

Facility-based Management of the Third Stage of Labor and Community Perceptions and Actions on Postpartum Hemorrhage

Findings from a National
Survey in Tanzania

May 2006

POPPHI

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About POPPHI

The Prevention of Postpartum Hemorrhage Initiative (POPPHI) is a USAID-funded, three-year project focusing on the reduction of postpartum hemorrhage, the single most important cause of maternal death worldwide. The POPPHI project is led by PATH and includes four partners: RTI International, EngenderHealth, the International Federation of Gynecologists and Obstetricians (FIGO), and the International Confederation of Midwives (ICM).

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Acronyms

AMTSL	Active management of the third stage of labor
APN	Antepartum hemorrhage
ECSA	East, Central, Southern, Africa Health Community, Family, and Reproductive Health Programme
EDL	Essential drug list
FGM	Female genital mutilation
FIGO	International Federation of Gynecology and Obstetrics
ICM	International Confederation of Midwives
MOH	Ministry of Health
MSD	Medical Store Department
MUCHS	Muhimbili University College of Health Sciences
NIMR	National Institute of Medical Research
POPPHI	Prevention of Postpartum Hemorrhage Initiative
PPH	Postpartum hemorrhage
RCQHC	Regional Center for Quality of Health Care, Reproductive, and Neonatal Health
SARA	Support, Analysis, and Research in Africa
STG	Standard Treatment Guidelines
TFDA	Tanzania Food and Drug Authority
USAID	U.S. Agency for International Development
WHO	World Health Organization

Executive Summary

Postpartum hemorrhage (PPH) is one of the world's leading causes of maternal mortality. Active management of the third stage of labor (AMTSL) is a feasible and inexpensive intervention that can help save millions of women's lives. AMTSL involves three basic procedures: the use of a uterotonic agent (preferably oxytocin) within one minute following the delivery of the baby, delivery of the placenta with controlled cord traction, and massage of the uterus after delivery of the placenta.* Based on conclusive evidence from clinical trials, the International Confederation of Midwives (ICM) and the International Federation of Gynecology and Obstetrics (FIGO) issued a joint statement in 2003¹ stating that every woman should be offered AMTSL as a means of reducing the incidence of PPH. The World Health Organization (WHO) Making Pregnancy Safer Technical Update on Prevention of Postpartum Haemorrhage by AMTSL (October 2006) recommends that "AMTSL should be practiced by all skilled attendants at every birth to prevent postpartum haemorrhage."²

Currently, very little is known about the actual practice of AMTSL. The aim of this study is to provide ministries of health and their international partners with the descriptive information necessary to assess AMTSL practices and identify major barriers to its use. A complementary component of the study includes a qualitative assessment of the practices and perceptions among community members regarding serious postpartum bleeding at home-based births. Specifically, the study asks:

1. In what proportion of deliveries is AMTSL used nationally?
2. What practices are in place that do not conform with the ICM/FIGO definition of AMSTL?
3. What are the facility- and policy-level barriers and facilitators to the use of AMTSL?

To answer these questions, a nationally-representative sample of facility-based deliveries was selected for observation; Standard Treatment Guidelines, the Essential Drug List and medical and midwifery school curricula were reviewed; the central pharmaceutical storage site, as well as pharmacies in health facilities selected for the study, were visited; and interviews were conducted with hospital directors, pharmacists, health care providers, and community members. Data collection took place between November 10 and December 15, 2005.

The results of the study show that a uterotonic drug was used during some stage of labor in 97 percent of the 251 facility-based vaginal, non-instrumental deliveries observed in the 29 selected health facilities. Oxytocin was used in one-quarter of deliveries. Use of AMTSL according to the ICM/FIGO definition was observed in 7 percent of deliveries. If the definition of AMTSL is relaxed to allow for administration of the uterotonic drug within three minutes of delivery of the fetus, the proportion receiving AMTSL increases to 17

* This is an updated definition of AMTSL from the 2003 ICM/FIGO Joint Statement on Management of the Third Stage of Labour to Prevent Postpartum Hemorrhage and the WHO, *Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors* (2000)

percent. The most significant factor contributing to the very low rate of AMTSL use was provision of the uterotonic drug after, rather than prior to, the delivery of the placenta. The study also documented that potentially-harmful procedures were practiced in approximately one-third of deliveries. Such practices included: the application of fundal pressure or fundal massage following delivery of the baby, the use of controlled cord traction without administration of a uterotonic drug following delivery of the baby, and the use of controlled cord traction without manual support to the uterus.

The policy environment is mixed in its support of AMTSL. At the national level, the Standard Treatment Guidelines mention but do not define AMTSL. They also state that oxytocin (5 IU) should be administered intramuscularly (IM) for uterine stimulation after delivery of the fetus, instead of the recommended 10 IU, and that the same amount should be used intravenously for induction and augmentation of labor. The national formulary for the routine management of the third stage of labor recommends giving ergometrine (0.5 mg/IM) or oxytocin (5 IU/IM) on delivery of the anterior shoulder or—at the latest—immediately after the baby is delivered.

The situation regarding drugs and supplies was found to be satisfactory in most but not all facilities in the sample. Ninety-seven percent of observed deliveries occurred in facilities with either oxytocin, ergometrine, or both available in the labor and delivery ward. Both drugs are also properly stored at a temperature of 2°C to 8°C and restricted from light at the national storage site, where the drugs are also stored in mobile cold boxes during procurement. There was great variability and numerous storage issues identified at health facilities. Over one quarter (28 percent) of health facilities stored oxytocin and ergometrine at room temperature.

A qualitative assessment was done to determine the perceptions and practices on PPH of communities. Interviews with traditional birth attendants (TBAs) and community leaders captured data on community knowledge, perceptions, and practices toward PPH. In addition, focus group discussions provided information from mothers delivering at home within the past 6 months. The study participants were drawn from the catchment areas covered by the 29 selected facilities.

Selected key recommendations resulting from this study are summarized below:

1. The Tanzanian MOH should revise the national STG to include the recommended dose of oxytocin (10 IU/ IM) for AMTSL, should specifically identify all AMTSL components, including proper massage, recommended uterotonic drug dosage, and the appropriate timing of administration of a uterotonic drug (following the delivery of the fetus).
2. The MOH should update STG guidelines and incorporate them into both pre-service and in-service training materials for all providers conducting deliveries, and provide standardized, competency-based refresher courses for MOH staff managing deliveries in Tanzania. Which providers are most important to target, either first or exclusively?

3. Pre-service and in-service training should specifically discourage the potentially harmful practices identified in this study and train professionals on the correct practice and appropriate use of AMTSL.
4. Review procurement and distribution policies as Tanzania increases use of oxytocin (and decreases ergometrine use) to comply with WHO, FIGO, and ICM standards and work to decrease zonal variation in drug supplies.
5. Revise or develop policies on proper storage, and disseminate these policies to all facilities.
6. Train supervisors in AMTSL, and include items on the supervision checklists to ensure its use is an indicator of quality.
7. Labor and delivery logbooks should include space to note and monitor AMTSL use.
8. Implement clinical audits on AMTSL use.
9. Encourage women who deliver at home to seek a skilled birth attendant to increase access to AMSTL.
10. Educate TBAs about the serious consequences of PPH and their role in rapid transfer of such women is important.

In summary, a major reason for the low percentage of AMTSL use in Tanzania is that a significant portion of providers give the uterotonic drug after the birth of the placenta (fourth stage of labor). There are a number of advocates in Tanzania working to reduce PPH and save lives, including MOH officials and other programs. By incorporating the updated definition of AMTSL, including a change in the oxytocin dose to 10 IU/ IM, into their STGs, formularies, and pre-service and in-service education programs, Tanzania will quickly increase the percentage of health providers using the very effective and cost-saving intervention, AMTSL.

1. Background

Postpartum hemorrhage (PPH) is one of the world's leading causes of maternal mortality. Active management of the third stage of labor (AMTSL) is a feasible and inexpensive intervention that can help save millions of women's lives.

AMTSL involves three main components:

- The use of a uterotonic agent within one minute following the birth of the baby.
- Delivery of the placenta with controlled cord traction.
- Massage of the uterus after delivery of the placenta.¹

This definition is supported by the International Federation of Gynecology and Obstetrics (FIGO), the International Confederation of Midwives (ICM) and the World Health Organization (WHO). This definition differs from the original research protocol in the Bristol³ and Hinchingsbrooke⁴ trials because the original protocols include immediate cord clamping and do not include massage. The FIGO/ICM Joint Statement and *Managing Complications in Pregnancy and Childbirth*, produced by the WHO, do not include immediate cord clamping.⁵

Clinical trials in developed countries have shown that the use of AMTSL, in contrast to physiologic management of the third stage of labor—in which oxytocic drugs are not used and the placenta separates spontaneously (delivered by gravity and maternal effort)—significantly reduces PPH. When compared to AMTSL, the use of physiologic management has a higher rate of PPH and severe PPH, the need for blood transfusion, the need for therapeutic oxytocics, and the duration of the third stage of labor. A Cochrane review of these trials concludes by recommending AMTSL for all women delivering in a hospital and anticipating the vaginal birth of a single infant.⁶

Endorsement and use of AMTSL

Based on this body of evidence, ICM and FIGO issued a joint statement in November 2003 stating that every woman should be offered AMTSL “as a means of reducing the incidence of postpartum hemorrhage due to uterine atony.”ⁱ The inclusion of AMTSL in the WHO evidence-based manual *Managing Complications in Pregnancy and Childbirth* also attests to the international acceptance of this practice as the standard of care.

Evidence regarding adoption of this practice, however, is limited. Evaluations of donor-funded projects incorporating AMTSL tend to be limited to reporting on the numbers of providers trained and the percent achieving competence following training. Apart from anecdotal information, a 2003 article by the Global Network for Perinatal and Reproductive Health⁷ offers a limited glimpse into the adoption of this practice. Their results, based on an evaluation of 15 university-based referral obstetric centers in developed and developing countries, show substantial variation between and within hospitals. Overall, only 25 percent of observed deliveries included AMTSL. Only one (in Dublin, Ireland) consistently used all three components of the practice. Variation in the prophylactic use of oxytocic drugs ranged

from 0 to 100 percent; the practice of controlled cord traction ranged from 13 to 100 percent; and the number of women who received additional doses of oxytocin during the third stage of labor ranged from 5 to 100 percent. There is insufficient evidence for drawing conclusions about the effectiveness of this practice in its altered states. These results do suggest, however, that the use of AMTSL is quite low and, where it is practiced, the definition varies within and between countries.

Since 1987, the Safe Motherhood Initiative has stated that maternal mortality is an issue of health infrastructure. AMTSL is a highly measurable, evidence-based, life-saving aspect of this health infrastructure. Given that PPH is a leading cause of maternal death in many countries with high maternal mortality, there is an important and urgent need for information from these countries on current practices regarding AMTSL.

About this study

As a complement to work undertaken by the Global Network for Perinatal and Reproductive Health, the survey discussed in this report was designed to advance understanding of current AMTSL practices in East Africa, represented by Ethiopia, Tanzania, and Uganda. This report focuses on Tanzania. Surveys will also be conducted in West Africa (Benin and potentially Mali or Ghana) as well as Latin America (El Salvador, Honduras, Nicaragua, and Guatemala). One Asian country—Indonesia—has also been included.

These ten country surveys focus on policy, provider-related factors, and supplies and logistics. When viewed together, these components provide important insights on routine use of AMTSL (Figure 1).

Policy

At the national level, a number of influences determine the priority given to AMTSL. For example, given that AMTSL has been a standard of care in the United Kingdom (UK) for many years, some researchers have hypothesized that AMTSL is more common in former British colonies and among providers who have trained in the UK. Likewise, effective leaders from national or international agencies may have been able to influence national policies, the inclusion of drugs in the essential drug list (EDL) and country formula regarding standards of care, and health provider education. In turn, such training may influence facility-based policies and behavioral expectations.

