities benefiting from a government or non-governmental programme that supports the public with funds by providing money in cash or through mobile banking	0.088	0.099	0.099	0.828	0.840	0.999
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 33 Health Facility

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% communities where there is:						
• a general hospital	0.044	0.056	0.028	0.696	0.628	0.385
• a health facility	0.456	0.465	0.479	0.897	0.787	0.869
Distance to nearest health facility:						
• zero or one km	0.265	0.254	0.301	0.918	0.551	0.478
• 2–5 km	0.294	0.352	0.329	0.478	0.588	0.879
• 6–10 km	0.250	0.127	0.151	.063*	0.171	0.645
• 11–20 km	0.029	0.085	0.055	0.172	0.437	0.511
• 21 km or more	0.162	0.183	0.164	0.746	0.724	0.504
% nearest health facilities that offer services for:						

• antenatal care	0.836	0.803	0.775	0.565	0.342	0.707
• postnatal care	0.836	0.831	0.803	0.912	0.610	0.685
• delivery of babies	0.676	0.718	0.676	0.606	0.998	0.597
• immunisation for infants and young children	0.941	0.972	0.958	0.394	0.661	0.664
• nutritional supplements and counselling	0.846	0.929	0.829	0.134	0.787	.072*
% nearest health facilities where there is:						
• a doctor	0.313	0.435	0.296	0.179	0.773	0.104
• a nurse	0.585	0.529	0.486	0.497	0.251	0.625
• a midwife	0.687	0.690	0.634	0.990	0.478	0.497
• a Community Health Extension Worker (CHEW)	0.908	1.000	0.913	.012**	0.904	.012**
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 34 Community-Level Shocks

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% communities affected by any shock in the past 12 months	0.853	0.887	0.873	0.593	0.745	0.825
% communities affected by any **NATURAL SHOCK** in the past 12 months	0.824	0.845	0.845	0.801	0.751	0.958
FLOODS – % of communities:						
Affected by flood in past 12 months	0.471	0.479	0.535	0.976	0.421	0.407
Where more than half of households were affected in past 12 months	0.344	0.324	0.368	0.922	0.808	0.720
Affected for more than a month in past 12 months	0.250	0.382	0.316	0.277	0.552	0.564
Where shock made it difficult to access places in community where you can buy food	0.719	0.676	0.658	0.722	0.589	0.819
Where shock made it difficult to access nearest health facility	0.625	0.618	0.553	0.892	0.541	0.603
Where shock made it difficult to travel outside community, to nearest large town/city	0.656	0.647	0.553	0.865	0.378	0.408
DROUGHT/POOR RAINS – % of community:						
Affected by drought/poor rains in past 12 months	0.676	0.521	0.648	.064*	0.725	0.125
Where more than half of households were affected in past 12 months	0.652	0.657	0.783	0.989	0.212	0.203
Affected for more than a month in past 12 months	0.609	0.703	0.652	0.541	0.844	0.712
Where shock made it difficult to access places in community where you can buy food	0.370	0.459	0.457	0.468	0.463	0.959
Where shock made it difficult to access nearest health facility	0.261	0.378	0.261	0.338	0.920	0.287
Where shock made it difficult to travel outside community, to nearest large town/city	0.261	0.378	0.217	0.320	0.521	0.134
CROP DAMAGE BY PESTS – % of communities:						
Affected by crop damage by pests in past 12 months	0.721	0.606	0.634	0.119	0.249	0.716
Where more than half of households were affected in past 12 months	0.625	0.476	0.778	0.142	0.139	.003***
Affected for more than a month in past 12 months	0.417	0.512	0.533	0.383	0.260	0.847

CROP DAMAGE BY DISEASE – % of communities:						
Affected by crop damage by disease in past 12 months	0.588	0.577	0.606	0.829	0.849	0.694
Where more than half of households were affected in past 12 months	0.650	0.600	0.651	0.698	0.994	0.710
Affected for more than a month in past 12 months	0.425	0.463	0.548	0.696	0.261	0.541
% communities affected by any **MAN-MADE SHOCK** in the past 12 months	0.353	0.380	0.437	0.614	0.232	0.509
CURFEWS – % of communities:						
Affected by curfews in past 12 months	0.044	0.028	0.085	0.648	0.310	0.147
Where more than half of households were affected in past 12 months	0.667	1.000	0.833	0.397	0.650	0.374
Affected for more than a month in past 12 months	0.333	0.500	0.667	0.787	0.404	0.730
Where shock made it difficult to access places in community where you can buy food	0.333	0.500	0.667	0.787	0.404	0.730
Where shock made it difficult to access nearest health facility	0.333	0.500	0.667	0.787	0.404	0.730
Where shock made it difficult to travel outside community, to nearest large town/city	0.333	0.500	0.500	0.787	0.677	1.000
VIOLENCE IN THE COMMUNITY (e.g. rioting or protests) – % of communities:						
Affected by violence in past 12 months	0.206	0.183	0.211	0.809	0.900	0.703
Where more than half of households were affected in past 12 months	0.692	0.923	0.714	0.132	0.894	0.271
Affected for more than a month in past 12 months	1.000	0.769	0.643	.075*	.016**	0.594
Where the shock made it difficult to access places in the community where you can buy food	0.538	0.692	0.600	0.597	0.784	0.447
Where the shock made it difficult to access the nearest health facility	0.462	0.692	0.600	0.357	0.521	0.447
Where the shock made it difficult for people to travel outside the community, to the nearest large town or city	0.538	0.692	0.600	0.597	0.784	0.447
WIDESPREAD MIGRATION INTO COMMUNITY – % of communities:						
Affected by widespread migration into community in past 12 months	0.250	0.296	0.254	0.477	0.934	0.547
Where more than half of households were affected in past 12 months	0.188	0.000	0.278	.074*	0.576	.015**
Affected for more than a month in past 12 months	0.750	0.650	0.667	0.354	0.587	0.907
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 35 Population age characteristics

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Mean age	17.677 (16.512)	17.365 (16.031)	17.195 (15.966)	0.186	0.039**	0.46
Proportion of total population that are:						
• Children aged 0–5	0.289	0.292	0.296	0.689	0.203	0.417
• Children aged 6–12	0.226	0.218	0.223	0.144	0.611	0.437

• Children aged 13–17	0.083	0.090	0.087	.059*	0.354	0.373
• Adults of working age (18–64)	0.383	0.387	0.382	0.534	0.797	0.406
• Elderly (aged 65 and above)	0.018	0.013	0.013	.03**	.015**	0.744
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 36 Household composition

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Household size	7.514 (4.219)	7.358 (4.196)	7.306 (4.227)	0.513	0.33	0.756
Number of males	3.573 (2.315)	3.485 (2.299)	3.444 (2.296)	0.447	0.23	0.66
Number of females	3.941 (2.509)	3.873 (2.457)	3.863 (2.526)	0.627	0.523	0.88
Gender ratio[+]	1.366 (.973)	1.382 (1.006)	1.398 (1.097)	0.65	0.397	0.665
Number of children (0–12)	3.872 (2.772)	3.752 (2.696)	3.792 (2.84)	0.389	0.561	0.786
Number of minors (0–17)	4.499 (3.178)	4.416 (3.173)	4.426 (3.25)	0.635	0.656	0.984
Number of adults (18+)	3.015 (1.519)	2.942 (1.456)	2.88 (1.409)	0.377	0.055*	0.327
Number of elderly (65+)	.135 (.407)	.097 (.316)	.092 (.355)	0.025**	0.011**	0.711
Dependency ratio[++]	130.639 (83.067)	128.07 (86.626)	126.148 (81.308)	0.389	0.219	0.579
Number of children three or under	1.464 (1.081)	1.413 (1.086)	1.425 (1.083)	0.296	0.423	0.797
Number of women of reproductive age (12–49)	1.936 (1.131)	1.938 (1.152)	1.913 (1.146)	0.911	0.671	0.583
% households:						
• With children 0–5 years old	0.889	0.877	0.881	0.315	0.512	0.736
• With children 0–12 years old	0.911	0.908	0.903	0.705	0.440	0.678
• With at least one pregnant woman	0.683	0.693	0.687	0.601	0.819	0.751
• Where woman's husband is present	0.996	0.995	0.998	0.571	0.175	.095*
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. [+] Defined as number of females to number of males in the household. [++] Defined as number of children 0–14 and elderly 65+ over adults 15–64, multiplied by 100.						

Table 37 Household Heads

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Age of household head	39.778 (11.848)	39.762 (12.416)	39.299 (11.433)	0.959	0.36	0.384
% female household heads	0.001	0.001	0.001	0.973	0.963	0.996
% elderly (65+) household heads	0.036	0.041	0.029	0.628	0.343	0.162

% household heads who are under 18	0.000	0.001	0.001	0.316	0.316	0.996
% household heads who have ever attended school	0.528	0.494	0.502	0.391	0.441	0.842
% household heads who have completed primary education	0.422	0.425	0.404	0.963	0.608	0.607
% male household heads in a monogamous marriage	0.530	0.545	0.520	0.609	0.541	0.280
% male household heads in a polygamous marriage	0.451	0.435	0.457	0.542	0.694	0.332
% unmarried male household heads (widowed, separated, divorced, never married)	0.018	0.021	0.022	0.613	0.386	0.756
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 38 Women's Demographics

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Age	25.233 (7.164)	24.861 (6.522)	24.732 (6.863)	0.176	0.069*	0.63
% of women:						
• who are under 18	0.100	0.105	0.123	0.648	.055*	0.187
• currently attending school	0.027	0.036	0.032	0.323	0.541	0.642
• who have ever attended school	0.190	0.199	0.208	0.765	0.509	0.775
• who have completed primary education	0.080	0.097	0.089	0.503	0.636	0.781
• who can read or write in at least one language	0.199	0.198	0.239	0.951	0.175	0.236
• in a monogamous marriage	0.536	0.561	0.528	0.317	0.622	0.139
• in a polygamous marriage	0.463	0.438	0.472	0.308	0.602	0.126
• unmarried (widowed, separated, divorced, never married)	0.001	0.001	0.000	0.694	0.315	0.316
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 39 Religion, Language, and Ethnicity

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% households practising:						
• Islam	0.999	0.999	1.000	0.940	0.315	0.304
• Christianity	0.001	0.001	0.000	0.940	0.315	0.304
Main language spoken in household						
• Hausa	0.910	0.899	0.906	0.825	0.920	0.890
• Fulani	0.056	0.060	0.051	0.932	0.820	0.745
• Other+	0.034	0.041	0.044	0.802	0.674	0.870
Ethnicity of household members						
• Hausa	0.877	0.873	0.891	0.975	0.634	0.646
• Fulani	0.074	0.079	0.058	0.923	0.575	0.498

• Other++	0.049	0.047	0.050	0.861	0.998	0.860
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. + Other languages include: Fulfulde, Kanuri, Bade, Arabic, Nupe, Tiv, Igbo, Yoruba, other. ++ Other ethnicities include: Badawa, Bussawa, Dukawa, Gwari, Ibo, Kanuri, Mangawa, Nupe, Tiv, Yoruba, Zarbama, other.						

