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

## Findings from a National Survey in Ethiopia

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POPPHI
1800 K St. NW, Suite 800
Washington, DC 20006 USA
Tel: 202.822.0033 Fax: 202.457.1466

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POPPHI Prevention of Postpartum Hemorrhage Initiative

SARA

Federal Democratic Republic of Ethiopia Ministry of Health

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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 deaths

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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For more information or additional copies of this report, please contact:

Deborah Armbruster
Project Director, POPPHI
PATH
1800 K St., NW, Suite 800
Washington, DC 20006

Tel: 202.822.0033
Email: darmbruster@path.org

www.pphprevention.org

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## Acronym list

| | |
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| AMTSL | Active management of the third stage of labor |
| CCT | Controlled cord traction |
| DACA | Drug Administration and Control Authority |
| ECSA | East, Central, Southern Africa Health Community, Family, and Reproductive Health Programme |
| EDL | Essential drug list |
| ESOG | Ethiopian Society of Obstetricians and Gynecologists |
| FIGO | International Federation of Gynecologists and Obstetricians |
| ICM | International Confederation of Midwives |
| IM | Intramuscular administration |
| IV | Intravenous administration |
| MOH | Ministry of health |
| PHARMID | Pharmaceutical and Medical Supply Import and Wholesale Share Company |
| POPPHI | Prevention of Postpartum Hemorrhage Initiative |
| PPH | Postpartum hemorrhage |
| RCQHC | Regional Center for Quality of Health Care, Reproductive and Neonatal Health |
| REDSO | Regional Economic Development Services Office |
| SARA | Support, Analysis, and Research in Africa |
| STG | Standard treatment guidelines |
| USAID | US Agency for International Development |
| WHO | World Health Organization |

## Executive Summary

Postpartum hemorrhage 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 2003 stating that every woman should be offered AMTSL as a means of reducing the incidence of postpartum hemorrhage. The World Health Organization (WHO) Making Pregnancy Safer Technical Update on Prevention of Postpartum Haemorrhage by AMTSL recommends that "AMTSL should be practiced by all skilled attendants at every birth to prevent postpartum haemorrhage."[1]

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 observed; 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.

The results of the study show that a uterotonic drug was used during the third or fourth stage of labor in 100 percent of facility-based deliveries in the sample, with oxytocin used in two-thirds of deliveries. Use of AMTSL according to the ICM/FIGO definition was observed in 29 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 40 percent. It should also be noted that the practice of AMTSL varies dramatically by region, with three of six regions in the country showing no deliveries for either definition. 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 do not include postpartum hemorrhage. The national drug formulary describes appropriate use of oxytocin and ergometrine for the prevention of postpartum hemorrhage but is based on outdated information that promotes use of uterotonic drugs following the delivery of the placenta. This formulary also states that oxytocin should be stored at room temperature, versus 2°C to 8°C, as recommended by the drug manufacturers and ICM/FIGO.[*] In 2004, the Ethiopian Society of Obstetricians and Gynecologists (ESOG) in collaboration with the Ministry of Health (MOH), Ethiopia produced updated guidelines that reflect the ICM/FIGO recommendations; these guidelines have not been distributed as widely as needed.

The situation regarding drugs and supplies was found to be satisfactory in most but not all facilities in the sample, with an average stock of uterotonic drugs sufficient for approximately six months across all facilities. However, in five and three of the 23 facilities visited, there was no stock of oxytocin and ergometrine, respectively. Families are required to buy their own uterotonic drugs in one-third of the facilities.

Interviews with traditional birth attendants and community leaders captured data on community knowledge, perceptions, and practices toward postpartum hemorrhage. In addition, focus group discussions provided information from mothers delivering at home within the past 6 months.

Selected key recommendations resulting from this study are summarized below:

1. Standard treatment guidelines should be updated to be in line with the 2004 MOH/ESOG guidelines and the FIGO/ICM recommendations for AMTSL.
2. Pre-service and in-service training materials should be developed and incorporated into the curricula for physicians and midwives and a plan developed for the dissemination of these materials which prioritizes the regions and professional cadres with low use of AMTSL.
3. The 2004 MOH/ESOG guidelines for AMTSL, with accompanying job aids, should be disseminated to all health facilities in the country.
4. A mechanism to inform every nongovernmental reproductive health training initiative about AMTSL must be established.
5. Women who deliver at home should be encouraged to seek a skilled birth attendant.
6. Educating traditional birth attendants about the serious consequences of postpartum hemorrhage and their role in rapid transfer of such women is important.
7. Procedures for procurement and distribution of uterotonic drugs, particularly oxytocin, should be reviewed and updated to ensure that all facilities have adequate supplies of oxytocin to provide AMTSL to all women having a vaginal birth.

