

## TESTING APPROACHES FOR INCREASING SKILLED CARE DURING CHILDBIRTH: KEY FINDINGS FROM IGUNGA DISTRICT, TANZANIA



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## I. INTRODUCTION

Each year, over 500,000 women die from complications of pregnancy and childbirth, almost all of them in the developing world. This could be largely prevented if all women received high-quality care during pregnancy and childbirth. More than 70% of maternal deaths are attributable to five major complications,<sup>1</sup> and 77% occur during or shortly after childbirth (within 24 hours)—highlighting the critical need for good quality care during this period.

Increasing rates of skilled care during childbirth is widely recognised as a priority strategy for reducing maternal mortality, and skilled attendance at childbirth is being used as the target indicator to measure progress toward the 5<sup>th</sup> Millennium Development Goal of improving maternal health. Globally, however, there is little evidence-based guidance available on how to make skilled care available and accessible in low-resource settings, and in many countries, little or no progress has been made in increasing skilled attendance<sup>2</sup> during childbirth. In Tanzania, although antenatal care coverage is extensive (94% of women make at least one visit), nationally, only about 47% of deliveries occur in health facilities and only about 43% of all births<sup>3</sup> are attended by skilled attendants. Moreover, there is little evidence-based guidance available on how to make skilled care available and accessible in low-resource settings.

### The Skilled Care Initiative

In 2001, the Ministry of Health and Social Welfare (MOHSW) and Family Care International (FCI) launched the Skilled Care Initiative in Igunga district, Tabora Region, Tanzania. The Skilled Care Initiative aimed to test and evaluate strategies to increase women's use of skilled maternity care before, during, and after childbirth. It was specifically designed to:

- **Improve the availability and quality of skilled maternity care through health systems interventions.** These interventions included upgrading the health infrastructure, including surgical facilities, where needed; addressing equipment gaps; training providers in clinical and interpersonal skills in routine and emergency obstetric care; strengthening referral systems and improving health management systems.
- **Increase utilisation of maternity services through facility- and community-level behaviour change interventions.** These interventions included antenatal counselling on birth preparedness and a community-level behaviour change communication (BCC) campaign on the benefits of skilled maternity care before, during, and after childbirth.

As shown in Box 1, a range of strategies were introduced in Igunga district to improve the availability, quality, and utilisation of maternity care.

<sup>1</sup> The five complications are severe bleeding/haemorrhage, infection/sepsis, unsafe abortion, eclampsia, and obstructed labour.

<sup>2</sup> According to the World Health Organization, skilled attendants include trained midwives, nurse/midwives or doctors who have completed set course of study and are registered or legally licensed to practise. This definition does not include traditional birth attendants.

<sup>3</sup> National Bureau of Statistics, United Republic of Tanzania and ORC Macro. 2005, Tanzania Demographic Health Survey 2004-2005. Dar es Salaam, Tanzania: National Bureau of Statistics and ORC Macro.

### Box 1. The Skilled Care Initiative at a Glance

Health systems interventions in Igunga district included:

- Training 115 maternity care providers in life-saving emergency obstetric care skills, and routine maternal health services, including individualised birth preparedness counselling, compassionate maternity care, and postpartum care. In addition 20 providers were trained in postabortion care, including manual vacuum aspiration.
- Addressing gaps in essential obstetric care equipment, such as blood pressure gauges, delivery kits, examination couches, sterilising equipment, and such other items, at 29 health facilities at all levels of the health system in the district.
- Strengthening the infrastructure of health facilities through the installation of solar panels for lighting at selected health facilities.
- Installing a radio call system at the district hospital, four health centres, and selected dispensaries to facilitate emergency referral of patients.

Community-level behaviour change campaign activities carried out in Igunga district emphasised the importance of planning for delivery, and the importance of skilled maternity care during pregnancy, childbirth, and the postpartum period. These activities included:

- Mamanju, a three-day traditional song and dance performance emphasizing the importance of planning for delivery and using skilled maternity care during childbirth. Approximately 10,000 people in the district were reached through the performance.
- Drama performances in each division, reaching approximately 5,600 community members.
- Village-level meetings on skilled care, reaching approximately 6,500 people.
- Distribution of educational and promotional materials through campaign activities and antenatal counselling, including posters on key messages, as well as 12,000 booklets and 10,000 khangas with skilled care information and messages.

## II. EVALUATION DESIGN AND METHODS

A rigorous methodology was used to evaluate the availability and quality of skilled care in the intervention districts, its financial and cultural accessibility, and changes in use of skilled care over time. The pre-test, post-test, quasi-experimental design included health facility survey and household surveys in Igunga district and Urambo District, the comparison or control district.

The specific objectives of the **health facility assessments** were to:

- Assess the maternal health services at all levels of the health care system and identify gaps in these services
- Guide the design of project interventions by identifying strategies for improving maternal health services and assist in prioritising interventions
- Evaluate the impact of SCI project interventions on maternal health services at health facilities by comparing baseline and endline data.

Developed from the World Health Organization's Safe Motherhood Needs Assessment methodology, the health facility survey instruments included: interviews with district health management teams, interviews with facility managers, interviews with midwifery personnel, exit interviews with antenatal and postpartum clients, structured observation, and reviews of facility records.

The baseline sample of health facilities included 33 public, private, and mission facilities in the two districts that were known to be providing maternity care. The endline survey sample was similar, but smaller (N=29) as some of the facilities in the baseline survey were found not to be providing maternity care services.