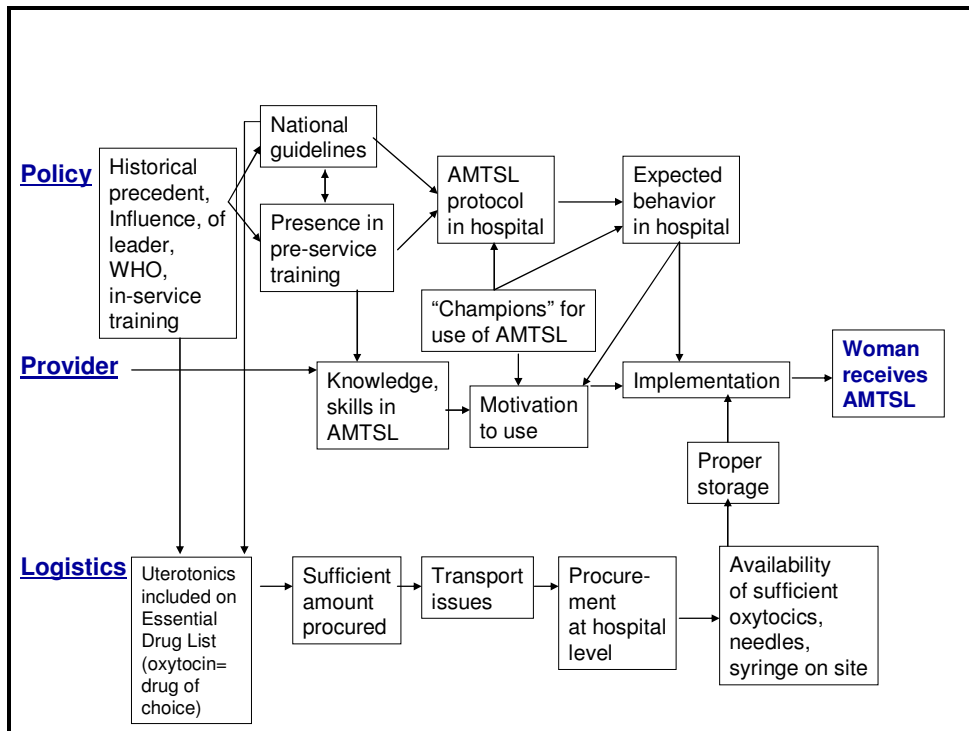
Provider-related factors

The knowledge and skills required to perform AMTSL are essential for routine use of the practice. Provider motivation, which is influenced by facility-based behavioral expectations, is also key.

Supplies and logistics

The sufficient availability of high-quality uterotonic drugs, needles, and syringes at national and local levels is essential for routine use of AMTSL. Effective use of AMTSL also implies appropriate conditions during transport and storage to ensure the use of chemically-active drugs and safe, sterile needles and syringes.

Figure 1. Determinants of the routine use of AMTSL.



The aim of this study is to provide ministries of health (MOHs) and their international partners with the descriptive information necessary to assess AMTSL practices and identify major barriers to its use. A complementary component includes a qualitative assessment of the practices and perceptions among community leaders, traditional birth attendants (TBAs), and recently delivered mothers regarding serious postpartum bleeding at home-based births. The findings will inform interventions that improve adoption and implementation of AMTSL and provide policymakers with the information they need to promote skilled attendance at birth. A third aim of this study is to produce tools and a method that others could employ to document change in the practice of AMTSL.

The study's specific research questions are as follows:

1. For what proportion of deliveries is AMTSL used at a national level? Which components of AMTSL (e.g., prophylactic use of oxytocic agents, controlled cord traction, fundal massage, or early cord clamping, if using the outdated protocol) are practiced, and how consistently are they practiced?

2. Is AMTSL formally promoted in the Standard Treatment Guidelines (STGs) in each country at national level? If so, since when? How is AMTSL defined in the standards?
3. How is the need for AMTSL drugs quantified at national and facility levels?
4. Which uterotonic drug (e.g., oxytocin, ergometrine, or a prostaglandin) is used? How is it stored?
5. At the facility level, is enough oxytocin available to allow for routine use of AMTSL?
6. What are the major barriers to correct use of AMTSL, as defined by WHO and FIGO/ICM in their Joint Statement on Prevention of Postpartum Hemorrhage?
7. What are the perceptions of and practices among community leaders, TBAs, and recently delivered mothers regarding serious postpartum bleeding at home-based births?

This report provides the results of both the quantitative study of the management of the third stage of labor and the qualitative study on perceptions regarding postpartum bleeding for Tanzania. The East African team requested the qualitative component of this report, and it is not included in the reports for countries in West Africa, Latin America, or Asia.

2. Methods

The development of the study methods was a participatory process that involved many people. The study team held an initial workshop of experts at PATH's Washington, DC, office on May 17, 2005, to elicit feedback on the draft proposal. A team of East African experts then provided feedback on the revised proposal. These inputs substantially broadened the scope of the study. In particular, the reviewers expressed interest in documenting practices and barriers regarding logistics and drug procurement in addition to observing the management of the third stage of labor. In July 2005, the co-investigators met in Nairobi for four days to plan for implementation. During this workshop, they drafted questionnaires to capture the expanded study objectives, discussed different approaches to sampling, and established budgets and timelines.

Shortly after this meeting, the proposal was submitted to ethical review boards in Ethiopia and Tanzania and at the Johns Hopkins Bloomberg School of Public Health (JHSPH) and PATH. The request for consent procedures described in the proposal consisted solely of verbal consent for health care providers and for parturients. No personal identifiers were recorded. In Ethiopia, the study was considered exempt from human subjects review. In Tanzania, the proposal received full review and was accepted. JHSPH judged the proposal to be exempt from review for human subjects research because no personal identifiers were recorded. However, the panel at JHSPH did specify that, where possible, a woman's consent must be obtained at admission, rather than in the delivery room. PATH deferred to JHSPH for their review.

Researchers designed this descriptive study to answer the research questions outlined above for the national and facility levels.

The research team collected five types of data to address the study objectives:

1. Observations from deliveries.
2. Short interviews with key informants regarding procurement of AMTSL drugs and the content of pre- and in-service medical and midwifery education.
3. Document review of both the STG and pre-service curricula for midwives and physicians regarding AMTSL.
4. Verification of the availability and storage conditions of AMTSL drugs.
5. In-depth interviews with TBAs and community leaders regarding perceptions of bleeding in and around childbirth.

The team collected the data from November 10 through December 15, 2005.

Sample design, size, and study areas

To address the objectives of the study, researchers selected a nationally-representative sample of facility-based deliveries. The study team selected the sample using a two-stage design. To begin, 15 of the 21 regions in the Tanzanian mainland were selected with equal probability.¹ These regions included Mtwara, Lindi, Ruvuma, Mbeya, Iringa, Morogoro, Dodoma, Coast, Tanga, Kilimanjaro, Arusha, Manyara, Mwanza, Shinyanga, and Dar es Salaam. Data collectors then met with the regional medical officer (RMO) and regional maternal and child health coordinator and obtained a current list of all hospitals with at least two deliveries per day. From this list, researchers randomly selected two hospitals to provide a total of 30 hospitals. The purposive selection of Muhimbili hospital in Dar es Salaam—the national hospital in Tanzania—provided one exception to this plan. However, due to a staff strike during the study, a visit to the Muhimbili hospital was not possible.

The distribution among the remaining 29 hospitals surveyed was as follows: 9 regional hospitals (one was both a regional and referral hospital), 17 district hospitals, and 3 faith-based (church-affiliated) hospitals.

Once at a selected hospital, a data collector observed all deliveries possible over two days for a period of 16 hours per day (7 am to 11 pm). The target sample size was 180 deliveries. Researchers selected Mwananyamala and Mkuranga district hospitals for pre-testing the questionnaires.

Sampling techniques

Weighted analyses

To reduce bias in the results, researchers applied weights during the analysis for both the observation of deliveries and provider interviews. These weights are described below:

- **Delivery weights**, which correct for the number of observed deliveries not being in proportion to the number of reported deliveries per year. If, during the observation period, the number of deliveries per day in a facility is less than the average number of deliveries per day for the entire year, the weight will adjust the value to match the number of deliveries per day for the entire year. Conversely, if the number of deliveries during the observation period was greater than the average number of deliveries per day, the value was adjusted downward.
- **Provider weights**, which adjust for the number of providers interviewed being different from the number managing deliveries in the facility. If the number of providers interviewed in a facility was less than the number that managed deliveries, the weight adjusts the value to match the number that managed deliveries. If the number interviewed matches the number that manage deliveries, the weight would

¹ Researchers selected facilities with equal probability because the actual number of deliveries per facility was unknown in all areas. If this were known, selection could have been done with probability proportional to the number of deliveries as the measure of size.

initially be 1.0, because no adjustment is required. In a few cases, the value was adjusted downward because health practitioners not managing deliveries directly were included in the sample.

The final weights in these cases could differ from 1.0, because another adjustment was made to ensure the overall weighted and unweighted sample sizes match. If the indicator is presented for a sub sample, the weighted and unweighted sample sizes will differ. The n values in all tables represent the weighted values.

Individual health facility questionnaire

Researchers completed a questionnaire for each health facility (n=29) in which deliveries were observed. Interviews conducted with facility staff documented the number of deliveries, policy information, and availability and storage conditions of uterotonic drugs in the pharmacy.

Health care providers

Interviews with health care providers at the maternity ward documented attitudes and perceptions regarding the routine use of AMTSL in those facilities. The study team interviewed a total of 106 providers over a 2-day period in each facility. Many of the interviewed providers were also observed during delivery.

Training for data collectors

Twelve data collectors were trained for this study. All data collectors were research scientists/medical doctors (5) or midwives (4). The 3-day training consisted of discussions and presentations about the various survey questionnaires, role-playing exercises, demonstrations of AMTSL with anatomical models, and a pretest. Training also provided time for data collectors to observe at least nine deliveries under the supervision of a study coordinator.

Definition of AMTSL

The definition of AMTSL promoted by FIGO/ICM includes the following elements:

1. Administration of 10 IU of oxytocin (the drug of choice) via intramuscular injection (IM) one minute following the delivery of the fetus. In cases where oxytocin is not available, 0.5 mg of ergometrine IM is recommended.
2. Controlled cord traction (gentle traction on the umbilical cord with manual support to the uterus).
3. Immediate uterine massage following delivery of the placenta and palpation of the uterus to assess the need for continued massage every 15 minutes over the next 2 hours.

For the purposes of this study, the criteria for correct use of AMTSL include elements 1 and 2, plus observation of immediate uterine massage following delivery of the placenta

(Definition A). Palpation and continued massage in the fourth stage of labor was not documented in this study.

A second definition of AMTSL (Definition B) is also provided in the analyses below. This definition follows the same criteria as for correct use but relaxes the requirement that oxytocin must be administered within one minute of delivery of the fetus—instead allowing oxytocin administration within three minutes.

Definition of controlled cord traction

For this study, controlled cord traction is defined as the application of gentle traction of the umbilical cord, with upward, manual support of the uterus, as a means of delivering the placenta. It was not deemed feasible for observers to detect if these actions were taken only after there were signs the placenta had begun to separate from the uterine wall, as specified in the FIGO/ICM recommendation.

Community knowledge, perceptions, and practices toward postpartum hemorrhage

Interviews with TBAs and community leaders established community knowledge, perceptions, and practices towards PPH. In addition, focus group discussions provided information from mothers delivering at home within the past six months. The participants for the community study were drawn from the catchment areas covered by the 29 selected facilities.

Qualitative data collection techniques explored community understanding about PPH. To better explore the issues surrounding PPH, researchers conducted in-depth interviews with TBAs and community leaders and focus group discussions with mothers who delivered at home.

Community leaders, in collaboration with the district maternal and child health coordinators identified TBAs in their respective areas. Interviews with four to six TBAs in each catchment area helped capture their knowledge, perceptions, and practices towards management of PPH.

Focus group discussions with mothers aged 30 or younger who delivered at home in the past six months explored their knowledge, perception, and practices towards PPH. The study team also opened the focus group to TBAs. Each focus group contained five to eleven participants and discussion took one to two hours. All group moderators used the same questions to guide focus group discussions.

Interviews with community leaders—village/ward executive officers, village chairmen, religious leaders, influential persons, and chairpersons of women groups and the village health committees—provided additional information about the perception of PPH. Maintaining gender balance proved difficult since most of the leaders were male.

Data management

Data were double entered and validated using Epi Info™ (Version 6). Following the data-cleaning process, descriptive analyses were carried out using STATA (Version 8.0) (College Station, TX, USA).

3. Findings: policy, logistics, and drug availability

National standard treatment guidelines

The Tanzania STGs and the 1997 EDL list and register two types of uterotonic drugs: oxytocin and ergometrine. The list indicates that oxytocin (5 IU) should be administered IM for uterine stimulation after delivery of the fetus, and the same amount should be used intravenously for induction and augmentation of labor. The National Formulary for the routine management of the third stage of labor recommends giving ergometrine (0.5 mg/IM) or oxytocin (5 IU/IM) on delivery of the anterior shoulder or—at the latest—immediately after the baby is delivered. It should be noted that the dosage recommended for AMTSL in these two documents is less than the ICM and FIGO recommendations supporting the use of oxytocin (10 IU).

