

COST OF FAMILY CARE INTERNATIONAL'S SKILLED CARE INITIATIVE IN KENYA AND TANZANIA

Stephanie Boulenger, MS
Tania Dmytraczenko, PhD

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AND TANZANIA**

ABSTRACT

Family Care International (FCI) launched the Skilled Care Initiative (SCI) in 2001 to increase the use of skilled care in selected project districts through a multi-faceted approach that improved the quality and availability of maternal health services, and included a comprehensive behavior change communication (BCC) component to promote increased use of skilled care before, during, and after childbirth. The objective of this study is to determine the cost of the skilled care package, including health systems components and community-focused BCC components in one district in Tanzania and two districts in Kenya. All input and unit cost data were collected through a retrospective analysis of financial records, budgets, reports, and all other available documents from FCI headquarters, and the field offices in Kenya and Tanzania. To supplement and verify the data, interviews with FCI staff were conducted. The total implementation cost of the SCI from 2002 to 2006 in Igunga district in Tanzania and Homabay and Migori districts in Kenya are 559,095 US\$, 364,469 US\$, and 277,140 US\$, respectively. The average annual cost of the SCI per delivery with a skilled birth attendant was 15.0 US\$ for Tanzania, and 10.6 US\$ for Kenya. The cost per capita was 1.7 US\$ for Tanzania, and 0.6 US\$ for Kenya. This study also provides the maintenance costs of the intervention beyond the implementation phase, and the replication costs, i.e. what would be the cost for a government to replicate the SCI interventions to other districts or additional facilities in Tanzania and Kenya.

CONTENTS

- Abstract..... v**
- Contents..... vii**
- Acronyms..... ix**
- 1. Background..... 1**
- 2. Study Objectives and Methodology..... 5**
 - 2.1 Costs..... 5
 - 2.1.1 Methodology for the measurement of the maintenance costs..... 8
 - 2.1.2 Methodology for the measurement of the replication costs..... 9
- 3. Results 13**
 - 3.1 Implementation costs of the Skilled Care Initiative..... 13
 - 3.2 Maintenance cost of the Skilled Care Initiative 15
 - 3.3 Replication cost of the Skilled Care Initiative 16
- 4. Conclusions..... 19**
- Annex 1: Content of Skilled Care Initiative Interventions in Tanzania and Kenya..... 21**
- Annex 2: List of Equipment Purchased 23**
- Annex 3: Breakdown of Implementation Costs 25**
- Annex 4: Recurrent and Capital Costs (US\$)..... 29**
- Annex 5: Maintenance Costs of the SCI, 2004-2011 31**
- Annex 6: Bibliography..... 35**

LIST OF TABLES

- Table 1: Health and socio-economic profile of the districts 2
- Table 2: SCI program implementation by district..... 6
- Table 3: Measurement unit of maintenance costs in Tanzania and Kenya..... 8
- Table 4: Frequency and measurement unit of replication costs in Tanzania..... 10

Table 5: Frequency and measurement unit of replication costs in Kenya	11
Table 6: Cost per activity – implementation, 2002-2006 (US\$).....	14
Table 7: Maintenance cost of the SCI, 2004-2011 (US\$).....	16
Table 8: Replication costs – Tanzania, 2007 (US\$).....	16
Table 9: Replication costs – Kenya, 2007 (US\$)	17
Table A-1. Content of Skilled Care Initiative interventions in Tanzania and Kenya	21
Table A3-1. Detailed breakdown of the implementation costs in Igunga, Tanzania (US\$)	25
Table A3-2: Detailed breakdown of the implementation costs in Homabay, Kenya (US\$).....	27
Table A4-1: Recurrent and capital costs per activity of the SCI implementation phase (US\$)	29
Table A4-2: Recurrent and capital costs per year of the SCI implementation phase (US\$)	30
Table A5-1: Maintenance cost of the SCI, 2004-2011, Igunga (US\$)	31
Table A5-2: Maintenance cost of the SCI, 2004-2011, Homabay (US\$)	33
Table A5-3: Maintenance cost of the SCI, 2004-2011, Migori (US\$)	34

LIST OF FIGURES

Figure 1: The continuum of maternal and newborn care	1
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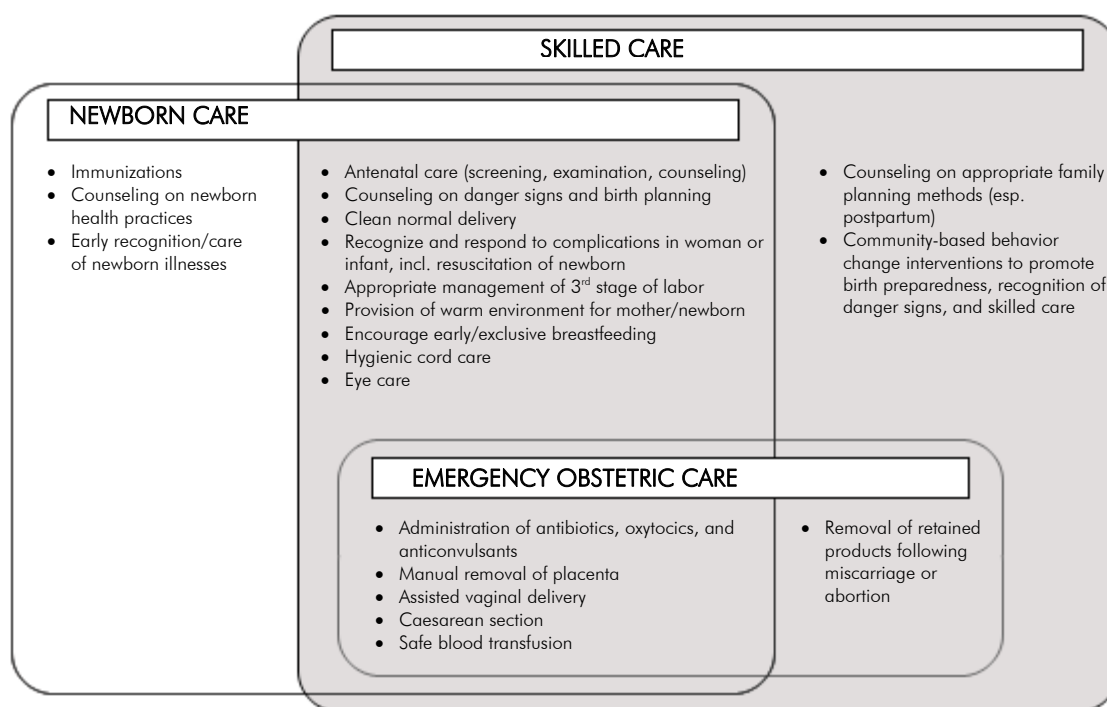
ACRONYMS

BCC	Behavior change and communication
COPE	Client-oriented, provider-efficient
DHMT	District health management team
FCI	Family Care International
HB	Hemoglobin
HMIS	Health management information system
LSS	Life-saving skills
MVA	Manual vacuum aspiration
PAC	Post-abortion care
PPC	Postpartum care
SBA	Skilled birth attendant
SCI	Skilled Care Initiative

I. BACKGROUND

In 2000, Family Care International (FCI) launched the Skilled Care Initiative (SCI), a five-year project funded by the Bill & Melinda Gates Foundation that aimed to increase the number of women who receive skilled care before, during, and after childbirth. The concept of skilled care acknowledges the central role of the skilled birth attendant (SBA) but also emphasizes the critical importance of the environment in which the services are provided.

FIGURE I: THE CONTINUUM OF MATERNAL AND NEWBORN CARE¹



Skilled maternity care encompasses a continuum of maternal and newborn care interventions, including emergency care for obstetric complications (see Figure 1). The skilled care approach decentralizes routine and emergency obstetric care for mothers and newborns to the lowest levels of the health system that can safely provide these services, thereby reaching those women who are least able to access hospital care, including the poor, uneducated, and those living in remote, rural settings. It aims to prevent obstetric complications through high-quality routine maternity care, and to ensure that complications that do develop are recognized promptly and managed appropriately, either on site or by referral to higher-level care. It promotes the rational use of limited resources in the health sector by

¹ Based on: G.L. Darmstadt, et al.[1]; Mia MacDonald and Ann Starrs [2]; and UNICEF/WHO/UNFPA [3]. The content of “essential newborn health packages” varies considerably by source. Save the Children’s “Every Newborn’s Health: Recommendations for Care for All Newborns,” for example, focuses on immediate newborn care (keeping the baby warm, cord care, eye care, exclusive breastfeeding, and routine immunizations); other documents are more comprehensive and cover most of the major components of skilled care during pregnancy and childbirth, recognizing that good maternal care is essential to neonatal survival.

easing pressure on district hospitals and ensuring that appropriate services can be provided by mid- and lower-level facilities.