The specific objectives of the **household surveys** were to:

- Gather data on demographic, socioeconomic, and other variables that may influence the use of skilled care
- Assess knowledge, attitudes, and behaviours related to birth preparedness and care-seeking during pregnancy, delivery, and the early postpartum period
- Measure the use of skilled care during normal and complicated deliveries and the early postpartum period by the district population
- Evaluate the impact of SCI project interventions regarding these indicators

The survey instruments included a Household Questionnaire (with the head or other adult member of household), a Woman's Questionnaire, and a Husband's Questionnaire. Most of the questions were based on those used in the international Demographic and Health Surveys (DHS). Questionnaires used in other safe motherhood surveys were also reviewed, and relevant questions were then adapted for the survey. Women were asked about *all* of their births and stillbirths in the two years prior to the survey, as well as their experience of three obstetric complications (fits or convulsions not caused by fever, severe bleeding, and labour lasting more than 12 hours).<sup>4</sup> The inclusion of all births and stillbirths in the 24-month reference period helped to ensure that women and their births would be represented in proportion to the number of births the women have had. Moreover, this type of sample requires a smaller sample of women than a sample based on the most recent birth only.

More than 2,000 households were surveyed in each district during the baseline and endline (See Table 1), and within each household, all women of reproductive age and their co-resident husbands were interviewed. In total, almost 10,000 women with recent pregnancies (i.e. had had a live or still birth within the previous two years) were interviewed. As very few surveys have collected such extensive data on women's care-seeking behaviour before, during and after childbirth, this research provides an extraordinary opportunity to understand the reasons why women seek skilled care, and what can be done to ensure that skilled care is available and accessible for all women.

**Table 1. Household survey samples**

	Igunga		Urambo	
	Baseline	Endline	Baseline	Endline
Number of households interviewed	2,150	2,404	2,438	2,400
Number of women interviewed who were pregnant within the last 2 years	2,306	2,856	2,075	2,729

### Data Analysis

Data were analysed using SPSS 14.0 for Windows (Chicago, Ill, SPSS, Inc). Functional indexes were developed to assess changes in the status of essential aspects of quality care related to antenatal care, normal delivery care, complicated delivery care, and postpartum care. Drawing on the results of these functional indices, composite indexes were developed to give a complete picture of the overall capacity to provide normal delivery care and complicated delivery care. Similar composite indexes were developed to measure respondents' exposure to and awareness of interventions to promote the use of skilled care during childbirth. Statistical analyses were done using the chi-square test and linear regression models, whose dependent variable was "delivery at a health care facility."

<sup>4</sup> Since there is evidence that early pregnancy losses are underreported in surveys these were excluded.

### III. FINDINGS

#### A. Antenatal Care

Although most pregnancy- and delivery-related complications cannot be predicted, high-quality antenatal care (ANC) during pregnancy is recognised as an important opportunity for promoting health and education, instituting prophylactic measures for disease prevention, managing existing diseases and other health conditions, and detecting and managing maternal health complications. The WHO recommends that all pregnant women should have a minimum of four antenatal visits.

To improve the quality and availability of ANC, project interventions focused on updating the knowledge and skills of maternal health providers in Igunga through advanced or basic Life-Saving Skills (LSS) training, which covered antenatal care and individualized birth preparedness counselling, as well as addressing critical gaps in equipment. In addition, posters and client education booklets were developed and distributed to all health facilities to aid providers in providing essential information and counselling during ANC consultations.

##### ***Capacity to Provide and Provision of ANC Services***

The vast majority of health facilities in Igunga routinely provided antenatal care and related services, such as tetanus toxoid immunisation and management of sexually transmitted infections (STIs). The facility survey showed a marked improvement in provider knowledge, in terms of provider ability to recall essential functions of quality antenatal care. Overall, greater changes were observed in the knowledge of providers based at health centres and dispensaries, compared to the two hospitals.

The availability of equipment essential for ANC was good at baseline and did not change significantly in either district. A composite index was used to appraise overall readiness for quality antenatal care provision in terms of the availability of essential equipment and supplies, including a blood pressure gauge, foetoscope, iron/folate supplements, tetanus toxoid vaccine, and malaria prophylaxis. Scores increased slightly from 4.2 to 4.4 ( $p=ns$ ) in Igunga and in Urambo from 4.3 to 4.4 ( $p=ns$ ).

##### ***Utilisation of ANC Services***

The household survey showed a significant increase in the use of antenatal care during pregnancy. In Igunga, the proportion of women with at least one ANC visit during pregnancy increased from 88% to 95% ( $p<.001$ ). In Urambo district, a smaller increase was observed (91% to 96%,  $p<.001$ ). In Igunga, the first ANC visit was at an average of 7.0 months gestation and decreased to 6.1 months at endline, a positive change. The timing of the first ANC visit did not change in Urambo.

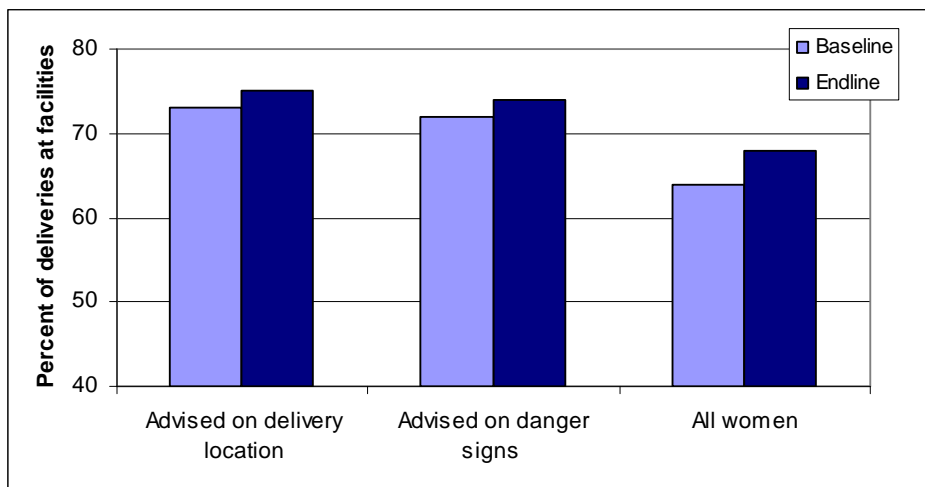
The household survey also showed an improvement in the content of women's antenatal visits. Women in Igunga received an average of 5.7 out of 8 essential diagnostic, counselling and preventive ANC functions in the endline survey, compared to 5.3 at baseline. In Urambo, women received an average of 5.7 out of 8 essential ANC functions at baseline, and no change was observed at endline. The largest changes in diagnostic antenatal care functions observed through the household survey were in the areas of checking for anaemia and pregnancy-induced hypertension. Encouraging improvements were also observed in the provision of preventive measures, such as malaria prophylaxis, however, there was no improvement in the provision of iron supplements.

