Lufwanyama Integrated Neonatal and Child Health Project in Zambia (LINCHPIN)

Final Detailed Implementation Plan (Revised)

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Table of Contents

Acronyms and Terms

ACT	Artemisinin Combination Therapy
ANC	Antenatal Care
BCC	Behavior Change Communication
BU	Boston University
C-IMCI	Community-based Integrated Management of Childhood Illnesses
CAH	Child and Adolescent Health
CBD	Community-based Medication Distributors
CBV	Community-based Volunteer
CCM	Community Case Management
CHAZ	Christian Health Association of Zambia
CHW	Community Health Worker
CSHGP	Child Survival and Health Grant Program (USAID)
DHMT	District Health Management Team
DIP	Detailed Implementation Plan
DPT	Diptheria-Petussis-Tetanus Immunization
ENC	Essential Newborn Care
HCP	Health Communication Partnership
ICCM	Integrated Community Case Management
IPTp	Intermittent Presumptive Treatment (of malaria) in Pregnancy
ITN	Insecticide Treated Nets
JSI	John Snow, Incorporated
KPC	Knowledge, Practices, and Coverage
LBI	Localized Bacterial Infection
LINCHPIN	Lufwanyama Integrated Newborn and Child Health Project in Zambia
LiST	Lives Saved Tool
LUNESP	Lufwanyama Neonatal Survival Project (of Boston University)
M&E	Monitoring and Evaluation
MCHIP	USAID's Maternal and Child Integrated Health Project
MOH	Ministry of Health
NHC	Neighborhood Health Committee
OR	Operations Research
ORS	Oral Rehydration Solutions
PMO	Provincial Medical Office/Officer
PMTCT	Prevention of Mother-to-Child Transmission
PNC	Postnatal Care
PSBI	Possible Severe Bacterial Infection
RDT	Rapid Diagnostic Tests
SC4CCM	"Supply Chain for Community Case Management" project funded by The Bill & Melinda Gates Foundation award in four African countries.
TBA	Traditional Birth Attendants
TDRC	Tropical Disease Research Centre
TT	Tetanus Toxoid Immunization
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

WHO	World Health Organization
ZIMMAPS	Zambia Integrated Management of Malaria and Pneumonia Study

A. Technical Approach

A.1. Brief project overview

THE CHALLENGE *If Zambia were able to achieve 80 % coverage for a package that contained community case management of diarrhea, pneumonia, malaria, and serious neonatal illness and home-based resuscitation of 50 percent of newborns with birth asphyxia, an additional 12,000 lives of children under 5 could be saved each year, including 3,000 newborns. This package would reduce overall under-five mortality by over 25 percent in Zambia.*[1]

Save the Children, in partnership with the Boston University (BU) Center for Global Health and Development, is supporting the District Health Management Team (DHMT) to implement a catalytic five-year Innovation Category project to decrease under-five mortality in Lufwanyama District (12˚46'S 27˚32"E) in Zambia's Copperbelt Province.

The **Lufwanyama Integrated Newborn and Child Health Project in Zambia (LINCHPN)** is introducing an integrated, community-based newborn care and community case management (CCM) package delivered through an enhanced district-wide community health program linked to health facilities and Neighborhood Health Committees (NHCs) and consistent with Ministry of Health (MOH) plans and policies. The interventions include maternal and newborn care (40 percent), pneumonia case management (20 percent), prevention and treatment of malaria (20 percent), and control of diarrheal disease (20 percent).

LINCHPIN offers an opportunity to integrate, strengthen, and further evaluate two streams of recently concluded USAID-supported research in Zambia – LUNESP (Lufwanyama Neonatal Survival Project) for newborn care and ZIMMAPS (Zambia Integrated Management of Malaria and Pneumonia Study) for CCM – both carried out by BU.

Beneficiary population Lufwanyama District has a current (2010) total population of 85,033 (official government projection extrapolated from 2000 census) with 15,136 (17.8 percent) children under five and 18,537 (21.8 percent) women of reproductive age.

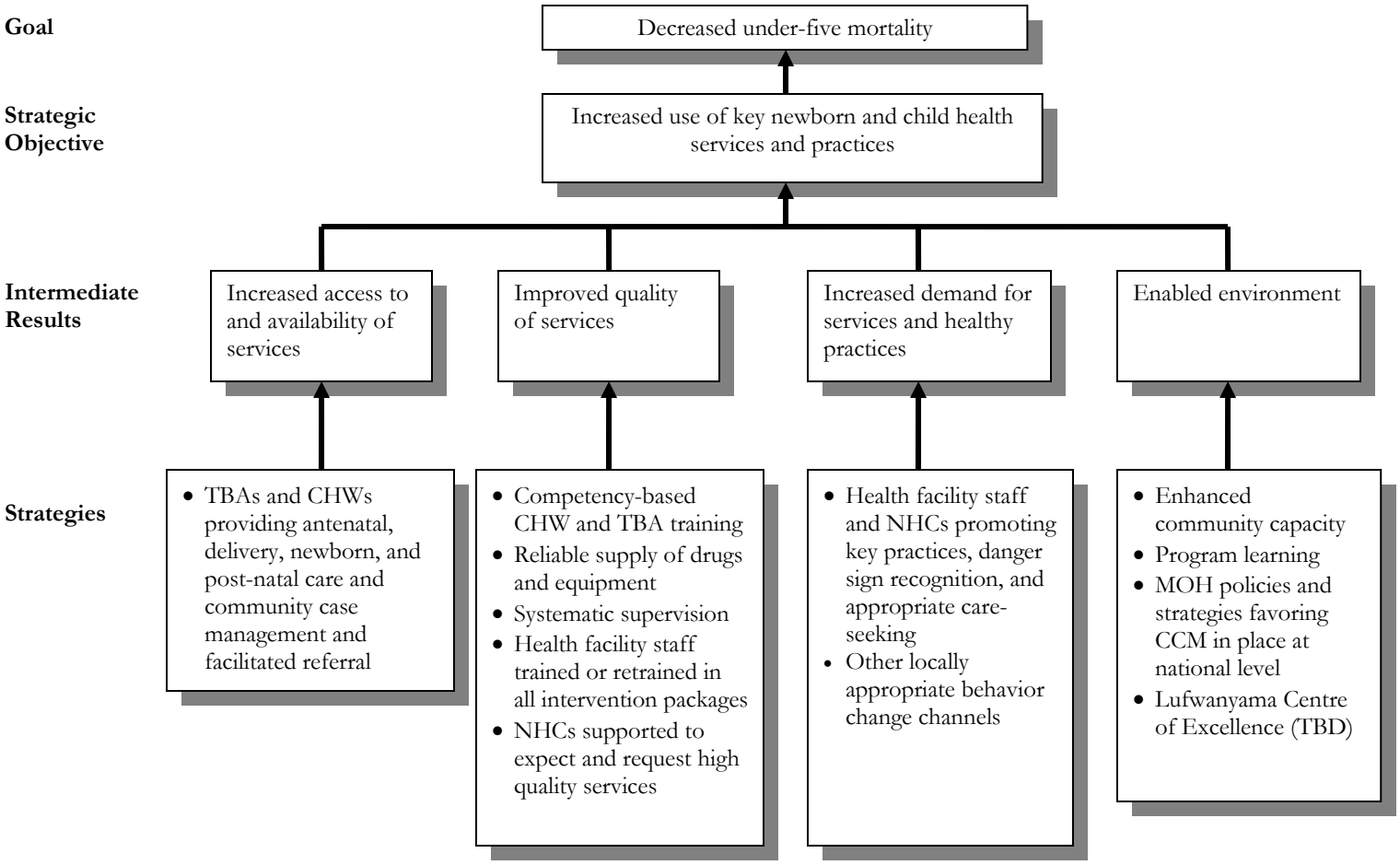
LINCHPIN is co-funded by the USAID Child Survival and Health Grant Program (CSHGP) in Washington, DC, (1 October 2009-30 September 2014) and ELMA Philanthropies, with additional match funding from Towers and Perrin.

[1] This estimate was generated from the Spectrum Policy Modelling System version 3.2 using the Lives Saved Tool (LiST). LiST is based on the Lancet Child and Neonatal Survival Series modelling and uses the most recent mortality and cause of death data, with effect estimates from a menu of interventions based on anticipated change between current and target coverage. It was developed by the Futures Institute, prepared by USAID/Health Policy Initiative, and funded by the Bill & Melinda Gates Foundation.

A.2. Results framework

LINCHPIN's **goal** is to decrease under-five mortality in Lufwanyama District by increasing the **use of evidence-based, life-saving interventions**[i,ii] through delivery channels that are **accessible, available, high quality, demanded, and supported by an enabling environment**.

Figure 1 LINCHPIN Results Framework



A.3. Key strategies and activities to achieve results

Strategic Objective: Increased use of key newborn and child health services and practices
Curative (unlike preventive) interventions of high quality must be continuously available and accessible to newborns and children because they fall ill unpredictably and can die quickly.

Current status of the use of key services and practices Limited access and availability, compromised quality, incomplete community knowledge and weak demand, and an incomplete enabling environment all contribute to low or erratic use of key services and practices – especially those that deliver high impact, life-saving, curative interventions. At baseline, only a third (36%) of mothers were delivered by a skilled attendant. Less than half of mothers (47%) of children 0-23 months in Lufwanyama reported use of a modern method of contraception. Most neonates were dried immediately after delivery (80%) and wrapped in a dry cloth or blanket (88%). However, less than half (44%) were put to the breast within an hour of birth. Only half (50%) of children with suspected pneumonia received an antibiotic - very few (12.5%) an appropriate antibiotic within 24 hours of illness. Only 60 percent of mothers live in households with soap at the place of hand washing. Only half (51%) of children 0-23 months slept under an insecticide-treated bednet the night previous to the survey.

Strategy to increase use of key services and practices Through the key strategies of an **integrated community package** (see Table 1) and **innovative teaming of traditional birth assistants (TBAs) and community health workers (CHWs)**, LINCHPIN delivers life-saving curative interventions (anti-malarials, antibiotics for pneumonia, low osmolarity oral rehydration solution (ORS) and zinc for diarrhea, antibiotics for newborn sepsis, and resuscitation for non-breathing newborns) to address the leading killers of children in Lufwanyama and in Zambia.

Role of key partners in achieving increased use of key services and practices Save the Children supports the Lufwanyama DHMT to implement LINCHPIN with technical, programmatic, and material assistance for training, supervision, materials, and supplies. NHCs support the community-based providers, link with health facilities, and promote community mobilization for timely and appropriate care-seeking. BU is LINCHPIN's operations research (OR) and monitoring and evaluation (M&E) partner and is responsible for providing technical support and analysis for baseline and endline surveys, health facility assessment, and qualitative research. These partners collaborate across the board on the intermediate results that contribute to increasing use: access/availability, quality, demand, and the enabling environment - described below.

A.3.1. Intermediate Result 1: Increased access and availability of services

Current status of access and availability of services Lufwanyama District is a vast, needy and underserved location. Compared with other, more urbanized and industrialized Copperbelt districts, Lufwanyama's formal health services are sparsely distributed and understaffed. The DHMT oversees health needs and programs for the district, which has 13 formal health care centers (11 health centers and two health posts) staffed exclusively by nurses, nurse midwives, and/or clinical officers – but not one medical officer. Six new health posts have recently been constructed but are not yet operational because they lack personnel. Two of the facilities are

operated by the Churches Health Association of Zambia (CHAZ). Until the planned new district hospital is built and operational in the district's new *boma* (by 2012?), the nearest referral hospital is outside the district in Kitwe, 120 miles from some Lufwanyama communities. Transport is a major impediment to accessing facility care because of limited availability, lack of communications, seasonal impassability, and cost constraints. Facility staffing (~59 clinical officers, nurses, and environmental health technicians) varies from one to 10 per facility; most facilities are understaffed, some markedly so. Retention of trained health workers is unfortunately very low, with turnover about every two years.

As a consequence of all of these factors, a high proportion of basic healthcare services are provided through several categories of minimally trained community workers – TBAs, CHWs, and community-based distributors (CBDs) (for family planning). Lufwanyama District has been mapped by the DHMT into 140 health zones, which represent either a single village or small cluster of closely spaced villages. Each health zone is defined by a Zonal NHC that supervises and advises health care issues in that area. These Zonal NHCs are comprised of ten community members each (five men and five women) plus a chairperson. Committee chairs in turn participate in a larger assembly comprised of all 140 chairpersons, which acts as an advisory board advocacy platform for Lufwanyama's 13 health centers. Each health facility links with 8-11 NHCs, each of which, in turn, serves up to 1,000 people from villages within three miles. There are 135 active NHCs in total. The NHC is a formally recognized structure that typically includes community leaders, TBAs, CHWs, CBDs, malaria agents, and other community-based providers. The role of the NHC is to support community-based agents, promote behavior change and link the community to its health facility.[iii]

Zambia's National Health Strategic Plan specifies an ideal ratio of one CHW to 500 total population (about 100 households). With a census of 85 active trained CHWs in Lufwanyama (a ratio of 1:1000), current coverage is about half of the standard. CHWs are volunteers trained for six weeks by the DHMT. They are equipped, albeit erratically at times, with kits containing simple supplies (e.g., topical antibiotic ointments, gentian violet, anti-helminthics, soap, bandages), but many or most kits are now depleted. National plans stress the need for a re-invigorated, re-stocked CHW corps: 2,000 have been trained (but lack job aids), and 22,000 kits have arrived. The MOH has not yet finalized its new CHW strategy or training curriculum, but plans are afoot to train additional CHWs across the country. Notwithstanding, deployment in Lufwanyama of additional trained CHWs may not happen within the lifetime of LINCHPIN.

TBAs, also trained for six weeks and supplied by DHMTs with kits, remain an essential provider of many maternal and newborn interventions (clean delivery and recognition of and referral for danger signs), at least until "infrastructure – in particular, availability of midwives – dramatically improves."[iv] Thanks to the LUNESP study, there is at least one trained TBA active in each of the NHC zones, exceeding the government standard of 1:1000 by nearly twice the number.

At baseline, nearly one in five women (17%) received their only antenatal care from TBAs, and only about half (55%) received the recommended four antenatal care visits during their most recent pregnancy.

Strategy to increase access and availability Since access to round-the-clock curative care is

extremely limited in Lufwanyama District, LINCHPIN supports the delivery of interventions to mothers, newborns, and children through two valued cadres of community-based providers: TBAs and CHWs. We are implementing LINCHPIN at the community, facility, and district levels: community, because children fall ill and commonly die at home; facility, because all district providers form a team that must treat according to similar protocols. All 135 NHCs in the district are covered. While limited resources do not allow LINCHPIN to train new TBAs or CHWs, the project focuses on strengthening the skills of 120 currently active TBAs and 85 CHWs in essential newborn care (ENC), postnatal care (PNC), and integrated CCM (ICCM) and links them with facilities and NHCs to support their practice. LINCHPIN trains or refreshes facility-based health care workers to increase access to standard case management and referral. (Training Plan is in **Annex 8.)**

Role of key partners in achieving increased availability and access The DHMT is responsible for delivering health care services to the Lufwanyama population consistent with MOH policies and strategies. This includes deployment of health workers and management of supply logistics and provision of community-based providers. Save the Children provides material and technical assistance to support training and works closely with the DHMT to improve supply chain management and provisioning of the CHWs and TBAs.

A.3.2. Intermediate Result 2: Improved quality of services

Current status of service quality Quality of care is challenged by insufficient skilled personnel to deliver facility-based services, conduct outreach activities, and supervise community-based providers. Facility-based workers are overloaded. Ruptures in the supply chains are common; and rapid diagnostic tests (RDTs), clean delivery kits, and drugs are often lacking. Community-based providers - unpaid volunteers - are poorly motivated, supplied, monitored, and supervised. CHWs especially, are over-stretched with many competing duties and responsibilities – and must travel long distances without adequate transport. Supervision can be erratic and perfunctory.

At baseline, very few children ill with fever/malaria had diagnostic testing (7%) or received artemisinin combination therapy (ACT) within 24 hours of fever onset (11%). Even though two-thirds (67%) of children with suspected pneumonia sought appropriate care, only half (50%) received appropriate antibiotics; and only 12.5% received the antibiotic within the first 24 hours after illness onset. Fortunately, vaccination coverage was fairly high at baseline, measles and DPT3 (both 85%).

Strategy to improve quality LINCHPIN's overall strategy to improve quality is to strengthen the facility-community continuum of care by building DHMT capacity to support community-based providers, including TBA-CHW teams, with monitoring and supervision. During the DIP process, Save the Children shared its CCM toolkit[v] (indicators, registers, supervision check-lists, competency-based training and supervision, etc.) with the MOH, WHO and UNICEF and has been invited to continue working with the national-level partners on adaptation of the tools and CCM training package for Zambia. High quality services will be facilitated through:

- competency-based training for TBAs and CHWs and health facility staff;
- use of improved data collection and monitoring tools;

- reliable supplies of medicines (amoxicillin, ACTs), supplies (RDTs), and equipment (clean delivery kits, reusable bag and masks, respiration counters);
- systematic supportive supervision of case management and postnatal visits; and
- orientation for NHCs to expect/demand high quality ENC and treatment of neonatal sepsis.

At the DIP workshop, much lively discussion and debate catalogued the challenges of motivating and sustaining community-based volunteer providers. There was consensus that incentives were necessary but needed to be non-monetary. Current thinking is that LINCHPIN will organize kids (baby goats) for the TBAs and CHWs to be awarded at completion of their trainings or refreshers. Recipients will agree to pass new kids along to their respective NHCs. Thus, both volunteer providers and their support systems will benefit.

Partner roles in improving service quality DIP workshop participants focused on two priority challenges to improving service quality: supervision and reliable supplies of medicine and equipment. Save the Children will support the DHMT to address these challenges with supervisory training, supplemented by new thinking and tools, and close pro-active collaboration on supply chain management. The Bill & Melinda Gates Foundation award to John Snow, Incorporated (JSI) for "Supply Chain for Community Case Management" (SC4CCM) in four African countries provides an opportunity for JSI and Save the Children to benefit from each organization's program learning. JSI and Save the Children already partner to implement CCM within USAID's Maternal and Child Integrated Health Project (MCHIP) and are planning to partner for SC4CCM in Malawi. A JSI logistics expert participated in Save the Children's "CCM in Africa: State of the Art" conference in Pretoria (September 2009). Save the Children has been in dialogue with JSI and the DELIVER Team at headquarters and country level advocating for Zambia as a SC4CCM focus country.

Table 1: LINCHPIN's Integrated Community Package

Interventions by Delivery Channel and Program Period

Delivery Channel		Intervention by Programmatic Period				
		Antenatal	**Immediate Essential Newborn Care**	**Day 2, 3**	**Day 7**	**Beyond Day 7**
TBA	**TBA-CHW intra-referral (pregnant women, sick children, etc.)**	Referral; counseling on danger signs; breastfeeding counseling, birth planning	Clean delivery; resuscitation for non-breathing babies; ENC (cord care, drying and wrapping, immediate breastfeeding); danger signs and referral	Danger signs; amoxicillin and referral for likely sepsis; "Plan B" for likely sepsis without referral; treatment for localized infection		Handover to CHW between 6 weeks and 2 months (TBD)
CHW				*Collaboration with TBA for urging referral when indicated*	Danger signs; amoxicillin and referral for likely sepsis; "Plan B" for likely sepsis without referral; treatment for localized infection	Danger signs; amoxicillin and referral for likely sepsis; "Plan B" for likely sepsis without referral; treatment for localized infection; RDT/antimalarials; amoxicillin; ORS and zinc
Health Worker (facility or outreach)		TT, IPTp, counseling on danger signs, immediate and exclusive breastfeeding	Clean delivery; resuscitation for non-breathing babies; ENC (cord care, drying and wrapping, immediate breastfeeding); danger signs, treatment and referral	Treatment and possible referral for likely sepsis; treatment for localized infection; RDT/antimalarials; amoxicillin; ORS and zinc		

Please see Annex 12, Child Health Technical Package and Delivery Strategy for additional details of the technical package.

A.3.3. Intermediate Result 3: Increased demand for services and healthy practices

Current status of demand Educational levels in Lufwanyama are low (62% of mothers reported "some primary education"). Mothers had fair knowledge of newborn and child danger signs and appropriate care-seeking. More that two-thirds (70%) knew at least two neonatal danger signs; but only 11% knew at least four. Most (85%) mothers knew at least two danger signs of childhood illness; far fewer (22%) knew at least four. Only two-thirds (66%) of families whose children had suspected pneumonia sought appropriate care. Exclusive breastfeeding for the first six months was reportedly high (82%), but far fewer (38%) 6-23 month old children received appropriate complementary feeding the night and day prior to the survey. (Twenty-three percent of the children surveyed were underweight.)

Strategy to increase demand for key services and practices LINCHPIN's overall behavior change goal is to create an environment that supports mothers and families to recognize danger signs and seek optimal care for newborn and childhood infections. The project creates demand for high-impact, curative services through the use of a set of clear messages that supports the four technical interventions and are delivered through multiple channels (NHCs, TBAs, CHWs, and facility-based health workers) using a variety of methods (interpersonal counseling, community dialogue, family and group education, *a capella* song, village theatre).

Key LINCHPIN message topics include:

- recognition of danger signs for newborn and childhood illness;
- appropriate home management of simple diarrhea episodes;
- timely and appropriate care-seeking for, and compliance with, treatment and/or referral;
- improved household practices (e.g., hygiene and sanitation, use of insecticide treated nets (ITNs), optimal infant and young child feeding, proper management of simple diarrhea); and
- use of key protective and curative services.

The LINCHPIN strategy to increase demand for key services and practices focuses on strengthening the official government C-IMCI strategy. It uses messages and materials consistent with national policy, which were tested and disseminated by the recently completed USAID-funded Health Communication Partnership (HCP) in Zambia Leader with Associate award), of which Save the Children was the managing partner.

A.3.4. Intermediate Result 4: Enabled environment

Current status of the enabling environment Zambia only recently permitted use of RDTs, ACTs, and antibiotics by CHWs; and supportive guidance and training materials are still in development. Clinical IMCI includes the newborn (in the first month of life); CHW practice generally covers children 6-59 months old. The young infant 2-5 months old sometimes falls through the cracks in the system. Even though Zambia launched the *WHO-UNICEF Joint Statement on Post-Natal Home Visits*, the community postnatal visitation schedule has yet to be aligned with international standards (first 24 hours, 3rd day, 7th day). The MOH is in the process of revising its *Road Map for the Accelerated Reduction of Maternal, Newborn, and Child Mortality and Morbidity*, to include children under five for the first time – but CCM, though

mentioned in the draft document, requires further elaboration. These and other policy and strategy challenges require a close working relationship between Save the Children and the technical partners and donors in the capital, Lusaka.

Current Thinking for the Technical Package with integrated TBA-CHW Teams

Technical package for 0-5.9 month old

1. 2-5.9 months = CCM like in some other African countries
2. 0-1.9 months
    a. Danger Signs (fever and fast breathing only): stat amoxicillin and refer
        i. TBAs/CWs will NOT have a thermometer
    b. Danger Signs (difficult feeding, convulsions, lethargy, chest indrawing, hypothermia): refer
        i. TBAs/CHWs will NOT have a thermometer
    c. Omphalitis, pustulosis, conjunctivitis: refer
    d. Diarrhea: treat with ORS and zinc
3. Who does what?
    a. 0-6.9 days: TBA
    b. 7-59 days: TBA and/or CHW
    c. 2-59 months: CHW
4. Plan B: ONLY for when referral is not feasible, according to TBA/CHW (needs more thought)

Strategy to strengthen the enabling environment During the DIP process, government and multilateral stakeholders identified LINCHPIN as policy-informing. Basing the LINCHPIN Program Manager in Lusaka enables Save the Children to participate actively and regularly in technical working groups and task forces and collaborate closely with the MOH, WHO, UNICEF, BU, USAID and its bi-laterals and with other national and international stakeholders. This enhanced level of engagement at the national level increases opportunities to promote national policies, strategies, tools, and materials supportive of ENC and ICCM. (At the end of April, Save the Children was invited to comment on and contribute to the MOH's draft of its new *Road Map*. In addition, during the DIP process, we were invited as a stakeholder to the national dialogue on registers and other normative inputs for Zambia's evolving CCM strategy and package.)

At the local level, LINCHPIN's strategy to enable the environment includes strengthening linkages and communication along the TBA/CHW-NHC-facility continuum and supporting the DHMT and NHCs in mobilizing communities for bi-annual Child Health Days and routine community outreach activities.

Role of partners in strengthening the enabling environment Save the Children's and Boston University's engagement at the national and global/international policy levels, positions the LINCHPIN partnership to apply evidence and lessons learned to address important questions, such as the cost-effectiveness of supervision strategies and the effect of integrated TBA-CHW teams, among others

A.4. Plans for ongoing USAID Mission input throughout project implementation

Dr. William Kanweka, USAID/Zambia Child Survival Specialist, participated in the first day of the DIP workshop held in Kitwe, in early March 2010. Throughout the life of the project, Save the Children will maintain regular contact with the Mission's Health, Population, and Nutrition team and participate in partner meetings in Lusaka and elsewhere. The Mission is due to announce awardees for two of its new bi-lateral procurements in health systems strengthening and behavior change/mass media. Save the Children looks forward to collaborating closely with the new bi-lateral project teams to achieve maximum impact at scale for newborn care and CCM of childhood illness. Moreover, as indicated above, Save the Children has been in dialogue with JSI and the DELIVER project team in Lusaka and is standing by to learn whether or not Zambia will be selected as a CS4CCM focus country.

A.5. Project work plan

The LINCHPIN 5-year work plan is in **Annex 1.**

B. Innovation

B.1. Summary of challenges

The challenges in Lufwanyama are many, including: (1) the human resource shortage, (2) distance, (3) supply, and (4) supervision. Most facilities are understaffed except for the two CHAZ facilities. The distances are vast, complicated by complete inaccessibility during parts of the rainy season. Supply of clean delivery kits for TBAs and drugs for CHW kits is hampered both by logistical challenges and recent budget cuts due to partners' balking at 2009 corruption – although this seems to be improving, and development partners are returning. Supervision is a challenge due to all of the above, plus the lack of MOH tools at the district level. Moreover, the MOH C-IMCI supervisory checklist for CHWs needs review. Key topics and competencies are covered, but criteria for scoring are missing; moreover, although the form is lengthy, it omits some key domains. Needless to say, these challenges to access, availability, and quality limit the timely use of some services – especially those that deliver high impact, live-saving, curative interventions as shown by the baseline survey.

B.2. Description of innovation

The central innovation aims to increase the use of curative interventions through the planned teaming of currently deployed individuals from existing MOH cadres, including trained TBAs and CHWs, who will deliver ICCM to newborns and children from birth to 59 months of age.

The teams will share joint training, supervision, reporting to MOH and NHC, behavior change communication, problem solving, referral for reluctant families, planning, and assisting at monthly outreach. They will have intra-team patient referral, consulting, coverage, learning, and patient hand-over at around six weeks of age. They will be identified as a team by themselves, the community, and the health facility staff. The teams will have mainly complementary tasks - the TBA will be the newborn care provider and the CHW will handle children ~2-59 months of age. Of course, these are the families, mothers, and even the same patients over time. The generally older female TBAs and younger male CHWs will have different social and

communication networks, thereby maximizing reach and influence in BCC. Their age difference should neutralize community suspicion regarding extra-marital, male-female on-going companionships.

B.3. Interest in the innovation

All partners support this innovation, including national, provincial, and district government partners, UNICEF, USAID and WHO. Typical of many countries, Zambia has an ambiguous view of TBAs – wishing to discourage their delivering mothers but realizing that options are limited. LINCHPIN's strategy seeks to both expand the scope of TBAs (as newborn care provider) while reinforcing accepted tasks (ANC, PNC), and discouraging controversial tasks by encouraging TBAs to refer patients to facilities for skilled attendance as much as possible. Allied challenges of incentivization, retention, quality, and supervision are of high interest within the fluid policy context of not only TBAs, but also CHWs and CCM. During pre-DIP consultations and the DIP workshop itself, government and multilateral stakeholders identified LINCHPIN as policy-informing. We accept this role and will conduct, document, present, and publish rigorous evaluative and operations research throughout the life of the project.

B.4. Assessing the innovation

The project aims to evaluate the teaming through our partnership with BU. We will: (1) census the existing community-based volunteers (CBVs), including those who have become inactive due to lack of motivation/discouragement[2]; (2) explore re-animating and teaming inactive CBVs; (3) specify "teaming competencies" (such as, to deliver an interactive "health talk" together or to handover the care of a 6-week old baby and deliver a "two-on-one" explanation to the caregiver of illness signs requiring CHW consultation); (4) develop a low-literacy training manual for a 1-2 day training targeting both CHWs and TBAs; (5) gather baseline data on all team members; (6) train teams, the members of which have already been trained in delivering their respective interventions; (7) assess terminal teaming competencies; (8) deploy the teams; (9) track competency in both teaming and their respective case management tasks; and (10) measure use of interventions in their catchment areas through service statistics.

Questions include: (1) What is teaming in a Zambia context? (2) How do we measure it? (3) Can LINCHPIN achieve teaming? (4) Is teaming associated with use of intervention?

B.5. Additional innovations

LINCHPIN also aims to conduct additional program learning by evaluating supervision strategies and training methods. Currently supervision is limited to a supervisor gathering forms after a two-hour bicycle ride to a community, an all-day outreach, and the prospects of a two-hour return trip, hopefully not in the dark. The most promising two approaches to supervision are the current monthly outreach (supplemented with a stronger checklist) vs. even-month outreach and odd-month systematic supervision. LINCHPIN will also measure competencies achieved

[2] At the very least, teams will be activated, trained, deployed, monitored, and evaluated in the 75 NHCs that have both active trained TBAs and CHWs.

through traditional case management training using clinical cases (which is costly and unreliable), supplemented with a more extensive video library which Save the Children is already developing for CCM training. Additionally, supervision and training will be supplemented by "Zambino," a prototype infant mannequin we will plan to develop in partnership with LINCHPIN's neonatologist/training consultant Dr. Nicholas Guerina, the Massachusetts Institute of Technology and WHO/CAH/Geneva. This mannequin will be programmable for various respiratory rates, with or without chest in-drawing, and will serve as a valuable hands-on training tool.