According to a source at the central Medical Store Department (MSD), public use of drugs for the management of third stage of labor is not restricted to those drugs in the STG and EDL.

AMTSL is minimally mentioned in the revised (1997) STG and the practice undefined. In addition, a few policies restrict the use of uterotonic drugs at the facility and provider levels. Policies state that oxytocin for induction and augmentation is administered only at hospital-level facilities; oxytocin can be prescribed only by medical doctors and administered only by qualified health personnel (although these qualifications are not specified in the document). No restrictions are mentioned for using ergometrine.

The pre-service curricula for medical doctors and nurse-midwife students do not specifically mention AMTSL. However, the curricula on preventing PPH recommends resources (Lawson et al 1983; Lewis et al, 2000) that advocate the use of oxytocin (5 IU/IM) or ergometrine (0.5mg/IM) after delivery of the baby's anterior shoulder, followed by umbilical cord clamping immediately after delivery and removing the placenta by controlled cord traction. The curricula mention that uterine massage is also used in the treatment of PPH. The in-service training program, Life-Saving Skills, for doctors, nurses, and midwives includes information on AMTSL practice. The course includes the following AMTSL components: administration of ergometrine (0.5mg/IM) or oxytocin (5 IU/IM) after delivery of the anterior shoulder, controlled cord traction, and immediate massage after delivery of the placenta.

Availability of uterotonic drugs

Researchers found available supplies of oxytocin ampoules (5 IU/ML) and ergometrine ampoules (0.5mg/ML) during their visit to the central pharmaceutical storage site. Misoprostol is often available at research institutions but not in the government central MSD. Syntometrine® was not available.

For the past two years, the MOH has obtained oxytocin from the Vital Company-India and Rotexmedica-Germany. Ergometrine is obtained solely from the Vital company-India. The

process for ordering uterotonic and other drugs includes a quality assurance check at the Dar es Salaam airport or harbors. When questions or problems with samples occur, the drugs are sent to the Tanzania Food and Drug Authority and the chief pharmacist for testing.

Both drugs are stored at a temperature of 2°C to 8°C and restricted from light at the national storage site, where the drugs are also stored in mobile cold boxes during procurement. Several factors determine the quantity of drugs to procure: the previous monthly consumption rate, purchasing power, and storage and distribution capacity.

Both oxytocin and ergometrine are readily available at health facilities in Tanzania. For example, 97 percent of observed deliveries occurred in facilities with either oxytocin, ergometrine, or both available in the labor and delivery ward.

Storage conditions

Appropriate storage of these life-saving drugs remains an issue. In nearly three-quarters (72 percent) of the health facility pharmacies assessed, the recommended storage conditions for oxytocin was between 8°C and 25°C (without freezing). One health facility erroneously recommended that oxytocin be stored at room temperature². For ergometrine, the recommended storage temperature in 69 percent of visited facilities was between 2°C and 8°C. The actual storage conditions for oxytocin and ergometrine differed from these recommendations. Over one quarter (28 percent) of health facilities stored oxytocin and ergometrine at room temperature.

Drug costs

The purchase price (health facilities cost) for uterotonic drugs varied little; 180 Tanzania shillings (TSH) (approximately US\$0.15) for one ampoule of oxytocin and 130 TSH for one ampoule of ergometrine. Only one facility paid slightly higher prices (200 and 350 TSH, respectively). Most uterotonic drugs are distributed free of charge to patients in Tanzania. However, 4 of 29 health facilities charged patients for oxytocin (range: 90 to 4,000 TSH) and ergometrine (range: 65 to 2,000 TSH).

Facility supplies of uterotonic drugs

Researchers found a generally acceptable amount of oxytocin and ergometrine in the facility pharmacies, with most health facilities having a one-month uterotonic drug supply. Analysis at the zonal level showed that drug availability is problematic in certain zones. For example, the Southern Highland zone—which averages 400 deliveries per month—had less than one

² The US Pharmacopeia has changed their guidance on storage of oxytocin from 15°C to 25°C to a narrower range of 2°C to 8°C in the last few years. A recent review of this change questioned the stringency of this requirement; another change is expected soon and will likely allow the use of the manufacturer's recommendations for storage. It should also be noted that research has identified that oxytocin can remain at room temperature up to 30°C for 3 months.

week's supply of oxytocin. Similarly, the Eastern zone reported enough ergometrine supplies for less than one month, while nearly 750 deliveries were expected in the next month.

4. Findings: use of AMTSL

Data collectors observed a total of 251 facility-based vaginal, non-instrumental deliveries between November 10 and December 15, 2005. The characteristics of these observed deliveries are shown in Table 1.

Almost 90 percent of the observations were conducted in regional or district hospitals; six percent were in a central referral hospital. The study team observed deliveries in seven geographic zones located throughout Tanzania. The volume of deliveries in selected facilities varied substantially, ranging from low-volume facilities (managing fewer than 1,200 deliveries per year; 4 percent) to high-volume facilities (more than 10,000 deliveries per year; 27 percent).

Physicians were not observed in this study because they tend to manage instrumental or more complicated deliveries, which were excluded from this study sample. Consequently, 71 percent of the observed deliveries were managed by midwives and 11 percent by nurses. The mean age of mothers was 25.1 years (range: 14 to 46 years). A majority of the mothers were in the 2 to 5 gravidity group (58 percent).

Table 1. Distribution of deliveries by facility and characteristics of the mother

Delivery characteristic	%	n	Delivery characteristic	%	n
Type of facility			Qualification of provider		
Central referral hospital	5.7	14.1	Clinical medical officer	1.1	2.8
Regional hospital	39.1	97.1	Midwife	71.3	176.8
District hospital	52.4	130.2	Nurse	11.1	2.5
Faith-based Hospital	2.9	7.2	Other	11.6	28.8
			Missing	5.1	12.7
Volume of deliveries per year			Age of mother		
<1,200	4.4	10.9	<20 years	17.4	43.3
1,200—2,999	14.2	35.4	20-34 years	75.3	187.2
3,000—5,499	18.8	46.8	35+ years	7.2	18.0
5,500—6,999	17.7	43.9	Gravidity		
7,000—9,999	18.1	45.1	1	32.8	81.5
10,000+	26.7	66.4	2-5	58.0	144.2
Zone			> 5	9.2	22.8
Central	7.0	17.3	Total	100.0	248.6
Eastern	35.1	87.3			
Lake	12.7	31.5			
Northern	16.8	41.8			
Southern	10.4	25.9			
Southern Highlands	14.1	35.1			
Western	3.9	9.7			
Total	100.0	248.6			

Use of uterotonic drugs

In this sample of observed deliveries, almost all women received a uterotonic drug at some point during their births (97 percent). Eight percent of women were induced, and among spontaneous deliveries, 10 percent were augmented (data not shown). Slightly less than two-thirds (64 percent) of the women observed received ergometrine, a quarter of the observed women received oxytocin and three percent received both. Combination drugs such as Syntometrine or prostaglandins such as misoprostol were not used at all.

Table 2 presents findings about the use of uterotonic drugs by facility and characteristics of the mother. Use of ergometrine or oxytocin varied little across these characteristics. Women delivering at facilities managing 7,000 or more deliveries per year were more likely to receive oxytocin compared to women delivering at lower volume facilities. Use of ergometrine was slightly higher among older and high parity women (84 and 78 percent respectively). The Western zone showed almost exclusive use of ergometrine (94 percent). When examining data by time of delivery, data collectors saw no obvious pattern of uterotonic drug use or non-use.

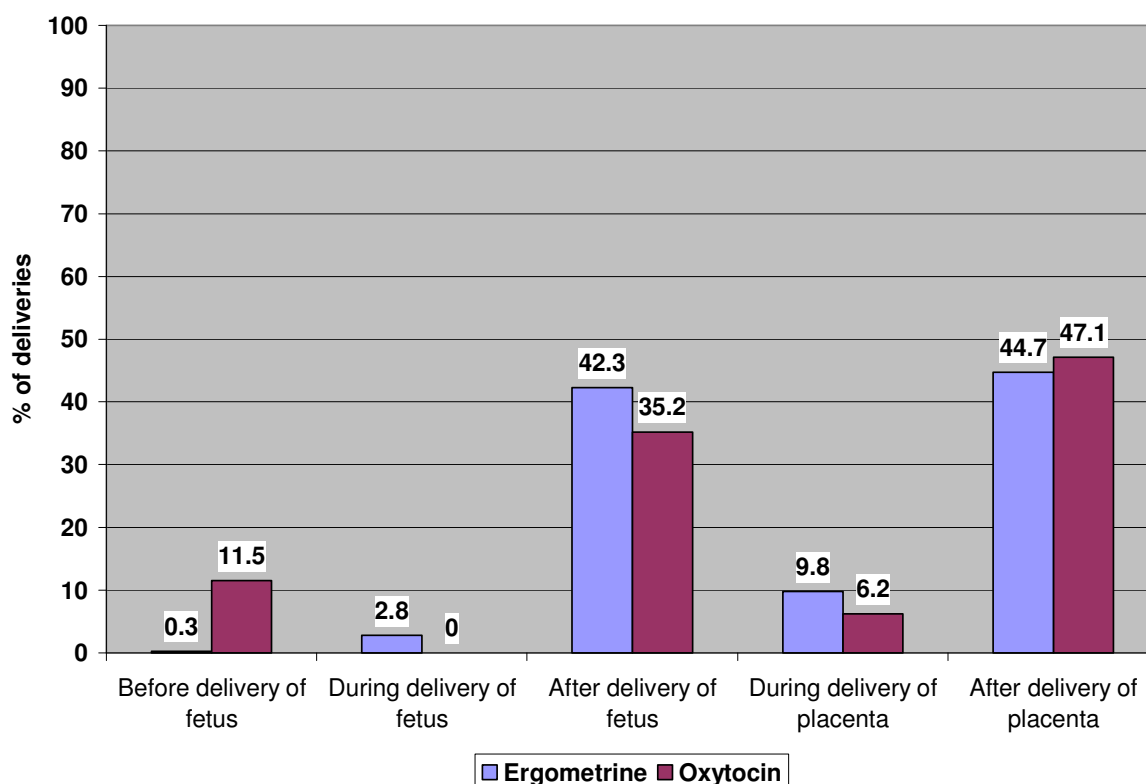
Table 2. Distribution of the use of uterotonic drugs during labor, delivery, and the immediate postpartum period.

	Use of oxytocin (no ergometrine) (%)	Use of ergometrine (no oxytocin) (%)	Use of Both (%)	Use of Neither (%)	Missing data	Total (%)	n
Total	25.8	63.8	3.0	2.1	5.2	100.0	248.6
Age of mother							
<20 years	20.4	66.8	4.3	0.0	8.6	100.0	43.3
20-34 years	28.3	61.2	2.7	2.8	4.9	100.0	187.2
35+ years	12.6	84.5	2.9	0.0	0.0	100.0	18.0
Gravidity							
1	24.0	66.5	6.7	0.0	2.8	100.0	81.5
2-5	27.5	60.0	1.4	3.7	7.4	100.0	144.2
> 5	21.6	78.4	0.0	0.0	0.0	100.0	22.8
Time of birth							
Midnight to 7 am	42.4	57.6	0.0	0.0	0.0	100.0	11.9
7 am to 1 pm	30.9	65.0	3.4	0.0	0.6	100.0	84.5
1 pm to 7 pm	24.6	61.9	3.7	4.2	5.6	100.0	126.1
7 pm to midnight	7.1	72.5	0.0	0.0	20.4	100.0	26.1
Type of facility							
Central referral hospital	11.1	81.5	3.7	3.7	0.0	100.0	14.1
Regional hospital	23.4	65.5	2.0	0.0	9.2	100.0	97.1
District hospital	30.2	60.1	3.0	3.7	3.1	100.0	130.2
Faith-based Hospital	8.6	75.1	16.3	0.0	0.0	100.0	7.2
Volume of deliveries per year							

<1,200	5.7	83.5	10.8	0.0	0.0	100.0	10.9
1,200—2,999	4.1	88.2	5.7	0.0	2.0	100.0	35.4
3,000—5,499	13.1	81.2	2.5	0.0	3.3	100.0	46.8
5,500—6,999	13.2	71.4	1.2	1.2	13.0	100.0	43.9
7,000—9,999	52.1	38.9	4.1	0.0	4.9	100.0	45.1
10,000+	40.1	47.4	1.1	7.2	4.2	100.0	66.4
Geographic zone							
Central	9.3	90.7	0.0	0.0	0.0	100.0	17.3
Eastern	47.8	40.4	0.0	5.5	6.3	100.0	87.3
Lake	38.3	47.0	5.9	0.0	8.8	100.0	31.5
Northern	11.9	78.7	7.7	0.0	1.7	100.0	41.8
Southern	8.5	75.6	4.6	0.0	11.3	100.0	25.9
Southern Highlands	4.4	89.3	3.6	1.5	1.1	100.0	35.1
Western	0.0	93.8	0.0	0.0	6.2	100.0	9.7
In-service training in selected facility:							
For midwives	19.1	73.6	2.6	0.5	4.3	100.0	96.3
For nurses	19.1	73.6	2.6	0.5	4.3	100.0	96.3
For doctors	10.5	78.8	6.2	1.3	3.3	100.0	39.8

Figure 2 details the timing for uterotonic drug administration in the observed deliveries. Among women receiving ergometrine—which in Tanzania appears to be the drug of choice during delivery—42 percent of women received this drug after delivery of the fetus, and 45 percent of women received it after delivery of the placenta. An additional ten percent of cases saw ergometrine administered during delivery of the placenta. This is in contrast to the FIGO/ICM definition recommending use of a uterotonic within one minute of the delivery of the fetus. Although use of oxytocin is much less frequent, the same pattern exists regarding timing for administration. Among women receiving oxytocin, about one-third (35 percent) received it following delivery of the fetus, and nearly half (47 percent) received it following delivery of the placenta.

