



REFANI

RESEARCH ON FOOD ASSISTANCE
FOR NUTRITIONAL IMPACT

SUMMARY REPORT

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REPORT OVERVIEW

The REFANI project was established to strengthen the evidence base on the nutritional impact and cost-effectiveness of cash and voucher transfer programmes for populations affected by humanitarian emergencies. Informed by an analysis of evidence gaps, the theory of change that was developed, and discussions with country partners, the consortium defined the specific research questions and study designs which were implemented in Pakistan, Niger, and Somalia. The findings from these studies should be of value to those concerned with CBI, particularly in humanitarian and fragile contexts.

The REFANI project was conducted over a four-year period between 2014 and 2017, with funding from the UK Department for International Development and co-financing through humanitarian aid from the European Commission. In all three studies, the primary outcomes of interest were the effect of CBI on the risk of acute malnutrition and mean weight for height (WHZ) in children, 6-59 months of age. The studies also examined a set of secondary outcomes including household expenditure, food security, diet diversity, coping strategies, morbidity, WASH, access to health care, maternal nutrition, stunting, and blood haemoglobin concentration.

TABLE 1 The REFANI Study Sites and Study Designs

<i>Study Country</i>	<i>Niger</i>	<i>Pakistan</i>	<i>Somalia</i>
Study Area	Affala and Takanamatt communes, Tahoua	Dadu district, rural and semi-rural Sindh Province	Afgoye Corridor, peri-urban Mogadishu
Humanitarian context	Resident population affected by high levels of poverty and recurrent seasonal hunger gaps	Resident population with recurrent periods of high wasting during summer lean season & prone to disasters	Internally displaced persons (IDP) living in camps; displaced by on-going conflict and drought
Study Population	Children 6-59 months and mothers or carers	Children 6-48 months at baseline and mothers or carers	Children 6-59 months and mothers or carers
Design	Two arm cluster randomised controlled trial (10 clusters per arm)	Four arm cluster randomised controlled trial (114 clusters in total)	Two arm cluster controlled trial (10 clusters per arm)
Sample size	1,932 HHs 1,831 children	2,469 HHs 3,462 children	228 HHs and 332 children received detailed questionnaire. 2,138 children had MUAC measured monthly

STUDY SITES AND CONTEXT

The REFANI study sites were chosen to reflect a range of different humanitarian contexts. The Niger study was implemented in the arid district of Tahoua in south west Niger, where there is an annual lean season or hunger gap between June and September during which most households are unable to produce sufficient cereals for their own consumption. Besides food insecurity, challenges in the public health and social and caring environment also exist. The Pakistan study was set in Dadu District in Sindh Province, southeast Pakistan. Here, the economy is largely agrarian; dependent on crop production, livestock keeping, and agriculture labour, and is highly vulnerability to climatic shocks such as flooding. The third study was located in southern Somalia which has one of the highest global prevalences of child acute malnutrition due to a prolonged state of instability and conflict, coupled with natural disasters. The study was conducted in IDP camps located in Weydow area, Deyniile district, Mogadishu.

INTERVENTIONS AND STUDY DESIGNS

The study sites and designs are summarised in **TABLE 1**. All the studies utilised a cluster controlled design with randomised clusters in Niger and Pakistan and purposively selected clusters in Somalia. Mixed methods were utilised involving both quantitative and qualitative methods. All 3 studies were registered with ISRCTN and the protocols were peer reviewed and published^{5,6,7}. The interventions that were tested are summarised in **TABLE 2**, which also provides an overview of some of the trial results. The main results from the Pakistan trial have been published and publication of the two other trials is expected soon⁸. The main trial findings from the three studies are summarised below.

TRIAL RESULTS

CASH AND VOUCHER TRANSFERS DID NOT CONSISTENTLY REDUCE ACUTE MALNUTRITION

The combined findings from Pakistan and Somalia indicate that cash and voucher transfers are only effective at reducing acute malnutrition in some contexts. Of the 4 intervention arms in these 2 studies, only the double cash intervention in Pakistan resulted in a decrease in the prevalence or incidence of GAM. Although statistically significant the effect size was small. Mean WHZ improved in this arm and also in the arm receiving fresh food vouchers but in this latter arm no decrease in GAM was seen, suggesting that weight gain was not achieved in the most vulnerable children. In the CTP comparison study in Niger there was no difference in GAM at endline despite increases in expenditure and improvements in food security. This finding strongly suggests the role of malaria and other infections in the causation of acute malnutrition in the Niger context.

