Comparing the cost and cost-efficiency of two seasonal cash-based interventions of equal value but different timing and duration in Tahoua, Niger

Authors: Lani Trenouth, Victoria Sibson, Carlos Grijalva-Eternod, Kate Golden, and Chloe Puett

Highlights

Cash-based interventions (CBIs) have been promoted as a cost-efficient and cost-effective form of humanitarian assistance, yet evidence as such remains inconclusive. In order to test this assertion, we carried out a study to compare the costs, cost-efficiency, and cost-effectiveness of two CBIs designed to prevent acute malnutrition among children 6-48 months of age. The selected programs were implemented in southern Niger in 2015 during the annual lean season amid a context of a high prevalence of child undernutrition. We gathered cost and resource use data as reported in institutional accounting ledgers, along with interviews of institutional staff, programme beneficiaries and community members, surveys of programme beneficiaries, and document review.

The results of this economic analysis demonstrated that the six-month "modified cash transfer" programme cost more overall and was less cost-efficient than the four-month "standard cash transfer" programme. Furthermore, the higher cost of the modified cash transfer program was not commensurate with the hypothesised greater effectiveness in improving child nutrition outcomes.

This study also highlights that costs to program beneficiaries were unevenly distributed across the recipient population. Costs to beneficiaries over the intervention period ranged from 3-12 days' equivalent of income depending on the number of distributions they attended and their travel distance to the distribution points. It is possible that this difference in retained net transfer may have influenced the impact of the interventions. This suggests that consideration of costs to programme beneficiaries, including the seasonal variation of opportunity costs in agrarian contexts, may be key to programme design to maximise programme impact.

Introduction

CBIs are an increasingly common assistance delivery modality, often implemented instead of or as a complement to in-kind aid, yet they still form a small proportion of overall humanitarian assistance.[1-4] The majority of CBIs to date have been implemented with improving food security as the main objective although there is a growing interest in implementing CBIs to supplant or supplement other forms of in-kind aid, either in support of other basic needs or as "multipurpose" cash transfers. Concurrently, there is a growing demand for more robust evidence supporting the positive claims put forward by advocates of CBIs, including claims related to cost-efficiency and cost-effectiveness.

Cost-efficiency is a measure of the rate of economic resource use, sometimes measured as cost per beneficiary. While cost-effectiveness is a measure of the rate at which those economic resources affected a change of interest, such as cost per case of acute malnutrition averted. To date there are

relatively few published studies on the cost-efficiency of CBIs, even fewer on cost-effectiveness, and there is little consensus in the results among those studies published.[4,9-11] Among the relatively few published economic assessments of CBIs, only a handful included cost-effectiveness analysis. [7,12-17]

Cost, cost-efficiency, and cost-effectiveness analyses have the potential to provide valuable information for decision-makers. Cost analyses can show how costs are shared among programme stakeholders, how implementation decision may affect net transfers, as well as highlight possible avenues to reduce operational cost through a cost driver analysis.[12,13] Cost-efficiency and cost-effectiveness analyses are useful tools in choosing between two or more interventions to address a particular problem vis-à-vis their relative cost per relative outputs or outcomes.

While cost-efficiency of a programme is linked closely to efficient implementation, cost-effectiveness is strongly influenced by many non-cost related factors such as the effectiveness of the intervention to address the problem in question or the quality of program implementation. Moreover, it is challenging to produce broadly generalisable conclusions owing to differences in study methods, the types of CBIs assessed and the variable contexts in which the programmes are implemented.[14,18] Detailed cost data for CBIs are rarely published, rendering implementation costs opaque, while the consistency of methods for cost analysis varies greatly among published economic evaluations of CBIs, as does the quality of reporting.[1,6,9,14,19-21] Consequently, more high-quality evidence on cost, cost-efficiency and cost-effectiveness of CBIs is required to guide humanitarian action and policy with the proviso that globally comparable benchmarks may prove impractical.

This study was part of the Research on Food Assistance for Nutritional Impact (REFANI) project designed to investigate the effectiveness and cost-effectiveness of CBIs on nutrition outcomes in multiple humanitarian settings. An impact study carried out in Niger in 2015 tested the hypothesis that a modified monthly cash transfer programme, initiated earlier and of longer duration than the standard programme, would be more effective at preventing acute malnutrition among children.[22] However, the impact study found that there was no statistically significant difference between the two programmes in endline prevalence of acute malnutrition.[27]

This economic evaluation, carried out concurrent with the impact study, was designed to assess incremental cost, cost-efficiency and cost-effectiveness of a modified cash transfer program compared to the standard cash transfer intervention. Since there was no statistically significant difference in effectiveness in achieving improvements in child nutrition status between the two programmes the least costly programme was automatically more cost-effective. Therefore, this economic evaluation compares the only the cost, cost drivers and cost-efficiency of the two programmes included in the impact study.