[*] 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.

8. A grading system for facilities that monitors the routine use of AMTSL should be developed. Supervisors should be trained in AMTSL, and supervision checklists should be included as an indicator of quality.

In summary, AMTSL has a strong foothold in Ethiopia, with between 30 and 40 percent of births benefiting from this practice. Yet, there is substantial room for improvement. Given that there are numerous providers implementing this practice correctly, these providers constitute an important resource that can be used to expand the practice to additional providers and to facilities in regions where AMTSL is not the norm.

# 1. Background

Postpartum hemorrhage 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 1 minute following the birth of the baby.
- Delivery of the placenta with controlled cord traction.
- Massage of the uterus after delivery of the placenta.[2]

This definition is supported by the International Federation of Gynecologists and Obstetricians (FIGO), the International Confederation of Midwives (ICM) and the World Health Organization (WHO). This definition differs from the original research protocol in the Bristol[3] and Hinchingbrooke[4] trials because the original protocols include immediate cord clamping and did not include massage of the uterus. 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 postpartum hemorrhage. When compared to AMTSL, the use of physiologic management has a higher rate of postpartum hemorrhage and severe postpartum hemorrhage, 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."[2] 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.[5]

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 Health (Festin et al.) [7] 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.[7]

Since 1997, 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 postpartum hemorrhage 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 Ethiopia. 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 UK 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 and country formulary, and health provider education regarding AMTSL. In turn, such training may influence facility-based policies and behavioral expectations.

### Provider-related factors

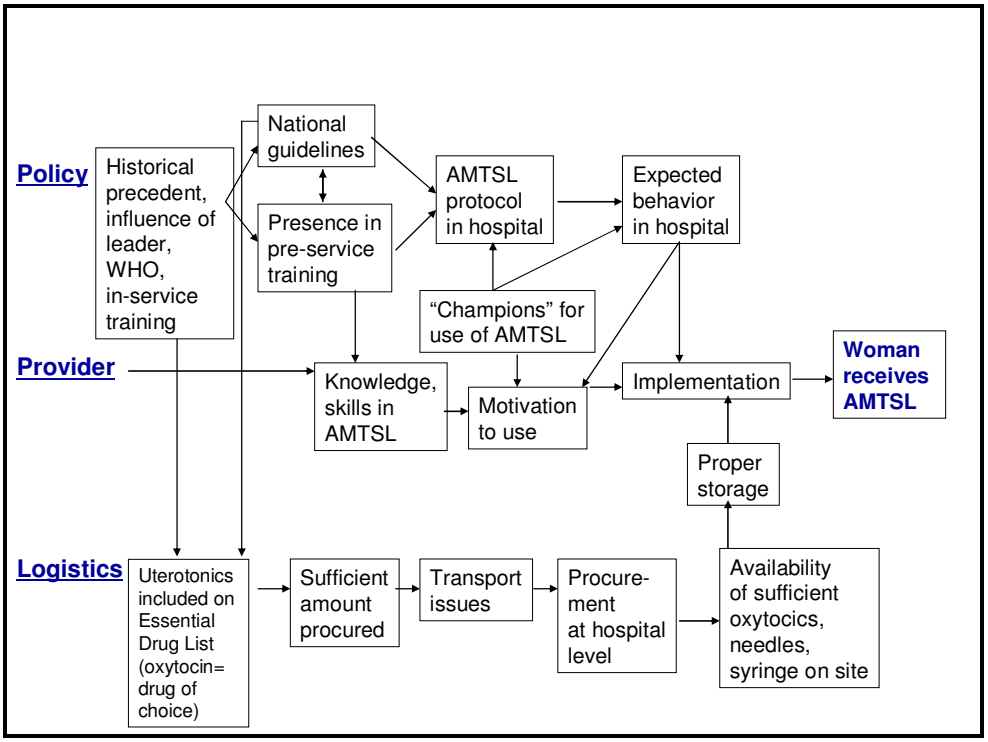
The knowledge and skills required to perform AMTSL are essential for routine use of the practice. Provider motivation, which is influenced by facility-based behavioral expectations, also is key.

### 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, 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. (As of 2000, 90 percent of births in Ethiopia occurred at home.[8] Thus the benefit of an effective AMTSL intervention in Ethiopia will be limited until the proportion of births with skilled birth attendants increases.) A third aim of this study is to produce tools and a method that others could employ to document the current 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) are practiced, and how consistently are they practiced?
2. Is AMTSL formally promoted in the Standard Treatment Guidelines (STGs) in each country at national and/or facility levels? 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, traditional birth attendants, 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 Ethiopia. The qualitative component was requested by the East African team and 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 4 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.