THE IMPACT OF CASH TRANSFERS ON ACUTE CHILD MALNUTRITION WAS TRANSIENT

The transfer of 'double cash' in the Pakistan setting was effective in reducing the odds of GAM at 6 months post-baseline. However, by 12 months of follow up there was no significant difference between the intervention and control arms, indicating that the reduction in the risk of GAM was transient and not sustained much beyond the intervention period.

CASH AND VOUCHER TRANSFERS REDUCED STUNTING IN PAKISTAN

The Pakistan study produced compelling evidence that cash and voucher transfers can increase mean HAZ and reduce stunting. This effect was seen in all 3 study arms and the improvement was seen both at 6 months and 12 months of follow-up, indicating a sustained benefit on child growth.

CASH TRANSFERS INCREASED HOUSEHOLD EXPENDITURE

In both studies that included a control group that received no cash, we observed increases in total household expenditure and/or household food expenditure.

CASH TRANSFERS IMPROVED HOUSEHOLD FOOD SECURITY

In all three studies cash transfers led to improvements in household food security. However, we saw no improvement in food security following a fresh food voucher transfer.

5 Sibson VL, Grijalva-Eternod CS, Bourahla L, Haghparast-Bidgoli H, Morrison J, Puett C, et al. The REFANI-N study protocol: a cluster-randomised controlled trial of the effectiveness and cost-effectiveness of early initiation and longer duration of emergency/seasonal unconditional cash transfers for the prevention of acute malnutrition among children, 6-59 months, in Tahoua, Niger. *BMC Public Health*. (2015) 15:1289.

6 Fenn B, Sangrasi GM, Puett C, Trenouth L, Pietzsch S. The REFANI Pakistan study-a cluster randomised controlled trial of the effectiveness and cost-effectiveness of cash-based transfer programmes on child nutrition status: study protocol. *BMC Public Health*. (2015)15:1044.

7 Jelle M, Grijalva-Eternod CS, Haghparast-Bidgoli H, King S, Cox CL, Skordis-Worrall J, Morrison J, Colbourn T, Fottrell E, Seal AJ. The REFANI-S study protocol: a non-randomised cluster controlled trial to assess the role of an unconditional cash transfer, a non-food item kit, and free piped water in reducing the risk of acute malnutrition among children aged 6-59 months living in camps for internally displaced persons in the Afgoye corridor, Somalia. *BMC Public Health*. (2017)17:632.

8 Fenn B, Colbourn T, Dolan C, Pietzsch S, Sangrasi M, Shoham J. Impact evaluation of different cash-based intervention modalities on child and maternal nutritional status in Sindh Province, Pakistan, at 6 mo and at 1 y: A cluster randomised controlled trial. *Plos Medicine*. (2017) 14, 24. The results from the other two trials will be published in the near future.

CASH AND VOUCHER TRANSFERS IMPROVED DIETARY DIVERSITY

In households receiving cash transfers in Pakistan and Somalia there was an improvement in household diet diversity scores (DDS) but this improvement was not seen in response to a fresh food voucher in Pakistan (TABLE 2). Improvements in individual DDS were seen in both women and children in all arms receiving either cash or fresh food voucher transfers.

THE SIZE OF THE CASH TRANSFER IS ONE FACTOR THAT INFLUENCES EFFECTIVENESS

We found some evidence that nutrition impacts are effected by the size of the cash transfer. In Pakistan, while the standard cash intervention did not reduce the prevalence of GAM the double cash intervention was effective. However, it is also worth noting that the size of the cash transfer in Pakistan was the smallest when comparing the unadjusted value of the transfers used in the 3 studies.

NUTRITIONAL IMPACTS OF CBI ARE MODULATED BY SEASONALITY AND THE EPIDEMIOLOGY OF INFECTIOUS DISEASE

The prevalence of GAM and other indicators of interest in these studies are often influenced by seasonality. Therefore, the change, or lack of change, in indicators between baseline and endline measurements needs to be interpreted with this in mind. Large decreases in the prevalence of GAM in all study arms were observed over the course of the study in Pakistan and, to a lesser extent, in Somalia. In contrast, no change in the prevalence of GAM was seen in Niger between baseline and end line. It is likely that the seasonal spike in malaria infection overwhelmed the benefits of improved food security and diet diversity seen in both study arms in Niger. The importance of seasonality remains key and cash or voucher transfers implemented in the same locations but during a different season may have different impacts to those described here.