Context and Programmes

Located in the Sahel region of central-western Africa, Niger has experienced recurrent episodes of drought, food shortages, high food prices and livelihood shocks. Consequently, its population lives with chronic food insecurity and a high prevalence of undernutrition. In July 2014, the global acute malnutrition (GAM) prevalence in Tahoua Department was 14.7% and the severe acute malnutrition (SAM) prevalence was 2.2%, a level of high public health concern[i].[26,28] To prevent acute malnutrition, multiple actors in the international community have been implementing seasonal cash transfer programmes in southern Niger since 2008, targeting the poorest households during the annual lean season. Since 2013, these seasonal cash transfer programmes have also included supplementary food distribution for children aged 6-23 months and pregnant and lactating women.

This study was carried out on two cash and supplementary food transfer programmes implemented by Concern Worldwide (hereafter Concern) in the Tahoua District of southern Niger (Table 1). The monthly cash and food transfers totalled $220 in cash value and were not conditional on any particular behaviour on the part of the programme recipients. Additional information on the study population, along with details on randomisation, sample size, data collection and results of the impact study are reported elsewhere.[22,27]

Table 1 Description of programmes[i]

Standard cash	**Modified cash**
• Seasonal unconditional cash transfer to 1124 poor households	• Seasonal unconditional cash transfer to 951 poor households
• Total value of $220 in cash was provided over four monthly transfers, June-September 2015; approximately $55/month	• Total value of $220 in cash was provided over six monthly transfers, April-September 2015; approximately $37/month
• Total value of $13 in supplementary food for children 6-23 months of age and/or pregnant and lactating women was provided to eligible households over four months, June-September 2015	• Total value of $13 in supplementary food for children 6-23 months of age and/or pregnant and lactating women was provided to eligible households over four months, June-September 2015
• Behaviour change communication sessions were carried out during distributions	• Behaviour change communication sessions were carried out during distributions
• 64% of households received transfer in their own village; 36% travelled to another village	• 73% of households received transfer in their own village; 27% travelled to another village
• Distribution was carried out in 13 villages over seven days each month	• Distribution was carried out in 13 villages over seven days each month

[i]Number of households in each programme are based on figures at the start of the programmes; costs are in 2015 United States dollars.

[i] GAM includes both severe and moderate acute malnutrition; according to the World Health Organization, when GAM affects 10-14% of the population under 5 years of age the situation is deemed “serious” and when 15% or more of the child population is acutely malnourished the situation is considered “critical”.

Both programmes were implemented in the same manner except for the duration and amount of the monthly cash transfers. All households in the study received the same total amount of cash by the end of the programme. Between June and September, all households with children 6-23 months old received Super Cereal Plus and households with pregnant and lactating women received Super Cereal and vegetable oil. There was, however, a slight difference between the two programmes in the proportion of households that received the transfer in their own village compared to those who travelled to a neighbouring village to collect the transfer. Women were the registered beneficiaries of all the cash and food transfers.

Concern reached a total of 7,954 households with the cash and food transfer programme in 2015, the majority of which was implemented outside the study area. The impact and cost studies included only 39 of the 93 villages targeted by the Concern programme, totalling approximately 2,075 households, or 26% of the total number of households receiving the transfers.

While the programmes were unconditional, soft conditioning was done via behaviour change communication sessions carried out as part of the distributions. These sessions covered such topics as optimal breastfeeding, complementary feeding, handwashing and use of bed nets. Cooking demonstrations were also done onsite at each monthly supplementary food distribution.

Households receiving the cash, food and behaviour change communication programmes were deemed to be the poorest within their communities through a beneficiary selection process that was standardised across multiple organisations implementing cash transfers in Niger.[27,29,30] Concern staff undertook village selection and a consultant led an external team to undertake beneficiary selection which was supervised by Concern staff.

The monthly cash transfer value given to households was fixed and did not vary according to household size, seasonal variations in purchasing power or inflation. The cash transfer value was set by multiple aid organisations at the cost of a locally purchased food basket meeting 75% of daily energy needs for a household of seven people. The amount and kind of supplementary food provided varied according to the number and category of eligible recipients in the household.