C. Monitoring & Evaluation

C.1. M&E systems

Current system The current CHW monitoring system relies on: (1) a generic open-ended treatment register for all ages (date, number, name, age, sex, address, diagnoses, treatment and referral); (2) a monthly 3-page report (of which there are various versions tracing their provenance to an earlier World Vision child survival project) which requires the CHW to compute "cross-tabulations" from the register to derive numbers of diseases by age group (<5, ≥5), along with information about health talks, home visits, growth monitoring, de-worming, water, sanitation and drug supply; and in theory (3) a 35-item two-page C-IMCI supervisory checklist which, in fact, is not yet used. In addition, there is a newly developed 74-item community register for well children to track birth weight, immunizations, vitamin A, growth monitoring, de-worming, environmental health, Prevention of Mother-to-Child Transmission (PMTCT), and two-week recall of malaria, diarrhea and pneumonia. Limitations of current forms: (1) They track preventive and promotional activities, not high impact curative interventions. (2) They rely on cumbersome, error-prone "cross-tabulations" to transform written data into numerical data. (3) They do not guide treatment or lend themselves to review for case management consistency. (4) They lack "timeliness" of treatment. (5) They are demanding for volunteers – especially when completed in duplicate.

The current TBA monitoring system is a two-page form. One side, pictorially tracks all deliveries (date, name, address, age, infant sex, mother well, baby well, maternal death, child death, referral of mother, and twins). The other side tallies aspects of health talks (number, attendance) by topic (ANC, clean safe delivery, newborn care, postnatal planning and other); home visits by reason (ANC, PNC, family planning, follow up, other); and ANC (first visits, total, and referrals). For both providers, the monthly report is completed in duplicate, one copy retained by the provider and the other given to the supervisor either at outreach or when providing periodic care at the health facility. Limitations of current forms: (1) They track activities, not high impact interventions. (2) They do not accommodate the sick newborn (danger signs, treatment, or even referral). (3) They do not track "timing" of PNC. (4) They do not track supplies.

Tentative recommendations LINCHPIN aims to support and strengthen existing tools and methods. Save the Children has extensive experience with registers for CCM and growing experience with newborn care. Based on this experience and Save the Children's CCM Toolbox, ***we have been invited as a stakeholder to the national dialogue on registers and other normative inputs for Zambia's CCM strategy and package***. Indeed, we believe that tracking the

CCM strategy for children and newborns requires national consensus on a results framework, indicators or measures of success, and tools and methods to inform such indicators.

Our recommendations to the Government Zambia as of this writing, and which have been conveyed to all partners, are to: (1) adopt a six-box results framework similar to LINCHPIN; (2) adopt globally accepted measures of coverage or use of curative interventions, access, quality, demand, and environment which are informed by global technical consensus[vi] and those selected by similar countries, such as Uganda and Malawi; and (3) design registers and supervision checklists that preferentially target life-threatening conditions among the most vulnerable (children under five) so as to guide assessment, classification (malaria, diarrhea, fast breathing and other), and treatment AND inform program indicators – mainly use and quality.

Thus, for the CHW, we recommend splitting the register into a front section for 2-59 month olds and a back section for those five years and above. We recommend a "tick and tally" format that minimizes writing and maximizes guiding choices among the steps of assessment (respiratory rate and RDT result), classification, and treatment (specifying all life-saving treatments and formulations – hopefully pre-packaged and perhaps color-coded). We recommend adding a column that specifies the timeliness of treatment (<24 hours since illness onset). Depending on national dialogue and decisions about routine follow-up, LINCHPIN could add columns for follow up, compliance with treatment, outcome, etc. Compliance with referral seems important as well based on the "team" approach to specifically motivate reluctant families for referrals. We recommend adapting the monthly summary to include refined measures of timeliness of treatment and referral for the cardinal CCM syndromes.

For TBAs, we recommend adding pictorial[3] tick-columns for assisted breathing, PNC home visits consistent with the *WHO-UNICEF Joint Statement* (up to three times in three columns to reflect global standards, although Zambia has yet to adopt this), signs of possible severe bacterial infection (PSBI) (columns specifying the seven signs, plus other), signs of localized bacterial infection (LBI) (column specifying the three syndromes, plus other), and columns for initial treatment and referral and perhaps localized treatment for LBI – if of interest. As for CHWs, depending on national dialogue and decisions about routine follow-up for newborns, LINCHPIN could add columns for follow up, compliance, outcome, etc. Compliance with referral is important to LINCHPIN, since families are often reluctant to bring newborns outside the home. We recommend adapting the monthly summary to include refined measures of PNC, PSBI, LBI, treatment, and referral.

For both CHWs and TBAs, LINCHPIN plans to engage with the district, provincial, and national-level partners to refine supervision tools to both track activities, drugs and supplies, and also to assess specifically enumerated competencies against standards in a more structured, systematic way. The Save the Children CCM Toolbox has prototype forms for local adaptation. Finally, for both CHWs and TBAs, LINCHPIN will explore adapting Save the Children tools for aggregating, analyzing, interpreting and responding to indicators of use (from registers and monthly reports) and quality (from supervisory checklist) to yield a line-listing of catchment area providers for a given period. LINCHPIN will also support the periodic aggregation of all 14

[3] Victoria Guerina, wife of our neonatologist/training specialist consultant to LINCHPIN, can draft pictographs – similar to those she prepared for LUNESP.

catchment areas to yield the district experience.

Assessments In addition to routine administrative service statistics, Save the Children and BU, with the Tropical Disease Research Centre (TDRC) in Ndola, conducted a population-based household survey (adapted KPC) at baseline **(Annex 10**). This survey will be repeated at endline to monitor (and evaluate) progress towards achieving targets, as well as measures within the embedded operations research and program learning. In addition, a health facility assessment and qualitative inquiry will have been carried out by the time of the DIP review in June 2010 and shared with the Lufwanyama DHMT and other stakeholders shortly thereafter.

C.2. M&E Table

The LINCHPIN Monitoring & Evaluation Table is in **Annex 2**.

Informed by Save the Children's engagement to identify and test the best indicators to monitor CCM, we have incorporated 28 of the 42 currently proposed indicators (including 10 of the 13 for "global" monitoring). The DHMT provided valuable input for local adaptation and vetted the proposed changes. Two caveats must be noted: (1) the list remains fluid, so "the 42" are not yet final; and (2) some indicators are experimental and may not perform well in the field. We aim to track not only the levels but also the process of using the indicators to continue to inform the state of the art.

The DIP Review letter from Ms Kureshy (19 July 2010) approving the DIP with minor modifications requested that the M&E table include "relevant required Rapid Catch indicators." A follow-on conversation between David Marsh and Ms. Kureshy (23 August 2010) resulted in the following consensus – that all Rapid Catch indicators are in some way relevant to LINCHPIN, that none apart from those already in the M&E table are modifiable by LINCHPIN, and that, therefore, no additional Rapid Catch indicators will be added to the M&E table, which is already ambitious.

D. Revisions from the original application

As a result of the DIP process, there are no substantive changes to project location, local partners, implementation strategies, indicators, intervention mix or levels of effort, or specific activities. Minor changes are:

- The Lufwanyama **district population** was updated from 78,783 (2009 government projection) to 85,300 (2010 projection) to be consistent with the figure used by the district administration, MOH, PMO, and DHMT.

- LINCHPIN's **Program Manager**, Grace Mazala-Phiri, resigned unexpectedly at the time of the DIP in order to take up other employment. Save the Children is recruiting for this key position, which should be filled by the time of the DIP review. Given opportunities that emerged during the DIP process, Save the Children decided to base the Program Manager in Lusaka to facilitate contact and "sit at the table" with MOH, USAID, WHO, UNICEF, and other national-level partners. The very able Deputy Program Manager, Ngosa Sondashi, based in Kalulushi, is responsible for day-to-day project management

and coordination with the DHMT and local stakeholders while the Program Manager in Lusaka provides technical leadership and oversight and liaises with national-level partners, including MOH, USAID, WHO, UNICEF, and others. Revised job descriptions (**Annex 7)** reflect these new roles. Save the Children is confident that basing the Program Manager in Lusaka maximizes our ability to influence national policy, strategy, and scale for newborn and child health, while at the same time ensuring smooth partnering and project implementation in the field.

- Decisions during the DIP process to: (1) support National Child Health Days and other district initiatives and (2) strengthen the LINCHPIN training required streamlining somewhat our **community mobilization strategy**, described below. At the end of calendar year 2010, the number of community mobilizers will be reduced from 12 to four, each assigned strategically to a health center and linked with NHCs.

- DIP workshop participants did not prioritize the Partnership Defined Quality approach with NHCs, and this component has been removed.

- At the DIP workshop, the partners agreed to omit the initially-proposed, match-funded **PMTCT interventions** delivered by trained TBAs, due to lack of funding and human resources and current limited access to referral testing and treatment facilities in the district. LINCHPIN is committed to supporting PMTCT as it rolls out in the district over the course of the five-year project period.

- Decisions about a Lufwanyama "Living University" (or Centre of Excellence) have been put on hold until the midterm evaluation, pending leverage of additional funds and stakeholder buy-in.

- Save the Children is submitting a **detailed budget amendment**, including Forms 424 and 424A and supporting narrative. Adjustments in local costs - especially for training, salaries, and staff travel - guided the budget revision.

E. Project Management

Annex 4 – Management/Human Resources Table

Annex 5 – LINCHPIN Organigram

Annex 6 – MOU with Lufwanyama DHMT and Sub-grant Agreement with Boston University Center for Global Health and Development.

Note: The sub-grant agreement between Save the Children USA and Save the Children Sweden is currently being reviewed and a revised version should be available at the time of the DIP review in June.

Annex 7 – Job Descriptions of Key Personnel

F. Training Plan

Annex 8 – Training Plan

G. Operations Research Concept Paper

Annex 9 – Operations Research/Evaluative Plan (DRAFT)

H. Updated CSHGP Data Form

Annex 11 – Updated CSHGP Data Form

I. Child Health Technical Package and Delivery Strategy

Annex 12 – Child Health Technical Package and Delivery Strategy

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[i] Jones, G, Steketee RW, Black RE, Bhutta ZA, Morris SS, and the Bellagio Child Survival Study Group. How many child deaths can we prevent this year? Lancet. 2003; 362: 11-17.

[ii] Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, de Bernis L, for the Lancet Neonatal Survival Steering Team. Evidence-based, cost-effective interventions: How many newborn babies can we save? Published online March 3, 2005. http://image.thelancet.com/extras/05art1217web.pdf.

[iii] Kalesha P, Overview of Community IMCI in Zambia, Sub-regional Conference on Community-based Child Health Interventions, Lusaka, Zambia, 3 May 2007.

[iv] Copperbelt Provincial Director of Health, 2 November 2007.

[v] Marsh DR, Sadruddin S, Rivera D, Swedberg E, Tools to Introduce Community Case Management of Serious Childhood Infection, Save the Children: 2008.

[vi] Measuring Community-Based Care for Sick Children in Low-Income Countries Delivered through the Community Case Management Strategy: The "Stockholm Indicators" – in preparation by the Global Community Case Management Operations Research Group, May 2010.

Annex 1: LINCHPIN (CSHGP) Work Plan by Year, Quarter, and Activity Cluster

		09		2010				2011				2012				2013				2014			
		Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep
Cluster	**Activities**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Start Up	Staff recruited	X																			
	Briefings for national, provincial, district-level stakeholders	X	X																		
	Detailed implementation planning with stakeholders	X	X																		
	Partnership agreement(s) signed with DHMT		X																		
	DIP review in Washington, DC			X																	
Project Management	Monthly meetings with DHMT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Stakeholder meetings					X				X				X				X			
	Monthly skill building meetings with CMs			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Exchange Visit to Malawi				X																
Monitoring & Evaluation	Baseline assessments developed	X																			
	Formative research			X																	
	Baseline population-based survey		X																		
	Health facility assessment			X																	
	Policy and strategy review	X	X	X								X							X		
	Baseline assessment results disseminated					X															
	Process documentation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Midterm assessment/survey (ELMA endline)								X												
	Participatory midterm evaluation (ELMA final)									X											
	Endline population-based survey																		X		
	Final evaluation																			X	
	Routine field monitoring/data collection			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Operations Research	Questions finalized		X																		
	Protocol developed			X	X																
	Data collection tools developed				X	X															
	Data Collection Study #1 (Teaming)						X	X	X	X	X	X	X	X	X	X	X	X		X	
	Data Cleaning and Analysis									X	X	X	X	X	X	X	X	X	X		
	Documentation and Dissemination															X	X	X	X	X	X
	Data Collection Study #2 (Training: funding permitting)						X	X	X	X	X										
	Data Collection Study #3 (Supervision: funding permitting)						X	X	X	X	X										
Access	Training materials reviewed/adapted/developed		X		X		X														
	120 TBAs refreshed in ENC, PNC, CCM, facilitated referral			X	X																
	8 Master Trainers trained in CCM				X																
	85 CHWs trained in CCM, ENC				X	X															
	150 TBAs/CHWs trained in teaming						X														
	National Days			X		X		X		X		X		X		X		X		X	
Quality	20 nurses refreshed in TBA supervision			X																	
	22 clinical/EHO trainers trained in CHW supervision					X															
	Medication and supply system monitored & facilitated			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Supportive supervision facilitated/documented			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Demand	1 Community Mobilization Officer and 3 Community Mobilizers trained as trainers in CM/BCC					**X**																
	135 NHCs trained in CM/BCC							**X**	**X**													
	Lufwanyama District Center of Excellence - TO BE DETERMINED											**X**										
	Participation in national technical, policy, strategy meetings		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
	District/provincial planning cycles engaged			**X**				**X**				**X**				**X**						**X**
	LINCHPIN national dissemination meeting																				**X**	

Annex 2: Monitoring and Evaluation Table (yellow boxes represent emerging consensus on priority indicators for ICCM, informed by USAID's benchmarks, "Stockholm Indicators" and Save the Children's CCM Toolbox)

Result Level	Indicator (Illustrative)	Method 1		Method 2			Levels (%)	
		Source	Timing	Source	Timing	Comment	Baseline	Target
Use of Interventions Increased	Newborn thermal care	HHS	BL/EL			Drying and warming) (a) Drying (b) Warming	79.1% (a) 79.8% (b) 87.5%	90% (a) 95% (b) 95%
	Treatment ratio for non-breathing newborn	LUNESP		SS	q3m	% of expected for TBAs delivering assisted breathing	6%	6%
	Treatment ratio for possible severe bacterial infection	LUNESP		SS	q3m	% of expected for TBAs providing referral and/or first dose and referral	11%	11%
	Postnatal care within the first two days	HHS	BL/EL	SS	q3m	% of newborn babies who are born at home, receiving postnatal care with 2 days of delivery.	28% (among 77 infants <3 months of age)	60%
	Timely treatment or treatment ratio for pneumonia	HHS	BL/EL	SS	q3m	(a) Received antibiotics for pneumonia	12.5% (a) 50.0%	50% (a) 70%
	Timely treatment or treatment ratio for malaria	HHS	BL/EL	SS	q3m	Antimalarial for RDT+ fever/ malaria (ACTs for 3 days starting within 24 hours of onset of fever) (a) ACTs starting within 24 hours of onset of fever	11.2% (a)12.4%	50% (a) 70%
	Timely treatment or treatment ratio for diarrhea	HHS	BL/EL	SS	q3m	ORT and zinc for diarrhea (a) ORT for diarrhea (b) Zinc for diarrhea	0 (a) 73.8% (b) 0	50% (a) 90% (b) 50%

Access Increased	CHW (and TBA) Density			TR/Sup	q12m	# CHWs (and TBAs) delivering ICCM/1000 population	0	1/1000
	Catchment Coverage			TR/Sup	q12m	% NHCs with trained, deployed CHW delivering ICCM (and TBA delivering ENC and CCM)	0%	90%
	Functionality			Sup	q3m	% CHWs (and TBAs) submitting reports	0%	90%
	Retention Strategy			DHMT	q12m	Does a written plan exist and is it reviewed annually for CHW? TBA? (DHMT has no current "package," and proposes % of planned retention or motivation activities implemented i.e: transport,training, reporting tools, medicines)	No 50%	Yes 75%
	Retention			Sup	q12m	% CHWs (and TBAs) functional on Jan 1 who are still functional on Dec 31st. (or % CHWs [and TBAs] functional 12 months after training)	0	80%
	Referral	HSA		Sup	q3m	% cases seen who are recommended for referral	unknown	to be deter-mined
	Appropriate Referral	HSA		Sup	q3m	% cases with DS or severe disease referred	0	80%
	Successful Referral	HSA		Sup	q3m	% recommended referral accomplished (based on next day follow up)	0	80%

Service Quality According to Standard	Supervision Strategy			DHMT	q12m	Availability of ; 1) checklists, 2) SOPs 3) CHW training material 4) TBA tranining material 5) Supervision plan	 No No No No Yes	 Yes
	Routine Supervision Coverage			Sup	q3m	% CHWs (and TBAs) receiving > 1 supervisory visit in the prior 3 months with registers and/or reports review	pending	80%
	Clinical Supervision Coverage			Sup	q3m	% CHWs (and TBAs) receiving > 1 supervisory visit in the community in the prior 3 months where case management was observed (and/or scenarios used) and coaching provided	pending	80%
	CHW/Supervisor Ratio			Sup	q12m	a) # CHWs/# Supervisors b) # TBAs/# Supervisors	pending	a) 5/1 b) 5/1
	Consistent Case Management			Sup	q3m	% registered cases with complete, consistent assessment, classification, treatment	not applicable	80%
	Case Management Knowledge			Sup	q6m	% correctly managing case scenario, stratified for CHW and TBA	not applicable	80%
	Respiratory rate determination			Sup	q6m	% correctly counting RR (+/- 2 bpm), stratified for CHW and TBA	not applicable	80%
	Stockout	HSA		Sup	q3m	% CCM sites with stock-outs of any CCM medicine or RDT in the last quarter.	not applicable	20%
	Treatment compliance			Sup	q3m	based on follow-up		90%
	Case Load	HSA		Sup	q3m	# cases/provider/m	unknown	5-20/m

Demand Increased	Communication Strategy			DHMT	q12m	plan for communication developed and messages and materials for health staff and community tested and available (yes/no)	No	yes
	Knowledge of Illness signs (newborn)	HHS	BL/EL			Knowledge of 2+ newborn danger signs (a) Know ledge of 4+ danger signs	69.9% (a) 11.2%	80% (a) 60%
	Knowledge of Illness signs (child)	HHS	BL/EL			Knowledge of 2+ child danger signs (a) Knowledge of 4+ danger signs	85.4% (a) 22.4%	90% (a) 70%
	First Source of Care	HHS	BL/EL			% caregivers of children U5 in CCM areas who report seeking CHWs or TBAs as first source of care for the sick child	0	80%
Environment Enabled	Lufwanyama Living University			PR	q6m	DHMT interested in knowing how this will be measured.	No	TBD
	Research findings presented (#)			PR	q6m		0	3
	NHCs trained in BCC			PR	q6m	#of NHC Trained in BCC	0	75%
	TBA-CHW teams trained in teaming			PR	q6m	#of TBA-CHW teams Trained in teaming	0	90%
	Costing			DHMT	q12m	comprehensive costing for all components established, i.e. supply chain mgt, training, supervision, etc.) (yes/no)	Yes	yes
	District Financial Contribution			DHMT	q12m	DHMT budget includes line item(s) for CCM (% of comprehensive); DHMT needs to know "units"	No	yes
	Sensitization			DHMT	q12m	% targeted units (135 NHCs with each unit having an population on 500 people) sensitized to strategy		80%
	Standard Reporting			DHMT	q12m	standardized CCM Tools 1)TBA/CHW registers 2) Summary reports 3) Supervisory Checklist 4) Consolidated reports	No	yes

	District CCM Monitoring			DHMT PA report	q12m	% implementing sub-districts using CCM monitoring data	0	80%

Annex 4 Management/Human Resources Table

Title	#	% Effort, Location	Principal role in LINCHPIN
Save the Children Sweden (Zambia)			
Country Director	1	5 % Lusaka	Overall responsibility for administration, financial and grant management of the LINCHPIN project.
Deputy Country Director for Programmes	1	5% Lusaka	Provides programmatic leadership and implementation oversight for the LINCHPIN project.
Finance Manager	1	5% Lusaka	Provides financial management oversight to LINCHPIN, ensuring quality of financial reporting according to donor requirements.
Grants Manager	1	50% Lusaka	Responsible for management of grants and funding agreements, ensuring compliance with donor reporting requirements.
Program Manager	1	100% Lusaka	Provides technical leadership and oversight for the Project and liaises with national level partners including MOH, UNICEF,WHO etc.
Deputy Program Manager	1	100% Kalulushi/ Lufwanyama	Responsible for day to day project management and coordination with the DHMT and local stakeholders.
Training Coordinator	1	100% Kalulushi/ Lufwanyama	Responsible for organizing and coordinating all project trainings related to child health within the catchment area of LINCHPIN.
Training Officer	1	100% Kalulushi/ Lufwanyama	To assist the training coordinator to ensure all planned trainings take place.
Finance Officer	1	100% Kalulushi/ Lufwanyama	Responsible for the day to day financial management of the project in the adherence to donor requirements.
Administrator	1	100% Kalulushi/ Lufwanyama	Provides administrative, human resource and logistic support to the LINCHPIN team.
Monitoring and Evaluation Officer	1	100% Kalulushi/ Lufwanyama	Manages LINCHPIN M&E plan; collects and analyses data.
Data Manager	1	100% Kalulushi/ Lufwanyama	Responsible for managing and maintaining a comprehensive information resource for LINCHPIN, IT management.
Community Mobilisation Officer	1	100% Kalulushi/ Lufwanyama	Oversees the mobilization and sensitisation of the community within Lufwanyama District about the project; participates in advocacy activities; liaises with NHCs and field-based Community Mobilizers.
Community Mobilizers	3*	100% Kalulushi/ Lufwanyama	Links project with health facilities and local community, including leadership and NHCs.
Drivers	2	100% Kalulushi/ Lufwanyama	Drives project vehicles and ensures proper vehicle use and maintenance.

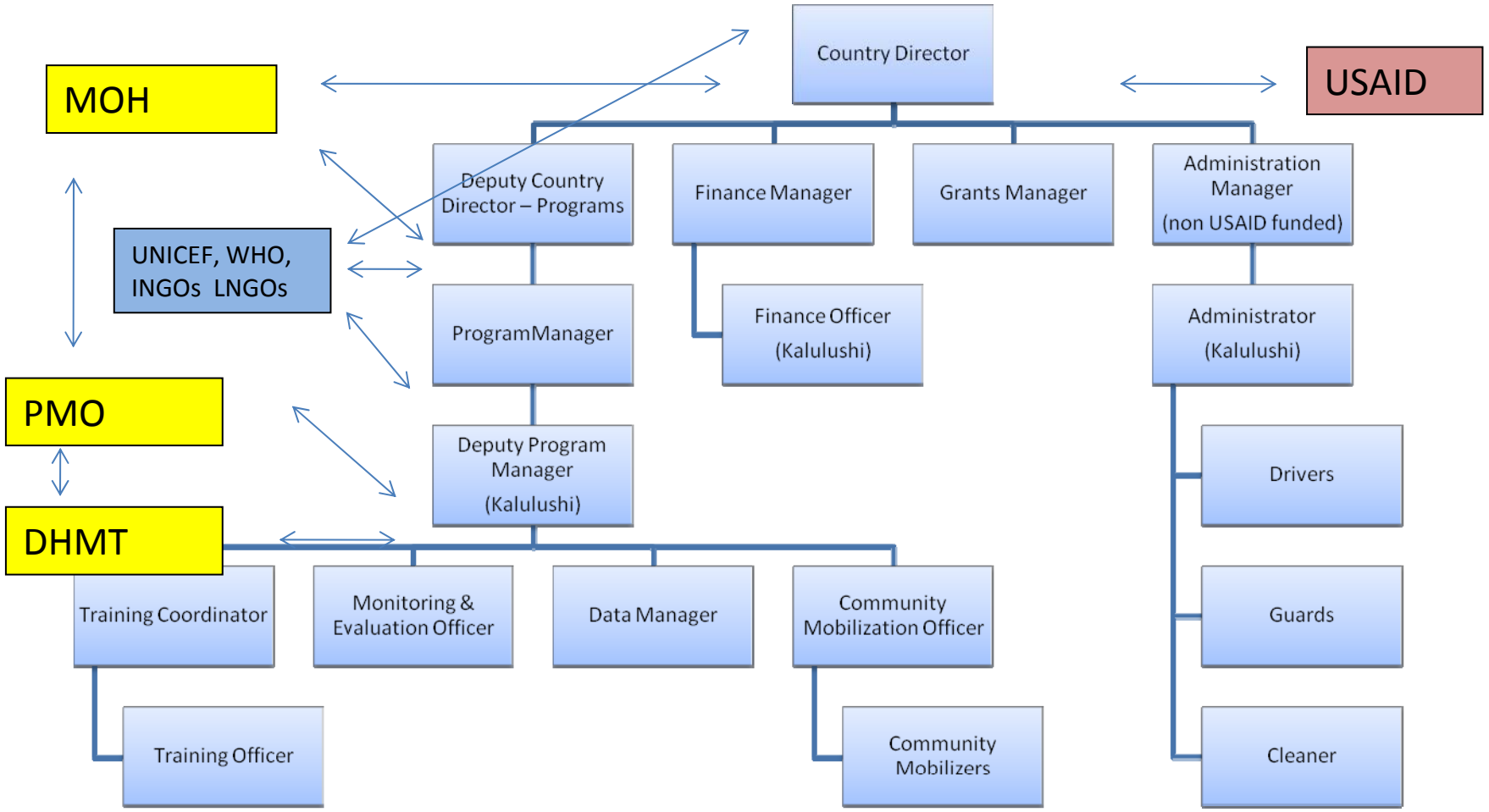
Guards	3	100% Kalulushi/ Lufwanyama	Provides security and safeguards project property.
Cleaner	1	100% Kalulushi/ Lufwanyama	Cleans project premises and is responsible for preparation of refreshments for staff and visitors.

District Health Management Team (MOH)			
Child Health Specialist	1	2% Kalulushi/ Lufwanyama	Provides policy direction on child health, coordinates Child Health Programme, prepares treatment protocols and guidelines, and provides capacity building.
Reproductive Health Specialist	1	2% Kalulushi/ Lufwanyama	Provides policy direction on reproductive health, coordinates Reproductive Health Programme, and provides capacity building.
Provincial Medical Officer	1	2% Kalulushi/ Lufwanyama	Represents the interests of the Ministry of Health in scaling up programmee, provides supportive supervision to district and project, participates in Detailed Implementation Planning, midterm and final evaluations, oversees programme management and implementation.
District Medical Officer	1	5% Kalulushi/ Lufwanyama	Maintains ownership and accountability for programme implementation, participates in Detailed Implementation Planning and midterm and final evaluation, monitors progress of the programme, reports progress of the project to Provincial Office, participate in the planning process, participate in supportive supervision, provide capacity building.
Health Centre In-Charges	13	100% Lufwanyama	Provide local technical support to community health providers, establish good and effective linkage and referral system, monitor implementation of the programme at the community level, provide logistical support to community health providers, participate in formulation of the project plan, provide curative and preventive care.
Community Volunteers			
Neighbourhood Health Committees	270	50% Lufwanyama	Provide community mobilization, promotion of key health messages, promotion of behaviour change communication approaches, support community-based providers, local leadership and linkages with traditional leaders and health facilities.
Community Health Workers	85	100% Lufwanyama	Provide community case management, referral, follow up; promote key health messages; participate in outreach preventive programme and mass campaigns.
Trained Traditional Birth Attendants	120	100% Lufwanyama	Provide neonatal care, refer to health facilities for delivery assistance and/or assist in delivery where necessary, participate in providing antenatal and postnatal care, promote key health messages, facilitate early referral to antenatal care.
Save the Children USA - Headquarters and Regional			
Senior Child Survival Advisor	1	15% Yr 1, 3, & 5; 7.5% Yrs 2 & 4 Westport	Supports CS project technically, especially in the areas of OR and M&E; primary liaison with Boston University and neonatologist/training specialist consultant. Participates in DIP, DIP review, MTE, FE.

Africa Regional Health Advisor	1	15% South Africa	Serves a Technical Backstop (CSHGP) for LINCHPIN. Writes/revises DIP, annual reports, other documents; organizes and participates in midterm and final evaluations; provides technical and programmatic support, and backstops project through e-mail correspondence and through prompt responses to CSHGP queries.
Africa Capacity Building Advisor	1	5% South Africa	Supports the project's training, demand creation, and community mobilization components, including curriculum design for the TBA-CHW teaming approach and TOT.
Office of Health Associate Director	1	5% Yrs 1-5 Westport	Provides contractual/financial backstopping, including regular monitoring of project budget pipelines and support for sub-grants and consultancies, liaises with USAID/CSHGP on grant management issues.
Senior Communication Specialist	1	5% Westport	Provides support in documentation and knowledge management needs from home office.
Boston University Center for Global Health and Development			
Principal Investigator	1	15% Boston	Serves as principal investigator for LINCHPIN OR; coordinates baseline and endline assessments and prepares reports.
Co-Principal Investigator	1	10% Boston	Serves as co-principal investigator for LINCHPIN OR; provides technical support for baseline and endline assessments.
Coordinator	1	10% Boston	Coordinates BU OR participation and responsibilities.
Demographer	1	10% Boston	Provides technical support for baseline and endline assessments and OR.
Consultant			
Neonatologist/ Training Specialist (Consultant)	1	Boston	Supports TBA training and supervision in essential newborn care, including resuscitation of non-breathing babies.

* *Community mobilizers n = 11 until November 2010; n= 3 thereafter.*

Annex 5: LINCHPIN Organigram



Annex 6 Agreements

Memorandum of Understanding

OPERATING AGREEMENT

Between

Save the Children

A non-government organization working for the Health and Welfare of the Children worldwide, duly registered under the Laws of Zambia,

And

The Lufwanyama District Health Management Team, (DHMT)

Represented by the Officer duly authorized, The District Medical Officer (DMO).

ACRONYMS

CCM	**Community Case Management**
CHW	**Community Health Worker**
DHO	**District Health Office**
IEC	**Information Education Communication**
LINCHPIN	**Lufwanyama Integrated Neonatal and Child Health Project in Zambia**
MoH	**Ministry of Health**
MoU	**Memorandum of Understanding**
NHC	**Neighborhood Health Committee**
PHO	**Provincial Health Office**
TBA	**Traditional Birth Attendant**

WHEREAS

The Ministry of Health highlights Child Health as one of the national health care priorities under the Basic Health Care Package. This package seeks to provide efficient and cost effective quality basic health care services for common illnesses as close to the family as possible.

The Provincial Health Office represents the interests of the Ministry of Health in the implementation process for programmes under the Public Health portfolio, and plays a critical role in providing supportive supervision of the District Health Offices.

The DHO is responsible for Health Care Delivery to constituents, and recognizes that prevention and early management for common childhood illnesses through technical support, provision of basic commodities and implementation of various interventions is the core role.