THE USE OF FRESH FOOD VOUCHERS

Fresh food voucher transfers did not increase dietary diversity as we had expected. The use of vouchers is likely to be optimal where food availability is good and access (via income) is limited. However, the design and running of a voucher programme is inherently more complex than an unconditional cash transfer. This was reflected in the relatively high cost transfer ratio for this intervention.

THE COST OF PROGRAMME DELIVERY

The cost of making the cash or voucher transfers were fairly consistent across the studies, with the modified cash intervention in Niger being somewhat higher than the others at \$183 per beneficiary household (TABLE 3). The total cost transfer ratio, i.e. the cost to transfer \$1 to a household ranged from 1.55 for the standard cash arm in Niger to 2.51 for the single cash arm in Pakistan, similar to the results from other studies on cash and voucher transfer programmes.

THE COST OF PROGRAMME PARTICIPATION

Participation in the CBI programmes also resulted in costs for beneficiary households. These depended on local prices and the programme design, ranging from \$5 for households receiving the fresh food vouchers up to \$17 for households receiving cash transfers in Pakistan, with the cost to beneficiaries in Niger falling somewhere between these high and low values.

COST EFFECTIVENESS

Evidence on the cost-effectiveness of CBI on nutrition outcomes in emergency settings is still nascent and has focused primarily on treatment as opposed to prevention interventions. The cost reported here for preventing a case of acute malnutrition in Pakistan is relatively high. However, caution is required with comparing the costs of prevention and treatment. Preventive interventions will likely carry higher costs per beneficiary and per case of disease prevented than the resources required to manage an identified case. In many cases the cost per case averted estimated by a CEA will not adequately represent the full range of benefits the cash transfer is likely to confer.

TABLE 2 Key Trial Results

Study Country & Arm		Global Acute Malnutrition		Mean MUAC (cm)		Stunting (HAZ <-2)		Individual Dietary Diversity Score		Recent morbidity ³	
		Baseline prevalence % (95% CI) & mean WHZ ± SD	6 month OR or HR (95% CI); diff. mean WHZ (95% CI)	Baseline mean ± SD	6 month intervention effect	Baseline prevalence % (95% CI)	6 month intervention effect	Baseline mean SD	6 month intervention effect	Baseline prevalence % (95% CI)	6 month intervention effect
Niger	Standard Cash (US\$ 58.25/mo. for 4 mo.)	14.1 % (10.3, 18.8) -0.98 ± 1.00		14.2 ± 1.3		36.6% (33.0, 40.3)		2.3 ± 1.3		27.5 % (18.0, 39.8)	
	Modified Cash (US\$ 38.83/mo. for 6 mo.)	12.9 % (9.5, 17.4) -0.87 ± 0.99	OR 1.10 (0.77, 1.56) P=0.60 -0.00 (-0.09, 0.09) P=0.98	14.4 ± 1.2	-0.90 (-2.38, 0.58) P=0.236	34.8% (30.6, 39.3)	OR 1.33 (0.97, 1.84) P=0.078	2.3 ± 1.3	-0.03 (-0.59, 0.52) P=0.904	31.5% (26.8, 36.5)	-4.3 (-19.5, 11.0) P=0.565
Pakistan	Control	21.9% (19.2, 24.9) -1.15 ± 1.30		13.5 ± 1.2		51.7% (48.2-55.1)		7.5 ± 2.0		82.5% (79.8, 85.0)	
	Single Cash (US\$ 14.59/mo. for 6 mo.)	22.0% (19.3, 24.8) -1.11 ± 1.34	OR 1.09 (0.64, 1.87) P=0.75 + 0.04 (-0.07, 0.14) P=0.50	13.5 ± 1.3	0.06 (-0.02, 0.15) P=0.15	50.9% (47.6-54.2)	OR 0.36 (0.22, 0.59) P<0.001	7.0 ± 1.9	+0.59 (0.39, 0.79) P<0.001	75.9% (73.0, 78.7)	OR 0.79 (0.57, 1.08) P=0.14
	Double Cash (US\$ 29.19/mo. for 6 mo.)	24.0% (21.1, 27.1) -1.24 ± 1.28	OR 0.52 (0.29, 0.92) p=0.02 + 0.11 (0.00, 0.21) P<0.05	13.6 ± 1.3	0.06 (-0.15, 0.03) P=0.21	46.5% (43.0-49.9)	OR 0.39 (0.24, 0.64) P<0.001	7.1 ± 2.0	+0.73 (0.53, 0.93) P<0.001	80.7% (77.8, 83.3)	OR 0.97 (0.71, 1.33) P=0.87
	Fresh Food Voucher (US\$ 14.60/mo. for 6 mo.)	19.3% (16.7, 22.1) 1.08 ± 1.14	OR 1.16 (0.67, 2.01) P=0.60 + 0.16 (0.05, 0.26) p=0.004	13.8 ± 1.2	-0.05 (-0.14, 0.04) P=0.27	54.9% (51.5-58.3)	OR 0.41 (0.25, 0.67) P<0.001	7.2 ± 1.9	+0.43 (0.23, 0.63) P=0.001	78.9% (76.0, 81.5)	OR 1.04 (0.77, 1.41) P=0.80
Somalia	Control	13.7% (8.84; 20.7) -0.82 ± 1.13		14.3 ±1.48		45.4% (36.4, 54.2)		2.37 ± 0.97		68.5% (63.0, 73.6)	
	Intervention (US\$ 84.00/mo. for 6 mo.)	14.9% (10.5; 20.8) -0.83 ± 1.13	HR 0.94 (0.51, 1.74) P=0.84	14.1 ± 1.44	-0.07 (-0.38, 0.24) P=0.6	55.5% (44.6, 65.9)	-0.16% (-7.61, 7.29) P=0.9	2.95 ±1.03	+0.57 (0.04, 1.10) P=0.036	74.2% (62.2; 83.4)	-4.41% (-28.8, 19.9) P=0.7