Figure 2. Timing for administering uterotonic drugs.



Use of AMTSL by differing definitions

As noted in the Methods section, the study used two definitions of AMTSL:

- **Definition A** is the FIGO/ICM definition, which involves administration of 10 IU of oxytocin within 1 minute following the delivery of the fetus, controlled cord traction, and immediate uterine massage following delivery of the placenta. In cases where oxytocin is not available 0.5mg of ergometrine IM is recommended.
- **Definition B** follows the same criteria as Definition A but relaxes the time requirement for oxytocin administration from 1 to 3 minutes.

Table 3 provides the percentage of observed deliveries using both definitions of AMTSL by background characteristics. In this table, only AMTSL use with ergometrine is included, as AMTSL with oxytocin is not practiced. Overall, seven percent of observed deliveries received AMTSL following the strict version of the FIGO/ICM definition. The percentage increases to 17 percent when using the definition allowing administration of ergometrine within 3 minutes of delivery of the fetus. The percentage of AMTSL use by Definitions A and B vary similarly by characteristics of the mother and facility. In general, women under 20 and over 35 years of age are more likely to have had AMTSL, as are low and high parity women. The largest differences in the use of AMTSL are by geographic zone. In the Central zone, 23 and 40 percent of deliveries met the criteria for Definitions A and B, respectively. In the Lake and Northern zones, however, none of the deliveries met the criteria for Definition A, and 6 and 13 percent met the criteria for Definition B.

Table 3. Deliveries using AMTSL definition A and B,* by characteristic of the mother and facility.

	Definition A	Definition B	n		Definition A	Definition B	n
	(%)	(%)			(%)	(%)	
Age of mother				Zone			
<20 years	10.6	30.5	43.3	Central	22.8	40.0	17.3
20-34 years	5.5	13.4	187.2	Eastern	2.7	10.9	87.3
35+ years	9.2	22.4	18.0	Lake	0.0	5.9	12.7
Gravidity				Northern	0.0	13.0	16.8
1	9.3	21.8	81.5	Southern	18.4	28.5	10.4
2-5	4.8	13.5	144.2	Southern	3.6	16.6	14.1
>5	8.9	22.8	22.8	Highland			
Time of birth				Western	43.7	56.2	9.7
Day (7 am-6 pm)	6.0	17.3	210.6	Deliveries per month			
Night (7 pm-6 am)	10.3	15.5	38.0	<1,200	10.8	21.6	10.9
Type of facility				1,200- 2,999	10.1	14.1	35.4
Central Referral hospital	3.7	33.3	14.1	3,000- 5,499	9.1	23.3	46.8
Regional hospital	9.2	19.5	97.1	5,500- 6,999	1.2	10.7	43.9
District hospital	4.6	12.6	130.2	7,000- 9,999	8.7	19.4	45.1
Faith-based Hospital	16.3	32.7	7.2	10,000+	4.7	16.1	66.4
				In-Service Training on AMTSL			
				Midwives*	14.8	26.5	96.3
				Nurses*	14.8	26.5	16.0
				Doctors*	9.9	25.2	39.8
Total	6.7	17.1	248.6				

*Definition A: FIGO/ICM definition (oxytocin within one minute). Definition B: FIGO/ICM with relaxed timing requirement (oxytocin within three minutes).

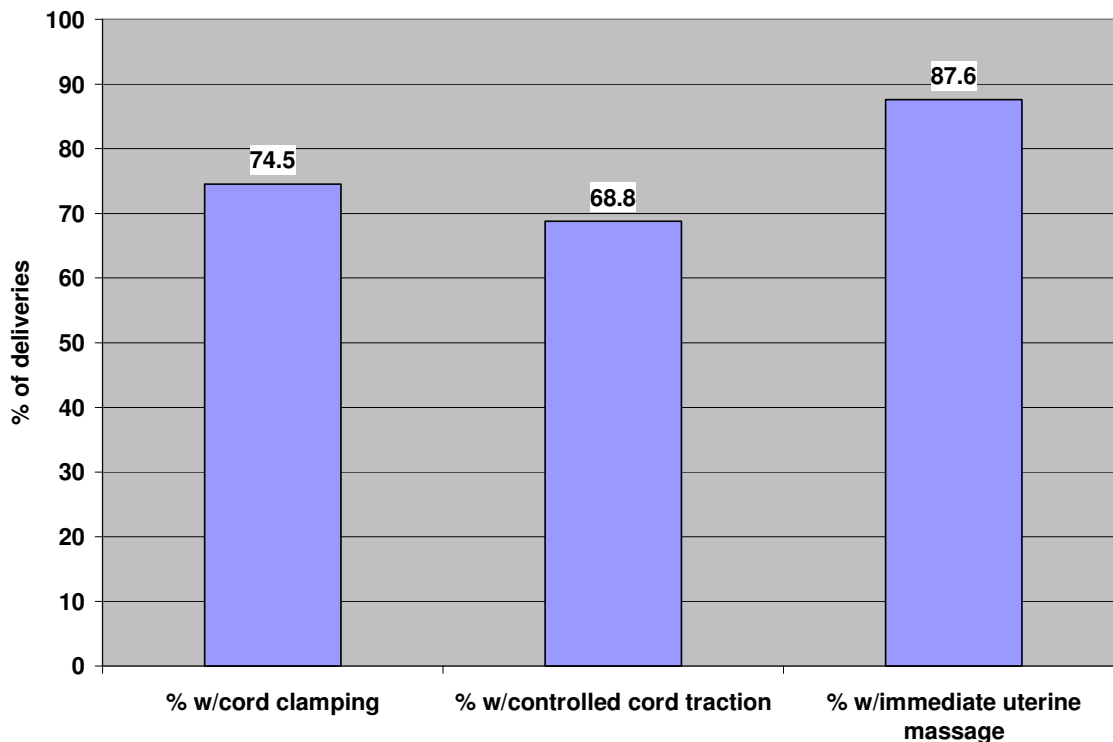
Elements of AMTSL

Controlled cord traction, cord clamping, and uterine massage

Figure 3 summarizes findings and observations of cord clamping, controlled cord traction, and uterine massage. Researchers defined controlled cord traction as the application of gentle traction of the umbilical cord, with upward, manual support of the uterus, as a means of delivering the placenta. Observers could not detect if this action was taken only after detecting signs that the placenta was beginning to separate from the uterine wall (as specified in the FIGO/ICM recommendation). According to the study's definition, providers performed controlled cord traction in over two-thirds (69 percent) of observed deliveries. Nearly 88 percent of all deliveries benefited from immediate uterine massage following delivery of the placenta. The study did not document palpation of the uterus at 15-minute intervals following delivery of the placenta.

Immediate cord clamping is not an element of AMTSL as defined by ICM/FIGO and debate continues about the ideal timing for cord clamping for maximum benefit to mother and baby. Figure 3 shows that cord clamping in within one minute of fetal delivery was practiced in three quarters of facility-based deliveries in Tanzania. Researchers observed cord clamping within two to three minutes of delivery with a large majority of the remaining deliveries (data not shown).

Figure 3. Deliveries with cord clamping within one minute, controlled cord traction, and uterine massage immediately following delivery of the placenta.



Despite the fact that uterotonic drugs are used universally in facility-based deliveries in Tanzania, correct use of AMTSL for this study was between 7 and 17 percent, depending on the definition. To isolate which practice or practices are responsible for the relatively low percentage of deliveries meeting all the criteria for correct use of AMTSL, Figure 4 presents data for the individual components practiced.

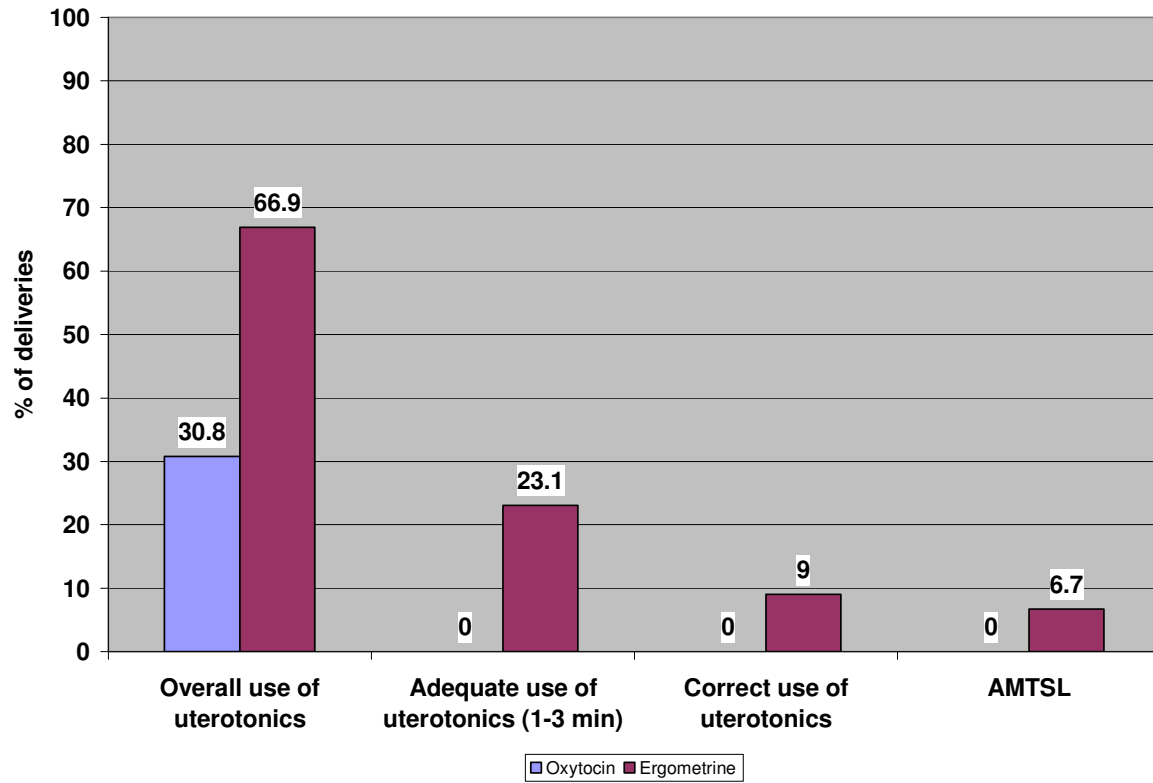
The percent of deliveries for which ergometrine and oxytocin were used was 67 and 31 percent respectively, with no restrictions on timing, mode of administration, or dose. The “adequate” use of the uterotonic drug is defined here as using the correct dose of the uterotonic drug, correct mode of administration, and the timing of the administration of the uterotonic drug within three minutes of the delivery of the fetus. The restrictions included in the definition of adequate relative to overall use, cause a drop of 44 percentage points among births with ergometrine (dropping from 67 to 23 percent). The use of ergometrine during or following delivery of the placenta accounts for virtually all of this decrease.