Concern implemented the cash transfers with the assistance of a local microfinance institution, Asusu SA, who provided the cash, armoured vehicles and staff as part of their service. The World Food Programme (WFP) provided the supplementary foods to Concern who then distributed it to beneficiary households at the same time as the cash distribution. WFP covered the procurement, transportation and storage costs up until transferring the food to Concern.

Most households in the standard cash programme (64%) and in the modified cash programme (73%) received the transfers in their own villages while the rest of the beneficiaries travelled less than five kilometres, typically by foot, to a nearby village hosting the distribution each month.

Methods

Costing Methods

Costing was conducted from a societal perspective whereby the costs to all main stakeholders involved in the programme were included in the economic evaluation. These costs included the direct financial and indirect economic costs to the main implementing organisation, other institutional partners, programme participants and other local community members.

Stakeholders were all those who contributed direct or indirect resources to the realisation of the programmes, namely Concern, WFP, Asusu, beneficiary households and other community members. Data sources included accounting ledgers and budgets, key informant interviews, semi-structured group interviews and a survey of programme beneficiaries (Table 2).

Table 2 Stakeholders and data sources

Stakeholder	Data source
Concern	Concern accounting ledgers and staff interviews
WFP	WFP budget and staff interviews
Asusu	Concern accounting ledgers, contract documents between Concern and Asusu and staff interviews
Beneficiary household	Group interviews and survey of programme beneficiaries
Community	Group interviews with community members

We collected cost data in Niger in August and September 2015, and accounting data was provided by Concern in early 2016. WFP provided cost data in the form of aggregated budget lines and unit costs in early 2016. We derived most of the cost data from the accounting records provided by Concern. When accounting data was non-specific or unclear we used an “ingredients approach” to activity-based costing, whereby unit costs were multiplied by estimated usage of the various components comprising an activity.

The Comité Consultatif National d'Ethique in Niger (ID number 021/2014/CCNE) and University College London Research Ethics Committee (project ID 6543/001) granted ethical approval (ISRCTN25360839). Prior to the collection of cost-related data, a standardised script was read out to respondents informing them of the purpose of the study, how the data would be treated and their rights. Since most focus group participants were illiterate they were asked to verbally indicate if they understood the information provided and their consent to participate which was recorded with an audio recorder; none refused to participate.

We conducted key informant interviews with community members and staff members of Concern, WFP and Asusu. These interviews focused primarily on staff time allocation to the activities within the programme but were also designed to gather data used to determine proration values for certain categories of cost (e.g. transportation, joint costs etc.). Community key informant interviewees were the community volunteers from each of the villages visited for the beneficiary group interviews.

We estimated costs to programme beneficiaries based on group interviews undertaken in nine of the 20 villages enrolled for this study; six to nine beneficiaries attended each interview. To ensure a varied

sample, we purposively selected villages for the group interviews, taking into consideration village size, distance from Tahoua city and geographic distribution. We then used convenience sampling to select individuals in the group interviews. Discussion topics included direct costs, such as transportation fares, and indirect costs, such as opportunity cost of time spent accessing the programme. Relevant questions for assessing programme costs to beneficiaries were integrated into the survey questionnaires used to assess the impact of the programme.[22]

We used the monthly exchange rates from West African CFA franc to US dollar used by Concern in their accountancy. Costs were not adjusted for inflation since the programmes were implemented within one year. Vehicles were rented not purchased, and other capital items such as computers and phones were amortised using standard tables and discounted at a rate of 3%. All costs are expressed in 2015 US dollars.

Once we assembled all the costs using the above-described methods, we used information from staff interviews and programme documentation to determine appropriate proration of various costs including jointly shared resources. For most cost categories we prorated costs according to the proportion of households in the villages enrolled in the REFANI study compared to total households enrolled in the cash and food transfer intervention implemented by Concern. The total estimated cost for each programme was then analysed according to stakeholder cost centres and activity cost centres.

The stakeholder cost centres were Concern, WFP, Asusu, beneficiary households and other community members. To avoid double counting, we made a distinction between the financing agent (the stakeholder that spent the funds) and the financing source (the stakeholder that donated the funds).[30,31] In this case, Concern was the financing source of the expenditures incurred by Asusu, in that Concern paid Asusu for the distribution services rendered.

Institutional costs from Concern, WFP and Asusu were organised into five mutually exclusive cost centres: 1) programme transfers; 2) personnel – technical; 3) personnel – support; 4) programme transportation; and 5) support. The category of support included running costs of the capital and base offices, and transportation costs for support staff. For the purposes of this study we defined operational costs as all institutional costs excluding the cost of the cash or food. The activity-based cost centres were the primary activities undertaken to implement the programme by which the total cost was divided (Table 3). Programme start-up activities, such as office set up, contract negotiations, programme design and planning etc., were not included in the costing since they had been carried out years before this study and reliable estimates were not possible to tabulate.

