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The role of unconditional cash transfers during a nutritional emergency in Maradi region, Niger: a pre–post intervention observational study

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Abstract

Objective: To assess the effect of an unconditional cash transfer (CT) implemented as part of an emergency response to food insecurity during a declared state of emergency.
Design: Pre–post intervention observational study involving two rounds of data collection, i.e. baseline (April 2012) and final survey (September 2012), on the same cohort of 'poor' and 'very poor' households enrolled by Save the Children in an unconditional CT programme.
Setting: Aguié district, Maradi, Niger.
Subjects: Households with a non-acutely malnourished child aged 6–36 months (n 412).
Results: The study showed that the living standards of 'poor' and 'very poor' households improved, as indicated by a reduction in poverty-related indicators and an improvement in household food security. Anthropometric outcomes for children aged 6–36 months improved significantly, despite a decline in child health and women's well-being and autonomy. Risk factors for becoming acutely malnourished post-intervention were being from a very poor household at baseline, starting the lean season with low weight-for-height Z-score (WHZ < -1) and the presence of co-morbidity.
Conclusions: The results of the study are consistent with the published evidence regarding the general impact of CT and suggest it is plausible that giving cash during an emergency can help safeguard living standards of the very poor and poor. While improvements in childhood nutrition status were seen it is not possible to attribute these to the CT programme. However, knowledge of the risk factors for acute malnutrition in a particular setting can be used to influence the design of future CT interventions for which a controlled trial would be recommended if feasible.

Keywords
Cash transfers
Pre–post intervention study
Emergency response
Nutrition emergency
Niger

Cash transfers (CT) are becoming a popular intervention of choice by agencies and non-governmental organisations as a complementary or alternative approach to food-based assistance, as part of an emergency response. There is strong evidence that CT programmes lead to an increase in household income and protect household assets from being sold, resulting in an increase in food quantity and improved dietary diversity which in turn are thought to protect children from malnutrition[1]. However, the evidence for an impact of CT on undernutrition is mixed and inconclusive[2–7]. Despite this, CT are increasingly being used in emergency responses with an objective of preventing acute malnutrition.

The mainstay of interventions to treat and prevent moderate acute malnutrition among children aged 6 months to 5 years have been targeted supplementary feeding programmes and blanket supplementary feeding programmes, respectively. The effectiveness of targeted supplementary feeding programmes in some contexts has been called into question[8], while the cost-effectiveness of blanket supplementary feeding programmes has also been challenged. As a result the use of unconditional CT is becoming more common, whereby cash is given to poor parents (usually the mother), who have children at risk of becoming undernourished, during periods of food insecurity or during emergencies.

The present study took place in Aguié district in Maradi region in southern Niger, where poverty and food insecurity have been identified as major factors contributing to undernutrition in children[9]. Over the past decade the

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prevalence of acute malnutrition in Maradi region has mostly remained above 15 %, the threshold applied by the WHO to classify the situation as critical, and is the highest within Niger. In November 2011 the Government of Niger declared a nutrition emergency.

If emergency CT programmes are to prevent malnutrition it is important to understand not only whether the cash is effective in safeguarding households' assets, but also how cash is used and whether this has an indirect effect on children's nutritional status. Due to the ethical difficulties of undertaking a randomised controlled study, the study described here was a prospective observational study. This pre–post intervention study involved the same cohort of households with a non-acutely malnourished child at baseline, to assess (i) changes in mediating factors within the causal pathway between unconditional CT and child nutritional status and (ii) risk factors for acute malnutrition post-intervention.

Methods

Study area

The study was conducted in the twenty-one villages participating in the Save the Children CT programme in Aguié department, located 80 km to the east of the regional capital, Maradi. The department has an estimated population of 386 197 inhabitants whose livelihoods are based on agriculture and rearing livestock. The local agriculture is rain fed – between June and September millet, sorghum and legumes are cultivated, while livestock holdings are small. The period from April/May to September is the most difficult for households because it corresponds to both the lean and rainy seasons, when food availability is poor and field work is intense. During this time, the poorest households borrow grain or money to buy food, which peaks in price on the market due to insufficient supply[10]. Households are categorised into wealth groups according to local definitions of wealth and assets using a Household Economy Approach[10,11]. The Household Economy Approach defines a wealth group as a group of households sharing a similar capacity to exploit the different food and income options within a particular livelihood zone[12], so the divisions depend on how the community views its own society. In this specific context the 'poorest' households were estimated to comprise 42 % of the community and typically had seven members, owned 0·8 ha of land, and had no cattle, two goats and four hens, while the 'poor' households comprised 28 % of the community and had eight household members, owned 1·5 ha of land, and had no cattle, three goats and eight hens[10].