### Quantitative surveys

#### Questionnaire development

The processes and outcomes identified in the conceptual framework for the study (Figure 1) determined the content and number of questionnaires required for the study. In all, four questionnaires were developed:

- **National-level questionnaire.** This questionnaire was designed to capture the policy environment for AMTSL. It includes questions regarding the content of the essential drug list, STGs, pre- and in-service training curricula, procurement practices for uterotonic drugs and supply, and storage conditions for uterotonic drugs at the central pharmaceutical storage site. Completing this questionnaire required document review, interviews with MOH staff and other policymakers, and a visit to the pharmaceutical storage site. The study's country coordinator conducted the national-level questionnaire.
- **Facility-level questionnaire.** This questionnaire was designed to capture the policy environment at the individual facility level. It includes questions on the availability of an essential drug list and STGs in the facility, provision of in-service training (including AMTSL), the cost of uterotonic drugs to the facility and to patients, access to the facility pharmacy, procurement practices for uterotonic drugs, and supply and storage conditions at the facility. Completing this questionnaire required interviews with hospital administrators and the pharmacist and a visit to the facility pharmacy. One of the two members of the data-collection team completed this questionnaire during his/her visit to selected facilities.

- **Observation-of-deliveries questionnaire.** This questionnaire was designed to document provider practices during the third stage of labor and the first 30 minutes of the fourth stage of labor for all vaginal deliveries. It was based on the questionnaire used in the study by Festin et al.[7] The questionnaire documents the availability of uterotonic drugs and other supplies in the unit as well as storage conditions for uterotonic drugs. Members of the data-collection team completed the questionnaire, which required observing deliveries, during their visit to selected facilities.
- **Provider questionnaire.** This questionnaire was designed to capture provider knowledge, attitudes, practices, and perceived barriers to the routine use of AMTSL. Completing the questionnaire required a brief one-on-one interview with providers responsible for managing deliveries. These interviews were conducted by members of the data-collection team during their visits to selected facilities.

### Training for data collectors

A team of eight data collectors was recruited to administer the facility-level, observation-of-deliveries, and provider questionnaires. The team included four obstetricians, one general practitioner, two midwives, and one resident. The country coordinator, assisted by three gynecologists, provided a 3-day training (October 2–4, 2005) in Addis Ababa. The training involved lectures, a CD-based visual presentation on AMTSL, demonstrations and practice using an anatomical model, and field practice that provided an opportunity for pre-testing the questionnaires and supervised experience for the data collectors. Based on the pre-test results, the investigators made minor modifications to the questionnaires before beginning the fieldwork.

*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) 1 minute following the delivery of the fetus. In cases where oxytocin is not available, 0.25 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 or

[*] Administration of oxytocin intravenously or via intramuscular injection is considered correct use for deliveries that were induced or augmented. In this sample, 2 percent of the deliveries were induced and 12 percent were augmented.

ergometrine must be administered within 1 minute of delivery of the fetus—instead allowing oxytocin/ergometrine administration within 3 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 the uterus had started to contract, as specified in the FIGO/ICM recommendation.

## Data entry and analysis

Using Epi Info (version 6), the team adapted data-entry programs developed for the global survey to the Ethiopian context. An obstetrician in Addis Ababa with previous experience in data entry led the double data entry and preliminary cleaning process. Final data cleaning was accomplished through a team effort during a data analysis workshop held at Lake Manyara, Tanzania, from December 12–16, 2005. The team carried out the data analysis using STATA statistical software.

## Sample design

To meet study objectives, the team needed a nationally representative sample of facility-based deliveries. For budgetary and logistical reasons, the sample was restricted to facilities with at least three deliveries per day (i.e., one per shift, on average). In Ethiopia, there are 22 such facilities, and all were selected. In addition, the team selected a health facility in Dire Dawa with 60 deliveries per month, as Dire Dawa is a major urban area.

Thus the team selected a total of 23 health facilities—representing all regions except the Southern Nations, Nationalities, and People's Region (SNNPR); Somalia region; Afar region; Benshangul region; and Gambela region. A team of two data collectors visited each selected health facility for 2.5 days. Each data collector observed all deliveries over an 8-hour period on the first and second day, thus ensuring observation for 16 hours per day for 2 days. A total of 286 deliveries were observed in 23 health facilities.

On the afternoon of the second day and the morning of the third day, the data collectors interviewed health care providers. They compiled a complete list of providers responsible for managing delivery with assistance from hospital staff and randomly selected three providers from this list for interviews. Sixty-nine providers were interviewed in total.