The implementation of the SCI involved training maternity care providers in essential clinical, interpersonal, and decision-making skills for providing high-quality routine care throughout pregnancy, childbirth, and the postpartum period and for managing obstetric complications; strengthening health systems and creating an enabling environment that includes essential equipment, supplies, infrastructure, and supervision; improving emergency communications and transport systems to facilitate prompt referral of complicated cases to advanced levels of care; implementing community-level interventions to ensure that women can reach appropriate health facilities in time; and establishing strong national policies, programs, and guidelines in support of skilled care.

TABLE I: HEALTH AND SOCIO-ECONOMIC PROFILE OF THE DISTRICTS²

	Tanzania		Kenya		
	National	Igunga	National	Homabay	Migori
Total population [5], [6]	34,443,603 (2002)	324,094 (2002)	33,947,066 (2006*)	337,214 (2006*)	614,262 (2006*)
Life expectancy (years) [6], [7]	57 (2006)	n.a.	60.4 (1999)	40.7 (1999)	42.8 (1999)
Total fertility rate [8, 9]	5.7	n.a.	5.0 (1999)	6.1 (1999)	5.9 (1999)
Mortality rates [5, 10, 11]					
Infant (per 1,000 live births)	95 (2002)	84 (2002)	73 (2002)	133 (Nyanza, 2003)	
Under-5 (per 1,000)	153 (2002)	134 (2002)	110 (2004)	206 (Nyanza, 2003)	
Poverty					
Percentage of households below basic needs poverty line [12]	36% (2000/01)	48%	n.a.	n.a.	n.a.
Poverty incidence (% of individuals below poverty line)[13]	n.a.	n.a.	n.a.	Rural: 71% Urban: 73%	Rural: 48% Urban: 38%
Poverty gap (% of poverty line) ³ [13]	n.a.	n.a.	n.a.	Rural: 31% Urban: 31%	Rural: 16% Urban: 12%
Net primary school enrollment rate ⁴ [12]	59 (2000)	67 (2000)	70.7 (1999)	76.9 (1999)	75.4 (1999)
Adult literacy rate [12]	69.4% (2004)	49% (2000)	73.6% (2004)	n.a.	n.a.

*: Projections
n.a = not available

² The goal of this table is mainly to show where the districts of Igunga, Homabay, and Migori stand compared to the national average. In order for this comparison to be possible, the choice of source or year of data was based on the availability of the indicator data for the districts and for the whole country. When data for the districts were not available, the most recent data available at national level were used (e.g., life expectancy in Tanzania).

³ The poverty gap is mean distance below the poverty line as a proportion of the poverty line. The mean is measured across the whole population, counting the non-poor as having zero poverty gap. Source: World Bank. World Development Indicators. Washington, D.C., annual. (table 2.6).

⁴ Definition: The number of children enrolled in primary school who belong to the age group that officially corresponds to primary schooling, divided by the total population of the same age group.

The implementation of the SCI started in 2002 in the rural districts of Homabay and Migori in Kenya, and Igunga in Tanzania. The health and socio-economic profile of each district is presented in Table I. As shown in the table, most socio-economic indicators for the three SCI districts are worse than national averages, confirming that the districts are relatively disadvantaged. These districts had been chosen in consultation with the national Ministries of Health. They were selected based on a range of criteria, but a key consideration was that they were “average” districts that had not benefited from the presence of large outside donors. Because the districts were not better off than other districts, they were considered to be nationally representative of the investment needed for introducing the skilled care package.

In Tanzania, official estimates suggest that 8,700 women die each year from pregnancy-related causes, and maternal mortality constitutes a major health problem in Tabora Region (in which Igunga district is located), where only slightly more than a third of women deliver with a skilled attendant. At the start of the project, the use of skilled care in Igunga district was 44% [4]. The district of Igunga shows, on one hand, lower mortality rates, and higher school enrollment rates than the national average, but on the other, a higher incidence of poverty and a lower adult literacy rate.

In Kenya, the region where the SCI was implemented (Nyanza province) shows lower health and socio-economic status compared to the national average: higher mortality rate, lower life expectancy, higher total fertility rate. When the project began, the proportion of births taking place in health facilities was 29% in Homabay and 32% in Migori.

2. STUDY OBJECTIVES AND METHODOLOGY

The primary objectives of this study are to determine (1) what are the costs of implementing the SCl package, (2) what are the maintenance costs⁵ of the SCl intervention, and (3) what are the replication costs of the SCl intervention. This study analyzes Homabay and Migori districts in Kenya, and Igunga district in Tanzania.

2.1 COSTS

The SCl package is broken down into two main interventions, which in turn are divided into several activities.

- Intervention 1: Health Sector Strengthening
 - Activity 1: Strengthening health services management and introducing quality improvement approaches
 - Activity 2: Making structural improvements to health facilities
 - Activity 3: Providing maternal health equipment and consumables
 - Activity 4: Strengthening communication and referral system
 - Activity 5: Strengthening provider skills and competencies
- Intervention 2: Behavior Change Communication (BCC)
 - Activity 1: Developing BCC messages/materials
 - Activity 2: Implementing BCC campaign

Activities in Intervention 1 (health sector strengthening) were aimed at improving the quality and availability of skilled maternity care at all levels of the health system in the three districts. Specifically, the clinical interventions promoted through the project included focused antenatal care, including birth preparedness counseling; improved routine delivery care, including labor monitoring with the partograph and active management of the third stage of labor; emergency obstetric care, including newborn complications and post-abortion care; and early postpartum care (within 14 days) for mothers and newborns.

Health sector strengthening activities were complemented by a BCC intervention aimed at promoting increased use of skilled maternity care. However, BCC activities were only conducted in Igunga district (Tanzania) and Homabay district (Kenya). No BCC campaign or other BCC-related activities were undertaken in Migori district (Kenya). Annex I provides a detailed description of the

⁵ The maintenance costs can be defined as the cost that are incurred after the implementation phase and that are necessary to maintain the intervention, including repurchasing of equipment obtained during implementation, and training to maintain the skills of the health personnel.

interventions and activities implemented in Igunga and Homabay. Table 2 shows for each district the number of facilities where the SCI package was implemented and the number of people trained as part of the SCI implementation. In all the districts, the interventions covered all public health facilities, including hospitals, health centers, and dispensaries with the capacity to provide maternity care.

This study considers the cost of every activity that was necessary for the implementation and maintenance of the SCI from the perspective of the Kenyan and Tanzanian governments. The costs include the incremental, or additional, costs for a government to implement these activities but exclude the cost of health personnel, supplies, and infrastructures already in place, since these costs have already been incurred.

TABLE 2: SCI PROGRAM IMPLEMENTATION BY DISTRICT

	Igunga (TZ)	Homabay (KE)	Migori (KE)
Total number of births per year ⁶	13,774	13,387	24,386
Number of people trained through SCI by type of training ⁷			
Postpartum care registers ⁸	15	-	-
Computer skills	11	-	-
Health management info system (HMIS)	-	17	35
Indent	76	-	-
PAC	20	20	21
LSS	115	53	49
Number of facilities where the SCI was implemented			
Total	29	34	56
Hospitals	2	1	4
Health centers ⁹	5	13	13
Dispensaries	22	20	39

The incremental costs include consultant fees, facilitator fees, purchase of equipment (water supply, solar equipment, maternal health equipment, communication equipment, etc.), equipment installation, renovation costs, maintenance and repair costs of the purchased ambulance and medical equipment, fuel cost of the purchased ambulance, licensing fees for the referral system equipment (mobile phone or radio systems), printing costs, costs of meetings and trainings (which include per diems, hall hire, lunches and meals, accommodation, secretarial services, stationeries, supplies and printing), and any travel costs associated with the activities.

As a separate item, the study also considers the cost of two evaluations performed before and after the implementation of the SCI in Kenya and Tanzania. The studies included a facility-level survey to measure the availability and quality of skilled care at health facilities in the intervention districts, and population-based surveys to assess changes in service utilization and related knowledge, attitudes, and care-seeking behaviors during pregnancy, childbirth, and the postpartum period. These costs are not considered for the maintenance and replication, as these were very specifically related to the demonstration project and would not be repeated in maintenance or scale-up by the government.

⁶ See Box 2 in Chapter 3 for details on how these numbers were derived.

⁷ The table cells in which there is no figure means that this type of training was not conducted in that district. For example, no HMIS training was done in Igunga.