In addition, improvements in ANC counselling were observed. At baseline very few women received the full range of birth preparedness counselling that is recommended at ANC visits, but household survey results showed an increase in both districts in the proportion of women who were counselled on danger signs of problems during

pregnancy and childbirth. There was also an increase in the proportion of women in Igunga who were advised where to deliver, while in Urambo it declined. While the increases in Igunga are encouraging, it should be noted that overall, the majority of women are not receiving such counselling, and that opportunities to inform antenatal clients about danger signs during pregnancy and childbirth are being missed.

Compared to all women in Igunga, women who received advice about where to deliver were more likely to seek skilled care during delivery (see Figure 1). Similar results were observed for women who were advised about danger signs during pregnancy and childbirth.

**Figure 1. Antenatal counselling and use of health facilities for delivery (Household Survey)**



## B. Normal Delivery Care

The vast majority of maternal deaths occur during delivery and in the immediate postpartum period. The WHO recommends that health facility staff have the appropriate skills, tools, and supplies to provide the appropriate of routine care to all women during labour and delivery, including:

- Diagnosis of labour
- Monitoring labour progress, and maternal and foetal well-being with the partograph
- Providing supportive care and pain relief
- Detection of problems and complications (e.g. malpresentation, prolonged or obstructed labour, hypertension, bleeding and infection)
- Clean, atraumatic delivery and immediate care of the newborn, including initiation of breastfeeding
- Newborn resuscitation
- Active management of the third stage of labour (AMTSL).

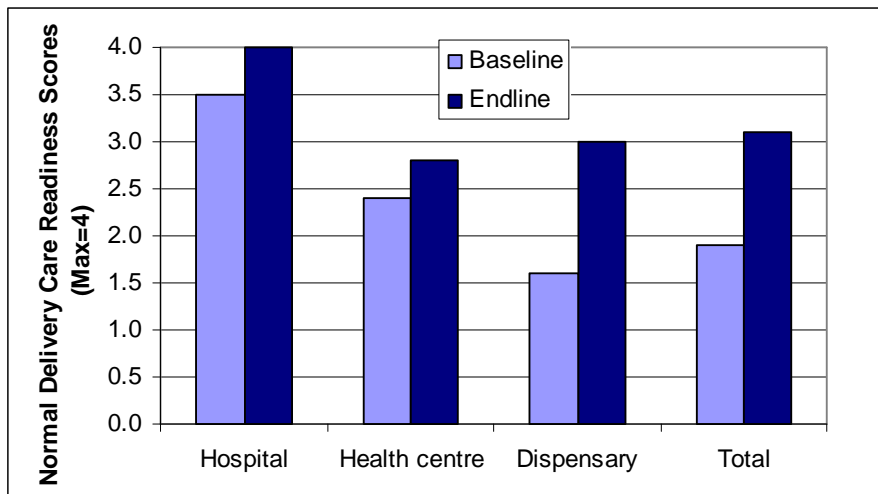
Improving normal delivery care and encouraging women to deliver with a skilled attendant were key elements of the SCI intervention package. Maternity care providers at all levels of the health system were trained in advanced or basic life-saving skills (LSS). These trainings had a focus on routine maternity care, including interpersonal and compassionate dimensions of care, as well as complications management. In addition to the training interventions, infrastructural improvements and a range of obstetric equipment were provided to each health facility to address gaps identified through the baseline assessment.

### **Capacity to Provide and Provision of Normal Delivery Care Services**

The facility survey found that the majority of health facilities in Igunga had provided routine delivery care within the month prior to the baseline survey, and at endline, all facilities had. The facility survey showed that all hospitals and health centres, and the majority of dispensaries were routinely providing delivery care at baseline, and had provided this care within the month prior to the survey. At endline, every facility in Igunga was had recently conducted a delivery.

To appraise the overall capacity of each health facility to provide quality and skilled maternity care, a composite Facility Readiness Index was developed from functional indexes for infrastructure, equipment, supplies, and provider training and skills related to routine obstetric care. There was a significant increase in index scores in both districts from baseline to endline. In Igunga, the mean Facility Readiness Index score increased from 1.9 at baseline to 3.1 (with a maximum score of 4) at endline (see Figure 2). The largest improvements were observed at dispensaries—the facilities that handle the majority of deliveries in Igunga. Improvements in facility infrastructure, equipment, and provider training accounted for most of the gain.