Save the Children UK has implemented CT programmes in Maradi and neighbouring Zinder nearly every lean season since 2008, except 2010, with the objective of protecting people's livelihoods and preventing undernutrition. In 2012, the CT programme was part of a comprehensive, multi-sector emergency response strategy including health, nutrition, food security and livelihoods; water, sanitation, hygiene (WASH); and child protection. However, only the nutrition and CT components were funded and implemented at scale; other sectors were severely underfunded. The CT amounts were set by Save the Children as part of its CT programme and were estimated to meet 80 % of the energy requirements for an average-sized household. The CT was initially equivalent to about GBP32 per household per month, rising to about GBP43 in June when food prices increased.

Save the Children's eligibility criteria for the CT programme depended on two factors: (i) households identified as 'poor' or 'very poor'; and (ii) households with a child less than 5 years old. Some households were also included if considered vulnerable, for example female- or child-headed households.

Procedures and participants

The CT programme took place over six consecutive months. Enrolment and baseline data collection for the study started two weeks prior to the first cash distribution, in April 2012. The last data, a repeat of the baseline data, were collected a week before the final cash distribution in September 2012; thus the data cover five months of CT distributions. The Save the Children CT programme list for Aguié was used as the sampling frame to randomly select eligible households for the study (n 642); those with a child aged 6–36 months without obvious chronic or physical illness affecting anthropometric measurement and not classified as acutely malnourished (defined as weight-for-height Z-score (WHZ) ≥ -2 compared with the WHO growth reference, or mid-upper arm circumference (MUAC) above 125 mm, and free of bilateral oedema). In the small number of cases where there were two or more children aged 6–36 months in the household, one child was randomly selected by the enumerators on the day of enrolment.

The Niger Ministry of Health granted approval for the study. Study participants gave written informed consent with the option to opt out at any time. Each mother was given an identification card with a photograph of the enrolled child for identification purposes in follow-up procedures. To allow collection of data on practices performed at home, as well as ensuring attrition remained low, all data collection was carried out at the homes of enrolled households.

The sample size for the current analysis includes 412 children from households with no missing data. A *post hoc* power estimation, based on the change in mean WHZ and taking into consideration correlation from repeated measures, was >90 %.

Any child who was identified as acutely malnourished (WHZ < -2 and/or MUAC <125 mm or with oedema) at baseline (n 184, 28·7 %) was not included in the study but referred to the nearest supplementary feeding centre.

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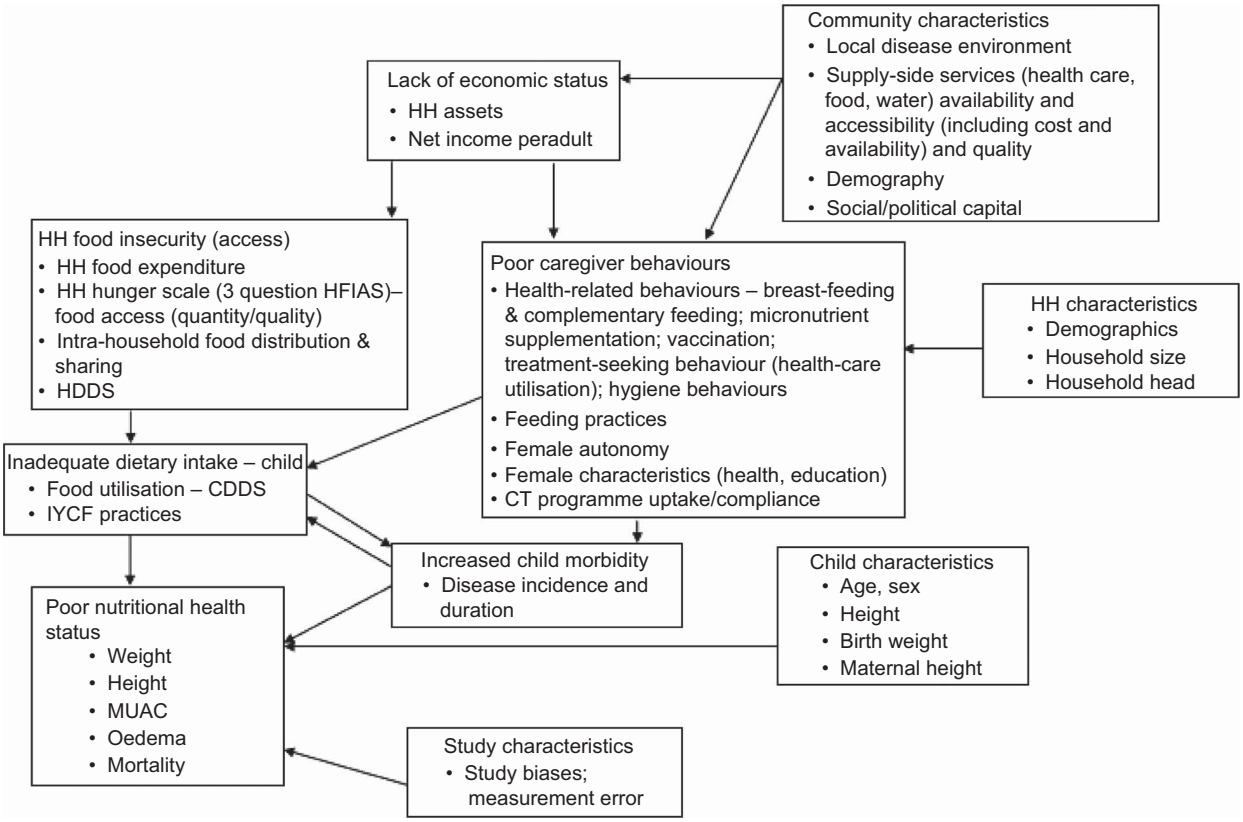