⁸ The registers should include information on each delivery, namely, date of admission, patient name, address, age, parity, gestation, date of delivery, time of delivery, mode of delivery, obstetric complication (if any), maternal outcome, sex of baby, neonatal weight, neonatal outcome and Apgar score, name of attending personnel, date of discharge.

⁹ Figures for the number of health centers in Kenya include the subdistrict hospitals, which generally resemble a health center more than a hospital.

However, a scaled-down version of the facility survey is included in the replication costs, as it is important for districts to have key data on the availability and quality of maternity care in their district as a basis for planning and evaluating their interventions.

The unit costs and the number of inputs (e.g. time spent by a consultant on a specific activity, number of equipment or drugs purchased, number of trainings, etc.) used for each activity and subactivity were estimated through a retrospective analysis of budgets, reports, and all available documents from FCI headquarters, and the field offices in Kenya and Tanzania. The costs reported in a certain month in these documents were converted into US dollars using the average monthly exchange rate.¹⁰ To supplement and verify the data, interviews with FCI staff at the headquarters was also conducted.

Cost items were each assigned to an activity (activity 1 to 5 of intervention 1, activity 1 and 2 of intervention 2) and it was determined whether each item was part of the implementation costs or the maintenance costs, or both.

In the case of Kenya, where the SCI was implemented in two districts, it was necessary to separate the costs for Migori versus Homabay. In some cases, this separation was obvious and it was possible to identify to which district an expenditure item went to. But in some cases, the expenditure reported in the budgets and financial reports was not disaggregated for each district. An example of this was the expenditure for the trainings that were organized for both districts at the same time. In order to allocate the expenditure between the two districts, either the number of facilities or the number of trainees from each district relative to the total was used.

The time horizon was five years for the implementation phase (2002 to 2006), and up to 2011 for the maintenance costs of the intervention.

For the analysis, a “useful life”¹¹ of one, three, five, or 10 years was assigned to each type of equipment purchased.¹² This in turn determined at which frequency the equipment needed to be re-purchased. For example, the weighing scales have a useful life of five years, which means that they need to be purchased every five years. The equipment included an ambulance (only in the case of Tanzania), water supply equipments, solar power equipment, and medical equipment. The rule used was one year for disposable equipment, three years for linens, five years for medical equipment, and 10 years for the ambulance, furniture, solar power equipment, and water supply equipment. These rules were based on a review of the literature [14, 15].

The inflation rate used was 2.67%. It represents the average inflation rate between 2001 and 2006 in the United States [16].

¹⁰ Source: www.oanda.com

¹¹ The useful life is defined as the life expectancy of an item.

¹² The list of equipment purchased for each country is provided in Annex 2.

2.1.1 METHODOLOGY FOR THE MEASUREMENT OF THE MAINTENANCE COSTS

The maintenance costs were evaluated for a total of 10 years from the onset of the SCI implementation, but maintenance costs only appear at year 3 after the first set of equipment was purchased. The starting point was to use the list of implementation activities in Annex 1. From this comprehensive list it was determined which items and activities would need to be carried out again and at which frequency in the years subsequent to the implementation. The estimation of the maintenance costs was based on the unit costs and quantities used in the implementation costs analysis. The units of measurement of the costs per activity are presented in Table 3. The inflation rate used was 2.67% [16].

To estimate the maintenance costs of the trainings it was determined, among all the trainings undertaken to implement the SCI, which ones would need to be re-conducted (either to refresh the skills and notions acquired during the implementation phase or to train new staff), and at what frequency.

TABLE 3: MEASUREMENT UNIT OF MAINTENANCE COSTS IN TANZANIA AND KENYA

	Tanzania	Kenya	
	Igunga	Homabay	Migori
Intervention 1: Health sector strengthening			
Activity 1: Strengthening health services management and introducing quality improvement approaches			
Maternity client files printing (maternity, antenatal, postnatal registers)		Entire district (34 facilities)	Entire district (56 facilities)
Supervision and follow-up of activities	23 facilities	57 facilities	
Activity 2: Structural improvements to health facilities			
Maintenance of solar power systems	12 facilities	12 facilities	20 facilities
Maintenance of water supply system		13 facilities	23 facilities
Activity 3: Maternal health equipment and consumables			
Maintenance of equipment	29 facilities	57 facilities	
Re-purchase of equipment	29 facilities	57 facilities	
Activity 4: Strengthening communication and referral system			
Ambulance	1 ambulance	No ambulance purchased	
Fuel			
Insurance			
Maintenance			
Re-purchase of equipment (Handie talkie, Repeater station)	11 facilities	-	-
Maintenance of equipment purchased during implementation phase	11 facilities	-	-
Licensing fees	11 facilities	-	-
Cell phone re-purchase	-	14 facilities	12 facilities
Cell phone charges	-	14 facilities	12 facilities
Activity 5: Strengthening provider skills and competencies			
LSS training	1 training per year (15 people)		
PAC training	1 training every 2 years (12 people)		
Intervention 2: Behavior Change Communication			
	District with a population of about 325,000	District with a population of about 337,000	-

The second element related to equipment that was taken into account for the maintenance costs is the cost of repairs, cleaning, and general maintenance of the new equipment.. They are indicative of the total amount that would be needed to ensure that the SCI is being fully implemented. The rules used were the following [14]:

- 5% of the unit cost for the equipment with three or five years of useful life¹³
- 10% of the unit cost for equipment with 10 years of useful life¹⁴

For the ambulance in Tanzania, the cost of maintaining the vehicle was obtained directly from the retrospective analysis.

It can be noted that several subactivities from the implementation phase were dropped for the maintenance phase. The following trainings were considered not to be necessary for the maintenance phase: postpartum care registers,¹⁵ computer skills, COPE, HMIS, indent, BCC campaign. Some activities that only needed to be done prior to the implementation were excluded such as: postpartum care registers development, pre-test of postpartum care register, Community Health Fund study, ambulance manuals, radio call books, referral forms, clinical flowcharts, district health management team (DHMT) orientation, BCC qualitative study, BCC launch, BCC materials preparation, BCC traditional leaders study and BCC feedback meeting. Furthermore, the purchase of some of the equipment with a useful life of 10 years (because of the timeframe of the evaluation which is until 2011) and renovations in Kenya were not considered in the timeframe of the maintenance costs analysis.

For the LSS and PAC trainings, it was assumed that one training per year for each topic would be done. For the BCC campaign, compared to the implementation costs, it was assumed that in Tanzania, only one booklet would be printed instead of two, and that it would be printed every two years.

2.1.2 METHODOLOGY FOR THE MEASUREMENT OF THE REPLICATION COSTS

The underlying rationale for estimating the replication cost is to provide some indication of what it would cost to conduct and apply the SCI activities to other districts in Kenya and Tanzania.

The first step of the estimation was to select the activities and, within each activity, the cost items relevant for replicating the activities (i.e. recurrent costs), thus excluding any implementation (or fixed) cost that would not need to be re-incurred, such as developing training curricula. The second step was to convert the cost into 2007 values using the 2.67% inflation rate. The third step was to determine the unit of measurement or denominator of each replicated activity. The denominators are shown in Tables 4 and 5 below. The tables also indicate at which frequency each activity would need to be replicated. For example, if the government of Tanzania decides to implement the SCI activity in another district, the training for postpartum care registers would need to be done one time, whereas the LSS training would be carried out annually.

¹³ Three years was assigned to linens and five years for other medical equipments.

¹⁴ Ten years was assigned to furniture, solar power systems, and VHF base stations.

¹⁵ The registers should include information on each delivery, namely, date of admission, patient name, address, age, parity, gestation, date of delivery, time of delivery, mode of delivery, obstetric complication (if any), maternal outcome, sex of baby, neonatal weight, neonatal outcome and Apgar score, name of attending personnel, date of discharge.