## Weighted results

To reduce bias, the research team applied weights for the results presented in this report, including:

- **Delivery weights,** which correct for the number of observed deliveries not being in proportion with the number of reported deliveries per year. If the number of deliveries during

the observation period was less than the facility's average number of deliveries per day for the entire year, the value was adjusted 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 who manage deliveries in the facility. If the number of providers interviewed was less than the number who manage deliveries, the value was adjusted to match the number who manage deliveries in the facility. In a few cases, the value was adjusted downward because health practitioners not managing deliveries directly were included in the sample. If the number of providers interviewed matched the number who manage deliveries, the weight would initially be 1.0 (because no adjustment is required). The final weights in these cases, however, could differ from 1.0 because another adjustment was made to ensure the overall weighted and unweighted sample sizes matched.

The *n* values in all tables represent the weighted values.

### Fieldwork

The data collectors contacted selected health facilities in advance of their arrival, and the hospital administrator granted permission for the facility to participate in the study. Four teams of two data collectors conducted the fieldwork from November 6 through 29, 2005. Within each team, the senior member was assigned additional duties as supervisor. These duties included initiating contact with hospital administrators and reviewing all questionnaires daily.

## Qualitative component

The qualitative study was designed to look into perceptions, opinions, attitudes, and practices toward postpartum hemorrhage at the community level and address relevant issues in planning and implementing appropriate interventions. The study team used both focus group discussions and key informant interviews to generate a large quantity of relevant information with relative ease and low cost.

The November 2005 focus group discussions included women who had given birth outside of a health facility in the last six months. These participants were identified by traditional birth attendants (TBAs). The in-depth interviews included TBAs and community leaders selected by the heads of the hospitals and health centers. Key community leaders included local leaders, members of women's group, *idir*[**] leaders, religious leaders, and sub-chiefs.

### Study sites

The study team collected data at four sites:

[**] *Idir* is a social institution in which a group of people contribute money on a regular basis to support members in case of emergencies.

- **Debre-Birhan,** which is 160 kilometers northeast of Addis Ababa and situated in the Amhara region. The hospital serves the city population (estimated 80,000) and the neighboring *woredas* (similar to district) in the countryside.
- **Ambo,** a city of 60,000 located 126 kilometers west of Addis Ababa in the Oromiya region. Ambo has a hospital that serves the city population and a catchment area of 1.6 million people.
- **Addis Ketema,** a sub-city in Addis Ababa that has health stations that serve a large selection of the Addis Ababa population. Part of the busiest commercial section of the city, Addis Ketema has an estimated population of more than 529,000.
- **Nifas-Silk Lafto,** a sub-city in Addis Ababa that also has health stations that serve a large selection of the Addis Ababa population. Nefas-Silk Lafto has a population of about 264,600.

### Data instrument

The data-collection tool was structured into three themes: perceptions on bleeding after delivery, referral of women to health facilities, and comments and suggestions on care of women experiencing postpartum hemorrhage. Specific points were outlined under each theme to help the facilitator keep the discussion focused. Predetermined probing questions were used to generate responses in sensitive and cultural/tradition-bound issues.

### Data collection

The study team conducted four focus group discussions among mothers who delivered at the community level (consisting of a total of 30 participants in all sites), 18 in-depth interviews with TBAs considered knowledgeable about delivery by the community, and 18 in-depth interviews with community leaders. The facilitator of all sessions was an experienced sociologist with a postgraduate diploma on demography.

The facilitator first welcomed participants. After introducing himself and asking the note-taker to explain the topic for the discussion, the facilitator briefed the participants on the purpose of the study, assured confidentiality, and obtained permission to record the discussions and interviews. The participants of the focus-group discussions were identified by a number worn on the chest. The team recorded all responses. At the end of the session, the team debriefed and acknowledged the participants' contributions. They labeled and reviewed the data on the same day.

### Data analysis

The facilitator and note-taker team transcribed the data from the cassettes. They coded the responses and created an expression for each code. Coding started at the main theme and continued to related themes that appeared important. The team created a matrix based on the coded responses. Two experienced persons—an obstetrician-gynecologist and a social scientist—assimilated and analyzed the responses manually.

## 3. Findings regarding national and regional policy and logistics

Results from the four questionnaires yielded the following information about policy and logistics at both the national and regional levels.