**Figure 2. Changes in Facility Readiness Index for Normal Delivery (Facility Survey)**

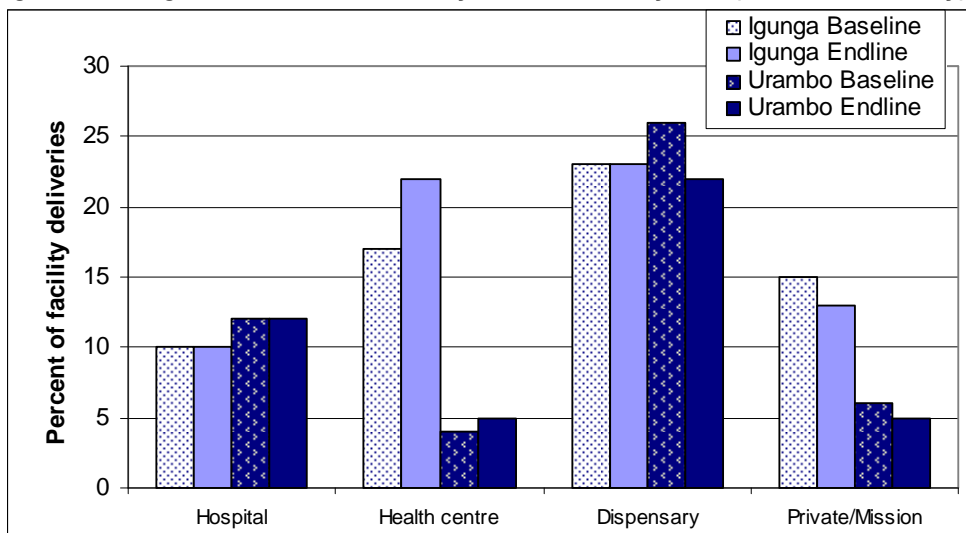


### **Utilisation of Normal Delivery Care Services**

The household survey showed a small increase in the proportion of live and still births that took place in health facilities in Igunga. The percentage of births in health facilities increased from 64% at baseline to 68% at endline ( $p=.08$ ). In Urambo, however, where no intervention was carried out, the use of health facilities for delivery decreased, from 47% to 44% ( $p$ =not significant or ns). There was a small increase in delivery by a skilled attendant in Igunga (from 48% to 54%), which appeared to be at the expense of both nurse auxiliaries and family members/friends. In Urambo, there was a small decrease in delivery by skilled attendant cadres.

Use of the health system for delivery care changed over time (see Figure 3). The majority of the increased delivery caseload in Igunga was handled by health centres; at baseline, 25% of all facility deliveries occurred at this level of the health system, compared to 32% at endline ( $p<.01$ ) (see Figure 3). There was a small decrease in the absolute number of births at private health facilities in Igunga.

**Figure 3. Changes in use of the health system for delivery care (Household Survey)**



### C. Complicated Delivery Care

Given that most life-threatening maternal health complications are sudden in onset and difficult to predict, high-quality essential obstetric care (EOC) services must be provided as close as possible to the communities where women live. The WHO recommends that elements of EOC can be safely provided at the each level of the health system as follows:

- **Dispensary level:** the provision of obstetric first aid, such as the administration of antibiotics and anticonvulsants; the injection of ergometrine and other oxytocics; and the administration of IV fluids.
- **Health centre level:** the provision of basic essential obstetric care, including the administration of oxytocics and antibiotics; assisted normal delivery; manual removal of placenta and vacuum aspiration to treat complications of incomplete abortion.
- **Hospital level:** the provision of comprehensive essential obstetric care, including blood transfusion and Caesarean deliveries.

These services must be complemented by well-functioning communication and transport linkages to ensure that referrals to appropriate-level facilities can be made promptly.

Project interventions to improve the availability of EOC were similar to those described earlier for normal delivery care—i.e. strengthening provider skills, addressing gaps in essential equipment, and improving the referral system through the provision of a radio call system linking rural health facilities to the district hospital.

#### **Capacity to Provide and Provision of Complicated Delivery Services**

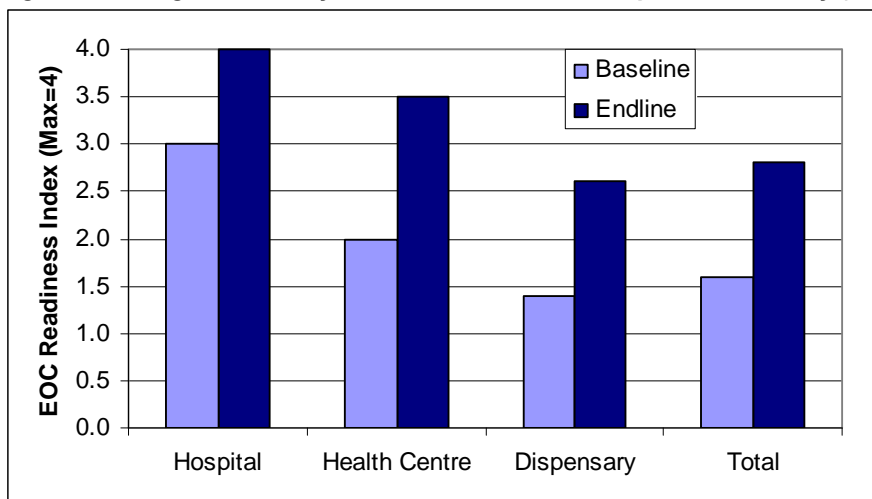
A composite EOC Readiness Index was developed to appraise the capacity of each facility to handle obstetric complications (Figure 4). The index took into account changes in provider skills for complicated delivery, equipment, supplies, and referral capacity (radio/phone/emergency vehicle). The mean score for all types of facilities increased from baseline to endline, with larger improvements being observed in Igunga, where the mean score increased from 1.6 at baseline to 2.8 at endline ( $p < .01$ ) (maximum score of 4) for all types of facilities (see Figure 4). An increase in EOC Readiness Index scores was also observed in Urambo (from 0.8 to 1.5,  $p < .001$ ). In Igunga, the greatest increases in EOC Readiness Index scores were at health centres (2.0 to 3.5) and

dispensaries (1.4 to 2.6)—an encouraging finding given that these facilities were the primary focus of the intervention.