TABLE 4: FREQUENCY AND MEASUREMENT UNIT OF REPLICATION COSTS IN TANZANIA

	Frequency	Measurement Unit
Activity 1: Strengthening health services management and introducing quality improvement approaches		
Training postpartum care (PPC) register	1 time	Maternity staff trained
Training computer skills	1 time	Trainee
COPE training	1 time	District hospital
Supervision and follow-up		
Indent	Annual	23 facilities
Referral system	Annual	District
Activity 2: Structural improvements to health facilities		
Solar power system	1 time	Facility
Activity 3: Maternal health equipment and consumables		
Equipment	1 time	Facility
Indent training	Annual	Trainee
Activity 4: Strengthening communication and referral system		
Ambulance	1 time	Ambulance
Equipment	1 time	Facility
Licensing fees	Annual	Radio call system
Radio call books	1 time	Facility
Referral forms	1 time	Facility
Activity 5: Strengthening provider skills and competencies		
LSS training	Annual	Trainee
Job Aid	1 time	District
PAC training	Every 2 years	Trainee
Behavior Change Communication Intervention	1 time ¹⁶	District with a population of about 325,000
Facility gap assessment	1 time	District

Additionally, the tables show, for example, that the LSS training (part of Activity 5) in Tanzania would need to be conducted every year and its estimated value is per trainee or per session of about 15 trainees. A third example is purchase of maternal health care-related equipment for Kenya (Activity 3); it would need to be purchased only one time, at the beginning of the implementation phase, and the indicated value is the average cost per facility.

¹⁶ After the BCC is replicated, the cost of printing booklets as educational materials every two years and the cost of distribution and promotional activities for the BCC need to be considered. See their estimated value in Annex 7.

TABLE 5: FREQUENCY AND MEASUREMENT UNIT OF REPLICATION COSTS IN KENYA

	Frequency	Measurement Unit
Activity 1: Strengthening health services management and introducing quality improvement approaches		
HMIS training	1 time	Trainee
Maternal health registers and register schedule (Printing and distribution)	Annual	District
COPE	1 time	Facility
Supervision and follow-up	Annual	Facility
Activity 2: Structural improvements to health facilities		
Renovations	1 time	Facility renovated
Solar power system	1 time	Facility
Water supply system	1 time	Facility
Activity 3: Maternal health equipment and consumables		
Equipment	1 time	Facility
Activity 4: Strengthening communication and referral system		
Cell phone purchase	1 time	Facility
Cell phone annual charge	Annual	Facility
Activity 5: Strengthening provider skills and competencies		
LSS training	Annual	Trainee
PAC training	Every 2 years	Trainee
Clinical flowcharts (Printing)	1 time	Facility
DHMT orientation	1 time	District
Behavior Change Communication Intervention	1 time ¹⁷	District with a population of about 337,000
Evaluation studies		
Rapid assessment	1 time	District

¹⁷ After the BCC is replicated, the cost of printing booklets as educational materials every two years and the cost of distribution and promotional activities for the BCC need to be considered. See their estimated value in Annex 7.

3. RESULTS

3.1 IMPLEMENTATION COSTS OF THE SKILLED CARE INITIATIVE

The total implementation cost of the SCI from 2002 to 2006, shown in Table 6, was 819,475 US\$ in Igunga (Tanzania), 648,228 US\$ in Homabay (Kenya) and 583,081 US\$ in Migori (Kenya). When the costs of the household and facility surveys are excluded, the implementation costs of the SCI in Igunga, Homabay, and Migori are 559,095 US\$, 364,469US\$, and 277,140 US\$, respectively. A detailed breakdown of the costs per intervention, activity and per year in each district is available in Annex 3.

In Igunga, the most expensive set of activities (excluding the evaluation studies) was that aimed at strengthening provider skills and competencies (Activity 5) followed by the BCC campaign. The components of the first were trainings provided to health workers on LSS, PAC, a gestational pregnancy wheel (for calculating expected due dates), and the development and distribution of an obstetric job aide. This set of activities was more expensive in the Tanzania district because of the larger number of providers trained in Igunga (115), compared to only 53 and 49 providers, respectively, in Homabay and Migori districts. Generally, the facilities in the two intervention districts in Kenya had lower staffing levels than those in Tanzania, and thus, there were fewer staff available to benefit from training.

In Homabay, the activity with the highest cost (excluding the evaluation studies) was the BCC campaign. The main cost items (shown in Annex 4) of the BCC campaign were the production of promotional materials, such as khangas, bags, and tee shirts, and educational materials, including leaflets, booklets, and flipcharts. These items represent 41.1% and 21.5%, respectively, of the total cost of the BCC campaign. The other components were a qualitative study to design the campaign (19.4% of total BCC cost), the activities to distribute and promote the materials (12.3% of total BCC cost), and the trainings of the troops delivering messages (5.7% of total BCC cost).

In Igunga, the BCC promotional and educational materials represented 25.5% and 24.7%, respectively, of the total cost of the BCC campaign. The other main components were a qualitative study to design the campaign (13.4% of total BCC cost), the launch of the BCC campaign (9.7% of total BCC cost), the activities to distribute and promote the materials (7.4% of total BCC cost) and the trainings of the troops delivering messages (9.3% of total BCC cost).

In Migori, structural improvements to health facilities (Activity 2) required the most financial resources. This activity was based on renovating 10 health facilities, and on equipping 32 facilities with

**Box 1:
Life Saving Skills and
Post-Abortion Care Trainings**

LSS training covered skills for routine maternal health services (antenatal care, normal delivery care and postpartum care), as well as recognition and management of obstetric complications, such as severe anemia, retained placenta, sepsis, abnormal presentation, hemorrhage, and health conditions worsened by pregnancy.

PAC training covers clinical and counseling skills for post-abortion clients, including treatment of incomplete abortion using manual vacuum aspiration (MVA), and post-abortion counseling on self-care and the return of fertility, as well as post-abortion contraception.

solar power systems and water supply systems. It was the second most costly activity for Homabay. In Igunga, the cost of this activity was much lower because no renovations were performed; only solar power systems and water supply systems were purchased and installed.

The costs of the interventions in Tanzania and Kenya differ because they did not focus on the same activities, depending on the needs and priorities identified in each district through baseline evaluation activities. In Igunga, the need for strengthening the communication and referral system (Activity 4) was greater than in both districts in Kenya. The cost of the activity was much higher because it involved purchasing an ambulance and radio-call system versus only purchasing cellular phones for Kenyan districts. FCI funds were used to cover the costs of solar equipment and repairs/renovations at health facilities because both Homabay and Migori district already had ambulances for transportation of obstetric emergencies.

In Kenya FCI opted to purchase cell phones for the health facilities rather than a radio call system, because the annual radio licensing fee was prohibitively expensive – the DHMTs would not have been able to assume the cost of this service once the project ended. FCI was able to choose the much less expensive option of providing cell phones because the districts already had cell phone connectivity.

Data in Annex 3 also show that LSS training was more expensive in Tanzania than in Kenya. The first source of difference is the length of the training: it lasted three weeks in Tanzania versus two weeks in Kenya. LSS training curricula were developed in consultation with a range of key stakeholders and experts in each country. In Tanzania, the group developing the LSS curriculum felt strongly that the advanced LSS course required three weeks to ensure mastery of skills. In Kenya, a comparable group felt that only two weeks were necessary and feasible, given that participation in such a course inevitably meant that facilities were short-staffed while their staff was attending training. The second source of difference is that Tanzania used national, more expensive, trainers; in Kenya, provincial resource persons conducted the training. In both countries, FCI used the national LSS training curriculums that have been developed based on internationally available curricula, including the American College of Nurse-Midwives, and the World Health Organization’s midwifery training modules.

TABLE 6: COST PER ACTIVITY – IMPLEMENTATION, 2002-2006 (US\$)

	Igunga (TZ)	Homabay (KE)	Migori (KE)
Activity 1: Strengthening health services management and introducing quality improvement approaches	23,158.55	16,010.25	18,420.04
Activity 2: Structural improvements to health facilities	17,861.58	75,206.09	99,866.46
Activity 3: Maternal health equipment and consumables	67,413.21	56,037.10	94,773.36
Activity 4: Strengthening communication and referral system	105,715.15	11,097.19	9,511.88
Activity 5: Strengthening provider skills and competencies	191,893.44	58,554.18	54,568.32
Behavior Change Communication Intervention	153,052.96	147,564.57	
Sub-total	559,094.90	364,469.38	277,140.06
Evaluation studies	260,380.45	283,758.75	305,941.38
Total	819,475.35	648,228.13	583,081.43

The average annual cost of the SCI per delivery with a SBA was 15.0 US\$ for Tanzania, and 10.6 US\$ for Kenya. (The SCI cost per capita was 1.7 US\$ for Tanzania, and 0.6 US\$ for Kenya.) See Box 2 for a description of the methodology used to calculate these values. When including the evaluation study costs, the average annual cost of the SCI per delivery with a SBA is 22.0 US\$ in Igunga, 20.4 US\$ in Kenya. These figures are another way of looking at the results and the costs of the intervention, and they provide an indication of the incremental investment needed to achieve higher rates of deliveries with SBAs.