Table 3 Description of activity-based cost centres

Cost category	Description	Data sources
Beneficiary targeting	Programme staff time and vehicle rental/running costs	Accounting data, staff interviews, external consultant interview, community informants, beneficiaries
Cash/food preparation	Programme staff time	Accounting data, staff interviews, partner interviews
Cash/food distribution	Value of cash transferred to beneficiaries, programme staff time, vehicle rental/running costs, partner costs for staff and vehicles, partner costs for food procurement, warehousing and transportation, and beneficiary and community direct/indirect costs	Accounting data, staff interviews, partner interviews, partner budget data, community informants, beneficiaries
Monitoring	Staff time and vehicle rental/running costs	Accounting data, staff interviews, community informants, beneficiaries
Support[i]	Support staff time, staff guest house running costs, support staff transportation, office running costs, supplies, communications, security	Accounting data, staff interviews

[i] Support is not an activity as such but is essential to the implementation of the programme and was therefore included as a category separate from the programme activities

Stakeholder cost centres and activity cost centres were analysed in terms of total cost and operational cost separately. The analysis was done in these two ways for two reasons: first, including the value of the cash can have a distorting effect that limits internal and external comparability; and second, analysis of the operational cost better represents the distribution of effort across the stakeholders contributing to the programme activities.

Analysis of costs and cost-efficiency of the programmes was done using the assembled and prorated cost data. Comparative cost-efficiency was calculated based on mean programme cost per beneficiary household and total cost-transfer ratio. The mean programme cost per beneficiary household was the estimated total cost of each programme divided by the number of beneficiary households at the start of implementation. The total cost-transfer ratio (TCTR), a metric often used in assessing the efficiency of CBIs, is the total cost of each programme divided by the total value of cash distributed to the beneficiary households. The closer the ratio is to parity, the more cost-efficient the programme is.

Results

Cost Analysis

Stakeholder Costs

Total costs for each programme broken down by stakeholder group are shown in Table 4. The largest proportion of the total cost of both programmes was the value of the cash transferred to beneficiaries, followed by the operational cost to Concern.

Table 4 Cost and percentage of cost per programme, by stakeholder group and cost category

	Standard Cash			Modified Cash		
Cost category	USD	% of total	% of operational total[i]	USD	% of total	% of operational total
Total programme cost[ii]	405,767	100%	-	395,402	100%	-
Total transfer (cash and food)	262,471	64.7%	-	221,808	56.1%	-
Total operational cost	143,296	35.3%	100%	173,594	43.9%	100%
Concern Worldwide costs	350,395	86.4%	71.3%	337,994	85.5%	73.9%
Programme transfer - cash	248,192	61.2%	-	209,727	53.0%	-
Operational cost						
Personnel - technical	33,075	8.2%	23.1%	41,912	10.6%	24.1%
Personnel - support	28,191	6.9%	19.7%	38,791	9.8%	22.3%
Programme activities	13,042	3.2%	9.1%	11,774	3.0%	6.8%
Transportation	17,445	4.3%	12.2%	21,330	5.4%	12.3%
Support costs[iii]	10,449	2.6%	7.3%	14,461	3.7%	8.3%
Partner costs - WFP	29,084	7.2%	10.3%	24,607	6.2%	7.2%
Programme transfer - food	14,279	3.5%	-	12,081	3.1%	-
Operational cost						
Personnel - technical	1,737	0.4%	1.2%	1,469	0.4%	0.8%
Personnel - support	621	0.2%	0.4%	525	0.1%	0.3%
Transportation - staff	853	0.2%	0.6%	721	0.2%	0.4%
Transportation - food[iv]	8,777	2.2%	6.1%	7,426	1.9%	4.3%
Support costs	2,817	0.7%	2.0%	2,384	0.6%	1.4%
Partner costs - Asusu[v]	11,419	2.8%	8.0%	15,987	4.0%	9.2%
Operational cost						
Personnel - technical	2,165	0.5%	1.5%	3,030	0.8%	1.7%
Personnel - support	2,420	0.6%	1.7%	3,389	0.9%	2.0%
Transportation	6,048	1.5%	4.2%	8,467	2.1%	4.9%
Support costs	787	0.2%	0.5%	1,102	0.3%	0.6%
Community costs	14,869	3.7%	10.4%	16,814	4.3%	9.7%
Beneficiary costs	11,682	2.9%	8.2%	13,498	3.4%	7.8%
Other community costs	3,187	0.8%	2.2%	3,316	0.8%	1.9%