Contributing to the improvement in the health centres and dispensaries was increased availability of essential equipment and improvements in the referral system—i.e. the availability of radio communication. Provider skills did not appear to increase significantly—a result that may be related to the transfer, redeployment, or turnover among many of the providers trained in LSS during the course of the intervention. The availability of supplies and drugs also did not improve, and at health centres and dispensaries, the availability of these items decreased slightly, despite efforts to improve logistics systems.

Despite the increases observed in the capacity to provide essential obstetric care, little change was observed in the proportion of facilities that reported having provided basic essential obstetric care (BEOC) services during the three-month period prior to the baseline and endline facility surveys—a result that may be due to low caseloads, as opposed to gaps in capacity. However, both hospitals in Igunga had performed all comprehensive essential obstetric care (CEOC) functions within the three months prior to both baseline and endline surveys. These include all the BEOC functions, as well as Caesarean section and blood transfusion.

**Figure 4. Changes in Facility Readiness Index for Complicated Delivery (Facility Survey)**



#### **Utilisation of Complicated Delivery Care Services**

Encouraging outcomes were observed in terms of the proportion of women with complications who sought treatment at a facility. In Igunga, among women who experienced any one of three complications (convulsions, bleeding, or prolonged labour), 93% went to a facility for treatment, which was an increase from 80% at baseline ( $p < .001$ ). No significant increases in proportion of women seeking treatment were observed in Urambo. In addition, among women in Igunga who experienced complications, 82% delivered at a health facility—a proportion that is considerably higher than the percentage of deliveries among the general population surveyed (68%). This was an increase from 69% at baseline.

#### **D. Postpartum Care**

The period immediately following delivery is an important time for detecting and managing life-threatening obstetric complications. Postpartum care should therefore include the identification and management of maternal health problems and health

promotion, as well as immunisations for newborns. In addition, postpartum care should include counselling, information and services for family planning.

The project interventions consisted primarily of training interventions to heighten maternity care providers' awareness of the importance of **early** postpartum care for new mothers (as opposed to the traditional 6-week visit that is mainly focused on the well-being and immunisations of the infant). LSS trainings included a module on postpartum care. A postpartum care register was also designed and introduced at all health facilities in both districts. Supplies, such as contraceptive commodities were not supported through the project, as such items are requisitioned through national logistics systems. However, the project did produce informational booklets on maternal health care that included information on self-care during the postpartum period and the importance of a postpartum check-up for both mothers and newborns. The importance of a postpartum check-up was also the subject of a poster developed for display at health facilities.

### ***Capacity to Provide and Provision of Postpartum Care Services***

Modest improvements were found in the availability of essential equipment and supplies for postpartum care. The availability of a range of contraceptives was good at baseline and generally improved in both districts, particularly injectable contraceptives in Igunga. Similarly, the availability of health education materials, such as information on postpartum care and family planning also improved in Igunga, but no change was observed in Urambo.

Large increases were observed in the proportion of health facilities that were routinely providing postpartum care services, including check-ups for mothers and newborns, as well as breastfeeding support, newborn immunisations, and family planning services. In addition, in the endline surveys, almost all health facilities (96%) had provided early maternal postpartum check-ups (i.e. within one week of delivery), whereas at baseline, only 24% of facilities had provided any maternal postpartum check-ups within the previous month.

The content of maternal postpartum check ups was fair at baseline, and did not change significantly. Less than half of women interviewed in the endline household survey had received counselling and check-ups of their own health status during postpartum visits, suggesting that women's visits with their newborns are not used consistently to ensure their own health status and recovery after childbirth.

### ***Utilisation of Postpartum Care Services***

At baseline the percent of babies (80%) who had a postpartum check-up was high. However, few mothers had a check-up (24%). At endline, the percent of babies who had check-up was higher (98%,  $p < .001$ ), and a small increase was observed in the proportion of mothers who had a postpartum check-up (27%).

## **E. Characteristics associated with Skilled Care-Seeking during Childbirth**

As described earlier, the SCI intervention package included both facility- and community-level interventions to promote the use of skilled maternity care during childbirth. At the health facility level, these interventions were primarily comprised of strengthened birth preparedness counselling during antenatal consultations. At the community-level, a behaviour change campaign was carried out, targeting women, men, female elders, and community leaders with information on the benefits of skilled care during childbirth, as well as the importance of antenatal care, maternal postpartum care, and preparing for childbirth through household planning and discussion and setting aside funds for delivery. Community-level interventions also aimed to heighten awareness about the risks associated with pregnancy and childbirth, and

improve individual, household, and community-level recognition of and responsiveness to obstetric complications.

A series of indexes were developed to measure exposure to health facility and community-level behaviour change interventions aimed at promoting birth preparedness, heightening awareness about maternal health and signs of complications (see Box 2). Separate indexes were created to distinguish between exposure to birth preparedness messages during health consultations, such as antenatal visits, and exposure to such messages through community-level events, such as community-level meetings, print materials, drama, and other traditional media. The indexes can be regarded as a series of indicators of: exposure to information about birth preparedness and safe motherhood either through the antenatal setting or through other community-level sources; adoption of positive attitudes toward birth preparedness; and, ultimately, planning for and using skilled maternity care during delivery.