Box 2:
Methodology for estimating the average annual cost of SCI per delivery with a skilled birth attendant

The first step is to calculate the annual number of deliveries with a SBA

=

Number of birth per year per district * Percentage of deliveries with a SBA
where Number of birth per years = Crude birth rate * District population/1,000

The second step is to annualize the total cost of the SCI intervention and divide it by the annual number of deliveries with a SBA

	Igunga	Homabay	Migori
Number of deliveries with a SBA	7,438	3,541	8,523
Crude birth rate	42.5 [9]	37.5 [10]	
District population	324,094 [5]	337,214 [6]	614,262 [6]
Percentage of deliveries with a SBA	54% [17]	28% [17]	37% [17]

During the implementation phase, capital costs represented, on average for the three districts, 20% of the total costs. Capital costs refer to costs of goods that have a useful life of more than one year, i.e., are not consumed or replaced every year. The capital costs in this study include medical equipment, an ambulance in the case of Tanzania, radio call systems, water supply systems, and solar power systems. The detailed figures on recurrent and capital costs are presented in Annex 4.

3.2 MAINTENANCE COST OF THE SKILLED CARE INITIATIVE

The annual maintenance costs of the SCI are presented in Table 7. The table shows, by district, the annual cost of maintaining the SCI once the implementation activities have taken place. Annex 5 presents the costs in more detail, i.e. per district, activity, and sub-activity.

It should be noted that the high increase in certain years, for example in year 7 in Tanzania, correspond to years where heavy capital equipment will need to be replaced such as solar or water supply equipments.

TABLE 7: MAINTENANCE COST OF THE SCI, 2004-2011 (US\$)

	2004	2005	2006	2007	2008	2009	2010	2011
	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Igunga	8,256.92	64,945.40	42,059.31	75,117.54	98,242.04	79,138.08	51,135.07	83,060.74
Homabay	304.29	3,007.22	52,621.58	50,346.01	67,143.45	65,866.53	82,283.80	62,585.13
Migori	128.44	3,180.69	34,124.20	29,718.72	46,545.56	45,720.43	102,375.32	33,082.11

3.3 REPLICATION COST OF THE SKILLED CARE INITIATIVE

Tables 8 and 9 provide information on what would be the cost for a government to replicate the SCI interventions in other districts or additional facilities in Tanzania and Kenya. The replication costs assume for the trainings that their length would be the same as during the implementation phase and that similar curricula would be used. The equipment purchased would basically be the same as the ones purchased during the implementation phase (as presented in Annex 1).

TABLE 8: REPLICATION COSTS – TANZANIA, 2007 (US\$)

Activity 1: Strengthening health services management and introducing quality improvement approaches	
Training PPC Register	13 US\$ per maternity staff
Training computer skills	231 US\$ per trained person
COPE training	6,748 US\$ for a district hospital
Supervision and follow-up	
Indent	736 US\$ for 23 facilities
Referral system	187 US\$ for a district
Activity 2: Structural improvements to health facilities	
Solar power system	1,578 US\$ per facility
Activity 3: Maternal health equipment and consumables	
Equipment	2,010 US\$ per facility
Indent training	197 US\$ per trained person
Activity 4: Strengthening communication and referral system	
Ambulance	44,551 US\$
Equipment	5,861 US\$ per facility
Licensing fees	693 US\$ per radio call system per year
Radio call books	93 US\$ per facility
Referral forms	34 US\$ per facility
Activity 5: Strengthening provider skills and competencies	
LSS training	1,534 US\$ per trained person (training conducted every year)
Job Aid	23,347 US\$ per district
PAC training	1,045 US\$ per trained person (training conducted every two years)
Behavior Change Communication Intervention	
	166,419 US\$ for a district with a population of about 325,000 or of about 14,000 births per year
Evaluation Studies	
Facility gap assessment	10,880 per district

TABLE 9: REPLICATION COSTS – KENYA, 2007 (US\$)

Activity 1: Strengthening health services management and introducing quality improvement approaches	
HMIS training	97 US\$ per trained person
Maternal health registers and register schedule (Printing and distribution)	4,448 US\$ per district
COPE	1,151 US\$ per facility
Supervision and follow-up	182 US\$ per facility
Activity 2: Structural improvements to health facilities	
Renovations	7,190 US\$ per facility renovated
Solar power system	2,895 US\$ per facility
Water supply system	578 US\$ per facility
Activity 3: Maternal health equipment and consumables	
Equipment	2,753 US\$ per facility
Activity 4: Strengthening communication and referral system	
Cell phone purchase	80 US\$ per facility
Cell phone annual charge	299 US\$ per year per facility
Activity 5: Strengthening provider skills and competencies	
LSS training	820 US\$ per trained person (training conducted every year)
PAC training	796 US\$ per trained person (training conducted every 2 years)
Clinical flowcharts (Printing)	45 US\$ per facility
DHMT orientation	739 US\$ per district
Behavior Change Communication Intervention	
	125,810 US\$ for a district with a population of about 337,000 or of about 13,400 births per year
Evaluation Studies	
Rapid assessment ¹⁸	10,880 US\$ per district

For example, if the Ministry of Health wanted to train its health personnel in LSS, it would cost about 1,534 US\$ per trained person in Tanzania and, on average, 820 US\$ per trained person in Kenya. Similarly, equipping health facilities with medical and maternal health equipment would cost, per facility, about 2,010 US\$ in Tanzania and 2,753 US\$ in Kenya.

It should be noted that as the replication scale increases, there are opportunities for economies of scale. This means that as the number of trained personnel or quantity of goods and materials purchased or produced increases, their unit costs could potentially decrease. For example, the unit cost of equipment will become cheaper as the quantities purchased increases. So as the government replicates the SCI intervention at a national scale or to a greater number of districts, the costs evaluated in Tables 8 and 9 could in fact be lower.

In parallel to this costing study, FCI conducted a household and a facility survey to measure the availability and quality of skilled care and to assess changes in service utilization and related knowledge, attitudes, and care-seeking behaviors during pregnancy and childbirth. The baseline surveys and end-line surveys were conducted in Kenya in 2003 and in Tanzania in 2006. These report are available through FCI.

¹⁸ The Rapid Assessment is for identifying priority gaps at health facilities in terms of staff training and equipment.

4. CONCLUSIONS

The average annual cost of the SCI per delivery with a skilled birth attendant was 15.0 US\$ for Tanzania, and 10.6 US\$ for Kenya. The SCI cost per capita was 1.7 US\$ for Tanzania, and 0.6 US\$ for Kenya. It was not possible to identify in the literature studies measuring the costs of similar interventions: either the interventions or the type of costs measured differed too much to be compared and to be able to draw conclusions.

But the series “Investing in Maternal Health” [18], which analyses the decline in maternal mortality in Malaysia and Sri Lanka in the past 5060 years, concludes that it is not the level of expenditure but rather the specific interventions that make the difference in lowering maternal mortality. Among those interventions identified in Malaysia and Sri Lanka that contributed to decreasing maternal mortality are well-trained midwives adequately supplied and equipped and supervised and supported by nurse-midwives and a small number of medical doctors; rapid expansion of ambulance services; institutionalization of systems for maternal death reviews; integration of family planning services into maternal and child health programs; targeting of the poor; and removal of financial, geographic and cultural barriers for the poor to access maternal health care. Most of these interventions are the foundation of the SCI package, so the SCI could represent a replicable “model” for scaling-up of maternal health services in developing countries.

Scaling up the SCI intervention will require some additional investments on the part of governments to ensure effectiveness and sustainability of the intervention, such as the recruitment and deployment of additional SBA cadres, upgrading of health facilities to deal with increased client flows, and provision of additional equipment and consumables. While the SCI could not address all of these broader health system challenges, as they would not have been sustained after the project ended, related advocacy efforts were partially successful in getting governments to post a few extra providers to the intervention districts. Nonetheless, most facilities are still functioning below the norms, and additional investment is needed.

It is critical to recognize and acknowledge that investments made in maternal health extend far beyond the sole area of maternal health, such as poverty, child survival, and other health care services provided in facilities.

First, reducing maternal and perinatal mortality can help reduce poverty by freeing up resources otherwise diverted to health crises, which in turn stimulates economic activity and can feed back into improvements in maternal and perinatal health, and can be a means of achieving wider health service improvements [19].

Second, investing in maternal health is directly linked to improving child survival: the latter cannot be achieved without the former. Indeed, maternal health and health care are an essential determinant of neonatal survival: complications during labor are a determinant of fetal and neonatal survival and health, intrapartum risk factors are associated with greater increases in risk of neonatal death than those identified during pregnancy, obstructed labor and malpresentation carry the highest risk of neonatal death and require skilled intervention. [20].