A donor has made funding available through Save the Children to support and complement Government efforts in the improvement and implementation of these interventions and thereby contribute to the overall wellbeing of under five children in Lufwanyama District.

Health Centres have regular interaction with both the well, sick, and new born children. The Health Centres are also the core team in the training, supervision and enrollment of CHWS/TBAs and will play a very critical role in both the implementation and monitoring of the program.

Save the Children supports successful Community Case Management and new born health programs in remote under-resourced areas such as those existing in Lufwanyama District. It is also a technical partner on the Health Systems and Services Program, Zambia's USAID–funded bilateral health system strengthening initiative.

THEREFORE IT IS AGREED AS FOLLOWS:

SAVE THE CHILDREN'S PROPOSED PROGRAM

The goal of Save the Children's four-year Community Case Management program is to reduce child mortality in Lufwanyama District through the increased use of key health practices and services also known as "evidence-based interventions". These are both preventive and curative.

(a) preventive

Clean and safe delivery, essential newborn care such as immediate exclusive breast-feeding, warming and drying, and cord care.

(b) **curative**

Resuscitation for birth asphyxia, oral rehydration therapy and zinc for diarrhea, antibiotics for pnenumonia and newborn sepsis, and antimalarials for malaria.

Save the Children proposes to increase the use of these interventions in four ways, specifically through:

- Increased **access** to and availability of services, which will be delivered by:
    - Community Health Workers who will provide community case management of serious infection.
    - Traditional birth attendants who provide essential newborn care and post-natal visitation and referral.
    - Facilitated referrals, where feasible.
- High **quality** services, including:
    - Competency-based training for community health workers and traditional birth attendants.
    - Systematic joint supervision, with the district, of community case management.
    - Training or re-training of health facility staff.

- Training neighbourhood health committees, in the Partnership Defined Quality approach, to expect and request high quality services. (Partnership Defined Quality mobilizes communities to engage providers to improve the quality and accessibility of services.)

- Increased **demand** for services and healthy practices, through:

  - Training health facility staff and neighbourhood health committees (including community health workers and traditional birth attendants) to deliver key messages that promote evidence-based relevant household practices, danger sign recognition and prompt appropriate care-seeking.
  - Local communication channels, such as grandmother groups, and/or local non governmental organizations, such as the Zambian Women's Development Association.

- An **enabled environment** to facilitate, sustain and scale up the interventions, including:

  - Enhanced community capacity through training by health communication partnership and distance radio learning.
  - The "Lufwanyama District Centre of Excellence" to demonstrate and replicate best practices along the entire household-community-facility continuum (including a tool-box of orientation, technical, training, on-the-job, supervision and roll-out documents).
  - Program learning to answer questions relevant to planners.
  - Ministry of Health policies and strategies supporting CCM at the national level.

Success is dependant upon open communication, partnership, effective planning, and monitoring between the PHO, DHO, and MoH.

The responsibilities and specific activities designated below are to be reviewed and revised in the detailed implementation planning (DIP)

process during the first quarter of 2010 and may require an amendment to this MOU.

I. Responsibilities of Save the Children

By signature below, Save the Children agrees to:

1. Competency-based training for community health workers, traditional birth attendants, Neighbourhood Health Committees
2. Systematic supervision of community case management interventions.
3. Facilitation of reliable supplies of medicines and equipment, within budgetary limitation and consistent with donor rules and regulations.
4. Training or re-training of health facility staff.
5. Training neighbourhood health committees, in the Partnership Defined Quality approach, to expect and request high quality services. (Partnership Defined Quality mobilizes communities to engage providers to improve the quality and accessibility of services.) Training health facility staff and neighbourhood health committees (including community health workers and traditional birth attendants) to deliver key messages that promote evidence-based relevant household practices, danger sign recognition and prompt appropriate care-seeking.
6. Facilitate referrals, where feasible.
7. Periodically monitor program progress at both the Facility and Community levels.
8. Work with other local stakeholders to improve local communication channels, such as grandmother groups, and/or local nongovernmental organizations, such as the Zambian Women's Development Association.
9. Support District and Health Centre targeted distribution efforts with effective IEC and promotional materials that meet local language and key message requirements.
10. Facilitate quarterly/annual program review meetings called by the PHO, Districts Health Office, health facility staff and community level stakeholders to report on program progress,
11. Participate actively in the district, provincial, and national MOH planning cycles.

II. Responsibilities of the PHO

By signature below, The PHO agrees to:

1. Understand and represent the interests of the Ministry of Health in scaling up the newborn care and child health interventions consistent with the National Health Strategic Plan.
2. Provide supportive supervision of the District in implementing the program according to the parameters laid out in this Operating Agreement and in the overall programme design, increasing District ownership and accountability for program performance.
3. Participate in detailed implementation planning, and midterm and final evaluations; and attend program review meetings annually with DHO and other program stakeholders,
4. Liaise with programme management staff in developing activities that are in line with MoH policy,
5. Oversee and witness programme management and implementation and ensure effective community case management of childhood illnesses,
6. Contribute to development of the Lufwanyama Centre of Excellent.

III. Responsibilities of the DHMT

By signature below, The DHMT agrees to:

1. Maintain ownership and accountability for programme implementation at all times, according to the parameters laid out in this Operating Agreement and in the overall programme design. More specifically, to ensure consistent availability and accessibility of commodities, training/capacity building of implementing staff and routine monitoring of the program.
2. Take part in detailed implementation planning and midterm and final evalutions
3. Monitor progress of the program through monthly reports prepared and submitted by staff linked to Program,

4. Maintain comprehensive, accurate and up-to-date records of the program
5. at health facility and community levels,
6. Report progress of the program to PHO,
7. Identify refresher training needs and provide refresher trainings where possible to Health Centre Staff/NHCs to ensure continuity.
8. Disseminate and provide periodic updates on LINCHPIN progress and results,
9. Appoint an officer to serve as focal point at the District to promote effective communication with Save the Children and the LINCHPIN team,
10. Participate in the planning and conduct of operations research to answer important question relevant to service delivery, sustainability, scale up and establishment of the Centre of Excellence.

IV. Responsibilities of the Health Centre

In addition, the DHO is responsible for monitoring and enforcing health centre performance, including:

1. Providing local technical and logistical support to community based health providers implementing the program, including medicines and supplies as available,
2. Establish a good and effective linkage and referral system for the patients (Newborn babies and children under five) found to be very sick at community level by the community health providers,
3. Coordinate at local level the activities of the program with those of other stakeholders implementing similar programs,
4. Monitor and ensure that all the trainings, activities, commodities and IEC materials being used by the program meet National MOH guidelines.
5. Contribute towards the formulation of plans for the program during the planning period of the program

V. Program reporting, monitoring and evaluation

- The PHO shall continuously monitor, along with its other programs, the performance of the Program to ensure that all activities are being implemented in accordance with the program guidelines above,

- The DHO shall continuously monitor, along with its other programs, the performance of each Health Centre to ensure that they at all times operate in accordance with the program guidelines above,
- Save the Children shall visit DHO at least once per quarter to assess program performance with the DMO and Clinical Care Officer.
- In all monitoring visits, Save the Children and the DHO shall document Health Centre and community based health worker performance by completing program monitoring forms, designed by and provided by Save the Children,
- The DHO/Project staff shall work with the low-performing Health Centres to determine areas, guidelines, and timelines for improving performance;
- The DHO shall meet with Save the Children project staff a minimum of once every six months to review program progress,
- In partnership with the district and province, Save the Children shall conduct quantitative and qualitative baseline assessments as required at the beginning of the programme, as well as other assessments at endline and during the course of the project, as required. These assessments will measure programme progress towards the goals of Community Case Management, coverage, appropriate use, availability, accessibility and affordability. Results of these surveys will be shared broadly with the PHO and DHO.

VI. Low-performance by Health Centres and Communities

Health Centres and communities shall be considered low performing for the following reasons:

- Health facilities are not giving technical and logistical support to the community health providers implementing the project.
- Communities and health facilities are not reporting on the progress of the project using the recommended data collection tools of the project.
- Community activities of community case management of childhood illnesses are not being conducted by community health providers under the project.

- Information or guidelines in the trainings undertaken is not incorporated into the day to day activities of the project.

Low-performance by DHO

DHO shall be considered low performing for the following reasons:

- Failing to take part in the project review and /or planning meetings.
- Technical updates pertaining to Community Case Management especially in childhood illnesses is not given to project staff.
- Insufficient record keeping on project interventions by facility staff.
- Equipment, drugs and other commodities supplied by the project are kept in a non accountable manner at health facility level.
- If the focal point officer attached to the project is not released when required.

All Health Centres classified as low performing need technical support by the DHO and Project Staff within a quarter for the program based on performance review by the DHO and/or Project Staff.

VII. Low-performance by Save the Children – LINCHPIN PROJECT

Save the Children shall be considered low performing for the following reasons:

- Appropriate trainings at district, facility and community levels were not conducted.
- Essential commodities of the program were not provided in an on-time manner to effectively implement the program.
- There is failure to adequately involve the DHO in the programs such as planning process and review meetings of the project.
- Insufficient IEC support provided to the health facility staff, Community Health providers and the caretakers.

After discussion with Save the Children to try to resolve the difficulties, low performance by Save the Children should be documented to the Project National Office and MOH through the Province, District, and/or Health Centres when and where noticed, to enable the Project Office / MOH to take appropriate action.

Xa. Conditions interfering with performance and arbitration of low performance

Each party hereto shall promptly provide written notice of the occurrence and effects of any condition(s) which interfere(s) with, or which may reasonably interfere with, the running and/or effective performance of its obligations pursuant to the agreement. In cases of low-performance or disputes between implementing partners, National Office of Save the Children will designate an outside, neutral arbitrator to negotiate settlements.

Xb. Duration of partnership

This partnership shall extend automatically for five years from the date of signature on this MOU and for as long as funding permits. The partnership shall extend beyond this time frame automatically as additional funding becomes available to sustain the LINCHPIN PROGRAMME of Community Case Management of Child hood illnesses.

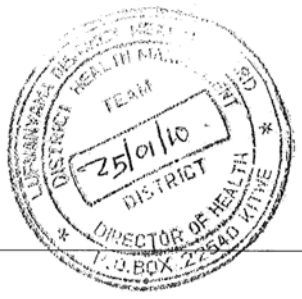
Xc. Signatures

THUS AGREED TO and signed on this 25th day of JANUARY, 2010 in the presence of the undersigned.

SIGNED BY

For and on behalf of .....Lufwanyama DHMT, the Representative duly recognized:

Name: Dr John Kamalamba



Signature: _____

Designation: District Medical Officer

For and on behalf of .....PHO, the Representative duly recognized:

Name: _____

Signature: _____

Designation: _____

For and on behalf of Save the Children, the Representative duly recognized:

Name: PETRONELLA MAYEYA

Signature: _____

Designation: COUNTRY MANAGER - SCS

WITNESSED BY

For and on behalf of Save the Children – National Office , the Representative duly recognized:

Name: PATIENCE MWELA

Signature: _____

Designation: ADMINISTRATION MANAGER

This document is valid only with the stamp of the Provincial Health Office

Subgrant Agreement with Boston University

Save the Children

January 6, 2010

Kojo Yeboah-Antwi
Assistant Professor
Center for Global Health & Development
Boston University School of Public Health
801 Massachusetts Ave, 3rd Floor
Boston MA 02118

Dear Dr. Yeboah-Antwi,

Save the Children Federation, Inc. (hereinafter referred to as "SC" or "Grantor") hereby grants **Boston University, Center for Global Health and Development** (hereinafter referred to as CGHD or "Sub-grantee"), the sum of **US** $199,427 to provide financial support for the SC program in the **Lufwanyama District, Zambia,** as described in Attachment 1 of this Sub-grant entitled "Schedule", and Attachment 3 entitled "Program Description".

Further, this Sub-grant is authorized under the ***Lunfwanyama Integrated Neonatal and Child Survival*** project to Save the Children from United States Agency for International Development (hereinafter referred to as "USAID") under USAID FY 2009 Child Survival and Health Program Innovation Award Cooperative agreement No.USAID-M-OAA-GH-09-298. The above-referenced sub award will be funded in the amount of $199,427 through USAID.

This Sub-grant is effective and obligation of $64,370.53 is made as of the date of this letter and shall apply to commitments made by the sub-grantee in furtherance of program objectives during the period beginning October 1, 2009 and ending March 31, 2010. SC shall not be liable for reimbursing the Sub-grantee for any costs in excess of the committed amount.

This Sub-grant is made to the Sub-grantee on condition that the funds will be administered in accordance with the terms and conditions as set forth in this cover letter and the following attachments, which are incorporated as part of this Agreement:

Attachment 1 Schedule
Attachment 2 Budget Breakdown
Attachment 3 Scope of Work
Attachment 4 SC Financial Reporting
Attachment 5 Applicable USAID Regulations (22 CFR 226, A-122, A-133)
Attachment 6 Standard Provisions for US Non-Governmental Organizations
Attachment 7 VAT Reporting

This sub-grant is subject to USAID's ultimate rights as provided in the Agreements with SC, to approve items, request changes, effect work continuance or termination, make adjustments and settlements of payments, revise time schedules and request financial and other information and

2

Save the Children Federation, Inc.

and

Boston University

Sub-grant Agreement

Lunfwanyama Integrated Neonatal and Child Survival Project in Zambia (LINCHPIN-Zambia)

Sub-grant # 840 10418A

January 2010

data.

The amounts to be paid to the Sub-Grantee through this Sub-Grant hereunder are to be provided by USAID pursuant to the Agreements with SC and therefore, those payments to the Sub-Grantee are subject to the same terms and conditions applicable to USAID's payment to SC except as may otherwise be expressly stated herein. In particular, should any costs incurred by the Sub-Grantee be denied reimbursement by USAID, the Sub-Grantee shall have no recourse against SC for such reimbursement or payment.

Please sign the original and (3) copies of this letter to acknowledge your receipt and acceptance of the Sub-Grant. Retain one copy for your files and return the original and (2) copies to the undersigned.

Sincerely yours,

Save the Children

Acknowledged and Agreed by: Sub-grantee

Signature: _____

Name: Jane F. Kinsel, Ph.D., MBA
Title: Director, Office of Sponsored Programs-MED

Date: 4/20/10

SC General:

Total Estimated budget:	$199,427.54
Total Obligated amount:	$64,370.53
Period of grant:	10/1/2009-9/30/2011
Obligated Period:	10/1/2009 – 3/31/2010
Total Match / Cost Share:	**NA**

SC Specific:

SC GL Number:	**84010418**
SC Cost Center:	**009**
Country office:	**Zambia**
Contact Persons:	**SC Home Office – David Marsh Senior Advisor Child Health & Nutrition; Carmen Weder, DHN Associate Director**

3

SUB-GRANT #84010418A

ATTACHMENT 1: SCHEDULE

A. Purpose of Sub-grant

The purpose of this Sub-grant is for Save the Children Federation, Inc. (hereinafter referred to as "SC" or "Grantor") to provide support to Trustees of Boston University (hereinafter referred to as Boston University, Center for Global Health and Development or "Sub-grantee") for program described in Attachment 3 of this Sub-grant entitled "Approved Implementation Plan."

B. Period of Sub-grant

1) The effective date of this Sub-grant is the date of the cover letter and the estimated completion date is **September 30, 2011.**

2) Funds committed hereunder are available for allowable program expenditures for the estimated period beginning **October 1, 2009** through **March 31, 2010.**

C. Amount of Sub-grant

1. The total estimated amount of this Sub-grant for the period shown in Section B.1, above is **$199,423.54.**

2. SC hereby obligates the amount of **$64,370.53** for program expenditures during the period set forth in Section B.2, above.

The subgranteee will be given written notice by SC if additional funds will be added. SC is not obligated to reimburse the subgrantee for the expenditure of amount in excess of the total obligated amount.

D. Terms of payment:

SC will provide no initial advance upon full execution of this sub agreement. Upon acceptance of this Sub-grant, SC shall make periodic payments to the Recipient in the form of cost reimbursement in amounts needed to meet current disbursement needs. Payments will be scheduled so that the funds are available to the Recipient (Sub-grantee) as close as is administratively feasible (within 10 days from receipt of a finance report).

Funds will be made available by:

Boston University
Citizens Bank
1 Citizens Drive
Riverside, RI 02915
Account # 110780-798-8
ABA # 011500120
Swift code: CTZIUS33

E. Financial Plan

1.Budget and Budget Revision

The following is the Sub-grant budget summary. A detailed budget breakdown is attached in attachment 2. Revisions to this budget shall be made in accordance with 22CFR226.25 entitled "Revision of Grant budget"

Line Item	*Total Estimated Budget* (10/1/2009-9/30/2011)	*Obligated Amount* (10/1/2009 – 3/31/2010)
Salaries	**$102,781.75**	**$31,516.75**
Fringe Benefits	**$27,237.16**	**$ 8,414.97**
Travel and Per Diem	**$24,856.77**	**$10,556.00**
Other Direct	**$3,396.96**	**$ 600.00**
Total Indirect	**$41,150.89**	**$13,282.81**
Total:	**$199,423.53**	**$64,370.53**

2. Notes to the Budget

(a) In applying and accounting for funds made available pursuant to this Sub-grant to carry out the purposes of this Sub-grant, the Sub-Grantee shall adhere to the applicable cost principles of the U.S. Government Office of Management and Budget (OMB) Circular A-122 and its determination of reasonable, allocable and allowable costs (Attachment 4)

(b) Any variance from the major line items will be done within the provision of 22CFR226. Variation of more than 10% of the total budget should have prior written approval of SC.

F. Procurement and (Sub)-Contracting

1. Authorized Geographical Code

(a) The authorized geographic code for procurement of goods and services under this award is 000.
(b) The Sub-Grantee shall not procure goods or services that can be identified as having a source or origin in the following countries: Cuba, Iran, Laos, Libya, North Korea and Syria.
(c) In accordance with the Required as Applicable Standard Provision for non-U.S. Non-Governmental Grantees entitled "AID Eligibility Rules For Goods and Services," the Sub-Grantee shall not procure any of the following goods and services without prior authorization of USAID, as submitted through SC:
    (I) Agricultural commodities,
    (ii) Motor vehicles,
    (iii) Pharmaceuticals,
    (iv) Pesticides,
    (v) Rubber compounding chemicals and plasticizers,

(vi) Used equipment,
(vii) U.S. Government-owned excess property, or
(viii) Fertilizer

(d) Funds provided through this Sub-Grant shall be used only for those activities necessary to complete the project as described in Attachment 1. Project funds shall not be used for the following activities:
(i) Commerce or business;
(ii) Religious activities;
(iii) To support violence or violation of the law;
(iv) Political activity; or
(v) Lobbying in the US or elsewhere.

G. Indirect Costs:

Pending the establishment of revised provisional and/or final indirect cost rates, allowable indirect costs shall be reimbursed on the basis of the following negotiated provisional rates and the appropriate basis:

Description	Rate	Base
Overhead	26%	Direct Costs

Should the final rates result in upward adjustments, applications to increase allowable rates must be made within the total obligated amount and within the period of the Sub-grant. This should be done through the budget revision process in accordance with 22 CFR 226.

Please provide a copy of the NICRA

H. Reporting

The Sub-Grantee shall submit all reports in English.

1. Financial Reporting
Quarterly financial reports should be sent to **Nadia Babar, SC Manager Billing and Donor Reporting at nbabar@savechildren.org** and copy to **Carmen Weder, SC DHN Associate Director at cweder@savechildren.org** within 15ays after each reporting period. (See schedule below.) The report shall follow the format provided by SC (Attachment 6). These reports will be checked and approved by SC Finance Officer before payment. This may require a review of actual payments and supporting documents.

The Sub-grantee shall submit a Final Financial Report no later than 30 days following the end of the Sub-Grant period.

Financial Reports	Period Covered	Due Date
Quarterly Financial Report	10/1/2009 - 12/31/2009	1/31/2010
Quarterly Financial Report	1/1/2010 - 3/31/2010	4/30/2010
Quarterly Financial Report	4/1/2010 - 6/30/2010	7/31/2010
Quarterly Financial Report	7/1/2010 - 9/30/2010	10/31/2010
Quarterly Financial Report	10/1/2010 - 12/31/2010	1/31/2011

Quarterly Financial Report	1/1/2011 - 3/31/2011	4/30/2011
Quarterly Financial Report	4/1/2011 - 6/30/2011	7/31/2011
Quarterly Financial Report	7/1/2011 - 9/30/2011	10/31/2011

2. **Periodic** Monitoring and Reporting Project Performance
The Sub-Grantee will provide quarterly performance reports to SC within 15 days following the end of the reporting period. These reports will include: a comparison of actual accomplishments with the goals and objectives established for the period; reasons why established goals were not met (if appropriate); a discussion of any problems operative during the period together with the Sub-Grantee's plans to address those problems; and any other programmatic or financial matter that substantially deviates from the approved budget, the approved proposal, or the approved implementation plan. SC will provide a specific format for the quarterly narrative report to the Sub-Grantee.

An annual Study Finding Report after each survey will be submitted to SC Attn: Karen Waltensperger at kazowa@gmail.com and to Dr. David Marsh at dmarsh@savechildren.org. Therefore, the first progress report due is on the April 30 2010. (See schedule below.) The report shall follow the format provided by SC.

Technical Reports	Due Date
Study Findings Report	April 30, 2010
Study Findings Report	June 30, 2011

3. Final Performance Report
Within 45 days following the end of the Sub-Grant period, the Sub-Grantee shall submit a final report which includes: an executive summary of the results/outcomes and accomplishments; an overall description of the Sub-Grantee's's activities and accomplishments; an assessment of the performance in accomplishing the project's objectives; significance of these activities; conclusions about the need for future assistance; and comments and recommendations. A specific format for the final performance report will be provided to the Sub-Grantee by SC.

4. Reporting of Foreign Taxes
(a) The Sub-grantee will annually submit one report to Save the Children by April 05 each year.
(b) Contents of Report. The reports must contain:
(1) Contractor/recipient name.
(2) Contact name with phone, fax and email.
(3) Agreement number(s).
(4) Amount of foreign taxes assessed by a foreign government [each foreign government must be listed separately] on commodity purchase transactions valued at $500 or more financed with U.S. foreign assistance funds under this agreement during the prior U.S. fiscal year.
(5) Only foreign taxes assessed by the foreign government in the country receiving U.S. assistance is to be reported. Foreign taxes by a third party foreign government are not to be reported. For example, if an assistance program for Lesotho involves the purchase of commodities in South Africa using foreign assistance funds, any taxes imposed by South Africa would not be reported in the report for Lesotho (or South Africa).

(6) Any reimbursements received by the Save the children and or its sub-grantees on the taxes reported in (4) through October 31 for the interim report and March 31 for the final report.
(7) The final report is an updated cumulative report of the interim report.
(8) Reports are required even if the contractor/recipient did not pay any taxes during the report period.
(9) Cumulative reports may be provided if the contractor/recipient is implementing more than one program in a foreign country.

(c) Definitions. For purposes of this clause:
(1) "Agreement" includes USAID direct and country contracts, grants, cooperative agreements and interagency agreements.
(2) "Commodity" means any material, article, supply, goods, or equipment.
(3) "Foreign government" includes any foreign governmental entity (4)
(4) "Foreign taxes" means value-added taxes and custom duties assessed by a foreign government on a commodity, It does not include foreign sales taxes.

(d) Where. Submit the reports as per format in attachment 7 to:

Nadia Babar, SC Manager Billing and Donor Reporting at nbabar@savechildren.org.
Address:
Save the Children
54 Wilton Road
Westport, CT 06880

(e) Sub-agreements. The Sub-grantee must include this reporting requirement in all applicable sub-contracts, sub-grants and other sub-agreements.

5. Special Reports:

I. **Sub-grantee capacity and action plan:** Below is the sub-grantee improvement and agreed points of action plan. The Sub-grantee will report on progress quarterly as part of it narrative reports

Item	Observation	Agreed recommendation and action	Proposed completion date
1			
2			
3			
4			

J. SC Involvement:
(1) The Sub-grantee will implement this project per attachment 3 Approved Implementation Plan. Any modification to this plan needs prior written approval from SC.

8

(2) Designation of Key Personnel. The following positions have been designated as key to the successful completion of the objective of this award. SC must approve any replacement of key personnel designated below:

Boston University Principal Investigator
Dr. Kojo Yeboah-Antwi

Dr. Kojo Yeboah-Antwi will serve as Principal Investigator for this Subagreement. He is not authorized to alter or amend this Subagreement, except that his written concurrence shall be required to alter or amend the Scope of Work. Any proposed changes in Subagreement personnel must be submitted in writing to Save the Children for approval.

(3) In addition to reviewing and approving the periodic program reports described above, SC and USAID, and any field designees will periodically monitor activities as necessary, for the effective management of this Sub-Grant. Monitoring activities may include on-site visits to program activities, periodic implementation meetings and other measures necessary to monitor activities under this Sub-Grant. Furthermore, Sub-Grantee programs will be periodically evaluated at selected sites with a minimum of two weeks prior notification to Sub-Grantee whenever possible.

(4) SC personnel may participate in activities (e.g., workshops, consultations, etc.) as appropriate.

[(5) Others: Specific to the Sub-grant agreement:

K. Special Provisions:

1.DEBARMENT, SUSPENSION, INELIGIBILITY, AND VOLUNTARY EXCLUSION
The Sub-Grantee certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2.EFFORT REPORTING:
In order to comply with the U.S. Government policy on reconciling effort reporting for all federal grants (Attachment 4, OMB Circular A-122), it is necessary that the Sub-Grantee maintain and reconcile records to verify that payroll dollars charged to this award are based on actual and approved time sheets or other documentation sufficient to substantiate the time worked on this project.

3. PUBLICATIONS AND COPYRIGHT:
Ownership of all materials developed by Sub-Grantee pursuant to this Agreement shall reside with the Sub-Grantee. Sub–Grantee has the right to publish and otherwise publicly disclose information derived from work conducted under this Agreement. Subcontractor shall provide drafts of any such publications to the Technical Point Person in SC prior to submission for publication. Sub-Grantee agrees to grant to SC a royalty-free, worldwide, nonexclusive, irrevocable license to use, reproduce, disseminate and dispose of said material for non-commercial, academic or research purposes only.
Furthermore, neither Party shall use the name, emblem or official seal of the other in any form of advertising or promotion without the prior written approval from an authorized representative of the Party whose name is requested to be used. The Parties may, however, reference Sponsor's

support for, and the nature of, the Scope of Work being pursued under this Agreement. In any such statement, the relationship of the Parties shall be accurately and appropriately described.

4. SUB-GRANTS/SUB-CONTRACTS
The Sub-Grantee shall not enter into any sub-grants or sub-contracts without the prior written authorization and approval of SC.

5. TERMINATION OF THE PROJECTS
In addition to termination provisions provided under the Standard Provisions, this sub-grant may be terminated in the event no additional funding is secured from USAID.

In addition:
a) If Sub-Grantee breaches any of the conditions of this sub-grant, SC may terminate this agreement by providing written notice to the Sub-Grantee. Upon receipt of such notice, Sub-Grantee shall stop work immediately. Sub-Grantee will be given thirty (30) days to remedy the breach. In the event the breach cannot be remedied, SC shall be responsible for reimbursing Sub-Grantee for any non-cancellable costs and for work performed up to the date of termination. Any remaining monies that are unused shall be returned to SC. If Sub-Grantee is able to cure the breach, Sub-Grantee will be allowed to continue work under this Agreement.

b) Sub-Grantee may terminate this agreement, with reasonable notice (at least 60 days), and seek legal recourse for the payment of all allowable (as determined by USAID regulation) project expenses and/or those expenses which were previously approved by SC in writing, to the extent that SC fails to reimburse Sub-Grantee in accordance with the specified USAID requirements and the terms of this Agreement.

6. MARKING RULE:
As a condition of receipt of this sub-grant, marking with the USAID Identity of a size and prominence equivalent to or greater than the recipient's, sub-recipient's, other donor's or third party's is required. In the event the recipient chooses not to require marking with its own identity or logo by the sub-recipient, USAID may, at its discretion, require marking by the sub-recipient with the USAID Identity.

7. ORDER OF PRECEDENCE

In case of a conflict between the Sub-Grant proposal and this Sub-Grant agreement, the following shall be the order of precedence:
(a) The Cover Letter and Schedule
(b) Applicable USAID Regulations (22 CFR 226, A-122, A-133)
(c) Standard provisions
(d) Program description/ Approved Implementation Plan

In the Standard Provisions, the following terms apply: "Save the Children Federation, Inc." is substituted for "USAID", "Sub-Grantee" is substituted for "Grantee", "Sub-Grant" is substituted for "Grant", and the "SC Field Office Director" is substituted for "AID Grant Officer."

L. Title, Use and Disposition of Property
Title to property purchased by the Sub-Grantee under this Sub-Grant shall be vested with the Sub-Grantee. All use and disposition of the property shall be in accordance with 22CFR **226.31-226.37.**

M. Audit, Accounting and Records

[X] **Audit requirement for US Based organizations**: If the sub-grantee is spending more that $500,000 per year of total US federal funding, then the sub-grantee is required to have its financial statements audited in accordance with OMB A-133 audit requirements. SC finance staff is expected to review audit findings, ask for corrective action if needed and follow up with the sub-grantee. Copies of annual audited reports should be filed in the sub-grantee file, at the Save the Children field office.

[X] **This sub-grant valued at $100,000 or more and will be subject to an end of project grant specific audit. The audit must be conducted by an external audit firm approved by Save the Children.**

[ ] **This Sub-grant valued under $ 100,000 and will not be subject to audit**

N. TRAVEL
In addition to the conditions of the Required as Optional Standard Provisions entitled "Air Travel and Transportation," the Sub-Grantee shall obtain prior written approval from SC for any international travel funded by this Sub-Grant.

O. Cost Share (Match):
The Sub-grantee agrees to expand an amount not less than $ 0 OR 0 % of total actual activity costs.
If at the end of any year (or funding period) hereunder, the recipient has expended an amount of non-Federal funds less than the agreed upon amount or percentage of total expenditures, the difference may be applied to reduce the amount of USAID incremental funding the following year (or funding period), or, if the award has expired or has been terminated, the difference shall be refunded to USAID.

The source, origin and nationality requirements and the restricted goods provision established in the Standard Provision entitled "USAID Eligibility Rules for Goods and Services" do not apply to cost sharing (matching) expenditures.

P. Program Income:
The Sub-grantee Shall account for program Income in accordance with 22CFR 226.24

Program Income earned under this award shall be applied and used as follows:

Q. Voluntary Population Planning:
Please insert Section # 6 of the required as Applicable Standard Provisions if the Sub-grant involves any aspect of family planning

R: Communication Products:

Please insert Section # 14 of the Mandatory Standard Provisions if the Sub-grant involves production of any printed material, photographic services or video production services.