[i] Operational costs are the total costs from a societal perspective minus the value of the transfers
[ii] Total cost is the operational cost plus the value of the cash and food
[iii] Support includes: office running costs of the base and capital, and transportation for support staff
[iv] Primarily for international shipping
[v] Concern Worldwide paid these costs to Asusu SA for their services in cash distribution

Concern bore the majority of the operational cost in both programmes, as expected. The cost charged to Concern by Asusu for distribution services rendered by the bank was disaggregated from the operational cost to Concern to highlight the proportion of the cost of this service compared to the total cost. It is noteworthy that the cost share to beneficiary households as a percent of the operational total was

similar to the cost share of Asusu and the operational cost to WFP, ranging from 7-10% of the total operational cost.

The four-month standard cash programme cost just over US$ 10,000 more than the six-month modified cash programme despite a longer implementation period. This may initially seem surprising however, the standard programme included 173 (18%) additional beneficiary households compared to the modified programme. As a result, the standard programme disbursed US$40,663 more to beneficiaries than the modified programme. Predictably, the operational cost to implement the six-month intervention was higher, by about US$ 30,298, than the four-month program.

The cost to beneficiaries was a sum of the estimated opportunity cost and the direct cost for transportation. Based on our interviews, we estimated the total time contribution by each beneficiary during the beneficiary selection process was two days; time at the distributions ranged from 2-7 hours; and travel time ranged from 0-3 hours. We then estimated the opportunity cost by multiplying the beneficiary time spent engaging in the programmes by our estimates of the average daily agricultural labour wage of $2.12 for women, based on interviews with beneficiaries during the data collection. Approximately 9% of those who attended a distribution in another village also incurred an average cost of $1.70-2.12 for one-way transportation. The highest possible total transportation cost was $12.72 for six distributions and the lowest was $0 for those who received the transfer in their own village.

The average cost incurred by beneficiaries in both programmes, during both targeting and distribution, was modest in terms of absolute value and as a percentage of the gross transfer (Table 5), yet this cost burden was unequally distributed across beneficiary households. Beneficiaries who received the transfer in their own village spent an average of 4.5 hours participating in the programme, while those who travelled to another village to receive their transfer spent an average of 8.0 hours participating in the programme. Although a smaller proportion of the modified cash programme beneficiaries travelled to another village to receive the transfer, they all attended two more distributions than those in the standard cash programme.

Table 5 Participation cost to beneficiary households[i]

Metric	**SC**	**MC**
Mean total participation cost incurred by each beneficiary household[ii]	$10.39	$14.19
Mean opportunity cost incurred by each household, for targeting	*$4.25*	*$4.25*
Mean opportunity cost incurred by each household, for distribution	*$5.81*	*$9.25*
Mean total transfer value per household (cash and food), gross[iii]	$233	$233
Mean total transfer value per household (cash and food), net[iv]	$223	$219
Total participation cost to each household as a % of total gross transfer	4.44%	6.08%

[i] Any discrepancies in the addition of values are due to rounding errors

[ii] Includes opportunity cost and transportation cost

[iii] The total transfer amount provided to beneficiaries

[iv] The gross transfer provided to beneficiaries minus their participation cost

The mean total opportunity cost was $10.06 for standard cash programme beneficiaries and $13.50 for modified cash programme beneficiaries. However, the maximum per beneficiary opportunity cost was $16.99 for a beneficiary in the modified programme attending six distributions in another village and spending the maximum estimated time engaging in the programme. At the other end of the cost range, we estimate that the minimum beneficiary opportunity cost was $6.85 for a beneficiary in the standard programme attending four distributions in their own village and spending the minimum estimated time

engaging in the programme. The difference between the highest and lowest opportunity cost was $10.14, or just over 4% of the transfer value.

Activity-Based Cost Centres

Distribution activities made up the largest single component of operational costs (Table 6). Preparation and distribution of cash and food together comprised nearly half of the total operational cost in both programmes, while support costs made up just over a third of operational expenditures. Included in the category of support were costs for management, finance, logistics and other support staff, along with office running costs, transportation for support staff and other ancillary costs.

It should be noted that some of the Niger-based upper management staff classified here as support staff undertook significant responsibilities in directing and overseeing the program implementation that might otherwise be tasked to technical staff. Furthermore, the security environment necessitated weekly flights in and out of Tahoua District for expatriate staff which added to the total support cost required to implement the program. The cost of these weekly flights accounted for 17% of the transportation cost to Concern Worldwide.