Table 40 Drinking Water and Sanitation

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% households where the main source of drinking water is						
• a tubewell/borehole	0.354	0.340	0.344	0.691	0.806	0.889
• an unprotected dug well	0.280	0.290	0.225	0.639	0.225	.083*
• a public tap/stand/pipe	0.125	0.156	0.176	0.449	0.127	0.421
• surface water (pond, river, dam etc.)	0.087	0.054	0.091	0.280	0.880	0.173
• protected dug well	0.067	0.064	0.061	0.968	0.785	0.790
• other+	0.087	0.096	0.104	0.783	0.499	0.706
% households using improved drinking water source*	0.602	0.640	0.655	0.585	0.268	0.541
Households with improved water source:						
• % not treating drinking water	0.937	0.905	0.940	0.156	0.864	0.137
• % treating drinking water++	0.063	0.095	0.060	0.156	0.864	0.137
• % using adequate treating method++	0.024	0.022	0.023	0.859	0.959	0.913
Households with unimproved water source:						
• % not treating drinking water	0.946	0.923	0.911	0.231	0.166	0.617
• % treating drinking water++	0.054	0.077	0.089	0.231	0.166	0.617
• % using adequate treating method++	0.016	0.020	0.027	0.658	0.354	0.618
% households that (confirmed by interviewer): +++						
• have a place for hand washing	0.464	0.513	0.504	0.195	0.264	0.828
• have soap, detergent or other cleansing agent (e.g. ash) at the place for hand washing	0.133	0.182	0.120	.041**	0.433	.004***
• store drinking water in a covered container	0.911	0.925	0.917	0.372	0.658	0.603
Type of toilet						
• Pit latrine without slab / uncovered pit	0.719	0.716	0.700	0.920	0.626	0.560
• No facilities	0.172	0.156	0.210	0.553	0.341	0.108
• Pit latrine with slab	0.078	0.087	0.069	0.641	0.592	0.343
• Other++++	0.031	0.040	0.021	0.450	0.179	.063*
% households w. access to improved sanitation facilities++++	0.108	0.128	0.089	0.468	0.337	0.127
% households not sharing toilets with other households	0.625	0.685	0.580	0.147	0.274	.007***
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

[+] Other drinking water sources considered in the questionnaire are: piped water into a dwelling, piped water to a yard/plot, a protected spring, an unprotected spring, rainwater collection, a tanker truck, a bottled/sachet, a cart with a small tank/drum, other. 'Improved' drinking water sources are: piped water into a dwelling, piped water into a yard/plot, a public tap/stand/pipe, tubewell/borehole, a protected dug well, a protected spring, bottled/sachet water, collected rainwater (WHO and UNICEF, 2006). Two households reported using solar-powered tanks.
[++] Treatment methods for drinking water surveyed in the questionnaire are: 'adequate' methods (boiling, adding bleach or chlorine, straining water through a filter, solar disinfection), and 'not adequate' (straining it through a cloth, letting it stand still). Two households reported also using alum as a treatment agent. For details, see WHO and UNICEF (2006).
[+++] Here N might differ from 5,431 when the interviewer was denied access to the place for hand washing or to the drinking water containers.
[++++] Other toilet facilities considered in the questionnaire are: flush/pour flush, a ventilated improved pit latrine, a composting toilet, a bucket, a hanging toilet/latrine, other. 'Improved' toilet facilities are: a flush toilet, a ventilated improved pit latrine, a pit latrine with a slab, a composting toilet (WHO and UNICEF, 2006).

Table 41 Dwelling

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
PPI	28.464 (12.604)	28.784 (13.662)	28.204 (12.574)	0.827	0.754	0.624
Main flooring material						
• Earth/mud or dirt/straw	0.788	0.770	0.765	0.515	0.430	0.994
• Cement/concrete	0.210	0.227	0.233	0.529	0.447	0.993
• Other[+]	0.002	0.003	0.003	0.669	0.505	0.989
Main roofing materials						
• Corrugated iron sheets	0.489	0.508	0.470	0.619	0.712	0.380
• Mud/mud bricks	0.303	0.267	0.351	0.432	0.324	.073*
• Wood/bamboo	0.121	0.103	0.098	0.588	0.458	0.861
• Thatch (grass or straw)	0.083	0.116	0.078	0.408	0.838	0.291
• Other[++]	0.003	0.005	0.003	0.328	0.941	0.308
% households with indoor cooking place (conf. by interviewer)	0.118	0.143	0.127	0.276	0.673	0.495
Main fuel used for cooking						
• Fire wood	0.947	0.949	0.965	0.900	0.236	0.259
• Other[+++]	0.053	0.051	0.035	0.900	0.236	0.259

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
[+] Other floor types considered in the questionnaire are: wood; tiles; plants.
[+++] Other roofing types considered in the questionnaire are: cement/concrete; tiles.
[+++] Other fuels include: electricity; gas; kerosene, coal / lignite / charcoal; straw / shrubs / grass; animal dung.

P.2 Work, Income, and Livelihoods

Table 42 Women's Work Activities

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2

% of women involved in any work activity (besides housework or child care) in the past 12 months	.724	.695	.71	0.465	0.722	0.688
Of which % involved in:[+]						
• Agriculture	0.622	0.580	0.526	0.514	0.110	0.340
• Professional labour	0.000	0.003	0.003	0.212	.042**	0.995
• Skilled labour	0.241	0.258	0.320	0.642	.018**	.06*
• Unskilled labour	0.488	0.478	0.473	0.777	0.632	0.885
% of working women reporting multiple job categories[++]	0.369	0.361	0.349	0.928	0.707	0.789
% of working women who are self-employed (working only for themselves or for someone else in the household)	0.797	0.840	0.838	.042**	.045**	0.920
% of working women who do not receive any payment for work	0.332	0.280	0.295	.071*	0.203	0.532
Weekly payment from woman's work activities (for women who are earning) (NGN)	1422 (4884)	1208 (2167)	1226 (2604)	0.305	0.387	0.901
% of working women who were helped by husband in work activities in the past three months	0.691	0.725	0.695	0.196	0.757	0.321

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level.
Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
[+] Categories can have a sum greater than 100% since multiple activities were recorded for the same person.
The categories above comprise the following activities:
Agriculture: Farming/ land cultivation/ selling food from your farm; fishing/selling fish you have caught; animal rearing/ tending animals; landlord/ renting shops or houses; other agricultural work.
Professional labour: religious leader; local doctor/ traditional doctor / traditional birth attendant/ healer; doctor / health worker / CHEW / dentist / nurse; politician/ government officer; teacher; non-governmental organisation (NGO) worker; advocate / lawyer; other professional.
Skilled labour: plumber; electrician; painter; engineer; roofer; mechanic; repairs / garage work; furniture maker; artisan; carpenter; tailor; tanner / leather maker; weaver; nail maker; shoemaker / cobbler; goldsmith; wheel maker; stone mason; bladesmith; locksmith; potter; blacksmith; other skilled labour.
Unskilled labour: porter; car washing; barber; hairdresser; beautician; businessman; petty trader; street vendor; making and selling snacks; making and selling soap; factory worker; brick layer / construction work/builder; transport operator / driver; maid/servant/cleaner; restaurant or hotel work; DJ/ entertainer/ musician; other unskilled labour.
[++] Women that have at least two activities that fall into two of the above categories (agriculture, professional, skilled, unskilled).

Table 43 Husbands' Work Activities

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Proportion of husbands involved in any work activity (besides housework or child care) in past 12 months	.945	.945	.925	0.931	0.226	0.191
Of which % involved in:[+]						
• Agriculture	.894	.894	.884	0.956	0.701	0.649
• Professional labour	.124	.139	.114	0.581	0.508	0.325
• Skilled labour	.14	.145	.145	0.667	0.76	0.933
• Unskilled labour	.321	.316	.328	0.893	0.744	0.674
% of working men reporting multiple job categories[++]	.467	.476	.463	0.714	0.932	0.632
% of working men who are self-employed (working only for themselves or someone else in the household)	.899	.872	.88	0.188	0.189	0.736
% of working men who do not receive any payment for work	.573	.533	.565	0.202	0.767	0.285
Weekly payment from man's work activities (for men who are earning) (NGN)	9765 (23663)	11528 (99414)	8280 (18080)	0.624	0.23	0.357
Proportion of husbands who helped their wife[+++] in work activities in the past three months	.74	.745	.723	0.869	0.662	0.566

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level.
Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
[+] Categories can have a sum greater than 100% since multiple activities were recorded for the same person.
The categories above comprise the following activities:
Agriculture: farming/ land cultivation/ selling food from your farm; fishing/selling fish you have caught; animal rearing/ tending animals; landlord/ renting shops or houses; other agricultural work.
Professional labour: religious leader; local doctor/ traditional doctor / traditional birth attendant/ healer; doctor / health worker / CHEW / dentist / nurse; politician/ government officer; teacher; NGO worker; advocate / lawyer; other professional.
Skilled labour: plumber; electrician; painter; engineer; roofer; mechanic; repairs / garage work; furniture maker; artisan; carpenter; tailor; tanner / leather maker; weaver; nail maker; shoemaker / cobbler; goldsmith; wheel maker; stone mason; bladesmith; locksmith; potter; blacksmith; other skilled labour.
Unskilled labour: porter; car washing; barber; hairdresser; beautician; businessman; petty trader; street vendor; making and selling snacks; making and selling soap; factory worker; brick layer / construction work/builder; transport operator / driver; maid/servant/cleaner; restaurant or hotel work; DJ/ entertainer/ musician; other unskilled labour.
[++] Men that have at least two activities that fall into two of the above categories (agriculture, professional, skilled, unskilled).
[+++] In the case where the man has multiple wives, this question refers to the wife that our survey team interviewed

Table 44 Temporary Migration

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% households where:						
• No household member left the village for more than 30 days for work in the past year	.839	.848	.838	0.652	0.948	0.591
• One member left for more than 30 days for work in the past year	.049	.039	.048	0.3	0.91	0.29
• Two members left for more than 30 days for work in the past year	.105	.105	.106	0.986	0.938	0.954
• Three members left for more than 30 days for work in the past year	.006	.006	.007	0.86	0.719	0.861
• Four members left for more than 30 days for work in the past year	.001	.002	.001	0.316	0.584	0.664
• Five members left for more than 30 days for work in the past year	.001	0.00	.001	0.315	0.963	0.305
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 45 Women's Land Cultivation

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% women who cultivated any land in past 12 months	0.044	0.035	0.057	0.46	0.436	0.17
• % of which cultivated 0–4 plots	1.000	0.969	0.971	.074*	.061*	0.893
• % of which cultivated 5–9 plots	0.000	0.031	0.019	.074*	0.121	0.548
• % of which cultivated 10–14 plots	0.000	0.000	0.010		0.331	0.332
Proportion of women cultivating:						
• Sorghum	0.468	0.328	0.400	0.314	0.992	0.331
• Sesame	0.364	0.297	0.381	0.288	0.624	0.461
• Millet	0.299	0.359	0.343	0.751	0.97	0.764
• Roselle	0.195	0.234	0.190	0.936	0.708	0.582
% women who own one or more plots themselves	0.740	0.600	0.629	.064*	0.232	0.768
% women cultivating multiple crops	0.688	0.569	0.619	.07*	0.231	0.517

Total income from crop sales in past 12 months (if positive) (NGN)	17442 (20365)	19693 (29676)	19712 (37605)	0.241	0.422	0.974
Proportion of women who used fertiliser on their crops in past 12 months	0.377	0.323	0.314	0.92	0.861	0.988
Proportion of women who used pesticides/insecticides/herbicides in past 12 months	0.247	0.231	0.190	0.68	0.845	0.641
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 46 Husbands' Land Cultivation

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% husbands who cultivated any land in past 12 months	0.958	0.954	0.954	0.787	0.72	0.992
• % of which cultivated 0–4 plots	0.761	0.760	0.774	0.999	0.541	0.538
• % of which cultivated 5–9 plots	0.207	0.198	0.192	0.578	0.395	0.764
• % of which cultivated 10–14 plots	0.021	0.030	0.025	0.193	0.477	0.473
• % of which cultivated more than 14 plots	0.011	0.013	0.009	0.603	0.656	0.361
Proportion of husbands cultivating:						
• Sorghum	0.586	0.610	0.618	0.353	0.325	0.98
• Millet	0.533	0.503	0.498	0.41	0.394	0.978
• Maize	0.176	0.174	0.145	0.978	0.323	0.317
• Soya Beans	0.111	0.125	0.142	0.513	0.273	0.713
% husbands who own one or more plots themselves	0.813	0.811	0.821	0.945	0.707	0.653
% husbands cultivating multiple crops	0.848	0.858	0.841	0.715	0.778	0.514
Total income from crop sales in past 12 months (if positive) (NGN)	413312 (1771904)	244242 (1361211)	203315 (1058111)	0.104	.03**	0.609
Proportion of husbands who used fertiliser on their crops in past 12 months	0.743	0.740	0.705	0.948	0.174	0.177
Proportion of husbands who used pesticides/insecticides/herbicides in past 12 months	0.549	0.532	0.511	0.76	0.265	0.445
Proportion of husbands that owned any uncultivated land in past 12 months	0.135	0.130	0.120	0.839	0.321	0.479
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 47 Time spent looking after animals

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Men: time spent looking after animals on a typical day:						
Less than 1 hour	.395	.45	.42	0.054*	0.375	0.275
1–2 hours	.372	.347	.339	0.247	0.149	0.697
3–4 hours	.126	.126	.147	0.995	0.249	0.267
More than 4 hours	.107	.078	.094	0.069*	0.498	0.282

Women: time spent looking after animals on a typical day:						
Less than 1 hour	.484	.517	.53	0.368	0.164	0.625
1–2 hours	.397	.362	.358	0.348	0.245	0.82
3–4 hours	.06	.072	.082	0.415	0.123	0.455
More than 4 hours	.059	.049	.029	0.398	0.016**	0.082*
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 48 Women's Livestock