Third, among the benefits that were not measured and captured in the cost of the intervention and which could potentially reduce the overall costs of the SCI are the non-obstetric benefits. The SCI is

an intervention aimed at improving the quality and availability of maternal health services. By doing so, it also benefits other medical specialties in a health facility because the equipment purchased or skills acquired can be used for other services than the ones related to maternal health or obstetric care. For example, the blood pressure machines purchased can be used for interventions other than deliveries; the same goes for stethoscopes and scales. The availability of equipment can improve the quality of care, increase the availability of care, and improve the working conditions of the health personnel. Likewise, we can also assume that the training received by the health workers has had an impact on other services than obstetric care. These factors in turn have an impact on the use of care by the population and thus the health status of the population. A patient is more likely to return or seek care from a health facility that has equipment available and high-quality service. But further research is needed to assess the impact of maternal health packages on broader health systems.

The findings of this report will contribute to documenting the cost of maternal health interventions and the marginal costs of implementing packages similar to the SCI. The data provided can be used to inform evidence-based decision making, can help in better planning for maternal health services, can help the budgeting process for health, and can be used for advocating for funding for these services.

ANNEX I: CONTENT OF SKILLED CARE INITIATIVE INTERVENTIONS IN TANZANIA AND KENYA

TABLE A-1. CONTENT OF SKILLED CARE INITIATIVE INTERVENTIONS IN TANZANIA AND KENYA

		Tanzania	Kenya
Intervention 1: Health Sector Strengthening	Activity 1: Strengthening health services management and introducing quality improvement approaches	<ul style="list-style-type: none"> • Postpartum care registers: development, printing, and distribution. • Trainings: <ul style="list-style-type: none"> • Postpartum care registers • Computer skills • Supportive/facilitative supervision for district health managers • Training COPE¹⁹ 	<ul style="list-style-type: none"> • Maternal health registers: development, printing, and distribution • Trainings: <ul style="list-style-type: none"> • HMIS • Training COPE
	Activity 2: Structural improvements to health facilities	<ul style="list-style-type: none"> • Solar equipment: purchase and installation • Renovation of facilities • Training of staff in use and maintenance of solar equipment 	<ul style="list-style-type: none"> • Water supply and solar equipment: purchase and installation • Renovation of facilities • Training of staff in use and maintenance of water supply and solar equipment
	Activity 3: Maternal health equipment and consumables ²⁰	<ul style="list-style-type: none"> • Community Health Fund study • Equipment: purchase and installation • Training: Indent 	<ul style="list-style-type: none"> • Equipment: purchase and installation
	Activity 4: Strengthening communication and referral system	<ul style="list-style-type: none"> • Ambulance: Purchase, insurance, translation of utilization manual • Communications equipment (handie talkie, repeater station, mobile radio): purchase and installation • Referral forms: printing 	<ul style="list-style-type: none"> • Purchase of mobile phone • Training: use of the phones

¹⁹ COPE® stands for “client-oriented, provider-efficient” services. It is a process for improving quality in health services. The COPE tools include (i) a series of self-assessment guides, including a record-review checklist, (ii) client-interview guides, (iii) client-flow analysis, (iv) action plan. FCI adapted EngenderHealth’s COPE.

²⁰ The list of equipment purchased in each country is provided in Annex 2.

		Tanzania	Kenya
		<ul style="list-style-type: none"> • Training: use, maintenance, and monitoring of communications equipment and ambulance 	
	Activity 5: Strengthening provider skills and competencies	<ul style="list-style-type: none"> • Obstetric Job Aid²¹: development (including pre-test and review) and printing • Training: <ul style="list-style-type: none"> • Life-Saving Skills (LSS)²² • Post-abortion care (PAC)²³ • Wheel calendar 	<ul style="list-style-type: none"> • Clinical flowcharts: printing • Training: <ul style="list-style-type: none"> • LSS • PAC • District health management team
Intervention 2: Behavior Change Communication (BCC)	Activity 1: Development of BCC messages/materials	<ul style="list-style-type: none"> • Pre-testing of materials • Training of troops and actors • Survey <p><u>Materials</u> include khangas, booklets, pamphlets, and posters.</p>	<p><i>Note that the BCC intervention was implemented in the Homabay district only</i></p> <ul style="list-style-type: none"> • Pre-testing of materials • Training of troops and actors • Survey <p><u>Materials</u> include khangas, booklets, pamphlets, posters, bags, tee-shirts</p>
	Activity 2: Implementation of BCC campaign	<ul style="list-style-type: none"> • BCC launch • Participatory theater and folk media • Health workers seminar • Mamanju • Safety week • Traditional leaders meeting 	<p><i>Note that the BCC intervention was implemented in the Homabay district only</i></p> <ul style="list-style-type: none"> • BCC launch • Participatory theater and folk media • SDA Women’s Day • Community Health Days • • Women group leaders meeting

²¹ Job Aid is a quick reference tool that enables providers at all levels of the health system to quickly recognize complications and take appropriate steps to stabilize and/or manage the case.

²² LSS training covered skills for routine maternal health services (antenatal care, normal delivery care, and postpartum care), as well as recognition and management of obstetric complications, such as severe anemia, retained placenta, sepsis, abnormal presentation, hemorrhage, and health conditions worsened by pregnancy.

²³ PAC training covers clinical and counseling skills for post-abortion clients, including treatment of incomplete abortion using manual vacuum aspiration (MVA), and post-abortion counseling on self-care and the return of fertility, as well as post-abortion contraception.

ANNEX 2: LIST OF EQUIPMENT PURCHASED

TANZANIA

Ambu bag,	Gasket,	Stethoscope,
Amniotomy device,	Glass slides,	Straight catheter,
Autoclave,	HB calorimeter,	Stretcher,
Baby towel,	Microscope, microscope	Suction catheter,
Bed pan,	Needle holder,	Suction machine,
Bedside lamp,	Neonatal resuscitation (bag	Tape measure,
BP machine,	Neonatal resuscitation tray,	Test tubes,
C-section kit,	Oxygen concentrator,	Tourniquet,
D & C set,	Pint measure,	Urine dipstick,
Delivery kit,	Protective clothing,	Vacuum extractor,
Drabkin's solution,	RPR,	Watch,
Dressing drum,	Scissors,	Water bath,
Episiotomy scissors,	Speculum,	Weighing scale (adult,
Examination bed,	Sterilizer,	Wheelchair.
Fetal scope,		
Foley Catheter &		

KENYA

Ambu Bag	Hand washing station	Screen
Autoclave	Hospital bed	Screen cover
Bedside lockers	Incubator	Speculum
Boiling basins	Laryngoscope	Sphygmomanometer
Bowl stand	Linen trolley	Stainless steel trolley
BP Machine	Manual suckers	Sterilizing drum
C-section kit	Mayo trolley	Stethoscope
Delivery bed	Medicine trolley	Suction machine
Delivery kit	MVA kit	Suture materials
Dressing drum	Operating table	Tenaculum forceps
Drip stand	Operation light	Theatre boots
Equipment trolley	Oxygen flowmeter	Theatre light
Examination bed	Humidifier and regulator	Vacuum extractor
Examination couch	Patient trolley	Ward beds
Examination lamp	Resuscitation kit	Ward screen
Fetal scope	Revolving stools	Weighing scale (adult infant).
Gowns	Hand washing station	

ANNEX 3: BREAKDOWN OF IMPLEMENTATION COSTS

TABLE A3-I. DETAILED BREAKDOWN OF THE IMPLEMENTATION COSTS IN IGUNGA, TANZANIA (US\$)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	2002	2003	2004	2005	2006	
INTERVENTION I: HEALTH SECTOR STRENGTHENING						
Activity 1: Strengthening health services management and introducing quality improvement approaches						
PPC registers development		750.00				750.00
Pre-test of PPC Register		47.61	334.33			381.94
Training PPC Register			1,398.89			1,398.89
Training computer skills				2,410.83		2,410.83
COPE training				6,492.21		6,492.21
Supervision and follow-up						
Indent			578.30	104.05		682.35
LSS		1,227.85	2,111.38	7,278.13		10,617.35
Referral system			173.14			173.14
Task force			251.84			251.84
Total		2,025.46	4,847.87	16,285.22		23,158.55
Activity 2: Structural improvements to health facilities						
Solar power system		1,800.00		16,061.58		17,861.58
Total		1,800.00		16,061.58		17,861.5
Activity 3: Maternal health equipment and consumables						
Community Health Fund study		390.00				390.00
Equipment		48,178.84	62.14	4,974.14		53,215.12
Indent training			13,808.09			13,808.09
Total		48,568.84	13,870.23	4,974.14		67,413.21
Activity 4: Strengthening communication and referral system						
Ambulance manuals	618.97	321.72	224.32			1,165.01
Ambulance		35,506.48	4,296.19	1,762.77		41,565.43
Equipment		24,328.31	21,546.00	13,398.17		59,272.48
Licensing fees		670.24	652.71	635.19	674.57	2,632.71
Radio call books		219.18		30.90		250.08
Referral forms			829.44			829.44
Total	618.97	61,045.93	27,548.66	15,827.02	674.57	105,715.15
Activity 5: Strengthening provider skills and competencies						
LSS training	7,499.97	65,106.08	75,705.03			148,311.09
Job Aid				22,148.57		22,148.57
PAC training			15,957.49	3,450.00		19,407.49
Wheel calendar training			2,026.30			2,026.30
Total	7,499.97	65,106.08	93,688.82	25,598.57	0.00	191,893.44