Table 6 Programme activity costs as a proportion of total operational cost[i], US dollars

Programme activities and stakeholders	Standard Cash		Modified Cash	
	USD	% of operational total	USD	% of operational total
Beneficiary targeting	22,041	15.4%	19,335	11.1%
Concern Worldwide	15,059	10.5%	13,428	7.7%
Beneficiaries	4,773	3.3%	4,039	2.3%
Other community	2,208	1.5%	1,868	1.1%
Cash/food preparation[ii]	7,887	5.5%	10,497	6.0%
Concern Worldwide	6,475	4.5%	9,063	5.2%
WFP	978	0.7%	828	0.5%
Asusu SA	433	0.3%	606	0.3%
Cash/food distribution	323,401	42.5%	295,088	42.2%
Concern Worldwide – operational	33,088	23.1%	39,840	23.0%
Concern Worldwide – cash transfer	248,192	-	209,727	-
WFP – operational	9,756	6.8%	8,254	4.8%
WFP – food transfer	14,279	-	12,081	-
Asusu SA	10,200	7.1%	14,279	8.2%
Beneficiaries	6,909	4.8%	9,459	5.4%
Other community	978	0.7%	1,447	0.8%
Monitoring	5,434	3.8%	7,608	4.4%
Institutional cost	5,434	3.8%	7,608	4.4%
Support costs	47,004	32.8%	62,873	36.2%
Concern Worldwide	42,146	29.4%	58,327	33.6%
WFP	4,070	2.8%	3,444	2.0%
Asusu SA	787	0.5%	1,102	0.6%

[i] Operational costs are the total costs from a societal perspective minus the value of the transfers

[ii] This refers to the re-packaging of food from bulk containers into individual containers and preparing cash in envelopes

Cost-Efficiency Analysis

Two cost-efficiency metrics, total cost per beneficiary household and total cost-transfer ratios are presented in Table 7. The standard cash programme was more cost-efficient than the modified cash programme by all cost-efficiency metrics.

Table 7 Cost-efficiency metrics

Metric	SC	MC	Difference
Average cost per beneficiary household, total	$361	$416	$55; 15%
Average cost per beneficiary household, operational[i]	$127	$183	$55; 43%
Total cost-transfer ratio, gross transfer	1.55	1.78	0.24; 15%
Total cost-transfer ratio, net transfer[ii]	1.62	1.90	0.28; 17%

[i] Operational costs include all costs from a societal perspective minus the value of the transfer itself

[ii] Net transfer is the gross transfer provided to beneficiaries minus their participation cost

Sensitivity Analysis

There is some inherent uncertainty in the base case cost estimates even when basing cost estimates on actual values reported in accounting ledgers. There was less uncertainty for cost categories such as the transfer values and associated fees because this was fixed and these costs were exclusive to the two CBIs included in this study. On the other hand, there was greater uncertainty around the point estimates for programme staff time allocation as well as the proportion of joint costs to allocate to each CBI, such as the costs for support staff and office management. There was even greater uncertainty around the point estimates for the opportunity cost to beneficiaries because of high variation in the time and expenses they reported spending to engage in the programme. Wherever possible, a variance estimate was calculated, and where this was not possible a standard +/- 25% was applied to each cost category. The range of uncertainty is larger for the modified cash because the operational cost uncertainty is compounded with each additional month of distribution; the percent of uncertainty for each cost category is the same for each of the CBIs.

Table 7 Cost and cost-efficiency estimate ranges

	Standard cash, USD			Modified cash, USD		
Metric	Low estimate	Base case estimate	High estimate	Low estimate	Base case estimate	High estimate
Total programme cost	361,476	405,767	455,143	342,502	395,402	455,311
Total transfer (cash and food)	258,901	262,471	266,041	218,788	221,808	224,828
Total operational cost	102,574	143,296	189,102	123,715	173,594	230,483
Number of households	1,124	1,124	1,124	951	951	951
Cost per beneficiary household, total	322	361	405	360	416	479
Cost per beneficiary household, operational costs only	91	127	168	130	183	242

Discussion

This study shows that beneficiaries in the standard cash programme ultimately retained more of the transfer value than those in the modified cash programme as a result of the additional participation costs to those enrolled in the longer CBI. It cost comparatively less to provide $1 to a household delivered through the standard cash programme compared to the modified cash programme, both in terms of institutional financial cost and societal economic cost.