S: Arbitration:
If a dispute arises out of or relates to this contract, or the breach thereof, and if the dispute cannot be settled through negotiation, the parties agree first to try in good faith to settle the dispute by mediation administered by the American Arbitration Association under its Commercial Mediation Rules before resorting to arbitration, litigation, or some other dispute resolution procedure. If the matter is not resolved within 60 days after initiation of mediation, either party may demand arbitration administered by the American Arbitration Association under its Commercial Arbitration Rules. The demand for arbitration shall state with specificity the claims or issues to be arbitrated. The parties shall select a mutually acceptable arbitrator within ten (10) days of receiving the list from the American Arbitration Association Administrator in the State of New York, and in the event the parties are unable to do so, the parties or their attorneys may request the American Arbitration Association to appoint the neutral arbitrator. The place of arbitration shall be New York, New York, in the United States

T. Limitations on Liability
1. SC/AID shall not be liable for:
(a) Any third party claims, losses and expenses that may arise from Sub-grantee's negligent, recklessness or intentional act or omission that is related to or in connection with this Agreement.
(b) compensation for the death, disability, or other hazards which may be suffered by the employees, vendors, agents or other representatives of Sub-Grantee arising from Sub-grantee's performance in connection with this Agreement; and/or
(c) Any expenditure incurred by Sub-Grantee in excess of its contribution as specified in this Agreement.

2. SC has no obligation to provide other or additional support to the Sub-Grantee for implementation of the current program or for any other purposes.

U. Representations, Warranties, Indemnification and General Conditions:
1. REPRESENTATIONS, WARRANTIES AND INDEMNITIES:
(a) Sub-Grantee represents and warrants that: (i) it is authorized and has the right and ability to undertake the obligations as set forth in this Agreement, and (ii) it is properly registered in all jurisdictions as may be required to perform its obligations under this Agreement.
(b) Sub-Grantee agrees to indemnify and hold SC, its trustees, officers, employees, agents and representatives (including volunteers) harmless from all claims, losses and expenses (including attorneys fees) claimed against or incurred by SC that arise from Sub-Grantee's negligent, recklessness or intentional act or omission that is related to or in connection with this Agreement. Further, no provision of this Agreement shall in any way inure to the benefit of any third-party so as to constitute such party as a third-party beneficiary of the Agreement or any one or more of the terms here of, or otherwise give rise to any cause of action in any person or entity not a party to the Agreement. This provision shall survive the termination of this Agreement.

2. AMENDMENTS: Any alterations, amendments, modifications or waivers of terms under this Sub-Grant Agreement must be approved in advance by SC and memorialized in a written amendment signed by both SC and the Sub-Grantee.

3. EFFECTIVE DATE: The conditions of the present agreement are accepted and come into

force as of the effective date as defined in Paragraph B.1.

4. **CHILD SAFETY POLICY**: The sub-grantee confirms that it has read and will comply with SC's child safety policy.

5. **DUE DILIGENCE COMPLIANCE**: The Sub-grantee is reminded that US. Executive orders and U.S. law prohibits transactions with and the provision of resources and support to individuals and organizations associated with terrorism. It is the legal responsibility of the sub-grantee to ensure compliance with these Executive orders and laws.

6. **ANTI-PROSTITUTION AND SEX TRAFFICKING**: The Sub-grantee is opposed to the practices of prostitution and sex trafficking because of the psychological and physical risks posed.

ATTACHMENT 2: BUDGET BREAKDOWN
(see worksheet attached)

ATTACHMENT 3: SCOPE OF WORK

The Boston University Center for Global Health and Development (BU CGHD) team will be responsible for the provision of technical support to Save the Children, US (Save) for the collection of baseline data prior to the implementation of the Lufwanyama Integrated Neonatal Child Health Program (LINCHPIN).

BU CGHD will provide the following services under this subcontract: 1) assistance with the design and implementation of comprehensive baseline evaluations; and 2) the design and IRB approvals of operational research (OR) questions key to successful program development. If additional funds are secured for this project this subcontract will be amended to include execution and analysis of OR.

The OR questions will aim to assess the effectiveness of different strategies for supervision and retraining of Traditional Birth Attendants (TBAs) and Community Health Workers (CHWs).

The BU CGHD team is optimally positioned to carry out this scope of work because BU CGHD developed and implemented the original LUNESP and ZIMMAPS applied research, upon which LINCHPIN is based. In addition, BU CGHD has developed excellent working relationships with the MoH, the Provincial Health Director, and DHMT Directors that will facilitate the proposed innovative program.

Roles of BU team members

Dr. Yeboah-Antwi will be the PI for the subcontract and will be responsible for the overall coordination of BU's technical support to the expanded program in Lufwanyama District. His roles as a district health officer in Ghana, a community-based researcher in Ghana, and, more recently, as the PI of the ZIMMAPS study, bring critically important experience to the project team. He will be responsible for the provision of technical support and work with Save and other subcontractors to develop protocol and data collection instruments and implement the baseline evaluations; design and develop protocols and data collection instruments for the comparison of the different supervision strategies; and overall financial supervision of the BU subcontract. As PI, Dr. Yeboah-Antwi will be responsible for the ethical conduct, planning and conducting the baseline study, and planning the OR.

In coordinating these efforts with the Save team in Zambia Dr. Yeboah-Antwi will travel to Zambia once during the six month baseline evaluation phase to help with the training and initiation of the study. Thereafter, he will travel at least once per year for face-to-face meetings with the local team, and will maintain regular contact by email, Skype, and telephone. He will also coordinate a monthly study coordination meeting of the Boston group and ad hoc meetings as required. His participation is essential at 15% each year.

Dr. Davidson Hamer will assist the PI and the Save team with the provision of technical input on the development of protocol and data collection instruments and analysis of the baseline evaluations. During the last three years, he has played a central role in the design and management of both LUNESP and ZIMMAPS. Dr. Hamer will also assist Dr. Yeboah-Antwi with the process of obtaining ethical clearance for the baseline evaluations and proposed OR. His participation will be 10% for year one, and 8% thereafter. (Project year four is six months in duration.)

Dr. William MacLeod is a demographer and statistician who has extensive experience with community-based studies of childhood illness in Asia and sub-Saharan Africa. He provides study design, data management, and analysis services for studies based at the BU CGHD. He has worked closely with Drs. Hamer and Yeboah-Antwi on several previous projects in Asia and sub-Saharan Africa. Dr. MacLeod will assist Drs. Yeboah-Antwi and Hamer with the protocol development, design of the data collection forms, database, and analysis strategies. Dr. MacLeod will have primary responsibility for the analysis of the baseline evaluation and assist with the design of operational research. Dr. MacLeod's level of effort will be 10% during the life of the project.

Program Manager (PM) (TBD) will be responsible for the management of all administrative details of the BU subcontract including financial tracking of the project. The PM will also serve as liaison to the collaborating partners including Save, the Lufwanyama DHMT, and other subcontractors. His/her participation at 10% effort is essential.

Dr. Grace Chan is an intern at the Department of Pediatrics, Boston Medical Center and Children's Hospital Boston. Dr. Chan will assist Drs. Yeboah-Antwi and Hamer in the development of protocol and study instruments for the baseline evaluations andassist in the training of data collectors and initiation of the study. Dr Chan will not draw salary support from the project but the project will support her with one trip to Zambia during the training of data collectors and initiation of the baseline evaluations.

Please note that the BU subcontract does not include interim or end of project evaluation surveys, data collection, data entry, or any additional work not specifically described above.

Methods of accountability	Boston University will be expected to provide regular technical and financial reports to the prime recipient, thus contributing to the reporting requirements of USAID under this award. Save the Children will have management oversight of the subcontractor.

ATTACHMENT 4: SC FINANCIAL REPORTING

Actual Expenditures Report
Period Covered by this Report: From _____ to _____

Subgrantee Name: Boston University - Center for Global Health and Development
Subgrant #: 840 10418-a

BUDGET LINE ITEM	BUDGET (US$)	EXPENDITURES (US$)		BALANCE (US$)
		THIS PERIOD	CUMULATIVE	
Personnel Costs				
Fringe Benefits				
Travel and Perdiem				-
Other Direct				
Indirect at 26%				
Total		-	-	-

Note: All Amounts in US Dollars ($)

The undersigned hereby certifies: (A) that all payment of the sum claimed is proper and due and that appropriate refund to Save the Children US will be made promptly upon request in the event of disallowance of costs not reimbursable under the terms of the subgrant; (B) that information on the fiscal report is correct and such detailed supporting information as Save the Children US may reasonably require will be furnished promptly to Save the Children US on request;(C) that all requirements called for under the subgrant agreement to date of this certification have been met.

Signature: _____ **Signature:** _____

Name: **Name:**

Title: Finance Manager, Boston University **Title:** Principal Investigator, Boston University

Date: **Date:**

Annex 7 Job Descriptions of Key Personnel

Position: **LINCHPIN Programme Manager**
Reports to: **Deputy Country Director for Programmes**
Duty Station: **Lusaka (with frequent travel to the Copperbelt)**

Position Overview: The LINCHPIN Programme Manager (PM) is responsible for technical leadership and managerial oversight of LINCHPIN, including partner relations, budget monitoring and expenditures, documentation/ reporting, monitoring and evaluation (M&E), and operations research. The PM works independently, in consultation with Save the Children country office senior leadership, carrying out planned or assigned duties of varying difficulty and complexity. (S)he represents Save the Children with the Ministry of Health (MOH) at the national, provincial, and district levels; and with donors and international partners in Lusaka, including USAID, UNICEF, and WHO. The PM embodies Save the Children values and principles in all interactions with staff and external audiences. (S)he is a strong manager and technical leader who focuses on strengthening systems, ensuring quality, building capacity, facilitating communication, and inspiring creativity and productivity in her/his team. The PM supervises and mentors the Deputy Project or Programme Manager based in Kalulushi and makes frequent trips to Lufwanyama District to monitor implementation.

Specific Duties and Responsibilities:

1. Responsible for implementation of LINCHPIN, consistent with the Detailed Implementation Plan (DIP) and donor and Save the Children requirements;
2. Provides technical and programmatic leadership to the LINCHPIN team, including M&E;
3. Provides technical support to the MOH, PMO, and DHMT through participation in meetings, work groups, and task forces, as well as consultation and targeted field visits;
4. Represents Save the Children to national and international partners in Lusaka, especially the MOH, USAID, UNICEF, and WHO;
5. Maintains a positive working relationship with MOH units and departments critical to promoting the integrated community package for newborn interventions and community case management (CCM) of pneumonia, diarrhea, malaria, and neonatal sepsis;
6. Ensures that the LINCHPIN team maintains excellent relationships with community leaders, Neighborhood Health Committees, health workers, and community-based providers (TBAs, CHWs);
7. Ensures technical quality of all LINCHPIN interventions and activities;
8. Prepares high-quality and timely monthly/quarterly/annual documentation and reports, as required by Save the Children and donors;
9. Liaises with LINCHPIN OR partners (Boston University, Tufts University) and with Save the Children regional and home office technical advisors;
10. Supervises the Deputy Project (or Programme) Manager who is responsible for day-to-day management of LINCHPIN in Kalulushi;
11. Reviews performance objectives and evaluates performance of direct supervisees per Save the Children policies and procedures;
12. Manages all external affairs at the national, provincial, and district levels and communicates accomplishments, challenges, and status to Save the Children in Lusaka and Westport/Washington;

13. Monitors budget expenditures and compliance;
14. Oversees procurement, administration, and logistical processes for LINCHPIN; and
15. Performs other duties as requested, including programme development activities to build Save the Children's complementary health portfolio in Zambia.

Qualifications:

- Qualified health care professional with experience in newborn health and child survival;
- Nurse-midwife, clinical officer, or medical doctor with public health training preferred;
- Minimum of 5-10 years experience in health care delivery and community-based approaches;
- Demonstrated experience with INGOs/NGOs in some combination of program design, project management, monitoring and evaluation, and operations research required;
- Excellent interpersonal, management, coordination, training, and supervision skills;
- Excellent command of written and spoken English;
- Solid report writing/documentation/computer skills;
- Willing to work under pressure and work extra hours, when required.

Position: **LINCHPIN Deputy Programme Manager**
Reports to: **LINCHPIN Programme Manager**
Duty Station: **Kalulushi/Lufwanyama**

Position Overview: The LINCHPIN Deputy Project Programme Manager (DPM) is responsible for the day-to-day management of LINCHPIN in Kalulushi, supervising all operations of the project. S/he undertakes field visits to monitor project activities as well as conduct periodic project reviews with partners, identify necessary action for adjustments. S/he provides technical assistance to health facilities and community health providers, supporting the development of guidelines, tools and recommendations related to the implementation and evaluation of the programme. In collaboration with the PM, the Deputy provides technical leadership and supports related to strategies and approaches related to implementation of programmes. S/he assists to develop and maintain external network of contacts within the province and district, including with the Lufwanyama District Health management Team (LDHMT) and the Provincial Medical Office (PMO).

Specific Duties and Responsibilities:

1. Assists in the implementation of LINCHPIN, consistent with the Detailed Implementation Plan (DIP) and donor and Save the Children requirements;
2. Supports the provision of technical and programmatic leadership to the LINCHPIN team, including M&E;
3. Provides technical support to the PMO, and LDHMT through participation in meetings, work groups, and task forces, as well as consultation and targeted field visits;
4. Represents Save the Children to Provincial and District partners in Ndola, Kalulushi and Lufwanyama.
5. Maintains a positive working relationship with LDHMT units and departments critical to promoting the integrated community package for newborn interventions and community case management (CCM) of pneumonia, diarrhoea, malaria, and neonatal sepsis;
6. Ensures that the LINCHPIN team maintains excellent relationships with community leaders, Neighbourhood Health Committees, health workers, and community-based providers (TBAs, CHWs);
7. Assists to ensure technical quality of all LINCHPIN interventions and activities;
8. Assists in the preparation of high-quality and timely monthly/quarterly/annual documentation and reports, as required by Save the Children and donors;
9. Supervises the LINCHPIN staff Kalulushi;
10. Reviews performance objectives and evaluates performance of direct subordinates per Save the Children policies and procedures, in coordination with the PM;
11. Facilitates the monitors budget expenditures and compliance;
12. Facilitates the procurement, administration, and logistical processes for LINCHPIN; and
13. Performs other duties as requested, including programme development activities to build Save the Children's complementary health portfolio in Zambia.

Qualifications:

- Qualified health professional with experience in maternal child health and newborn care and training in integrated Management of Childhood Illnesses (IMCI);
- Nurse-midwife or clinical officer with public health training preferred.

- Experience in health care delivery and community-based approaches with in-depth knowledge of new born health initiatives.
- Project management skill to be able to analyse, develop and follow up on project and action plans
- Fluency in written and spoken English with good report and proposal writing skills.
- Understanding of and experience in working with Ministry of Health and other related departments.
- Strong communication, interpersonal and representational skills.
- Ability to work collaboratively as part of a team.
- Good analytical and writing skills as well as strong organizational skills and the ability to work independently;
- Strong networking and advocacy skills;
- Willing to work under pressure and work extra hours, when required.

Position: **Regional Health Advisor (Africa)**
Reports to: **Director, Child Health and Nutrition**
Duty Station: **South Africa**

Position Overview: The Regional Health Advisor (Africa) provides leadership; strategic guidance; and advocacy, policy, and programmatic and technical support for health – especially newborn health and child survival - to Save the Children country offices, programs, and partners in the Africa region. The incumbent in this position works closely with the Africa Area Office and home office technical teams regarding development, implementation, and monitoring of global strategies, as well as use of the evidence base to advance the global agenda related to child survival and newborn health and achieve impact at scale, especially in Africa. The Regional Advisor identifies needs and builds capacity in the Africa region health sector through modeling, mentoring, teamwork, technical assistance, and structured skill-building activities, as appropriate. As part of the DHN Child Health and Nutrition technical team and SNL Country Support and Coordination Unit (CSU), the Regional Advisor is responsible for providing/coordinating programmatic and technical support to countries in Africa to ensure alignment of global and national policy, research, advocacy, implementation, and dissemination. This may include leadership, support, and guidance for planning exercises; proposal development; program design; gap analysis; work planning; technical assistance planning; strategic alliance development and maintenance; documentation and knowledge management; tools development/adaptation/application; and advocacy/communication plan development and/or implementation. In addition, the Regional Health Advisor (Africa) may supervise or provide oversight for professional students, interns, and/or consultants, as appropriate.

The Regional Health Advisor serves as Technical Backstop for LINCHPIN in Zambia to ensure quality of project management and implementation, and acts as primary liaison between CSHGP and the country office, for this award.

Specific Duties and Responsibilities:

1. Determines, in collaboration with senior management, the vision, strategy, and operational plan for Africa country office technical/programmatic support and is accountable for achieving results set out in the strategic and operational plans.
2. Together with other departments/offices, develops program approaches/designs that meet the needs of vulnerable children.
3. Provides senior level technical expertise and oversight to ensure programs are of high quality and develops new state-of-the-art approaches.
4. Develops strategies to build the capacity of country offices and other senior staff to design and deliver quality programs.
5. Monitors new developments in newborn health and child survival and seeks to create a positive policy framework from taking best practices to scale.
6. Identifies best practices from field programs, ensures documentation and dissemination, promotes uptake within agency and raises profile of SC approaches within program community.
7. Actively engages in defining, testing, evaluation, and/or documentation of program innovations.

8. Leads development and submission of quality proposals in response to identified opportunities, and oversees content and program strategy across key sector work areas.

Qualifications:

- Advanced degree in public health (e.g., MPH; PhD or DrPH desirable).
- 10 years + of professional experience in health and child survival, with at least 5 years in sub-Saharan Africa.
- Expertise in tested community-based approaches to delivery and scale-up of evidence-based interventions for newborn health and child survival.
- Ability to work in Portuguese and/or French highly desirable.
- Knowledgeable about strategies that generate community and partner ownership to ensure sustainable results.
- Able to play lead role in development of effective and responsive project proposals, implementation plans, and monitoring frameworks.
- Ability and willingness to travel approx. 50% of time in Africa region and overseas.
- Demonstrates SC Core Values of accountability, commitment, excellence, innovation, and teamwork.
- Able to give effective and engaging presentations to groups and individuals/demonstrates strong verbal and written communication skills.
- Identifies partnership needs, explores partnership opportunities, formulates action plans and implements effective means for monitoring and evaluating partnerships.
- Establishes course of action for self and at times others and ensures work is completed efficiently and effectively in accordance with SC values.
- Explains and demonstrates, provides feedback and reinforcement and aligns performance for success, builds trust, delegates responsibility, coaches.
- Encourages others to seek opportunities for different and innovative approaches, facilitates implementation and acceptance of change.
- Actively identifies areas for learning, creates and takes advantage of learning opportunities, uses newly gained skills and knowledge on the job.

Annex 8 Training Plan

Intermediate Result	Content Area	Training No.**	Days per Training	Training topic and number of participants	2009-2010 Year 1				2010-2011 Year 2				2011-2012 Year 3			
					1	2	3	4	1	2	3	4	1	2	3	4
Quality	TBA/ ENC	10	2	20 nurses refreshed in TBA supervision			X									
Access/ availability		7	4	120 TBAs refreshed in ENC, PNC, CCM for neonatal sepsis, facilitated referral			X	X								
Demand	CM/ BCC	11	4	1 Comm Mob Officer + 4 Comm Mobs trained as trainers in CM/BCC					X							
Demand		6	2	135 NHCs trained in CM/BCC					X	X	X					
Quality	CHW/ CCM	9	2	22 clinical/EHO trainers trained in CHW supervision						X						
Access/availability		2	4	8 Master Trainers trained in CCM					X							
Access/availability		3	6	85 CHWs trained in CCM, ENC						X	X					
All	Teaming	8	6	150 TBAs/CHWs trained in teaming								X	X			

***SC reference*

Annex 9 Operations Research/Evaluative Plan

Teaming OR Protocol – Draft 6
29 April 2010

FEASIBILITY AND EFFECTIVENESS OF AN INTEGRATED COMMUNITY HEALTH WORKER – TRAINED TRADITIONAL BIRTH ATTENDANT TEAM ON THE DELIVERY AND USE OF TREATMENTS FOR INFECTIONS AMONG CHILDREN 0-59 MONTHS OF AGE IN LUFWANYAMA DISTRICT, COPPERBELT PROVINCE, ZAMBIA

An Operations Research Protocol within the
Lufwanyama Integrated Newborn and Child Health Project in Zambia (LINCHPIN), supported by USAID/CSHGP, ELMA Philanthropies, and Towers and Perrin

Kojo Yeboah-Antwi, David Marsh, David Hamer, Nicholas Guerina,
Karen Z. Waltensperger, William MacLeod, Shepherd Khondowe,
Ngosa Sondashi, Bias Sichamba

Draft 6: April 29, 2010

I. Background and Problem Statement

Problem Statement An estimated 9 million children under five years of age died worldwide in 2007 with half of these deaths occurring in sub-Saharan Africa (WHO 2009, UNICEF 2009). Zambia contributes approximately 1% of global child mortality, with some 85,000 deaths among children younger than age 5 years annually (UNICEF 2008). For the five-year period 2002-2006, the infant mortality rate (IMR) was reported as 70 per 1,000 live births and the under-five mortality rate (U5MR) as 119 per 1,000 live births (CSO 2009). This represents a significant downward trend when compared to the IMR of 95/1000 and U5MR of 158/1000 in the preceding five year period (1997-2001). However, the neonatal mortality rate (NMR) of 34/1000 and post-neonatal mortality rate (PNMR) of 36/1000 indicate that 29% of under-five deaths take place during the first month of life, and 59% take place before the child's first birthday. Despite some improvement, Zambia is not on track to achieve Millennium Development Goal 4, a two thirds reduction in child mortality by 2015 compared to its 1990 level. Zambia's strained health care system with few health facilities and insufficient human resources is inadequate to confront the unacceptably high newborn and under five mortality.

The Center for Global Health and Development (CGHD) of Boston University working with local partners, including the District Health Management Teams (DHMTs), has just completed two cluster randomized community based research projects in Zambia. In the first study, the Lufwanyama Neonatal Survival Project (LUNESP), the existing network of traditional birth attendants (TBAs) received additional training and supplies to enable them to deliver interventions[*] that targeted three of the most important, preventable causes of neonatal mortality: birth asphyxia, hypothermia, and neonatal sepsis. The TBAs carried out resuscitation, thermal protection, and identification of newborns with signs of possible sepsis followed by the provision of a first dose of treatment (oral amoxicillin) and referral to the nearest health facility. The LUNESP approach was associated with a significant reduction of newborn mortality of 45% (Gill 2010).

The second study, The Zambia Integrated Management of Malaria and Pneumonia Study (ZIMMAPS) pioneered community case management (CCM) in Zambia. Community health workers (CHWs) were trained to perform rapid diagnostic tests (RDTs) and prescribe artemisinin-based combination therapy (ACT) based on RDT results and prescribe amoxicillin for non-severe pneumonia instead of the current practice of referral. ZIMMAPS confirmed the capacity of CHWs to correctly use RDTs, ACT and amoxicillin to manage both malaria and pneumonia at the community level. There was a significant reduction in the over-use of ACTs for malaria and an increase in the proportion of children with pneumonia who received early and appropriate treatment (Yeboah-Antwi 2008).

Teaming Several studies conducted in South Asia have demonstrated the effectiveness of using community-based health workers to reduce neonatal and child mortality (Bang 1999, Bang 1990, Bang 2005, Jokhio 2005, Baqui 2008, Kumar 2008, Bhutta 2008).

[*] The word "intervention" has two technical uses in this concept paper: (1) evidence-based medicines (e.g., amoxicillin for fast breathing [i.e., likely pneumonia]), vaccines (e.g., Pentavalent), commodities (e.g., ORS sachet), or behaviors (e.g., immediate breastfeeding) known to reduce child death and (2) the programmatic component to be evaluated (e.g., training in teaming).

Where CHWs and TBAs have worked together, they performed only one type of service, either child care or neonatal services, but not both. In the Bang and colleagues project in Gadchiroli in Maharashtra, India, TBAs conducted deliveries and liaised with village health workers (VHWs) who were trained to diagnose and manage birth asphyxia, low birth weight and neonatal sepsis (Bang 2005). Bang and his group had earlier used VHWs and TBAs to manage childhood pneumonia in the same area (Bang 1990). In a Save the Children/Saving Newborn Lives supported trial in Hala District of Pakistan, Bhutta and colleagues evaluated the effectiveness of a TBA-Lady Health Worker (LHW) team to deliver newborn care. The conclusion was that the TBA-LHW team can be effective in implementing a community and outreach package that leads to improved home care practices by families, increased care-seeking behavior and greater utilization of skilled care providers (Bhutta 2008). These studies did not evaluate the effect of teaming on the outcomes nor the determinants of teaming.

A PubMed search of "teaming" yielded 151 articles, two of which were somewhat relevant. The Mozambican Ministry of Health and Médecins Sans Frontières formed Community Health Teams in Angónia District comprised of community health agents, community health volunteers and TBAs to improve coverage of basic health services including tuberculosis and HIV care (Simon 2009). Team members received joint five-day initial training, plus on-going training at bi-monthly health facility meetings, plus the necessary drugs, supplies and job aides. Although the report lacked measures of teaming or evidence of effect at the beneficiary level, the authors asserted that the teams had advantages over "vertical CHW" approach including: mutual accountability, joint problem-solving, improved geographical access to preventive and curative health services, and consistent health education messages. They concluded that the team approach improved accountability, acceptability, and access to care.

A Georgetown University Medical Center project in an urban, low income community in the District of Columbia, USA deployed teams of medical and nursing students to provide health promotion and prevention for community health problems. In addition to meeting the health needs of the community, the teaming resulted in the better understanding of the team members' future roles and responsibilities as physicians and nurses. The team members also developed skills in accountability and responsibility for shared work, setting goals and working together toward achieving the goals (Sternas 1999).

The concept of teaming including training in teaming (US DHHS, accessed 2010) and measuring teaming (TEAM Measure, accessed 2010) (MedTeams, accessed 2010) have been practiced in widely in developed countries. Assessing the impart of teaming in health care setting has been done in settings such as operating rooms (Sexton 2000), emergency departments (Morey 2002) and patient safety (Flin 2009) Reports of evaluations of teaming training were mixed and illustrated by the following excerpt from a teamwork training brief (US DHHS, accessed 2010):

> "While teamwork training is conceptually attractive, the evidence supporting the benefits of such programs in health care is inconsistent. A systematic review of teamwork training in health care and other industries highlighted the need to comprehensively evaluate teamwork interventions in order to accurately assess their effectiveness. Although studies have consistently demonstrated improvements in participants' knowledge of teamwork principles, attitudes toward the importance of teamwork, and overall safety climate, these

have not necessarily translated into durable behavioral changes or improved skills. The only randomized trial of teamwork training in health care, performed in obstetrics wards, did not demonstrate any reduction in errors or improvement in clinical outcomes. However, a subsequent single-institution study [Pratt 2007] using a similar intervention resulted in a decrease in the frequency and severity of errors. The effectiveness of teamwork training may depend on baseline perceptions of safety culture as well as the intensity and duration of the intervention".

In cases, where teaming has been measured, domains have been used. The number of domains used has been variable ranging from four to nine (Gibson 1980); Baker 2008; TEAM Measure, accessed 2010; Flin 2009). A total of 10 domains have been identified as illustrated in the table below (Table X).

Table X: Illustrative Domains of Teaming from Three Sources

Domain	Flin (2009)	TEAM Measure (2010)	Gibson (1980)	Baker (2008)
Goal comprehension	X		"objectives/goals"	"goal and means clarity
Communication	X	X	X	X
Conflict management	X			
Decision-making	X			
Performance evaluation	X			
Division of labor	X	"structure"	X	"role clarity"
Leadership	X	X	X	
Process monitoring	X	X	"work orientation/ work methods"	"goal and means clarity
Feedback	X			
Mutual Support		X	"group commitment" "group climate / environment"	"cohesiveness"

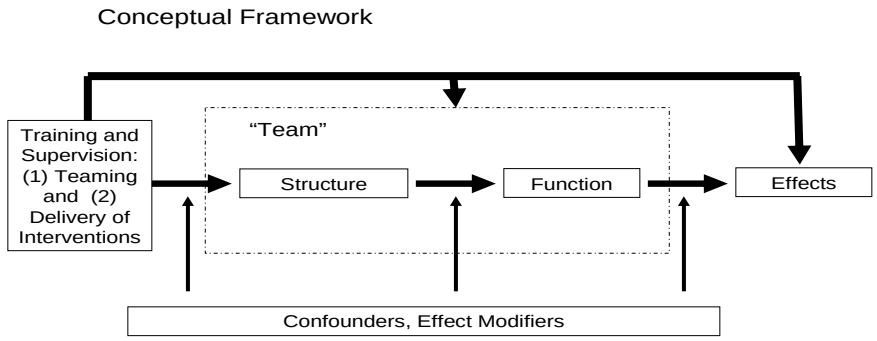
Some of the domains address the structure of a team while others addressed its function. We would conduct a formative research to help us identify which of these domains are relevant and feasible to measure in our context (a two-person team in a rural setting).

Proposed intervention The proposed intervention will be training and supervision for the delivery of an integrated, community-based newborn care and CCM package by a TBA-CHW team linked to health facilities and Neighborhood Health Committees (NHCs) and consistent with Ministry of Health (MOH), Zambia plans and policies. This integrated intervention is intended to provide a continuum of care from the neonatal period through to five years in underserved rural communities. We operationally define "team" as *a cohesive, communicating TBA-CHW dyad with shared goals, complementary roles, and mutually supportive activities.*

TBAs and CHWs are among the only feasible, national community-based agents for many rural populations in Zambia. TBAs provide care to pregnant women and limited care to newborns. The CHWs provide care to the child six months and above. The infant 1-5 months of age is therefore

left without any care. Currently TBAs and CHWs may reside in the same community, but work independently of each other leading to inefficiency and missed opportunities for teaming and continuity of care.

Gaps in evidence The evidence gaps are many: how to (1) define, (2) measure, (3) achieve, and evaluate (4) the level of teaming achieved and how to (5) evaluate the association between teaming and the use of high impact interventions in a rural sub-Saharan African setting. The conceptual framework attempts to organize these concepts.