### Standard treatment guidelines

The study team reviewed the national STGs on common illnesses, which were prepared in 2004 by Ethiopia's Drug Administration and Control Authority (DACA). Postpartum hemorrhage is not specifically listed among the common obstetric and gynecological illnesses in this manual. In the national drug formulary, also prepared by DACA, the use of both oxytocin and ergometrine is described in some detail. Information in this formulary, however, differs substantially from the current FIGO/ICM recommendations for use of oxytocin and ergometrine for the prevention of postpartum hemorrhage. The main areas of disagreement are the timing of administration and the storage conditions for uterotonic drugs. For example, the formulary states that ergometrine should never be given prior to the delivery of the placenta and that oxytocin should be stored at room temperature. This is in direct contrast to the FIGO/ICM recommendations, which promote use of a uterotonic immediately following delivery of the fetus and storage of oxytocin at 2°C to 8°C. (It should be noted that 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.)

Another form of treatment guidelines, which exist in the form of institutional management protocols, is available in three of the Addis Ababa–region hospitals affiliated with the Addis Ababa University medical faculty. These three facilities are central referral hospitals. The other 20 (87 percent) of facilities involved in the study have neither of the guidelines mentioned above.

There is also a quick-reference treatment guideline on AMTSL according to FIGO/ICM recommendations that was prepared and published in 2004 by the Ethiopian Society of Obstetricians and Gynecologists (ESOG), the MOH, PRIME II and the Ethiopian Nurse Midwives Association. Although a copy of this manual has been distributed to the majority of obstetricians and gynecologists, it has not yet reached the frontline delivery service providers, midwives, or nurses.

### Uterotonic drugs and other AMTSL supplies

#### Availability of uterotonic drugs

The study team found both oxytocin and ergometrine in adequate amounts at the central store of the Pharmaceutical and Medical Supply Import and Wholesale Share Company (PHARMID), the major supplier for the public sector. During the survey period, oxytocin and ergometrine were available in 17 and 18 of the 23 facilities, respectively. Both drugs were available in 16 of 23

facilities, and at least one type of uterotonic drug was available in all but two facilities. While there were problems in the recording of data on exposure to daylight, in at least 2 facilities oxytocin and ergometrine were stored in daylight. Although the mean months of stock on hand was 6.5 for both drugs (range: 0–60 months), there were five facilities with zero stock of oxytocin and three facilities with zero stock for ergometrine. The stock-out periods ranged from 7 to 90 days, mainly affecting district and regional hospitals. The most common reasons for stock out (in order of their frequency) were delay in ordering the supplies and consumption exceeding expectation.

All of the health facilities in this study had a pharmacy on site. The mean number of working hours per day was 18 hours for central referral, regional, and district hospitals (range: 9–24 hours) and 9 hours for health centers. Uterotonic drugs were set aside for use while the pharmacies were locked in 16 of 23 facilities, while families were asked to search for drugs in the remaining facilities (7 of 23). Families were asked to purchase uterotonic drugs in 8 of 23 facilities, syringes in 11 of 23 facilities, and both uterotonic drugs and syringes in 8 of 23 facilities.

### Storage conditions

The study team observed that both oxytocin and ergometrine are stored according to the manufacturers' recommendations in a cold room with a temperature range of 2°C to 8°C at the central PHARMID store. They found the storage conditions of uterotonics at health institutions to be up to the standard (refrigerator, 2°C to 8°C) in 18 of 21 institutions but stored at room temperature at 3 facilities. The team was unable to make observations on 2 of the 23 facilities due to the absence of uterotonic drugs at the time of the survey.

### Essential drug list

Oxytocin, ergometrine, and the combination drug, Syntometrine®, are registered for in-country use and the only prostaglandin family of drugs registered is prostaglandin $E_2$ ($PGE_2$). An essential drugs list containing 234 chemical entities was prepared in 1987 as an extract from the national drugs list. However, the essential drugs list was only recently revised; it is currently being printed. It contains both ergometrine and oxytocin (for both oral and injectable administration) but not the combination drug or prostaglandins. The study team found a copy of the essential drug list in only 1 of the 23 health facilities selected in the sample.

### Drug registration process

Because article 16 of the DACA proclamation states that "no drug, whether produced locally or imported, shall be put to use unless it is duly registered by the Authority," the team reviewed written guidelines on drug evaluation and registration. This process involves assessing the safety, efficacy, and quality of products through clinical and pharmaco-chemical data evaluation as well as through laboratory quality control. Submission of a WHO pre-qualification certificate is required for products to be imported into Ethiopia. However, this registration process is not linked to Good Manufacturing Practice requirements, which include inspection of manufacturing plants.

### Source, selling, and procurement processes

The public sector, private sector, nongovernmental organizations (NGOs), and international organizations import and sell or freely supply uterotonic drugs. PHARMID, a semi-governmental organization, is the major supplier for public facilities, followed by the federal MOH, with the support of its international donors. PHARMID's purchasing practices are based on historical consumption and occasional needs-assessment surveys; while the purchasing practices of the federal MOH is based on morbidity methods. All of the health institutions surveyed estimate their future needs using the historical consumption method plus some additional stock as a cautionary measure.