1 Adjusted for child age, sex, and baseline measure

2 The hazard ratio (HR) for acute malnutrition was calculated using MUAC data collected on all children in the study IDP camps by a population surveillance system.

3 A 2 week recall period was used in Pakistan and a 4 week recall period was used in Niger and Somalia.

TABLE 3 Main cost, cost-efficiency, and cost-effectiveness results from Niger and Pakistan (\$US)

	<i>Niger</i>		<i>Pakistan</i>		
	<i>Standard Cash</i>	<i>Modified Cash</i>	<i>Single Cash</i>	<i>Double Cash</i>	<i>Fresh Food Voucher</i>
Costs					
Value of transfer/ household	\$233	\$233	\$88	\$175	\$88
Implementation cost/ household	\$127	\$183	\$105	\$109	\$132
Total programme cost/ household	\$361	\$416	\$193	\$284	\$220
Cost of programme participation/household	\$10.06	\$13.50	\$16.87	\$16.87	\$4.92
Cost-efficiency					
Total cost transfer ratio (per \$US)	1.55	1.78	2.20	1.62	2.51
Cost-effectiveness					
Cost/case of wasting averted				\$4,865	
Cost/case of stunting averted			\$882	\$1,290	\$883
Cost/DALY averted, wasting & stunting ¹				\$1,252	
Cost/DALY averted, stunting ¹			\$845		\$1,096

1 Discounted and age-weighted

CONCLUSIONS AND RECOMMENDATIONS

1. THE IMPACT OF CASH AND VOUCHER TRANSFERS SHOULD BE ASSESSED WITHIN THE WIDER HUMANITARIAN CONTEXT

UCT will usually be implemented with the aim of achieving a range of different humanitarian outcomes, which may or may not explicitly include nutrition. While not directly addressed within the research conducted for REFANI, the primary aim of humanitarian response is to reduce excess mortality and cash transfers may or may not influence this overriding objective via a number of pathways. Therefore, in assessing the benefit and cost-benefit of CBI programmes it is important to take into account their multiple purposes, which may encompass a number of sectors and potential outcomes. Analysing the costs for CBI recipients is another element to include when considering impact. This raises methodological challenges for designing and implementing efficacy and effectiveness studies, and cost-effectiveness analysis. Cost-efficiency and cost-effectiveness comparisons with other studies should be done with caution as methods and approaches are still evolving.

