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Cost and Effectiveness Analysis of LINKAGES' Breastfeeding Interventions in Ghana

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Abstract

This study analyzes the cost effectiveness of a breastfeeding promotion program implemented by LINKAGES (a USAID-funded cooperative agreement managed by the Academy for Educational Development) and its partners – Ministry of Health, Catholic Relief Services, Ghana Red Cross, UNICEF – in five districts in Ghana. The two indicators used to measure effectiveness are Exclusive Breastfeeding (EBF) and Timely Initiation of Breastfeeding (TIBF). The main findings are: 1) There is a positive relationship between the costs incurred in a district and the behavior change outcomes; 2) The factors affecting cost effectiveness include the level of partner participation in implementation, the size of the target population, and the baseline rates of EBF and TIBF; 3) The cost of replicating this package of interventions is \$16 per targeted child, while the cost per new EBF acceptor is \$34, and the cost per new TIBF acceptor is \$45; 4) LINKAGES may be able to increase its cost effectiveness by selecting partners who are ready and able to implement relatively intensive community level activities, increasing its target population in program districts, and selecting populations that have lower baseline EBF and TIBF rates; 5) Although comparable studies are limited, LINKAGES' approach in Ghana appears to be cost effective at an average cost per new EBF acceptor of \$34, compared with data from Brazil showing cost per new EBF acceptor to be \$59.

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Acronyms

BCC	Behavior Change Communication Program
CRS	Catholic Relief Services
CS	GRC Child Survival Project
DALY	Disability Adjusted Life Year
EBF	Exclusive breastfeeding
DHMT	District Health Management Team
FACS	CRS Food Assisted Child Survival Project
GRC	Ghana Red Cross
MOH	Ministry of Health
NGO	Non-governmental organization
RHA	Regional Health Administration
SDHMT	Sub-District Health Management Team
TBA	Traditional birth attendant
TIBF	Timely initiation of breastfeeding
TCF	Timely complementary feeding
USAID	United States Agency for International Development

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Executive Summary

Introduction

In 1998, the Ghana Ministry of Health (MOH) Child Health Task Force and USAID/Accra invited LINKAGES, a USAID-funded cooperative agreement to implement a national Behavior Change Communication (BCC) program jointly with the MOH Nutrition Unit. The program is committed to making significant improvements in the nutritional status of Ghanaian children, focusing on rates of exclusive breastfeeding (EBF), timely initiation of breastfeeding (TIBF), and timely complementary feeding (TCF). The LINKAGES program is multi-dimensional and uses a combination of strategies to improve infant feeding practices including community level interventions with partners, advocacy and information dissemination, and pre-service training curricula reform and development. This study focuses on the promotion of breastfeeding at the community level.

While LINKAGES has been successful in increasing target breastfeeding behaviors, USAID and other stakeholders are increasingly interested in the cost of these interventions. LINKAGES asked Abt Associates to conduct a cost and effectiveness analysis of LINKAGES' breastfeeding promotion activities in Ghana. This study was conducted to provide useful cost and cost effectiveness information to USAID and LINKAGES' in-country partners. The objectives of this study are:

- to analyze the cost effectiveness of LINKAGES breastfeeding promotion activities (both with other breastfeeding promotion activities and among the study districts);
- to determine the cost implications of replicating activities.

The specific questions addressed in this study are:

- How do costs and outcomes compare across the five study districts?
- What are the determinants of costs and cost effectiveness across the study districts?
- How can LINKAGES improve its cost effectiveness?
- What would it cost to replicate these activities in Ghana and is it cost effective?
- How does the cost effectiveness of the interventions in Ghana compare with other breastfeeding promotion interventions?

LINKAGES promotes appropriate breastfeeding at the community level by providing training, materials, and technical assistance to NGO and MOH partners, who have ongoing activities at the community level. LINKAGES does not implement activities directly – instead, it seeks to facilitate and enable its partners, who have community level networks, to promote appropriate infant feeding. During the study period, LINKAGES worked with three NGO partners and the MOH in selected communities in nine districts within three northern regions of Ghana (Northern Region, Upper East Region, and Upper West Region). These regions are the most remote regions in Ghana, and the most sparsely populated. Each of the partners was active in three districts, with the MOH providing input through Regional Health Administrations (RHAs) and District Health Management Teams (DHMTs). All of the NGOs have existing programs with health components. LINKAGES' partners are:

- MOH – through the Regional Health Administrations (RHA), District Health Management Teams (DHMT), and Sub-District Health Management Teams (SDHMT)

- Catholic Relief Services (CRS)
- Ghana Red Cross (GRC)
- UNICEF

Partner staff attended LINKAGES' training, and in most districts were active in training mother's group leaders, health staff and health volunteers. CRS and GRC also funded durbars, World Breastfeeding Week events, outreach activities, and monitoring and evaluation. However, some key training activities were not conducted in Yendi (a UNICEF district) until 2001.

Methodology and Data Collection

The period of this study is October 1999 through September 2000, coinciding with the beginning of LINKAGES' community level activities in August/September 1999 and an appraisal of infant feeding practices conducted in September/October 2000, which provides outcome data. At the request of LINKAGES, this study focuses on two of the three key indicators included in the appraisal – EBF and TIBF. This study looks at the five districts included in the 2000 appraisal.

The full cost of LINKAGES/Ghana in support of breastfeeding promotion, including allocation of all overhead/fixed costs associated with the Ghana office, is included in the analysis. Direct costs of the LINKAGES DC office associated with breastfeeding promotion in Ghana are also included. Indirect costs of the LINKAGES DC office are excluded. The direct costs of NGO and MOH partners are included, but overhead costs are always excluded because breastfeeding promotion represents a very small portion of overall activities and has minimal impact on fixed costs. Household and volunteer costs are not included in this study.

Once all the costs are compiled, the allocation of costs to achieving behavior change in each of the study districts is calculated in the following way:

1. The direct costs for the full set of LINKAGES/Ghana activities are compiled, with all costs incurred during the study period fully allocated to the full set of LINKAGES' activities.
2. Based on discussions with LINKAGES staff, a subset of activities is identified as ones that contribute to behavior change, and are included in this study.
3. Costs for partner activities are compiled for each of the study districts, with regional level input allocated to each of the districts, based on population data.
4. LINKAGES' costs for each activity are allocated to each of the appraisal districts.
5. Based on discussions with LINKAGES and document review, the content of each activity is reviewed and apportioned based on its messages on EBF, TIBF, and TCF.

The key indicator used throughout this study to measure cost effectiveness is the total cost per new acceptor (EBF or TIBF). For example, the indicator of the cost effectiveness of promoting EBF in each district, is expressed in the following formula:

$$\frac{\text{[cost of activities to promote EBF]}}{\text{[target population] * ([EBF rate-program] - [EBF rate-control])}}$$

The methodology developed here will be applied in a series of studies of the cost and effectiveness of LINKAGES' interventions. A second study in Madagascar is currently underway, and will provide complementary and comparative results.

In-country data collection for this study occurred primarily between February 2002 and April 2002. Data on total LINKAGES' costs related to Ghana activities were collected from records kept in the LINKAGES DC and Accra offices. Data to determine the specific activities conducted in support of community level breastfeeding promotion were collected based on staff interviews. Data on costs incurred by NGO partners and various levels of the MOH were collected through interviews and document reviews. The interviews focused on description of the overall program, specific activities undertaken during the study period, costs of activities, and staff time dedicated to breastfeeding activities. Data on funds spent were gathered through review of expense reports, budgets, and staff estimates of costs. Whenever possible, data were reconciled across several sources.

Findings

1. How do costs and outcomes compare across the five study districts?

Based on the five districts studied, there is a positive relationship between the costs incurred and EBF and TIBF rates, with the exception of Lawra's results in TIBF. Table ES1 shows the total of LINKAGES and partner costs (excluding LINKAGES institutional overheads and CRS food costs) in each of the five districts. Bolgatanga and Yendi, which had much lower costs per targeted child (\$5 and \$12, respectively), experienced lower increases in EBF rates, while East Mamprusi and Lawra had higher costs (\$33 and \$58, respectively) and achieved higher increases in EBF rates. Excluding Lawra, the two districts with the higher costs (East Mamprusi and Bongo) achieved higher increases in TIBF rates, while Bolgatanga and Yendi experienced low or no increases.

Table ES1: Relationship between Costs and Outcomes

(US\$)	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
LINKAGES & Partner Costs Alloc to EBF (US\$)	18,327	16,128	18,090	11,250	10,597
Costs per Child to Promote EBF	33	32	58	5	12
Increase in EBF Rate	46%	28%	48%	24%	7%
LINKAGES & Partner Costs Alloc to TIBF (US\$)	18,327	16,128	18,090	11,250	10,597
Costs per Child to Promote TIBF	33	32	58	5	12
Increase in TIBF Rate	74%	29%	12%	20%	-15%

Note: Excludes CRS food costs.

2. What are the determinants of costs and cost effectiveness across the study districts?

The key driver of cost differences was the number of participants from each district involved in LINKAGES trainings and workshops. The cost per workshop participant, driven both by total workshop cost and number of participants, also impacted total costs.

The factors affecting cost effectiveness include the level of partner participation in implementation, the size of the targeted population, and the control (or assumed baseline) rates of EBF and TIBF. For example, in Bolgatanga partners provided 19% of total costs, the target population was 2,395

children, and the baseline rate of EBF was 25%. The total cost per new EBF acceptor was \$20. By comparison, in Yendi, where partners provided 4% of costs, the target population was 907, and the baseline rate of EBF was 66%, the total cost per new EBF acceptor was \$167.

3. What would it cost to replicate these activities in Ghana and is it cost effective?

To calculate the cost of replication in Ghana, only the costs of implementation activities are included (start-up activities would not be incurred again, and evaluation costs do not produce behavior change and are not included in comparable studies). The cost of replicating the package of LINKAGES and partner interventions to promote EBF and TIBF is \$16 per targeted child. The cost per beneficiary (defined as the total population of the program areas) is \$0.61. Of these total costs, the portion of costs contributed by partners is \$2.65 per targeted child, or \$0.10 per beneficiary. The cost per new EBF acceptor is \$34, and the cost per new TIBF acceptor is \$45.

4. How can LINKAGES improve its cost effectiveness?

While on average it cost \$34 to persuade one additional child to adopt EBF and \$45 to induce one additional child to adopt TIBF the data show that these results can be achieved at much lower cost. In Bolgatanga, each new EBF acceptor only cost \$10, and each new TIBF acceptor only cost \$12. Based on the findings of the previous sections, LINKAGES may be able to improve its cost effectiveness in several ways if it were to expand activities in Ghana:

- Selecting partners who are ready and able to implement relatively intensive community level activities
- Increasing its target population in program districts, either by choosing more densely populated districts or targeting a larger portion of the district population
- Selecting populations that have lower EBF and TIBF rates, where impact may be achieved at lower marginal cost
- Conducting further analysis of its key cost drivers to see how the mix of activities impacts outcomes and cost effectiveness

5. How does the cost effectiveness of the interventions in Ghana compare with other breastfeeding promotion interventions?

Comparable studies of the cost effectiveness of breastfeeding promotion interventions are limited. The most notable series of studies were conducted in 1992-93 in seven hospitals in Brazil, Honduras, and Mexico by the USAID LAC-HNS project. The LAC-HNS studies included only interventions in hospitals in urban settings, while the intervention areas in Ghana are among the most remote and least densely populated areas of the country. The LAC-HNS studies reported aggregate net costs, which took into account the foregone cost of infant formula, only included implementation costs, and excluded hospital overhead and administrative costs. Despite these differences, the disaggregated data from Brazil was available, and adjusted to allow comparison with Ghana results.

In Brazil, the EBF rate in the program hospital was 43%, and was 20% in the control hospital. Based on a average cost per newborn of \$11 found in the study, this translates into a cost per additional child breastfeeding of \$48 (\$11/23%). In 2000 dollars, the cost per new EBF acceptor in Brazil was \$59.

By comparison, the implementation costs per new EBF acceptor in Ghana ranged from \$10 in Bolgatanga to \$94 in Yendi, and averaged \$34 across the five districts.

Discussion and Conclusions

While this study provided data that will be useful in shaping future activities, there are nonetheless many other important questions that could shape future activities that have not been addressed:

- What is the impact of each of the individual activities?
- What is the optimal mix of activities?
- What is the level of input required for specific activities, given program parameters such as target population, population density?
- How sustainable is the behavior change?

This study was not designed to determine the cost effectiveness of specific activities, but of the package of LINKAGES and partner activities. While it has been demonstrated that this package of activities produces behavior change, we are unable to determine whether all of the activities conducted were necessary or whether the outcomes could have been achieved by undertaking just one, or some limited combination, of these activities. Additional research to determine the optimal package of activities to maximize cost effectiveness would be useful for guiding future program design. Lastly, the sustainability or longevity of LINKAGES interventions is a key question affecting cost effectiveness. This study does not measure ongoing behavior change beyond the period of intervention, nor does it measure the input of intervention toward establishing the targeted behaviors as self-sustainable cultural norms.

Due to limited availability of cost data for other breastfeeding promotion interventions, conclusions about LINKAGES' cost effectiveness in Ghana are only preliminary. On average, LINKAGES appears to be cost effective compared with a study of breastfeeding cost effectiveness conducted in Brazil. Because it is difficult to eliminate precisely the effect of organization-specific management requirements, applying the methodology used in this study to analyze cost effectiveness of other USAID child survival interventions would provide the most accurate assessment of LINKAGES' cost effectiveness.

While the cost effectiveness of LINKAGES interventions are comparable to other breastfeeding promotion interventions on average, LINKAGES appears to be *very* cost effective in some districts. LINKAGES could improve its cost effectiveness by selecting partners who are ready and able to implement relatively intensive community level activities, increasing its target population in program districts, and selecting populations that have lower baseline EBF and TIBF rates. Under these conditions (which were found in Bolgatanga), this study shows that the implementation cost per child to achieve the package of EBF and TIBF results was only \$5.