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% Women Look After Any Animal	0.701	0.652	0.668	0.109	0.252	0.601
Cows						
% women looking after any	0.033	0.028	0.032	0.595	0.905	0.687
Number looked after	3.500 (4.182)	3.719 (5.219)	2.974 (2.170)	0.852	0.570	0.540
% women owning any themselves	0.829	0.875	0.795	0.627	0.821	0.498
Number owned themselves	3.147 (2.560)	3.929 (5.544)	2.903 (2.343)	0.525	0.702	0.396
Bulls						
% women looking after any	0.024	0.028	0.041	0.681	0.134	0.230
Number looked after	2.276 (2.852)	1.970 (1.551)	2.300 (1.233)	0.587	0.969	0.318
% women owning any themselves	0.833	0.758	0.780	0.472	0.673	0.901
Number owned themselves	1.800 (1.291)	1.960 (1.719)	2.026 (1.287)	0.592	0.360	0.865
Calves						
% women looking after any	0.015	0.010	0.019	0.382	0.602	0.162
Number looked after	5.143 (7.543)	2.333 (1.506)	3.714 (2.525)	0.318	0.516	0.113
% women owning any themselves	0.947	0.833	0.826	0.431	0.221	0.885
Number owned themselves	2.833 (2.358)	2.600 (3.534)	2.684 (2.518)	0.959	0.925	0.944
Sheep						
% women looking after any	0.409	0.388	0.383	0.502	0.358	0.877
Number looked after	2.726 (2.175)	2.755 (1.981)	2.560 (2.223)	0.797	0.455	0.380
% women owning any themselves	0.901	0.929	0.926	0.171	0.185	0.842
Number owned themselves	2.481 (1.849)	2.573 (1.827)	2.241 (1.766)	0.465	0.115	.044**
Goats						
% women looking after any	0.720	0.726	0.714	0.748	0.902	0.620
Number looked after	2.804 (2.222)	2.896 (2.421)	2.683 (2.465)	0.390	0.479	0.169
% women owning any themselves	0.931	0.948	0.910	0.195	0.161	.007***
Number owned themselves	2.643 (1.955)	2.699 (2.166)	2.557 (2.195)	0.497	0.547	0.244
% women looking after any chicken	0.522	0.511	0.490	0.645	0.257	0.580

% women looking after any Guinea fowl	0.057	0.047	0.034	0.401	.034**	0.222
% women looking after any horse, mule, or donkey	0.002	0.002	0.001	0.990	0.545	0.558
% women selling milk	0.007	0.007	0.010	0.904	0.706	0.664
% women selling eggs	0.009	0.005	0.007	0.328	0.705	0.518
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 49 Income Volatility

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Women						
% women reporting that there were some month(s) where they earned more than usual in the past 12 months	0.386	0.393	0.335	0.824	.079*	.044**
Earnings in high-earning months (NGN)+	4577 (8054)	4523 (7580)	5072 (11537)	0.976	0.546	0.523
% reporting high earnings in January	0.077	0.096	0.119	0.361	.063*	0.341
% reporting high earnings in February	0.093	0.108	0.112	0.553	0.436	0.850
% reporting high earnings in March	0.085	0.118	0.099	0.173	0.549	0.435
% reporting high earnings in April	0.073	0.102	0.089	0.149	0.387	0.541
% reporting high earnings in May	0.085	0.127	0.124	.059*	.072*	0.876
% reporting high earnings in June	0.232	0.245	0.282	0.704	0.165	0.287
% reporting high earnings in July	0.368	0.331	0.415	0.246	0.220	.013**
% reporting high earnings in August	0.205	0.191	0.220	0.581	0.652	0.307
% reporting high earnings in September	0.195	0.171	0.172	0.460	0.475	0.977
% reporting high earnings in October	0.250	0.245	0.225	0.972	0.564	0.536
% reporting high earnings in November	0.232	0.199	0.163	0.299	.033**	0.267
% reporting high earnings in December	0.136	0.116	0.115	0.488	0.506	0.979
% women reporting that there were some month(s) where they earned less than usual in the past 12 months	0.376	0.375	0.331	0.927	.083*	0.109
Earnings in low-earning months+	1358 (2071)	1376 (2493)	1301 (2952)	0.923	0.808	0.772
% reporting low earnings in January	0.175	0.140	0.148	0.211	0.309	0.745
% reporting low earnings in February	0.185	0.188	0.190	0.931	0.879	0.951
% reporting low earnings in March	0.181	0.173	0.183	0.796	0.935	0.751
% reporting low earnings in April	0.194	0.161	0.135	0.269	.044**	0.304
% reporting low earnings in May	0.188	0.150	0.148	0.185	0.164	0.975
% reporting low earnings in June	0.215	0.177	0.204	0.213	0.760	0.348
% reporting low earnings in July	0.231	0.240	0.241	0.776	0.760	0.971
% reporting low earnings in August	0.396	0.426	0.445	0.384	0.177	0.573
% reporting low earnings in September	0.200	0.198	0.244	0.944	0.192	0.162
% reporting low earnings in October	0.060	0.079	0.107	0.292	.012**	0.187
% reporting low earnings in November	0.067	0.073	0.081	0.740	0.405	0.667
% reporting low earnings in December	0.052	0.042	0.067	0.432	0.371	0.106

Men						
% men reporting that there were some month(s) where they earned more than usual in the past 12 months	0.393	0.364	0.359	0.355	0.271	0.831
% reporting high earnings in January	0.130	0.130	0.166	0.999	0.197	0.179
% reporting high earnings in February	0.119	0.139	0.156	0.388	0.141	0.504
% reporting high earnings in March	0.085	0.123	0.130	.058*	.041**	0.806
% reporting high earnings in April	0.084	0.085	0.110	0.947	0.139	0.175
% reporting high earnings in May	0.073	0.090	0.089	0.258	0.345	0.941
% reporting high earnings in June	0.134	0.141	0.143	0.775	0.638	0.821
% reporting high earnings in July	0.182	0.209	0.194	0.347	0.616	0.675
% reporting high earnings in August	0.144	0.133	0.135	0.621	0.818	0.767
% reporting high earnings in September	0.177	0.150	0.171	0.281	0.787	0.380
% reporting high earnings in October	0.351	0.318	0.369	0.339	0.695	0.200
% reporting high earnings in November	0.409	0.348	0.432	.06*	0.568	.027**
% reporting high earnings in December	0.336	0.305	0.355	0.374	0.645	0.225
Earnings in high-earning months+	39680 (77097)	38345 (55856)	40531 (66633)	0.789	0.953	0.757
% men reporting that there were some month(s) where they earned less than usual in the past 12 months	0.361	0.340	0.339	0.472	0.437	0.924
Earnings in low-earning months+	10193 (23386)	8570 (17376)	7836 (13883)	0.236	.058*	0.569
% reporting low earnings in January	0.138	0.120	0.143	0.432	0.804	0.287
% reporting low earnings in February	0.178	0.150	0.172	0.250	0.869	0.322
% reporting low earnings in March	0.209	0.194	0.186	0.616	0.354	0.704
% reporting low earnings in April	0.176	0.179	0.198	0.852	0.489	0.644
% reporting low earnings in May	0.179	0.177	0.193	0.997	0.719	0.790
% reporting low earnings in June	0.228	0.226	0.243	0.992	0.703	0.710
% reporting low earnings in July	0.307	0.270	0.310	0.305	0.976	0.316
% reporting low earnings in August	0.440	0.419	0.480	0.554	0.278	0.100
% reporting low earnings in September	0.176	0.184	0.170	0.814	0.928	0.808
% reporting low earnings in October	0.056	0.054	0.056	0.818	0.992	0.786
% reporting low earnings in November	0.040	0.054	0.050	0.319	0.398	0.879
% reporting low earnings in December	0.038	0.039	0.040	0.973	0.830	0.831
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 50 Household's Non-Work Income

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Interest						
Proportion of households that received any income from interest in the past 30 days	0.078	0.065	0.051	0.321	.022**	0.258
Income received from interest in the past 30 says (estimated cash value for in-kind income)	15922 (24332)	10725 (13767)	13432 (24339)	.055*	0.562	0.374
Renting out animals						

Proportion of households that received any income from renting out animals or farm equipment in the past 30 days	0.030	0.017	0.029	.035**	0.928	.061*
Income received from renting out animals or farm equipment in the past 30 says (estimated cash value for in-kind income)	16760 (22904)	20203 (47181)	27448 (30617)	0.785	0.223	0.626
Assisting with the sale of property						
Proportion of households that received any commissions from assisting with the sale of property, land or other items in the past 30 days	0.017	0.015	0.019	0.649	0.675	0.414
Income received as commissions from assisting with the sale of property, land or other items in the past 30 says (estimated cash value for in-kind income)	2537 (4661)	10073 (20550)	3297 (5109)	0.235	0.571	0.240
Remittances						
Proportion of households that received any income from remittances sent by a relative or friend living outside the household in the past 30 days	0.082	0.071	0.068	0.326	0.229	0.819
Income received from remittances sent by a relative or friend living outside the household in the past 30 says (estimated cash value for in-kind income)	9155 (19398)	7730 (15823)	8826 (13468)	0.501	0.939	0.588
Gifts						
Proportion of households that received any income from gifts in the past 30 days	0.161	0.145	0.145	0.301	0.315	0.998
Income received from gifts in the past 30 says (estimated cash value for in-kind income)	4277 (8260)	3324 (5489)	4539 (7218)	0.133	0.694	.045**
Benefits						
Proportion of households that received any income from a government benefit, cash transfer or other item from an NGO in the past 30 days	0.049	0.045	0.051	0.786	0.825	0.652
Income received from a government benefit, cash transfer or other item from an NGO in the past 30 says (estimated cash value for in-kind income)	6492 (12974)	19511 (11473)	7397 (14430)	0.324	0.698	0.370
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

P.3 Household Saving and Borrowing

Table 51 Household Savings

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% households with any cash savings	0.425	0.400	0.369	0.379	.026**	0.223
% of these households saving at:[+]						
Home	0.775	0.757	0.784	0.593	0.810	0.433
Informal savings group	0.194	0.208	0.194	0.546	0.900	0.635
Bank	0.190	0.219	0.163	0.497	0.445	0.151
Other[++]	0.032	0.030	0.027	0.859	0.536	0.799
Value of household money savings (NGN)	45861 (15934)	35964 (94260)	36416 (95580)	0.373	0.416	0.940
% households with in-kind savings	0.432	0.383	0.423	0.108	0.769	0.186
Value of in-kind savings (NGN)	43763 (80085)	32762 (53703)	36767 (61369)	.021**	0.144	0.334
Total value of savings (NGN)	57047 (151400)	42422 (89159)	44248 (97616)	.068*	0.121	0.792

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
[+] Percentages do not have a sum of 100 because respondents were allowed to select multiple applicable strategies.
[++] Other savings institutions considered in the questionnaire were: savings associations or cooperatives, microfinance institutions or NGOs.

Table 52 Household Borrowing

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% households currently borrowing from any source	0.230	0.221	0.217	0.666	0.541	0.862
% of these households borrowing from:						
Family members or friends	0.773	0.761	0.746	0.768	0.528	0.740
Shop (on credit)	0.300	0.271	0.289	0.500	0.826	0.646
Moneylender	0.071	0.079	0.090	0.778	0.478	0.655
Bank	0.064	0.059	0.045	0.813	0.357	0.502
Other[+]	0.057	0.059	0.038	0.887	0.208	0.169
Value of most recent loans from all sources (NGN)	26515 (116300)	18605 (44858)	18035 (46606)	0.282	0.252	0.874
% households which tried to borrow in past 12 months but were unable to	0.074	0.076	0.060	0.842	0.300	0.204

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
[+] Other answers considered in the questionnaire were: savings associations/cooperatives, microfinance institutions/NGOs, other households in the village where another wife lives, landlord.