Fig. 1 Conceptual framework for understanding causal pathways for cash transfers (HH, household; HFIAS, Household Food Insecurity Access Scale; HDDS, household dietary diversity score; CDDS, child dietary diversity score; IYCF, infant and young child feeding; MUAC, mid-upper arm circumference; CT, cash transfer)

All quantitative data were collected using a questionnaire which was administered to the mothers of enrolled children during both surveys. The guiding framework (Fig. 1) for our study was adapted from a model developed by Gaarder *et al.*[5], which postulates that CT are mediated through twenty-six underlying community-, household- and individual-level variables which affect a number of necessary health behaviours, so influencing nutritional outcomes. The questionnaire was designed to capture each of these elements. Qualitative data, using a set of open questions mainly to provide information on programme delivery and uptake, were collected through taped key informant interviews with CT beneficiaries (seventeen mothers with an acutely malnourished child were matched geographically and by age and sex of the child to those with a non-acutely malnourished child) and focus group discussions with the three Save the Children programme field staff and the ten study team leaders.

Composite variables were constructed by either summing or scoring data collected. A measure of food security was based on the shortened validated version of the Household Food Insecurity Access Scale (HFIAS)[13]. A household dietary diversity score was created by summing the number of food groups consumed in the past 24 h. A child dietary diversity score was adapted from Ruel and Menon[14] based on breast-feeding, meal frequency and number of food groups consumed each day, appropriate for each age group. A hygiene score was created by combining observations regarding cleanliness of the house, presence or not of animal faeces near the front of the house, presence or not of a hand-washing device in the house or compound, the type of vessel water was stored in (narrow necked, covered or not), and a score for access to safe water from a protected water source that took less than 30 min to collect. A depression score was calculated from the Self-Reporting Questionnaire (SRQ-19) to assess mental health symptom change[15,16].

Women's autonomy was assessed through validated questions aimed at capturing whether or not she had sole, or joint (with husband), control to make decisions on five important issues: women's own health, large and daily household purchases, family visits and daily meals. Social networking was assessed through membership to available groups within the community.

Enumerators were trained to make anthropometric measurements using standard techniques[17], applying SMART (Standardised Monitoring & Assessment of Relief & Transitions) guidelines[18] and standardisation tests during training and refresher training, using the Emergency Nutrition Assessment (ENA) software[19]. Weight was recorded to a precision of 0·1 kg using an electronic baby/toddler scale (Tanita BD-590, USA); the length of

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children <87 cm was measured to a precision of 1 mm using a baby mat (SECA S210, UK); and the height of children ≥87 cm was measured using a plastic stadiometer (Leicester, Child Growth Foundation, UK). A tape was used to measure MUAC on the left arm to a precision of 1 mm. The presence of bilateral pitting oedema was recorded. Moyo weight-for-height charts[20] were used to assess and interpret a child's weight-for-height (according to WHO growth standards for girls and boys) in the home. Age was determined by asking to see a birth certificate or by asking the mother/carer directly; or, if not known, it was estimated using a local event calendar.

Child morbidity (diarrhoea (three watery stools per day), fever, cough or difficulty breathing, malaria) was assessed from mother's knowledge of the child's symptoms during the previous two weeks and verified if the child had been taken for treatment. Co-morbidity was defined as the presence of two or more of these symptoms/diseases.

Statistical analysis

Data were double entered into EpiInfo version 7[21] by two data-entry clerks on the day after data collection. Data were imported, merged and analysed in the STATA statistical software package version 12. Anthropometric indicators of the attained growth standards were calculated using the WHO macro for STATA[22].