1. Background to the Study

In 1998, the Ghana Ministry of Health (MOH) Child Health Task Force and the United States Agency for International Development (USAID)/Accra invited LINKAGES, a USAID-funded cooperative agreement, to implement a national Behavior Change Communication (BCC) program jointly with the MOH Nutrition Unit.¹ LINKAGES is committed to making significant improvements in the nutritional status of Ghanaian children. Three indicators were identified to measure the program's achievements:

1. Exclusive breastfeeding (EBF) rate of infants 0–6 months of age
2. Timely initiation of breastfeeding (TIBF) rate
3. Timely complementary feeding (TCF) rate of children 6–10 months of age

LINKAGES uses a combination of strategies to improve infant feeding practices. These strategies include collaboration with nongovernmental organizations (NGOs) and MOH partners on community level interventions to promote appropriate infant feeding, advocacy and information dissemination on the national policymaking level, and curriculum reform and development for pre-service training of health workers. This study focuses on the first strategy, the promotion of breastfeeding at the community level.

LINKAGES does not directly implement interventions in the community but rather provides training, materials, and technical assistance to Non-governmental organization (NGO) and MOH partners that have ongoing programs at the community level. LINKAGES provides training to NGO and MOH partners, who in turn train others within their districts to promote appropriate infant feeding. LINKAGES also provides promotional materials, such as T-shirts and calendars, to the partners. The NGO and MOH partners have an established presence and network within the communities. They conduct many health promotion activities as part of their ongoing programs, including supporting mothers' support groups, conducting outreach clinics, holding health campaigns, etc. LINKAGES' interventions enable the partners to promote appropriate infant feeding more effectively within these ongoing programs.

While LINKAGES has been successful in increasing target breastfeeding behaviors, USAID and other stakeholders are increasingly interested in the cost of these interventions. LINKAGES requested Abt Associates to conduct a cost and effectiveness analysis of LINKAGES' breastfeeding promotion activities in Ghana. This study is the first of a series of studies of the cost and effectiveness of LINKAGES' interventions. The second country study in Madagascar is currently underway using the same methodology employed here, and will provide complementary and comparative results.

¹ The prime contractor for the LINKAGES cooperative agreement is the Academy for Educational Development.

2. Objectives of the Study

This study was conducted to provide useful cost and cost effectiveness information to USAID and LINKAGES' in-country partners. The objectives of this study are:

- to analyze the cost effectiveness of LINKAGES breastfeeding promotion activities (both with other breastfeeding promotion activities and among the study districts); and,
- to determine the cost implications of replicating activities.

Because of the dual objectives and different audiences for this study, data are presented in many different ways. For example, USAID may be more interested in the cost effectiveness of its funding through LINKAGES, while the Ghanaian MOH may wish to see the total costs borne by various levels of the health system. Depending on their objectives, different readers will be interested in analysis performed in somewhat different ways. While all the data analysis adheres to the methodology described in Section 4, costs are disaggregated in various ways to answer different questions. The specific questions of interest are:

- How do costs and outcomes compare across the five study districts?
- What are the determinants of costs and cost effectiveness across the study districts?
- How can LINKAGES improve its cost effectiveness?
- What would it cost to replicate these activities throughout Ghana and is it cost effective?
- How does the cost effectiveness of the interventions in Ghana compare with other breastfeeding promotion interventions in that country and elsewhere?

As detailed in the findings section, the data available allows us to answer some of these questions, but drawing conclusions in other areas will require further study.

3. Description of LINKAGES and Partner Activities

LINKAGES promotes appropriate breastfeeding at the community level by providing training, materials, and technical assistance to NGO and MOH partners, who have ongoing activities at the community level. Central to the LINKAGES strategy is building the capacity of all partners to improve infant feeding practices using effective Behavior Change Communication (BCC) methods. LINKAGES does not implement activities directly at the community level. Instead, it seeks to facilitate and enable its partners, who have community level networks, to promote appropriate infant feeding.

During the study period, LINKAGES worked with three NGO partners and the MOH in selected communities in nine districts within the three northern regions of Ghana (Northern Region, Upper East Region, and Upper West Region). These regions are the most remote regions in Ghana, and the most sparsely populated. Each of the NGO partners was active in three districts, with the MOH providing input through Regional Health Administrations (RHAs), District Health Management Teams (DHMT), and Sub-District Health Management Teams (SDHMT). LINKAGES' partners are:

- MOH – through the RHAs, DHMTs, and SDHMTs
- Catholic Relief Services (CRS)
- Ghana Red Cross (GRC)
- UNICEF

LINKAGES relies on its partners' networks in the communities to promote breastfeeding at the community level. While breastfeeding promotion has become an important part of all the partner activities (as a result of LINKAGES), it is only one component of the partners' many activities. LINKAGES and its partners align their activities to support their common objectives. For example LINKAGES conducts training for partner staff, but the partners then conduct training for community level health staff and volunteers. There are some activities that do not have overlap – for example, LINKAGES does not provide funding support for community outreach activities, which are solely funded by the NGO and MOH partners.

3.1. LINKAGES' Activities

Many of LINKAGES' activities during the study period represent start-up or development activities. As of October 1999, LINKAGES had just established a long-term presence in Ghana, with the arrival of a Resident Advisor, and the establishment of an office in Accra. The bulk of its activities during the study period focused on promotion of appropriate infant feeding at the community level. Other activities conducted included central level advocacy, and development of pre-service and in-service health staff training.

The development work related to community level breastfeeding promotion included a series of workshops and focus group discussions aimed at defining and developing the messages and materials to be used at the community level. There was also a workshop to review and validate the literature on infant feeding practices in Ghana – this workshop helped to ensure consensus on the key issues to address related to infant feeding.

These development activities are distinct from LINKAGES “core” implementation activities – providing support to partners who in turn implement activities within the target communities. These core activities include workshops to train trainers from among the NGO and MOH partner organizations. These trainers then train mothers’ support group leaders, as well as other health and community health staff in BCC techniques. LINKAGES also funded development of promotional materials such as calendars and T-shirts that were distributed at the regional, district and community level. Lastly, LINKAGES sponsored Breastfeeding Week events and radio broadcasts discussing infant feeding practices. These activities represent LINKAGES’ ongoing activities to promote appropriate infant feeding.

In addition to start-up/development and implementation activities, LINKAGES also conducted monitoring and evaluation activities during the study period. The main activity of this type is the community assessment conducted in September/October 2000. LINKAGES’ also traveled regularly to the northern regions for planning, monitoring and review of activities with its partners.

3.2. Partner Activities

In addition to LINKAGES activities, each of the partners conducted activities in their program districts. The activities conducted in the five study districts are described below.

3.2.1. Activities in East Mamprusi, Bongo, and Lawra

Three of the districts included in this study – East Mamprusi, Bongo, and Lawra – are part of the CRS Food Assisted Child Survival (FACS) program. The FACS program was started in 1996/97 and by the time of the LINKAGES interventions, had an established network of community volunteers and a clear set of activities. The FACS program includes many components, such as antenatal care, growth monitoring, diarrhea management, immunization, micronutrients, and promotion of appropriate infant feeding. All components of the program include a food distribution element linked to child health – for example, pregnant, breastfeeding mothers, and malnourished children all receive food supplements.

During the study period, LINKAGES trained CRS staff, who supported activities in these districts, as well as RHA and DHMT staff in these districts. These staff then trained (with CRS funds) mother support group leaders, other community health volunteers, and other health staff. Some of the people trained are key participants in regular community outreach clinics, which offer immunization, growth monitoring, health talks, and individual counseling. Promotion of appropriate infant feeding became a regular component of these outreach clinics. Mother support groups also meet regularly to discuss appropriate infant feeding, sometimes with health staff present. Food distribution also occurs during these clinics. Except for the MOH health staff, all participants at the community level are volunteers, and receive no income for their participation.

CRS has its own paid Program Officers (PO), who coordinate and oversee program activities. The POs plan activities, organize and conduct training, help coordinate durbars, provide general support to the districts and communities, and monitor the activities regularly. CRS supported training of Mothers Support Group Leaders, and BCC training for health staff and community volunteers. In addition to supporting training, CRS also supported durbars, Breastfeeding Week activities, community outreach (with per diems and transport costs), and monitoring and evaluation activities.

This model was generally consistent across the three districts. The key difference is the number of people from each district participating in the LINKAGES training, and presumably the number of people fully knowledgeable of appropriate infant feeding and BCC techniques, and newly motivated to promote appropriate practices. There were also differences in the number of durbars or community campaigns in the districts, and the support from radio stations donating free airtime.

3.2.2. Activities in Bolgatanga

The GRC Child Survival (CS) Project began operating in Bolgatanga in September 1999. The CS Project works in the areas of nutrition (including infant feeding), malaria, HIV/AIDS, diarrheal disease, immunization, and acute respiratory infections. More broadly, GRC primarily is involved in health promotion (including child survival), provision of infrastructure, and income generation activities. It relies on an extensive network of volunteers that were in place in well before LINKAGES interventions or the CS Project.

During the study period, several RHA staff were very active in infant feeding activities. They attended LINKAGES' training, were active in training mother's group facilitators, and promoted appropriate feeding practices in durbars and on the radio.

Funding available under the CS Project allowed GRC to pay two regional coordinators, one who had previously been a GRC volunteer, and the other recruited from the MOH. Given the new financial incentives, the launch of a new project generally, and the LINKAGES activities, the study period was one of high participant motivation and significant activity. The CS project also funded Mothers' Support Group training, supervision costs, outreach activities, and monitoring and evaluation. Although durbars also were held, GRC did not provide support to durbars as CRS did in its FACS districts.

3.2.3. Activities in Yendi

The scale and scope of activities in Yendi were quite different from the CRS and GRC districts. UNICEF did not have the same type of community level network as did CRS and GRC. UNICEF began its Village Action Planning (VAP) program in selected communities in Yendi in 1999. Under VAP, communities address a broad range of issues ranging from food security to water to sanitation, and involve many other ministries in addition to the MOH, and community extension workers to carry out interventions to address the problem.

While UNICEF did provide funding to support breastfeeding in 2001, there was little data on UNICEF supported BF promotion activities in 1999/2000. One reason is that few VAP communities identified breastfeeding as a high priority in its list of issues. Another is that during the study period, UNICEF was not able to provide the advance funding that is often required to jump-start activities due to accounting/auditing issues.

Although breastfeeding topics were covered in some UNICEF supported training (such as TBA training), there was little focused training on appropriate infant feeding. Some key activities that were conducted in the four districts discussed above did not take place until 2001. For example, mother support groups were started in 2000, but training for group leaders was not conducted until 2001. Training for the community extension workers also did not take place until 2001. In contrast, the other study districts all trained mother support group leaders and health staff in early 2000.

Activities in Yendi differed in two key ways. First, the second level training of people from the communities and health staff did not occur in 2000 in Yendi. Second, Yendi did not have an already established community level network as did the other districts. These two factors significantly impacted the level of community-based activities to promote appropriate infant feeding.

4. Methodology

The period examined in this study is October 1999 through September 2000. This period was selected to coincide with the beginning of LINKAGES' community level activities in August/September 1999, with the appointment of a resident advisor, and an appraisal of infant feeding practices conducted in September/October 2000, which provides documentation of activity outcomes.

The appraisal used three indicators to measure changes in infant feeding: 1) exclusive breastfeeding (EBF); 2) timely initiation of breastfeeding (TIBF); and 3) timely complementary feeding (TCF). LINKAGES requested that this cost effectiveness study focus on the impact on EBF and TIBF.

4.1. Types of Costs Included in the Analysis

LINKAGES efforts to promote appropriate breastfeeding practices incur costs at both the LINKAGES/Ghana office and at the program headquarters in Washington, DC. The current study considers all these costs.

The full cost of LINKAGES/Ghana in support of breastfeeding promotion, including allocation of all overhead/fixed costs (office administration, rent, office equipment, etc.) associated with the Ghana office is included in the analysis. Direct costs of the LINKAGES/DC office associated with breastfeeding promotion in Ghana are also included. Indirect costs of LINKAGES/DC (including DC office rent, accounting, financial management and billing, contracts management, etc.) are not included. This is in part because the overhead costs related to LINKAGES/DC and the LINKAGES contractor would not be incurred in replication in-country. Further, the administrative and overhead structure exists for a wide array of activities, and does not vary based on community-based breastfeeding promotion activities in Ghana.

The direct costs of NGO and MOH partners are included. Examples of these costs are staff time, costs of training workshops, and per diem for outreach activities. Partner overhead/fixed costs are always excluded because breastfeeding promotion represents a very small portion of their overall activities, and has minimal impact on their fixed costs, whether analysis is of cost effectiveness or replication costs. Household or volunteer costs are not included in this study for several reasons – volunteers had worked with the NGOs prior to LINKAGES interventions, the costs of volunteer time are not incurred costs, and the opportunity cost of the volunteers would have little impact on overall cost effectiveness. Further, volunteers receive some compensation in the form of T-shirts or gifts, the costs of which are included in the costs of specific activities. Table 1 summarizes the types of costs included in this analysis.

Table 1: Types of Costs Included in Analysis

Partner	Costs Included	Costs Excluded
LINKAGES/DC	<ul style="list-style-type: none"> • Direct costs – TDY costs, consultancies, technical and other support to Ghana, etc 	<ul style="list-style-type: none"> • Indirect costs of the DC office are excluded for analysis of the costs of replicating activities (DC office rent, financial and contracts management, etc)
LINKAGES/Ghana	<ul style="list-style-type: none"> • Direct costs – cost of staff, training workshops, development of materials, monitoring and evaluation, etc. • Indirect costs – cost of Ghana office (rent, utilities, support staff, administration) • Capital costs – annualized cost of equipment, furniture, vehicle for Ghana office calculated based on useful life 	None
Partners	<ul style="list-style-type: none"> • Direct costs – cost of staff, training workshops, development of materials, monitoring and evaluation, etc. • For CRS districts, results are shown both including and excluding food costs 	<ul style="list-style-type: none"> • Indirect costs – administration exists primarily for other activities • Transport cost for community-based activities – partners are traveling to communities for other activities • Volunteer costs – not incurred costs, and would have little overall impact on analysis

For the CRS districts, two analyses are conducted – one including food costs, and the other excluding food costs. This study does not analyze how food distribution affects behavior change in the CRS districts. Given that the FACS program was already established prior to LINKAGES’ intervention, behavior change may not be attributable to food distribution. For this reason, data excluding food costs is used throughout the report for comparison with other districts. Nonetheless, food cost is the dominant component of the CRS program costs, and so costs including food distribution are also presented.