P.4 Household Assets and Expenditure

Table 53 Household Assets

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% Own Mattress/bed	0.936	0.938	0.930	0.962	0.592	0.540
% Own Hoe	0.890	0.889	0.889	0.985	0.977	0.988
% Own Chair	0.812	0.762	0.792	0.113	0.484	0.286
% Own Mobile phone	0.572	0.589	0.588	0.599	0.586	0.973
% Own Radio/player	0.530	0.551	0.545	0.254	0.445	0.703
% Own Motorbike	0.434	0.395	0.415	0.187	0.480	0.493
% Own Table	0.163	0.190	0.171	0.221	0.662	0.391
% Own Bicycle	0.175	0.158	0.165	0.495	0.619	0.807
% Own Iron	0.133	0.125	0.139	0.744	0.788	0.557
% Own Sewing Machine	0.082	0.081	0.075	0.921	0.535	0.634
% Own Stove	0.077	0.087	0.059	0.509	0.183	.098*
% Own Wheelbarrow	0.059	0.068	0.075	0.420	0.201	0.603
% Own Generator	0.052	0.078	0.049	0.101	0.768	.055*

% Own TV set	0.066	0.068	0.045	0.947	0.236	0.198
% Own Plough	0.064	0.052	0.058	0.366	0.674	0.613
% Own Fan	0.047	0.048	0.036	0.934	0.464	0.494
% Own Fishing net	0.041	0.037	0.041	0.677	0.982	0.675
% Own Cars/other vehicle	0.030	0.038	0.028	0.462	0.762	0.325
% Own Trailer/cart	0.018	0.017	0.010	0.919	0.199	0.304
% Own Fridge/freezer	0.011	0.018	0.010	0.435	0.848	0.371
% Own Canoe	0.012	0.009	0.009	0.507	0.505	0.926
% Own Tractor	0.007	0.008	0.005	0.997	0.400	0.496
% Own Computer	0.003	0.007	0.003	0.250	0.720	0.160
% Own Gas cooker	0.002	0.005	0.002	0.163	0.741	0.236
% Own Air conditioning	0.003	0.003	0.001	0.842	0.223	0.287
% Own Microwave	0.001	0.003	0.000	0.250	0.153	.021**
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 54 Household Expenditure

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Aggregates						
Household yearly food expenditure (NGN)[+]	118024 (446513)	108384 (218940)	96040 (171851)	0.588	0.180	0.286
Household yearly non-durable expenditure (NGN)[++]	155072 (271259)	155662 (225365)	136293 (205343)	0.936	0.250	0.219
Household yearly durable expenditure (NGN)[+++]	7405 (50433)	8319 (56282)	6874 (41305)	0.647	0.770	0.494
Per capita[++++]						
Per capita yearly food expenditure (NGN)[+]	18102 (47723)	17279 (30140)	16369 (27973)	0.731	0.436	0.616
Per capita yearly non-durable expenditure (NGN)[++]	23139 (35697)	26297 (49397)	22544 (37215)	0.297	0.806	0.198
Per capita yearly durable expenditure (NGN)[+++]	1061 (6956)	1632 (9971)	1244 (7664)	0.110	0.564	0.313
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. [+] Yearly food expenditure is projected by reference to expenditure on food items in the seven days prior to the survey. [++] Yearly non-durable expenditure is projected using: • seven-day recall regarding consumable items (e.g. petrol, fuel, phone credit, cigarettes); • 30-day recall regarding a different list of items (e.g. toiletries, clothing, utensils); • annual expenditure on larger items (e.g. dowry, marriage, funeral, school expenses, books). [+++] Yearly durable expenditure is the sum of the reported annual expenditure on assets (e.g. table, mattress, stove, motorbike, plough etc.). [++++] Per capita expenditure is total expenditure divided by household size.						

P.5 Food Security

Table 55 Household Hunger Scale

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
A – In the past 30 days, was there ever no food to eat of any kind in your household because of lack of resources to get food?						
% Never	0.838	0.868	0.848	.078*	0.521	0.244
% Rarely (1–2 times)	0.095	0.083	0.095	0.302	0.980	0.275
% Sometimes (3–9 times)	0.054	0.039	0.045	.074*	0.317	0.421
% Often (10 times or more)	0.014	0.010	0.011	0.434	0.550	0.875
B – In the past 30 days, did you or any household member go to sleep at night hungry because there was not enough food?						
% Never	0.912	0.923	0.916	0.402	0.762	0.523
% Rarely (1–2 times)	0.056	0.051	0.051	0.636	0.578	0.949
% Sometimes (3–9 times)	0.028	0.024	0.030	0.439	0.832	0.294
% Often (10 times or more)	0.003	0.002	0.003	0.254	0.931	0.401
C – In the past 30 days, did you or any household member go a whole day and night without eating anything at all because there was not enough food?						
% Never	0.951	0.953	0.950	0.799	0.948	0.705
% Rarely (1–2 times)	0.033	0.039	0.032	0.521	0.811	0.351
% Sometimes (3–9 times)	0.014	0.008	0.016	0.116	0.550	.042**
% Often (10 times or more)	0.002	0.000	0.002	.095*	0.937	.086*
A+B+C → HHS[a] – % households that report:						
Little to no household hunger (HHS = 0 or 1)	0.910	0.920	0.917	0.472	0.617	0.788
Moderate household hunger (HHS = 2 or 3)	0.086	0.077	0.076	0.501	0.464	0.959
Severe household hunger (HHS = 4, 5 or 6)	0.005	0.003	0.007	0.603	0.475	0.229
D – In the past 30 days, did you ever reduce the number of meals you ate per day because there was not enough food?						
% Never	0.812	0.851	0.832	.067*	0.331	0.265
% Rarely (1–2 times)	0.110	0.093	0.101	0.231	0.472	0.541
% Sometimes (3–9 times)	0.066	0.045	0.057	.060*	0.401	0.163
% Often (10 times or more)	0.011	0.010	0.010	0.767	0.782	0.956

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
[a] The HHS is calculated using questions A, B, and C above. A score of 0 for each of these questions is attributed if the respondent reports 'No' to the main question, a score of 1 is attributed if the respondent reports 'Rarely' or 'Sometimes' to the following question, and a score of 2 is attributed for 'Often'. The scores are then added together to obtain the HHS, which therefore ranges from 0 to 6.

Table 56 Household Food Security

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% households that sometimes did not have enough food to eat from mid-October 2013 to time of interview	0.160	0.133	0.160	0.214	0.980	0.167

• Between mid-October 2013 and mid-January 2014	0.040	0.039	0.048	0.813	0.422	0.309
• Between mid-January and the start of June 2014	0.060	0.041	0.059	.068*	0.883	.053*
• Between the start of June and mid-August 2014	0.064	0.052	0.054	0.309	0.376	0.832
• Between mid-August and day of interview	0.112	0.083	0.106	0.162	0.755	0.195
% of these households using the following strategy in the past year to cope with insufficient food availability						
• Helped by relatives or friends	0.408	0.299	0.333	.026**	0.116	0.468
• Members of household took on more work	0.248	0.320	0.330	0.129	.064*	0.756
• Did nothing	0.255	0.283	0.303	0.623	0.325	0.640
• Borrowed money	0.277	0.254	0.269	0.964	0.905	0.921
• Sold livestock	0.082	0.066	0.065	0.688	0.548	0.855
• Sold harvest early	0.060	0.053	0.068	0.842	0.701	0.605
• Members of household moved away to find work	0.018	0.033	0.051	0.252	.073*	0.378
• Sold property or farm equipment	0.035	0.029	0.034	0.865	0.953	0.893
• Sold other belongings or household items	0.032	0.029	0.027	0.939	0.762	0.733
• Purchased fewer non-food items	0.011	0.020	0.003	0.417	0.296	.095*
• Sent children to live with friends	0.014	0.008	0.010	0.563	0.710	0.902
• Other	0.082	0.053	0.051	0.158	0.112	0.944
% households that used more than one strategy	0.362	0.361	0.408	0.775	0.278	0.369
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. + Interviews were conducted from mid-August to the end of October 2014 ++ Percentages do not add up to a sum of 100 because respondents were allowed to select multiple applicable strategies +++ Other strategies in the questionnaire were: sold land, withdrew children from school, married daughter early, delayed payment obligations, relied on savings, received assistance from NGO, received assistance from government, took advance payment from employer, reduced number of meals, ate a limited range of foods.						

P.6 Household Decision Making

Table 57 Household Decision Making – Woman's Report

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Who usually makes decisions about making major household purchases? (non-food, such as mattress or furniture)						
• Husband or household head, without consulting woman	0.474	0.440	0.466	0.288	0.776	0.413
• Husband or household head, consulting woman first	0.198	0.206	0.177	0.718	0.434	0.264
• Woman and husband or household head, jointly	0.170	0.181	0.184	0.615	0.556	0.911
• Woman	0.114	0.122	0.136	0.687	0.265	0.509
• Someone else	0.041	0.049	0.037	0.586	0.582	0.275
• Don't know	0.002	0.002	0.001	0.990	0.457	0.392
Who usually makes decisions about what food to grow for household to eat?						

• Husband or household head, without consulting woman	0.688	0.647	0.674	0.216	0.641	0.391
• Husband or household head, consulting woman first	0.173	0.176	0.164	0.867	0.719	0.572
• Woman and husband or household head, jointly	0.114	0.153	0.130	.074*	0.435	0.352
• Woman	0.007	0.008	0.009	0.853	0.700	0.796
• Someone else	0.012	0.008	0.013	0.250	0.905	0.219
• The household does not grow food to eat	0.006	0.008	0.010	0.448	0.245	0.699
• Don't know	0.001	0.000	0.001	0.316	0.988	0.316
Who usually makes decisions about what food to buy?						
• Husband or household head, without consulting woman	0.560	0.545	0.571	0.607	0.761	0.394
• Husband or household head, consulting woman first	0.270	0.255	0.239	0.728	0.317	0.527
• Woman and husband or household head, jointly	0.148	0.179	0.166	0.129	0.413	0.608
• Woman	0.009	0.009	0.011	0.799	0.550	0.688
• Someone else	0.010	0.009	0.011	0.553	0.878	0.478
• The household does not buy food	0.003	0.003	0.002	0.939	0.522	0.407
'Suppose the woman were to make NGN 3,500 in 30 days selling snacks. Who do you think would decide how this money was used?'						
• Husband or household head, without consulting woman	0.078	0.092	0.074	0.551	0.767	0.385
• Husband or household head, consulting woman first	0.104	0.110	0.077	0.729	0.134	.058*
• Woman and husband or household head, jointly	0.309	0.290	0.327	0.520	0.497	0.197
• Woman	0.503	0.498	0.517	0.898	0.681	0.592
• Someone else	0.005	0.006	0.004	0.784	0.526	0.405
• Don't know	0.001	0.004	0.001	.051*	0.976	.047**
'Now suppose the woman were to be given a regular monthly gift of NGN 1,000, and that this money is to be given only to her and not to any other household member. Who do you think would decide how this money was used?'						
• Husband or household head, without consulting woman	0.075	0.095	0.077	0.374	0.944	0.420
• Husband or household head, consulting woman first	0.108	0.109	0.079	0.953	0.111	.076*
• Woman and husband or household head, jointly	0.329	0.315	0.349	0.624	0.467	0.235
• Woman	0.483	0.478	0.495	0.882	0.740	0.631
• Someone else	0.004	0.004	0.001	0.915	.046**	.065*
'Now suppose the woman were to be given a regular monthly gift of NGN 3,500, and that this money is to be given only to her and not to any other household member. Who do you think would decide how this money was used?'						
• Husband or household head, without consulting woman	0.076	0.094	0.075	0.404	0.935	0.372
• Husband or household head, consulting woman first	0.108	0.115	0.080	0.696	0.129	.051*
• Woman and husband or household head, jointly	0.338	0.321	0.356	0.549	0.529	0.231
• Woman	0.474	0.466	0.489	0.825	0.659	0.505
• Someone else	0.004	0.004	0.001	0.923	.046**	.062*

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.