Baseline variables for household, mother and child were expressed either as medians (with interquartile range) for continuous variables or percentages for categorical variables. Two-sample Wilcoxon rank-sum (Mann–Whitney *U*) tests (medians) and *z* tests (categorical variables) were carried out to compare variables between survey rounds. To assess risk factors for acute malnutrition, a GEE (generalized estimating equations) approach[23] was used to construct a multivariable logistic regression model, with a logit link and binomial distribution, to account for possible within-child correlation between repeated measures and adjusting for potential confounders. More detailed analyses of risk factors using data collected monthly will be reported elsewhere.

Results

Baseline characteristics for households, mothers and children are shown in Table 1. The sample of households was largely of Hausa ethnicity. The median household size

Table 1 Household, mother and child characteristics at baseline (*n* 412) in a pre–post intervention observational study on the role of unconditional cash transfers during a nutritional emergency among households with a non-acutely malnourished child aged 6–36 months, Aguié district, Maradi region, Niger, April–September 2012

Characteristic	Median or %	IQR	Range
Household			
Household size	7·0	6·0–9·0	3·0–16·0
Number of people aged < 18 years	5·0	3·0–6·0	1·0–11·0
Religion (% Muslim)	100·0	–	–
Ethnicity (%)			
Hausa	79·9	–	–
Fulani/Peul	19·2	–	–
Other	1·0	–	–
Years lived in village	16·5	10–23	2·0–65·0
Safe water supply (%)	51·0	–	–
Minutes to walk to health facility	30·0	10·0–60·0	1·0–150·0
Mothers			
Age (years)	30·0	24·0–35·0	15·0–81·0
Pregnant (%)	17·2	–	–
Highest education level (%)			
None	87·9	–	–
Primary	5·3	–	–
Secondary	0·2	–	–
Informal	6·6	–	–
Child			
Female (%)	50·0	–	–
Age (months)	22·2	15·8–28·0	5·9–35·3
Vaccinated against measles (%)*	82·0	–	–
Received vitamin A supplement† (%)	94·7	–	–
Received BCG vaccination‡ (%)	81·3	–	–
WHZ	−0·9	−1·4 to −0·4	−2·0 to 1·56
HAZ§	−2·5	−3·4 to −1·7	−5·7 to 5·6
Stunted¶ (%)	67·8	–	–

IQR, interquartile range; WHZ, weight-for-height *Z*-score; HAZ, height-for-age *Z*-score.
*Percentage yes with card or with mother's knowledge.
†Over past 6 months.
‡BCG (Bacillus Calmette–Guérin) vaccination against tuberculosis.
§Two measurements were flagged (outside biological range of ±6) and so excluded from analysis.
¶Stunting defined as HAZ < −2.

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Table 2 Comparison of median (and interquartile range) expenditures and incomes between rounds (exclusive of those households without expenditures and incomes; *n* 412) in a pre–post intervention observational study on the role of unconditional cash transfers during a nutritional emergency among households with a non-acutely malnourished child aged 6–36 months, Aguié district, Maradi region, Niger, April–September 2012

	Baseline			Final survey			
Variable	*n*	Median	IQR	*n*	Median	IQR	*P* value*
Money spent in past 3 months (CFA†)							
Adult's clothing	17	3250	1500–6000	50	7000	4350–10 000	< 0·001
Children's clothing	29	1000	500–2000	56	4000	2000–6000	< 0·001
Other clothing	19	500	150–1500	34	1000	300–1600	0·003
Shoes	26	500	300–750	51	1500	1000–2000	< 0·001
Money spent last month (CFA)							
Household food	412	6400	3500–11 400	412	21 000	15 000–26 000	< 0·001
Household medical	103	500	150–1200	253	1200	700–2600	< 0·001
Household non-food	226	525	350–1000	403	1600	900–3500	< 0·001
Child food	407	450	250–750	412	1500	1000–2000	< 0·001
Child medical	85	150	50–250	95	200	100–600	0·01
Child non-food	163	500	200–600	631	700	400–1250	< 0·001
Money spent last week (CFA)							
Household food	412	2000	1200–3000	412	5000	3490–7000	< 0·001
Household medical	60	200	88–850	188	1000	500–2000	< 0·001
Household non-food	190	200	100–500	384	475	250–800	< 0·001
Child food	412	125	75–200	412	350	225–500	< 0·001
Child medical	52	100	50–200	200	200	100–400	0·001
Child non-food	111	125	75–250	287	175	100–500	0·003
Income in past month (CFA)	30	6000	3000–10 000	175	11 500	5500–16 000	0·003

IQR, interquartile range.
**P* value for two-sample Wilcoxon rank-sum (Mann–Whitney *U*) test.
†West African franc.

was 7·0 with a median of 5·0 household members less than 18 years of age. Half the sample reported having access to safe water. The median reported time to walk to a health facility was 30 min (interquartile range: 10–60 min); 119 (28 %) households had to walk for an hour or longer. The median age of mothers was 30 years; two children had no mother so a primary carer was identified. Nearly 94 % of mothers in the study had no formal education.