4.2. Allocation of Costs to Activities

LINKAGES/Ghana conducts both activities to promote appropriate breastfeeding at the community level and other activities. Each activity that took place during the study period was reviewed with consideration of its objectives and content, and a subset of activities was designated as ones supporting appropriate infant feeding at the community level. Other activities focused on central level advocacy or development of health staff training. The direct costs for each activity (community

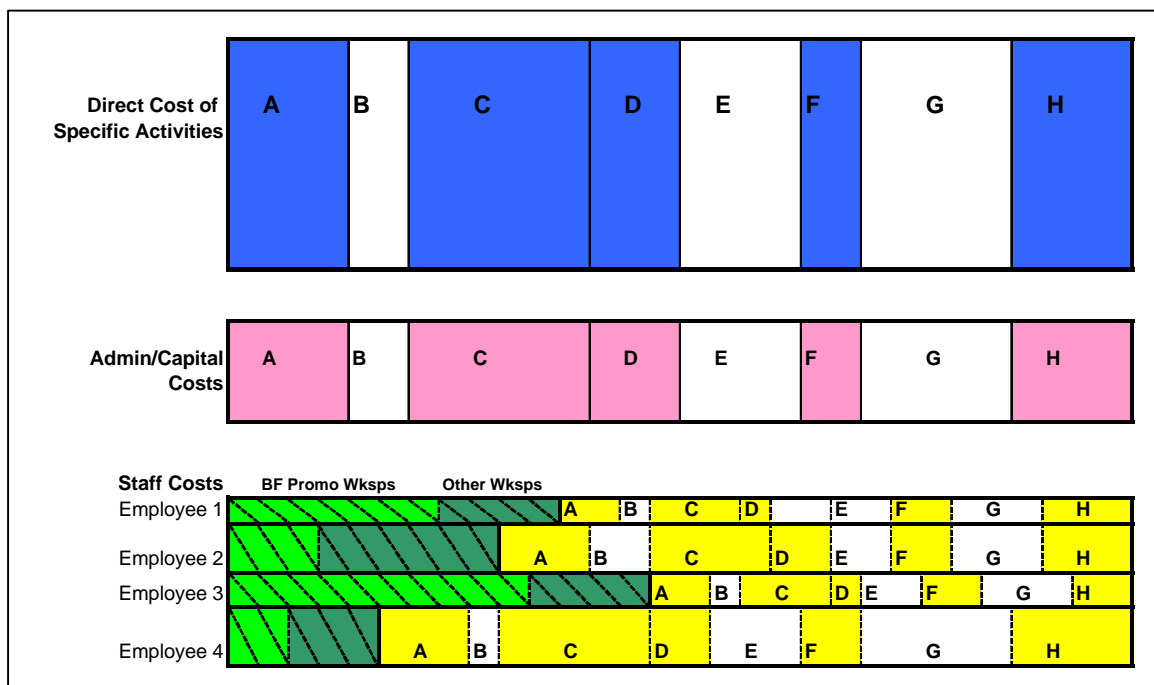
level infant feeding and other activities) were compiled (see Annex A for a list of all LINKAGES activities, specifying whether the activity costs were included in this study). Overhead and administrative costs were pro-rated across all activities based on the direct cost of each activity. A one-year estimate of the capital costs was calculated based on useful life, then pro-rated across all activities based on the direct cost of each activity. Data on actual staff time spent by activity was not available, so LINKAGES/Ghana staff costs were allocated specifically by attendance in workshops, with unspecified time allocated pro-rata across all activities based on the direct cost of the activity.

LINKAGES/DC costs were allocated to specific activities where appropriate (consultancies, workshop attendance, etc). Non-specific support costs were pro-rated across all LINKAGES/Ghana activities based on the direct cost of the activity. Thus, all costs incurred during the study period were allocated to the full set of LINKAGES' activities, a subset of which are included in this study.

Costs for partner activities were calculated in a similar way. Descriptions of activities were collected through interviews with partners (officials at NGOs, RHAs, DHMTs, SDHMTs). Data on the direct cost of each activity were collected. Activities included training workshops, outreach support, durbars or health campaigns, and supervision and monitoring. Staff cost was allocated based on actual time in workshops and staff estimates of time allocated to infant feeding. Staff time not directly attributable to workshops was allocated across activities based on the direct cost of the activity.

Figure 1 shows an illustrative allocation of LINKAGES costs. The top rectangle represents all of the direct costs of LINKAGES activities A, B, C, etc. A subset of these activities is included in this study, as indicated in blue. The second rectangle represents all of LINKAGES' administrative costs, and their allocation to each of the activities. The bottom rectangle represents LINKAGES staff costs, of which the portion in green is attributable to specific activities. The remaining staff cost is then allocated across all activities.

Figure 1: Allocation of LINKAGES' Costs



4.3. Allocation of Activity Costs to District Level Behavior Change

LINKAGES' costs for each activity were allocated to each of the appraisal districts using several methods. Costs for training and workshops were allocated based on the percentage of partner participants from each district (with participants from the national and regional levels allocated to districts using population-based formulas). Essentially, the total cost of each training or workshop was divided by the total number of participants to calculate the cost per participant. The cost for each participant was then allocated to the districts with which the participant was affiliated. Costs for promotion and education materials were allocated based on actual distribution to each district. Costs for the community assessment were allocated evenly across the nine target districts.

Costs incurred by the NGOs were directly attributed to each district. Staff costs that are not directly attributable to each district were allocated based on population. Costs incurred at the RHA not directly attributable to a district were allocated to the target districts based on population.

The content of each activity was reviewed and apportioned based on its messages on EBF, TIBF, and TCF. These estimates were reviewed with LINKAGES, since it is difficult to apportion activities to specific behaviors in a quantitative manner. For workshops, apportioning an activity to a behavior was based on review of the workshop agenda and the time spent discussing different topics. However, while time spent on breastfeeding could be isolated, it was harder to determine what portion of the discussion on breastfeeding was related to EBF vs. TIBF. Therefore, the time apportioned to breastfeeding was divided evenly between EBF and TIBF behaviors. For some activities, there was no quantitative basis for apportionment to targeted behavior – for example, distribution of T-shirts. In those instances, the costs were evenly allocated among the three targeted behaviors – EBF, TIBF, and TCF.

In addition to the costs related to EBF and TIBF, costs are also presented on an aggregated basis for each target district. There is higher validity to the district aggregated data, and changes in all three behaviors may be converted to health impact for a calculation of cost effectiveness of the group of LINKAGES' activities in each district. Further, the aggregated costs provide a more accurate estimate of the cost of replication, since a certain portion of activity costs are fixed, and would not be reduced even if only one behavior change were targeted.

4.4. Use of Rapid Appraisal to Measure Outcomes

The measure of effectiveness used in this study is based on the findings of a community assessment conducted in September/October 2000 by the MOH, LINKAGES, and other partners. The assessment sampled 870 mothers with infants less than one year in communities where exclusive breastfeeding and appropriate complementary feeding was actively promoted (program), as well as communities in which these behaviors were not actively promoted (control). Five of the nine districts in which the partner NGOs work were included in the assessment.

The community assessment data provide the best estimate of behavior change available. Other studies exist, but they used different definitions of EBF and TIBF, and do not provide true baseline data for the LINKAGES interventions due to their timing. Baseline surveys conducted by NGOs in 1995, 1996, and 1999 were available for three of the five study districts. In these studies, the data on EBF targeted infants 0-3 months and 0-5 months who were exclusively breastfed, while the data on

TIBF questioned mothers of infants breastfed within eight hours of birth. These differences in definition and the timing of earlier surveys make the control data in the 2000 assessment a better comparison.

The assessment defined the EBF rate as the percentage of children under six months exclusively breastfed. The TIBF rate was defined as the percentage of children under 12 months who were put to the breast within the first hour of birth. As the results of the rapid appraisal in Table 2 show, there were significant increases in the EBF and TIBF rates in districts where breastfeeding was promoted. However, the data on TIBF rates in program areas were very uneven and have significant impact on cost effectiveness results.

Table 2: Changes in EBF and TIBF in Study Districts

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
Program EBF Rate	94%	76%	96%	49%	73%
Control EBF Rate	48%	48%	48%	25%	66%
Program TIBF Rate	83%	38%	21%	30%	12%
Control TIBF Rate	9%	9%	9%	10%	27%

Source: Adjei, Adjei, and Schubert 2000, with updates from LINKAGES.

4.5. Indicators of Cost Effectiveness

Three measures of cost and effectiveness are used in this study: 1) cost per beneficiary, or cost per capita; 2) cost per targeted child; and, 3) cost per new acceptor. While the first two indicators look at unit costs, only the third indicator compares costs with outcomes. Since the outcome data available was at the behavior change level (not actual health outcomes), it is necessary to develop an indicator that compares costs with behavior change. The indicator used throughout this study to measure cost effectiveness is the cost per new acceptor (EBF or TIBF). For example, the indicator of the cost effectiveness of promoting EBF in each district is expressed in the following formula:

$$\frac{[\text{cost of activities to promote EBF}]}{[\text{target population}] * ([\text{EBF rate-program}] - [\text{EBF rate-control}])}$$

The denominator, the difference in EBF rate between program and control areas multiplied by the target population, represents the number of new acceptors, or people whose behavior has changed as a result of the breastfeeding promotion interventions. The cost of activities to promote EBF is divided by the estimated number of new acceptors, providing a measure of the costs incurred per new acceptor to obtain the desired behavior change. A similar formula is applied with program and control TIBF rates to measure cost effectiveness of promoting TIBF.

4.6. Selection of Study Districts

The selection of districts was based entirely on the districts included in the September/October 2000 appraisal, as there is outcome data in these districts. All five districts covered in that assessment are included in this study. These districts include three CRS districts (East Mamprusi, Bongo, and Lawra), one GRC district (Bolgatanga), and one UNICEF district (Yendi). It was not worthwhile to include other districts, because there would have been no outcome data available.

4.7. Comparability and Applicability of this Study

There have been few studies of the cost effectiveness of breastfeeding interventions in developing countries, and no studies of programs that are similar to LINKAGES' model of targeting rural areas, and acting solely as a catalyst or facilitator. It is therefore difficult to provide results that are directly comparable with other studies of breastfeeding programs, although this study attempts a rough, indicative comparison (see Section 6.5). This study does not address the question of whether LINKAGES' interventions are more or less cost effective than other child survival interventions. However, the methodology developed can be used to analyze other breastfeeding and child survival interventions and is applicable across LINKAGES' program countries.

4.8. Limitations of this Study

As detailed earlier, the measures of cost effectiveness are based solely on the community assessment data. The measures are accurate to the extent that the rates of EBF and TIBF in the control communities represent behavior without LINKAGES interventions. For GRC and CRS, no LINKAGES related interventions occurred in the control areas. But, for UNICEF, both program and control communities were selected from the same district, so staff from the DHMT and District Assembly attended the LINKAGES training, and likely there were diffused messages on infant feeding to the entire district, irrespective of whether a community was part of the UNICEF program. For this reason, it is likely that there was some "contamination" of the control communities in Yendi. Nonetheless, the community assessment data provide the best estimate of LINKAGES' impact on behavior change.

The measures of cost effectiveness also depend heavily on the allocation of costs of activities to the different behaviors targeted with each activity. Allocation of cost to each targeted behavior, as discussed in Section 4.3, is based on quantitative data wherever possible, which does not necessarily capture a basic distinction between what is required to encourage "one-time" behaviors (such as TIBF), versus "continuous" behaviors (such as EBF). As such, the allocation of costs to behavior change in this study may be overestimating the cost of TIBF (and underestimating the cost of EBF), since there is no adjustment to capture the difference between "one-time" and "continuous" behaviors.

4.9. Costing Terminology

There is a common terminology that is often used to describe different types of costs. This subsection reviews the common costing terminology and explains some of the terms used within this report to prevent any confusion in terminology.

Costs are often categorized into fixed and variable costs, or capital and operating costs. Fixed costs are costs that do not vary with the volume of output (in this case the target population, or the number of children changing behavior), while variable costs do vary with output. Capital costs refer to costs of goods that have a useful life of more than one year (such as equipment or vehicles), while operating costs refer to items that have a useful life of under one year (such as supplies, radio broadcasts). Capital costs generally involve payment for some good that maintains value to the owner. Categorizing costs in these ways can serve many purposes, including analysis of pricing, cost control, profit maximization, and budget planning.

Categorizing costs in this manner has limited applicability to the questions addressed in this study – all costs are included in this study, and are allocated to activities as described earlier in this section. One important point that should be understood about the cost structure of these interventions is that most of the costs in Ghana are fixed costs. Given that the unit of output is the number of people targeted or changing behavior, costs for most of the activities (district level training/workshops, Breastfeeding Week activities, monitoring and evaluation) are not tied to the target population. The activities that are tied to the target population (such as community outreach, where health personnel would spend more time in a village with many more people) are relatively low cost. Understanding the value of fixed costs and being able to determine the minimum level of fixed costs per district will allow LINKAGES to improve cost effectiveness in the future.

Another cost-related term often used is *marginal cost*. Marginal cost refers to the additional cost to produce one additional unit of output. This study does not seek to analyze the marginal cost of reaching each additional child – this intervention is not a standard production or service delivery one, where the marginal cost is related to capacity and variable costs. Analysis of marginal cost goes beyond costing and would require data on the rate of behavior change, given varying baseline behavior rates, and varying levels of intervention. However, the data across districts do provide some confirmation of the increasing marginal costs of achieving higher rates of EBF and TIBF.