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	2002	2003	2004	2005	2006	
INTERVENTION 2: BEHAVIOR CHANGE COMMUNICATION						
Qualitative study	20,495.94					20,495.94
BCC launch			14,883.25			14,883.25
BCC materials preparation			4,821.99			4,821.99
BCC materials (Printing and production)						
Educational materials			36,857.56	1,008.15		37,865.71
Promotional materials			38,997.44			38,997.44
Trainings			14,238.36	50.13		14,288.49
Educational materials distribution and promotional activities			5,192.43	6,180.27		11,372.70
Traditional leaders study			2,509.65			2,509.65
Feedback meeting				7,817.79		7,817.79
Total	20,495.94	0.00	117,500.67	15,056.35	0.00	153,052.96
EVALUATION STUDIES						
Facility survey	29,052.86	3,350.00	2,775.53		25,614.17	60,792.56
Household survey	36,175.75	13,426.07	10,144.99	336.29	129,713.18	189,796.27
Facility gap assessment	9,791.62					9,791.62
Total	75,020.23	16,776.07	12,920.52	336.29	155,327.35	260,380.45
Total SCI implementation costs (without evaluation study)	28,614.89	178,546.32	257,456.26	93,802.87	674.57	559,094.90
Total SCI implementation costs (with evaluation study)	103,635.11	195,322.39	270,376.77	94,139.16	156,001.92	819,475.35

TABLE A3-2: DETAILED BREAKDOWN OF THE IMPLEMENTATION COSTS IN HOMABAY, KENYA (US\$)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	2002	2003	2004	2005	2006	
INTERVENTION 1: HEALTH SECTOR STRENGTHENING						
Activity 1: Strengthening health services management and introducing quality improvement approaches						
HMIS training			1,461.07			1,461.07
Maternal health registers and register schedule		83.11	2,178.07	1,048.54		3,309.73
COPE		1,585.49	1,479.43	3,057.69		6,122.60
Supervision and follow-up						
BCC		303.03				303.03
COPE				614.09		614.09
Equipment inventory	53.64			70.48	403.42	527.54
LSS/PAC		320.33	1,614.38	277.67		2,212.37
MOH and DO health center visits		210.19				210.19
Renovations			63.06	1,123.36		1,186.42
Others				63.20		63.20
Total	53.64	2,502.15	6,796.01	6,255.03	403.42	16,010.25
Activity 2: Structural improvements to health facilities						
Renovations				33,581.97		33,581.97
Solar power system (equipment and installation)			10,223.18	25,343.30		35,566.48
Water supply system (equipment and installation)				6,057.65		6,057.65
Total			10,223.18	64,982.91		75,206.09
Activity 3: Maternal health equipment and consumables						
Equipment		6,143.04	12,208.47	26,808.93	10,876.66	56,037.10
Total		6,143.04	12,208.47	26,808.93	10,876.66	56,037.10
Activity 4: Strengthening communication and referral system						
Cell phone purchase			1,029.00			1,029.00
Cell phone monthly charge			1,974.00	3,967.74	4,126.45	10,068.19
Total			3,003.00	3,967.74	4,126.45	11,097.19
Activity 5: Strengthening provider skills and competencies						
LSS training		19,741.09	5,176.38	15,135.79		40,053.26
PAC training		10,616.80	2,075.21	2,771.13		15,463.15
Clinical flowcharts			370.01	1,486.56		1,856.56
DHMT orientation			731.78			731.78
Site assessment		449.42				449.42
Total		30,807.32	8,353.38	19,393.48		58,554.18
INTERVENTION 2: BEHAVIOR CHANGE COMMUNICATION						
Qualitative study	28,640.83					28,640.83
BCC materials (Printing and production)						0.00
Educational materials			7,316.34	24,401.00		31,717.35
Promotional materials			2,875.74	57,813.67		60,689.41

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	2002	2003	2004	2005	2006	
Trainings			5,039.26	3,329.73		8,368.99
Educational materials distribution and promotional activities			802.09	17,345.89		18,147.99
Total	28,640.83		16,033.44	102,890.30		147,564.57
EVALUATION STUDIES						
Household survey	195.37	109,461.13	25.75		129,919.99	239,602.24
Facility survey	19,043.38				15,321.51	34,364.89
Facility gap assessment	9,791.62					9,791.62
Total	29,030.37	109,461.13	25.75		145,241.50	283,758.75
Total SCI implementation costs (without evaluation study)	28,694.47	39,452.51	56,617.48	224,298.39	15,406.53	364,469.38
Total SCI implementation costs (including evaluation study)	57,724.84	148,913.63	56,643.23	224,298.39	160,648.03	648,228.13

ANNEX 4: RECURRENT AND CAPITAL COSTS (US\$)

TABLE A4-1: RECURRENT AND CAPITAL COSTS PER ACTIVITY OF THE SCI IMPLEMENTATION PHASE (US\$)

	Recurrent costs	Capital costs
Igunga (Tanzania)		
Activity 1: Strengthening health services management and introducing quality improvement approaches	23,158.55	
Activity 2: Structural improvements to health facilities	4,408.58	13,453.00
Activity 3: Maternal health equipment and consumables	17,543.92	49,869.29
Activity 4: Strengthening communication and referral system	24,632.15	81,083.00
Activity 5: Strengthening provider skills and competencies	191,893.44	
Behavior Change Communication Intervention	153,052.96	
Evaluation studies	260,380.45	
Total Igunga	675,070.06	144,405.29
As a percentage of total	82.38%	17.62%
Homabay (Kenya)		
Activity 1: Strengthening health services management and introducing quality improvement approaches	16,010.25	
Activity 2: Structural improvements to health facilities	33,581.97	41,624.13
Activity 3: Maternal health equipment and consumables	2,961.16	53,075.95
Activity 4: Strengthening communication and referral system	10,068.19	1,029.00
Activity 5: Strengthening provider skills and competencies	58,554.18	
Behavior Change Communication Intervention	147,564.57	
Evaluation studies	283,758.75	
Total Homabay	552,499.06	95,729.07
As a percentage of total	85.23%	14.77%
Migori (Kenya)		
Activity 1: Strengthening health services management and introducing quality improvement approaches	18,420.04	
Activity 2: Structural improvements to health facilities	34,622.69	65,243.77
Activity 3: Maternal health equipment and consumables	5,260.37	89,512.99
Activity 4: Strengthening communication and referral system	8,629.88	882.00
Activity 5: Strengthening provider skills and competencies	54,568.32	
Evaluation studies	305,941.38	
Total Migori	427,442.68	155,638.75
As a percentage of total	73.31%	26.69%

TABLE A4-2: RECURRENT AND CAPITAL COSTS PER YEAR OF THE SCI IMPLEMENTATION PHASE (US\$)

	Recurrent costs		Capital Costs	
	Value	% of total recurrent costs	Value	% of total capital costs
Igunga (Tanzania)				
2002	103,635.11	15.35%		
2003	94,767.76	14.04%	100,554.63	69.63%
2004	253,021.89	37.48%	17,354.88	12.02%
2005	67,643.38	10.02%	26,495.78	18.35%
2006	156,001.92	23.11%		
Total Igunga	675,070.06	100.00%	144,405.29	100.00%
Homabay (Kenya)				
2002	57,724.84	10.45%		
2003	142,770.59	25.84%	6,085.82	6.36%
2004	33,662.21	6.09%	22,981.02	24.01%
2005	168,570.04	30.51%	55,728.35	58.21%
2006	149,771.37	27.11%	10,933.88	11.42%
Total Homabay	552,499.06	100.00%	95,729.07	100.00%
Migori (Kenya)				
2002	41,642.65	9.74%		
2003	139,730.27	32.69%	2,568.83	1.65%
2004	19,932.10	4.66%	37,237.65	23.93%
2005	66,804.76	15.63%	115,832.27	74.42%
2006	159,332.90	37.28%		
Total Migori	427,442.68	100.00%	155,638.75	100.00%