Typical for cash transfer programmes, the primary cost driver for the total programme cost was the value of the cash transfer itself at 61% and 53% for the standard and modified programmes respectively. The incremental operational cost of the two additional monthly cash transfers in the modified cash programme was as anticipated, however, it was not commensurate with the hypothesised greater reduction in the prevalence of global acute malnutrition in children aged 6-59 months in the modified programme compared to the standard programme.[27]

Cost to Beneficiaries

The modified cash programme cost more per beneficiary for the implementing institutions and beneficiaries alike because of the additional two rounds of cash distribution. However, the opportunity cost to beneficiaries was highly variable.

The number of monthly distributions and the location of distribution points were the primary drivers of the variation in cost to beneficiaries. Beneficiary cost was estimated using three main factors: 1) beneficiary time spent engaging in the programme; 2) transportation costs to and from the distribution sites; and 3) local daily wage as a proxy for opportunity cost. The most important factor in influencing beneficiary cost was related to the lost wages associated with the time spent to attend the monthly distributions. Transportation costs were negligible for beneficiaries since even those who travelled to another village typically did so by foot.

As expected, the cost to a beneficiary household increased for each additional distribution they were required to attend, and the cost to attend a distribution in another village was higher than that of attending a distribution in one's own village. Overall, the cost of an additional distribution was a more important factor in the total cost to a beneficiary than the location of the distribution point relative to the beneficiary's village.

Some beneficiaries stated that it took them a full day to attend a distribution, including the time to reach the distribution point. Walking to a distribution point took up to an hour each way, or longer when accompanied by small children who were required to attend the malnutrition screening during the supplementary food distribution. Furthermore, it was common for beneficiaries to leave for the distribution village as soon as their morning tasks were completed even if the distribution was scheduled for the afternoon out of a perceived fear that they might miss the distribution.

Some beneficiaries faced much higher participation costs than others, particularly those in the modified cash programme who had to travel to another village to receive the transfer. The average cost to each beneficiary was equivalent to more than three days of income loss for standard cash programme beneficiaries who collected the transfer in their own village, and up to 12 days of income loss for a modified cash programme beneficiary who used a moto-taxi each month to travel to the distribution point. All beneficiaries lost an estimated two working days to participate in the beneficiary selection process alone, with the balance of the cost to beneficiaries attributable to participation in the monthly distributions.

The standard cash programme had more beneficiaries than the modified cash programme and a larger percentage of them had to travel to another village to collect their transfer. Yet, the total cost borne by all modified cash programme beneficiaries was 17% higher than that of the standard cash programme beneficiaries because of the beneficiary costs associated with the two additional distributions in the modified cash programme. This explains the higher total beneficiary cost in the modified cash programme despite fewer beneficiaries, as shown above in Table 4.

Total Cost-Transfer Ratios

We found that the TCTRs of the two programmes ranged from 1.55 to 1.90. These results are similar to those of a meta-analysis of cash, voucher and in-kind transfer programmes, where the inter-quartile range of TCTRs was between 1.28 and 1.95.[9] Using the same costing methods and analytical approach, a parallel study in Pakistan estimated the TCTRs of three CBIs as ranging from 1.62 to 2.20.[33]

However, TCTR values do not necessarily index cost-efficiency across contexts. Costs and TCTRs are affected by project- and context-specific factors that are unrelated to operational efficiency such as: the number of beneficiaries; the size, frequency and duration of the transfers; distribution modality (e.g. electronic or manual); type of emergency (e.g. refugee response, post-natural disaster); remoteness of programme location; degree of insecurity; local financial and physical infrastructure; and local operating costs.[9,23,24] Higher TCTRs, connoting lower cost-efficiency, were common, for example, among programmes that were small-scale, provided small transfer values, provided cash in-hand rather than via electronic means, responded to an a sudden onset emergency, or were implemented in sparsely populated areas.[9] TCTRs can therefore provide an indicative assessment of efficiency, but programmes should be evaluated within a broader implementation context.

Costs to beneficiaries are not routinely assessed in costing studies of CBIs and therefore are not reflected in TCTRs. At the time of writing, we are unaware of other studies that explicitly deduct the cost to beneficiaries from the value of the transfer and therefore use a net transfer rather than a gross transfer in the TCTR estimation. Using the gross transfer value in the calculation of a TCTR underestimates the true cost to deliver a unit of cash to a recipient, since a dollar delivered is not necessarily a dollar retained.

Factors Influencing Cost and Cost-Efficiency

Beyond the difference in the number of distributions between the two programmes, the most significant cost driver for both programmes was the value of the cash itself, more so than any design or implementation choice. The value of the transfer was set based on local food basket costs and the gap between expected household resources available to meet basic needs and estimated shortfalls.