Lastly, one of the key measures of cost effectiveness used in this report is the “cost per new acceptor.” This term refers to the *total* costs incurred per child that is induced to change behavior (see Section 4.5) – it does not refer to marginal cost, which is the *additional* cost incurred per additional child changing behavior.

5. Data Collection

Data collection for this study occurred in two phases. The first phase occurred during two weeks in February 2002 with a team of three in Accra, Tamale, East Mamprusi, Bongo, and Bolgatanga. The second phase of data collection took place in April 2002 with a team of two in Tamale, Wa, Lawra, and Yendi. Between these two intensive periods, there was ongoing data collection with LINKAGES' DC and Accra offices, and clarification of NGO costs by a consultant based in Tamale.

5.1. LINKAGES' Costs

Data on LINKAGES' costs were collected from records kept in the LINKAGES DC and Accra offices. The costs paid directly by the DC office are primarily costs related to the resident advisor, and costs for consultancies to support in-country activities. Other costs related to the Ghana program are general DC-based management, administrative, and support costs.

LINKAGES' in-country costs were collected from the accountant in the LINKAGES Accra office. Costs to support activities in country are paid directly by the Accra office, which had detailed cost information for the study period readily available. Cost data was disaggregated by specific activities (such as the cost for a workshop on a line item basis), and for overhead costs (such as detailed furniture and equipment expenditures). The data from Accra was maintained in Ghanaian cedis.

Data on total costs related to Ghana activities was collected at the LINKAGES DC office. Data was disaggregated by general DC office support/management, field-based costs, resident advisor costs, and by specific consultancies to support in-country activities. The data from Accra was compared with aggregate figures of field-based costs from the DC office. The figures were reconciled with a difference of \$3,400, representing 1.4% of the total costs. The primary reason for the difference is because data from the Accra office was maintained in Ghanaian cedis (which were then converted to US dollars using an average exchange rate for the period), while the data in DC used the actual exchange rate at the time of each expenditure report. In light of the time it would have taken to disaggregate the DC data to the level of detail available in Ghana, or to apply the actual exchange rate for each expenditure to the detailed data from Ghana, the data from Ghana is used (which was available with a high level of detail), and an average exchange rate (US \$1 = GHC 4,564) over the period was applied for conversion to US dollars.

Data to determine the specific activities conducted in support of community level breastfeeding promotion were collected based on interviews with the Ghana resident advisor and the Ghana country program technical manager.

5.2. NGO Partner Costs

Data on NGO partner costs (from CRS, GRC, and UNICEF) were collected through interviews and document reviews. Data was collected on activities conducted, expenditures, and estimates of staff time spent on various activities. Key informants among the central administration (management and finance/accounting) and program staff were interviewed at each of the NGOs. The interviews focused on description of the overall program, specific activities undertaken during the study period, and staff time dedicated to BF activities. Data on funds spent were gathered through review of

expense reports and budgets (where actual expense reports were unavailable). Whenever possible, these data were reconciled with data from other sources (MOH staff) regarding activities undertaken in each district. There was ongoing discussion with the NGO after review of the expense reports for clarifications.

5.3. MOH Partner Costs

Data from various levels of the MOH (Central Nutrition Unit, Regional Health Administrations, District Health Management Teams, and other health staff) were collected through interviews with key officials. As such, much of the data from MOH partners are based on recall of activities implemented, estimates of staff time commitments, and estimates of activity costs from the study period. Although several staff provided a written estimates of costs, no historical documents (expense reports, budgets, etc.) were available verifying the cost estimates.

Data collected include description of breastfeeding promotion activities undertaken in the district during the study period, estimates of costs incurred related to breastfeeding promotion activities, and estimates of staff time dedicated to breastfeeding promotion activities.

5.4. Data Limitations

Given the nature of a retrospective study, data access was not easy, particularly with some of the partners. Sometimes data required adjustment for use in this study. In some cases, data could not be reconciled across several sources, and a judgment was made to use available data from the source or sources deemed more reliable. There was no quantitative data regarding staff time dedicated to breastfeeding activities, so calculations of staff time costs are based on staff recall of estimated time spent on activities.

There were also instances of incomplete data – in these cases estimates were made to complete the study. Generally the estimates were based on data in other districts. For example, where there was no data on the amount of time a health nurse spent on breastfeeding at an outreach session, an average from the other districts was used. Where there was no data on the title of a staff person, an estimate of salary was made given the level of the health system in which she worked (health staff without a title at the DHMT would be assigned an average standard salary level).

6. Findings

The findings presented are organized along each of the study questions:

- How do costs and outcomes compare across the five study districts?
- What are the determinants of costs and cost effectiveness across the study districts?
- How can LINKAGES improve its cost effectiveness?
- What are the costs of replicating these interventions in Ghana?
- How does the cost effectiveness of the interventions in Ghana compare with other breastfeeding promotion interventions?
- What is the cost effectiveness of LINKAGES' investment in Ghana?

Selected information is shown in the sections below to address the question of interest. Annex B includes detailed cost data for LINKAGES and its partners by district.

6.1. How Do Costs and Outcomes Compare Across the Five Study Districts?

***Overall Finding:** Costs and outcomes varied significantly across the five districts, but there is a positive relationship between the costs incurred in a district and the behavior change outcomes. Generally higher costs were incurred where the rate of behavior change was higher.*

To answer the question of how costs and outcomes compare across districts, all costs for LINKAGES Ghana and DC based activities and partner activities to promote EBF and TIBF are included.

6.1.1. LINKAGES' Costs

Table 3 shows that the cost of LINKAGES' infant feeding activities across the five study districts was \$219,995. Of the total activities aimed at improving infant feeding practices, it is estimated that 30.5% of activities focus on increasing EBF, 30.5% of activities focus on increasing TIBF, and 39.0% of activities focus on improving TCF. Based on these percentages, the total cost of activities to promote EBF and TIBF is \$133,980, with \$66,990 attributed to activities to increase EBF, and \$66,990 attributed to activities to increase TIBF. Costs in each district varied significantly, ranging from \$18,252 in Bolgatanga to \$35,512 in East Mamprusi. Costs in the CRS districts (East Mamprusi, Bongo, and Lawra) were significantly higher than in other districts, as discussed further in later sections.

Table 3: Total Cost of LINKAGES Activities to Promote EBF and TIBF in Study Districts

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
Total Cost of Infant Feeding Activities	52,662	48,538	54,116	30,754	33,925	219,995
Costs allocated to EBF	16,256	14,976	16,511	9,126	10,121	66,990
Costs allocated to TIBF	16,256	14,976	16,511	9,126	10,121	66,990
Total Costs of EBF/TIBF	32,512	29,952	33,022	18,252	20,242	133,980

6.1.2. Partner Costs for CRS Districts – East Mamprusi, Bongo, and Lawra

Although the model for the partner activities is very similar from district to district – training a network of community volunteers to conduct health promotion activities – implementation differs significantly between the districts. The level of activities in some districts was much more intensive than in other districts. Costs for the three CRS districts are presented together due to similarities in the program. The costs for the GRC and UNICEF districts are presented separately.

The CRS program is unique in that food distribution is a significant component of its activities. CRS districts as a whole produced better outcome measures compared with other districts, which may be linked to the food incentive – mothers exclusively breastfeeding are provided food supplements. But the CRS program, including food distribution tied to EBF, began several years prior to LINKAGES interventions, so improvements in breastfeeding practices should have occurred by the beginning of LINKAGES work. Given the uncertainty of the impact of food distribution on BF behaviors, costs in these districts are shown with and without food costs.

Excluding Food Costs

Total partner costs to promote appropriate infant feeding are shown in Table 4. Excluding CRS food costs, partner costs across the three CRS districts ranged from \$3,717 in Bongo to \$6,112 in East Mamprusi. Of the total partner activities, 32.6% was attributable to promotion of EBF and 32.6% was attributable to promotion of TIBF. Costs to increase EBF and TIBF ranged from \$1,152 in Bongo to \$2,071 in East Mamprusi.

Table 4: Total Costs of Partner Activities to Promote EBF and TIBF, CRS Districts
(US\$ excluding food costs)

	East Mamprusi	Bongo	Lawra
Total Costs	6,112	3,717	4,898
Cost to Increase EBF	2,071	1,152	1,579
Cost to Increase TIBF	2,071	1,152	1,579

Including Food Costs

Total partner costs to promote appropriate infant feeding are shown in Table 5. Including CRS food costs, partner costs across the three CRS districts ranged from \$9,277 in Lawra to \$10,214 in East Mamprusi. Of the total partner activities, 32.6% was attributable to promotion of EBF and 32.6% was attributable to promotion of TIBF. Costs to increase EBF and TIBF ranged from \$3,021 in Lawra to \$3,485 in East Mamprusi.

Table 5: Total Costs of Partner Activities to Promote EBF and TIBF, CRS Districts
(US\$ including food costs)

	East Mamprusi	Bongo	Lawra
Total Costs	10,214	9,917	9,277
Cost to Increase EBF	3,485	3,065	3,021
Cost to Increase TIBF	3,485	3,065	3,021

6.1.3. Partner Costs for GRC District – Bolgatanga

Total partner costs to promote appropriate infant feeding in Bolgatanga were \$6,413, as shown in Table 6. Of the total partner activities, 33.1% was attributable to promotion of EBF and 33.1% was attributable to promotion of TIBF. Costs to increase EBF were \$2,124, and costs to increase TIBF were \$2,124.

Table 6: Total Costs of Partner Activities to Promote EBF and TIBF, Bolgatanga (US\$)

	Partner Costs
Total Costs	6,413
Cost to Increase EBF	2,124
Cost to Increase TIBF	2,124

6.1.4. Partner Costs for UNICEF District – Yendi

Total partner costs to promote appropriate infant feeding in Yendi were \$1,463, as shown in Table 7. Of the total partner activities, 32.6% was attributable to promotion of EBF and 32.6% was attributable to promotion of TIBF. Costs to increase EBF were \$476, and costs to increase TIBF were \$476.

Table 7: Total Costs of Partner Activities to Promote EBF and TIBF, Yendi (US\$)

	Partner Costs
Total Costs	1,463
Cost to Increase EBF	476
Cost to Increase TIBF	476

6.1.5. Package of LINKAGES and Partner Interventions Compared with Outcomes

Based on the five districts studied, there is a relationship between the costs incurred and EBF and TIBF rates, with the exception of Lawra's results in TIBF. Table 8 shows the total of LINKAGES and partner costs (excluding CRS food costs) in each of the five districts. Bolgatanga and Yendi, which had much lower costs per targeted child (\$5 and \$12, respectively), experienced lower increases in EBF rates, while East Mamprusi and Lawra had higher costs (\$33 and \$58, respectively)

and achieved higher increases in EBF rates. The pattern is a bit less clear for the TIBF results because of results from Lawra. Excluding Lawra, the two districts with the higher costs (East Mamprusi and Bongo) achieved higher increases in TIBF rates, while Bolgatanga and Yendi experienced low or no increases.

Table 8: Relationship Between Costs and Outcomes

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
LINKAGES & Partner Costs Alloc to EBF (US\$)	18,327	16,128	18,090	11,250	10,597
Costs per Child to Promote EBF	33	32	58	5	12
Percent Difference between Program and Control Communities – EBF	46%	28%	48%	24%	7%
LINKAGES & Partner Costs Alloc to TIBF (US\$)	18,327	16,128	18,090	11,250	10,597
Costs per Child to Promote TIBF	33	32	58	5	12
Percent Difference between Program and Control Communities – TIBF	74%	29%	12%	20%	-15%

Note: Excludes CRS food costs.

6.2. What are Determinants of Costs and Cost Effectiveness?

***Overall Finding:** The key driver of cost differences was the number of participants from each district involved in LINKAGES' trainings and workshops. The cost per training/workshop participant, driven by total workshop cost and number of participants, also impacts total costs. The factors affecting cost effectiveness include the level of partner participation in implementation, the size of the targeted population, and the control (or assumed baseline) rates of EBF and TIBF.*

Although higher costs per child (defined as cost/targeted child) are related to EBF and TIBF rates, they were not necessarily related to higher or lower cost effectiveness (defined as the cost per new acceptor). To analyze factors affecting cost effectiveness, costs are disaggregated in a variety of ways to examine patterns among different types of costs. Non-cost related factors were also examined to see relationships with cost effectiveness.

6.2.1. Key Cost Drivers

The key driver of cost differences among the five districts was the level of partner participation in training activities, as the training represented a significant portion of total costs. The number of people from each district who participated in LINKAGES-sponsored training and the follow-on trainings conducted by the partners are key cost drivers. Also important is the overall cost of the training/workshop, as that affects the cost per participant, which is then allocated to different districts. Table 9 shows the costs allocated to EBF for different activities by district – costs allocated to TIBF are not shown separately but mirror the EBF costs.

Table 9: Costs per District to Promote EBF by Activity (US\$)

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
Materials & Messages Devel	6,385	6,003	5,751	2,056	1,950
Mother Support Grp Training	3,720	3,165	2,852	364	1,487
BCC Training	2,489	2,271	3,375	2,839	3,011
Other Mtgs and Training	1,341	820	1,044	1,302	333
World BF Week	1,044	870	2,095	772	759
Other	760	398	376	849	543
RAP, Spvsn, M&E	2,588	2,600	2,597	3,064	2,516
LINKAGES & Partner Costs Alloc to EBF (US\$)	18,327	16,127	18,090	11,246	10,599

Notes: Excludes CRS food costs.

Totals may not match previous table due to rounding.

In all districts, three key LINKAGES sponsored trainings/workshops (Materials and Messages Development workshops, Mother to Mother Support Group training, and Behavior Change Communication training) accounted for the majority of costs. The district cost for these three activities depended on the number of participants from the district who attended. For example, Yendi only had one representative at the M&M workshops, while East Mamprusi had three – hence the higher costs in East Mamprusi compared with Yendi. Similarly, three representatives from Yendi attended the BCC training, while Bongo sent only one representative.

While the number of people representing each district affects the cost allocated to that district, the cost per participant also has significant impact on overall costs. Developing ways to lower the cost per participant either by lowering the costs for delivering the training or increasing the total number of people at each training would have significant impact on total costs.