ANNEX 5: MAINTENANCE COSTS OF THE SCI, 2004-2011

TABLE A5-1: MAINTENANCE COST OF THE SCI, 2004-2011, IGUNGA (US\$)

	Unit of measurement	2004	2005	2006	2007	2008	2009	2010	2011
		Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Activity 1: Strengthening health services management and introducing quality improvement approaches									
Supervision and follow-up of activities	23 facilities		553.66	568.44	583.62	599.20	615.20	631.63	648.49
Activity 2: Structural improvements to health facilities									
Maintenance of solar power systems	12 facilities	145.00	148.87	152.85	1,357.23	1,393.47	1,430.67	1,468.87	1,508.09
Activity 3: Maternal health equipment and consumables									
Maintenance of equipment	29 facilities	2,351.09	2,414.31	2,723.01	2,678.94	2,750.47	486.35	2,898.78	2,570.31
Re-purchase of equipment	29 facilities	2,869.18	3,000.47	5,190.20	3,162.83	49,998.38	5,627.26	8,995.67	3,514.39
Total Activity 3		5,220.27	5,414.78	7,913.20	5,841.77	52,748.85	6,113.61	11,894.45	6,084.70
Activity 4: Strengthening communication and referral system									
Ambulance	1 ambulance								
Fuel			1,224.72	1,257.42	1,291.00	1,325.47	1,360.86	1,397.19	1,434.50
Insurance				1,801.02	1,849.11	1,898.48	1,949.17	2,001.21	2,054.64
Maintenance		1,247.30	1,280.61	1,314.80	1,349.90	1,385.95	1,422.95	1,460.94	1,499.95
Re-purchase of equipment (Handie talkie, Repeater station)	11 facilities					8,650.06			
Maintenance of equipment purchased during implementation phase	11 facilities	1,644.35	3,422.85	4,475.04	4,594.53	4,334.13	4,843.15	4,972.46	5,105.23
Licensing fees	11 facilities			652.15	669.56	687.44	705.79	724.64	743.98
Total Activity 4		2,891.65	5,928.18	9,500.43	9,754.09	18,281.52	10,281.92	10,556.44	10,838.30
Activity 5: Strengthening provider skills and competencies									
LSS training	1 training per year (15 people)		17,546.55	18,015.04	18,496.04	18,989.88	19,496.91	20,017.48	20,551.95
PAC training	1 training every 2 years (12 people)		9,916.78		12,271.75		12,935.81		13,635.80
Total Activity 5			27,463.32	18,015.04	30,767.79	18,989.88	32,432.72	20,017.48	34,187.75

	Unit of measurement	2004	2005	2006	2007	2008	2009	2010	2011
		Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Behavior Change Communication Intervention	District with a population of about 325,000								
BCC materials (Printing and production)									
Educational materials			19,680.92		20,745.91		21,868.53		23,051.90
Educational materials distribution and promotional activities			5,755.67	5,909.35	6,067.13	6,229.12	6,395.43	6,566.19	6,741.51
Total BCC				25,436.59	5,909.35	26,813.03	6,229.12	28,263.96	6,566.19
Total Igunga		8,256.92	64,945.40	42,059.31	75,117.54	98,242.04	79,138.08	51,135.07	83,060.74

TABLE A5-2: MAINTENANCE COST OF THE SCI, 2004-2011, HOMABAY (US\$)

	Unit of measurement	2004	2005	2006	2007	2008	2009	2010	2011
		Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Activity 1: Strengthening health services management and introducing quality improvement approaches									
Maternity client files printing (Maternity, Antenatal, Postnatal registers)	Whole district			775.00	795.69	4,677.33	838.75	861.14	884.14
Supervision and follow-up of activities	26 facilities			409.52	420.45	431.68	443.20	455.04	467.19
Total Activity 1				1,184.52	1,216.14	5,109.01	1,281.95	1,316.18	1,351.32
Activity 2: Structural improvements to health facilities									
Maintenance of solar power system	12 facilities		1,022.32	3,583.94	3,679.64	3,777.88	3,878.75	3,982.31	4,088.64
Maintenance of water supply system	13 facilities			605.76	621.94	638.54	655.59	673.10	691.07
Total Activity 2			1,022.32	4,189.71	4,301.57	4,416.43	4,534.34	4,655.41	4,779.71
Activity 3: Maternal health equipment and consumables									
Re-purchase of equipment	31 facilities					7,001.32	7,679.39	22,956.50	6,642.95
Maintenance of equipment	31 facilities	304.29	1,161.39	2,616.44	3,477.82	3,570.68	3,666.02	3,763.90	3,864.39
Total Activity 3		304.29	1,161.39	2,616.44	3,477.82	10,572.00	11,345.40	26,720.39	10,507.35
Activity 4: Strengthening communication and referral system									
Cell phones									
Re-purchase	14 facilities						1,173.91		
Phone charges	14 facilities			4,073.68	4,182.45	4,294.12	4,408.77	4,526.48	4,647.34
Total Activity 4				4,073.68	4,182.45	4,294.12	5,582.68	4,526.48	4,647.34
Activity 5: Strengthening provider skills and competencies									
LSS training	1 training per year (15 people)			11,989.06	12,309.17	12,637.83	12,975.26	13,321.69	13,677.38
PAC training	1 training every 2 years (12 people)			9,913.65		10,450.10		11,015.59	
Total Activity 5				21,902.71	12,309.17	23,087.93	12,975.26	24,337.28	13,677.38
Behavior Change Communication Intervention									
Printing of BCC educational materials (booklets, leaflets and posters)	District with a population of about 337,000				5,706.26		9,957.89		6,340.53
Educational materials distribution and promotional activities			823.51	18,654.53	19,152.60	19,663.98	20,189.01	20,728.05	21,281.49
Total BCC			823.51	18,654.53	24,858.86	19,663.98	30,146.90	20,728.05	27,622.02
Total Homabay		304.29	3,007.22	52,621.58	50,346.01	67,143.45	65,866.53	82,283.80	62,585.13

TABLE A5-3: MAINTENANCE COST OF THE SCI, 2004-2011, MIGORI (US\$)

	Unit of measurement	2004	2005	2006	2007	2008	2009	2010	2011
		Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Activity 1: Strengthening health services management and introducing quality improvement approaches									
Maternity client files printing (Maternity, Antenatal, Postnatal registers)	Whole district			775.00	795.69	4,677.33	838.75	861.14	884.14
Supervision and follow-up of activities	31 facilities			470.20	482.76	495.65	508.88	522.47	536.42
Total Activity 1				1,245.20	1,278.45	5,172.98	1,347.63	1,383.61	1,420.56
Activity 2: Structural improvements to health facilities									
Maintenance of solar power system	20 facilities		1,833.14	5,205.29	5,344.27	5,486.96	5,633.47	5,783.88	5,938.31
Maintenance of water supply system	23 facilities			1,368.03	1,404.56	1,442.06	1,480.56	1,520.09	1,560.68
Total Activity 2			1,833.14	6,573.32	6,748.83	6,929.02	7,114.03	7,303.97	7,498.99
Activity 3: Maternal health equipment and consumables									
Re-purchase of equipment	26 facilities					2,986.06	13,387.35	60,527.98	60.04
Maintenance of equipment	26 facilities	128.44	1,347.55	5,620.14	5,770.20	5,924.26	6,082.44	6,244.84	6,411.58
Total Activity 3		128.44	1,347.55	5,620.14	5,770.20	8,910.32	19,469.79	66,772.82	6,471.62
Activity 4: Strengthening communication and referral system									
Cell phones									
Re-purchase	12 facilities						1,006.20		
Phone charges	12 facilities				3,631.39	3,728.35	3,827.90	3,930.10	4,035.04
Total Activity 4				3,631.39	3,728.35	4,834.10	3,930.10	4,035.04	
Activity 5: Strengthening provider skills and competencies									
LSS training	1 training per year (15 people)			11,970.24	12,289.85	12,617.99	12,954.89	13,300.78	13,655.91
PAC training	1 training every 2 years (12 people)			8,715.29		9,186.90		9,684.03	
Total Activity 5				20,685.53	12,289.85	21,804.89	12,954.89	22,984.81	13,655.91
Total Migori		128.44	3,180.69	34,124.20	29,718.72	46,545.56	45,720.43	102,375.32	33,082.11

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