Girls and boys were equally represented in the sample with a combined median age of 22·2 months. Coverage of children immunised against tuberculosis (BCG vaccine), receiving vitamin A supplementation and vaccinated against measles met district targets (>80 %)[24]. The percentage of children who were stunted was very high (67·8 %).

Data on changes in reported expenditures (from recall) and income are shown in Table 2. Expenditures on food and non-food items and medical costs for adults between the baseline and final surveys, with recall periods of 3 months, a month and a week were all significantly higher ($P < 0·001$). This increase was lower, but still significant, for medical expenditure on children during the previous week ($P = 0·001$) and during the previous month ($P = 0·01$). Medical expenditures on children are difficult to assess because the government provides free services for children under 5 years of age, although some families took their child to non-government health service providers, including drug peddlers, for treatment where costs were incurred. Reported incomes, recalled from the past month, were significantly higher ($P = 0·003$); as was the number of people in waged employment ($P < 0·001$; data not shown).

Baseline and final survey comparisons for household and child variables are shown in Table 3. According to the same Household Economy Approach classification at baseline, the number of households classified as 'very poor' decreased significantly over time ($P = 0·04$); 7 % of households were identified as being in the top two wealth groups, compared with 1 % at baseline. There were significant differences ($P < 0·001$) between survey rounds in the number of assets bought (higher) and sold (lower), especially among 'very poor' households. The percentage of households in financial debt (self-reported) was significantly lower in the final survey ($P = 0·01$) as was the percentage of households with men migrating for work ($P < 0·001$), reflecting increased incomes and employment with more men returning to the community.

Social networking improved significantly over time: twice as many households reported joining a community group ($P = 0·02$) compared with baseline, although the percentage of households belonging to any group was still small (8·7 %). Women's decision making declined significantly with an increasing number of men making decisions alone, especially on spending money on large household purchases ($P < 0·001$), small daily household items ($P = 0·01$) and on what was eaten each day ($P = 0·01$).

While there was a significant improvement in mother's self-reported mental health, women perceived that their physical health declined. Child morbidity reported during the previous two weeks, especially malaria incidence, was also significantly higher than at baseline, coinciding with the usual malaria transmission during the rainy season which started in July[25].

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Table 3 Comparison of baseline and final survey household and child variables (*n* 412) in a pre–post intervention observational study on the role of unconditional cash transfers during a nutritional emergency among households with a non-acutely malnourished child aged 6–36 months, Aguié district, Maradi region, Niger, April–September 2012

	Baseline	Final	Difference		
Categorical variables		%		*z* test	*P* value*,†
Wealth group using HEA classification					
Better off	0·0	0·2	0·2	–	–
Middle	1·0	6·6	5·6	0·4	0·66
Poor	63·8	70·6	6·8	1·7	0·09
Poorest	35·2	22·6	– 12·6	2·1	0·04
Assets (sold)	24·4	5·3	– 19·1	– 7·7	< 0·001
Assets (owned)					
Donkey	7·2	18·0	10·7	4·6	< 0·001
Plough	0·5	8·3	7·8	5·5	< 0·001
Debt (yes)	25·4	18·2	– 7·2	– 2·5	0·01
Migration (out migration for work)	20·5	7·3	– 13·2	– 5·5	< 0·001
Household food security index (poor)	86·2	4·1	– 82·1	– 23·7	< 0·001
Social networks (yes)	4·6	8·7	4·1	2·4	0·02
Woman's decision making (woman alone or jointly with husband)					
Woman's own health	22·9	18·8	– 4·2	– 1·5	0·14
Large household purchases	21·7	6·6	– 15·1	– 6·2	< 0·001
Daily household purchases	27·7	19·8	– 8·0	– 2·7	0·01
Family visits	19·6	18·3	– 1·3	– 0·5	0·64
Daily meals	40·1	31·5	– 8·6	– 2·6	0·01
Hygiene category (highest)	18·6	22·0	3·4	1·2	0·23
Mother's health (self-reported) (poor)	18·4	34·4	16·1	5·3	< 0·001
Child morbidity‡ (any)	37·7	61·7	24·0	6·9	< 0·001
Child co-morbidity§ (yes)	9·2	13·1	3·9	1·8	0·07
Continuous variables		Median			
WHZ	– 0·85	– 0·60	0·25	4·94	< 0·001
WHZ‖ (*n* 17)	– 1·23	– 2·63	– 1·40	– 4·98	< 0·001
MUAC (cm)	14·1	14·4	0·3	4·49	< 0·001
MUAC (cm)‖ (*n* 10)	13·3	12·4	0·9	– 3·33	< 0·001
Household dietary diversity score	2·0	4·0	2·0	18·9	< 0·001
Child dietary diversity score	4·0	6·0	2·0	13·0	< 0·001
Mother's depression score	8·5	6·0	– 2·5	– 7·0	< 0·001

HEA, Household Economy Approach; WHZ, weight-for-height *Z*-score; MUAC, mid-upper arm circumference.
**P* value for paired *z* test for categorical variables.
†*P* value for two-sample Wilcoxon rank-sum (Mann–Whitney *U*) test for continuous variables.
‡One of diarrhoea, malaria, respiratory infection or measles.
§With two or more diseases occurring together.
‖Became acutely malnourished (WHZ < – 2).