LINKAGES' rapid assessment and other supervision and monitoring activities represent another high cost area. In most cases, the bulk of the monitoring and evaluation costs were consumed by the rapid assessment. This study was not designed to draw conclusions on the cost effectiveness of any individual activities. But, because the workshops and training are such a large component, further research to see which ones are more cost effective may be warranted.

6.2.2. Cost Effectiveness and Partner Participation and Input

Total partner contributions and the breakdown of partner contributions varied significantly from district to district. Table 10 shows total partner costs for each district to promote appropriate EBF and TIBF, excluding CRS food costs. Partner costs ranged from \$1,463 in Yendi to \$6,413 in Bolgatanga. CRS supported the large majority of the costs in its three districts, representing 87.1% of total partner costs. GRC supported the large majority of the costs in Bolgatanga, representing 95.0% of partner costs. In Yendi, the district radio station accounted for 43.5% of the costs, sponsoring radio programs and events free of charge. UNICEF supported 27.7% of the total costs, while the MOH supported 28.8% of the costs.

Table 10: Cost of Partner Activities to Promote EBF and TIBF (US\$)

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
NGO Costs	5,200	3,249	4,379	6,092	406
MOH Costs	481	468	464	321	421
Other Partner Costs	431	0	55	0	636
Total Costs	6,112	3,717	4,898	6,413	1,463

Note: Excludes CRS food costs.

There is a relationship between partner contribution to costs (representing the level of partner activity) and cost effectiveness. Table 11 shows the breakdown between LINKAGES and partner costs, compared with cost effectiveness, as measured by cost per new EBF and TIBF acceptor.

Table 11: Comparison of LINKAGES & Partner Cost Breakdown with Cost-Effectiveness

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
LINKAGES & Partner Costs Alloc to EBF (US\$)*	18,327	16,128	18,090	11,250	10,597
LINKAGES Costs as Percent of Total	89%	93%	91%	81%	96%
Partner Costs as Percent of Total	11%	7%	9%	19%	4%
Cost per New EBF Acceptor (US\$)	72	114	122	20	167
Cost per New TIBF Acceptor (US\$)	45	110	486	23	NM**

Note: Excludes CRS food costs.

* Costs allocated to TIBF activities are not shown separately as they are the same as costs shown for EBF.

** Calculation is not meaningful as TIBF rates in program areas were below control areas.

The districts that were relatively more cost effective were Bolgatanga and East Mamprusi, where the costs incurred by the partners represented a higher percent of total costs (11% in East Mamprusi and 19% in Bolgatanga). By comparison, Yendi, which was the least cost effective, had the lowest partner input (4%). Although LINKAGES costs were similar in Bolgatanga (\$11,250) and Yendi (\$10,597), the difference in partner costs/activity had a significant impact on outcomes and cost effectiveness. Partner costs in Bolgatanga were \$2,124, while Bolgatanga's cost per new EBF acceptor was \$20, and \$23 for each new TIBF acceptor. By comparison, Yendi's partner costs were \$476, and its cost per new EBF acceptor was \$167 (results for cost effectiveness of TIBF activities in Yendi were not meaningful).

This finding is compatible with the fact that LINKAGES relies on its NGO and MOH partners to implement activities on the ground. If its partners are not prepared to carry out community level activities, then it is unlikely that LINKAGES costs incurred to support the partners through trainings, materials, etc. will result in a great positive outcome.

6.2.3. Cost Effectiveness and Target Population

The size of the target population within a district also has an impact on cost effectiveness – as mentioned earlier, a large share of LINKAGES costs are fixed, and unit costs would decrease as total costs are spread over a larger population. Table 12 shows the target population, along with the total costs per child, and the cost per new EBF and TIBF acceptor. As the data show, the costs are not

related to the target population, because the primary driver of costs was the number of people from each district who participated in LINKAGES trainings, which was not related to population.

Table 12: Comparison of Total Cost, Population and Cost-Effectiveness

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
LINKAGES & Partner Costs Alloc to EBF (US\$)*	18,327	16,128	18,090	11,250	10,597
Target Population	551	507	310	2,394	907
Cost per Child alloc to EBF (US\$)	33	32	58	5	12
Cost per Child alloc to TIBF (US\$)	33	32	58	5	12
Cost per New EBF Acceptor (US\$)	72	114	122	20	167
Cost per New TIBF Acceptor (US\$)	45	110	486	23	NM**

Note: Excludes CRS food costs.

* Costs allocated to TIBF activities are not shown separately as they are the same as costs shown for EBF.

** Calculation is not meaningful as TIBF rates in program areas were below control areas.

LINKAGES costs across the three CRS districts (East Mamprusi, Bongo, and Lawra) are nearly the same, even though the target population in Lawra is 56% of the target population in East Mamprusi. The costs in Bolgatanga and Yendi are also similar, although Yendi's population is 37% of the population of Bolgatanga. In fact, the target population in Bolgatanga is substantially larger than any of the other districts. It is one of the key reasons why Bolgatanga is the most cost effective – despite less impressive behavior change outcomes (Bolgatanga's percentage change in EBF ranked fourth of the five districts, and the percentage change in TIBF ranked third of the five districts). Based on this data, it is more efficient to work in districts with larger target populations – the costs in Bolgatanga (target population: 2,394) are \$5 per child, while the costs in Lawra (target population: 310) are \$58 per child.

6.2.4. Cost Effectiveness and Marginal Costs

Differences in cost effectiveness between districts may also be partially explained by the increasing marginal cost of achieving higher EBF and TIBF rates. As discussed in Section 4.9, marginal costs refer to the additional cost required to produce one additional unit of output. Table 13 shows the rates of EBF and TIBF with no intervention, compared with the cost per new EBF and TIBF acceptor with LINKAGES' interventions. Based on the EBF rates in control communities, the CRS districts had higher EBF rates (48%) compared with Bolgatanga (25%). The cost per new EBF acceptor was higher in the CRS districts (\$72, \$114, and \$122) than in Bolgatanga (\$20). In Yendi, where EBF rates in control communities were the highest (66%), the cost per new EBF acceptor was also the highest (\$167).

Table 13: Comparison of Control Rates of EBF and TIBF with Cost Effectiveness

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
LINKAGES & Partner Costs Alloc to EBF (US\$)	18,327	16,128	18,090	11,250	10,597
Target Population	551	507	310	2,394	907
Control EBF Rate	48%	48%	48%	25%	66%
Control TIBF Rate	9%	9%	9%	10%	27%
Cost per New EBF Acceptor (US\$)	72	114	122	20	167
Cost per New TIBF Acceptor (US\$)	45	110	486	23	NM*

Note: Excludes CRS food costs.

* Calculation is not meaningful as TIBF rates in program areas were below control areas.

While the data for costs of increasing EBF support the impact of increasing marginal costs at higher rates of EBF, the data on costs for TIBF is less conclusive. Except for Yendi, all districts had similar control rates for TIBF and large variations in costs per new TIBF acceptor, largely due to very different results in TIBF rates in program communities. Yendi, which had the highest control rate of TIBF, actually showed lower TIBF rates in the program communities.

Reviewing the data for EBF costs and outcomes, there appears to be a relationship between higher baseline rates of EBF and lower cost effectiveness, which can be explained by increasing marginal costs for behavior change at higher EBF rates. The data for TIBF, however, is less clear, as there were significant variations in the TIBF rate results.

6.3. What Would It Cost to Replicate These Activities in Ghana and Is it Cost Effective?

Overall Finding: *The cost of replicating the package of LINKAGES and partner interventions to promote EBF and TIBF is \$16 per targeted child. The cost per beneficiary (defined as the total population of the program areas) is \$0.61. Of these total costs, the portion of costs contributed by partners is \$2.65 per targeted child, or \$0.10 per beneficiary. The cost per new EBF acceptor is \$34, and the cost per new TIBF acceptor is \$45.*

6.3.1. Cost to Replicate Package of LINKAGES and Partner Activities

Determining the replication costs entailed a review of costs for all LINKAGES activities in Ghana, a subset of which are included in this study. Other activities such as early formative research and TIPS form a key part of the LINKAGES package of activities. However, these costs were not incurred during this study period. The activities targeting community level behavior change were then classified as start-up/development activities, ongoing implementation activities, and monitoring and evaluation activities. Development activities are one-time activities that would not be replicated, such as workshops to develop key messages and materials. Implementation activities are an ongoing part of the program and include training workshops, production of promotional materials, radio broadcasts. Monitoring and evaluation activities are ones aimed only at assessing outcomes from the

interventions. Table 14 shows the classification of all the activities conducted by LINKAGES and its partners.

Table 14: Classification of LINKAGES and Partner Activities

Activity	Start-up, Implementation, or Monitoring/Evaluation
Materials & Messages development workshops	Start-up
Mother to Mother Support Group training	Implementation
Behavior Change Communication training	Implementation
Literature Review meeting	Start-up
Other training	Implementation
Rapid Appraisal	Monitoring/Evaluation
Supervision/M&E	Monitoring/Evaluation
Radio broadcasts	Implementation
Calendars	Implementation
Campaigns/durbars	Implementation
Community outreach	Implementation
World Breastfeeding Week	Implementation

Disaggregating costs associated with implementation activities provides the most accurate estimate of costs of replicating activities in Ghana. Start-up or development costs would not be incurred for replication in-country – those costs include costs of developing promotion materials, reviewing breastfeeding practices, etc. Implementation costs cover the cost of production of promotional materials, radio broadcasts, and training/refresher training. Monitoring and evaluation costs are not included as they do not directly produce behavior change and because evaluation costs are not included in other BF cost effectiveness studies, which are used for comparison.

The costs associated with implementation activities only for each district are shown in Table 15. Total implementation costs for the package of activities to promote EBF and TIBF ranged from \$11,946 in Bolgatanga to \$19,178 in Lawra.

Table 15: Costs of Replicating EBF & TIBF Promotion Activities, LINKAGES and Partner Implementation Costs Only

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
LINKAGES Costs (US\$)	14,752	12,761	16,456	8,851	11,019	63,839
Partner Costs (US\$)	3,649	1,980	2,722	3,095	939	12,385
Total Costs to Promote EBF & TIBF (US\$)	18,401	14,741	19,178	11,946	11,958	76,224
Target Population	551	507	310	2,394	907	4,669
Cost per Child (US\$)	33	29	62	5	13	16
Total Beneficiaries	14,722	13,543	8,289	64,000	24,250	124,804
Cost per Beneficiary (US\$)	1.25	1.09	2.31	0.19	0.49	0.61

Note: Excludes CRS food costs.

Across the five districts, the implementation cost of promoting EBF and TIBF was \$16 per targeted child, ranging from \$5 in Bolgatanga to \$62 in Lawra. The cost per beneficiary (defined as the total population of the program areas) was \$0.61, ranging from \$0.19 in Bolgatanga to \$2.31 in Lawra. Of these total costs, the portion of costs contributed by partners is \$2.65 per targeted child, or \$0.10 per beneficiary (not shown in Table 15).

It should be made clear that this section examines only the cost of replicating activities in Ghana. It would be inaccurate to apply this data to estimate replication costs in other countries, even ones with similar programs, because of differences in local costs. Further, this study did not include the costs of volunteer time (such as volunteer mother support group leaders or village health workers), since they are generally not formally employed and it is difficult to value their time. If these activities are replicated on a larger scale, volunteer costs could potentially become incurred costs, but such costs would still have a small impact on overall costs.

6.3.2. Cost Effectiveness of Replication

In addition to examining the cost of replicating these activities, it is also useful to examine the cost effectiveness of replicating these activities. As in the previous section, the cost of replicating these activities is limited to implementation costs only. Thus to measure cost effectiveness of replication, total implementation costs are compared with the number of new EBF and TIBF acceptors, to calculate the implementation cost per new EBF or TIBF acceptor.

Table 16 presents the cost effectiveness of promoting EBF in the five study districts. Based on data across the five districts, the cost per new EBF acceptor, if these interventions were replicated, would be \$34. There is wide variation across the districts, with costs per new EBF acceptor ranging from \$10 in Bolgatanga to \$94 in Yendi. Excluding Yendi, the cost per new EBF acceptor is \$29.

Table 16: Cost Effectiveness of Promoting EBF, LINKAGES and Partner Implementation Costs

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
LINKAGES and Partner Costs (US\$)	9,201	7,371	9,589	5,973	5,979	38,113
Target Population	551	507	310	2,394	907	4,669
Percent Difference between Program and Control Communities	46%	28%	48%	24%	7%	24%
Est. Number of New EBF Acceptors	253	142	149	574	63	1,120
Cost per New EBF Acceptor (US\$)	36	52	64	10	94	34

Note: Excludes CRS food costs.

A similar analysis was also conducted to determine the cost per new TIBF acceptor. The results are shown in Table 17. Across the five districts, replication costs per new TIBF acceptor is \$45, ranging from \$12 in Bolgatanga to \$258 in Lawra. The higher cost in Lawra is due to a relatively lower increase in its TIBF rate. Excluding Yendi, which did not experience an increase in TIBF, the cost per new TIBF acceptor is \$30.

Table 17: Cost Effectiveness of Promoting TIBF, LINKAGES and Partner Implementation Costs

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
LINKAGES and Partner Costs (US\$)	9,201	7,371	9,589	5,973	5,979	38,113
Target Population	551	507	310	2,394	907	4,669
Percent Difference between Program and Control Communities	74%	29%	12%	20%	-15%	18%
Est. Number of New TIBF Acceptors	408	147	37	479	NM*	840
Cost per New TIBF Acceptor (US\$)	23	50	258	12	NM*	45

Note: Excludes CRS food costs.

* Calculation is not meaningful as TIBF rates in program areas were below control areas.

These data do not allow us to draw conclusions about the cost effectiveness of replicating these activities versus other child health interventions. A follow-on analysis that may allow further conclusions to be drawn on the cost effectiveness of LINKAGES' breastfeeding interventions would be to compare these costs with morbidity or mortality averted or Disability Adjusted Life Years (DALY) gained as a result of appropriate breastfeeding. Section 6.5 compares the cost effectiveness of breastfeeding interventions in Ghana with available studies of cost effectiveness of other breastfeeding interventions, and shows the LINKAGES interventions to be cost effective, compared with a study in Brazil.