### **Box 2: Indexes to Evaluate Women's Exposure and Response to Skilled Care Promotion Interventions**

#### **Birth preparedness counselling index.**

Told about danger signs

- Advised where to go if had symptoms of complications
- Given advice on where to deliver
- Source of birth preparedness information was a health professional

**Birth preparedness community campaign exposure index.** Had heard of birth preparedness (a key BCC message in the project)

- Agreed women should plan where to deliver
- Source of information was from printed material
- Source of information was from community /group events

#### **Safe Motherhood Awareness.**

- Agreed that a woman should plan ahead where to deliver and how to get there
- Agreed that a woman should plan what to do in event of serious complication
- Could name 3 or more danger signs during pregnancy, childbirth, and postpartum
- Agreed that any of the danger signs can be fatal

#### **Planning and Discussion**

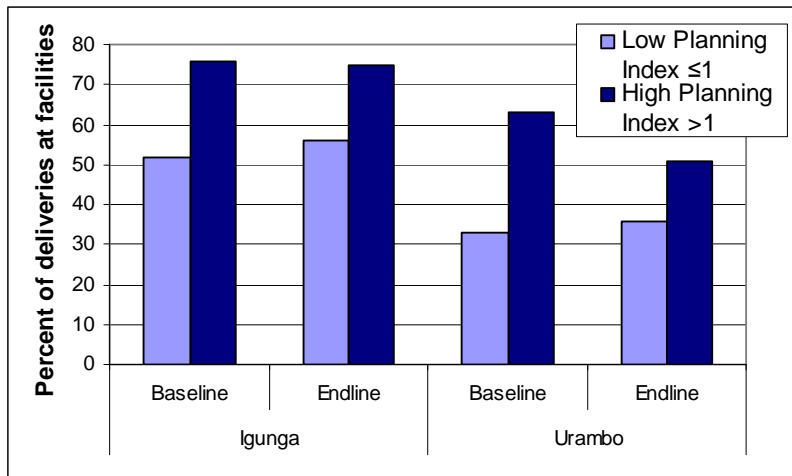
- Discussed with her husband or family where she would deliver the baby
- Discussed with her husband or family how to pay for the delivery
- If the woman or anyone in her family put aside money to pay for the delivery.

Significant changes were observed in all four of the indexes in Igunga district, indicating that skilled care promotion interventions had been effective in terms of increasing exposure to key messages and information. The most dramatic increases observed were related to exposure to birth preparedness messages at the community level, and increased safe motherhood awareness.

## **F. Effect of the Intervention on Care-Seeking**

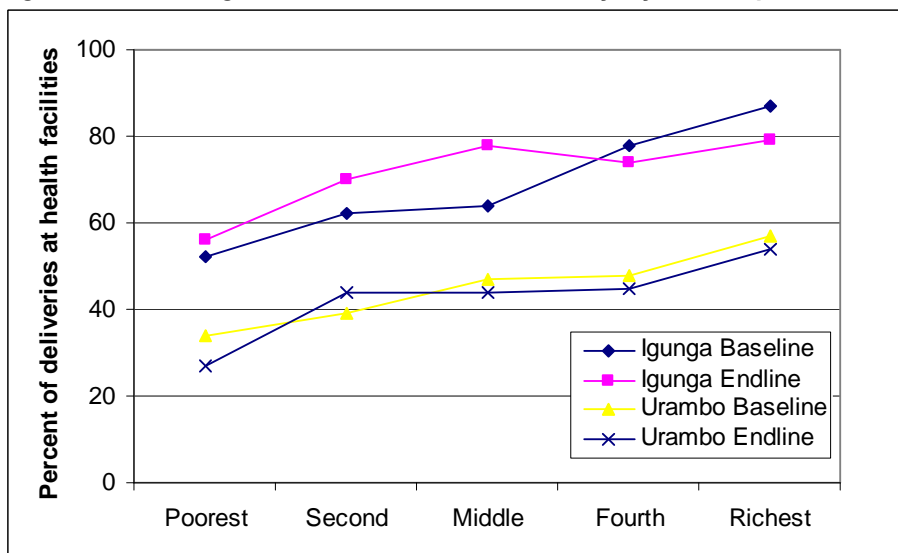
As a general pattern, in univariate analysis, higher scores on the four indexes correlated with an increased likelihood of seeking skilled care during childbirth. Significant differences in skilled care-seeking were observed in both districts according to the level of Birth Preparedness Counselling in the antenatal setting and Safe Motherhood Awareness. The greatest difference in skilled care-seeking was observed among women with high and low scores in the Planning and Discussion Index (see Figure 5).

**Figure 5. Planning and Discussion Index and Delivery at a facility**



The household survey found that age, educational status, distance from a health facility, and wealth were all found to be significantly associated with skilled care-seeking during childbirth. Wealth was especially significant; women in the highest wealth quintile were more likely to seek skilled care than women in the poorest quintile. Endline survey data showed that the gap between the poorest and richest quintiles had narrowed somewhat, and there were only small differences in skilled care-seeking between the second, middle, fourth, and fifth quintiles. The largest increase in skilled care-seeking in Igunga was observed in the middle wealth quintile (see Figure 6).