Health facilities purchase uterotonic drugs from local wholesalers, primarily PHARMID, but may also receive free donations from the MOH. When a facility is out of stock, patients are asked to buy and bring the drugs from private facilities.

The survey findings show that the average purchase and selling prices are as follows:

- For **oxytocin,** the purchase price was US$0.16 per ampoule, and the selling price was $0.19 per ampoule of 10 IU.
- For **ergometrine,** the purchase price was $0.19 per ampoule, and the selling price was $0.22 per ampoule of 0.5mg. Thus the difference between the purchase and selling price for both drugs is only US$0.03.

## Pre- and in-service training

### Pre-service training

The pre-service curriculum for medical doctors, midwives, and nurses does not include any detailed descriptions of AMTSL. Staff from all training institutions where interviews were conducted reported that their curricula are prepared for the instructor as guidelines on the major topics to be covered and are not highly explicit. Instructors are expected to add new knowledge to their teaching materials, and they consider their curricula to be flexible. The nursing curriculum, however, specifically indicates controlled cord traction as a part of the practical training sessions. A review of the latest (2003) management protocol for the Department of Obstetrics and Gynecology at Addis Ababa University, which is a reference material for teaching medical and postgraduate students, includes the points in Table 1.

**Table 1. Management protocol for postpartum hemorrhage and its management.**

| **Active management of the third stage** |
|---|
| Should be done for patients at high risk for postpartum hemorrhage (PPH) and mothers who cannot tolerate blood loss (e.g., a woman with pregnancy-induced hypovolemia).<br>• Principle: Use of oxytocic agents immediately after the delivery of the anterior shoulder of the (last) baby and controlled cord traction.<br>• Oxytocic agents: oxytocin infusion (dilute) IV, Syntometrine IM, Ergometrine IV. |
| **Physiologic management of the third stage** |
| Useful unless the patient is at high risk of PPH.<br>• Perform watchful waiting until signs of placental separation occurs.<br>• In the meantime, perform gentle palpation of the uterine fundus to stimulate contractions and observe for excessive bleeding. |
| **Preventive measures for PPH** |
| • Identify high-risk factors for PPH.<br>• Include active management of third stage in the presence of high-risk factor for PPH (see protocol on labor and delivery).<br>• Provide iron supplementation during pregnancy to build up iron stores in high-risk women.<br>• Seek and treat anemia in pregnancy.<br>• Encourage family planning/child spacing. |

IM=intramuscular administration; IV=intravenous administration.

Although this management protocol states that AMTSL should be used for high-risk patients, the heads and instructors of the medical faculty reported that their current teaching is in line with FIGO/ICM recommendations. Plans are in place to include the FIGO/ICM protocol in the revised management protocol for Ethiopia, although a date for the completion of this revision has not been set. The fact that none of the providers who reported having been trained in AMTSL during their pre-service training were able to correctly cite the current AMTSL protocol reflects the absence of the FIGO/ICM protocol in the curricula of both physicians and nurse-midwives.

### In-service training

Of the 23 facilities surveyed, 16 reported that providers working at their facility had participated in in-service training that included AMTSL during the past year. However, findings indicate that all of the health facilities conducting in-service training lack standard curricula, making assessment of the contents or quality of the training difficult. Although the document has not been officially adopted, the federal MOH states that it is using WHO's *Managing Complications in Pregnancy and Childbirth* as the basis for its in-service curriculum. This manual includes a detailed description of AMTSL in line with the FIGO/ICM recommendations.

## 4. Findings regarding the management of the third stage of labor

The principle objectives of this study were to measure the use of AMTSL according to FIGO/ICM criteria and to measure current practices regarding the management of the third and fourth stages of labor outside of this definition. This section describes the management of the third and fourth stages of labor by focusing on (1) the overall use of uterotonic drugs; (2) the timing, mode of administration, and dose of these drugs; (3) the correct use of AMTSL; (4) practices in use of the individual components of AMTSL; and (5) the observation of potentially harmful practices.

### Study sample

The study team observed a total of 286 deliveries in 23 health facilities. Table 2 describes the characteristics of the facilities and women associated with these deliveries.

Over two-thirds of the observed deliveries took place in either central referral hospitals (39 percent) or regional/provincial hospitals (35 percent), with one-fifth of the observations taking place in district hospitals. Due to sampling procedures that restricted the selection of facilities to those with at least 90 deliveries per month, only 6 percent of observed deliveries occurred in health centers.