Table 4 Multivariable analysis of risk factors associated with acute malnutrition using generalised estimating equations (*n* 412) in a pre–post intervention observational study on the role of unconditional cash transfers during a nutritional emergency among households with a non-acutely malnourished child aged 6–36 months, Aguié district, Maradi region, Niger, April–September 2012

Variable	Category	Coefficient*	SE	*z*†	*P* > |*z*|‡	95 % CI
Age	–	– 0·0238	0·0306	– 0·78	0·437	– 0·0837, 0·0362
Sex	Boys	Ref.				
	Girls	– 0·0786	0·5068	– 0·16	0·877	– 1·0719, 0·9146
Baseline wealth group	Poor	Ref.				
	Poorest	1·2431	0·5127	2·42	0·015	0·2381, 2·2480
WHZ < – 1 to ≥ – 2 at baseline	No	Ref.				
	Yes	1·4104	0·5790	2·44	0·015	0·2757, 2·5452
Morbidity	None	Ref.				
	Morbid	0·2386	0·5918	0·40	0·687	–0·9214, 1·3986
	Co-morbid	1·4783	0·6419	2·30	0·021	0·2201, 2·7365

WHZ, weight-for-height *Z*-score; Ref., referent category.
*Log odds.
†*z* Statistic.
‡Corresponding *P* value.

There was an improvement in food security indicated by a significant average increase in dietary diversity for both households and children ($P < 0·001$). The proportion of children who developed acute malnutrition post-intervention was 4·1 % (*n* 17); 1 % (*n* 4) were severely acutely malnourished (WHZ < – 3). Ten children (2·4 %)

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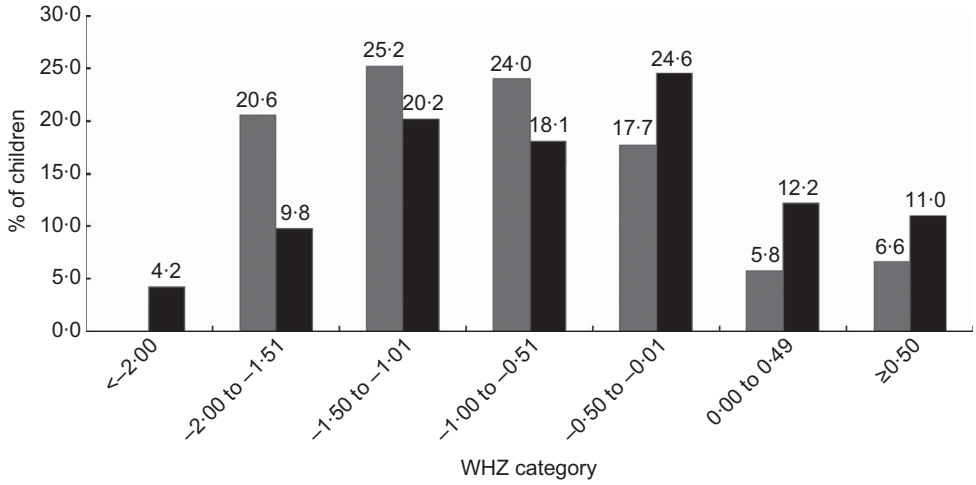

Fig. 2 Distribution of weight-for-height *Z*-score (WHZ) category over time (■, April 2012; ■, September 2012) among non-acutely malnourished children aged 6–36 months (*n* 412) in a pre–post intervention observational study on the role of unconditional cash transfers during a nutritional emergency in Aguié district, Maradi region, Niger

had MUAC <12·5 cm; all of these children also had WHZ < -2. Anthropometric measurements (WHZ and MUAC) showed significant improvements ($P < 0{\cdot}001$) from baseline. Children who were acutely malnourished post-intervention showed a significant decline in both WHZ and MUAC ($P < 0{\cdot}001$) from baseline, as would be expected. Risk factors associated with acute malnutrition adjusted for age and sex (Table 4) were belonging to a very poor household at baseline ($P = 0{\cdot}015$), starting the lean season with WHZ < -1 but ≥ -2 ($P = 0{\cdot}015$) and the presence of co-morbidity ($P = 0{\cdot}021$). The percentage of children with WHZ < -1 to ≥ -2 was significantly lower in the final survey (30·0 % *v.* 45·8 % at baseline; $P < 0{\cdot}001$) with a higher percentage of children with WHZ > -1 (Fig. 2).