**Figure 6. Percentage of deliveries in a health facility, by wealth quintile**



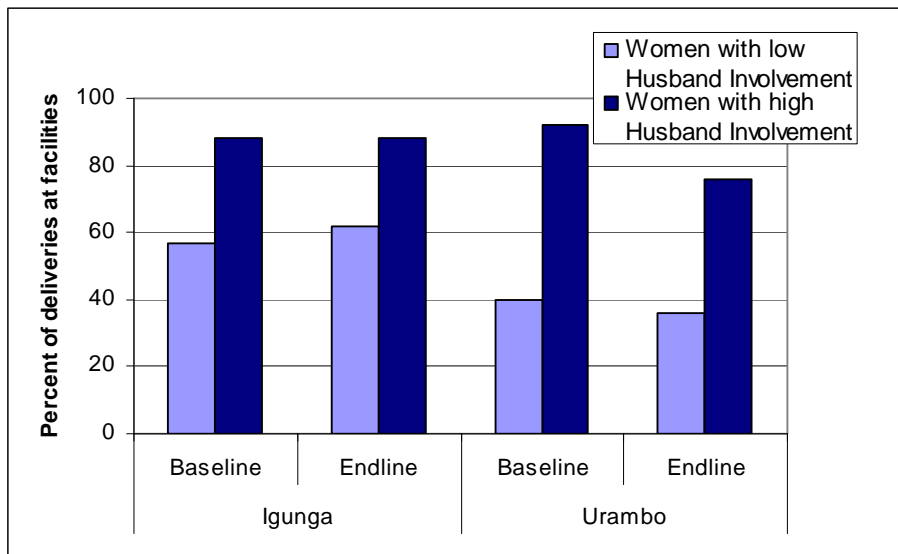
Family decision-making patterns related to health care-seeking were also significantly related to use of health facilities during childbirth. To examine family decision-making patterns quantitatively, a Husband Involvement in Decision-Making Index was derived based on the following variables:

- Woman recalls discussing with partner where to deliver

- Woman reports that husband made decision where to deliver
- Husband says he discussed with partner where to deliver
- Husband reports discussing with partner how to pay for the delivery costs

In both districts, high scores on the Husband Involvement Index were associated with skilled care-seeking during childbirth (see Figure 7). In Igunga, there was a 30 percentage point difference in the proportion of deliveries at health facilities between those with high levels of husband involvement and those with low levels. This gap was smaller at endline, however it was still significant.

**Figure 7. Husband Involvement in Decision Making and delivery at a facility**



In a multivariate regression model, skilled care-seeking was much more likely for births to households where the husbands were very involved in maternity care-related decision-making, irrespective of wealth, education, and distance to a health facility. Indexes measuring exposure to facility- and community-level skilled care promotion activities and their association with delivery at a health facility were also entered into a linear regression model. Interestingly, the only intervention variable that remained significantly associated with skilled care-seeking in Igunga district were birth preparedness counselling during antenatal consultations. Other key determinants of use of skilled care included husband involvement in decision-making and wealth status. Interestingly, education was not significantly associated with women's use of skilled care during childbirth in the multivariate model, nor were exposure to the BCC campaign or knowledge about maternal health issues.

## IV. DISCUSSION AND INTERPRETATION OF FINDINGS

### A. Antenatal Care

Evaluation results showed improvements in the area of antenatal care—both in terms of the content of antenatal care and the provision of essential diagnostic and preventive ANC functions, and in the use of antenatal care earlier during pregnancy. A large improvement was observed in providers' spontaneous recall of elements of birth preparedness counselling, and there was also an increase in the percentage of women interviewed through household and client exit interviews who reported receiving such advice. Nonetheless, more than one-third of women interviewed during the household survey at endline reported that they had not been advised on where to delivery, and more than half of women reported that they had not been advised on danger signs, indicating that antenatal care visits are not consistently used to provide such counselling—a gap that may be related to staffing shortages throughout the health system, which constrain the quality of care.

### B. Normal Delivery Care

Improvements were also observed in the capacity to provide normal delivery care, along with small increases in utilisation of health facilities for delivery. Most of the improvements in readiness or capacity to provide normal delivery care were observed at mid- and lower-levels of the health system, which handle the vast majority of deliveries in the district and were therefore the primary focus of the intervention package.

While the results of the household survey show only modest increases in the use of health facilities for delivery, any increase in care-seeking may be considered a positive outcome, given the high use of facility delivery at baseline, and especially when the costs of delivery care are considered. Although health services for pregnant women are officially provided free-of-charge in Tanzania, in reality, women do incur out-of-pocket expenses for such care. Costs of care were not targeted through the intervention package, however, women were asked about the costs of care during individual interviews in the household survey, and how costs compared to their expectations. Fully 89% of women in the baseline survey and 91% in the endline survey in Igunga reported incurring out-of-pocket expenditures for delivery care. Thirty-nine (39) percent of women said that the costs of delivery care were more than they expected. The mean cost was Tsh 4,217 for normal deliveries at baseline and Tsh 5,675 at endline—a 33% increase overall. This overall increase is considerable, especially given the fact that use of private hospitals and health centres (which are the most costly) decreased over the course of the intervention. Among public facilities, the out-of-pocket costs were highest at hospitals. However, the largest increases in costs among public facilities were observed at health centres and dispensaries; costs increased more than 70% at both types of facilities between the two surveys. The large increase in cost of care during the intervention period may have been an important barrier to skilled care-seeking, even those who were exposed to the SCI intervention.

Univariate analysis showed that women who received counselling on birth location and dangers signs during pregnancy were much more likely to deliver in a health facility. Household planning—particularly saving funds for delivery—was also significantly associated with skilled care-seeking. In a multivariate model, birth preparedness counselling remained a significant determinant of skilled care-seeking during childbirth, underscoring the importance of promoting birth preparedness through routine antenatal consultations. It was also apparent that irrespective of wealth or education status, husband involvement in care-related decisions is also a key determinant of use of health facilities during delivery—a finding that may be related to their control over household resources and spending.

Other interventions aimed at promoting the use of skilled care during delivery did not appear to have a strong association with care-seeking. Increases in safe motherhood knowledge and awareness were observed, but high levels of awareness about safe motherhood and exposure to community-level campaign activities were not correlated with increased use of health facilities for delivery. This finding was surprising given that awareness-raising activities had good coverage throughout the district. However, as noted above, almost two-thirds of births took place in health facilities at baseline, and thus skilled care-seeking may be a generalised norm that is influenced more by the proximity of maternity care services and availability of funds, rather than knowledge or awareness. This possibility is supported by the fact that in a multivariate regression model, both distance and wealth remained significantly associated with use of facilities for delivery, but knowledge about pregnancy and childbirth risks and exposure to skilled care promotion activities did not.