Justification The rationale for the integration and the teaming is that it will increase the likelihood that the effect of the team will exceed the effects of the individuals working alone in the following ways: (1) joint selection by communities for complementarity; (2) joint coordination by and accountability to the community; (3) joint training for overlapping content areas; (4) joint supervision approaches by the local health personnel and DHMT; (5) intra-team referral; (6) team approach to urge referral, especially for a reluctant family with a newborn or child with danger signs (7) coordinated "hand-over" of newborn from TBA to CHW at joint visit probably at about four to six weeks of age; (8) multi-channel delivery of identical messages for key household and family practices; (9) intra-team encouragement to boost confidence, (10) intra-team consultation to boost quality; (11) common monitoring approach, stressing use (or "coverage) of interventions and quality (performance according to protocol); (12) age-gender balance: older female (TBA) and younger male (CHW) with complementary social networks to facilitate dissemination of messages and identification and referral of ill children or pregnant women; and (12) cross-covering for follow-up visits or temporary absence from the community; among others.

Study location The study will be conducted in Lufwanyama District in the Copperbelt Province of Zambia. Lufwanyama is a recently created, large, rural, undeveloped district with an estimated 2009 population of 85,033 extrapolated from the 2000 census (CSO 2003). At one time, it was part of an administrative zone called Ndola Rural. Despite its location in the mostly urban and industrialized Copperbelt, rural Lufwanyama District is plagued by deplorable physical infrastructure, poorly maintained roads that are frequently impassible during the rainy

season, and a near complete absence of electricity except that produced locally by diesel generators, and no piped water or sewage. Lufwanyama's district health office is currently located outside the district in the town of Kalulushi, 14 kilometers west of the mining center town of Kitwe. Lufwanyama has 13 formal health care centers (11 health centers and two health posts) staffed exclusively by nurses, nurse midwives, and/or clinical officers – but not a single physician. Six other health posts have recently been constructed but are not yet operational because they lack personnel. As a consequence of all of these factors, a high proportion of basic health services are provided through several categories of minimally trained community workers – trained TBAs, trained CHWs, male motivators, safe motherhood agents, family planning agents, disease surveillance agents, malaria agents, tuberculosis agents, HIV/AIDS agents, family planning agents, as well as untrained TBAs and untrained CHWs.

Type of Study The study will employ a pre- and post-intervention (= training and supervision in teaming and delivery of interventions), single arm design to compare the levels of teaming achieved and of delivery of high impact newborn and child care interventions.

II. Formative Research

Objectives.
1. To explore and identify context and area specific domains and sub-domains for measuring teaming.

Overview
This will be done through group discussions with:

- members of NHCs (n=3 committees)
- current potential TBA-CHW teams (n=3 pairs)
- current non-teamed TBAs and CHWs (n=3 pairs)

Methods
We will use a similar approach in the three groups. We will start with the NHCs because they are already officially recognized committees (or teams) and are likely to have more insight into the characteristics of a team.

- We will have prepared (10-15) cards in the local language, each with one teaming domain from the literature, from experience, or from common sense.
- We will facilitate a discussion about each domain and request the informants to place the card in one of three "importance piles": high, low, unsure.
- After sorting all the cards, we will quickly review each pile, especially the "unsure" pile to determine if re-categorization is desired.
- We will ask if there are important domains that we have missed.

- We will also have prepared several cards in the local language of possible sub-domains within each teaming domain
- We will facilitate a discussion of the prepared sub-domains for each "high importance" domain, and request the informants to place the card in one of three piles: high, low, unsure.

- As before, after sorting all the cards, we will quickly review each pile, especially the "unsure" pile to determine if re-categorization is desired.
- We will ask if there are important sub-domains that we have missed
- We will continue pile-sorting until all sub-domains for all "high importance" domains are categorized.
- We will conduct pile-sorting exercises with three different NHCs

- We will conduct similar exercises with three teamed and with three unteamed TBA-CHWs.
- At the conclusion of each of these six pile-sorting exercises, we will share the results of the NHC exercises to stimulate discussion and perhaps reach consensus – however differences may be informative.

Analysis Plan We will analyze using the tabular approach shown below illustrating two weightings: (A gives 5 points for high, 3 for unsure, and 1 for low; B gives 5 points for high, 2 for unsure and 0 for low). We will prioritize the several highest scoring domains (and sub-domains), retaining mid-scoring ones pending vetting by TBA-CHWs. The final set will aim for three to four domains, each with three to four sub-domains.

Table X: Illustrative Prioritization of Teaming Domains by Pile-Sorting (see text)

Domain	NHC			Illustrative Scoring Method	
	1	2	3	A	B
A	high	low	low	7	5
B	high	high	high	15	15
C	unsure	unsure	high	11	9
D	low	low	low	3	0
E	high	low	high	11	10
F	low	unsure	low	5	2
etc.					

How Results will be Used The prioritized sub-domains will inform questions on a data collection tool to measure teaming in rural Lufwanyama.

III. Evaluative Research

Objectives

1. To assess the level of TBA-CHW teaming achieved
2. To assess the effectiveness of a TBA-CHW team to deliver high impact child survival interventions.

Research Questions

Objective 1: Level of teaming

- Can a CHW and TBA work as a team?
- What are the determinants of teaming?

Objective 2: Effect of teaming

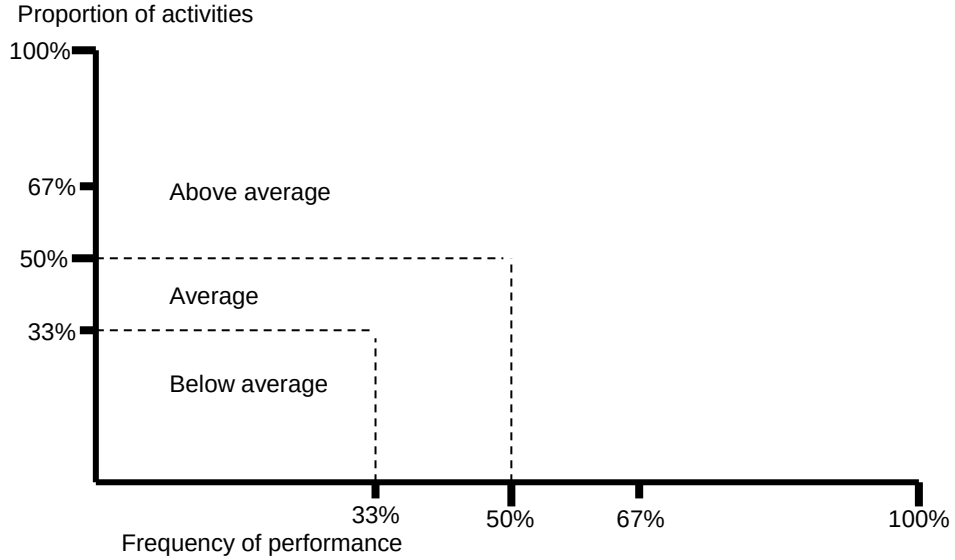
- What is the effect of TBA and CHW teams that deliver high impact interventions on the use of these interventions?

Hypothesis and Study Outcomes A TBA-CHW team delivering high impact child survival interventions will lead to increased use of these interventions.

Outcome 1a: Level of teaming

- The *structure* of teaming will include measures of teaming identified during formative research and literature review. Likely domains include: cohesiveness, communication, shared goals, knowledge of job descriptions and tasks. We will likely use sociometric questionnaires to measure social networking, among other methods.
- The *function* of teaming will be a composite measure of a range of activity variables yielding categories of above average, average, and below average (Figure).
    - Above average team: performing more than half of the teaming actions more than half of the time.
    - Average team will be defined as performing at least half of the teaming actions at least a third of the time or performing at least third of the actions at least half of the time.
    - Below average team will be defined as performing less than a third of the teaming actions less than third of the time.

Illustrative categorization of teaming function



Outcome 1b: Determinants of teaming

- We will assess factors that might explain why teams achieve varying levels of structure and/or function.

Outcome 2: Effect of Teaming – Delivery and use of key interventions

- Antibiotic use for pneumonia
- ACT use for malaria
- Zinc and ORS use for diarrhea
- Referrals for neonatal sepsis and other serious conditions

Study Interventions There will be one study arm-the intervention. The main intervention will be:

1. Provision of clinical skills to TBAs and CHWs to perform immediate newborn care and manage birth asphyxia, neonatal conditions, malaria, pneumonia and diarrhea
    a. TBAs will be trained to: perform routine antenatal care; recognize danger signs in pregnancy, labor and the postnatal period; refer pregnant women to the health facility and perform clean delivery when delivery in the health facility is not possible. They will also be trained in Neonatal Resuscitation Program - sequential steps in the management of newborn infants, including thermal control, provision of patent airway, stimulation, and assisted breathing when needed; and cord care.
    b. CHWs will be trained in case management of diarrhea, malaria, and pneumonia including performing and interpreting rapid diagnostic tests (RDTs); treatment with ORS and zinc, amoxicillin and ACT; and recognition of severe illness and referral after giving first dose of treatment.
2. Provision of teaming skills to TBAs and CHWs: The TBA-CHW team will receive joint training in:
    a. **Structural** teaming, including the domains identified through formative research, and likely to include cohesiveness, communication, understanding of goal and role and the like.
    b. **Functional** teaming, including intra-team referral; joint assessments and continuity from pregnancy to childhood; postnatal assessment and routine care; behavior change communication; recognition of signs and symptoms of pneumonia, sepsis and serious illness of infants < 2 months; their referral and administration of the first dose of treatment.
3. Provision of supplies, drugs and job aides
    a. The TBA-CHW team will be equipped with suction bulbs, reusable resuscitation masks, drying towels to perform NRP. Drugs include: AL, amoxicillin, ORS and zinc; other supplies like respiratory counters with be supplied through the DHMT. The relevant algorithms and job aides and registers will also be provided.
4. Focused supervision and support
    a. Focused supervision and support will be provided through the existing primary health system.

Study Population For all study outcomes, (level and determinants of teaming, use of interventions, and sustainability of teaming) the study population will TBA-CHW teams.

Evaluation methods:

Outcome 1: Teaming

Data Collection:

1. We will assess levels of teaming *structure* by methods appropriate for the domains and sub-domains selected through formative research.

   Data will be collected half yearly from all TBAs and CHWs by specialized trained data collectors.

2. We will assess levels of teaming *function* through data collection tools that periodically quantify the following, among other, activities:
   - Joint meeting with neighborhood health committee
   - Jointly conducting BCC
   - Joint problem solving
   - Joint support to outreach services
   - Joint referral
   - Intra-team referral
   - Handover of newborn at 6 weeks during joint PNC visits.

   Data will be collected half yearly from all TBAs and CHWs by specialized trained data collectors.

3. Potential confounders or effect modifiers: At baseline and/or during training, we will interview CHWs and TBAs regarding factors that could influence teaming or its effects. These will include:
   - Demographics
     - Age, sex
     - Education, training, experience
     - Socio-economic status
     - Language, tribe, political-religious-family affiliation
   - Community
     - Settlement pattern
     - Distance between CHW-TBA-families
   - Service
     - Technical or perceived quality of care (by self and community)
     - Payment or in-kind compensation
     - Motivation
   - Personal
     - Links to community structures, especially NHC
     - Temperament
     - Free time
     - Employment (farming, wage labor, own business, or other income-generating activity)

Analysis plan: We will determine the proportion in each category (above average, average, below average). We will use logistic regression analysis to identify the determinants of teaming.

Outcome 2: Effect of teaming – use of interventions

Data collection: We will use treatment-specific service statistics from CHW and TBA registers to measure use of interventions. We will standardize these per 1000 children based on the population of their catchment areas, which may be estimated by the number of households served. We will collect this information every one to three months.

Sample size and sampling: We will study all CHWs and TBAs, whether teamed or not.

Analysis plan: We will calculate population-specific use of CCM interventions (either *treatments per 1000* as described above *or treatment ratios* based on expected episodes per catchment area per time interval) and measure associations between use and levels of structural and or functional teaming. In a separate analysis, we will compare use between teamed TBAs and CHWs and their unteamed counterparts. We will use multivariable approaches (XXX) to control for likely confounding and/or to identify important effect modifiers.

IV. QUALITATIVE PROCESS DOCUMENTATION

Methodology We will carry out a series of focus group discussions (FGDs) and in-depth interviews (IDIs) to explore the community opinions about the TBA-CHW teaming, their acceptability and the characteristics of a good or not so good a team.

Sampling FGDs will be carried out with mothers of children (0 -23 months); and TBA and CHW teams. The IDIs will be performed with traditional/community leaders, local NHC members, and health managers at the district. Two FGDs will be conducted with mothers from NHC areas with TBA-CHW teams adjudged as “above average teams” and two from NHC areas with TBA-CHW teams adjudged as “below average teams.” In addition, two FGDs will be conducted with TBAs and CHWs belonging to “above average teams” and two with TBAs and CHWs belonging to “below average teams”. A total of eight FGDs will be performed. For the IDIs, two NHC areas with “above average TBA-CHW teams” and two with “below average teams” will be selected. For each NHC area, two community leaders (of which one will be a female) and four local heath committee members will be interviewed. In addition, four rural health center staff involved in supervision of TBAs and CHWs and two members of the DHMT will also be interviewed. A total of 30 IDIs will be conducted.

Units of Analysis	Focus Group Discussion	In-Depth Interview
NHCs with "above average" TBA-CHW team	▪ Two with mothers of children <24 months ▪ Two with TBA-CHW teams	In each of two NHCs (n=12 total): ▪ 1 male community leader ▪ 1 female community leader ▪ 4 NHC members
NHCs with "below average" TBA-CHW team	▪ Two with mothers of children <24 months ▪ Two with TBA-CHW teams	In each of two NHCs (n=12 total): ▪ 1 male community leader ▪ 1 female community leader ▪ 4 NHC members
RHC		▪ 4 supervisors
DHMT		▪ 2 members
Total	***8 group discussions***	***30 interviews***

Analysis plan All transcripts will be entered into NVivo software (QSR International, Cambridge, MA). We will code the themes that emerge and analyze the data using grounded theory approach and domain analysis. For analysis of IDI data, we will focus on individual views and will, where relevant, look at the proportion of total respondents who report particular views. For the FGD data, we will focus on whether most or many participants felt the same way about specific issues. Special note will be taken if one person (or a minority of respondents) in the focus groups expresses views or describes behaviors very differently than the majority of the group (an "outlier").

V. STUDY IMPLEMENTATION

Partners

BU
Save the Children
Tufts University
TDRC

Timelines

Activity	M1-M6	M7-M12	M13-M18	M19-M24	M25-M30	M36-M36
Finalizing study protocol and study instruments	**xxx**	**x**				
IRB submission and approval	**xxxx**	**x**				
Baseline data collection team	**x**	**x**				
Intervention		**xxx**	**xxxxx**	**xxxxx**	**xxxxxx**	
Endline data collection						**xx**
Data analysis reporting						**xx**
Dissemination						**x**

Ethical Approval

The protocol will be submitted to BU IRB and TDRC Ethics Committee for ethical approval.

References

Baker DP, Krokos KJ, Amodeo AM, TeamSTEPPS™ Teamwork Attitudes Questionnaire Manual, U.S. Department of Defense, Tricare Management Activity American Institutes for Research, Washington, DC 20007, 7 October 2008.

Bang AT, Bang RA, Baitule SB, Redy MH Deshmukh MD. Effect of home-based neonatal care and management of sepsis on neonatal mortality: field trial in rural India. Lancet 1999; 354 (9194): 1955-1961.

Bang AT, Rani A Bang, Tale O, Santakke P, Solanki J, Wargantiwar R, Kelzakar P. Reduction in pneumonia mortality and total child mortality by means of community-based intervention trial in Gadchiroli, India. Lancet, 1990; 336: 1129-30.

Bang AT, Rani A. Bang, Sanjay B. Baitule, Hanimi M. Reddy, Mahesh D. Deshmukh. Management of birth asphyxia in home deliveries in rural Gadchiroli: the effect of two types of birth attendants and of resuscitating with mouth-to-mouth, tube-mask or bag–mask. Journal of Perinatology 2005; 25:S82–S91

Baqui AH, El-Arifeen S, Darmstadt GL, Ahmed S, Williams EK, Seraji HR, Mannan I, Rahman SM, Shah R, Saha SK, Syed U, Winch PJ, Lefevre A, Santosham M, Black RE, Projahnmo Study Group. Effect of community-based newborn-care intervention package implemented through two service-delivery strategies in Sylhet district, Bangladesh: a cluster-randomised controlled trial. *The Lancet* 2008 June; 371(9628):1936–44

Bhutta, Z., Memon, Z., Soofi, S., Salat, M., Cousens, S. and Martines, J. Implementing community-based perinatal care: results from a pilot study in rural Pakistan. *Bulletin of the World Health Organization 2008*; 6, 417-496.

Central Statistical Office (CSO) (Zambia) 2003. 2000 Census of Population and Housing. Analytical Report Vol. 2 Copperbelt Province, Lusaka, Zambia

Central Statistical Office (CSO), Ministry of Health (MOH), Tropical Diseases Research Centre, University of Zambia, and Macro International Inc. 2009. Zambia Demographic and Health Survey 2007. Calverton, Maryland, USA: CSO and Macro International Inc.

Flin R, Winter J, Sarac C, Raduma M, Human Factors in Patient Safety: Review of Topics and Tools – Report for Methods and Measures Working Group of WHO Patient Safety. WHO/IER/PSP/2009.05 April 2009

Gibson TL, Moore J, Lueder EJ, Teamwork in Cooperative Extension Programs, University of Wisconsin-Extension, September 1980.

Gill CJ, Mazala G, Guerina N, Kasimba J, Knapp AB, Mulenga C, MacLeod WB, Mazimba A, Mirochnick M, Sabin L, Seidenberg P1, Hamer DH. Reducing neonatal mortality in rural Zambia with trained traditional birth attendants, a cluster randomized trial: the Lufwanyama Neonatal Survival Project (LUNESP). Abstract 752455. Pediatric Academic Society May 2010, Vancouver, Canada.

Jokhio AH, Heather R. Winter, Kar K Cheng. An Intervention Involving Traditional Birth Attendants and Perinatal and Maternal Mortality in Pakistan. *N Engl J Med* 352; 2005:2091-9.

Kumar, V., Mohanty, S., Kumar, A., Mishra, R., Santosham, M., Baqui, A., Awasthi, S., Singh, P., Singh, V., Ahuja, R., Singh, J., Malik, G., Ahmed, S., Black, R., Bhandari, M. and Darmstadt, G. Impact of community-based behavior change management on neonatal mortality: a cluster-randomized, controlled trial in Shivgarh, Uttar Pradesh, India. *Lancet 2008;* 372, 1151–62 .

MedTeams® accessed 2010, http://teams.drc.com/Medteams/Home/Home.htm

Morey JC, Simon R, Jay GD, Wears RL, Salisbury M, Dukes KA, Berns SD. Error reduction and performance improvement in the emergency department through formal teamwork training: evaluation results of the MedTeams project. Health Serv Res. 2002 Dec;37(6):1553-81.

Pratt SD, Mann S, Salisbury M, Greenberg P, Marcus R, Stabile B, McNamee P, Nielsen P, Sachs BP. Impact of CRM-based training on obstetric outcomes and clinicians' patient safety attitudes. Jt Comm J Qual Patient Saf. 2007 Dec;33(12):720-5.

Salas E, Wilson KA, Burke CS, Wightman DC. Does crew resource management training work? An update, an extension, and some critical needs. Hum Factors. 2006 summer; 48(2):392-412.

Sexton JB, Thomas EJ, Helmreich RL, Error, stress, and teamwork in medicine and aviation: cross sectional surveys, British Medical Journal 2000; 320:745-9

Simon S, Chu K, Frieden M, Candrinho B, Ford N, Schneider H, Biot M. An integrated approach of community health worker support for HIV/AIDS and TB care in Angonia district, Mozambibique. *BMC International Health and Human Rights 2009*. 9: 13. doi:10.1186/1472-698X-9-13

Sternas K, O'Hare P, Lehman K, Milligan R. Nursing and medical student teaming for service learning in partnership with the community: An emerging holistic model for interdisciplinary education and practice. *Holist Nurs* Pract 1999: 13:66-77.

TEAM Measure, Sacred Heart Medical Center, PeaceHealth, accessed 2010 http://www.peacehealth.org/Oregon/SeniorHealth/TeamMeasure/

UNICEF 2008. Countdown to 2015: Tracking Progress in Maternal, Newborn & Child Survival: The 2008 Report. UNICEF, New York, 2008

UNICEF 2009. The State of the World's Children, New York

United States Department of Health and Human Services, Agency for Healthcare Research and Quality, Teamwork Training. AHRQ Patient Safety Network, accessed 2010 http://www.psnet.ahrq.gov/primer.aspx?primerID=8
WHO 2009. World Health Statistics, Geneva, WHO.

Yeboah-Antwi K, Pilangana P, MacLeod WB, Siazeele K, Mtonga E, Chanda P, Sabin L, Kamholz K, Thea DM, Hamer DH. Management of malaria and pneumonia at the community level in Zambia. Abstract 732. 58th Annual Meeting of the American Society of Tropical Medicine and Hygiene. December 2009. Washington DC.

Annex 10 Baseline Household Survey Report

LUFWANYAMA INTEGRATED NEWBORN AND CHILD HEALTH PROJECT IN ZAMBIA (LINCHPIN-ZAMBIA)

REPORT FOR THE BASELINE HOUSEHOLD SURVEY

FINAL DRAFT

MAY 2010

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TABLE OF CONTENTS

LIST OF TABLES

ACRONYMS

ACT	Artemisinin-based Combination Therapy
ANC	Antenatal Clinic
BU/IRB	Boston University Institutional Review Board
CGHD	Center for Global Health and Development, Boston University
CCM	Community Case Management
CHW	Community Health Worker
CI	Confidence Intervals
CSO	Central Statistics Office
DHMT	District Health Management Team
IMR	Infant Mortality Rate
IPTp	Intermittent Preventive Therapy of Malaria in Pregnancy
ITN	Insecticide-treated Bed Net
LINCHPIN	Lufwanyama Integrated Neonatal and Child Health Program In Zambia
LUNESP	Lufwanyama Neonatal Survival Project
MOH	Ministry of Health
NCHS	National Center for Health Statistics
ORS	Oral Rehydration Solution
ORI	Oral Rehydration Therapy
NMR	Neonatal Mortality Rate
PNMR	Post-neonatal Mortality Rate
PNC	Postnatal Care
PPC	Postpartum Care
RDT	Rapid Diagnostic Test
SBA	Skilled Birth Attendant
SD	Standard Deviation
TBA	Traditional Birth Attendant
TDRC	Tropical Diseases Research Centre
TT	Tetanus Toxoid
U5MR	Under 5 Mortality Rate
WHO	World Health Organization
ZIMMAPS	Zambia Integrated Management of Malaria and Pneumonia Study

EXECUTIVE SUMMARY

Introduction: Save the Children, partnering with Center for Global Health and Development of Boston University and the Lufwanyama District Health Management Team, has launched a catalytic five-year *Innovation* project to decrease under-five mortality in Lufwanyama District in Zambia to increase the use of life-saving interventions through delivery channels that are accessible, available, high quality, demanded and supported. The strategy consists of an integrated, community-based newborn care and community case management of childhood illness package delivered through an enhanced district-wide community health program linked to health facilities and consistent with Ministry of Health plans and policies. This household survey was conducted as part of a comprehensive baseline evaluation to inform the strategy, refine targets, and measure baseline indicators for impact assessment at the end of the project.

Methods: A proportional sampling method was used to select and interview 465 caregivers of children aged 0-23 months from all the nineteen catchment areas in the district. The study instrument was adapted from the RAPID CATCH 2008 questionnaire. Information collected included knowledge about neonatal and child illnesses; recent illnesses of children; actions taken during the illness including type and source of treatment; use of antenatal, delivery, neonatal and child health services; and barriers to accessing health services and interventions. Socio-demographic characteristics of respondents and family were also collected.

Results: The mean age of the respondents was 27.4 years and most of the caregivers were in the age group of 20-35 years. The average number of children per household was 3.7. Almost nine out of ten of the respondents indicated that they had some schooling but most of them only reached the primary level. 55% received at least four antenatal care visits during the pregnancy and 16.8% of them received their only antenatal care from TBAs. 94.4% received at least two tetanus toxoid vaccinations before the birth of their youngest child and at least two doses of sulfadoxine-pyrimethamine as intermittent preventive treatment of malaria in pregnancy. 36.1% were delivered by skilled personnel and 55.7% by trained TBAs. 78.3% were delivered with clean delivery kit. Cord clamp and new string/thread were most commonly used to tie the cord, and a new razor blade was used most often to cut the cord. Most children were dried/wiped (79.8%) and wrapped in a dry warm cloth or blanket (87.5%) immediately after birth before the placenta was delivered. Less than half of the babies (44.3%) were put to the breast immediately (within 1 hour) after birth. 72.7% of the babies received postnatal care in the first week, but only 28% received it in the first two days. Immunization coverage reported for measles was 85.3%, DPT1 92.2%, and DPT3 85.9% while 89.1% had received vitamin A supplementation. The proportion of children with fever/malaria, diarrhea/bloody stool and suspected pneumonia in the past two weeks was 39.4%, 27.1% and 15.5%. Only 11.2% of the children with fever/malaria and 12.5% with suspected pneumonia received early and appropriate treatment. No child with diarrhea received zinc. The proportion of underweight children was 22.8%.

Conclusion: This study has shown the importance of TBAs in the provision of maternal and newborn care and the need to improve the access to case management of malaria, diarrhea and pneumonia in this district. The LINCHPIN project of teaming TBAs and CHWs to provide maternal and newborn care integrated into a program providing community case management of malaria, diarrhea and pneumonia is the right strategy for this district.

1. 0 BACKGROUND

An estimated 9 million children under five years of age died worldwide in 2007 with many of these deaths occurring in sub-Saharan Africa (WHO 2009). Zambia contributes approximately 1% of global child mortality, with some 85,000 deaths among children younger than 5 years old annually (UNICEF 2008). For the five-year period 2002-2006, the infant mortality rate (IMR) was reported as 70 per 1,000 live births and the under-five mortality rate (U5MR) as 119 over 1,000 live births (Zambia CSO 2009). This represents a significant downward trend when compared to the IMR of 95/1000 and U5MR of 158/1000 in the preceding five year period (1997-2001). However, the neonatal mortality rate (NMR) of 34/1000 and post-neonatal mortality rate (PNMR) of 36/1000 indicate that 29% of under-five deaths take place during the first month of life and 59% take place before the child's first birthday. Despite some improvement, Zambia is not on track to achieve Millennium Goal 4, a two thirds reduction in child mortality in 2015 compared to its 1990 level.

The main causes of child death in Zambia are (1) newborn conditions (23%); (2) pneumonia (22%); (3) malaria (19%); (4) diarrhea (17%); and (5) HIV/AIDS (16%) (Shiferaw 2007). Although effective interventions to prevent and/or treat neonatal and child mortality exist, children continue to die because the use of these interventions is low. Children with treatable conditions usually die at home, often untreated. The low coverage of these interventions is multi-factorial, involving challenges of access to, perceived quality of, and demand for service as well as the policy environment. Some of the challenges identified include understaffed health facilities, hard-to-reach communities, erratic availability of supplies and drug kits, lack of capacity of district health management teams (DHMTs) to lead and support health interventions, inability to harness and use community based resources and inadequacy of referrals (Nakwala 2007, Geslin 2007).

The Boston University Center for Global Health and Development (CGHD) working with local partners including the DHMTs has just completed two cluster randomized community based research projects. The first study, the Lufwanyama Neonatal Survival Project (LUNESP), used TBAs to deliver three essential newborn care interventions of resuscitation, thermal protection, and identification of newborns with signs of possible sepsis followed by the provision of a first dose of treatment (oral amoxicillin) and referral to the nearest health facility. The LUNESP approach has significantly reduced newborn mortality (Gill 2010). The second, the Zambia Integrated Management of Malaria and Pneumonia Study (ZIMMAPS), pioneered community case management (CCM) in Zambia. CHWs were trained to perform rapid diagnostic tests (RDT) and prescribe artemisinin-based combination therapies (ACT) based on RDT results and prescribe amoxicillin for non-severe pneumonia instead of referral. ZIMMAPS showed the capacity of CHWs to use RDTs, ACT and amoxicillin to manage both malaria and pneumonia at the community level (Yeboah-Antwi 2008). Several studies conducted in South Asia have also demonstrated the effectiveness of using community based health workers to reduce neonatal and child mortality (Bang 1999, Bang 1990, Bang 2005, Jokhio 2005, Baqui 2008, Kumar 2008, Bhutta 2008).

Building upon the findings of LUNESP, ZIMMAPS and studies in South Asia, Save the Children has obtained funds from USAID, ELMA Philanthropies, and a private donor to partner with CGHD and the Lufwanyama DHMT to implement a catalytic five-year *Innovation* project to decrease under-five mortality in Lufwanyama District in Zambia by increasing the use of life-saving interventions through delivery channels that are accessible, available, high quality, demanded and supported. The strategy will consist of an integrated, community-based newborn care and CCM package delivered through an enhanced district-wide community health program linked to health facilities and consistent with Ministry of Health (MOH) plans and policies. The core innovation will be an integrated TBA-CHW team to provide community-based newborn and under-five (0-59 months) care in a government setting.

The project will have four technical intervention areas: 1) Maternal and Newborn Care (40%) which is aimed at providing antenatal care, delivery with clean birth kits for those who cannot deliver at health facility and newborn care including postnatal care. 2) Pneumonia Case Management (PCM) (20%). This is aimed at increasing access to, and availability of, non-severe pneumonia case management services and facilitated referrals delivered by community based volunteers. 3) Malaria Prevention and Treatment (20%) through the use of RDTs and artemether-lumefantrine delivered by CHWs; and 4) Control of Diarrheal Disease (CDD) (20%) delivered by CHWs using low osmolarity ORS and zinc therapy.

Prior to implementing the project, this household survey was conducted as one of comprehensive baseline evaluations to inform the strategy, refine targets, and measure baseline indicators for impact assessment at the end of the project.

2.0 GOAL, OBJECTIVES AND INDICATORS

2.1 Study Goal

To conduct a comprehensive baseline evaluation to identify context-specific information to aid the design and refining of activities for the innovation project, refine targets, and measure baseline indicators for comparison at the end of the project.

2.2 Objective

To measure the knowledge, availability and use of neonatal and child survival interventions.

2.3 Indicators

The following indicators from rapid CATCH indicators as recommended by CORE Monitoring and working group (KPC 2000+) were used:

Antenatal care

Percentage of mothers with children age 0-23 months who received at least four antenatal care visits during the pregnancy of their youngest child.

Maternal tetanus toxoid (TT) vaccination

Percentage of mothers with children age 0-23 months who received at least two TT vaccinations before the birth of their youngest child.