More than half of the observations (55 percent) took place in facilities with 100 to 199 deliveries per month, and a quarter occurred in facilities with 200 to 299 deliveries per month. Very low- and very high-volume facilities each contributed approximately 10 percent of the study's total observations (13 percent and 7 percent, respectively). All regions with participating facilities were fairly well represented in the sample, with the exception of Dire Dawa, which contributed only 3 percent of the observations, and Tigray, with 6 percent. (As described previously, the inclusion of one facility in Dire Dawa was an exception to the sampling procedures, as it only included approximately 60 deliveries per month. As expected, data collectors observed few deliveries over the 2-day visit in this region.) Over 90 percent of the observed deliveries occurred in facilities in urban areas.

The study teams observed seven cadres of health providers. Midwives were responsible for nearly two-thirds (61 percent) of the observed deliveries, with 5 to 12 percent of births represented by physicians, nurses, and health assistants. Forty percent of the observed deliveries occurred among primiparous women, and 6 percent of deliveries were represented by women with five or more pregnancies.

**Table 2. Distribution of observed deliveries by facility and mother characteristics.***

| Facility characteristics | % | n | Mother's characteristics | % | n |
|---|---|---|---|---|---|
| **Type of facility** | | | **Mother's age (years)** | | |
| Central referral hospital | 38.7 | 119.9 | <20 | 8.2 | 25.5 |
| Regional/provincial hospital | 35.0 | 108.5 | 20-34 | 83.5 | 259.1 |
| District hospital | 20.7 | 64.4 | 35+ | 8.3 | 25.7 |
| Health center | 5.6 | 17.5 | | | |
| **Deliveries per month** | | | **Gravidity** | | |
| <100 | 12.8 | 39.6 | 1 | 40.7 | 126.3 |
| 100-199 | 54.6 | 169.5 | 2-5 | 53.0 | 164.3 |
| 200-299 | 25.3 | 78.7 | > 5 | 6.3 | 19.7 |
| 300-399 | 7.2 | 22.5 | | | |
| **Region** | | | | | |
| Addis Ababa | 28.2 | 87.5 | | | |
| Amhara | 32.7 | 101.5 | | | |
| Dire Dawa | 3.2 | 9.9 | | | |
| Hareri | 14.6 | 45.2 | | | |
| Oromiya | 15.3 | 47.4 | | | |
| Tigray | 6.0 | 18.7 | | | |
| **Area** | | | | | |
| Urban | 91.0 | 282.3 | | | |
| Periurban | 6.3 | 19.5 | | | |
| Rural | 2.7 | 8.5 | | | |
| **Provider qualification** | | | | | |
| Obstetrician | 6.5 | 20.0 | | | |
| Other physician | 12.3 | 38.2 | | | |
| Clinical medical officer | 6.1 | 19.0 | | | |
| Midwife | 60.8 | 188.6 | | | |
| Nurse | 8.3 | 25.9 | | | |
| Health assistant | 5.0 | 15.5 | | | |
| Other/unknown | 0.9 | 3.0 | | | |

*Note that values in this and subsequent tables represent weighted values.

## Use of uterotonic drugs

In this sample of observed deliveries, every woman was given a uterotonic drug during the third or fourth stage of labor. Oxytocin was given in more than two-thirds of the observed deliveries, and ergometrine was given in 28 percent. Very few women (1 percent) received both drugs. There was no evidence of the use of combination drugs (such as Syntometrine), misoprostol, or other prostaglandins.

In general, compared with their counterparts, higher-level facilities and higher-level providers in urban areas closer to the capital region were more likely to use oxytocin than ergometrine during the third and fourth stages of labor. For example, oxytocin was used in more than 90 percent of deliveries by physicians, during observed deliveries in Addis Ababa, and observed deliveries in

central referral hospitals. There are a few notable exceptions to this pattern: although the number of observed deliveries assisted by health assistants is small (n=16), health assistants used oxytocin in 87 percent of those deliveries. This is in contrast to clinical medical officers, also represented by few observations (n=19), who were much more likely to use ergometrine (86 percent). In addition, deliveries in regional/provincial hospitals were more likely to have received ergometrine (59 percent) than oxytocin (35 percent).

The study team was surprised to note that observed deliveries in the evening were more likely to have received ergometrine than deliveries during the day. Observed deliveries in facilities for which there had been an in-service training including AMTSL targeted at midwives, nurses, or doctors showed higher percentages of deliveries in which oxytocin was used relative to ergometrine (ranging from 63 to 88 percent of deliveries by midwives, nurses, and doctors using oxytocin, versus 8 to 34 percent of deliveries by doctors, nurses, and midwives that used ergometrine) (Table 3).