Table 58 Household Decision Making – Husband's Report

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Who usually makes decisions about making major household purchases? (non-food, such as mattress or furniture)						
• Husband or household head, without consulting woman	0.522	0.493	0.531	0.400	0.781	0.266
• Husband or household head, consulting woman first	0.208	0.203	0.181	0.951	0.357	0.413
• Woman and husband or household head, jointly	0.142	0.151	0.141	0.730	0.949	0.678
• Woman	0.081	0.110	0.119	0.163	.044**	0.678
• Someone else	0.043	0.039	0.027	0.615	.095*	0.253
• Don't know	0.005	0.004	0.001	0.969	.043**	0.150
Who usually makes decisions about what food to grow for household to eat?						
• Husband or household head, without consulting woman	0.679	0.630	0.664	0.161	0.629	0.319
• Husband or household head, consulting woman first	0.185	0.199	0.186	0.549	0.927	0.567
• Woman and husband or household head, jointly	0.101	0.146	0.123	.029**	0.289	0.314
• Woman	0.012	0.009	0.009	0.383	0.470	0.867
• Someone else	0.016	0.011	0.013	0.295	0.455	0.747
• The household does not grow food to eat	0.001	0.001	0.001	0.932	0.958	0.967
• Don't know	0.005	0.003	0.004	0.422	0.596	0.802
Who usually makes decisions about what food to buy?						
• Husband or household head, without consulting woman	0.572	0.541	0.590	0.380	0.620	0.165
• Husband or household head, consulting woman first	0.264	0.268	0.230	0.805	0.256	0.174
• Woman and husband or household head, jointly	0.138	0.166	0.155	0.227	0.491	0.667
• Woman	0.012	0.014	0.014	0.709	0.714	0.972
• Someone else	0.011	0.010	0.011	0.822	0.997	0.838
• The household does not buy food	0.003	0.001	0.001	0.138	0.142	0.978
'Suppose the woman were to make NGN 3,500 in 30 days selling snacks. Who do you think would decide how this money was used?'						
• Husband or household head, without consulting woman	0.092	0.108	0.087	0.466	0.761	0.294
• Husband or household head, consulting woman first	0.103	0.118	0.097	0.405	0.768	0.255
• Woman and husband or household head, jointly	0.275	0.279	0.284	0.836	0.731	0.892
• Woman	0.524	0.491	0.525	0.370	0.979	0.350
• Someone else	0.003	0.002	0.005	0.342	0.493	.068*
• Don't know	0.003	0.002	0.003	0.426	0.770	0.802
'Now suppose the woman were to be given a regular monthly gift of NGN 1,000, and that this money is to be given only to her and not to any other household						

member. Who do you think would decide how this money was used?'						
• Husband or household head, without consulting woman	0.080	0.101	0.077	0.312	0.851	0.205
• Husband or household head, consulting woman first	0.110	0.116	0.103	0.720	0.720	0.476
• Woman and husband or household head, jointly	0.287	0.298	0.305	0.634	0.506	0.821
• Woman	0.516	0.478	0.511	0.309	0.884	0.357
• Someone else	0.005	0.004	0.002	0.787	0.140	0.212
• Don't know	0.003	0.003	0.003	0.916	0.946	0.979
'Now suppose the woman were to be given a regular monthly gift of NGN 3,500, and that this money is to be given only to her and not to any other household member. Who do you think would decide how this money was used?'						
• Husband or household head, without consulting woman	0.075	0.104	0.075	0.135	0.958	0.114
• Husband or household head, consulting woman first	0.112	0.115	0.103	0.864	0.642	0.527
• Woman and husband or household head, jointly	0.294	0.306	0.312	0.605	0.498	0.831
• Woman	0.512	0.469	0.508	0.229	0.886	0.269
• Someone else	0.004	0.004	0.002	0.972	0.219	0.165
• Don't know	0.003	0.003	0.002	0.916	0.461	0.577
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 59 Women's decision making

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% women who have access to mobile phone	0.657	0.642	0.652	0.674	0.861	0.794
% women who own a mobile phone themselves	0.174	0.194	0.165	0.502	0.722	0.338
Who usually makes decisions about healthcare for yourself:						
• Husband or household head, without consulting you	0.479	0.478	0.504	0.946	0.443	0.433
• Husband or household head, consulting you first	0.274	0.266	0.255	0.918	0.532	0.628
• You and husband or household head, jointly	0.210	0.222	0.214	0.743	0.910	0.850
• You	0.027	0.024	0.020	0.635	0.349	0.559
• Someone else	0.010	0.010	0.007	0.976	0.406	0.353
• Don't know	0.000	0.000	0.001	.	0.316	0.316
Who usually makes decisions about healthcare for your child/children (for women with children):						
• Husband or household head, without consulting you	0.475	0.474	0.496	0.925	0.530	0.496
• Husband or household head, consulting you first	0.280	0.270	0.256	0.860	0.429	0.577
• You and husband or household head, jointly	0.206	0.218	0.212	0.736	0.860	0.885
• You	0.025	0.022	0.020	0.597	0.482	0.823
• Someone else	0.008	0.009	0.007	0.870	0.767	0.644
• Don't know	0.005	0.008	0.008	0.424	0.324	0.862

If you needed to, could you go to a market?						
• Could go alone	0.173	0.145	0.197	0.294	0.441	.064*
• Could go if accompanied by other household member	0.018	0.021	0.021	0.602	0.504	0.921
• Would not be able to go at all	0.506	0.473	0.488	0.418	0.620	0.722
• Place not applicable to her	0.304	0.360	0.293	0.178	0.764	.089*
• Doesn't know	0.001	0.002	0.001	0.343	0.963	0.317
If needed, could you go to a place where you can get treated by a health worker?						
• Could go alone	0.678	0.736	0.716	0.221	0.363	0.687
• Could go if accompanied by other household member	0.276	0.209	0.244	.089*	0.392	0.350
• Would not be able to go at all	0.034	0.027	0.022	0.487	0.150	0.634
• Place not applicable to her	0.011	0.027	0.015	0.106	0.593	0.295
• Doesn't know	0.001	0.002	0.002	0.316	0.172	0.712
If needed, could you go to a non-family friend's house?						
• Could go alone	0.838	0.873	0.874	0.195	0.201	0.898
• Could go if accompanied by other household member	0.135	0.104	0.110	0.206	0.331	0.885
• Would not be able to go at all	0.026	0.018	0.013	0.292	.057*	0.277
• Place not applicable to her	0.001	0.004	0.004	0.161	0.301	0.904
If needed, could you go to a relative's house?						
• Could go alone	0.907	0.924	0.908	0.414	0.973	0.359
• Could go if accompanied by other household member	0.083	0.069	0.087	0.491	0.793	0.316
• Would not be able to go at all	0.009	0.004	0.005	0.210	0.299	0.807
• Place not applicable to her	0.001	0.002	0.001	0.597	0.533	0.368
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

P.7 Education

Table 60 Primary School Completion by age

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
8-12	0.054	0.066	0.058	0.435	0.767	0.602
13-18	0.259	0.264	0.229	0.911	0.490	0.430
19-24	0.209	0.215	0.181	0.859	0.443	0.370
25-34	0.190	0.199	0.201	0.792	0.701	0.922
35-44	0.273	0.264	0.234	0.766	0.168	0.306
45-54	0.250	0.270	0.285	0.680	0.381	0.658
55+	0.100	0.129	0.097	0.285	0.877	0.229
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 61 Adult Education - Males

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% males (aged 18+) that:						
• Can read and write in at least one language	0.618	0.571	0.620	0.296	0.964	0.253
• Are attending school	0.092	0.077	0.084	0.351	0.599	0.621
• Have ever attended school	0.518	0.486	0.501	0.451	0.648	0.704
• Have completed primary education	0.367	0.373	0.356	0.892	0.753	0.673
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 62 Adult Education - Females

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% females (aged 18+) that:						
• Can read and write in at least one language	0.184	0.205	0.229	0.492	0.135	0.490
• Are attending school	0.031	0.036	0.038	0.598	0.528	0.947
• Have ever attended school	0.176	0.178	0.194	0.951	0.491	0.589
• Have completed primary education	0.083	0.091	0.081	0.775	0.907	0.708
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 63 Children education

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% children aged four to eight that:						
• Are attending school	0.356	0.391	0.353	0.422	0.957	0.395
• Have ever attended school	0.388	0.421	0.376	0.473	0.771	0.321
% children aged 9–18 that:						
• Are attending school	0.372	0.382	0.349	0.817	0.531	0.415
• Have ever attended school	0.476	0.473	0.441	0.937	0.376	0.473
• Have completed primary education	0.162	0.183	0.151	0.496	0.617	0.267
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

P.8 Women's and men's knowledge and beliefs about health

Table 64 Beliefs about pregnancy and infant health – Women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% would advise a pregnant woman to visit a health facility:						
• For a check-up if she is healthy and nothing is wrong	0.944	0.921	0.933	.066*	0.392	0.362
• For a check-up if there are complications with the pregnancy	0.805	0.816	0.809	0.696	0.895	0.803
• If she is about to give birth and the cost of travel and treatment was NGN 2,000	0.685	0.714	0.720	0.589	0.371	0.773
• If she is about to give birth and there are no female staff available	0.686	0.706	0.708	0.486	0.433	0.913
The best place for a woman to give birth is:						
• In own home	0.820	0.824	0.826	0.775	0.769	0.960
• Health facility	0.174	0.171	0.170	0.797	0.825	0.932
• At home of traditional birth attendant	0.003	0.002	0.000	0.271	.011**	.08*
• Other place	0.001	0.001	0.001	0.587	0.591	0.995
• Don't know	0.002	0.003	0.003	0.843	0.600	0.720
% would advise to take a young baby to health facility if:						
• Baby had malaria	0.973	0.975	0.978	0.866	0.545	0.652
• Baby had a fever	0.970	0.972	0.978	0.890	0.392	0.490
• Baby is having convulsions	0.957	0.959	0.962	0.935	0.696	0.736
• Baby is malnourished	0.955	0.949	0.957	0.595	0.887	0.500
• Baby had diarrhoea	0.949	0.943	0.957	0.653	0.673	0.337
• Baby was refusing to eat	0.908	0.919	0.933	0.692	0.212	0.410
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 65 Beliefs about pregnancy and infant health – Husbands

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% would advise a pregnant woman to visit a health facility:						
• For a check-up if she is healthy and nothing is wrong	0.960	0.962	0.962	0.855	0.824	0.964
• For a check-up if there are complications with the pregnancy	0.862	0.887	0.875	0.251	0.546	0.537
• If she is about to give birth and the cost of travel and treatment was NGN 2,000	0.730	0.761	0.767	0.564	0.374	0.805
• If she is about to give birth and there are no female staff available	0.753	0.790	0.780	0.167	0.306	0.682
The best place for a woman to give birth is:						
• In own home	0.768	0.768	0.782	0.892	0.606	0.732
• Health facility	0.222	0.218	0.210	0.805	0.656	0.877
• At home of traditional birth attendant	0.005	0.003	0.004	0.560	0.945	0.580

• Other place	0.000	0.001	0.001	0.316	0.316	0.996
• Don't know	0.006	0.010	0.003	0.269	0.214	.05**
% would advise to take a young baby to health facility if:						
• Baby had malaria	0.981	0.988	0.987	0.278	0.269	0.997
• Baby had a fever	0.979	0.984	0.989	0.403	.06*	0.367
• Baby is having convulsions	0.968	0.967	0.973	0.886	0.606	0.487
• Baby is malnourished	0.964	0.960	0.969	0.630	0.685	0.374
• Baby had diarrhoea	0.961	0.961	0.968	0.972	0.610	0.574
• Baby was refusing to eat	0.921	0.937	0.943	0.446	0.213	0.652
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 66 Beliefs about breastfeeding and feeding practices – Women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Best time at which a healthy mother can start breastfeeding her child after birth:						
• Within 30 minutes / immediately	0.159	0.186	0.147	0.284	0.694	0.153
• 30 minutes – one hour / shortly after birth	0.169	0.151	0.182	0.278	0.516	.08*
• More than one hour after birth / sometime after birth	0.439	0.434	0.454	0.880	0.645	0.547
• Whenever the baby wants	0.083	0.108	0.080	0.188	0.832	0.115
• Whenever the mother is ready	0.121	0.093	0.100	0.101	0.243	0.687
• Other	0.006	0.009	0.011	0.384	0.190	0.632
• Don't know	0.023	0.019	0.026	0.440	0.671	0.215
% think babies should receive something else other than breast milk (including water) within first day (no exclusive breastfeeding)	0.547	0.461	0.520	.038**	0.514	0.130
If not, number of weeks he/she thinks a baby should be exclusively breastfed	40.979 (36.538)	44.272 (37.139)	41.319 (37.571)	0.320	0.935	0.332
% think important for children to receive vaccinations from a health facility	0.919	0.945	0.935	0.181	0.408	0.538
% would participate if a vaccination campaign came to their village	0.945	0.950	0.951	0.673	0.613	0.904
% think colostrum is good for the baby	0.596	0.620	0.626	0.414	0.304	0.819
% think it is ok to give a young baby under six months some water to satisfy the baby's thirst when it is hot outside	0.899	0.896	0.902	0.870	0.834	0.745
% think it is best to have standard feeding times for children under six months	0.062	0.084	0.062	0.197	0.981	0.228
% think it is important for mothers to attend training sessions in the community, at a health facility or in a support group about breastfeeding and young child feeding practices	0.934	0.932	0.946	0.827	0.441	0.327
% think it is important for fathers to attend training sessions in the community, at a health facility or in a support group about breastfeeding and young child feeding practices	0.791	0.802	0.820	0.842	0.323	0.466
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 67 Beliefs about breastfeeding and feeding practices – Husbands