Qualitative data indicated that programme delivery was very good, with timely monthly payments made to every enrolled household as planned. Uptake of the programme was 100 % and satisfaction high. One of the most commonly stated reasons for this was that men were less likely to migrate for work and those who did, returned earlier than usual.

Discussion

The present study captured many of the moderating factors within the causal framework for undernutrition and the results are consistent with the direction of many of the pathways. The study shows that over five months of cash distribution, indicators of the living standards of 'poor' and 'very poor' households were raised; indicated by a reduction in indicators of poverty (improvement in household expenditures, incomes, employment, asset protection, wealth rank, access to social networks) and an improvement in indicators of household food security (household food security score, household and child dietary diversity). Furthermore, anthropometric measurements for children aged 6–36 months improved significantly, despite an increase in the incidence of child disease and decline in women's well-being and autonomy. Children were more likely to be acutely malnourished if they started the lean season in a household classified as 'very poor', with low WHZ at baseline and/or experienced co-morbidity. The important findings from the study are consistent with the available evidence on the general impact of CT[2,3,5,7] and as such suggest plausible improvements due to the CT.

There are a number of study limitations. Without a control group it is not possible to attribute the changes seen in the participants to the cash alone. Secular trends and seasonality may also explain some of the differences seen in the study findings. For example, the reduction in number of households reporting male members migrating for work may have been a result of normal seasonal changes[26] or increased household income from the CT. Qualitative interviews with key informants and Save the Children field staff indicated that men had come back to the community earlier than expected because they heard about the CT programme. That there were more men within the community during the final survey may help explain why women's autonomy declined significantly. It is common practice in this area for men to buy the staple foods from the markets and so, even though women were the targeted beneficiaries of the CT programme, the cash would be handed over to their husbands, who would then give a small amount back to the women to buy other mainly non-food items. This was consistent with information from qualitative interviews.

Improved access to food through increased incomes could help explain some of the improvements in food security and dietary diversity for both households

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and children. The main grain harvest usually starts in October[25]; thus improved access to food through increased availability would not be expected until the harvest, which was not covered by the present study.

The decline in perceived health status of women and increase in child morbidity are related to the rainy season, which coincides with the annual malaria epidemic[9,27]. It is difficult to say here by how much child anthropometric status would have improved had the incidence of disease also declined, but the strong association between nutritional status and disease indicates that reducing morbidity could have added benefits to child anthropometric status.

Finally, potential sources of bias, especially regarding collection of expenditure data, need consideration. Important here are both recall and social desirability bias in which respondents tend to give answers that will be viewed favourably by others[28]. Recall of expenditures on food, non-food and medicines may be different. For example, it is difficult to separate out expenditure on a child's food if that food is part of the household food as opposed to expenditure on non-food items and medicines specifically for the child.

Conclusions

The results from the present study are consistent with the available evidence from impact evaluations of CT programmes and plausibly show that giving cash during an emergency can help safeguard living standards of the very poor and poor in this population.

The results also show that the nutritional status of children aged 6–36 months who remained non-acutely malnourished improved, although without a control group it is difficult to say with certainty whether this was due to the CT programme and/or seasonal or secular trends. Interestingly, those children who fared worse were already worse off at baseline and this information provides important evidence as to the potential barriers to preventing acute malnutrition. To make a probability statement would require formal testing using controlled experimental or quasi-experimental methods, with a focus on areas that did not improve during the study and that are often associated with child nutrition status, such as child health; as well as investigating the effect of earlier transfers of cash to prevent low WHZ and to increase resilience of households prior to the lean season.

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References

1. Department for International Development (2011) *DFID Cash Transfers Evidence Paper*. London: DFID.
2. Manley J, Gitter S & Slavchevska V (2012) *How Effective are Cash Transfer Programmes at Improving Nutritional Status? A Rapid Evidence Assessment of Programmes' Effects on Anthropometric Outcomes*. London: EPPI-Centre, Social