6.4. How Can LINKAGES Improve its Cost Effectiveness?

***Overall Finding:** LINKAGES may be able to increase its cost effectiveness by selecting partners who are ready and able to implement relatively intensive community level activities, increasing its target population in program districts, and selecting populations that have lower baseline EBF and TIBF rates, where impact may be achieved at lower marginal cost. Identifying ways to lower the cost per participant trained would also improve cost effectiveness.*

While on average it cost \$34 per new EBF acceptor and \$45 per new TIBF acceptor, the data show that these results can be achieved at much lower cost. In Bolgatanga, each new EBF acceptor cost only \$10, and each new TIBF acceptor cost only \$12. Based on the findings of the previous sections, LINKAGES may be able to improve its cost effectiveness in several ways if it were to expand activities in Ghana:

- Selecting partners who are ready and able to implement relatively intensive community level activities
- Increasing its target population in program districts, either by choosing more densely populated districts or targeting a larger portion of the district population
- Selecting populations that have lower EBF and TIBF rates, where impact may be achieved at lower marginal cost

- Conducting further analysis of its key cost drivers to see how the mix of activities impacts outcomes and cost effectiveness

In summary, LINKAGES would be most cost effective by working with active partners who have strong networks covering large populations in areas with low EBF and TIBF. By choosing sites with these characteristics, LINKAGES could increase cost effectiveness, but there may be potential “side-effects” to consider – it may mean not working in the poorest communities, for example. LINKAGES could also increase its cost effectiveness by identifying ways to lower the cost per participant in its workshops and trainings, either by lowering workshop costs or increasing the number of participants per workshop.

One limitation of this study is that it does not allow analysis of the cost effectiveness of individual activities or of the optimal mix of activities. Thus, no recommendations can be made regarding ways to improve cost effectiveness by manipulating the package of activities.

6.5. Is LINKAGES Cost Effective Compared with Other Breastfeeding Interventions?

Overall Finding: Although comparable studies are limited, LINKAGES appears to be cost effective at an average cost per new EBF acceptor of \$34, compared with data from Brazil showing cost per new EBF acceptor to be \$59.

The most notable studies of breastfeeding promotion cost effectiveness – indeed, the only studies available – were a series of studies conducted in 1992-93 in seven hospitals in Brazil, Honduras, and Mexico (funded through the USAID LAC-HNS project). It is difficult to compare the results in Ghana with those studies due to differences in the nature of the interventions and the nature of the study methodology. Nonetheless, some comparison is useful. Disaggregated data was only available for Brazil, and so detailed comparisons are made with that study only.

The nature of the interventions studied under LAC-HNS was very different from those in Ghana. Those studies included only interventions in hospitals in urban settings. In Ghana, the intervention areas are among the most remote and least densely populated areas of the country. Because of the scale of the Brazil intervention, and the capacity of persons with direct contact with mothers, the hospitals studied did not use the model of cascading training of trainers, which accounts for the large portion of costs in Ghana. The primary costs in the LAC-HNS study hospitals were the costs of staff time for special clinics and individual counseling, the cost of changes in physical space required, and the cost of promotion materials.

The costing methodology and the effectiveness measures used were also very different. The LAC-HNS studies reported aggregate net costs, which took into account savings from breastfeeding (primarily the foregone cost of infant formula). The LAC-HNS studies include only implementation costs and exclude start-up or monitoring and evaluation costs. Hospital overhead and administrative costs were not included in the study. The measure of EBF was also different – in Brazil the EBF measure was based on interview results at a three month follow-up visit. Thus, it only measures EBF at three months after delivery. The summary data provides only the net cost (after savings from

formula) per additional child breastfeeding. The disaggregated data were available for Brazil, and were adjusted to allow comparison between the Brazil and Ghana results.

Under various assumptions, the gross cost of breastfeeding promotion per newborn in Brazil at the time of the study ranged from \$11.09 to \$11.94. The EBF rate in the program hospital was 43%, and was 20% in the control hospital. Based on an average cost per newborn of \$11, this translates into a cost per new EBF acceptor of \$48 (\$11/23%). Applying the total inflation rate (in US dollar terms) of 22.4% between 1992 and 2000, the cost per new EBF acceptor in Brazil was \$59, in 2000 dollars. By comparison, the implementation costs per new EBF acceptor in Ghana ranged from \$10 in Bolgatanga, to \$52 in Bongo, to \$94 in Yendi. The average cost across the study districts was \$34.

7. Discussion and Conclusions

7.1. Review of Key Research Questions

Review of the cost data and cost effectiveness ratios allows us to answer some key questions about LINKAGES' work:

- *How do costs and outcomes compare across the five study districts?*
Costs and outcomes varied significantly across the five districts, but there is a positive relationship between the costs incurred in a district and the behavior change outcomes. Generally higher costs were incurred where the rate of behavior change was higher.
- *What are the determinants of costs and cost effectiveness across the study districts?*
The key driver of cost differences was the number of participants from each district involved in LINKAGES trainings and workshops. The cost per workshop participant, driven by total workshop cost and number of participants, also impacted total costs. The factors affecting cost effectiveness include the level of partner participation in implementation, the size of the targeted population, and the control (or assumed baseline) rates of EBF and TIBF.
- *What would it cost to replicate these activities in Ghana and is it cost effective?*
The cost of replicating the package of LINKAGES and partner interventions to promote EBF and TIBF is \$16 per targeted child. The cost per beneficiary (defined as the total population of the program areas) is \$0.61. Of these total costs, the portion of costs contributed by partners is \$2.65 per targeted child, or \$0.10 per beneficiary. The cost per new EBF acceptor is \$34, and the cost per new TIBF acceptor is \$45.
- *How can LINKAGES improve its cost effectiveness?*
LINKAGES may be able to increase its cost effectiveness by selecting partners who are ready and able to implement relatively intensive community level activities, increasing its target population in program districts, and selecting populations that have lower baseline EBF and TIBF rates, where impact may be achieved at lower marginal cost. Identifying ways to lower the cost per participant trained would also improve cost effectiveness.
- *How does the cost effectiveness of the interventions in Ghana compare with other breastfeeding promotion interventions?*
Although comparable studies are limited, LINKAGES appears to be cost effective at an average cost per new EBF acceptor of \$34, compared with data from Brazil showing cost per new EBF acceptor to be \$59.

7.2. Additional Research Questions

While this study provided data that will be useful in shaping future activities, there are nonetheless many other important questions that could shape future activities that have not been addressed:

- What is the impact of each of the individual activities?
- What is the optimal mix of activities?
- What is the level of input required for specific activities, given program parameters such as target population, population density?
- How sustainable is the behavior change?

This study was not designed to determine the cost effectiveness of specific activities, but of the package of LINKAGES and partner activities. While it has been demonstrated that this package of activities produces behavior change, we are unable to determine whether all of the activities conducted were necessary or whether the outcomes could have been achieved by undertaking just one, or some limited combination, of these activities. Although LINKAGES appears to be cost effective, without more information on the optimal mix of activities, we cannot determine how LINKAGES can be *most* cost effective (though given the cross-district comparisons, we have some suggestions about how it could be *more* cost effective). Table 21 shows the costs to promote EBF by activity in each of the districts. The data show that Bolgatanga, which was the most cost effective district, incurred lower costs for the mother support group training – does this mean that training of mother support groups does not produce much behavior change? While the data lead us to develop these questions, it does not allow us to provide definitive answers that could improve the cost effectiveness of future programs.

Table 18: Costs to Promote EBF by Activity Compared with Cost Effectiveness (US\$)

	East Mamprusi	Bongo	Lawra	Bolgatanga	Yendi
Mother Support Grp Training	3,720	3,165	2,852	364	1,487
BCC Training	2,489	2,271	3,375	2,839	3,011
Other Mtgs and Training	1,341	820	1,044	1,302	333
World BF Week	1,044	870	2,095	772	759
Other Activities	760	398	376	849	543
Implementation Costs per New EBF Acceptor	36	52	64	10	94

Note: Excludes CRS food costs.

Further, since the number of participants in workshops and training is the key cost driver, it would be helpful to know the optimal number of participants for a given district, or a given target population. This point relates also to the fact that interventions are more cost effective in districts with higher target population – does this mean that fewer people should be trained in districts with lower target population? Or is there a critical mass that is required regardless of the target population?

Lastly, the sustainability or longevity of LINKAGES interventions is a key question affecting how we analyze cost effectiveness. This point can be viewed in two ways:

1. *How long would the activities conducted during this study period continue to affect EBF and TIBF behavior?* That is, if LINKAGES had discontinued all activities at the end of the study

period, would all new behavior have ceased? Because this scenario seems unlikely, to some extent we are underestimating cost effectiveness because the costs incurred during the study period are producing outcomes beyond the end of the study period. Nonetheless, we have no data about how long these effects would continue.

2. *At what point do the behaviors become self-sustainable?* That is, after some period of time, one may expect that the behaviors encouraged by these interventions would become cultural norms to be passed on within the community. If we could determine how long it takes for these types of behaviors to become cultural norms, then we would have a more accurate measure of cost effectiveness, because we could then measure the total input required to produce long term benefits from these interventions.

Some of these questions may be addressed with data from a companion study of the cost effectiveness of LINKAGES' interventions in Madagascar currently underway. The timing of interventions and the different mix of activities in Madagascar may allow us to draw conclusions related to some of these questions. It will also be useful simply to have cost data from another country for comparison purposes.

7.3. Implications for the Future

Due to limited availability of cost data for other BF promotion interventions, conclusions about LINKAGES' cost effectiveness in Ghana are only preliminary. On average, LINKAGES appears to be cost effective compared with a study of BF cost effectiveness conducted in Brazil. Due to differences in measurement of outcomes, program structure, and administrative requirements, however, it is difficult (and may be unfair) to compare this intervention with other breastfeeding promotion or child survival activities. For example, the cost structure under a USAID contract, with its reporting, administrative and procurement requirements, cannot be compared to costs of a program funded by a community based NGO. Because it is difficult to eliminate precisely the effect of such management requirements, applying the methodology used in this study to analyze cost effectiveness of other USAID child survival interventions would provide the most accurate assessment of LINKAGES' cost effectiveness. Ability to make comparisons between child survival interventions would be contingent on ability to convert behavioral and other outcomes to a common health impact indicator (such as DALYs) reliably.

While on average, LINKAGES interventions appear comparable to the cost effectiveness of other breastfeeding promotion interventions, within certain districts, LINKAGES appears to be *very* cost effective. Based on the data in Ghana, LINKAGES could improve its cost effectiveness by selecting partners who are ready and able to implement relatively intensive community level activities, increasing its target population in program districts, and selecting populations that have lower baseline EBF and TIBF rates, where impact may be achieved at lower marginal cost. Under these conditions (which were found in Bolgatanga), this study shows that the implementation cost per child to achieve the package of EBF and TIBF results was only \$5. Additional research to determine the optimal package of activities to maximize cost effectiveness would be useful for guiding future program design.

Annex A: List of All LINKAGES Activities

ACTIVITIES	Costs Included in this Study
WORKSHOP BY LINKAGES	
Materials and Messages development	Y
Mother to Mother Support Group training	Y
BCC Training	Y
RESEARCH	
Formative research - Focus Group Discussion	Y
TIPS	N
TIPS RESEARCH	N
Rapid Impact Appraisal (Pre-testing)	Y
Rapid Impact Appraisal (CRS- Area)	Y
Rapid Impact Appraisal (R-Cross/UNICEF- Area)	Y
WORKSHOP BY MOH	
PROFILES	N
BOB (HIV/AID AND BREASTFEEDING)	N
BFHI Training	N
EXCHANGE VISITS MEETINGS BY OTHER PARTNERS	
EXCHANGE VISIT-HANNAH TRNG IN HARARE	N
EXCHANGE VISIT-TO MADAGASCAR	N
NUTRITION OFFICERS MEETING	N
FREEDOM FROM HUNGER WORKSHOP	N
FOOD SECURITY NETWORK MEETINGS	N
OTHER ACITIVITIES	
RADIO BROADCAST	Y
CALENDERS 1,000 -PIECES	Y
WORLD BREASTFEEDING WEEK (Including Men's posters)	Y
PRINTING-Counselling Cards,Grannie Charts etc	N
NEWSLETTER	N
SUPERVISORY VISITS	Y
RADIOS FOR M-T-M SUPPORT GROUPS	Y
ROUND TABLE (LITERATURE REVIEW MEETING	Y

Y – cost of activity was included in this study.

N – cost of activity was excluded from this study as it did not promote appropriate breastfeeding in the communities studied.