### **C. Care for Complicated Deliveries**

The capacity and readiness to manage complicated delivery care increased significantly in Igunga, with the largest improvements observed at health centres and dispensaries. Most of the improvements observed were associated with improved availability of equipment for complicated delivery care and improvements in referral capacity (i.e. the availability of emergency communications and transport). Despite interventions to improve logistics at the health facility level, the availability of essential supplies and drugs did not improve—a result that may be related to national distribution systems and drug/supply stock-outs, rather than district- or facility-level requisitioning.

Also encouraging was the considerable increase in the proportion of women who sought treatment at a health facility when complications arose. Care-seeking increased at all levels of the health system, and a large increase was observed in the proportion of women with complications who delivered at a health centre. A shift from the use of private and mission facilities to government health centres and hospitals was also observed.

Evaluation results suggested that changes in provider knowledge and competencies related to the management of obstetric complications were small—results that were surprising given that all maternity care providers were trained in either advanced or basic life-saving skills, which is an intensive competency-based residential training. These results may be influenced by several factors, including the transfer and redeployment of many providers trained in LSS, as well as evaluation challenges related to measuring providers' skills and competencies.

### **D. Postpartum Care**

Improvements were observed in the provision and utilisation of postpartum care. Nonetheless, the study results suggest that more efforts are needed to ensure that women's visits for newborn care are used as an opportunity to ensure the mother's health as well. While almost all women (98%) brought their newborns to a health facility for a check-up after birth, the majority of women did not receive any check-up for themselves. This represents a missed opportunity to check on the health of new mothers, which is critical given the large proportion of maternal deaths that take place in the early postpartum period. Among women who did receive a check-up, there was almost universal satisfaction with the care received and all said that they would return to the facility for maternal health services, suggesting that those providers who do attend to women during postpartum check-ups provide very good quality care.

## V. CONCLUSIONS AND RECOMMENDATIONS

The Skilled Care Initiative in Igunga District is one of the few maternal health interventions with a rigorous evaluation component. As such, it provides a wealth of information on the effectiveness of the intervention package and its impact on maternal health care-seeking, and it illuminates the challenges of improving and evaluating such strategies, given the multi-faceted determinants of both the availability and quality of maternity care and the factors that influence women's care-seeking during childbirth.

The experience and results of the Skilled Care Initiative highlight a number of key issues for subsequent efforts to increase rates of skilled attendance during childbirth in Igunga district, and nationally in Tanzania, including:

- **The importance of focused antenatal care, including individualized birth preparedness counselling on place of delivery.** Women who received counselling on place of delivery and danger signs during pregnancy were more likely to deliver at a health facility. Given the fact that the vast majority of women in Tanzania have at least one antenatal care visit during pregnancy, it is critical to ensure that birth preparedness counselling is given. This is a relatively low-cost intervention in comparison with community-level mobilisation and sensitisation campaigns. As such, it should be a key element of any skilled care strategy.
- **The need to improve national logistics systems and the availability of essential drugs and supplies for obstetric care.** While two systems were introduced to improve the availability of drugs and supplies for obstetric care in Igunga, stock-outs persisted because essential commodities were not available for purchase. Thus, it is crucial that forecasting and purchasing systems at the national level be reviewed and strengthened. A review of essential items needed for obstetric care should guide these efforts, and priority should be placed on ensuring that facilities at all levels of the health system receive uninterrupted stocks of these items.
- **The importance of strengthening mid- and lower-level health facilities.** Peripheral health facilities are the most accessible, especially for the rural poor. In addition, the costs of care—both to women and to the health system—are lowest at these sites. Traditionally, however, these sites have received little investment and support, and many, if not most, are challenged by a decrepit physical infrastructure, shortages of skilled personnel, serious gaps in essential obstetric equipment, and limited referral capacity. In contexts where these sites are handling the majority of deliveries, there is an urgent need to address these gaps, and doing so can significantly improve the availability and provision of skilled maternity care before, during, and after childbirth.
- **The need to improve financing of maternal health services.** The vast majority of women incurred out-of-pocket expenditures for services that are officially provided free of charge, and these expenses increased dramatically over the period studied. This may have been a significant disincentive for women to seek skilled care, despite project interventions aimed at improving the availability and quality of care and promoting its use. These findings underscore the critical need to address the main costs to women, which were primarily related to the purchase of drugs and supplies for care.
- **The need to improve the training and deployment of skilled attendant cadres.** Overall, there is a shortage of skilled attendants, which has negative consequences for the availability and quality of maternity care. The content of pre-service training programmes should be reviewed to ensure that essential competencies of a skilled attendant are acquired, and overall manpower shortages



within the health system must be addressed to make quality, client-centred care available to the women who need it.

- **The importance of focusing on routine elements of maternal health services, in addition to complications.** While improvements were observed in the areas of antenatal care, normal delivery care, and postpartum care, there are still gaps in the content of these routine services—gaps that reduce the potential benefits of these health interventions in terms of preventing maternal mortality. Many women do not receive essential elements of focused antenatal care, and postpartum care visits are rarely used as an opportunity to assess the health status of new mothers and ensure that they are recovering well from childbirth. Given that a large proportion of maternal deaths take place in the early postpartum period, such missed opportunities can cost women their lives.

Overall, the results of the project underscore the need for context-specific approaches that are based on the capacity of the health system and maternity care utilisation patterns of communities. Such approaches can lead to improvements in the availability of skilled maternity care and can increase the likelihood that women receive care to prevent complications and can access life-saving care when complications arise.

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