Skilled Delivery Assistance
Percentage of children age 0-23 months whose births were attended by skilled personnel (i.e. qualified medical professionals such as a midwife/nurse, clinical officer or medical doctor)

Postnatal visit to check on newborn within the first 3 days after birth
Percentage of children age 0-23 who received a post-natal visit from an appropriate trained health worker within three days after the birth of the youngest child (appropriately trained health workers includes: skilled birth attendant (SBA) or trained community health worker (CHW) which includes trained traditional birth attendants (TBA).

Exclusive Breastfeeding
Percentage of children age 0-5 months who were exclusively breastfed during the last 24 hours

Appropriate complimentary feeding
Percent of infants and young children age 6-23 months fed at least three of the food groups during the night and day before the survey.

Underweight
Percentage of children 0-23 months who are underweight (-2 SD for the median weight-for-age, according to WHO/NCHS reference population).

Vitamin A supplementation
Percentage of children age 6-23 months who received a dose of vitamin A in the last 6 months (Mother's recall or documented)
Measles vaccination
Percentage of children age 12-23 months who received a measles vaccination

Access to immunization services
Percentage of children age 12-23 months who received a DPT1 vaccination before they reached 12 months.

Health system performance regarding immunization services
Percentage of children age 12-23 months who received a DPT3 vaccination before they reached 12 months.

Appropriate treatment for malaria/fever
Percentage of children age 0-23 months with a febrile episode during the last two weeks who were treated with an effective anti-malarial drug

Early and appropriate treatment for malaria/fever
Percentage of children age 0-23 months with a febrile episode during the last two weeks who were treated with an effective anti-malarial drug within 24 hours after the fever began.

Malaria prevention: insecticide-treated bed net ITN use
Percentage of children age 0-23 months who slept under an ITN the previous night.

ORT use
Percentage of children age 0-23 months with diarrhea in the last two weeks who received oral rehydration solution (ORS) and/or recommended home fluids.

Point of use
Percentage of households of children age 0-23 months that treat water effectively (i.e. by boiling, chlorination, solar, disinfection, or filtration to reduce or eliminate microbiological contaminants) before drinking

Appropriate hand washing practices
Percentage of mothers of children 0-23 months who live in a household with soap or a locally appropriate cleanser at the place for hand washing that and who washed their hands with soap at least 2 of the appropriate times during the day or night before the interview

Appropriate care seeking for pneumonia
Percentage of children age 0-23 months with chest-related cough and fast and/ or difficult breathing in the last two weeks who were taken to an appropriate health provider (i.e. doctor, nurse, auxiliary nurse or community health provider trained in community case management of pneumonia)

3.0 METHODS

3.1 Study Site
The study was conducted in Lufwanyama District in the Copperbelt Province of Zambia. Lufwanyama is a recently created, large, rural, undeveloped district with an estimated 2009 population of 85,033 extrapolated from the 2000 census (CSO 2003). At one time, it was part of an administrative zone called Ndola Rural. Despite its location in the mostly urban and industrialized Copperbelt, rural Lufwanyama District is plagued by deplorable physical infrastructure, poorly maintained roads that are frequently impassible during the rainy season, and a near complete absence of electricity except that produced locally by diesel generators, and no piped water or sewage. Lufwanyama's district health office is currently located outside the district in the town of Kalulushi, 14 kilometers west of the mining center town of Kitwe. Lufwanyama has 13 formal health care centers (11 health centers and two health posts) staffed exclusively by nurses, nurse midwives, and/or clinical officers – but not a single physician. Six other health posts have recently been constructed but are not yet operational because they lack personnel. As a consequence of all of these factors, a high proportion of basic health services are provided through several categories of minimally trained community workers – trained TBAs, trained CHWs, male motivators, safe motherhood agents, family planning agents, disease surveillance agents, malaria agents, tuberculosis agents, HIV/AIDS agents, family planning agents, as well as untrained TBAs and untrained CHWs.

3.2 Study Participants
Women resident in the study area with a living child aged below two years (0–23 months) were invited to participate in the survey. Those who refused to participate were excluded.

3.3 Sample Size and Sampling

The sample size calculation was based on the least prevalent condition among the key outcomes (indicators): treatment for pneumonia. It was assumed that 10% of children aged 0–23 months would have a history of cough and fast and/ or difficult breathing (pneumonia) during the last two weeks. The proportion of these children who received antibiotic treatment was 38.8% from the Zambia DHS 2007. The target for this project is to increase the proportion of children receiving antibiotic treatment to 70%. With 80% power at 95% confidence intervals (CI), we will need to enroll 45 children with fast/difficult breathing. Since the prevalence of fast/difficult breathing in children aged 0-23 months was estimated at 10%, we needed to recruit 450 women with children aged 0-23 months in the baseline survey. This sample size calculated from the formula below would give a high level of precision for the other outcomes since the prevalence of these conditions is higher.

$$n = \frac{\left[Z_\alpha \sqrt{(1+1/m)\bar{p}(1-\bar{p})} + Z_\beta \sqrt{p_0(1-p_0)/m + p_1(1-p_1)}\right]^2}{(p_0 - p_1)^2}$$

$$\bar{p} = \frac{p_1 + m\,p_0}{m+1} \qquad n_c = \frac{n}{4}\left(1 + \sqrt{1 \frac{2(m+1)}{n\,m\,|p_0 - p_1|}}\right)^2$$

p0 = Probability of event in Control Group
p1 = Probability of event in Experimental Group
m = Ratio of controls to experiment subjects
nc = Continuity correction factor

The sample size was recruited from all of the 19 health facility catchment areas proportional to their population. In each health facility catchment area, one or more villages were randomly selected to ensure that no more than 15 households were enrolled from each village (Annex 1).

In each village, households with mothers with young children (0-23 months) were selected systematically. The center of the village was identified with the help of the village headman and a bottle was spun to determine in which direction to select the first house. An integer "n" from 1-9 was randomly selected by the data collector and the nth house along the ray was selected as the first house. The next house selected was the one with the door nearest to the previous selected house and this continued until the number of survey participants for the village which was 15 was attained. If the selected household did not have a mother with 0-23 month old child, it was replaced by going to the next household. If the household has more than two mothers with a child of this age, the first to be introduced will be recruited. If the mother had more than one child < 24 months, the questions were related to the youngest child.

3.4 Selection and Training of Interviewers

The data collectors, formerly employed by the LUNESP project and now employed by Save the Children-LINCHPIN as community mobilizers, were selected as the interviewers. The team

members (8 males and 4 females) were literate with the level of education ranging from Grades 9-12. The added advantage was that they were very familiar with the study site.

Four-day training for the interviewers was conducted at Chapula in Lufwanyama from 27th to 30th January 2010. There were three facilitators, two from the Tropical Diseases Research Centre (TDRC) in Ndola (a social scientist and a research scientist) and the Principal Investigator from Boston University (CGHD) in the United States. The training was participatory and used several relevant methods including lectures, discussions and role plays. They were trained on how to use the household survey form. They were taken through the forms question by question, explaining each thoroughly and detailing the information required. The training also covered the protection of human subjects, confidentiality and the process of obtaining informed consent.

3.5 Data Collection

The study instrument was adapted from the RAPID CATCH 2008 questionnaire. The information collected included knowledge about neonatal and child illnesses, recent illnesses of children, actions taken during the illness including type and source of treatment, use of antenatal, delivery, neonatal and child health services, and barriers to accessing health services and interventions. Socio-demographic characteristics of respondents and family were also collected. The questionnaire consisted of the following parts:

- Demographics
- Maternal and newborn care
- Childhood illnesses
- Infant and young child feeding
- Vitamin supplementation and immunizations
- Water and sanitation

The questionnaire was pretested on the last day of the interviewers' training, and necessary modifications were made. It was also translated into the local language and each interviewer had a translated copy to guide in the asking of the questions. On assessing knowledge of danger signs of illness that warranted care in a health facility, the respondents were not prompted.

When an interviewer entered a household, he/she briefly introduced him/her self and the purpose of the visit and asked for mothers with child 0-23 months. When a respondent was identified, the interviewer excused the rest of the household and obtained some privacy with her and started the interview with informed consent process. He/she explained the purpose and rationale of the study and informed the participants that they would not be paid for participating, they were not obliged to participate, and they could refuse to answer any question. They were assured of confidentiality regarding any information they were going to provide. They were then asked to sign, mark, or thumbprint the consent form and offered the opportunity to receive a copy of the consent form. It was only after written informed consent was provided that the participant was interviewed with the questionnaire.

The interviewers were supervised by two key personnel of the LINCHPIN project, the deputy project manager and the monitoring and evaluation officer. Completed forms were checked by supervisors in the field. Forms were reviewed before collection and obvious errors and

incompletion corrected on the spot. Supervisors had a check list that was used to ensure that all details in all sections of the questionnaire were correctly completed.

3.6 Data Management and Analysis

Data entry and manipulation were undertaken using CS Pro through customized data entry screens with in-built range and consistency checks. All forms were entered twice by independent data entry clerks and completed data files compared. Errors were validated and reconciled.

Analysis was done using STATA/SAS software. Proportions of key indicators were calculated with 95% CI.

3.7 Ethical Considerations

Ethical approval was obtained from Boston University Institutional Review Board (BU/IRB) and the TDRC Ethical Review Committee. The consent form was developed in accordance with guidelines of BU/ IRB and the TDRC Ethical Review Committee. The consent form was translated into the local languages, which was verified and attested by a bilingual speaker.

4.0 RESULTS

A total of 465 caregivers of children 0-23 months were interviewed in all the 19 health facility areas ranging from 15 (one village) to 60 (four villages).

4.1 Socio-demographic Characteristics of Respondents and Households

The characteristics of respondents and household are shown in table 1. The mean age of the respondents was 27.4 years, and most of the caregivers were in the age group of 20-35 years. The average number of children per household was 3.7, and close to half of the women had 4 or more children. Almost nine out of ten of the respondents indicated that they had some schooling, but most of them reached primary level, with a mere 2.4% reaching higher level. When asked whether they worked outside to home to earn money to support the family, 37.6% responded in the affirmative, and half of this group was engaged in selling and trading. The head of the household was in most cases the husband/partner (82.0%), and the biological father of the target child in most cases lived with the family (83.8%, 95% CI: 80.1% - 87.0%).

4.2 Characteristics of Children

The characteristics of the children of the respondents are shown in table 2. The proportion of male children was 49.3%, and the mean age was 10.2 months. Two out of every 5 children were aged twelve months or more.

4.3 Maternal Care: Antenatal

All the women indicated that they received some form of antenatal care during the pregnancy of their last child with a mean of 3.7 visits; 55 % received at least four antenatal care visits during the pregnancy. About one in six women (16.8%) received their antenatal care only from TBAs. 439 of the mothers (94.4%) received at least two TT vaccinations before the birth of their youngest child. 81.9% of the women also received at least two doses of sulfadoxine-pyrimethamine as intermittent preventive treatment (IPTp) of malaria during the pregnancy of their last child and most of the women used ITNs during their pregnancy (Table 3).

When asked about the mothers' knowledge of danger signs in pregnancy, only 34.4% knew that vaginal bleeding during pregnancy was serious and needed urgent attention (Table 4). 76.1% (95% CI: 71.9 – 79.9) of the women knew two complications, and 19.6% (95% CI: 16.1 – 23.5) knew at least four complications. Very few (5.2% [95% CI 3.4 – 7.7]) knew no complication in pregnancy that warranted immediate referral to health facility.

Table 1: Socio-demographic characteristics of respondents and household

		Numerator	Denominator	Percent	95% CI
Maternal age					
	< 20 years	62	462	13.4	10.5-16.9
	20 – 35 years	335	462	72.5	68.2-76.5
	> 35 years	65	462	14.1	11.1-17.7
Number of children					
	1	82	465	17.6	14.3-21.5
	2 – 3	167	465	35.0	31.6-40.5
	≥4	216	465	46.5	41.9-51.5
Level of education					
	No education	50	465	10.8	8.2-14.0
	Primary	289	465	62.1	57.6-66.5
	Secondary	115	465	24.7	20.9-29.0
	Higher	11	465	2.4	1.2-4.3
Head of household					
	Mother	42	465	9.0	6.7-12.1
	Husband/partner	381	465	82.0	78.1-85.3
	Female relative	18	465	3.9	2.4-6.2
	Male relative	16	465	3.4	2.0-5.6
	Other	8	465	1.7	0.8-3.5
Work outside home to earn money					
	No work	290	465	62.4	57.8-66.8
	Farm labor	41	465	8.8	6.5-11.9
	Selling/trading	108	465	23.2	19.5-27.4
	Salaried worker	16	465	3.4	2.0-5.6
	Other	10	465	2.2	1.1-4.1

Table 2: Characteristics of children

		Numerator	Denominator	Percent	95% CI
Sex of child (n =465)					
	Male	229	465	49.2	44.6-53.9
	Female	236	465	50.8	46.1-55.4
Age of child					
	< 6 months	134	465	28.8	24.8-33.2
	6 – 11 months	138	465	29.7	25.6-34.1
	≥ 12 months	193	465	41.5	37.0-46.1

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Table 3: Antenatal care

		Numerator	Denominator	Percent	95% CI
Antenatal care					
	Received ≥ 4 more	255	465	55.1	50.4-59.7
	Only 1 ANC visit	10	465	2.2	1.1-4.1
	TBA only source of ANC	78	465	16.8	13.6-20.6
Maternal TT					
	At least 2 before birth of last child	439	465	94.4	91.8-96.2
	Received TT during pregnancy of last child	340	465	73.1	68.8-77.0
IPTp use					
	Received IPTp	445	465	95.7	93.3-97.3
	Received IPTp 2	289	465	81.9	78.1-85.3
Bednet use					
	All the time	331	465	80.1	75.9-83.8
	Most of the time	16	465	3.9	2.3-6.3
	Some of time	43	465	10.4	7.7-13.9
	Rarely	23	465	5.6	3.6-8.4

Table 4: Maternal knowledge of danger signs in pregnancy

Indicator	Numerator	Denominator	Percent	95% CI
Vaginal bleeding	160	465	34.4	30.1-38.9
Fast /difficult breathing	34	465	7.3	5.2-10.2
Fever	294	465	63.2	58.6-67.6
Severe abdominal pain	293	465	63.0	58.4-67.4
Headache or blurred vision	166	465	35.7	31.4-40.3
Convulsions	19	465	4.1	2.5-6.4
Foul smelling vaginal discharge	35	465	7.5	5.4-10.4
Baby not moving	106	465	22.8	19.1-26.9
Leaking brownish fluid from vagina	13	465	2.8	1.6-4.9

4. 4 Maternal Care: Delivery

Skilled personnel (i.e. qualified medical professionals such as a midwife/nurse, clinical officer or medical doctor) delivered only 168 (36.1%) of the respondents. However, 78.3% were delivered with a clean delivery kit (Table 5).

Table 5: Delivery care

		Numerator	Denominator	Percent	95% CI
Place of delivery					
	Health facility	173	465	37.2	32.8-41.8
	Home	245	465	52.7	48.0-57.3
	TBA hut	31	465	6.7	4.6-9.4
	Other	16	465	3.4	2.0-5.6
Who conducted delivery					
	Skilled personnel	168	465	36.1	31.8-40.4
	Trained TBA	259	465	55.7	51.0-60.3
	Others	66	465	14.2	11.2-17.8
Clean delivery kit					
	Yes	364	465	78.3	74.2-81.9
	No	34	465	7.3	5.2-10.2
	Do not know	67	465	14.4	11.4-18.0

Regarding knowledge of danger signs at delivery, about half (52.5%) knew that excessive vaginal bleeding during delivery was serious and needed urgent attention (Table 6). 76.6% (95% CI: 72.4 – 80.3) knew two complications, and 18.7% (95% CI: 15.3 – 22.6) knew at least four complications. Few (5.4% [95% CI: 3.3 – 7.9]) knew no complication in pregnancy that warranted immediate referral to health facility.

Table 6: Maternal knowledge of danger signs during delivery

Indicator	Numerator	Denominator	Percent	95% CI
Vaginal bleeding	244	465	52.5	47.8-57.1
Fast /difficult breathing	19	465	4.1	2.5-6.4
High fever	233	465	50.1	45.5-54.7
Severe abdominal pain	335	465	72.0	67.7-76.0
Headache or blurred vision	150	465	32.3	28.1-36.7
Convulsions	39	465	8.4	6.1-11.4
Foul smelling discharge from vagina	24	465	5.2	3.4-7.7
Pain in calf	49	465	10.5	8.0-13.8
Verbalization	13	465	2.8	1.7-5.1

4.5 Maternal Care: Postpartum

Forty of the 77 (51.9%) women with children less than 3 months received postpartum care within the first week after delivery. In most cases, the care was provided by a nurse/midwife or a TBA (Table 7).

A little over half of the women (53.1%) were currently doing something or using some method to delay or avoid getting pregnant, and 46.7% were using modern method of contraception. The most common modern method of contraception used by nearly half (46.7%) of the women was injectable contraceptives.

Table 7: Postpartum care

		Numerator	Denominator	Percent	95% CI
Place of PPC					
	Health center	20	40	50.0	33.8-66.2
	Health post	1	40	2.5	0.1-13.2
	Clients home	19	40	47.5	31.5-63.9
Who conducted PPC					
	Nurse/midwife	19	40	47.5	31.5-63.9
	TBA	16	40	40	24.9-56.7
	CHW	4	40	10	2.8-23.7
	Others	1	40	2.5	0.1-13.2
Using any form of contraception		247	465	53.1	48.5-57.7
Using modern method of contraception		217	465	46.7	42.1-51.3
	Pills	87	465	18.7	15.3-22.6
	Injectables	108	465	23.2	19.5-27.4
	Implants	1	465	0.2	0.0-1.4
	Male condom	17	465	3.7	2.2-5.9
	Female condom	3	465	0.6	0.2-2.0
	Diaphragm	1	465	0.2	0.0-1.4

4.6 Newborn Care

Cord clamp and new string/thread were most commonly used to tie the cord, and a new razor blade was used more often to cut the cord (Table 8). Of those who did not use a new razor blade to cut the cord, only 17.5% (95% CI: 12.5 – 23.5) boiled the instrument before using it to cut the cord. Only 15.3% of the women reported putting something on the cord, and in most cases it was baby powder.

Table 8: Cord care

		Numerator	Denominator	Percent	95% CI
Used to tie cord					
	New string/thread	200	465	43.0	38.5-47.7
	Cord clamp	208	465	44.7	40.2-49.4
	String or thread	40	465	8.6	6.3-11.6
	Do not know	17	465	3.7	2.2-5.9
Used to cut cord					
	New razor blade	237	465	51.0	46.3-55.6
	Scissors	183	465	39.3	34.9-44.0
	Razor blade	17	465	3.7	2.2-5.9
	Do not know	28	465	6.0	4.1-8.7
Cord application					
	Yes	71	465	15.3	12.2-18.9
	No	362	465	77.8	73.7-81.5
	Do not know	32	465	6.9	4.8-9.7

Most children were dried/wiped or wrapped in a dry warm cloth or blanket immediately after birth before the placenta was delivered (Table 9). Indeed, most (79.1%) were dried AND wrapped. Mothers reported that about one in eight (13.6% [95% CI: 10.6 – 17.1]) newborns did not cry or breathe easily immediately after birth; and in 88.9% of cases, something was done to aid crying or breathing. In addition to rubbing, drying and clearing the mouth to aid breathing or crying, tube-and-mask resuscitator (4), suction bulbs (2), mouth-to-mouth resuscitation (1) or putting on oxygen (1) were also described. Less than half (44.3%) of the babies were put to the breast immediately (within 1 hour) after birth.

Table 9: Newborn care

		Numerator	Denominator	Percent	95% CI
Dried immediately after birth					
	Yes	371	465	79.8	75.8-83.3
	No	76	465	16.3	13.2-20.1
	Do not know	17	465	3.9	2.4-6.2
Wrapped immediately after birth					
	Yes	407	465	87.5	84.1-90.3
	No	42	465	9.0	6.7-12.1
	Do not know	16	465	3.5	2.0-5.6
Aid breathing					
	Rubbed	38	63	60.3	47.2-72.4
	Dried	27	63	42.9	30.5-56.0
	Mouth cleared	30	63	47.6	34.9-60.6
Put to breast immediately					
	Yes	206	465	44.3	39.7-49.0
	No	253	465	54.4	49.8-59.0
	Do not know	6	465	1.3	0.5-2.9

About three in four (56/77 [72.7%]) mothers with children less than 3 months old reported receiving postnatal care within the first week, but only about one in four (21/77 [27.3%]) received it within two days after delivery. In most cases, the care was provided by a nurse/midwife or a TBA, and examination of the baby and checking the cord were frequently done (Table 10). In 85.7% (95% CI: 73.8 – 93.6) of cases, two essential newborn care actions were done during the visit, and in 35.7% (95% CI: 23.4 – 49.6) of cases at least four essential actions were performed.

Table 10: Postnatal care of baby

		Numerator	Denominator	Percent	95% CI
Place of PNC					
	Health center	29	56	51.8	38.0-65.3
	Health post	1	56	1.8	0.0-9.6
	Clients home	26	56	46.4	33.0-60.3
Who conducted PNC					
	Nurse/midwife	26	56	46.4	33.0-60.3
	TBA	24	56	42.8	29.7-56.8
	CHW	3	56	5.4	1.1-14.9
	Others	3	56	5.4	1.1-14.9
Action taken during PNC					
	Baby examined	49	56	87.5	75.9-94.8
	Baby weighed	23	56	41.1	28.1-55.0
	Cord checked	45	56	80.4	67.6-89.8
	Counseled on breastfeeding	20	56	35.7	23.4-49.6
	Breastfeeding observed	15	56	26.8	15.8-40.3
	Counseled on skin to skin contact	11	56	19.6	10.2-32.4
	Checked for danger signs	15	56	26.8	15.8-40.3
	Counseled on danger signs	13	56	23.2	13.0-36.4

4.7 Childhood Morbidity

183 of the 465 representing 39.4% (95% CI: 34.9 – 44.0) were classified as having fever/malaria in the past two weeks. 126 representing 27.1% (95% CI: 23.2 – 31.4) and 72 representing 15.5% (95% CI: 12.4 – 19.2) were also classified has having diarrhea/bloody stool and suspected pneumonia, respectively. Mothers had fair knowledge of sick neonates (Table 11) and children (Table 12) needing immediate care at health facility. 69.9% (95% CI: 65.5 – 74.0) of mothers knew at least two danger signs of neonates needing prompt treatment at health facility, but only 11.2% (95% CI: 8.5 – 14.5) knew at least four danger signs. Few 7.5% (95% CI: 5.4 – 10.4) knew no danger sign in neonates needing prompt treatment at health facility. For childhood illnesses, 85.4% (95% CI: 81.8 – 88.4) of mothers knew at least two danger signs, and 22.4% (95% CI: 18.7 – 26.5) knew at least four danger signs. Only 1.1% (95% CI: 0.4 – 2.6) knew no danger sign.

Table 11: Maternal knowledge of danger signs in newborns

Indicator	Numerator	Denominator	Percent	95% CI
Convulsions	69	465	14.8	11.8-18.5
Fever	354	465	76.1	71.9-79.9
Poor sucking or feeding	149	465	32.0	27.9-36.5
Fast/difficult breathing	96	465	20.7	17.1-24.7
Feels cold	40	465	8.6	6.3-11.6
Too small or born too early	40	465	8.6	6.3-11.6
Redness or discharge around cord	86	465	18.5	15.1-22.4
Red swollen eyes/discharge	51	465	11.0	8.3-13.3
Yellow palms/soles/eyes	43	465	9.2	6.8-12.3
Lethargy	48	465	10.3	7.8-13.5
Unconscious	25	465	5.4	3.6-7.9

Table 12: Maternal knowledge of danger signs in children

Indicator	Numerator	Denominator	Percent	95% CI
Looking unwell /not playing	325	465	69.9	65.5-74.0
Not eating/drinking	241	465	51.8	47.2-56.5
Lethargic	85	465	18.3	14.9-22.2
High fever	387	465	83.2	79.4-86.4
Fast/difficult breathing	70	465	15.1	12.0-18.7
Vomiting everything	129	465	27.7	23.8-32.1
Convulsions	44	465	9.5	7.0-12.6

The most common means of getting to the nearest health centre or health post was by walking, and the average time to do so was 93.1 minutes (Table 13).

Table 13: Modes of transportation and time to nearest health facility

		Numerator	Denominator	Percent	95% CI
Mode of transportation					
	Walking	387	465	83.2	79.4-86.4
	Bicycle	65	465	14.0	11.0-17.5
	Vehicle	13	465	2.8	1.6-4.9
Time to health facility					
		Mean	Standard deviation	Max	
	Walking	93.1 min	76 min	420min	
	Bicycle	98.1 min	55min	240 min	
	Vehicle	83.1 min	16.9	105 min	

4.8 Sick Children: Fever/Malaria

Out of 183 with reported fever/malaria, 80 (43.7%) received some care or treatment at home. The most common care received at home was giving antipyretic (Table 14). 152 (83.1%) of the fever/malaria cases sought treatment outside the home. In most cases the treatment was sought at the health center. Only 13 (7.1% [95% CI: 3.3 – 11.8]) of the fever/malaria cases had a RDT done, and eight were positive. Only 12.4 and 11.2 % of the fever/ malaria cases received early effective antimalarial (ACT within 24 hours of onset of fever) and early, appropriate, and effective antimalarial therapy (ACT for three days starting within 24 hours of fever onset) respectively. For prevention, about nine of ten households (88.0%) had ITNs, but only about five in ten (51.0%) children slept under one the previous night.

Table 14: Fever/malaria treatment and prevention

		Numerator	Denominator	Percent	95% CI
Home treatment		80	183	43.7	36.4-51.2
	Antimalarial (ACT)	13	80	16.3	8.9-26.2
	Antipyretic	49	80	61.3	49.7-71.9
	Sponged and washed	16	80	20	11.9-30.4
	Traditional herbs	6	80	7.5	2.8-15.6
Sought treatment outside home		152	183	83.1	76.8-88.2
	Health center	101	183	66.4	58.3-73.9
	Health post	30	183	19.7	13.7-27.0
	CHW	13	183	8.6	4.6-14.2
	Other	8	183	5.3	2.3-10.1
Effective antimalarial (ACT) within 24 hours of fever onset					
	Yes	22	178	12.4	7.9-18.1
	No	156	178	87.6	81.9-92.1
Appropriate effective antimalarial (ACT) within 24 hours of fever onset					
	Yes	20	178	11.2	7.0-16.8
	No	158	178	88.8	83.2-93.0
Household with bednets					
	Yes	409	465	88.0	84.6-90.7
	No	56	465	12.0	9.3-15.4
ITN use the previous night					
	Yes	237	465	51.0	46.3-55.6
	No	228	465	49.0	44.4-53.7

4.9 Sick Children: Diarrhea/Bloody Stools

Out of 126 who reported diarrhea/bloody stool, 90 (71.4%) sought care outside the home, and in most cases the care was sought at the health center. 93 (73.8%) of the diarrhea/bloody stool cases received ORT (ORS and/or recommended home fluids). No child received zinc (Table 15). One in five (19.8%) and one in three (34.1%) mothers reported giving less breastfeeding or less other feeding during diarrhea, respectively. Very few reported giving more breastfeeding (17.5%) or other feeding (9.5%) during the illness.

Table 15: Diarrhea/bloody stools treatment

		Numerator	Denominator	Percent	95% CI
Sought treatment outside home		90	126	71.4	62.7-79.1
	Health center	60	90	66.7	55.9-76.3
	Health post	17	90	18.9	11.4-28.5
	CHW	8	90	8.9	3.9-16.8
	Hospital	1	90	1.1	0.0-6.0
	Private clinic	1	90	1.1	0.0-6.0
	Friend/Relative	2	90	2.2	0.3-7.8
	Other	1	90	1.1	0.0-6.0
ORT use					
	Yes	93	126	73.8	65.2-81.2
	No	33	126	26.2	18.8-34.8
Other therapy					
	Antibiotic	8	126	6.3	2.8-12.1
	Antimotility agent	0	126	0	
	Zinc	0	126	0	
	Unknown pill	3	126	2.4	0.5-6.8
	Injection	4	126	3.2	0.9-7.9
	IV fluid	1	126	0.8	0.0-4.3
	Herbs	9	126	7.1	3.3-13.1
Breast feeding during diarrhea					
	Less than usual	25	126	19.8	13.3-27.9
	Same amount	70	126	55.6	46.4-64.4
	More than usual	22	126	17.5	11.3-25.2
	Do not know	9	126	7.1	3.3-13.1
Feeding during diarrhea					
	Less than usual	43	126	34.1	25.9-43.1
	Same amount	57	126	45.2	36.4-54.3
	More than usual	12	126	9.5	5.0-16.0
	Exclusive breastfeeding	13	126	10.3	5.6-17.0
	Do not know	1	126	0.8	0.0-4.3

196 of the respondents representing 42.2% (95% CI: 37.6 – 46.8) reported treating their water to make it safe for drinking. The commonest method of treating water was adding breach or chlorine. 279 of the respondents representing 60% (95% CI: 55.4-64.5) also reported washing hands with detergent.

4.10 Sick Children: Pneumonia

About two thirds (66.7%) of the children with suspected pneumonia sought care from an appropriate health provider (doctor, clinical officer, nurse, auxiliary nurse or community health provider trained in CCM of pneumonia); but only half (50.0%) of the pneumonia cases received antibiotics, and very few (12.5%) received early and appropriate antibiotic for their pneumonia episode (Table 16).

Table 16: Pneumonia treatment

		Numerator	Denominator	Percent	95% CI
Appropriate care seeking					
	Yes	48	72	66.7	54.6-77.3
	No	24	72	33.3	22.9-45.4
Antibiotic therapy					
	Yes	36	72	50	38.0-62.0
	No	36	72	50	38.0-62.0
Early and appropriate antibiotic					
	Yes	9	72	12.5	5.9-22.4
	No	63	72	87.5	77.6-94.1

4.11 Breastfeeding and Nutrition

110 of the 134 women with children aged 0-5 months representing 82.1% (95% CI: 74.5 – 88.2) reported exclusively breastfeeding their children (Table 17). About half of the 6-23 month old children received appropriate complementary feeding (fed with at least three of the food groups during the night and day before the survey).

One in five (22.8%) children were underweight (<-2 SD for the median weight-for-age) (Table 18), and one in ten (10.8%) were severely underweight (<-3 SD for the median weight-for-age) (Table 19). The mean weight-for-age Z-Score was Mean (SD) WFA Z-Score -0.96 (Table 20). On average children's weight-for-age decreased dramatically (2.6 z-scores) from birth to 12-17 months of age, with some recovery thereafter for boys, but continued deterioration for girls during age 18-23 months.