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Best time at which a healthy mother can start breastfeeding her child after birth:						
• Within 30 minutes / immediately	0.177	0.174	0.159	0.993	0.575	0.606
• 30 minutes – one hour / shortly after birth	0.149	0.139	0.166	0.521	0.380	0.148
• More than one hour after birth / sometime after birth	0.334	0.332	0.326	0.955	0.799	0.866
• Whenever the baby wants	0.116	0.128	0.134	0.545	0.338	0.737
• Whenever the mother is ready	0.128	0.103	0.101	0.184	0.172	0.895
• Other	0.005	0.005	0.004	0.849	0.938	0.750
• Don't know	0.092	0.120	0.110	0.111	0.268	0.594
% think babies should receive something else other than breast milk (including water) within first day (no exclusive breastfeeding)	0.513	0.433	0.495	.061*	0.682	0.117
If not, number of weeks he/she thinks a baby should be exclusively breastfed	54.052 (48.444)	57.495 (42.686)	56.005 (51.153)	0.336	0.618	0.681
% think important for children to receive vaccinations from a health facility	0.927	0.959	0.949	.048**	0.179	0.437
% would participate if a vaccination campaign came to their village	0.955	0.967	0.963	0.194	0.375	0.745
% think colostrum is good for the baby	0.557	0.564	0.565	0.866	0.825	0.951
% think it is ok to give a young baby under six months some water to satisfy the baby's thirst when it is hot outside	0.885	0.891	0.893	0.780	0.659	0.900
% think it is best to have standard feeding times for children under six months	0.086	0.103	0.082	0.368	0.800	0.290
% think it is important for mothers to attend training sessions in the community, at a health facility or in a support group about breastfeeding and young child feeding practices	0.952	0.948	0.961	0.681	0.492	0.261
% think it is important for fathers to attend training sessions in the community, at a health facility or in a support group about breastfeeding and young child feeding practices	0.793	0.804	0.822	0.870	0.332	0.458
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 68 Advice about pregnancy and children – Women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
If they needed information about pregnancy and looking after young children, would go to:						
• Husband	0.803	0.792	0.799	0.633	0.875	0.751
• Mother	0.272	0.292	0.306	0.390	0.135	0.510
• Trained health worker (doctor, nurse, CHEW)	0.225	0.233	0.208	0.842	0.501	0.429
• Husband's mother	0.162	0.161	0.165	0.971	0.822	0.852
• Husband's other wife	0.117	0.083	0.101	.022**	0.264	0.127
• Father	0.069	0.078	0.065	0.568	0.703	0.370
• Sister	0.062	0.071	0.065	0.442	0.809	0.616

• Brother	0.011	0.014	0.020	0.691	0.164	0.332
• Other+	0.090	0.098	0.089	0.493	0.951	0.456
• Would never need to seek advice from anyone	0.011	0.010	0.010	0.785	0.792	0.982
• Don't know	0.003	0.001	0.002	0.299	0.491	0.661
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. +Other people considered by the questionnaire were: biological child, adopted child, grandson, granddaughter, niece, nephew, brother in law, sister in law, uncle, aunt, grandmother, grandfather and domestic help.						

Table 69 Advice about pregnancy and children – Husbands

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
If they needed information about pregnancy and looking after young children, would go to:						
• Wife	0.589	0.524	0.574	.037**	0.699	.098*
• Mother	0.356	0.399	0.401	0.117	.089*	0.940
• Trained health worker (doctor, nurse, CHEW)	0.324	0.329	0.323	0.972	0.951	0.907
• Wife's mother	0.019	0.032	0.026	.098*	0.290	0.451
• Father	0.135	0.152	0.121	0.515	0.431	0.113
• Sister	0.048	0.041	0.045	0.583	0.783	0.730
• Brother	0.086	0.108	0.083	0.282	0.797	0.204
• Other+	0.065	0.069	0.064	0.829	0.877	0.683
• Would never need to seek advice from anyone	0.013	0.016	0.015	0.507	0.708	0.721
• Don't know	0.019	0.014	0.011	0.465	0.243	0.574
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. +Other people considered by the questionnaire were: biological child, adopted child, grandson, granddaughter, niece, nephew, brother in law, sister in law, uncle, aunt, grandmother, grandfather and domestic help.						

Table 70 Advice about food and nutrition – Women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
If they needed information about pregnancy and looking after young children, would go to:						
• Husband	0.896	0.896	0.890	0.980	0.716	0.688
• Mother	0.188	0.243	0.218	.014**	0.218	0.329
• Trained health worker (doctor, nurse, CHEW)	0.123	0.138	0.134	0.357	0.480	0.833
• Husband's mother	0.119	0.098	0.112	0.209	0.678	0.359
• Husband's other wife	0.092	0.087	0.079	0.691	0.396	0.634
• Father	0.066	0.078	0.067	0.439	0.995	0.463
• Sister	0.045	0.060	0.061	0.154	0.120	0.963

• Brother	0.013	0.024	0.017	.056*	0.381	0.295
• Other+	0.075	0.085	0.069	0.351	0.570	0.158
• Would never need to seek advice from anyone	0.015	0.011	0.013	0.326	0.663	0.534
• Don't know	0.002	0.001	0.001	0.245	0.237	0.996
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. +Other people considered by the questionnaire were: biological child, adopted child, grandson, granddaughter, niece, nephew, brother in law, sister in law, uncle, aunt, grandmother, grandfather and domestic help.						

Table 71 Advice about food and nutrition – Husbands

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
If they needed information about pregnancy and looking after young children, would go to:						
• Wife	0.687	0.649	0.680	0.293	0.894	0.357
• Mother	0.301	0.345	0.344	0.103	.069*	0.995
• Trained health worker (doctor, nurse, CHEW)	0.140	0.151	0.127	0.745	0.478	0.314
• Wife's mother	0.012	0.020	0.016	0.203	0.450	0.579
• Father	0.153	0.177	0.161	0.377	0.719	0.521
• Sister	0.035	0.040	0.034	0.617	0.927	0.533
• Brother	0.116	0.129	0.107	0.605	0.558	0.283
• Other+	0.051	0.060	0.051	0.484	0.942	0.423
• Would never need to seek advice from anyone	0.030	0.035	0.031	0.596	0.953	0.589
• Don't know	0.016	0.013	0.007	0.557	.085*	0.189
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. +Other people considered by the questionnaire were: biological child, adopted child, grandson, granddaughter, niece, nephew, brother in law, sister in law, uncle, aunt, grandmother, grandfather and domestic help.						

P.9 Maternal Health and Antenatal Care

Table 72 Fertility and Marriage

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% women who are married	0.999	0.999	1.000	0.694	0.315	0.316
% of which in a polygamous marriage	0.464	0.438	0.472	0.311	0.609	0.131
Age at first marriage (years)	14.802 (1.643)	14.811 (1.642)	14.702 (1.705)	0.992	0.268	0.337
% women with any adopted children	0.046	0.040	0.041	0.414	0.449	0.915
% women who are currently pregnant	0.674	0.684	0.679	0.627	0.812	0.775
% women who don't know whether they are currently pregnant	0.006	0.002	0.001	.082*	.017**	0.409

% have ever been pregnant (if not pregnant now)	0.975	0.977	0.961	0.972	0.165	0.183
% women who have given birth at least once	0.895	0.883	0.882	0.279	0.270	0.949
Number of living children of any age if have ever given birth (both adopted and biological)	3.038 (2.125)	3.071 (2.037)	3.051 (2.101)	0.712	0.904	0.839
% women who have given birth in past seven years	0.856	0.849	0.850	0.533	0.644	0.892
Number of children under seven years	1.751 (1.100)	1.722 (1.089)	1.737 (1.108)	0.526	0.748	0.731
Of which boys	0.864 (0.844)	0.868 (0.869)	0.877 (0.898)	0.924	0.735	0.777
Of which girls	0.887 (0.864)	0.853 (0.858)	0.860 (0.847)	0.288	0.369	0.809
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 73 Contraception and Birth Spacing

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
'Would you like to have other children (if pregnant, after the current pregnancy)?' % answering:						
• Yes, have a/another child	0.913	0.914	0.917	0.890	0.702	0.759
• No, no more/no children	0.051	0.049	0.050	0.892	0.963	0.939
• Can't get pregnant	0.004	0.002	0.002	0.208	0.391	0.726
• Undecided/don't know	0.033	0.035	0.031	0.828	0.777	0.602
How long would woman like to wait before having another child (if pregnant, after the current pregnancy)						
• Within one year	0.081	0.079	0.078	0.818	0.736	0.936
• After one year	0.136	0.141	0.139	0.847	0.917	0.946
• After two years	0.482	0.475	0.478	0.791	0.896	0.904
• After three years	0.170	0.175	0.185	0.837	0.402	0.563
• After four years	0.026	0.036	0.022	0.156	0.465	.048**
• After five years or more	0.014	0.016	0.017	0.484	0.518	0.934
• Don't know	0.091	0.079	0.082	0.465	0.621	0.914
% heard of any contraceptive methods	0.646	0.614	0.605	0.286	.086*	0.675
Which contraception method heard of:						
• Injectable contraceptives (Depo-Provera)	0.503	0.492	0.479	0.772	0.431	0.651
• Oral contraceptives (pill)	0.476	0.467	0.464	0.828	0.680	0.865
• Traditional method (herbs, bracelet, waist beads, ring etc.)	0.271	0.263	0.264	0.906	0.837	0.923
• Norplant/implant under the skin of the upper arm	0.046	0.057	0.039	0.377	0.462	0.127
• Male and female condoms	0.041	0.051	0.022	0.433	.049**	.006***
• Exclusive breastfeeding	0.043	0.034	0.025	0.434	.087*	0.279
• Abstinence	0.015	0.028	0.017	.037**	0.631	.081*
• Tubal ligation/female sterilisation	0.015	0.014	0.020	0.750	0.434	0.271
• Withdrawal	0.009	0.014	0.010	0.397	0.709	0.615
• Calculation/rhythm/calendar/safe period	0.002	0.008	0.004	0.107	0.292	0.317
• Diaphragm/intrauterine device/foam/jelly	0.003	0.005	0.003	0.411	0.938	0.403

• Vasectomy/male sterilisation	0.002	0.004	0.001	0.584	0.485	0.221
• Other	0.000	0.000	0.001	.	0.155	0.155
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 74 Woman's visits to health facilities

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Frequency of health facility visits in past six months (apart from antenatal care)						
• Never	0.619	0.621	0.611	0.835	0.788	0.618
• One	0.138	0.133	0.132	0.678	0.662	0.991
• Two	0.117	0.111	0.116	0.566	0.878	0.700
• Three	0.061	0.067	0.067	0.512	0.503	0.990
• Four or more	0.061	0.063	0.066	0.912	0.638	0.714
• Don't know	0.004	0.004	0.008	0.972	0.116	.089*
% women who have spent anything on treatment for themselves in the past six months	0.677	0.689	0.675	0.720	0.969	0.682
Expenditure for treatment for themselves in past six months (excluding transport costs) (NGN)	2332 (3428)	2454 (4214)	2238 (4143)	0.676	0.687	0.440
% women who have spent anything on treatment for their children in the past six months	0.774	0.781	0.803	0.817	0.320	0.398
Expenditure for treatment for children in past six months (excluding transport costs) (NGN)	2301 (3076)	2266 (3644)	1904 (2586)	0.879	.092*	0.160
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 75 Antenatal care for currently pregnant women

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% of currently pregnant women who have seen anyone for antenatal care	0.290	0.346	0.297	.08*	0.812	0.112
If they have seen someone for antenatal care, months pregnant when they first received antenatal care for this pregnancy	4.066 (1.743)	3.923 (1.710)	4.087 (1.846)	0.381	0.896	0.439
If they have not seen anyone, % of women who plan to see anyone for antenatal care later in the pregnancy	0.389	0.386	0.406	0.914	0.521	0.524
% of women for whom the last antenatal care was administered by:						
• Doctor, nurse, midwife or CHEW [+]	0.994	0.991	0.968	0.575	.019**	.043**
• Traditional birth attendant	0.003	0.005	0.008	0.700	0.345	0.504
• Family member	0.003	0.002	0.003	0.873	0.956	0.901
• Other / don't know	0.000	0.002	0.022	0.314	.007***	.021**
% of women who received the last antenatal care:						
• At a health facility	0.977	0.975	0.965	0.871	0.344	0.445