None of the deliveries met the criteria for adequate use when oxytocin is used. The decrease from 31 percent to 0 is due to both the administration of oxytocin at times other than following the delivery of the fetus, and to the dose of oxytocin; in 83 percent of the deliveries where oxytocin was used, 5 versus 10 IU of oxytocin were administered.

The correct use of uterotonic drugs is the same definition as adequate use, with the further restriction that the uterotonic drug must be administered within one minute of the delivery of the fetus. Among those receiving ergometrine, there is a further decrease in use from 23 percent to 9 percent. The Definition A for AMTSL use is correct use of a uterotonic drug, plus controlled cord traction and immediate massage following delivery of the placenta. An additional two percentage points are lost in use among deliveries receiving ergometrine.

In summary, the use of ergometrine during and following the delivery of the placenta is the biggest deterrent to correct use of AMTSL in Tanzania. The administration of ergometrine within three minutes also reduces use by more than half (23 to 9 percent). The additional requirements of controlled cord traction and uterine massage appear to be in place among providers using ergometrine, as these requirements further reduce correct use only from nine to seven percent.

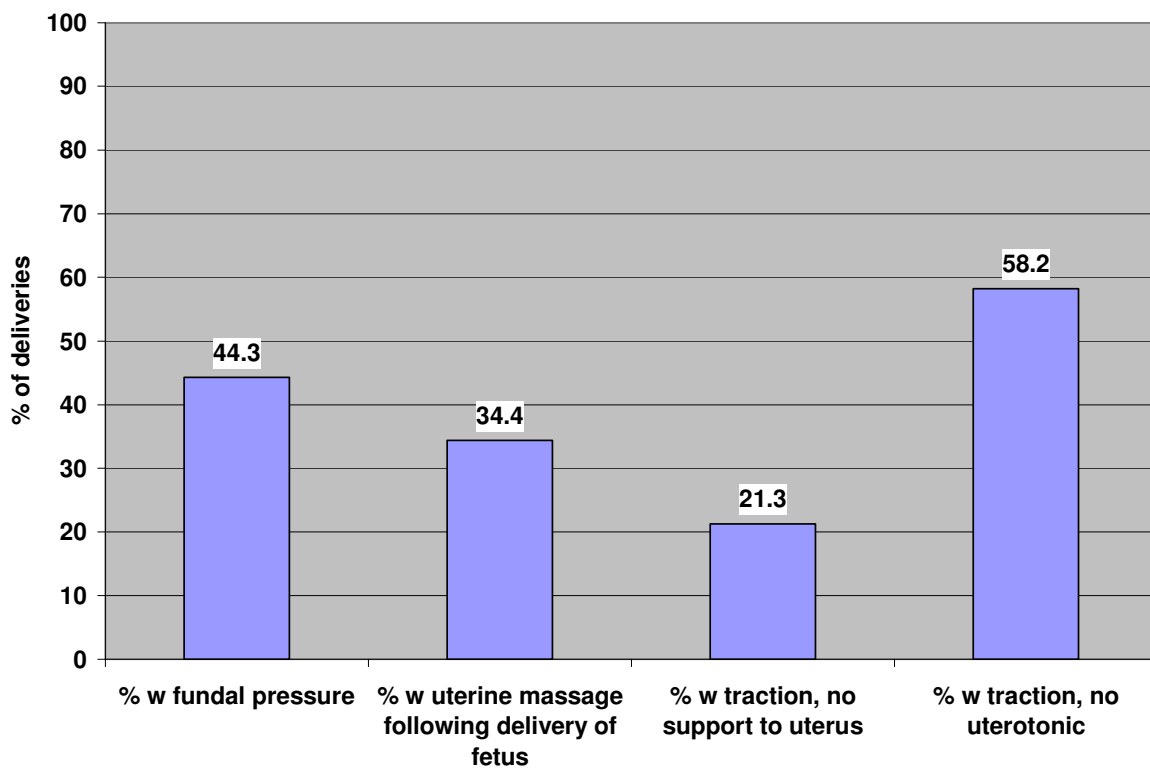
Figure 4. AMTSL use according to various definitions.



Potentially harmful practices

In addition to documenting AMTSL use, data from this study also identified four potentially harmful practices (Figure 5). These practices include the application of fundal pressure while awaiting the placenta (44 percent), uterine massage following delivery of the fetus (34 percent), application of cord traction without manual support of the uterus (21 percent), and applying cord traction without having administered a uterotonic drug to contract the uterus (58 percent). All of these practices can increase the risk of PPH or cause problems such as uterine inversion.

Figure 5. Potentially harmful practices observed during delivery.



5. Findings: provider knowledge of AMTSL

To complement data on the use of AMTSL during deliveries, the study team conducted face-to-face interviews with 106 labor and delivery professionals in facilities selected for this study (Table 4).

A majority of interviewed providers worked in district hospitals (60 percent), with an additional 31 percent working in regional hospitals. Midwives accounted for the majority (64 percent) of interviewees although nurses (11 percent) also were included. Almost all providers received training in AMTSL (93 percent), mostly during their pre-service education (70 percent).

Eight percent of providers reported participation in in-service training on AMTSL. These providers worked an average of seven years in obstetric wards, although this varied from one to 30 years across providers. The study also found that these providers worked an average of four years in their current facility.

Table 4. Characteristics of obstetric providers interviewed.

Provider Characteristics	%	n (n=106)
Interviews by type of facilities		
Central Referral	3.3	3.5
Regional	32.1	34.1
District	58.3	61.8
Faith-based	6.2	6.6
Qualifications		
Midwife	64.4	68.3
Nurse Officers	11.3	12.0
Others*	24.3	25.7
Training		
Any Training in AMTSL	93.3	98.9
No training in AMSTL	6.7	7.1
Pre-service Training	70.1	74.3
In-service training	7.7	8.2
Both pre- and in-service training	15.5	16.4

*Assistant medical officers, MCH AID, medical attendants, nurse assistants, and student nurses.

The researchers interviewed providers regarding their knowledge of the definition of AMTSL (Figure 6). About 85 percent of these providers made correct statements regarding

any of the following topics: the appropriate uterotonic drugs to use, the appropriate timing of administration of these drugs, or the purpose of administering these drugs (prevention of PPH). Approximately half (48 percent) made correct statements regarding the purpose of controlled traction, and one in five providers (21 percent) mentioned correct statements regarding external massage of the uterus for prevention or decrease in postpartum bleeding.

Figure 6. Providers knowledge of uterotonic drugs, controlled cord traction, and uterine massage.

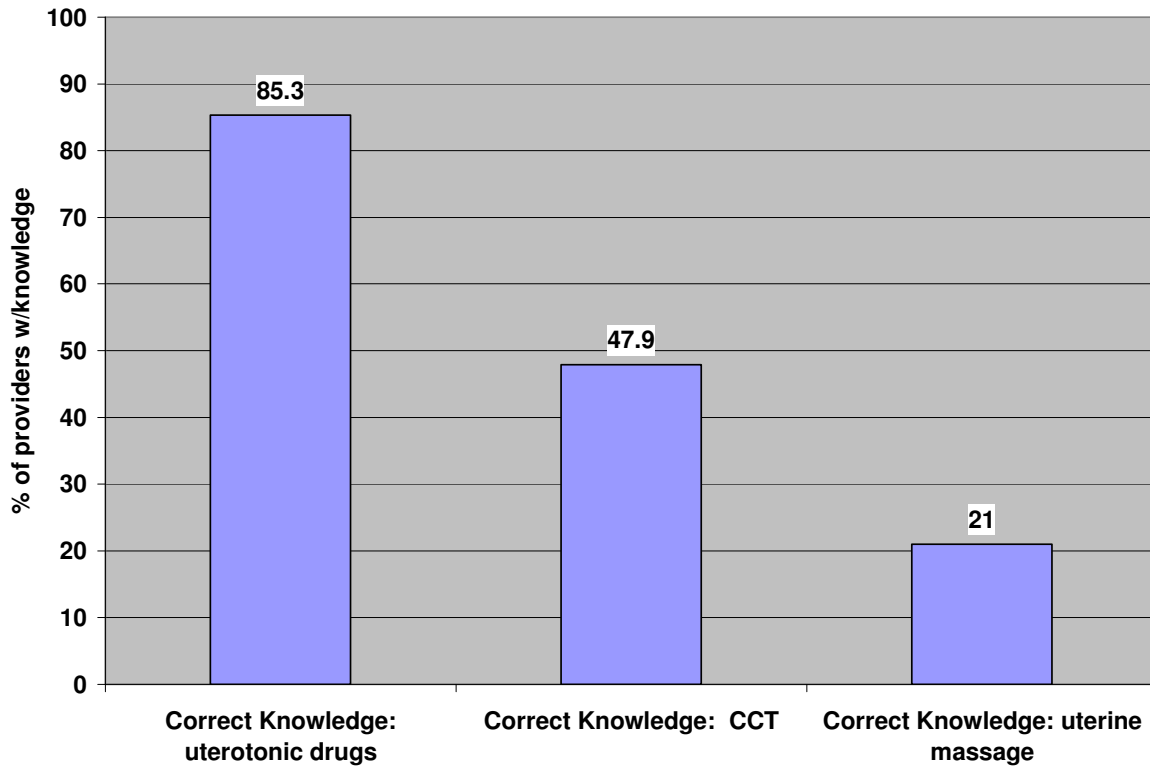
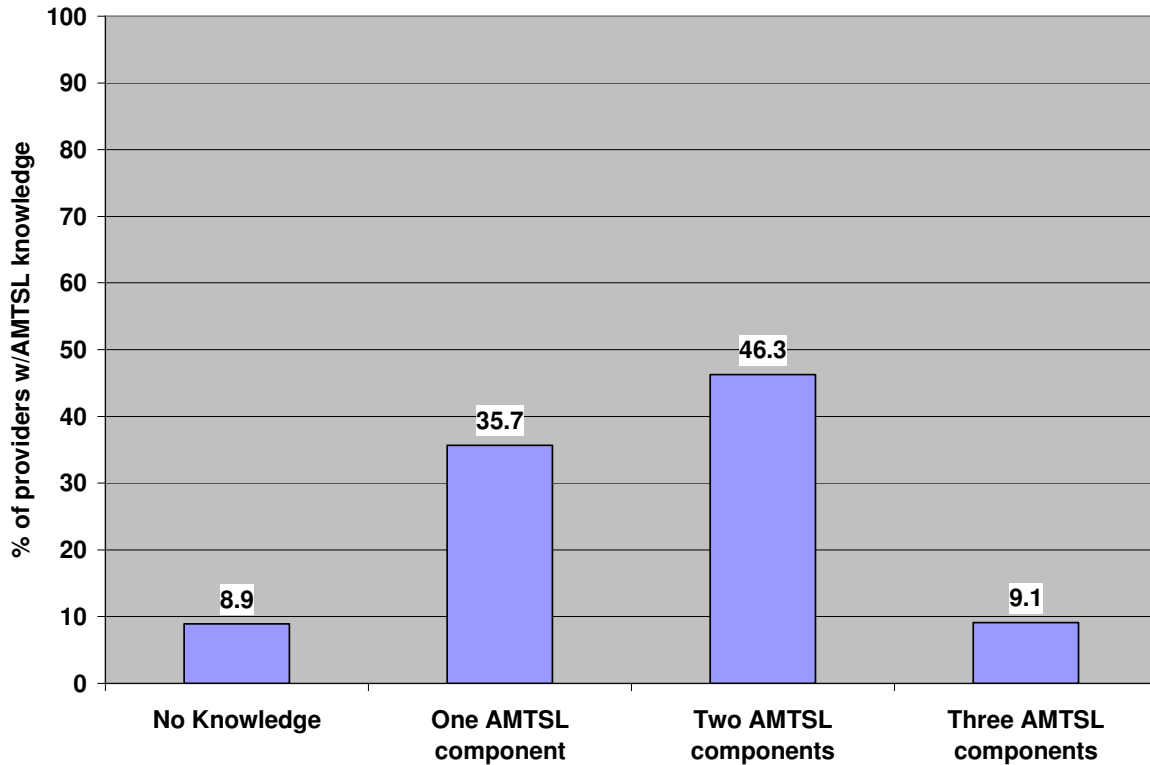


Figure 7 shows the percent of providers by the number of components to the AMTSL definition that they spontaneously mentioned when asked to define AMTSL. Only nine percent made correct statements regarding use of the uterotonic drug, controlled cord traction, and uterine massage. Thirty-six percent and 46 percent of providers mentioned one and two components, respectively. Nine percent of providers made no correct statements regarding the definition of AMTSL.