Table 17: Breastfeeding and nutrition

		Numerator	Denominator	Percent	95% CI
Exclusive breastfeeding					
	Yes	110	134	82.1	74.5-88.2
	No	24	134	17.9	11.8-25.5
Appropriate complimentary feeding					
	Yes	171	329	52.0	46.4-57.5
	No	158	329	48.0	42.5-53.6
Underweight					
	Yes	93	408	22.8	18.9-27.2
	No	315	408	77.2	72.8-81.1

Table 18: Moderate and severe malnutrition: % WFA Z-Score < -2

Sex	0-5 months	6-11 months	12-17 months	18-23 months	0-23 months
Female	6.8 (4/59)	25.0 (17/68)	32.1 (18/56)	32.1 (9/28)	22.7 (48/211)
Male	8.8 (5/57)	20.0 (10/50)	41.8 (23/55)	20.0 (7/35)	22.8 (45/197)
Total	7.8 (9/116)	22.9 (27/118)	36.9 (41/111)	25.4 (16/63)	22.8 (93/408)

Table 19: Severe malnutrition: % WFA Z-Score < -3

Sex	0-5 months	6-11 months	12-17 months	18-23 months	0-23 months
Female	1.7 (1/59)	10.3 (7/68)	21.4 (12/56)	17.9 (5/28)	11.8 (25/211)
Male	1.8 (1/57)	6.0 (3/50)	20.0 (11/55)	11.4 (4/35)	9.6 (19/197)
Total	1.7 (2/116)	8.5 (10/118)	20.7 (23/111)	14.3 (9/63)	10.8 (44/408)

Table 20: Malnutrition: Mean (SD) WFA Z-Score

Sex	0-5 months	6-11 months	12-17 months	18-23 months	0-23 months
Female	0.68 (1.85)	-0.75 (1.80)	-1.59 (2.00)	-1.81 (1.50)	-0.72 (2.05)
Male	0.18 (1.70)	-0.90 (1.56)	-2.76 (5.69)	-1.50 (1.13)	-1.22 (3.44)
Total	0.43 (1.79)	-0.81 (1.69)	-2.17 (4.27)	-1.64 (1.31)	-0.96 (2.82)

4.12 Vitamin A Supplementation and Immunization

Vitamin A supplementation and immunization coverage in this population was high (Table 21). All indicators exceeded 85%.

Table 21: Vitamin A and immunization

		Numerator	Denominator	Percent	95% CI
Vitamin A					
	Yes	293	329	89.1	85.2-92.1
	No	36	329	10.9	7.9-14.9
Measles					
	Yes	163	191	85.3	79.5-90.0
	No	28	191	14.7	10.0-20.5
DPT 1					
	Yes	176	191	92.2	87.4-95.5
	No	15	191	7.8	4.5-12.6
DPT 3					
	Yes	164	191	85.9	80.1-90.5
	No	27	191	14.1	9.5-19.9

5.0 DISCUSSION

This household survey assessed the knowledge and use of maternal, neonatal and child interventions in a typical rural district in Zambia. The sampling method used ensured that data were collected from all the nineteen health facility catchment areas of the district, thus making the results reflective of the entire district.

Although the mean number of ANC visit was close to four, only 55% of the women received the recommended minimum four visits during their last pregnancy. This is lower than the national average of 60% for a rural area (CSO 2009). It is important to note that 16.8% of the women received their antenatal care only from TBAs. The proportion of women whose last birth was protected against neonatal tetanus (received at least two doses of TT) and malaria (received at least two doses of IPTp) was impressively higher than the national average. The proportion of women delivered by skilled providers in this study was not much different from the national average for rural areas but was different in terms of the TBA deliveries. In this district, trained TBAs conducted 55.7% of the deliveries compared to the national average of 30.8%. This highlights the importance of TBAs in maternal care in this district.

Most children were dried/wiped and wrapped in a dry warm cloth or blanket immediately after birth before the placenta was delivered. Considering that most of the deliveries were conducted by trained TBAs who were recently re-trained by the LUNESP team to deliver essential newborn care, it is reassuring to note that these TBAs are sustaining the skills acquired during the project.

Despite the excellent immunization and high vitamin A supplementation coverage, this area is surprisingly a community with a substantial burden of childhood illness. The proportions of children with fever/malaria, diarrhea/bloody stool and suspected pneumonia in the past two weeks were 39.4%, 27.1% and 15.5%, respectively. These proportions were far higher than the national average. The proportion of underweight children (<-2SD for the median weight-for-age)

of 22.8% is also quite high. The access to case management for these conditions is extremely low. Only 11.2% of the children with fever/malaria and 12.5% with suspected pneumonia received early and appropriate treatment for their condition. Zinc was not provided as an adjunct to the treatment of diarrhea at all. This is not surprising since currently case management of malaria with RDTs and ACT, and pneumonia with antibiotics happens only at health facilities and not at the community level, and the means of getting to these facilities are by walking or bicycle. On average, people have to walk more than one and half hours to get to a health facility. This situation calls for the introduction of improved CCM delivered by trained and supplied CHWs.

This study has shown the importance of TBAs in the provision of maternal and newborn care and the need to improve the access to case management of malaria, diarrhea and pneumonia in this district. The LINCHPIN project of teaming TBAs and CHWs to provide maternal and newborn care and CCM of malaria, diarrhea and pneumonia came at the right time.

This population-based survey is a rich data set for additional analyses, including: (1) comparing reported use of newborn interventions among respondents from LUNESP intervention vs. comparison communities; (2) comparing reported use of curative intervention among respondents from communities with CHW and/or TBAs vs. those from communities without them; (3) comparing reported use of curative (and preventive) interventions among respondents stratified by their communities' distance from health facilities; (4) stratifying indicators by common demographic and socio-economic variables (sex, maternal schooling, etc.).

6.0 REFERENCES

Bang AT, Bang RA, Baitule SB, Redy MH Deshmukh MD. Effect of home-based neonatal care and management of sepsis on neonatal mortality: field trial in rural India. *Lancet* 1999; 354 (9194): 1955-1961.

Bang AT, Rani A Bang, Tale O, Santakke P, Solanki J, Wargantiwar R, Kelzakar P. Reduction in pneumonia mortality and total child mortality by means of community-based intervention trial in Gadchiroli, India. *Lancet* 1990; 336: 1129-30.

Bang AT, Rani A. Bang, Sanjay B. Baitule, Hanimi M. Reddy, Mahesh D. Deshmukh. Management of birth asphyxia in home deliveries in rural Gadchiroli: the effect of two types of birth attendants and of resuscitating with mouth-to-mouth, tube-mask or bag–mask. *Journal of Perinatology* 2005; 25:S82–S91

Baqui AH, El-Arifeen S, Darmstadt GL, Ahmed S, Williams EK, Seraji HR, Mannan I, Rahman SM, Shah R, Saha SK, Syed U, Winch PJ, Lefevre A, Santosham M, Black RE, Projahnmo Study Group. Effect of community-based newborn-care intervention package implemented through two service-delivery strategies in Sylhet district, Bangladesh: a cluster-randomised controlled trial. *Lancet* 2008 June; 371(9628):1936–44

Bhutta, Z., Memon, Z., Soofi, S., Salat, M., Cousens, S. and Martines, J. Implementing community-based perinatal care: results from a pilot study in rural Pakistan. *Bulletin of the World Health Organization* 2008; 6, 417-496.

Central Statistical Office (CSO) (Zambia) 2003. 2000 Census of Population and Housing. Analytical Report Vol. 2 Copperbelt Province, Lusaka, Zambia

Central Statistical Office (CSO), Ministry of Health (MOH), Tropical Diseases Research Centre, University of Zambia, and Macro International Inc. 2009. Zambia Demographic and Health Survey 2007. Calverton, Maryland, USA: CSO and Macro International Inc.

Geslin, C., Community Child Health in Africa Region and Its Contribution Towards Attaining the MDG-4, Sub-regional Conference on Community-based Child Health Interventions, Lusaka, Zambia, 3 May 2007.

Gill CJ, Mazala G, Guerina N, Kasimba J, Knapp AB, Mulenga C, MacLeod WB, Mazimba A, Mirochnick M, Sabin L, Seidenberg P1, Hamer DH. Reducing neonatal mortality in rural Zambia with trained traditional birth attendants, a cluster randomized trial: the Lufwanyama Neonatal Survival Project (LUNESP). Abstract 752455. Pediatric Academic Society May 2010, Vancouver, Canada.

Jokhio AH, Heather R. Winter, Kar K Cheng. An Intervention Involving Traditional Birth Attendants and Perinatal and Maternal Mortality in Pakistan. *N Engl J Med* 352; 2005:2091-9.

Kumar, V., Mohanty, S., Kumar, A., Mishra, R., Santosham, M., Baqui, A., Awasthi, S., Singh, P., Singh, V., Ahuja, R., Singh, J., Malik, G., Ahmed, S., Black, R., Bhandari, M. and Darmstadt, G. Impact of community-based behavior change management on neonatal mortality: a cluster-randomized, controlled trial in Shivgarh, Uttar Pradesh, India. *Lancet 2008;* 372, 1151–62 .

Nakawala, G., Experience from Luanga District, Sub-regional Conference on Community-based Child Health Interventions, Lusaka, Zambia, 3 May 2007.

Shiferaw T, Continuum of Care, Sub-regional Conference on Community-based Child Health Interventions, Lusaka, Zambia, 3 May 2007.

UNICEF 2008. Countdown to 2015: Tracking Progress in Maternal, Newborn & Child Survival: The 2008 Report. UNICEF, New York, 2008

WHO 2009. World Health Statistics, Geneva, WHO.

Yeboah-Antwi K, Pilangana P, MacLeod WB, Siazeele K, Mtonga E, Chanda P, Sabin L, Kamholz K, Thea DM, Hamer DH. Management of malaria and pneumonia at the community level in Zambia. Abstract 732. 58th Annual Meeting of the American Society of Tropical Medicine and Hygiene. December 2009. Washington DC.

7.0 ANNEXES

7.1 Annex 1: LINCHPIN Rapid CATCH Indicators

CSHGP Intervention Area	Rapid CATCH Indicator	Numerator	Denominator	Percentage	95% CI
Maternal Newborn Care	(1) Antenatal Care: Percentage of mothers of children age 0-23 months who had four or more antenatal visits when they were pregnant with the youngest child	255	463	55.1%	50.4 – 59.7
	(2) Maternal TT Vaccination: Percentage of mothers with children age 0-23 months who received at least two Tetanus toxoid vaccinations before the birth of their youngest child	439	465	94.4%	91.8 - 96.2
	(3) Skilled Birth Attendant: Percentage of children age 0-23 months whose births were attended by skilled personnel	168	465	36.1%	31.8 – 40.4
	*(4) Post-natal visit to check on newborn within	21	77	27.3	17.7-38.6

CSHGP Intervention Area	Rapid CATCH Indicator	Numerator	Denominator	Percentage	95% CI
	the first 2 days after birth: Percentage of children age 0-23 who received a post-natal visit from an appropriate trained health worker within two days after the birth of the youngest child				
	(5) Current Contraceptive Use Among Mothers of Young Children: Percentage of mothers of children age 0-23 months who are using a modern contraceptive method	217	465	46.7%	42.1 – 51.3
Breastfeeding	(6) Exclusive breastfeeding: Percentage of children age 0-5 months who were exclusively breastfed during the last 24 hours	110	134	82.1%	74.5 – 88.2
Nutrition	(7) Infant and Young Child Feeding: Percent of infants and young children age 6-23 months fed according to a minimum of appropriate	171	329	52.0%	46.4 – 57.5

CSHGP Intervention Area	Rapid CATCH Indicator	Numerator	Denominator	Percentage	95% CI
	feeding practices.				
Vitamin A	(8) Vitamin A Supplementation in the last 6 months: Percentage of children age 6-23 months who received a dose of Vitamin A in the last 6 months: card verified or mother's recall	293	329	89.1%	85.2 – 92.2
Immunization	(9) Measles vaccination: Percentage of children age 12-23 months who received a measles vaccination	163	191	85.3%	79.5 – 90.0
	(10) Access to immunization services: Percentage of children aged 12-23 months who received DTP1 according to the vaccination card or mother's recall by the time of the survey	176	191	92.2%	87.4 – 95.5
	(11) Health System Performance regarding Immunization services: Percentage of children aged 12-23 months who received DTP3	164	191	85.9%	80.1 – 90.5

CSHGP Intervention Area	Rapid CATCH Indicator	Numerator	Denominator	Percentage	95% CI
	according to the vaccination card or mother's recall by the time of the survey				
Malaria	(12) Treatment of Fever in Malarious Zones Percentage of children age 0-23 months with a febrile episode during the last two weeks who were treated with an effective anti-malarial drug within 24 hours after the fever began	20	178	11.2%	7.0 – 16.8
Control of Diarrheal Diseases	(13) ORT use: Percentage of children age 0-23 months with diarrhea in the last two weeks who received oral rehydration solution (ORS) and/or recommended home fluids.	93	126	73.8%	65.2 – 81.2

CSHGP Intervention Area	Rapid CATCH Indicator	Numerator	Denominator	Percentage	95% CI
Pneumonia Case Management	(14) Appropriate Care Seeking for Pneumonia: Percentage of children age 0-23 months with chest-related cough and fast and/ or difficult breathing in the last two weeks who were taken to an appropriate health provider.	48	72	66.7%	54.6 – 77.3
Control of Diarrheal Diseases	(15) Point of Use (POU): Percentage of households of children age 0-23 months that treat water effectively.	196	465	42.2%	37.6 – 46.8
	(16) Appropriate Hand washing Practices: Percentage of mothers of children age 0-23 months who live in households with soap at the place for hand washing	279	465	60.0%	55.4 – 64.5
Malaria	(17) Child sleeps under an insecticide-treated bednet: Percentage of children age 0-23 months who slept under an insecticide-treated bed net (in	237	465	51.0%	46.3 – 55.6

CSHGP Intervention Area	Rapid CATCH Indicator	Numerator	Denominator	Percentage	95% CI
	malaria risk areas, where bed net use is effective) the previous night.				
Nutrition	(18) Underweight: Percentage of children 0-23 months who are underweight (-2 SD for the median weight for age, according to WHO/NCHS reference population)	93	408	22.8%	18.9 – 27.2

* Mothers of children < 3 months.

7.2 Annex 2: Data Collection Sites

Name of health facility	Village and code
Bulaya	1. Bulaya 2. Misako
Chikabuke	1. Chikabuke
Chinemu	1. Chinemu
Mibila	1. Mibila
Fungulwe	1. Fungulwe 2. Chitaba
Kapilamikwa	1. Kapilamikwa
Lumpuma	1. Lumpuma 2. Kapimbe
Mibenge	1. Mibenge
Mukutuma	1. Mukutuma 2. Kanchule
Mukumbo	1. Mukumbo 2. Lwela A 3. Chifumpa A
Mushingashi	1. Mushingashi 2. Bwandu
Nkana	1. Nkana A
Shimukunami	1. Katembula A
Matipa	1. Kansoka
Kashininkisha	1. Kashininkisha
St. Mary's Mission	1.Chitashi 2.Luswishi East 3. Fumbwe 4. Kantende
St. Joseph Mission	1. St. Joseph 2. Kawama 3. Kandole
Chantete	1. Chantete
Kamakanga	1. Kamakanga

7.3 Annex 3: Household Survey Questionnaire

Identification			
Health Facility Name and Code			
Village Name and Code			
Household Number			
Name of Mother			

Interview				
Interview date				___/___/____ dd/mm/yy
Name of Interviewer and Code				
Result Code	1. Completed	2. Not completed	3. Refused	
Name of Supervisor and Code				

Data Entry		
	Name	Date
First Data Entry		___/___/____ dd/mm/year
Second Data Entry		___/___/____ dd/mm/year

1. DEMOGRAPHICS

1.1 How old are you? (99 IF DO NOT KNOW) | | |

1.2 Have you ever attended school? | 1. Yes | 2. No |

1.3 What is the highest level of education that you attained?

1. Primary	2. Secondary	3. Higher	8. NA

1.4 How many children do you have? | | |

1.5 What is the name of the surveyed child?_____

1.6 What is the date of birth of (NAME) | | | | | | | | |

1.7 What is the sex of (NAME)? | 1. Male | 2. Female |

1.8 Does (NAME'S) biological father live in this household?

1. Yes	2. No	

1.9 Who is the head of this household?

1. Mother (Respondent)	2. Husband/Partner
3. Female relative _____	
4. Male relative _____	
5. Other _____	

1.10 Do you work outside of the home to earn money? | 1. Yes | 2. No |

1.11 What kind of work do you do?

1. Handicrafts	2. Farm labour
3. Sellers/traders	4. Shop keeper
5. Servant/Household worker	6. Salaried worker/formal employment
7. Other _____	
8. NA	

1.12a What is the most common means of getting to the nearest health centre/post?

1. Walking	2. Bicycle
3. Ox-cart	4. Vehicle
5. Other _____	

1.12b About how long does it take you to get to the nearest health center/post by this means? | | | hrs | | | Mins

2. MATERNAL AND NEWBORN CARE

2.1 During your pregnancy with (NAME), did you see anyone for antenatal care?

1. Yes	2. No

2.2 Whom did you see for the antenatal care?

2.2.1	Doctor/Clinical officer	1. Yes	2. No	8. NA
2.2.2	Nurse /Midwife	1. Yes	2. No	8. NA
2.2.4	Traditional Birth Attendant	1. Yes	2. No	8. NA
2.2.5	Other _____	1. Yes	2. No	8. NA

2.3 How many times did you receive antenatal care? (88 IF NO ANC) | | |

2.4 During pregnancy, a woman may encounter severe problems or illnesses and should go or be taken immediately to a health facility. What type of symptoms would cause you to seek immediate care at a health facility? DO NOT READ RESPONSES

2.4.1	Vaginal bleeding	1. Yes	2. No
2.4.2	Fast/difficult breathing	1. Yes	2. No
2.4.3	Fever	1. Yes	2. No
2.4.4	Severe abdominal pain	1. Yes	2. No
2.4.5	Headache/blurred vision	1. Yes	2. No
2.4.6	Convulsions	1. Yes	2. No
2.4.7	Foul smelling discharge/fluid from vagina	1. Yes	2. No
2.4.8	Baby stop moving	1. Yes	2. No
2.4.9	Leaking brownish/greenish fluid from vagina	1. Yes	2. No
2.4.10	Other _____	1. Yes	2. No

2.5 During your pregnancy with (NAME) did you receive an injection in the arm to prevent the baby from getting tetanus, that is convulsions after birth?

1. Yes	2. No	9. Do not know

2.6 While pregnant with (name), how many times did you receive such an injection?

1. One	2. Two	3. Three or more	8. NA	9. Do not know

2.7 Did you receive any tetanus toxoid injection at any time before that pregnancy, including during a previous pregnancy or between pregnancies?

1. Yes	2. No	9. Do not know

2.8 Before the pregnancy with (Name), how many times did you receive a tetanus injection?

1. One	2. Two	3. Three or more	8. N/A	9. Do not know

2.9 When you were pregnant with (NAME), did you take any drugs in order to prevent you from getting malaria?

1. Yes	2. No	9. Do not know

2.10 Which drugs did you take to prevent malaria?

2.2.1	SP/Fansidar	1. Yes	2. No	8. NA
2.2.2	Chloroquine	1. Yes	2. No	8. NA
2.2.5	Other _____	1. Yes	2. No	8. NA

2.11 How many times did you take SP/Fansidar (88 IF NO FANSIDAR TAKEN) | | |

2.12 When you were pregnant with (NAME), did you sleep under a bednet?

1. Yes	2. No	

2.13 How often did you sleep under the bed net?

1. All the time	2. Most of the time	3. Some of time
4. Rarely	8. NA	

2.14 Where did you deliver?

1. Health facility	2. Home	3 TBA hut
4. Other_____		

2.14a Was (NAME) delivered by caesarean section? 1. Yes | 2. No

2.15 Who assisted with the delivery of (NAME)?

2.15.1	Doctor/Clinical Officer	1. Yes	2. No
2.15.2	Nurse/ Midwife	1. Yes	2. No
2.15.5	Other health staff with midwifery skills	1. Yes	2. No
2.15.6	Trained TBA	1. Yes	2. No
2.15.7	CHW	1. Yes	2. No
2.15.8	Untrained TBA	1. Yes	2. No
2.15.9	Relative/Friend	1. Yes	2. No

2.16 Was a Clean Delivery Kit used during delivery?

1. Yes	2. No	9. Do not know

2.17 What was used to tie the cord?

1. New string of thread	2. String or thread	3. Other_____
9. Do not know		

2.18 Was the thread/string used to tie the cord boiled prior to use?

1. Yes	2. No	8. NA	9. Do not know

2.19 What was used to cut the cord?

1. New razor blade	2. Razor blade	3. Scissors
4. Other_____	9. Do not know	

2.20 Was the instrument used to cut the cord boiled prior to use?

1. Yes	2. No	8. NA	9. Do not know

2.21 Was anything placed on the umbilical cord after it was cut?

1. Yes	2. No	9. Do not know

2.22 What was placed on the cut cord?

1. Cow dung	2. Any type of oil	3. Antiseptic	
4. Ash	5. Other_____	8. NA	9. Do not know

2.23 Was (NAME) dried (wiped) immediately after birth before the placenta was delivered?

1. Yes	2. No	9. Do not know

2.24 Was (NAME) wrapped in a dry, warm cloth or blanket immediately after birth before the placenta was delivered?

1. Yes	2. No	9. Do not know

2.25 Did your baby cry or breathe easily immediately after birth?

1. Yes	2. No	9. Do not know

2.26 Was anything done to help the baby cry or breathe at the time of birth?

1. Yes	2. No	9. Do not know

2.27 What was done to help the baby cry or breathe at the time of birth? (DO NOT READ RESPONSES: ASK ANYTHING ELSE? IF NOTHING WAS DONE, SELECT NA

2.27.1	Rubbed /massaged	1. Yes	2. No	8. NA
2.27.2	Dried	1. Yes	2. No	8. NA
2.27.3	Mouth cleared	1. Yes	2. No	8. NA
2.27.4	Other_____	1. Yes	2. No	8. NA

2.28 Did this child (NAME) put to the breast immediately (within 1 hour) after birth?

1. Yes	2. No	9. Do not know/remember

2.29 IF NO TO 2.28, How long after birth did you first put (NAME) to the breast?(88 IF NA, 99 IF DO NOT KNOW) | | | days | | | hrs

2.30 Sometimes after delivery mothers have severe illnesses and should be taken immediately to a health facility. What types of symptoms would cause you to go to a health facility right away? (DO NOT READ RESPONSES: ASK ANYTHING ELSE?)

2.30.1	Excessive vaginal bleeding	1. Yes	2. No
2.30.2	Fast/difficult breathing	1. Yes	2. No
2.30.3	High fever	1. Yes	2. No
2.30.4	Severe abdominal pain	1. Yes	2. No
2.30.5	Headache/blurred vision	1. Yes	2. No
2.30.6	Convulsions/loss of consciousness	1. Yes	2. No
2.30.7	Foul smelling discharge from vagina	1. Yes	2. No
2.30.8	Pain in calf	1. Yes	2. No
2.30.9	Verbalization/behavior that indicates she may hurt herself or the baby	1. Yes	2. No
2.30.10	Other_____	1. Yes	2. No

2.31 Sometimes newborns, within the first month of life, have severe illnesses and should be taken immediately to a health facility. What types of symptoms would cause you to take your newborn to a health facility right away? (DO NOT READ RESPONSES: ASK ANYTHING ELSE?)

2.31.1	Convulsions	1. Yes	2. No
2.31.2	Fever	1. Yes	2. No
2.31.3	Poor sucking or feeding	1. Yes	2. No
2.31.4	Fast/difficult breathing	1. Yes	2. No
2.31.5	Feels cold	1. Yes	2. No
2.31.6	Too small or born too early	1. Yes	2. No
2.31.7	Redness or discharge around cord	1. Yes	2. No
2.31.8	Red swollen eyes/discharge	1. Yes	2. No
2.31.9	Yellow palms/soles/eyes	1. Yes	2. No
2.31.10	Lethargy	1. Yes	2. No
2.31.11	Unconscious	1. Yes	2. No
2.31.12	Other_____	1. Yes	2. No

2.32 Are you currently doing something or using any method to delay or avoid getting pregnant?

1. Yes	2. No

2.33 What **main** method are you (or your husband/partner) using?

1. Female Sterilization	2. Male Sterilization	3. Pill	4. IUD
5. Injectables	6. Implants	7. Male Condom	8. Female condom
9. Diaphragm	10. Foam/Jelly	11. Lactational Amen. Method	
12. Standard Days method/Cyclebeads			
13. Rhythm method (other than Standard days	14. Withdrawal		
15. Other_____			
88. NA			

3. MATERNAL AND NEWBORN CARE (MOTHERS WITH INFANTS LESS THAN 3 MONTHS)

IF CHILD IS MORE THAN 3 MONTHS OLD,
DRAW TWO LINES ACROSS THIS SECTION

3.1 After (NAME) was born, did any health care provider or volunteer community health worker check on your baby's health in the first week?
PROBE FOR VISITS IN AND OUTSIDE THE HOME WHERE DISCUSSION OR COUNSELLING OR EXAMINATION TOOK PLACE

1. Yes	2. No

3.2 How long after delivery did the first check take place? (88 IF NA) ☐ days ☐☐ hrs

3.3. Who checked on your baby's health at that time?

1. Doctor/Clinical officer	2. Nurse/Midwife	
3. Other health worker	4. TBA	5. Volunteer Community health worker
6. Other _____		8. NA

3.4 Where did this first check take place?

1. Hospital	2. Health Center	3. Health Post
4. Private Clinic	5. Your home	
6. Other _____		8. NA

3.5 What did the health worker do during that visit to check the health of your baby?

3.5.1	Generally examined/looked at baby's body	1. Yes	2. No	8. NA
3.5.2	Weighed baby	1. Yes	2. No	8. NA
3.5.3	Checked cord	1. Yes	2. No	8. NA
3.5.4	Counseled on breastfeeding	1. Yes	2. No	8. NA
3.5.5	Observed breastfeeding	1. Yes	2. No	8. NA
3.5.6	Counseled on skin-to-skin contact/warmth	1. Yes	2. No	8. NA
3.5.7	Checked baby for danger signs	1. Yes	2. No	8. NA
3.5.8	Counseled on danger signs	1. Yes	2. No	8. NA
3.5.9	Other_____	1. Yes	2. No	8. NA

3.6 Was there a second check on (NAME) after the delivery ?

1. Yes	2. No	8. NA

3.7 How long after delivery did the second check take place? ☐☐ days ☐☐ hrs
CODE 88 IF NA

3.8 Who checked on your baby's health at this second check?

1. Doctor/ Clinical officer	2. Nurse/Midwife	
3. Other health worker	4. TBA	5. Volunteer community health worker
6. Other _____		8. NA

3.9 After (NAME) was born, did any health care provider or volunteer community health worker check on your health in the first week?
PROBE FOR VISITS IN AND OUTSIDE THE HOME WHERE DISCUSSION OR COUNSELLING OR EXAMINATION TOOK PLACE

1. Yes	2. No

3.10 How long after delivery did the first check take place? (88 IF NA) ☐ days ☐☐ hrs

3.11 Who checked on your health at that time?

1. Doctor/Clinical officer	2. Nurse/Midwife	
3. Other health worker	4. TBA	5. Volunteer Community health worker
6. Other _____		8. NA

3.12 Where did this first check take place?

1. Hospital	2. Health Center	3. Health Post
4. Private Clinic	5. Your home	
6. Other _____		8. NA

3.13 Was there a second check on your health after the delivery?

1. Yes	2. No	8. NA

3.14 How long after delivery did the second check take place? ☐☐ days ☐☐ hrs
CODE 88,88 IF NA

3.15 Who checked on your health at this second check?

1. Doctor	2. Nurse/Midwife	
3. Other health worker	4. TBA	5. Volunteer Community health worker
6. Other _____		8. NA

4. CHILDHOOD ILLNESS

4.1 Sometimes children get sick and need to receive care or treatment for illnesses. What are the signs of illness that would indicate your child needs treatment? (DO NOT READ RESPONSES: ASK ANYTHING ELSE?)