Science Research Unit, Institute of Education, University of London.
3. Leroy JL, Ruel M & Verhofstadt E (2009) The impact of conditional cash transfer programmes on child nutrition: a review of evidence using a programme theory framework. *J Dev Effect* **1**, 103–129.
4. Independent Evaluation Group (2011) *Evidence and Lessons Learned from Impact Evaluations on Social Safety Nets*. Washington, DC: World Bank.
5. Gaarder M, Glassman A & Todd J (2010) Conditional cash transfers and health: unpacking the causal chain. *J Dev Effect* **2**, 6–50.
6. Fiszbien A, Schady N, Ferreira FHG *et al*. (2009) Conditional Cash Transfers: Reducing Present and Future Poverty. A World Bank Policy Research Report. http://siteresources.worldbank.org/INTCCT/Resources/5757608-1234228266004/PRR-CCT_web_noembargo.pdf (accessed January 2012).
7. Bailey S & Hedlund K (2012) *The Impact of Cash Transfers on Nutrition in Emergency and Transitional Contexts. A Review of the Evidence. HPG Synthesis Paper*. London: Overseas Development Institute.
8. Navarro-Colorado C, Mason F & Shoham J (2008) *Measuring the Effectiveness of Supplementary Feeding Programmes in Emergencies. HPN Network Paper* no. 63. London: Humanitarian Practice Network, Overseas Development Institute.
9. Save the Children UK (2009) *How Cash Transfers Can Improve the Nutrition of the Poorest Children. Evaluation of a Pilot Safety Net Project in Southern Niger*. London: Save the Children UK.
10. Save the Children UK (2009) Understanding Household Economy in Rural Niger. http://www.savethechildren.org.uk/sites/default/files/docs/Understanding_HE_in_Rural_Niger_low_res_comp_1.pdf (accessed September 2012).
11. Save the Children UK (2008) The Practitioners' Guide to the Household Economy Approach. http://www.savethechildren.org.uk/sites/default/files/docs/The_Practitioners_Guide_to_HEA_1.pdf (accessed February 2012).
12. Save the Children UK (2012) Guide to the Household Economy Approach. http://www.savethechildren.org.uk/resources/online-library/practitioners%E2%80%99-guide-household-economy-approach (accessed February 2012).
13. Coates J, Swindale A & Bilinsky P (2007) *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v. 3)*. Washington, DC: Food and Nutrition Technical Assistance Project, Academy for Educational Development.
14. Ruel MT & Menon P (2002) *Creating A Child Feeding Index Using the Demographic and Health Surveys: An Example from Latin America. FCND Discussion Paper* no. 130 Washington, DC: International Food Policy Research Institute.
15. Harding TW, Arango MV, Baltazar J *et al*. (1980) Mental disorders in primary health care: a study of the frequency and diagnosis in four developing countries. *Psychol Med* **10**, 231–242.
16. Beusenberg M & Orley J (1994) *A User's Guide to the Self Reporting Questionnaire (SRQ)*. Geneva: WHO.
17. Habicht JP (1974) Standardisation of quantitative epidemiological methods in the field. *Bull World Health Organ* **76**, 375–384.
18. SMART (Standardized Monitoring & Assessment of Relief & Transitions) (2006) Measuring Mortality, Nutritional Status, and Food Security in Crisis Situations: SMART METHODOLOGY. http://www.smartindicators.org/SMART_Methodology_08-07-2006.pdf (accessed February 2012.
19. ENA (2009) Software for Emergency Nutrition Assessment. http://www.nutrisurvey.de/ena_beta/ena-epiinfo/index.htm (accessed February 2012).
20. Sikorski C, Kerac M, Fikremariam M *et al*. (2010) Preliminary evaluation of the Moyo chart – a novel, low-cost, weight-for-height slide chart for the improved assessment of nutritional status in children. *Trans R Soc Trop Med Hyg* **104**, 743–745.
21. Dean AG, Arner TG, Sunki GG *et al*. (2011) *Epi Info™, A Database and Statistics Program for Public Health Professionals*. Atlanta, GA: Centers for Disease Control and Prevention.
22. World Health Organization (2011) Child growth standards. WHO Anthro (version 3.2.2, January 2011) and macros. http://www.who.int/childgrowth/software/en/ (accessed February 2012).
23. Diggle PJ, Liang KY & Zeger SL (1994) *Analysis of Longitudinal Data*. Oxford: Oxford Science Publications.
24. World Health Organization (2012) *Global Measles and Rubella Strategic Plan: 2012–2020*. Geneva: WHO.
25. Doctors Without Borders/Médecins Sans Frontières (2012) Malaria compounding the ongoing food crisis in Niger. http://www.doctorswithoutborders.org/news/article_print.cfm?id=6292 (accessed July 2013).
26. Famine Early Warning Systems Network (2012) FEWS NET Seasonal Calendar and Critical Events Timeline. http://www.fews.net/pages/timelineview.aspx?gb=ne&tln=en&l=en (accessed July 2013).
27. Ehrhardt S, Burchard GD, Mantel C *et al*. (2006) Malaria, anemia, and malnutrition in African children – defining intervention priorities. *J Infect Dis* **194**, 108–114.
28. Paulhus DL (1991) Measurement and control of response biases. In *Measures of Personality and Social Psychological Attitudes*, pp. 17–60 [JP Robinson, PR Shaver and LS Wrightsman, editors]. San Diego, CA: Academic Press.