Figure 7. Providers knowledge of AMTSL components.



Women’s consent to the practice of AMTSL

During the study, only two percent of providers indicated their facilities asked women for consent to receive AMTSL.

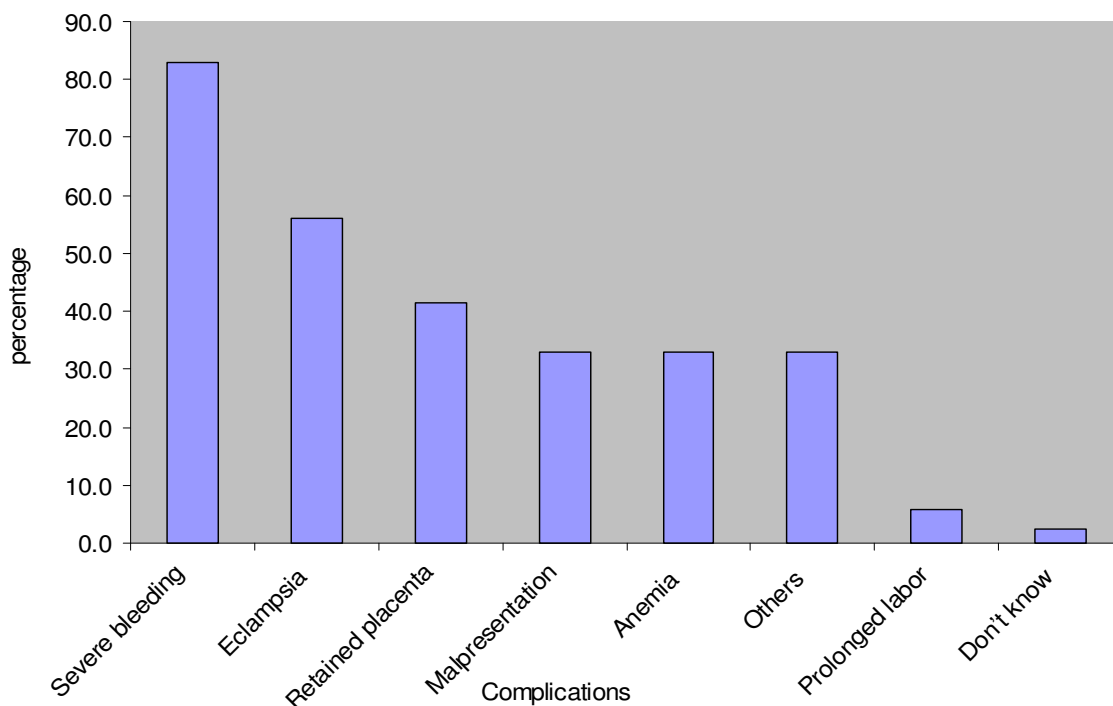
6. Findings: community qualitative study (PPH perceptions and practices)

Interviews with TBAs and community leaders captured data on community knowledge, perceptions, and practices toward PPH. In addition, focus group discussions provided information from mothers delivering at home within the past six months. The study participants were drawn from the catchment areas covered by the 29 selected facilities.

Traditional birth attendant interviews

Researchers interviewed 110 TBAs of which more than 50 percent mentioned PPH and eclampsia as the most common complications for mothers during and after delivery. Other problems noted include retained placenta, anemia, malpresentation, and prolonged labor (Figure 8).

Figure 8. Complications during and after delivery noted by TBAs.



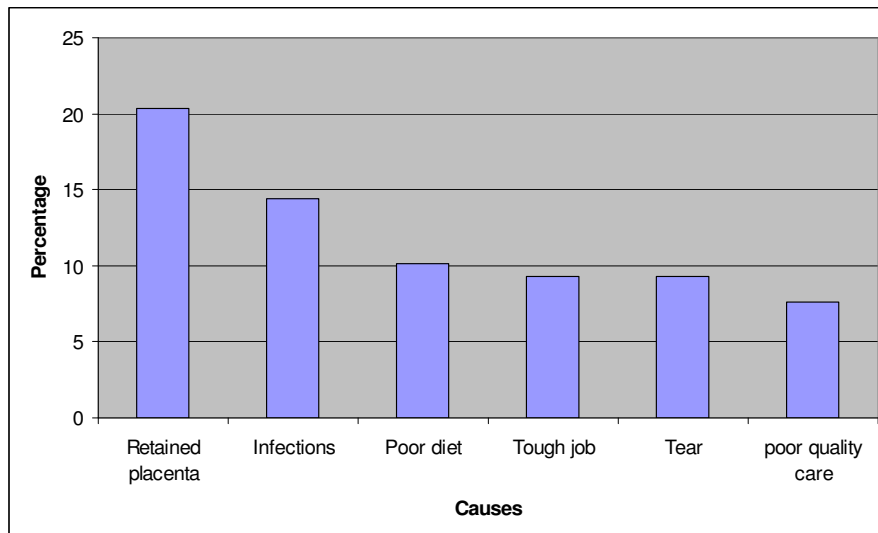
When asked about the severity of PPH in the community, a majority of TBAs did not see PPH as an important public health problem in their area; only 41 percent did consider PPH an important public health problem

All respondents perceived PPH to be extremely dangerous because of the threat to mothers and their neonates especially when severe anemia also results for the mother. TBAs also reported different definitions of PPH when asked to compare the condition to normal bleeding. The majority define PPH as continuous bleeding with clots or bleeding with high

speed. Two bottles (350ml each) were used as a cut-off point for PPH for some, while others mentioned one to three liters.

When asked about the perceived caused of PPH, TBAs reported issues such as retained placenta, poor nutrition, physical work during pregnancy, and infections (Figure 9). Others included feeding on soil, short spacing between pregnancies, multiple pregnancies, malpresentation, poor quality of health services, and giving birth at a young age. Cultural and social factors such as unfaithfulness of the male partner (extramarital affairs) and body structure were also believed to have impact on PPH. However, a majority of the respondents were unaware of the actual causes of PPH and believed it was “God’s wish.”

Figure 9. Perceived causes of PPH by TBAs.



Steps taken by TBAs with women expecting to deliver

Table 5 notes the various steps followed by TBAs interviewed. TBAs explained the steps they take after receiving an expectant mother in their care. The steps include:

1. **Preparation.** Inspecting the clinic card looking for any danger signs indicating what designates hospital delivery. This step also includes preparing the delivery bed/area, assessing the cleanliness of the area, preparing supplies (including gloves), and providing tea and traditional medicine to the mother to speed up labor.
2. **Examination the mother.** Looking for potential complications and examining for the stage of labor, fetal positioning, and presentation.
3. **Assist with delivery.**
4. **Cord clamping and cut.**
5. **Delivery the placenta.**

6. **Clean the mother and child.** This also included providing drugs like ergometrine (if available) and massaging of the mother using cold water (untrained TBAs noted using hot water).
7. **Referral to a health facility if needed.**

Table 5. Number and percentage of respondents according to the steps taken in delivery process.

Steps	Number	Percentage (%)
Preparation	80	67.8
Examining of the mother	77	65.3
Assist delivery	96	81.4
Cord clamp and cut	89	75.4
Delivery of the placenta	66	55.9
Clean the mother and her neonate	79	66.9
Others	11	9.3

TBA case load

A majority of TBAs worked with between 2 and 20 deliveries during the previous six months. Surprisingly, one respondent attended 60 deliveries while 24 hadn't attended any deliveries in that time period. However, a majority of the women included in these visits did not develop PPH. Very few TBAs had attended between one and ten PPH cases during the past six months.

Action taken once PPH started

Most TBAs referred women to health facilities in cases of PPH occurred (Table 6). Reasons for referral included seeking examination and medication from professionals to stop excessive bleeding. TBAs administered first-aid such as elevating the mother's lower limbs, placing pads, providing hot tea, and massaging the abdomen to expel clots, before making further decisions. Very few would refer a woman without taking preliminary action. However, instead of referring a mother to a health facility, other TBAs would provide medicine, whether ergometrine or traditional medicine.

Table 6. Actions by respondents once PPH occurs.

Action taken	Numbers	Percentage (%)
Referral to the health facility	55	46.6
Provide first aid	45	38.1
Provide some medication	35	29.7
Never assigned a case	27	22.9

Before referring a mother, over 60 percent of TBAs would most often seek advice from the mother’s parents, husband, or close relatives, including neighbors if necessary. In cases of excessive bleeding and to avoid unnecessary delays in urgent situations, other TBAs did not seek advice before referral.

TBAs spend less than one hour reaching the nearest health facility (by walking or vehicle) and a few spend up to eight hours. Most TBAs use public transport, hire a vehicle, or use bicycles to transport women due for delivery; however, stretchers were used where transportation was difficult. Boats were used in areas where the main means of transportation was by water.

A majority (73.8 percent) of TBAs experience no obstacles referring patients to health facilities; however, a few TBAs faced problems when referring because of hospital bills, disrespect of the nurses in health facilities, negligence on the part of the patient (the woman was not willing to attend a health facility), lack of clinic cards (patient had not attended antenatal clinic and so was not registered), minimal spacing between pregnancies, and transportation costs. There are times when mothers had to wait for their husband or father to decide.

TBA suggestions for reducing PPH

- Provide health education to mothers and community members on safe delivery including importance of antenatal care during pregnancy and maintaining a balanced diet.
- Provide TBA training to recognize the presence of complications.
- Build health facilities closer to the community.
- Provide TBAs with equipment and supplies to facilitate deliveries.

Community leader interviews

A total of 130 community leaders were interviewed with at least five leaders from each catchment area. Leaders identified the main problems affecting women during and after

delivery and indicated PPH as the main one. Other problems indicated by leaders included eclampsia, retained placenta, and anemia (Table 7). The leaders mentioned the following as minor problems leading to pregnancy complications: malaria, abdominal pains, miscarriage, death, birth before arrival, and loss of consciousness.

Table 7. Community leader’s perceptions of pregnancy complications.

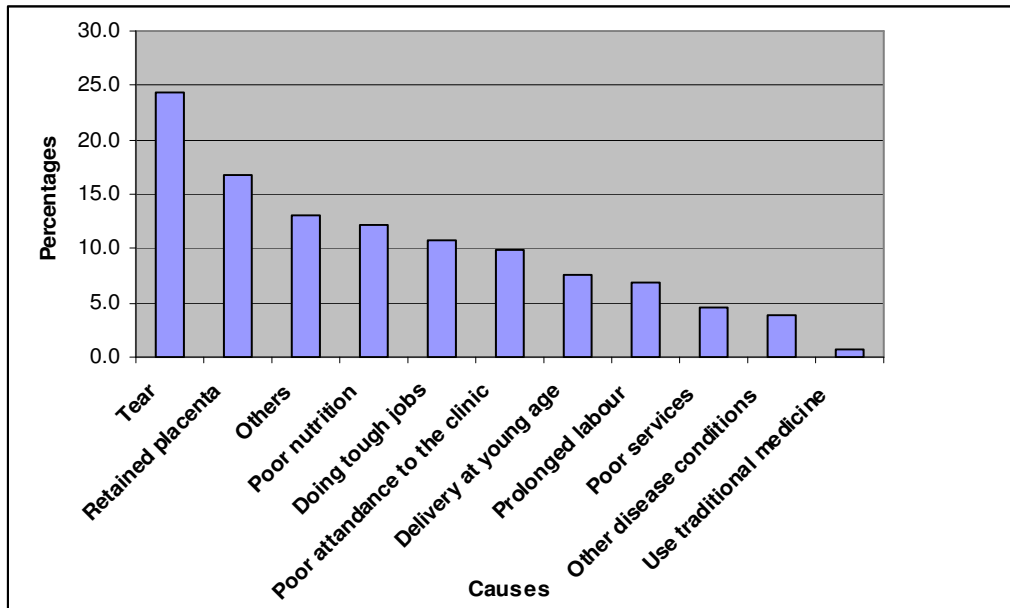
Problems	Number	Percentages (%)
PPH	90	69.2
Anemia	24	18.5
Eclampsia	27	20.8
Retained placenta	40	30.8
Overweight baby	15	11.5
Body malaise	15	11.5
Swelling of the legs/body	10	7.7
Rupture of the uteri/cervix	6	4.6
Prolonged labor	6	4.6
Others	35	26.9
Don’t know	9	6.9

When asked about how severe they perceived PPH to be, the leaders had differing perspectives. Of the 125 respondents, 45 percent perceived PPH as not an important public health problem because it doesn’t happen very often, while 32 percent viewed PPH as a big problem, and 23 percent didn’t know and had never seen a case of PPH.