Annex B: Detailed Cost Data

LINKAGES COSTS ALLOCATED TO ACTIVITIES AND DISTRICTS

(US Dollars without DC Indirect Costs)

October 1999 – September 2000

I. Summary of Fully Allocable Costs			
A) Ghana Capital Costs		Useful Lifeys	Annual Cost
EQUIPMENT (Air con, machines etc)	22,469	10	2,247
VEHICLE	27,470	5	5,494
FURNITURE (Desks/Chairs/Cabinets etc)	22,701	10	2,270
MISC FURN (Curtains, signs, trays etc)	4,034	10	403
TOTAL	76,674		10,414
B) Ghana Administrative Costs			
OFFICE RENT			24,000
CAR RENTAL AND OPER COSTS			5,181
OFFICE UTILITES (INC COURIER SERVICES)			3,281
OFFICE STATIONERY & SUPPL & COPIES			5,960
OTHER			3,883
TOTAL			42,305
C) DC Based Support Costs			
			210,465
TOTAL FULLY ALLOCABLE COSTS			263,185

II. Full Cost of BF/CF Promotion Activities									
	% Alloc for Capital & Admin Costs	Allocated Ghana Capital Cost	Allocated Ghana Admin Cost	Allocated Ghana Staff Costs	Direct Ghana Staff Cost	Direct Ghana Other Costs	DC Consultant Costs	Alloc DC Support Costs	Total Cost for Each Activity
	(a)	(b)	(b)	(c)	(d)	(e)	(f)	(b)	
Materials and Messages 1	10.7%	1,112	4,518	13,413	10,215	15,159	13,985	22,478	80,881
Materials and Messages (FGD)	5.2%	538	2,184	6,484	11,001	7,328	6,761	10,866	45,162
Materials and Messages 2	7.0%	725	2,944	8,740	7,072	9,878	9,113	14,647	53,118
TOT (Mother to Mother)	11.0%	1,148	4,665	13,849	11,787	15,652	29,251	23,209	99,561
Behavior Change Communication 1	10.1%	1,052	4,273	12,684	13,344	14,336	24,950	21,257	91,895
Behavior Change Communication 2	11.7%	1,223	4,969	14,752	11,787	16,708	24,950	24,722	99,112
Rapid Appraisal	6.7%	698	2,837	8,422	10,668	25,074	0	14,113	61,813
Radio Broadcasts	2.6%	267	1,085	3,221	0	3,640	0	5,397	13,610
Calendars	0.7%	69	280	832	0	940	0	1,394	3,515
World Breastfeeding Wk	5.7%	596	2,420	7,184	0	8,120	0	12,040	30,359
Supervision Travel	1.0%	108	437	1,297	0	2,159	0	2,173	6,174
Roundtable - Literature Review Meeting	0.7%	74	301	892	0	1,008	1,740	1,495	5,510
TOTAL	73.1%	7,610	30,913	91,769	75,874	120,003	110,750	153,791	590,710

Percentage of Each Activity Allocated to Study Districts						% Alloc to EBF/TIBF	
	E Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	EBF	TIBF
Materials and Messages 1	11.7%	10.9%	10.3%	3.6%	3.5%	31.3%	31.3%
Materials and Messages (FGD)	11.0%	10.5%	10.0%	3.6%	3.5%	31.3%	31.3%
Materials and Messages 2	10.3%	10.1%	9.7%	3.6%	3.5%	31.3%	31.3%
TOT (Mother to Mother)	10.8%	9.5%	8.3%	1.0%	4.5%	33.3%	33.3%
Behavior Change Communication 1	0.8%	0.0%	4.8%	1.4%	12.5%	25.0%	25.0%
Behavior Change Communication 2	9.3%	9.1%	8.8%	10.0%	0.5%	25.0%	25.0%
Rapid Appraisal	11.1%	11.1%	11.1%	11.1%	11.1%	33.3%	33.3%
Radio Broadcasts	6.7%	3.5%	3.9%	10.4%	4.9%	33.3%	33.3%
Calendars	4.9%	5.1%	5.8%	4.1%	3.8%	33.3%	33.3%
World Breastfeeding Wk	9.5%	7.5%	19.4%	7.5%	7.5%	33.3%	33.3%
Supervision Travel	11.1%	11.1%	11.1%	11.1%	11.1%	33.3%	33.3%
Roundtable - Literature Review Meeting	11.1%	11.1%	11.1%	11.1%	11.1%	25.0%	25.0%

See Wksp Detail and NonWksp Costs worksheets.

Full Cost of Each Activity Allocated to Each District						
	E Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
Allocated Cost of Each Activity						
Materials and Messages 1	9,460	8,841	8,332	2,935	2,808	32,375
Materials and Messages (FGD)	4,960	4,752	4,506	1,639	1,568	17,425
Materials and Messages 2	5,456	5,372	5,127	1,927	1,844	19,727
TOT (Mother to Mother)	10,754	9,462	8,230	1,032	4,446	33,923
Behavior Change Communication 1	735	0	4,410	1,303	11,487	17,936
Behavior Change Communication 2	9,173	9,012	8,731	9,919	526	37,361
Rapid Appraisal	6,868	6,868	6,868	6,868	6,868	34,341
Radio Broadcasts	913	482	532	1,419	674	4,020
Calendars	172	179	205	143	134	833
World Breastfeeding Wk	2,873	2,272	5,876	2,272	2,272	15,564
Supervision Travel	686	686	686	686	686	3,430
Roundtable - Literature Review Meeting	612	612	612	612	612	3,061
TOTAL	52,662	48,538	54,116	30,754	33,924	219,994

Costs of Each Activity Allocated to Each District to EBF						
	E Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
Allocated Cost of Each Activity						
Materials and Messages 1	2,956	2,763	2,604	917	877	10,117
Materials and Messages (FGD)	1,550	1,485	1,408	512	490	5,445
Materials and Messages 2	1,705	1,679	1,602	602	576	6,165
TOT (Mother to Mother)	3,581	3,151	2,741	344	1,480	11,296
Behavior Change Communication 1	184	0	1,103	326	2,872	4,484
Behavior Change Communication 2	2,293	2,253	2,183	2,480	132	9,340
Rapid Appraisal	2,287	2,287	2,287	2,287	2,287	11,435
Radio Broadcasts	304	161	177	472	224	1,339
Calendars	57	60	68	48	45	277
World Breastfeeding Wk	957	757	1,957	757	757	5,183
Supervision Travel	228	228	228	228	228	1,142
Roundtable - Literature Review Meeting	153	153	153	153	153	765
TOTAL	16,256	14,976	16,511	9,126	10,121	66,989

Costs of Each Activity Allocated to Each District to TIBF						
	E Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
Allocated Cost of Each Activity						
Materials and Messages 1	2,956	2,763	2,604	917	877	10,117
Materials and Messages (FGD)	1,550	1,485	1,408	512	490	5,445
Materials and Messages 2	1,705	1,679	1,602	602	576	6,165
TOT (Mother to Mother)	3,581	3,151	2,741	344	1,480	11,296
Behavior Change Communication 1	184	0	1,103	326	2,872	4,484
Behavior Change Communication 2	2,293	2,253	2,183	2,480	132	9,340
Rapid Appraisal	2,287	2,287	2,287	2,287	2,287	11,435
Radio Broadcasts	304	161	177	472	224	1,339
Calendars	57	60	68	48	45	277
World Breastfeeding Wk	957	757	1,957	757	757	5,183
Supervision Travel	228	228	228	228	228	1,142
Roundtable - Literature Review Meeting	153	153	153	153	153	765
TOTAL	16,256	14,976	16,511	9,126	10,121	66,989

LINKAGES COSTS ALLOCATED TO ACTIVITIES AND DISTRICTS

(US Dollars with all DC Indirect Costs)

October 1999 – September 2000

I. Summary of Fully Allocable Costs			
A) Ghana Capital Costs		Useful Lifeysrs	Annual Cost
EQUIPMENT (Air con, machines etc)	22,469	10	2,247
VEHICLE	27,470	5	5,494
FURNITURE (Desks/Chairs/Cabinets etc)	22,701	10	2,270
MISC FURN (Curtains, signs, trays etc)	5,487	10	549
TOTAL	78,127		10,560
B) Ghana Administrative Costs			
OFFICE RENT			32,640
CAR RENTAL AND OPER COSTS			7,046
OFFICE UTILITES (INC COURIER SERVICES)			4,462
OFFICE STATIONERY & SUPPL & COPIES			8,106
OTHER			5,281
TOTAL			57,535
C) DC Based Support Costs			286,233
TOTAL FULLY ALLOCABLE COSTS			354,327

II. Full Cost of BF/CF Promotion Activities										
	% Alloc for Capital & Admin Costs	Allocated Capital Cost	Allocated Admin Cost	Allocated Ghana Staff Costs	Direct Staff Cost	Direct Other Costs	DC Consultant Costs	Alloc DC Support Costs	Total Cost for Each Activity	
	(a)	(b)	(b)	(c)	(d)	(e)	(f)	(b)		
Materials and Messages 1	10.7%	1,128	6,145	16,049	12,087	20,617	19,020	30,570	105,615	
Materials and Messages (FGD)	5.2%	545	2,971	7,758	13,017	9,966	9,194	14,778	58,229	
Materials and Messages 2	7.0%	735	4,004	10,457	8,368	13,434	12,393	19,920	69,310	
TOT (Mother to Mother)	11.0%	1,164	6,345	16,570	13,946	21,287	35,912	31,564	126,788	
Behavior Change Communication 1	10.1%	1,067	5,811	15,177	15,925	19,496	32,071	28,909	118,455	
Behavior Change Communication 2	11.7%	1,240	6,758	17,651	13,946	22,722	32,071	33,622	128,012	
Rapid Appraisal	6.7%	708	3,858	10,077	12,675	34,101	0	19,194	80,614	
Radio Broadcasts	2.6%	271	1,475	3,854	0	4,950	0	7,340	17,891	
Calendars	0.7%	70	381	995	0	1,278	0	1,896	4,620	
World Breastfeeding Wk	5.7%	604	3,291	8,596	0	11,043	0	16,374	39,908	
Supervision Travel	1.0%	109	594	1,552	0	2,937	0	2,955	8,147	
Roundtable - Literature Review Meeting	0.7%	75	409	1,067	0	1,371	2,366	2,033	7,322	
TOTAL	73.1%	7,716	42,042	109,802	89,964	163,204	143,028	209,156	764,912	

Percentage of Each Activity Allocated to Study Districts						% Alloc to EBF/TIBF	
	E Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	EBF	TIBF
Materials and Messages 1	11.7%	10.9%	10.3%	3.6%	3.5%	31.3%	31.3%
Materials and Messages (FGD)	11.0%	10.5%	10.0%	3.6%	3.5%	31.3%	31.3%
Materials and Messages 2	10.3%	10.1%	9.7%	3.6%	3.5%	31.3%	31.3%
TOT (Mother to Mother)	10.8%	9.5%	8.3%	1.0%	4.5%	33.3%	33.3%
Behavior Change Communication 1	0.8%	0.0%	4.8%	1.4%	12.5%	25.0%	25.0%
Behavior Change Communication 2	9.3%	9.1%	8.8%	10.0%	0.5%	25.0%	25.0%
Rapid Appraisal	11.1%	11.1%	11.1%	11.1%	11.1%	33.3%	33.3%
Radio Broadcasts	6.7%	3.5%	3.9%	10.4%	4.9%	33.3%	33.3%
Calendars	4.9%	5.1%	5.8%	4.1%	3.8%	33.3%	33.3%
World Breastfeeding Wk	9.5%	7.5%	19.4%	7.5%	7.5%	33.3%	33.3%
Supervision Travel	11.1%	11.1%	11.1%	11.1%	11.1%	33.3%	33.3%
Roundtable - Literature Review Meeting	11.1%	11.1%	11.1%	11.1%	11.1%	25.0%	25.0%

Full Cost of Each Activity Allocated to Each District						
	E Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
Allocated Cost of Each Activity						
Materials and Messages 1	12,353	11,544	10,879	3,832	3,666	42,275
Materials and Messages (FGD)	6,396	6,127	5,810	2,113	2,021	22,466
Materials and Messages 2	7,119	7,010	6,691	2,515	2,406	25,740
TOT (Mother to Mother)	13,695	12,049	10,481	1,314	5,661	43,200
Behavior Change Communication 1	948	0	5,685	1,680	14,807	23,120
Behavior Change Communication 2	11,847	11,640	11,277	12,811	680	48,256
Rapid Appraisal	8,957	8,957	8,957	8,957	8,957	44,785
Radio Broadcasts	1,200	634	699	1,865	885	5,284
Calendars	226	235	269	188	177	1,095
World Breastfeeding Wk	3,776	2,986	7,725	2,986	2,986	20,460
Supervision Travel	905	905	905	905	905	4,526
Roundtable - Literature Review Meeting	814	814	814	814	814	4,068
TOTAL	68,235	62,902	70,191	39,980	43,966	285,274

Costs of Each Activity Allocated to Each District to EBF						
	E Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
Allocated Cost of Each Activity						
Materials and Messages 1	3,860	3,608	3,400	1,198	1,146	13,211
Materials and Messages (FGD)	1,999	1,915	1,815	660	632	7,021
Materials and Messages 2	2,225	2,191	2,091	786	752	8,044
TOT (Mother to Mother)	4,560	4,012	3,490	437	1,885	14,386
Behavior Change Communication 1	237	0	1,421	420	3,702	5,780
Behavior Change Communication 2	2,962	2,910	2,819	3,203	170	12,064
Rapid Appraisal	2,983	2,983	2,983	2,983	2,983	14,914
Radio Broadcasts	400	211	233	621	295	1,760
Calendars	75	78	90	63	59	364
World Breastfeeding Wk	1,257	994	2,572	994	994	6,813
Supervision Travel	301	301	301	301	301	1,507
Roundtable - Literature Review Meeting	203	203	203	203	203	1,017
TOTAL	21,063	19,407	21,419	11,870	13,122	86,880

Percent Difference bet Program and Control	46	28	48	24	7	24
Cost per Percent Difference	458	693	446	495	1,875	
Target Population	551	507	310	2,394	907	4,668
Cost per Child	38	38	69	5	14	19
Number of Children Changing Behavior	253	142	149	574	63	1,120
Cost per Child otherwise not EBF	83	137	144	21	207	78

Calculation of Implementation Costs Only

Development	8,287	7,916	7,509	2,847	2,733	29,292
Implementation	9,492	8,206	10,625	5,738	7,105	41,167
Monitoring & Evaluation	3,284	3,284	3,284	3,284	3,284	16,421
	21,063	19,407	21,419	11,870	13,122	86,880

Percent Difference bet Program and Control	46	28	48	24	7	24
Cost per Percent Difference	206	293	221	239	1,015	
Target Population	551	507	310	2,394	907	4,668
Cost per Child	17.24	16.20	34.27	2.40	7.83	8.82
Number of Children Changing Behavior	253	142	149	574	63	1,120
Cost per Child otherwise not EBF	37.47	57.86	71.41	9.99	111.91	36.75