4.1.1	Looks unwell or not playing normally	1. Yes	2. No
4.1.2	Not eating or drinking	1. Yes	2. No
4.1.3	Lethargic or difficult to wake	1. Yes	2. No
4.1.4	High fever	1. Yes	2. No
4.1.5	Fast/difficult breathing	1. Yes	2. No
4.1.6	Vomits everything	1. Yes	2. No
4.1.7	Convulsions	1. Yes	2. No
4.1.8	Other 1_____	1. Yes	2. No
4.1.9	Other 2_____	1. Yes	2. No

4.2 Did (NAME) experience any of the following in the past two weeks?

4.2.1	Diarrhea	1. Yes	2. No
4.2.2	Blood in stool	1. Yes	2. No
4.2.3	Cough	1. Yes	2. No
4.2.4	Difficult breathing	1. Yes	2. No
4.2.5	Fast breathing/short quick breaths	1. Yes	2. No
4.2.6	Fever	1. Yes	2. No
4.2.7	Malaria	1. Yes	2. No

IF RESPONSE TO **4.2.1 OR 4.2.2 IS YES**, ADMINISTER **DIARRHEA MODULE**

IF RESPONSE TO **(4.2.3 AND 4.2.4) OR 4.2.3 AND 4.2.5) ARE YES** ADMINISTER **PNEUMONIA MODULE**

IF RESPONSE TO **4.2.6 OR 4.2.7 IS YES** ADMINISTER **MALARIA MODULE**

5.0 MALARIA OR FEVER TREATMENT MODULE

5.1 Did you give any special care or treatment at home to (NAME) when s/he had the fever or malaria?

1. Yes	2. No

5.2 What did you give?

5.2.1	Antimalarial: ACT (Coartem/Lumet)	1. Yes	2. No	8. NA
5.2.2	Paracetamol/Aspirin	1. Yes	2. No	8. NA
5.2.3	Sponge/ Wash with water	1. Yes	2. No	8. NA
5.2.4	Traditional herbs/Steaming	1. Yes	2. No	8. NA
5.2.5	Other_____	1. Yes	2. No	8. NA

5.3 Did you seek advice or treatment for the fever/malaria outside the home?

1. Yes	2. No

5.4 Where did you go first for advice or the treatment?

1. Hospital	2. Health Center	3. Health Post
4. Clinic	5. Community health worker	
6. Traditional practitioner		
7. Pharmacy	8. Friend /Relative	
9. Other_____		88. NA

5.5 Did you go anywhere else for advice or treatment?

1. Yes	2. No	8. NA

5.6 Where did you go for this next advice or the treatment?

1. Hospital	2. Health Center	3. Health Post
4. Clinic	5. Community health worker	
6. Traditional practitioner		
7. Pharmacy	8. Friend /Relative	
9. Other_____		88. NA

5.7 How many days after the fever began did you first seek treatment for (NAME)?

1. Same day	2. next day	3. Two days	
4. Three days	5. Four or more days	8. NA	9. Do not know

5.8 Did the child have a finger-prick for a malaria rapid diagnostic test when you sought treatment for the fever?

1. Yes	2. No	8. NA	9. Do not know

5.9 What was the result of the test?

1. Positive	2. Negative	8. NA	9. Do not know

5.10 IF 5.3 IS NO, Why didn't you seek care for your child outside the home?

1. Expecting self resolution of the illness	2. Health facility too far/no transportation
3. Cost of treatment service high	4.Don't trust facility/poor quality of care
5. Family member did not allow_____	
6. Other_____	8. NA

5.11 At any time during the illness did (NAME) take any drugs for the fever?

1. Yes	2. No	9. Do not know

5.12 What drugs did (NAME) take?

5.12.1	ACT (Coartem/Lumet)	1. Yes	2. No	8. NA
5.12.2	SP/Fansidar	1. Yes	2. No	8. NA
5.12.3	Chloroquine	1. Yes	2. No	8. NA
5.12.4	Amodiaquine	1. Yes	2. No	8. NA
5.12.5	Quinine	1. Yes	2. No	8. NA
5.12.6	Paracetamol/Aspirin	1. Yes	2. No	8. NA
5.12.7	Other_____	1. Yes	2. No	8. NA

5.13 How long after the fever started did NAME) start taking the medicine?

5.13.1	ACT (Coartem/Lumet)	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK
5.13.2	SP/Fansidar	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK
5.13.3	Chloroquine	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK
5.13.4	Amodiaquine	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK
5.13.5	Quinine	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK
5.13.6	Paracetamol/Aspirin	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK

5.14 How many days did (NAME) take the drugs? (88 IF DRUG WAS NOT TAKEN)

5.14.1	ACT (Coartem/Lumet)		
5.14.2	SP/Fansidar		
5.14.3	Chloroquine		
5.14.4	Amodiaquine		
5.14.5	Quinine		

6. DIARRHEA TREATMENT MODULE

6.1 When (NAME) had the diarrhea how did you breast him/her?

1. Less than usual	2. About same amount	3. More than usual
8. NA (Child is not breastfeeding)	9. Do not know	

6.2 When (NAME) had the diarrhea how did you offer drink to him/her?

1. Less than usual	2. About same amount	3. More than usual
9. Do not know		

6.3 When (NAME) had the diarrhea how did you offer food to him/her to eat?

1. Less than usual	2. About same amount	3. More than usual
8. NA exclusive breast-feeding	9. Do not know	

6.4 Did you seek advice or treatment for the diarrhea outside the home?

1. Yes	2. No

6.5 Where did you go first for advice or the treatment?

1. Hospital	2. Health Center	3. Health Post
4. Clinic	5. Community health worker	
6. Traditional practitioner		
7. Pharmacy	8. Friend /Relative	
9. Other_____	88. NA	

6.6 How many days after the diarrhea began did you first seek treatment for NAME?

1. Same day	2. next day	3. Two days	
4. Three days	5. Four or more days	8. NA	9. Do not know

6.7 IF NO TO 6.4, Why didn't you seek care for your child outside the home?

1. Expecting self resolution of the illness	2. Health facility too far/no transportation
3. Cost of treatment service high	4.Don't trust facility/poor quality of care
5. Family member did not allow_____	
6. Other_____	8. NA

6.8 Was (NAME) given any of the following to drink at anytime since started having the diarrhea?

6.8.1	Fluid from ORS packet/sachet/powder	1. Yes	2. No	9. DK
6.8.2	ORS liquid	1. Yes	2. No	9. DK
6.8.3	Homemade fluid	1. Yes	2. No	9.DK

6.9 Was (NAME) given any of the following to treat the diarrhea?

6.9.1	Antibiotic pill or syrup	1. Yes	2. No
6.9.2	Anti motility pill or syrup	1. Yes	2. No
6.9.3	Zinc	1. Yes	2. No
6.9.4	Unknown pill or syrup	1. Yes	2. No
6.9.5	Injection	1. Yes	2. No
6.9.6	Intravenous	1. Yes	2. No
6.9.7	Home remedies/herbal medicines	1. Yes	2. No
6.9.8	Other_____	1. Yes	2. No

6.10 How many days did (NAME) take the drugs? (88 IF DRUG WAS NOT TAKEN)

6.10.1	Antibiotic pill or syrup		
6.10.2	Anti motility pill or syrup		
6.10.3	Zinc		

7.0 PNEUMONIA TREATMENT MODULE

7.1 Did you seek advice or treatment outside the home for (NAME) when s/he had cough with fast/difficult breathing (suspected pneumonia)?

1. Yes	2. No

7.2 Where did you go first for advice or the treatment?

1. Hospital	2. Health Center	3. Health Post
4. Clinic		5. Community health worker
6. Traditional practitioner		
7. Pharmacy		8 Friend /Relative
9. Other_____		88. NA

7.3 Did you go anywhere else for advice or treatment?

1. Yes	2. No	8. NA

7.4 Where did you go next for this advice or the treatment?

1. Hospital	2. Health Center	3. Health Post
4. Clinic		5. Community health worker
6. Traditional practitioner		
7. Pharmacy		8. Friend /Relative
9. Other_____		88. NA

7.5 How many days after the cough/fast breathing began did you first seek treatment for NAME?

1. Same day	2. next day	3. Two days	
4. Three days	5. Four or more days	8. NA	9. Do not know

7.6 Why didn't you seek care for your child outside the home?

1. Expecting self resolution of the illness	2. Health facility too far/no transportation
3. Cost of treatment service high	4.Don't trust facility/poor quality of care
5. Family member did not allow_____	
6. Other_____	8. NA

7.7 At any time during the illness did (NAME) take any drugs for the cough/fast breathing?

1. Yes	2. No	9. Do not know

7.8 Did (NAME) take any of the following drugs?

7.8.1	Amoxicillin pill/syrup	1. Yes	2. No	8. NA
7.8.2	Cotrimoxazole/Septrin	1. Yes	2. No	8. NA
7.8.3	Erythromycin	1. Yes	2. No	8. NA
7.8.4	Other antibiotic_____	1. Yes	2. No	8. NA
7.8.5	Cough mixture	1. Yes	2. No	8. NA
7.8.6	Paracetamol/Panadol/Aspirin	1. Yes	2. No	8. NA
7.8.7	Other_____	1. Yes	2. No	8. NA

7.9 How long after the cough/fast breathing started did (NAME) start taking the medicine?

7.9.1	Amoxicillin pill/syrup	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK
7.9.2	Cotrimoxazole/Septrin	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK
7.9.3	Erythromycin	0. D0	1. D1	2. D2	3. D3	8. NA	9.DK

7.10 How many days did (NAME) take the drugs? (88 IF DRUG WAS NOT TAKEN)

7.10.1	Amoxicillin pill/syrup		
7.10.2	Cotrimoxazole/Septrin		
7.10.3	Erythromycin		

8. BREASTFEEDING/INFANT AND YOUNG CHILD FEEDING

8.1 Now I would like to ask you about liquids or foods (NAME) had yesterday during the day or at night. Did s/he drink/eat any of the following?

8.1.1	Breast milk	1. Yes	2. No	9. DK
8.1.2	Plain water	1. Yes	2. No	9. DK
8.1.3	Commercially produced infant formula	1. Yes	2. No	9.DK
8.1.4	Fortified commercially infant and young child food (e.g. cerelac)	1. Yes	2. No	9.DK

8.2 Now I would like to ask you about (other) liquids or foods that (NAME) may have had yesterday during the day or at night. I am interested in whether your child had the item even if it was combined with other foods. Did s/he drink/eat-

8.2.1	**Group 1: Dairy**			
8.2.1.1	Milk such as tinned, powdered, or fresh animal milk	1. Yes	2. No	9. DK
8.2.1.2	Cheese, yogurt, or other milk products	1. Yes	2. No	9.DK
8.2.2	**Group 2: Grain**			
8.2.2.1	Any (other) porridge or gruel	1. Yes	2. No	9. DK
8.2.2.2	Bread, rice, noodles, or other foods made from grains	1. Yes	2. No	9. DK
8.2.2.3	White potatoes, white yams, , cassava, or any other foods made from roots	1. Yes	2. No	9.DK
8.2.3	**Group 3: Vitamin A Rich vegetables**			
8.2.3.1	Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside	1. Yes	2. No	9. DK
8.2.3.2	Any dark green leafy vegetables	1. Yes	2. No	9. DK
8.2.3.3	Ripe mangoes, papayas	1. Yes	2. No	9.DK
8.2.3.4	Foods made with red palm oil, palm nut, palm nut pulp sauce	1. Yes	2. No	9.DK
8.2.4	**Group 4: Other Fruits/Vegetables**			
8.2.4.1	Any fruits or vegetables like oranges, bananas, or pineapple	1. Yes	2. No	9. DK
8.2.5	**Group 5: Eggs**			

8.2.5.1	Egg	1. Yes	2. No	9.DK
8.2.6	**Group 6: Meat, poultry, fish**			
8.2.6.1	Liver, kidney, heart or other organ meats	1. Yes	2. No	9.DK
8.2.6.2	Any meat such as beef, pork, lamb, goat, chicken or duck	1. Yes	2. No	9. DK
8.2.6.3	Fresh or dried fish	1. Yes	2. No	9.DK
8.2.6.4	Grubs, snails, insects, other small protein food	1. Yes	2. No	9.DK
8.2.7	**Group 7: Legumes/nuts**			
8.2.7.1	Any foods made from beans, peas, lentils, or nuts	1. Yes	2. No	9. DK
8.2.8	**Group 8: Oils/fats**			
8.2.8.1	Any oils, fats, or butter, or foods made with any of these	1. Yes	2. No	9.DK
8.2.9	**Group 9: Other foods**			
8.2.9.1	Tea or coffee	1. Yes	2. No	9. DK
8.2.9.2	Any other liquid	1. Yes	2. No	9.DK
8.2.9.3	Any sugary foods, such as chocolates, candy, sweets, pastries, cakes, or biscuits	1. Yes	2. No	9.DK
8.2.9.4	Any other solid or soft food	1. Yes	2. No	9.DK

8.3 How many times did (NAME) eat solid, semi-solid, or soft foods other liquids yesterday during the day or at night | | |

9. VITAMIN A SUPPLEMENTATION AND IMMUNIZATIONS

9.1 Has (NAME) ever received a vitamin A dose? SHOW COMMON TYPES

1. Yes	2. No	9. Do not know

9.2 Did (NAME) receive a vitamin A dose within the last 6 months?

1. Yes	2. No	8. NA	9. Do not know

9.3. Do you have a card or child health booklet where (Name's) vaccinations and vitamin A (capsules) are written down?

1. Yes	2. No	9. Do not know

COPY VACCINATION DATE FROM BOOKLET OR CARD (88 /88/88 IF CARD NOT AVAILABLE AND 99/99/9999 IF DATE NOT RECORDED

9.4.1	Vitamin A							
9.4.2	DPT1							
9.4.3	DPT3							
9.4.4	Measles							

9.5. Has (NAME) received any vaccinations that are not recorded on this card, including vaccinations given during immunization campaigns?

1. Yes	2. No	8. NA	9. Do not know

9.6 How many times (88 IF NA AND 99 IF DO NOT KNOW)? ☐☐

9.7. Has (NAME) received a DPT vaccination that is an injection given in the arm/thigh, sometimes at the same time as polio drops?

1. Yes	2. No	8. NA (CARD SEEN)	9. Do not know

9.8 How many times (88 IF NA AND 99 IF DO NOT KNOW)? ☐☐

9.9. Has (NAME) ever received an injection in the arm to prevent measles?

1. Yes	2. No	8. NA (CARD SEEN)	9. Do not know

10. WATER AND SANITATION

10.1. Do you treat your water in any way to make it safe for drinking?

1. Yes	2. No

10.2 What do you usually do to the water to make it safer to drink?

10.2.1	Let it stand and settle/Sedimentation	1. Yes	2. No	8. NA
10.2.2	Strain it through cloth	1. Yes	2. No	8. NA
10.2.3	Boil	1. Yes	2. No	8. NA
10.2.4	Add breach/chlorine	1. Yes	2. No	8. NA
10.2.5	Water filter (ceramic, sand, composite)	1. Yes	2. No	8. NA
10.2.6	Solar disinfection	1. Yes	2. No	8. NA
10.2.7	Other_____	1. Yes	2. No	8. NA

10.3. Can you show me where you usually wash your hands and what you use to wash hands? ASK TO SEE AND OBSERVE

10.3.1 SITE OF WASH

1. Inside /near toilet	2. Inside or near kitchen or cooking place	
3. Elsewhere in yard	4. Outside yard	5. No specific place
6. No permission to see		

10.3.2 WASHING SUBSTANCE

1. Soap	2. Detergent	3. None
4. Other_____	7. No permission to see	

11 MALARIA – ITN USE

11.1 Does your household have any mosquito nets that can be used while sleeping?

1. Yes	2. No

11.2 Did (NAME) sleep under the bed net last night?

1. Yes	2. No	8. NA

11.3 Was the bed net that (Name) slept under last night ever soaked or dipped in a liquid or treated to repel mosquitoes or bugs?

1. Yes	2. No	9. Do not know

11.4 How long ago was the net last soaked or dipped in a liquid/treated to repel mosquitoes or bugs? ☐☐ months

MORE THAN 2 YEARS = 90; LLINS = 95, NA = 98, DO NOT KNOW =99

12. LUNESP

12.1 Have you heard of a program in Lufwanyama called LUNESP?

1. Yes	2. No

12.2 Did you participate in LUNESP?

1. Yes	2. No	8. NA

12.3 Have you changed your TBA because of LUNESP?

1. Yes	2. No	8. NA

13. ANTHROPOMETRICS

13.1 May I weigh (NAME)? 99.9 IF WEIGHT NOT TAKEN ☐☐ . ☐ **kg**

CHECK FOR THE COMPLETENESS OF THE
FORM AND THANK THE MOTHER FOR THE INTERVIEW

Annex 11 Updated CSHGP Data Form

Child Survival and Health Grants Program Project Summary

May-18-2010

Save the Children (Zambia)

General Project Information

Cooperative Agreement Number:	GHS-A-00-09-00013
SC Headquarters Technical Backstop:	
SC Headquarters Technical Backstop Backup:	Karen Waltensperger
Field Program Manager:	
Midterm Evaluator:	
Final Evaluator:	
Headquarter Financial Contact:	Carmen Weder
Project Dates:	9/30/2009 - 9/29/2013 (FY09)
Project Type:	Innovation
USAID Mission Contact:	William Kanweka
Project Web Site:	

Field Program Manager

Name:	(To be filled)
Address:	
Phone:	
Fax:	
E-mail:	
Skype Name:	

Alternate Field Contact

Name:	Petronella Mayeya (To be filled)
Address:	4902 Los Angeles Blvd. 4902 Los Angeles Blvd. Lusaka Zambia
Phone:	+260211250139
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Skype Name:	

Grant Funding Information

USAID Funding: $1,750,000 **PVO Match:** $583,275

General Project Description

Lufwanyama Integrated Newborn and Child Health Project in Zambia (LINCHPIN) Save the Children, in partnership with Boston University Center for Global Health and Development, is supporting the Lufwanyama District Health Management Team in Copperbelt Province, Zambia, to implement a catalytic five-year *Innovation Category* initiative to decrease under-five mortality by increasing use of life-saving interventions through delivery channels that are accessible, available, high quality, demanded and supported. The interventions include maternal and newborn care, pneumonia case management, prevention and treatment of malaria, and control of diarrheal disease. LINCHPIN's strategy is an integrated, community-based newborn care and community case management package delivered through innovative TBA-CHW teams, linked to health facilities and Neighborhood Health Committees, and consistent with Ministry of Health (MOH) plans and policies.

Project Location

Latitude: -12.91	**Longitude:** 27.36
Project Location Types:	Rural
Levels of Intervention:	(None Selected)
Province(s):	Copperbelt Province
District(s):	Lufwanyama District
Sub-District(s):	--

Operations Research Information

OR Project Title:	Feasibility and Effectiveness of an Integrated Community Health Worker-Trained Traditional Birth Attendant Team on the Delivery and Use of Treatments for Infections Among Children 0-59 Months of Age in Lufwanyama District, Copperbelt Province, Zambia
Cost of OR Activities:	$199,424
Research Partner(s):	Boston University
OR Project Description:	**Background** Community-based delivery of high impact, life-saving interventions to young infants is difficult in low income countries, especially in rural settings. Challenges include policy constraints, unclear roles among existing cadres, and lack of experience. "Teaming" is a common service strategy in high income countries, especially in serious outcome settings, such as emergency wards and operating theaters. Health teaming, though not reported in low income countries, seems a sensible strategy for vulnerable young infants. The LINCHPIN Project aims to train and deploy TBA-CHW teams to provide essential newborn and continuous curative care for infants 0-59 months of age in Lufwanyama District, Zambia. We define a "team" as a "cohesive, communicating dyad with shared goals, complementary roles, and mutually supportive activities." **Methods** We will conduct pile-sorting formative research to prioritize locally relevant domains and sub-domains of teaming to inform training and measurement. We will train existing TBA-CHW teams and measure the level of teaming achieved – both structurally and functionally – and the likely factors that influence it. We will also use service statistics to measure (a) delivery of interventions by TBAs and CHWs before and after teaming training and (b) the association between teaming achieved and the delivery of interventions. **Significance** The findings will contribute to the scant teaming literature from low income countries and, more importantly, may inform strategies to reduce newborn and young infant mortality in settings where TBAs and CHWs are policy-sanctioned, widely available community-based cadres.

Partners

Save the Children Sweden (Subgrantee)	$844,320
Boston University (Subgrantee)	$199,424
Lufwanyama District Health Management Team (Collaborating Partner)	$0
Copperbelt Provincial Medical Office (Collaborating Partner)	$0

Strategies

Social and Behavioral Change Strategies:	Community Mobilization Interpersonal Communication
Health Systems Strengthening:	Supportive Supervision Task Shifting Developing/Helping to develop clinical protocols, procedures, case management guidelines Developing/Helping to develop job aids Providing feedback on health worker performance Monitoring CHW adherence with evidence-based guidelines Referral-counterreferral system development for CHWs Community role in supervision of CHWs
Strategies for Enabling Environment:	Create/Update national guidelines/protocols Advocacy for revisions to national guidelines/protocols Stakeholder engagement and policy dialogue (local/state or national) Advocacy for policy change or resource mobilization
Tools/Methodologies:	Rapid Health Facility Assessment

Capacity Building

Local Partners:	National Ministry of Health (MOH) Dist. Health System Health Facility Staff Government sanctioned CHWs TBAs

Interventions & Components

Control of Diarrheal Diseases (20%)	IMCI Integration	CHW Training
Malaria (20%)	IMCI Integration	CHW Training
Maternal & Newborn Care (40%)	IMCI Integration	CHW Training HF Training
Pneumonia Case Management (20%)	IMCI Integration	CHW Training HF Training

Operational Plan Indicators

Number of People Trained in Maternal/Newborn Health
There is no data for this project for this operational plan indicator.
Number of People Trained in Child Health & Nutrition
There is no data for this project for this operational plan indicator.
Number of People Trained in Malaria Treatment or Prevention
There is no data for this project for this operational plan indicator.

Locations & Sub-Areas

Total Population:	85,033

Target Beneficiaries

	Zambia - SC - FY09
Infants < 12 months	0
Children 0-59 months	15,136
Women 15-49 years	18,537
Beneficiaries Total	33,673

Rapid Catch Indicators: DIP Submission

Sample Type: 30 Cluster

Indicator	Numerator	Denominator	Percentage	Confidence Interval
Percentage of mothers with children age 0-23 months who received at least two Tetanus toxoid vaccinations before the birth of their youngest child	439	465	94.4%	9.1
Percentage of children age 0-23 months whose births were attended by skilled personnel	168	465	36.1%	7.0
Percentage of children age 0-5 months who were exclusively breastfed during the last 24 hours	110	134	82.1%	16.7
Percentage of children age 6-23 months who received a dose of Vitamin A in the last 6 months: card verified or mother's recall	293	329	89.1%	10.7
Percentage of children age 12-23 months who received a measles vaccination	163	191	85.3%	14.0
Percentage of children age 12-23 months who received DTP1 according to the vaccination card or mother's recall by the time of the survey	176	191	92.1%	14.1
Percentage of children age 12-23 months who received DTP3 according to the vaccination card or mother's recall by the time of the survey	164	191	85.9%	14.0
Percentage of children age 0-23 months with a febrile episode during the last two weeks who were treated with an effective anti-malarial drug within 24 hours after the fever began	20	178	11.2%	6.8
Percentage of children age 0-23 months with diarrhea in the last two weeks who received oral rehydration solution (ORS) and/or recommended home fluids	93	126	73.8%	16.9
Percentage of children age 0-23 months with chest-related cough and fast and/or difficult breathing in the last two weeks who were taken to an appropriate health provider	48	72	66.7%	21.8
Percentage of households of children age 0-23 months that treat water effectively	196	465	42.2%	7.4
Percentage of mothers of children age 0-23 months who live in households with soap at the place for hand washing	279	465	60.0%	8.3
Percentage of children age 0-23 months who slept under an insecticide-treated bednet (in malaria risk areas, where bednet use is effective) the previous night	237	465	51.0%	7.9
Percentage of children 0-23 months who are underweight (-2 SD for the median weight for age, according to the WHO/NCHS reference population)	93	408	22.8%	6.2
Percentage of infants and young children age 6-23 months fed according to a minimum of appropriate feeding practices	171	329	52.0%	9.5
Percentage of mothers of children age 0-23 months who had four or more antenatal visits when they were pregnant with the youngest child	255	463	55.1%	8.1
Percentage of mothers of children age 0-23 months who are using a modern contraceptive method	217	465	46.7%	7.7
Percentage of children age 0-23 months who received a post-natal visit from an appropriately trained health worker within two days after birth	21	77	27.3%	15.3

Rapid Catch Indicators: Mid-term

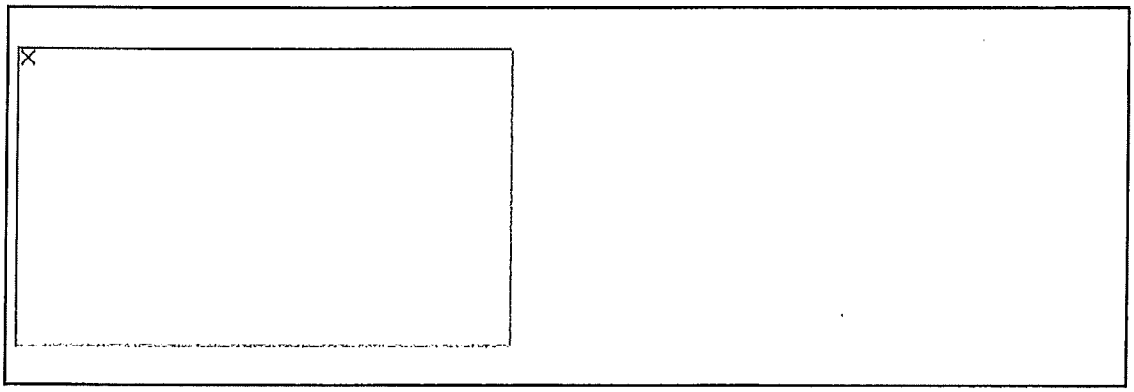
Rapid Catch Indicators: Final Evaluation

Rapid Catch Indicator Comments

Sample Size and Sampling

The sample size calculation was based on the least prevalent condition among the key outcomes (indicators) which is treatment for pneumonia. It was assumed that 10% of children aged 0 – 23 months will have a history of cough and fast and/ or difficult breathing (pneumonia) during the last two weeks. The proportion of these children who received antibiotic treatment was 38.8% from the Zambia DHS 2007. The target for this project is to increase the proportion of children receiving antibiotic treatment to 70%. With 80% power at 95% confidence intervals (CI), we will need to enroll 45 children with fast/difficult breathing. Since the prevalence of fast/difficult breathing in children aged 0-23 months was estimated at 10%, we needed to recruit 450 women with children aged 0-23 months in the baseline survey. This sample size calculated from the formula below (Figure 1) would give a high level of precision for the other outcomes since the prevalence of these conditions is higher.

Figure 1



* Did not print from online form,

The sample size was recruited from all of the 19 HF catchment areas proportional to their population. In each HF catchment area one or more villages were randomly selected to ensure that no more than 15 households were enrolled from each village.

In each village, households with mothers with young children (0-23 months) were selected systematically. The center of the village was identified with the help of the village headman and a bottle was spun to determine in which direction to select the first house. An integer "n" from 1-9 was randomly selected by the data collector and the nth house along the ray was selected as the first house. The next house selected was the one with the door nearest to the previous selected house and this continued until the number of survey participants for the village which was 15 was attained. If the selected household did not have a mother with 0-23 month old child, it was replaced by going to the next household. If the household has more than two mothers with a child of this age, the first to be introduced will be recruited.

A total of 465 care givers of children 0-23 months were interviewed in all the 19 HF areas ranging from 15 (one village) to 60 (four villages).

Annex 12 Child Health Technical Package and Delivery Strategy (Children 0-59 months)

Figure 1

Child Interventions by Age, Sign, and Cadre

Age Group	Sign	Intervention by Cadre	
		TBA	CHW
0-6 days	Well newborn	Active surveillance day 1 and 3 with referral to HC on day 7	
	Specific danger signs of PSBI (fever, fast breathing)	Refer with 1st dose amoxicillin per policy	In cases of TBA/CHW Team, both may provide similar services, or refer one to the other.
	Other danger signs of PSBI (difficult feeding, convulsions, lethargy, severe chest indrawing, hypothermia)	Refer	
	Signs of LBI (omphalitis, pustulosis, conjunctivitis)	Refer	
	Diarrhea	ORS and refer	
7-59 days	Specific danger signs of PSBI (fever, fast breathing)	In cases of TBA/CHW Team, both may provide similar services, or refer one to the other.	Refer with 1st dose amoxicillin per policy
	Other danger signs of PSBI (difficult feeding, convulsions, lethargy, severe chest indrawing, hypothermia)		Refer
	Signs of LBI (omphalitis, pustulosis, conjunctivitis)		Refer
	Diarrhea		ORS, zinc
2-59 months	Fast breathing		Amoxicillin
	RDT+ Fever		ACT
	Diarrhea		ORS, zinc
	Danger sign		Refer
	Severe illness		Refer with 1st dose per policy, depending on the syndrome

ACT=artimisinin combination therapy; CHW=Community Health Worker; LBI=localized bacterial infection; PSBI=possible severe bacterial infection; RDT=rapid diagnostic test (for falciparum malaria); TBA=traditional birth attendant.

Child Health Technical Package and Delivery Strategy In 2010, Zambia adopted a National Health Strategy at the community level to reduce maternal and child mortality and meet MDGs 4 and 5. The Ministry of Health (MOH), in collaboration with other stakeholders, adapted the WHO and UNICEF Community Health Worker Manual *Caring for Newborns and Children in the Community* which is fully compatible with Community Integrated Management of Neonatal and Childhood Illnesses (C-IMCI) for first level health workers. With support from WHO and UNICEF, MOH is rolling out C-IMNCI for the target population of children 0 to 59 months old. The MOH delivery strategy is Community Case Management (CCM) delivered by Community Health Workers (CHWs) able to identify the sick child and treat and/or refer to a health facility within 24 hours of problem onset. The MOH is rolling out CCM in 11 pilot districts – with Lufwanyama now added as the 12th district to be supported by LINCHPIN.

Save the Children and Boston University (BU) are partnering with the MOH to deliver this strategy by working in close collaboration with the Lufwanyama District Health Management Team (DHMT). At the health center level, LINCHPIN supports training and supervision of health center staff in supervisory skills and provides technical assistance to support IMNCI, as well as maternal care and essential newborn care (ENC). The project supports the DHMT to build the capacities of CHWs and Traditional Birth Attendants (TBAs) in C-IMNCI, maternal care and ENC. Also at the community level, LINCHPIN works with and supports Neighborhood Health Committees (NHCs) to mobilize communities to strengthen the enabling environment. LINCHPIN's innovation is the teaming of TBAs and CHWs to provide a continuum of care to mothers and children 0-59 months old.

Child Health Curative Package Figure 1 above, delineates the package of child health interventions by age, sign and cadre as delivered by the TBA/CHW team. These include identification of neonatal danger signs (e.g., difficulty feeding, convulsions, chest in-drawing, hypothermia and poor movement) and immediate referral. In the case of difficult breathing, the CHW may give a first dose of Amoxicillin as per MOH policy and refer. TBAs and CHWs are also trained to recognize and refer other neonatal conditions such as omphalitis, pustulosis, and conjunctivitis.

The CHW/TBA team also identifies danger signs in children 2 to 59 months (e.g., not able to drink or feed, convulsions, unusually sleepy or unconscious, difficult breathing, chest in-drawing, hypothermia, vomits everything, blood in stool, swelling of both feet, fever lasting for 7 days or more, cough for more than 21 days, diarrhea for more than 14 days, and red on MUAC). CHWs treat diarrhoea with low osmolarity ORS and zinc. For fever, CHWs conduct Rapid Diagnostic Test (RDTs) and provide anti-malarial drugs (Artimisinen Combination Therapy - ACTs). They treat difficult breathing with a first dose of Amoxicillin and referral. For those children with suspected pneumonia where referral is not possible, the CHW continues providing Amoxicillin and trying to facilitate referral. LINCHPIN supports NHCs working in partnership with other stakeholders to develop a community referral system that is appropriate and sustainable.

Antenatal Care TBAs identify pregnant women in their neighborhood catchment areas and encourage them to register their pregnancies early (in the first trimester, if possible) at the health facility. TBAs monitor pregnant women during the antenatal period, promote antenatal care, and

identify danger signs during ante partum, labor, and the postnatal periods. Those mothers found to have danger signs are referred to the health facility. TBAs are refreshed in clean and safe delivery, including appropriate stimulation and resuscitation techniques for non-breathing babies.

Postnatal Care TBA/CHW teams coordinate to provide postnatal care to mother and baby. During the first week of life, the TBA visits the mother and newborn during the first 24 hours and on the third day following delivery. TBAs encourage mothers to attend the health canter for postnatal care on the sixth day. During this facility visit, health workers counsel the mother on family planning, issue a child card to the infant, and give first doses of OPV and BCG vaccines. From the seventh to the 59th day following birth, the CHW assesses the baby for danger signs and serious illnesses, while continuing to counsel the mother on breastfeeding, nutrition, and personal hygiene.