The definition of PPH also varied among the community leaders. Most could not tell the difference between PPH and normal bleeding. Since they had little knowledge on PPH, a mother might faint or die before they realized it was a problem. Meanwhile, a substantial number of respondents (97 percent) perceived it to be very dangerous as it might affect the health of the mother and a child. Other household members like husband and parents were perceived to be at risk once there is a problem of PPH.

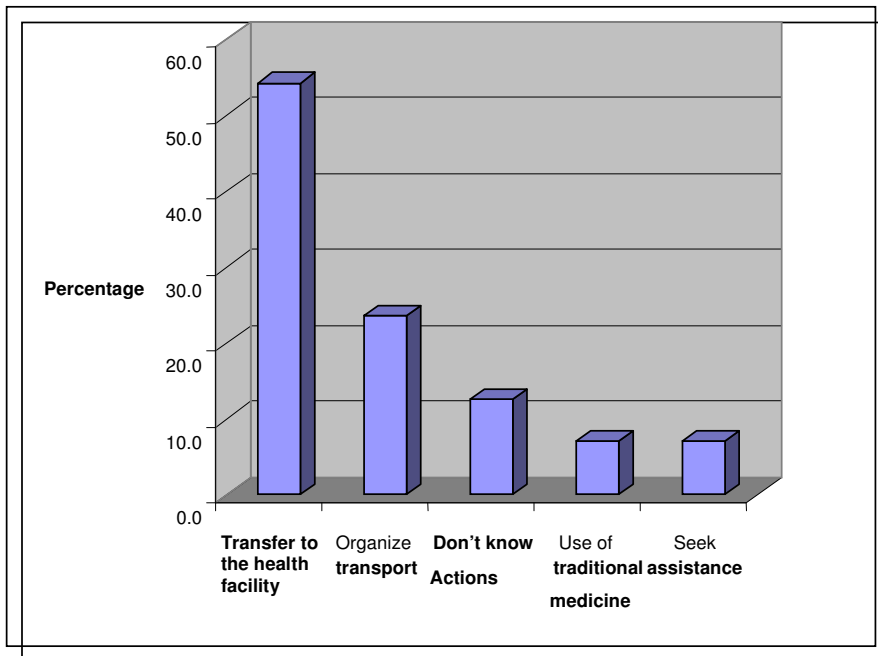
The community leaders mentioned several main causes of PPH: retained placentas; poor nutrition; and tearing of the cervix, vagina, or uteri (due to big baby or female genital mutilation [FGM]). These community leaders believed that using traditional medicine contributed to PPH. (Figure 10).

Figure 10. Knowledge of the community leaders about PPH causes.



The community leaders mentioned different actions taken once PPH occurs (Figure 11). Referral to the health facility was the most common action mentioned; however, use of traditional medicine was mentioned by seven percent of the respondents. Other actions taken to facilitate referral included arranging transportation and seeking assistance.

Figure 11. Action taken for PPH by the community leaders.



Several people were consulted for decision about whether to refer a woman to a health facility. These included TBAs, nearby health personnel, or family members including parents or husbands. Distance to the nearest health facility ranged from ¼ to 35 km, with a walking distance between ten minutes and five hours. Transportation costs were most often covered by the husband or parents of the mothers. In some cases, the extended family would pool their resources to ensure transportation was obtained, and other times community members were asked to help if a family couldn't afford the costs.

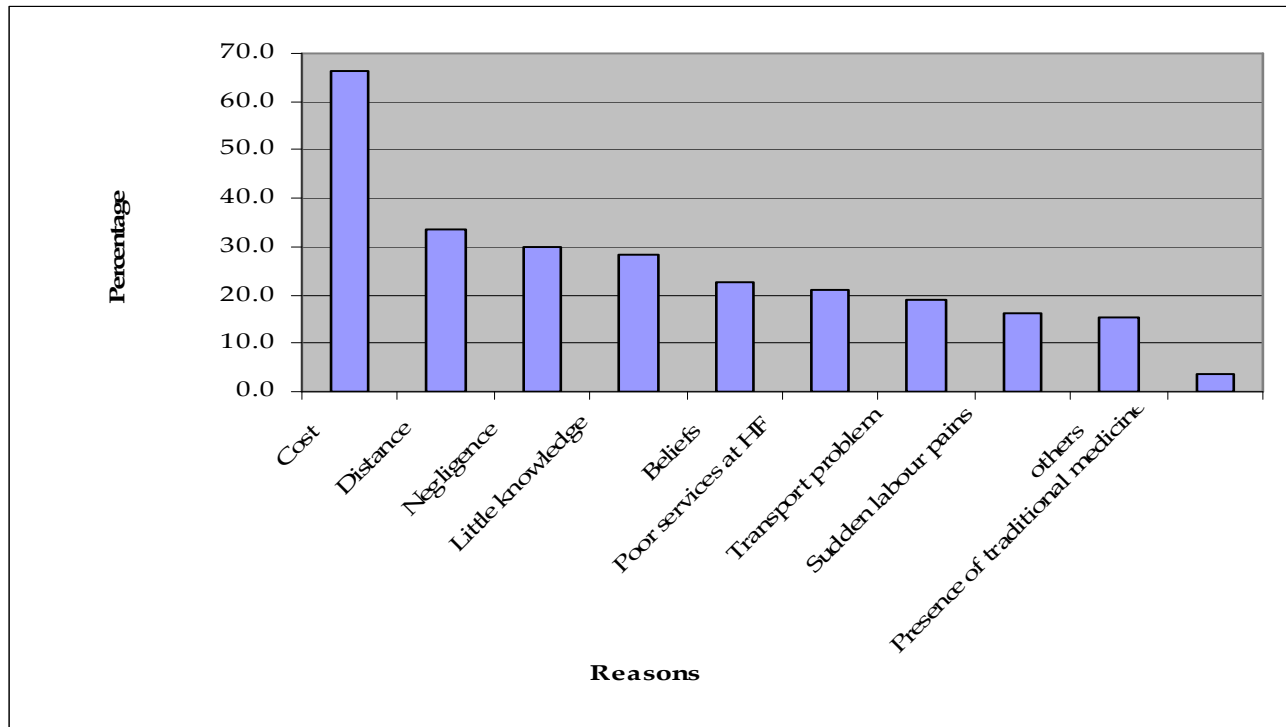
Most of the community leaders received information about PPH from families, relatives, or neighbors, and few received information from TBAs or health personnel. Other leaders never received information about PPH because of either few or no cases occurred in their communities. On other occasions, relatives and TBAs didn't inform the leaders because the mothers did not want to involve other people. However, once the community leaders were informed, many advised referral to the health facility and assisted in facilitating transport.

Quality of delivery services by TBAs

A majority of community leaders (49 percent) perceived TBAs services as inadequate. Several weaknesses were observed by community members including lack of equipment and proper training on safe delivery methods, poor sanitation, and unhygienic practices by TBAs. However, 23 percent of these respondents believed that TBAs gave sufficient patient services, while others (10.9 percent) couldn't comment because they never witnessed a case attended by a TBA.

When asked why home deliveries were common, the community leaders noted several reasons for the trend, including long distances to health facilities, poor services at the health facility, transportation costs, distance, and negligence by women to utilize health facilities when needed (Figure 12).

Figure 12. Reasons for home deliveries.



HF = health facility

Community leaders recommended the following actions:

- Provide education to pregnant mothers and community members on safe delivery practices, the importance of attending the health facility or clinic for antenatal care, and eating balanced diet.
- Provide education to health staff on safe delivery and client-provider interaction.
- Lower cost of delivery or provide free services at health facilities.
- Provide reliable transportation.
- Provide nearby health facilities.
- Improve health services at the health facilities (e.g., drugs, supplies, qualified staff, equipment, etc.).
- Research traditional medicine to assess their effectiveness.
- Ban genital mutilation activities.
- Provide TBA education on safe delivery practices and the importance of health facility referrals.

- Build maternity homes or waiting rooms at health facilities.
- Advise TBAs to stop providing delivery services to high-risk mothers.
- Provide TBAs with supplies including drugs to help stop excessive bleeding.
- Encourage older TBAs to stop providing delivery services.
- Provide income-generating activities for TBAs.

Focus group discussion with mothers

Women who delivered a baby within the past six months were invited to participate in one of 26 focus group discussions to gather information on their knowledge and perception towards PPH. Most participants mentioned several problems that mothers get during and after delivery including PPH. The problems included retained placenta, eclampsia, anemia, loss of consciousness, and body malaise or weakness. However, some mothers also mentioned the following: tearing of the cervix, stomach ache, prolonged labor, obstructed labor, death of a baby in the womb, high fever, and malpresentation.

Knowledge and severity of PPH

All mothers' focus groups perceived PPH as a problem because of the potential harm to mothers and children. It was therefore an important health problem in most of the communities visited. Participants offered many personal perspectives and experiences. One mother indicated that it was a common problem for young mothers and other participants mentioned personal PPH experiences:

"After delivery, I bled severely and became helpless. Retained placenta was the causative factor for severe bleeding."

—Muheza mother

"I bled severely when I lost my baby during delivery. I was then referred to a health facility immediately and was injected with drugs to stop bleeding."

—Mbozi mother

In some groups, women had never experienced problems with PPH. However, they were able to give examples from other areas:

"One woman gave birth at home where she bled severely. However, the woman died after reaching the health facility."

—Ilala participant

"Three years ago, my neighbor died at home after she bled excessively following delivery. The reason for death was that there was no transport to rush her to the health facility."

—Mbozi participant

In some areas mothers said PPH was not a big problem because it didn't happen very often.

Group participants defined PPH differently and “bleeding continuously” was the common definition. Participants from Bagamoyo and Arumeru defined PPH based on their own experience:

“I bled excessively to the extent that the small size bucket became full where I became helpless.”
—Bagamoyo mother

“Because animal skins are used as a delivery bed, sometimes the animal skins become full of blood, like an ocean, after mothers give birth.”
—Arumeru participant

Table 8. Examples of PPH definitions by area.

Catchment area of district/region	PPH definition
Sekoture	Bleeding for a long time or sudden bleeding, where a mother has to be referred to the health facility for blood transfusion, drugs, and re-hydration.
Tumbi	A patient faints, becomes anemic, weak, and dizzy.
Sengerema	Bleeding continuously for two days, bleeding with high speed, and changing pads frequently. It is accompanied with body malaise and a feeling of helplessness.
Dodoma	Abnormal bleeding with clots and bleeding continuously where some women usually faint.
Iringa	Bleeding continuously and excessively with blood clots, one liter of blood.
Mbulu	PPH (1 bucket) or a mother can become unconscious

Causes of PPH

Many women participating in focus groups believed PPH was “God’s wish” and were not knowledgeable on the actual factors that cause PPH:

“I don’t know the causes because a woman can stay healthy for the whole period of pregnancy but after delivery, she can start bleeding excessively.”
—Sekoture participant

“We don’t know the causes- whether there is a rupture of the blood vessels or not. Many have lost their lives but still the causes are unknown.”
—Bombo participant

Only a few groups of mothers were able to list conditions and situations they thought could cause PPH such as having a retained placenta, pushing the baby before active labor, giving birth to an overweight baby, excessive tearing of the cervix or vagina, experiencing weakness due to lack of vitamins or nutrients, arriving late to the health facility, doing strenuous work during pregnancy, or eating soil powder.

*"I gave birth at home for my first born where there was tearing of the perineum and this caused me to bleed excessively. I was then referred to the health facility, straight to theatre."***

—Kilwa participant

"The baby is carried for nine months therefore it is evident why there should be excessive bleeding during birth (due to the long period of pregnancy)."

—Shinyanga participant

One mother from Temeke said that her TBA believed that a certain worm comes out after delivery, which causes PPH.

Actions taken due to PPH

Participants mentioned different actions that were taken to reduce and stop excessive bleeding after delivery. Most groups would refer a patient to the health facility or sought help from a nearby health care provider once bleeding starts. Other groups mentioned that different actions were taken depending on the locality (Table 9).

TBAs—especially trained ones—played an important role in cases of severe bleeding. Mothers noted that some trained TBAs had injections to help stop bleeding. A few trained TBAs from Shinyanga and Bombo advised expectant mothers, before their delivery, to purchase drugs to stop bleeding.