• At home	0.020	0.009	0.011	0.196	0.316	0.773
• In another household	0.003	0.011	0.008	0.190	0.345	0.706
• Other place	0.000	0.005	0.016	0.152	0.010	.096*
% of women who paid no transport cost for antenatal care	0.393	0.369	0.393	0.704	0.921	0.638
Cost of transport for antenatal care (NGN)	525 (945)	382 (440)	492 (745)	.063*	0.721	.058*
% of women who paid nothing for antenatal care treatment	0.265	0.306	0.235	0.402	0.412	.076*
Cost of treatment for antenatal care (NGN)	704 (1160)	777 (1436)	699 (920)	0.554	0.978	0.549
% of women that received as part of antenatal care:						
• Iron supplements	0.863	0.876	0.846	0.670	0.464	0.237
• Folic acid supplements	0.720	0.726	0.765	0.883	0.342	0.306
• Anti-tetanus shot	0.697	0.754	0.676	0.155	0.472	.023**
• Drugs for intestinal worms	0.265	0.310	0.270	0.221	0.867	0.297
• Drugs to prevent malaria	0.647	0.641	0.622	0.862	0.472	0.549
• Advice for things to look out for during pregnancy	0.496	0.522	0.562	0.583	0.224	0.471
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 76 Antenatal care for mothers of children aged 0-35 months

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% women who received antenatal care	0.444	0.463	0.455	0.766	0.902	0.868
If not, reason why women did not receive antenatal care+						
• Saw no reason to seek antenatal care	0.677	0.740	0.711	0.108	0.305	0.563
• No permission to go to a health facility	0.242	0.188	0.206	0.156	0.245	0.770
• Health facility is too far or the travel cost to travel there too high	0.090	0.102	0.105	0.655	0.572	0.919
• Treatment costs are too high	0.059	0.036	0.057	0.163	0.963	0.192
• Too few treatments are available	0.032	0.042	0.017	0.504	0.208	.088*
• Other*	0.061	0.026	0.057	.015**	0.873	.052*
If yes, who administered antenatal care:						
• Doctor, nurse, midwife or CHEW	0.994	0.988	0.997	0.425	0.559	0.163
• Other person++	0.012	0.015	0.014	0.772	0.779	0.949
Number of times received antenatal care for the current pregnancy						
• Once	0.083	0.091	0.072	0.722	0.760	0.479
• Twice	0.107	0.088	0.115	0.432	0.508	0.139
• Three times	0.123	0.103	0.155	0.386	0.286	.082*
• Four times	0.181	0.166	0.143	0.623	0.109	0.356
• Five times	0.150	0.175	0.192	0.354	0.182	0.720
• More than five times	0.270	0.296	0.264	0.489	0.885	0.428
• Don't know	0.086	0.082	0.060	0.864	0.305	0.348

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
[+] Percentages do not add up to a sum of 100 because respondents were allowed to declare more than one reason. Other reasons considered in the questionnaire were: did not know about antenatal care, no female staff at health facility, don't know.
[++] Other persons considered by the questionnaire were: traditional birth attendant, family member, neighbour, don't know

Table 77 Delivery and postnatal care

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Location of birth						
• Home	0.907	0.897	0.919	0.742	0.411	0.374
• Health Facility	0.088	0.095	0.075	0.808	0.405	0.421
• At the house of a traditional birth attendant	0.003	0.005	0.003	0.347	0.989	0.323
• Other	0.001	0.001	0.001	0.928	0.978	0.993
• Don't know	0.001	0.001	0.001	0.987	0.987	0.995
Who assisted the birth of the child:						
• Doctor, nurse, midwife or CHEW	0.404	0.414	0.415	0.786	0.770	0.942
• Traditional birth attendant	0.347	0.333	0.361	0.700	0.714	0.422
• Family member (including co-wives)	0.196	0.179	0.193	0.558	0.947	0.600
• Neighbour	0.153	0.147	0.131	0.748	0.263	0.553
• No one	0.124	0.119	0.154	0.686	0.125	.055*
• Other	0.009	0.006	0.004	0.364	0.130	0.445
• Don't Know	0.001	0.001	0.004	0.549	0.243	0.400
% Births by caesarean	0.016	0.011	0.007	0.320	.04**	0.262

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.

Table 78 Women's anthropometrics

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Weight (kg)	52.452 (8.493)	52.762 (8.808)	52.288 (8.655)	0.396	0.735	0.264
Height (cm)	156.615 (5.833)	156.490 (5.298)	156.341 (5.735)	0.659	0.286	0.507
BMI	21.364 (3.097)	21.517 (3.236)	21.367 (3.174)	0.286	0.934	0.324
• % Thin (BMI <18.5)	0.154	0.136	0.147	0.128	0.524	0.393
• % Normal (BMI 18.5-24.9)	0.730	0.753	0.748	0.156	0.295	0.709
• % Overweight/obese (BMI ≥25)	0.116	0.111	0.106	0.831	0.485	0.662
MUAC (mm)	250.528 (29.345)	251.275 (29.887)	249.624 (28.926)	0.531	0.532	0.225
• % MUAC <185mm[+] (severe acute malnutrition definition 1)	0.005	0.008	0.008	0.318	0.323	0.974
• % MUAC 185 to 220mm[+] (moderate acute malnutrition definition 1)	0.108	0.090	0.104	.097*	0.615	0.189

• % MUAC <190mm+ (severe acute malnutrition definition 2)	0.006	0.010	0.009	0.285	0.349	0.910
• % MUAC 190 to 230mm+ (moderate acute malnutrition definition 2)	0.223	0.213	0.232	0.430	0.595	0.182
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. + There is no consensus on how to identify pregnant women as acutely malnourished so we present two definitions. Severe acute malnutrition is sometimes defined as having a MUAC of less than 185mm or 190mm. Moderate malnutrition is sometimes defined as having a MUAC of between 185mm and 220mm or 190 and 230mm.						

P.10 Child Health and IYCF Practices

Table 79 Children's health and treatment

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
% child given deworming medication in past six months	0.142	0.121	0.129	0.240	0.461	0.585
Location of last deworming medication:	0.381	0.456	0.448	0.299	0.732	0.593
• At home by health worker	0.320	0.333	0.392	0.789	0.224	0.335
• Health facility	0.237	0.135	0.116	.021**	.022**	0.972
• Chemist	0.057	0.076	0.044	0.376	0.823	0.290
• Other	0.026	0.033	0.026	0.516	0.977	0.509
% Weighed at birth	0.381	0.456	0.448	0.299	0.732	0.593
% children affected by illness or injury in the past 30 days (excluding diarrhoea)	0.476	0.462	0.435	0.567	0.131	0.297
If child was affected, % of cases when someone was consulted	0.888	0.893	0.881	0.783	0.734	0.556
If someone was consulted, where went for treatment						
• Dispensary / chemist / shop	0.418	0.364	0.343	0.285	0.121	0.613
• Hospital	0.314	0.328	0.325	0.833	0.907	0.958
• Primary health centre / health post / mobile clinic	0.157	0.156	0.176	0.965	0.552	0.486
• Traditional practitioner	0.059	0.053	0.071	0.802	0.351	0.220
• Private medical clinic	0.029	0.067	0.054	.013**	0.115	0.465
• Other+	0.021	0.031	0.032	0.307	0.265	0.958
• Don't know	0.002	0.002	0.000	0.990	0.324	0.310
If nobody was consulted, why?						
• Believed that child would get better without treatment	0.452	0.657	0.479	.021**	0.764	.025**
• Treatment costs are too high	0.301	0.057	0.288	0.00***	0.892	0.00***
• Mother/caregiver did not have permission to consult anyone	0.123	0.086	0.068	0.455	0.211	0.665
• Few treatments are available	0.082	0.114	0.068	0.584	0.721	0.307
• Health facility far away or the cost to travel there is too high	0.068	0.014	0.068	.063*	0.970	.089*
• Other reason	0.110	0.086	0.096	0.649	0.821	0.816
• Don't know	0.014	0.029	0.000	0.533	0.319	0.155
% children affected by diarrhoea in past two weeks	0.313	0.262	0.292	.026**	0.350	0.153

During the diarrhoea was the child given less than usual to drink, about the same amount, or more than usual to drink (including breast milk)?						
• Much less than usual	0.120	0.109	0.119	0.526	0.928	0.598
• Somewhat less than usual	0.226	0.232	0.192	0.869	0.331	0.296
• About the same	0.252	0.209	0.249	0.253	0.917	0.269
• More	0.167	0.184	0.209	0.467	0.227	0.570
• Nothing	0.235	0.265	0.231	0.561	0.900	0.454
During the diarrhoea was the child given less than usual to eat, about the same amount, more than usual or nothing to eat?						
• Much less than usual	0.189	0.202	0.221	0.720	0.321	0.457
• Somewhat less than usual	0.371	0.390	0.331	0.551	0.327	0.108
• About the same	0.354	0.305	0.307	0.160	0.188	0.927
• More	0.054	0.071	0.088	0.390	0.106	0.448
• Nothing	0.033	0.033	0.054	0.974	0.155	0.201
% households in which someone sought advice or treatment for the child's diarrhoea	0.795	0.786	0.781	0.834	0.687	0.870
% children given ORS at any time after diarrhoea started	0.364	0.414	0.384	0.318	0.668	0.576
% children given other treatment for diarrhoea	0.739	0.768	0.735	0.485	0.903	0.368
Other treatment given:						
• Antibiotic pill or syrup	0.782	0.838	0.807	0.145	0.484	0.400
• Zinc pill or syrup	0.107	0.095	0.063	0.716	.089*	0.238
• Herbal/traditional medicine	0.091	0.074	0.086	0.453	0.815	0.542
• Antibiotic injection	0.088	0.077	0.076	0.710	0.658	0.960
• Non-antibiotic injection	0.016	0.014	0.013	0.836	0.776	0.954
• Fluids via intravenous	0.009	0.007	0.007	0.740	0.704	0.942
• Other	0.025	0.011	0.027	0.177	0.961	0.194
• Don't know	0.050	0.039	0.076	0.613	0.250	0.105
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%. ++Other places reported by respondents were: neighbour/family friends, at home (mostly in cases where parents purchased medicines and treated the child themselves).						

Table 80 Child vaccinations

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Proportion of children with health card available	0.042	0.048	0.041	0.599	0.916	0.553
Proportion of children that have received vaccines against:						
• BCG	0.197	0.223	0.216	0.436	0.547	0.855
• Polio (any)	0.783	0.780	0.772	0.975	0.721	0.775
• Polio (at birth)	0.194	0.195	0.191	0.998	0.880	0.943
• DPT	0.167	0.178	0.183	0.726	0.549	0.840
• Measles/MMR	0.328	0.304	0.314	0.447	0.630	0.744
• Hepatitis B	0.117	0.122	0.103	0.879	0.558	0.575
• Yellow fever	0.145	0.158	0.153	0.705	0.716	0.965

• All basic vaccinations (BCG, 3 DPT, 3 Polio, measles)	0.042	0.046	0.032	0.874	0.332	0.369
• None of the basic vaccinations	0.209	0.215	0.220	0.911	0.722	0.846
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 81 IYCF Indicators

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Child ever breastfed Proportion of children born in the last 24 months who were ever breastfed	1.000	0.991	0.983	.078*	.005***	0.292
Age-appropriate breastfeeding Proportion of children 0–23 months of age who are appropriately breastfed	0.421	0.434	0.374	0.714	0.289	0.163
Early initiation of breastfeeding (immediately) Proportion of children born in the last 24 months who were put to the breast within one hour of birth	0.291	0.276	0.260	0.870	0.522	0.630
Early initiation of breastfeeding (24 hours) Proportion of children born in the last 24 months who were put to the breast within 24 hours of birth	0.662	0.596	0.619	0.144	0.261	0.596
Exclusive breastfeeding among children under six months Proportion of infants 0–5 months of age who are fed exclusively with breast milk	0.104	0.196	0.060	0.143	0.548	.027**
Predominant breastfeeding among children under six months Proportion of infants 0–5 months of age who are predominantly breastfed	0.729	0.706	0.701	0.976	0.837	0.919
Continued breastfeeding at one year (12–15 months) Proportion of children 12–15 months of age who are fed breast milk	0.920	0.887	0.942	0.537	0.688	0.259
Continued breastfeeding at two years (20–23 months) Proportion of children 20–23 months of age who are fed breast milk	0.185	0.228	0.152	0.518	0.510	0.200
Milk feeding frequency Proportion of non-breastfed children 6–23 months of age who receive at least two milk feedings in 24 hours	0.034	0.050	0.031	0.383	0.881	0.296
Introduction of solid, semi-solid or soft foods (6–8 months) Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods	0.556	0.429	0.429	0.745	0.599	0.903
Consumption of iron-rich/fortified foods (6–23 months) Proportion of children 6–23 months of age who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home	0.205	0.205	0.203	0.997	0.943	0.935
Minimum meal frequency (6–23 months) Proportion of breastfed and non-breastfed children 6–23 months old who receive solid, semi-solid, or soft foods (including milk feeds for non-breastfed children) the minimum number of times or more	0.365	0.385	0.360	0.464	0.962	0.529
Minimum dietary diversity (6–23 months) Proportion of children 6–23 months of age who receive foods from four or more food groups[+]	0.171	0.197	0.126	0.327	0.194	.033**
Minimum acceptable diet (6–23 months) Proportion of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk)[++]	0.061	0.067	0.031	0.626	0.156	.064*

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.
[+] The seven foods groups used for calculation of this indicator are: (1) grains, roots and tubers; (2) legumes and nuts; (3) dairy products (milk, yogurt, cheese); (4) flesh foods (meat, fish, poultry and liver/organ meats); (5) eggs; (6) vitamin A rich fruits and vegetables; (7) other fruits and vegetables
[++] This corresponds to the proportion of children who receive both the minimum amount of feeding times and the minimum dietary diversity
See **Annex M** and WHO Indicators for assessing infant and young child feeding practices (WHO, 2008, p. pp. 33 ff.) for the exact definitions and details for the indicators in this table.