As both programmes were implemented in the same manner, with the same total cash transfer value, the operational cost and cost-efficiency differentials primarily reflect the cost of two additional cash distributions in the modified cash programme. The number of distribution events was the most important factor influencing the operational costs to the institutional partners and the opportunity costs to beneficiaries, as described above.

Contributing towards a great cost-efficiency was the relatively large size of the value transferred to beneficiaries as well as the experience of the Concern Niger team in implementing cash transfers. This was the fifth consecutive year that Concern implemented such a cash transfer programme and therefore minimal set-up costs were incurred. Conversely, the short duration and relatively small scale of the operation spread out over a large geographic area, played a role in decreasing cost-efficiency.

The cost of internal flights for Concern's international staff working in Tahoua was one noteworthy cost category emerging from the results of this study. The cost of national flights for staff contributed 2.2% of all operational costs to Concern, and was 13.8% of all transportation costs to Concern. To put this into perspective, by comparison, the proportional share of the field office running costs attributed to the programmes assessed in this study accounted for 4.8% of implementation costs and the capital office running costs accounted for 2.2%, including equipment, communications, rental, security, stationery and warehousing. Due to Concern's safety procedures, international staff members were not permitted to

remain in Tahoua over the weekend and were flown weekly between Tahoua and Niamey, adding to the operational expense. A shift towards more remote management and/or greater managerial oversight by national, rather than international staff could potentially reduce these transportation costs, as well as lower the overall staffing costs. Any change in the staffing structure, however, could also affect implementation quality and programme impact.

Beneficiary targeting cost Concern approximately $13,000 for the modified cash programme and $15,000 for the standard cash programme, or 7-10% of total operational cost for each programme, respectively. For comparison, the cost to Concern for four or six distributions made up approximately 23% of the operational cost for each programme. It might be expedient to explore opportunities to reduce the cost of the one-off, annual beneficiary targeting exercise while not compromising on programme quality. The current selection process that has been coordinated among multiple aid organisations working in Niger is well elaborated, but options could be explored to adopt a more simplified beneficiary targeting mechanism, which could generate cost savings, particularly given the short duration of the programmes.

Limitations of the Study

A variety of approaches were used during interviews to help programme beneficiaries and community members best estimate the time they spent engaging in the programmes, however it was often a challenging exercise for some respondents. For this reason, there was greater uncertainty around point estimates of average beneficiary opportunity cost than there was around some of the other cost components. Direct observation to determine opportunity cost was not deemed feasible or necessary. Additionally, it was not possible to include start-up costs because these costs were incurred years before the studied programmes in this study, and therefore cost structure described represents a mature programme.

We did not estimate any additional demand on services such as health or education, which may have been incurred because of the CBI, or to estimate any multiplier effects in the local market economy because of the cash injected into the local economy since these fell outside the scope of the research objectives. We originally anticipated undertaking a cost-effectiveness analysis in this study, however there was no difference detected in impact on acute malnutrition prevalence between the two programmes[27], therefore a cost-effectiveness analysis was impossible.

Numerous authors have concluded that there are considerable limitations to comparisons of cost-efficiency across studies that were not designed to be compared.[1,9,18,23-25] These limitations include important intrinsic programmatic differences in context including elements of where, when and how a programme is implemented, differences in programme objectives and considerable methodological variations in costing studies themselves. Care should be exercised when comparing the results from this study to other studies.

Conclusions

This study has shown that the four-month standard cash programme was more cost-efficient for institutional stakeholders and beneficiaries alike, than the longer, but equal total value, six-month modified cash programme. The difference in cost-efficiency was due to the cost of two additional distributions in the modified cash programme, which was to be expected. However, contrary to the REFANI study hypothesis, the additional costs of the longer programme were not commensurate with greater effectiveness as measured by child nutrition outcomes.

While the results of the cost and cost-efficiency comparisons were not surprising, our study results underscore the importance of estimating cost to beneficiaries and how the cost burden can be differentially spread across the beneficiary population. Such differences affect the net benefit transferred and may influence the potential impact of a CBI. This suggests that a more systematic valuation of beneficiary costs and implications thereof could provide evidence to improve humanitarian programme design and implementation.

List of Abbreviations

CBI – Cash-based intervention

MC – Modified cash

SC – Standard cash

TCTR – Total cost-transfer ratio

UCL – University College London

USD – United States dollar

WFP – World Food Programme

Authors' Note

CP and LT designed the study. LT, CG-E and VS collected field data. LT and CP analysed the data. LT drafted the initial manuscript. All authors reviewed and approved the final manuscript.

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Declaration of Conflicting Interests

The authors declare that there is no conflict of interest.

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