2. CERTAIN DESIGN FEATURES OF CASH AND VOUCHER TRANSFER PROGRAMMES – INCLUDING THEIR INTEGRATION WITH OTHER INTERVENTIONS, TRANSFER SIZE, AND PURCHASING RESTRICTIONS – MUST BE CONSIDERED TO OPTIMISE NUTRITION-RELATED EFFECTS

A. Integration

Cash and voucher transfers alone may often not prove sufficient to reduce acute child malnutrition in humanitarian contexts, and therefore, will often require integration with other context-specific interventions to achieve nutrition-related goals. The exact mix of interventions will depend on the nature of the emergency, the resources and infrastructure available to the affected population, and the availability of goods and services through the market. Important drivers of health and nutrition outcomes, including access to public health services such as vaccination, availability of water and sanitation infrastructure, and access to curative nutrition and health services, are unlikely to be strongly influenced by cash transfers to individual beneficiaries in most contexts, and will continue to require direct, sector-specific interventions.

B. Size

The size of the cash transfer is an important design feature and the amount needs to be both consistent with national benchmarks/programmes yet adequate to allow households to utilise cash for improved dietary intake and to enhance their resilience to illness.

C. Restrictions

When designing restricted voucher transfer programmes it is important to ensure the adequate availability of macro and micronutrient containing foods in the food vendor outlets. Attention is particularly warranted in areas where high level of anaemia or other forms of micronutrient malnutrition exist prior to the intervention.

3. RESEARCH IN HUMANITARIAN CONTEXTS IS CHALLENGING BUT KEY FOR PROMOTING EVIDENCE-BASED INTERVENTIONS

Research in humanitarian contexts is vital to help facilitate and promote evidence-based practice. The challenges of conducting research varies from context to context and requires a variety of approaches that may include elements of remote research support and management, as well as on the ground engagement from the lead research team. It may be that operational and ethical reasons prevent the inclusion of control groups and certain types of measurements in some contexts but allow them in others. A pragmatic, opportunistic, and flexible approach to research in humanitarian contexts is therefore needed from all stakeholders. The involvement of independent research organisations is important to ensure any possible conflicts of interest are mitigated and to lend credibility to the findings. In all cases, the involvement of a dedicated team of field data collectors is indispensable.

4. STAKEHOLDERS SHOULD WORK TOGETHER TO ENABLE COMPARABLE STUDIES AND OPTIMISE GENERALIZABILITY

Due to the range of different contexts in which humanitarian programmes are implemented the challenge of maximising the generalizability of research findings from a single study or series of studies is a key issue. Efforts to ensure consistency between different studies are very important, but, for various reasons, it is unlikely that harmonisation of all measures and outcomes will be achievable. One of the challenges to harmonisation is that funding for interventions and for associated research are usually separate and, in the case of REFANI, even came for different donors, making the planning and execution of research plans more difficult. Conducting research on the back of ongoing and often separately funded interventions can constrain the choice of research methodology and raises questions about optimal institutional arrangements for research – especially in challenging humanitarian contexts.

5. FURTHER STUDIES SHOULD BE UNDERTAKEN TO BUILD EVIDENCE ON CBI

The REFANI studies generated substantial amounts of data and new evidence on cash and voucher transfer programmes in humanitarian contexts. The work also revealed the need for further research on a range of topics including:

A. Enhancing the effectiveness of CBI for nutrition and health outcomes

What combination of CBI and sector-specific direct interventions is most effective at achieving health and nutrition objectives in humanitarian contexts and to what extent can behaviour change communication and/or conditionality help improve outcomes?

B. Response analysis and decision support

How can decisions be best taken on the allocation of resources between cash transfer programmes and other interventions, e.g. vaccination or WASH programmes, in different humanitarian response situations? Can an evidence-based decision support tool be developed to ensure the optimal design of Cash+ interventions?

C. Optimising cost-effectiveness/cost-benefit analysis for CBI

Current approaches to cost-effectiveness analysis have methodological limitations for assessing the full impact of cash and voucher transfers. CEA can analyse only one outcome or composite outcome at a time. Interventions which impact multiple aspects of wellbeing for which there is no composite indicator will appear to be less cost-effective than an intervention which has a narrow and direct impact on the outcome of interest. Research is therefore needed on the development of enhanced methods for the economic analysis of CBI programmes.

D. Use of fresh food vouchers

The study in Pakistan unexpectedly found that provision of a fresh food voucher was associated with a significantly lower Hb concentration compared to the control group. Further research is needed on what accounted for this surprising result and what implications this might have for the future design of food voucher programmes.

E. Post-intervention impact on stunting

The findings from the Pakistan study at 12 months are potentially important. Further research could help determine whether this impact is easily replicated in other contexts as well as help understanding of the process by which CBI impact stunting both during and post-intervention.