Table 82 6–23 months and non-breastfed

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
WHO Minimum Dietary Diversity Index (MDD)	2.731 (0.927)	2.724 (1.053)	2.688 (0.846)	0.996	0.753	0.775
Food Group 1: grains, roots and tubers	0.992	0.990	1.000	0.869	0.320	0.317
Food Group 2: legumes and nuts	0.336	0.245	0.280	0.174	0.409	0.567
Food Group 3: dairy products (milk, yogurt, cheese)	0.193	0.245	0.160	0.362	0.562	0.130
Food Group 4: flesh foods (meat, fish, poultry and liver/organ meats)	0.210	0.184	0.232	0.615	0.702	0.414
Food Group 5: eggs	0.000	0.000	0.008	.	0.321	0.321
Food Group 6: vitamin A rich fruits and vegetables	0.874	0.837	0.880	0.481	0.857	0.403
Food Group 7: other fruits and vegetables	0.126	0.224	0.128	.061*	0.943	.095*
UN FAO Individual Dietary Diversity Score (IDDS)	3.160 (1.097)	3.245 (1.261)	3.168 (1.030)	0.522	0.908	0.618
Food Group 1: starchy staples	0.992	0.990	1.000	0.869	0.320	0.317
Food Group 2: dark green leafy vegetables	0.630	0.633	0.672	0.924	0.466	0.553
Food Group 3: other vitamin A rich fruits and vegetables	0.672	0.724	0.688	0.384	0.751	0.571
Food Group 4: other fruits and vegetable	0.126	0.224	0.128	.061*	0.943	.095*
Food Group 5: organ meat	0.008	0.000	0.000	0.308	0.308	.
Food Group 6: meat and fish	0.202	0.184	0.232	0.731	0.593	0.414
Food Group 7: eggs	0.000	0.000	0.008	.	0.321	0.321
Food Group 8: legumes, nuts, and seeds	0.336	0.245	0.280	0.174	0.409	0.567
Food Group 9: milk and milk products	0.193	0.245	0.160	0.362	0.562	0.130

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.

Table 83 6–23 months and breastfed

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
WHO Minimum Dietary Diversity Index (MDD)	2.373 (1.142)	2.397 (1.100)	2.199 (0.987)	0.600	0.222	0.119
Food Group 1: grains, roots and tubers	0.985	0.954	0.938	0.159	.051*	0.520
Food Group 2: legumes and nuts	0.269	0.206	0.205	0.177	0.160	0.958
Food Group 3: dairy products (milk, yogurt, cheese)	0.246	0.282	0.158	0.262	0.114	.008***

Food Group 4: flesh foods (meat, fish, poultry and liver/organ meats)	0.164	0.198	0.144	0.466	0.751	0.256
Food Group 5: eggs	0.000	0.000	0.007	.	0.321	0.322
Food Group 6: vitamin A rich fruits and vegetables	0.649	0.672	0.678	0.524	0.585	0.983
Food Group 7: other fruits and vegetables	0.060	0.084	0.068	0.288	0.710	0.619
UN FAO Individual Dietary Diversity Score (IDDS)	2.731 (1.420)	2.802 (1.367)	2.473 (1.176)	0.422	0.137	.036**
Food Group 1: starchy staples	0.985	0.954	0.938	0.159	.051*	0.520
Food Group 2: dark green leafy vegetables	0.448	0.496	0.418	0.268	0.614	0.186
Food Group 3: other vitamin A rich fruits and vegetables	0.560	0.580	0.534	0.513	0.816	0.460
Food Group 4: other fruits and vegetable	0.060	0.084	0.068	0.288	0.710	0.619
Food Group 5: organ meat	0.007	0.023	0.007	0.331	0.958	0.349
Food Group 6: meat and fish	0.157	0.176	0.137	0.688	0.733	0.404
Food Group 7: eggs	0.000	0.000	0.007	.	0.321	0.322
Food Group 8: legumes, nuts, and seeds	0.269	0.206	0.205	0.177	0.160	0.958
Food Group 9: milk and milk products	0.246	0.282	0.158	0.262	0.114	.008***
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 84 23-60 months

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
WHO Minimum Dietary Diversity Index (MDD)	2.750 (0.929)	2.710 (0.936)	2.739 (0.920)	0.542	0.834	0.690
Food Group 1: grains, roots and tubers	0.994	0.982	0.987	.032**	.09*	0.379
Food Group 2: legumes and nuts	0.284	0.258	0.264	0.344	0.525	0.813
Food Group 3: dairy products (milk, yogurt, cheese)	0.236	0.230	0.222	0.922	0.650	0.729
Food Group 4: flesh foods (meat, fish, poultry and liver/organ meats)	0.228	0.214	0.244	0.640	0.641	0.314
Food Group 5: eggs	0.003	0.004	0.007	0.746	0.177	0.287
Food Group 6: vitamin A rich fruits and vegetables	0.880	0.883	0.897	0.834	0.327	0.454
Food Group 7: other fruits and vegetables	0.125	0.140	0.118	0.512	0.706	0.279
UN FAO Individual Dietary Diversity Score (IDDS)	3.252 (1.136)	3.190 (1.137)	3.240 (1.097)	0.414	0.834	0.540
Food Group 1: starchy staples	0.994	0.982	0.987	.032**	.09*	0.379
Food Group 2: dark green leafy vegetables	0.686	0.656	0.674	0.295	0.666	0.517
Food Group 3: other vitamin A rich fruits and vegetables	0.696	0.707	0.724	0.627	0.326	0.618
Food Group 4: other fruits and vegetable	0.125	0.140	0.118	0.512	0.706	0.279
Food Group 5: organ meat	0.013	0.006	0.004	0.186	.063*	0.396
Food Group 6: meat and fish	0.215	0.209	0.241	0.813	0.454	0.288
Food Group 7: eggs	0.003	0.004	0.007	0.746	0.177	0.287
Food Group 8: legumes, nuts, and seeds	0.284	0.258	0.264	0.344	0.525	0.813
Food Group 9: milk and milk products	0.236	0.230	0.222	0.922	0.650	0.729
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

Table 85 Children anthropometrics (6-59 months)

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
WHZ	-0.271 (1.138)	-0.322 (1.214)	-0.239 (1.204)	0.452	0.558	0.205
% wasted (WHZ <-2SD)	0.068	0.079	0.074	0.381	0.565	0.733
% severely wasted (WHZ <-3SD)	0.016	0.024	0.026	0.219	.08*	0.749
HAZ	-2.539 (1.430)	-2.487 (1.466)	-2.590 (1.438)	0.491	0.506	0.208
% stunted (HAZ <-2SD)	0.665	0.653	0.674	0.618	0.679	0.390
% severely stunted (HAZ <-3SD)	0.369	0.364	0.392	0.823	0.390	0.291
WAZ	-1.628 (1.145)	-1.641 (1.179)	-1.636 (1.171)	0.912	0.902	0.960
% underweight (WAZ <-2SD)	0.349	0.351	0.346	0.955	0.872	0.947
% severely underweight (WAZ <-3SD)	0.122	0.130	0.134	0.649	0.484	0.780
MUAC	146.587 (15.013)	147.200 (15.959)	146.763 (15.558)	0.465	0.839	0.601
% Acutely malnourished (MUAC <125mm)	0.054	0.060	0.079	0.512	.026**	0.121
% Severely malnourished (MUAC < 115mm)	0.020	0.019	0.023	0.944	0.554	0.511

Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.

Table 86 Children ASQ Scores

	Treatment Arm: Mean (SD)			Tests of Equality		
Indicator	Contr.	T1	T2	Cont=T1	Cont=T2	T1=T2
Communication skills score	35.160 (18.981)	36.946 (19.439)	34.195 (19.331)	0.143	0.447	.025**
Proportion scoring:						
• 0	0.056	0.066	0.058	0.501	0.901	0.647
• 5	0.031	0.018	0.042	0.135	0.248	0.010
• 10	0.085	0.069	0.076	0.300	0.546	0.627
• 15	0.044	0.035	0.044	0.389	0.945	0.366
• 20	0.065	0.087	0.120	0.108	0.00***	.035**
• 25	0.063	0.043	0.047	.093*	0.156	0.730
• 30	0.101	0.096	0.091	0.699	0.484	0.767
• 35	0.077	0.054	0.057	.074*	0.118	0.786
• 40	0.099	0.100	0.085	0.955	0.388	0.333
• 45	0.050	0.056	0.051	0.580	0.954	0.652
• 50	0.079	0.068	0.077	0.405	0.880	0.510
• 55	0.055	0.068	0.071	0.316	0.197	0.824
• 60	0.195	0.240	0.180	.07*	0.546	.011**

Motor skills score	32.551 (19.459)	35.354 (19.488)	32.877 (19.269)	.031**	0.800	.056*
Proportion scoring:						
• 0	0.086	0.075	0.101	0.474	0.375	0.135
• 5	0.049	0.028	0.037	.023**	0.221	0.281
• 10	0.058	0.054	0.052	0.761	0.597	0.898
• 15	0.054	0.059	0.042	0.722	0.296	0.201
• 20	0.085	0.076	0.090	0.555	0.726	0.295
• 25	0.083	0.059	0.049	.088*	.009***	0.400
• 30	0.108	0.110	0.122	0.887	0.411	0.481
• 35	0.060	0.056	0.067	0.728	0.566	0.362
• 40	0.071	0.075	0.091	0.735	0.159	0.255
• 45	0.051	0.054	0.054	0.830	0.768	0.950
• 50	0.090	0.093	0.094	0.816	0.780	0.963
• 55	0.038	0.052	0.060	0.195	.061*	0.525
• 60	0.168	0.210	0.141	.098*	0.244	.005***
Notes: All tests of equality are based on OLS regressions including state fixed effects. Standard errors are clustered at PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.						

P.11 Multiple Tests for Treatment Group Balancing

Table 87 Test of balance using multiple indicators

	No Child Variables		Child Variables Only	
Specification	N	P-value	N	P-value
Linear Probability				
Control vs T1	3524	0.339	2600	0.702
Control vs T2	3518	0.347	2567	0.998
T1 vs T2	3606	0.174	2611	0.251
Probit				
Control vs T1	3524	0.474	2600	0.708
Control vs T2	3518	0.440	2567	0.998
T1 vs T2	3606	0.219	2611	0.255
Multinomial Logit	5324	0.181	3889	0.818

Note: The variables included in each specification are:

Household variables:
- Household size
- Gender ratio
- Dependency ratio
- PPI
- Household Head has completed primary education
- Household Head in in polygamous marriage
- HH has access to improved water source
- HH has access to improved toilet facilities

Husband variables:
- Age
- Can read or write
- Cultivated any land in past 12 months
- Has worked in past 12 months

Child variables:
- Age in months
- Gender
- Received none of the basic vaccinations
- Minimum Dietary Diversity Index

• HH looks after any animal • Total value of HH savings • Per capita food expenditure • Per capita non-food expenditure ***Woman variables:*** • Age • Completed primary education • Can read or write • Is in a polygamous marriage • Pregnant • Cultivated any land in past 12 months • Has worked in past 12 months • Has under-7 biological children • Is underweight	• Individual Dietary Diversity Score • Weight-for-Height Z-Score, WHO cleaning • Height-for-Age Z-Score, WHO cleaning • Weight-for-Age Z-Score, WHO cleaning All specifications include state fixed effects, and the standard errors are clustered at the PSU level. Stars indicate levels of significance of the differences between treatment arms: ***=1%, **=5%, *=10%.