Traditional medicines were also used to stop and reduce bleeding and mothers indicated the apparent effectiveness of specific remedies. The mothers from Shinyanga focus groups perceived that in the Shinyanga area, (where they thought many women prefer not to deliver at health facilities) some types of traditional medicines are common for increasing blood content. Contrary to this belief, focus group participants from Arumeru believe there is no medicine for stopping bleeding, and therefore treatment isn't provided to mothers; instead, these mothers are given food until the bleeding stops on its own.

Mothers from Muheza focus groups reported untrained TBAs using abdomen massaging with very hot water. Focus groups participants from these groups complained that the practice often caused mothers to become severely sick. In the Bombo area, hot water was not used by TBAs and one participant said:

"No massaging is done using very hot water as it increases bleeding. After delivery of the placenta, if there is abnormal bleeding, injection or traditional herbs are used. If no relief, referral is made to the health facility."

—Bombo participant

*** operating room

Table 9. Summary of regional actions taken before referral.

Group/area	Actions
Mvumi	Traditional medicine.
Kibong'oto	Cow's blood, mtori, soup, or fat used to reduce bleeding.
Mbeya	TBA massages the abdomen to push the placenta out as it is a source for PPH. No traditional medicine is used to stop the bleeding.
Iringa	Mothers are turned up-side-down (put into the shock position) when referring them to the health facility.
Karatu	Mothers are given hot tea, and then referred to a health facility.
Ndanda	Transferred to TBA where traditional medicine is used.
Dodoma	Use traditional medicine first (like barley flour mixed with water). If no relief is experienced, referral is made to a health facility.
Arumeru	Traditional food provided.
Temeke	Prepare the mother in hygienic condition (defined as: bathe her, make sure her clothes are clean, and provide her with a clean and safe pad to use) or use traditional medicine. Hot water is not used for massaging
Bombo	Injection of drugs by TBA or use of traditional medicine used. Prepare the mother in hygienic condition (see definition listed under Temeke) and if no injection by TBA is feasible, refer to health facility.
Muheza	Injection by nurse or massaging using very hot water. Traditional medicine of drinking whipped raw egg is used.
Sekoture	Hot tea is given, and then referral is made. Mother's legs are turned (vs. shock position) to reduce the speed of bleeding. Traditional medicines are used.
Shinyanga	Injection given by TBAs. Cold bath provided, then referral is made if injection is not available. Traditional medicine/herbs are also used.

Referral to the health facility

For PPH cases, all groups agreed that referral to the health facility is important although a few participant favored traditional medicine. In Shinyanga one mother said:

"I bled excessively but I was not referred to the health facility. In our area we have not heard of any patient being referred to the health facility after giving birth at home."

—Babati mother

Some mothers do not know whether referral is provided or not since referrals are secrets between the mother and TBA. In Bombo, women experiencing pre-term complications received referrals. TBAs sometimes escorted mothers to the health facility.

Husbands and fathers decided whether to refer a patient or not, and sometimes relatives were involved. Some of the families could make quick decisions to refer the woman while other families did not make the decision until they saw that the situation was very serious. However, it takes about one-half to eight hours to reach the health facility depending on the health facility location. Generally, all relatives available provided support to the patient.

Focus group participants noted several reasons for referral including the need for a blood transfusion or medicine to stop bleeding. Many believed the presence of an expert could save a woman’s life. One focus group said the health facility is the only option when PPH occurs because of the quality of service provided. Participants added that trained TBAs know and understand the importance of referral in cases of PPH.

Circumstances exist where referrals are not made, including instances of TBA’s lack of competence in treatment of a case, the presence of traditional medicine, when transportation problems or long distances impede reaching a health facility, and poverty. One participant from Shinyanga said:

“We usually use traditional medicine to stop bleeding as is our normal practice. We always boil guava leaves or tea leaves because the health facility is very far and we don’t have money to pay for transport cost. If bleeding becomes severe even after using herbs, a woman is transferred to traditional healers for further treatment.”
—Babati mother

In Dodoma, mothers said that TBA decisions could be money driven:

“If TBAs agree to refer a patient to the health facility means that they will not get money for consultation and treatment which ranges from 500-4000Tshs for each pregnant woman.”
—Babati mother

Table 10. Barriers to health center referral by area.

Area/group	Circumstances
Ndanda	Negligence or resistance between parents and mothers expected to deliver, transport cost.
Songea	Lack of accompanying person to go to the health facility or if the husband doesn't know how to ride a bicycle.
Mbeya	If the husband does not know how to ride bicycle, lack of support from relatives (to accompany the mother).
Mvumi	Presence of traditional medicine which seems to be very helpful.

Quality of services provided at home or at TBA's residence

Most focus group participants were not in favor of TBA services provided at home or a TBA's residence. Reasons given included lack of TBA knowledge on safe-delivery practices, equipment and modern services such as blood transfusion, and rehydration supplies for cases needing interventions. Some participants indicated that TBAs cannot detect whether a baby is in a right position for best delivery because they lack modern equipment. Others noted that some TBAs do not use protective gear:

"TBA service is not good. Sometimes a mother can buy gloves and other instruments but TBA may refuse to use them."

—Temeke participant

"I was helped by a TBA during delivery but cord clamping was not done properly so the bleeding started at the cord where the TBA admitted making some mistakes."

—Amana participant

Other groups were satisfied with TBA services and recommended the TBAs continue to practice. Some noted having TBAs nearby is helpful especially when labor begins suddenly or at night. The TBA practice of encouraging expectant mothers to purchase drugs (to stop bleeding) prior to delivery was also viewed as a good practice.

"TBAs have good services as they are dedicating their knowledge and competence to help the mother. They continue massaging the mother until she recovers."

—Muheza example.

"TBAs service is better than that at health facilities: there is no harassment and they are handled well and courteously. Referral is only done if TBA fails."

—Bombo example

Trained TBAs often used modern equipment and delivery beds, and also were knowledgeable on providing injections for excessive bleeding. A few participants had never seen or heard about TBA treatment for PPH.

Reasons for home deliveries

All focus groups reported the following main reasons for home deliveries: long distances to health facilities, sudden labor, and transportation problems. And in a few areas, participants complained about health facility services, transportation costs, and negligence by health providers. Lack of knowledge about the stages of labor by some women was also mentioned.

"Some women have no experience and so labor can start without knowing as they think it's normal. For others, the commencement of labor pains, cause them to be afraid to tell their mothers because they can be accused for not being tolerant or strong."

—Muheza and Tunduru example

Participants mentioned that TBAs also encourage women to deliver at home. The patriarchal system also seems to play a role in some areas; participants complained that often men are not concerned with their pregnant wives and don't necessarily accept their responsibility for the pregnancy.

Areas for improvement

Focus group participant proposed providing the following to help improve TBA services:

- TBA training on safe-delivery practices as other unsafe practices (for example, using very hot water).
- TBA training and directions on the importance of using safety instruments and supplies.
- Ensure availability of supplies and delivery beds, if possible.
- Education programs for mothers on the importance of getting to the health facility as early as possible in cases of PPH

As one participant stated:

“Every mother delivering at home with severe bleeding should be referred to the health facility and every mother should be advised to have injection or drug for stopping bleeding before delivery.”

—Bagamoyo participant

One participant shared her home birth experience of receiving a drug injection after delivery to stop bleeding. Some mothers advised nurses at health facilities to be more aware of health signs (e.g., fever) because patients often hide their illnesses. Other suggestions included providing family planning information to mothers on proper baby spacing, government introduction of income-generating activities to avoid the heavy workload of mothers, building maternity homes (waiting homes) for those living far from the health facilities, and providing free services to mothers or lowering delivery charges from 6,000-2,000TSH. Many felt the government should build more health facilities for accessibility by the majority (in terms of distance and cost). Lastly, focus group participants mentioned the need to improve the communication and interpersonal skills of doctors and nurses to ensure efficient and quick assistance for pregnant mothers.

7. Conclusions and recommendations

Policy

The national EDL and STG in Tanzania promote the use of oxytocin (5IU) for induction and augmentation of labor only, and intramuscular ergometrine (0.5mg) for prevention of PPH. When addressing AMTSL, the guideline includes only two components: the drug used (ergometrine) and controlled cord traction (guidelines fail to mention uterine massage following delivery of the placenta).

The study team proposes the following policy recommendation:

1. The Tanzanian MOH should revise the national STG to include using the recommended dose of oxytocin (10 IU) as recommended for AMTSL, and include all AMTSL components including proper massage, recommended uterotonic drug dosage, and the appropriate timing of administration of a uterotonic drug (following the delivery of the fetus).

The community-based, qualitative component revealed that despite the fact that many TBAs do not have the knowledge, skills, and equipment to perform deliveries, many women prefer to deliver with TBAs because they are inexpensive, compassionate, and are located close to their homes. The majority of TBAs, community leaders, and mothers did not know the cause of PPH and believed it to be God's wish. No TBAs mentioned AMTSL for prevention of PPH. Most mothers perceived PPH as a major problem and described the severity of PPH.

The study team proposes the following policy recommendations:

2. Training should be provided to TBAs, community leaders, and mothers, focused on how to recognize PPH and to quickly refer to health facilities
3. Provide education to the community, targeting women and families on safe motherhood, to encourage attendance at antenatal clinics and facility-based births.
4. The Government should provide reliable and improved delivery services, located close to communities and free of charge. Maternity homes should be considered for those living very far away.

Provider practices

In Tanzania, correct AMTSL use with ergometrine is generally low (seven percent) using the strictest definition and 17 percent when based on the definition which relaxes the timing requirement to allow up to three minutes following the delivery of the fetus for the administration of ergometrine. There is no correct use of AMTSL with oxytocin, which is the drug of choice according to FIGO/ICM.

Two practices are primarily responsible for low compliance with the official definition of AMTSL: using a uterotonic drug during or following delivery of the placenta (versus immediately following the delivery of the fetus), and using a uterotonic drug within three (versus one minute) following delivery of the fetus.

Fewer than one in ten providers interviewed for this study spontaneously mentioned all three components of AMTSL. This poor AMSTL knowledge is in sharp contrast to the 93 percent who claimed they received AMTSL training (generally during pre-service education, with a limited in-service training).

Based on these findings, the study team proposes the following recommendations for provider practices:

5. The MOH should update STG guidelines and incorporate them into both pre-service and in-service training materials, and provide refresher courses for MOH staff managing deliveries in Tanzania.

In addition to the findings regarding use and non-use of AMTSL, this study also documented a number of potentially harmful practices including applying fundal pressure while waiting for delivery of the placenta, gentle traction on the cord without external support of the uterus, external massage of the uterus while waiting for delivery of the placenta, and applying traction to the cord without prior administration of a uterotonic drug. All of these practices increase the possibility of a PPH or other problems such as uterine inversion. When asked to define AMTSL, only nine percent of health care providers made correct statements regarding uterotonic drug use, controlled cord traction, and uterine massage.

6. Pre-service and in-service training should specifically emphasize the potential danger to women when these practices are used, and encourage and train professionals on the correct practice and appropriate use of AMTSL.

Logistics

The routine use of AMTSL, as recommended, will increase the use of oxytocin in the country. Tanzanian leaders need to ensure that sufficient oxytocin supplies are available in hospitals, health centers, and clinics.

7. Review procurement and distribution policies as Tanzania increases use of oxytocin (and decreases ergometrine use) to comply with WHO, FIGO, and ICM standards.

Improper storage of oxytocin and ergometrine occurs at the facility level.

8. Revise or develop policies on proper storage, and disseminate these policies to all facilities.

Monitoring and evaluation

It is important to monitor and evaluate the use of AMTSL using the updated definition.

9. Train supervisors in AMTSL, and include items on the supervision checklists to ensure its use is an indicator of quality.
10. Labor and delivery logbooks should include space to note and monitor AMTSL use.
11. Implement clinical audits on AMTSL use.

In summary, a major reason for the low percentage of AMTSL use in Tanzania is that a significant portion of providers give the uterotonic drug after the birth of the placenta (fourth stage of labor). There are a number of advocates in Tanzania working to reduce PPH and save lives, including MOH officials and other programs. By incorporating the updated definition of AMTSL, including a change in the oxytocin dose to 10 IU/ IM, into their STGs, formularies, pre-service and in-service education programs, Tanzania will quickly increase the percentage of health providers using the very effective and cost-saving intervention, AMTSL.

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