Costs of Each Activity Allocated to Each District to TIBF						
	E Mamprusi	Bongo	Lawra	Bolgatanga	Yendi	Total
Allocated Cost of Each Activity						
Materials and Messages 1	3,860	3,608	3,400	1,198	1,146	13,211
Materials and Messages (FGD)	1,999	1,915	1,815	660	632	7,021
Materials and Messages 2	2,225	2,191	2,091	786	752	8,044
TOT (Mother to Mother)	4,560	4,012	3,490	437	1,885	14,386
Behavior Change Communication 1	237	0	1,421	420	3,702	5,780
Behavior Change Communication 2	2,962	2,910	2,819	3,203	170	12,064
Rapid Appraisal	2,983	2,983	2,983	2,983	2,983	14,914
Radio Broadcasts	400	211	233	621	295	1,760
Calendars	75	78	90	63	59	364
World Breastfeeding Wk	1,257	994	2,572	994	994	6,813
Supervision Travel	301	301	301	301	301	1,507
Roundtable - Literature Review Meeting	203	203	203	203	203	1,017
TOTAL	21,063	19,407	21,419	11,870	13,122	86,880
Percent Difference bet Program and Control	74	29	12	20	-15	18
Cost per Percent Difference	285	669	1,785	593	-875	
Target Population	551	507	310	2,394	907	4,668
Cost per Child	38	38	69	5	14	19
Number of Children Changing Behavior	407	147	37	479	-136	840
Cost per Child otherwise not EBF	52	132	576	25	-96	103
Calculation of Implementation Costs Only						
Development	8,287	7,916	7,509	2,847	2,733	29,292
Implementation	9,492	8,206	10,625	5,738	7,105	41,167
Monitoring & Evaluation	3,284	3,284	3,284	3,284	3,284	16,421
	21,063	19,407	21,419	11,870	13,122	86,880
Percent Difference bet Program and Control	74	29	12	20	-15	18
Cost per Percent Difference	128	283	885	287	-474	
Target Population	551	507	310	2,394	907	4,668
Cost per Child	17.24	16.20	34.27	2.40	7.83	8.82
Number of Children Changing Behavior	407	147	37	479	-136	840
Cost per Child otherwise not EBF	23.30	55.87	285.62	11.99	-52.23	49.00
Total Cost of EBF and TIBF	42,125	38,813	42,838	23,739	26,244	173,759

Region Northern
 District East Mamprusi

SUMMARY OF TOTAL PARTNER COSTS (exc. CRS Food Costs)
all costs in US
Dollars

Partner/Activity	Total Cost	% Alloc to EBF	% Alloc to TIBF	Cost Alloc to EBF	Cost Alloc to TIBF	Total
CRS						
LINKAGES Wksp -- M&M 1	316	31%	31%	99	99	198
LINKAGES Wksp -- M&M 2	211	31%	31%	66	66	132
LINKAGES Wksp -- MTMSG	396	33%	33%	132	132	264
LINKAGES Wksp -- BCC	0	25%	25%	0	0	0
Training Workshops	3,368	35%	35%	1,182	1,182	2,364
Campaigns/durbars	429	33%	33%	143	143	286
Monitoring and Evaluation	105	33%	33%	35	35	70
Rapid Appraisal	120	25%	25%	30	30	60
World Breastfeeding Week	97	33%	33%	32	32	64
Community Outreach	157	33%	33%	52	52	105
CRS Total	5,200			1,771	1,771	3,542
RHA						
LINKAGES Wksp -- M&M 1	10	31%	31%	3	3	6
LINKAGES Wksp -- M&M 2	5	31%	31%	1	1	3
LINKAGES Wksp -- MTMSG	16	33%	33%	5	5	11
LINKAGES Wksp -- BCC	13	25%	25%	3	3	7
Training Workshops	9	33%	33%	3	3	6
Campaigns/durbars	1	33%	33%	0	0	1
Monitoring and Evaluation	1	33%	33%	0	0	1
World Breastfeeding Week	9	33%	33%	3	3	6
RHA Total	64			20	20	40
DHMT & SDHMT						
LINKAGES Wksp -- M&M 1	7	31%	31%	2	2	4
LINKAGES Wksp -- M&M 2	5	31%	31%	1	1	3
LINKAGES Wksp -- MTMSG	6	33%	33%	2	2	4
LINKAGES Wksp -- BCC	33	25%	25%	8	8	17
Training Workshops	9	33%	33%	3	3	6
Campaigns/durbars	97	33%	33%	32	32	65
Monitoring and Evaluation	22	33%	33%	7	7	15
World Breastfeeding Week	158	33%	33%	53	53	105
Community Outreach	80	33%	33%	27	27	53
DHMT Total	417			136	136	272
Donated Radio Time	431	33%	33%	144	144	287
TOTAL OF ALL PARTNERS	6,112			2,071	2,071	4,141

Region Upper East
 District Bongo

SUMMARY OF TOTAL PARTNER COSTS (exc. CRS Food Costs)

all costs in US Dollars

Partner/Activity	Total Cost	% Alloc to EBF	% Alloc to TIBF	Cost Alloc to EBF	Cost Alloc to TIBF	Total
CRS						
LINKAGES Wksp -- M&M 1	214	31%	31%	67	67	134
LINKAGES Wksp -- M&M 2	0	31%	31%	0	0	0
LINKAGES Wksp -- MTMSG	28	33%	33%	9	9	18
LINKAGES Wksp -- BCC	0	25%	25%	0	0	0
Training Workshops	2,144	31%	31%	657	657	1,315
Campaigns/durbars	186	33%	33%	62	62	124
Monitoring and Evaluation	88	33%	33%	29	29	59
Rapid Appraisal	207	25%	25%	52	52	104
World Breastfeeding Week	161	33%	33%	54	54	107
Community Outreach	221	33%	33%	74	74	147
CRS Total	3,249			1,004	1,004	2,008
RHA						
LINKAGES Wksp -- M&M 1	3	31%	31%	1	1	2
LINKAGES Wksp -- M&M 2	4	31%	31%	1	1	3
LINKAGES Wksp -- MTMSG	8	33%	33%	3	3	5
LINKAGES Wksp -- BCC	10	25%	25%	2	2	5
Training Workshops	15	33%	33%	5	5	10
Campaigns/durbars	3	33%	33%	1	1	2
Monitoring and Evaluation	3	33%	33%	1	1	2
World Breastfeeding Week	15	33%	33%	5	5	10
RHA Total	61			19	19	38
DHMT & SDHMT						
LINKAGES Wksp -- M&M 1	14	31%	31%	4	4	9
LINKAGES Wksp -- M&M 2	9	31%	31%	3	3	6
LINKAGES Wksp -- MTMSG	6	33%	33%	2	2	4
LINKAGES Wksp -- BCC	62	25%	25%	16	16	31
Training Workshops	13	33%	33%	4	4	9
Campaigns/durbars	66	33%	33%	22	22	44
Monitoring and Evaluation	10	33%	33%	3	3	7
World Breastfeeding Week	167	33%	33%	55	55	110
Community Outreach	59	33%	33%	19	19	39
DHMT Total	407			129	129	258
Donated Radio Time	0	33%	33%	0	0	0
TOTAL OF ALL PARTNERS	3,717			1,152	1,152	2,304

Region Upper West
 District Lawra

SUMMARY OF TOTAL PARTNER COSTS (exc. CRS Food Costs)
 all costs in US Dollars

Partner/Activity	Total Cost	% Alloc to EBF	% Alloc to TIBF	Cost Alloc to EBF	Cost Alloc to TIBF	Total
CRS						
LINKAGES Wksp -- M&M 1	251	31%	31%	78	78	157
LINKAGES Wksp -- M&M 2	167	31%	31%	52	52	104
LINKAGES Wksp -- MTMSG	320	33%	33%	107	107	213
LINKAGES Wksp -- BCC	313	25%	25%	78	78	157
Training Workshops	2,644	34%	34%	889	889	1,778
Campaigns/durbars	115	33%	33%	38	38	77
Monitoring and Evaluation	43	33%	33%	14	14	29
Rapid Appraisal	248	25%	25%	62	62	124
World Breastfeeding Week	172	33%	33%	57	57	114
Community Outreach	106	33%	33%	35	35	71
CRS Total	4,379			1,412	1,412	2,823
RHA						
LINKAGES Wksp -- M&M 1	5	31%	31%	2	2	3
LINKAGES Wksp -- M&M 2	3	31%	31%	1	1	2
LINKAGES Wksp -- MTMSG	12	33%	33%	4	4	8
LINKAGES Wksp -- BCC	13	25%	25%	3	3	6
Training Workshops	0	0%	0%	0	0	0
Campaigns/durbars	0	0%	0%	0	0	0
Monitoring and Evaluation	0	0%	0%	0	0	0
World Breastfeeding Week	245	33%	33%	81	81	161
RHA Total	278			91	91	181
DHMT & SDHMT						
LINKAGES Wksp -- M&M 1	8	31%	31%	2	2	5
LINKAGES Wksp -- M&M 2	5	31%	31%	2	2	3
LINKAGES Wksp -- MTMSG	4	33%	33%	1	1	2
LINKAGES Wksp -- BCC	32	25%	25%	8	8	16
Training Workshops	6	33%	33%	2	2	4
Campaigns/durbars	103	33%	33%	34	34	68
Monitoring and Evaluation	14	33%	33%	5	5	9
World Breastfeeding Week	0	33%	33%	0	0	0
Community Outreach	13	33%	33%	4	4	9
DHMT Total	186			59	59	118
Donated Radio Time	55	33%	33%	18	18	36
TOTAL OF ALL PARTNERS	4,898			1,579	1,579	3,158

Region

Upper East

District

Bolgatanga

SUMMARY OF TOTAL PARTNER COSTS

all costs in US Dollars

Partner/Activity	Total Cost	% Alloc to EBF	% Alloc to TIBF	Cost Alloc to EBF	Cost Alloc to TIBF	Total
GRC						
LINKAGES Wksp -- M&M 1	34	31%	31%	11	11	21
LINKAGES Wksp -- M&M 2	23	31%	31%	7	7	14
LINKAGES Wksp -- MTMSG	40	33%	33%	13	13	26
LINKAGES Wksp -- BCC	106	25%	25%	26	26	53
Training Workshops	3,403	33%	33%	1,134	1,134	2,269
Campaigns/durbars	0	33%	33%	0	0	0
Monitoring and Evaluation	1,648	33%	33%	549	549	1,097
Rapid Appraisal	0	33%	33%	0	0	0
World Breastfeeding Week	0	33%	33%	0	0	0
Community Outreach	840	33%	33%	280	280	559
GRC Total	6,092			2,020	2,020	4,040
RHA						
LINKAGES Wksp -- M&M 1	10	31%	31%	3	3	6
LINKAGES Wksp -- M&M 2	13	31%	31%	4	4	8
LINKAGES Wksp -- MTMSG	23	33%	33%	8	8	15
LINKAGES Wksp -- BCC	28	25%	25%	7	7	14
Training Workshops	45	33%	33%	15	15	30
Campaigns/durbars	9	33%	33%	3	3	6
Monitoring and Evaluation	9	33%	33%	3	3	6
World Breastfeeding Week	45	33%	33%	15	15	30
RHA Total	182			58	58	115
DHMT & SDHMT						
LINKAGES Wksp -- M&M 1	0	31%	31%	0	0	0
LINKAGES Wksp -- M&M 2	0	31%	31%	0	0	0
LINKAGES Wksp -- MTMSG	0	33%	33%	0	0	0
LINKAGES Wksp -- BCC	0	25%	25%	0	0	0
Training Workshops	0	0%	0%	0	0	0
Campaigns/durbars	124	33%	33%	41	41	83
Monitoring and Evaluation	0	0%	0%	0	0	0
World Breastfeeding Week	0	33%	33%	0	0	0
Community Outreach	15	33%	33%	5	5	10
DHMT Total	139			46	46	93
Donated Radio Time	0	33%	33%	0	0	0
TOTAL OF ALL PARTNERS	6,413			2,124	2,124	4,248

Region Northern
District Yendi

SUMMARY OF TOTAL PARTNER COSTS
all costs in US Dollars

Partner/Activity	Total Cost	% Alloc to EBF	% Alloc to TIBF	Cost Alloc to EBF	Cost Alloc to TIBF	Total
UNICEF						
LINKAGES Wksp -- M&M 1	0	31%	31%	0	0	0
LINKAGES Wksp -- M&M 2	0	31%	31%	0	0	0
LINKAGES Wksp -- MTMSG	0	33%	33%	0	0	0
LINKAGES Wksp -- BCC	0	25%	25%	0	0	0
Training Workshops	406	33%	33%	135	135	271
Campaigns/durbars	0	33%	33%	0	0	0
Monitoring and Evaluation	0	33%	33%	0	0	0
Rapid Appraisal	0	33%	33%	0	0	0
World Breastfeeding Week	0	33%	33%	0	0	0
Community Outreach	0	33%	33%	0	0	0
UNICEF Total	406			135	135	271
RHA						
LINKAGES Wksp -- M&M 1	8	31%	31%	2	2	5
LINKAGES Wksp -- M&M 2	3	31%	31%	1	1	2
LINKAGES Wksp -- MTMSG	12	33%	33%	4	4	8
LINKAGES Wksp -- BCC	10	25%	25%	2	2	5
Training Workshops	6	33%	33%	2	2	4
Campaigns/durbars	1	33%	33%	0	0	1
Monitoring and Evaluation	1	33%	33%	0	0	1
World Breastfeeding Week	6	33%	33%	2	2	4
RHA Total	47			15	15	29
DHMT & SDHMT						
LINKAGES Wksp -- M&M 1	6	31%	31%	2	2	3
LINKAGES Wksp -- M&M 2	4	31%	31%	1	1	2
LINKAGES Wksp -- MTMSG	7	33%	33%	2	2	5
LINKAGES Wksp -- BCC	20	25%	25%	5	5	10
Training Workshops	153	28%	28%	42	42	84
Campaigns/durbars	0	0%	0%	0	0	0
Monitoring and Evaluation	0	0%	0%	0	0	0
World Breastfeeding Week	0	33%	33%	0	0	0
Community Outreach	184	33%	33%	61	61	123
DHMT Total	374			114	114	228
Donated Radio Time	636	33%	33%	212	212	424
TOTAL OF ALL PARTNERS	1,463			476	476	952

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