**Table 3. Use of uterotonic drugs during labor, delivery, and the immediate postpartum period by characteristics of the mother and the facility.**

| | Use of oxytocin only (%) | Use of ergo-metrine only (%) | Use of both oxytocin and ergometrine (%) | Missing data | Total (%) | Total n |
|---|---|---|---|---|---|---|
| Total | 68.2 | 28.4 | 1.0 | 2.4 | 100.0 | 310.3 |
| **Age of mother** | | | | | | |
| <20 years | 53.9 | 40.9 | 5.2 | 0.0 | 100.0 | 25.5 |
| 20-34 years | 68.4 | 28.3 | 0.7 | 2.6 | 100.0 | 259.1 |
| 35+ years | 80.2 | 16.8 | 0.0 | 3.0 | 100.0 | 25.7 |
| **Gravidity** | | | | | | |
| 1 | 69.5 | 27.3 | 1.1 | 2.1 | 100.0 | 126.3 |
| 2-5 | 70.5 | 27.5 | 1.0 | 0.9 | 100.0 | 164.3 |
| >5 | 40.7 | 42.2 | 0.0 | 17.1 | 100.0 | 19.7 |
| **Time of birth** | | | | | | |
| 6 pm to 6 am | 35.4 | 61.7 | 2.8 | 0.0 | 100.0 | 47.1 |
| 6 am to 6 pm | 74.1 | 22.4 | 0.6 | 2.8 | 100.0 | 263.2 |
| **Facility type** | | | | | | |
| Central referral hospital | 99.7 | 0.0 | 0.3 | 0.0 | 100.0 | 119.9 |
| Regional/provincial hospital | 39.5 | 58.9 | 0.0 | 1.6 | 100.0 | 108.5 |
| District hospital | 53.5 | 37.6 | 0.0 | 9.0 | 100.0 | 64.3 |
| Health center | 84.7 | 0.0 | 15.3 | 0.0 | 100.0 | 17.5 |
| **Provider qualification** | | | | | | |
| Obstetrician | 97.4 | 2.6 | 0.0 | 0.0 | 100.0 | 20.0 |
| Other physician | 94.3 | 4.7 | 1.0 | 0.0 | 100.0 | 38.2 |
| Clinical officer | 13.5 | 86.5 | 0.0 | 0.0 | 100.0 | 19.0 |
| Midwife | 67.8 | 29.0 | 1.4 | 1.8 | 100.0 | 188.6 |
| Nurse | 45.6 | 41.4 | 0.0 | 13.0 | 100.0 | 25.9 |
| Health assistant | 87.2 | 12.7 | 0.0 | 0.0 | 100.0 | 15.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Other | 0.0 | 60.7 | 0.0 | 39.3 | 100.0 | 2.0 |
| Missing data | 28.0 | 72.0 | 0.0 | 0.0 | 100.0 | 1.0 |
| **Region** | | | | | | |
| Addis Ababa | 95.6 | 0.0 | 3.5 | 0.9 | 100.0 | 87.5 |
| Amhara | 83.2 | 16.8 | 0.0 | 0.0 | 100.0 | 101.5 |
| Dire Dawa | 5.3 | 94.7 | 0.0 | 0.0 | 100.0 | 9.9 |
| Hareri | 24.0 | 76.0 | 0.0 | 0.0 | 100.0 | 45.2 |
| Oromiya | 66.2 | 21.2 | 0.0 | 12.7 | 100.0 | 47.4 |
| Tigray | 3.9 | 92.3 | 0.0 | 3.8 | 100.0 | 18.7 |
| **Area** | | | | | | |
| Urban | 72.7 | 23.5 | 1.1 | 2.6 | 100.0 | 282.3 |
| Periurban | 13.2 | 86.8 | 0.0 | 0.0 | 100.0 | 19.5 |
| Rural | 44.1 | 55.9 | 0.0 | 0.0 | 100.0 | 8.5 |
| **In-service training on AMTSL** | | | | | | |
| For midwives | 63.0 | 34.2 | 1.8 | 1.0 | 100.0 | 171.5 |
| For nurses | 76.5 | 18.9 | 3.4 | 1.2 | 100.0 | 78.7 |
| For doctors | 88.8 | 7.7 | 0.6 | 2.8 | 100.0 | 61.4 |
| **Deliveries per month** | | | | | | |
| <100 | 34.6 | 63.6 | 0.0 | 1.8 | 100.0 | 39.6 |
| 100-199 | 63.9 | 31.6 | 1.6 | 3.0 | 100.0 | 169.5 |
| 200-299 | 97.3 | 0.0 | 0.5 | 2.2 | 100.0 | 78.7 |
| 300-399 | 58.3 | 41.7 | 0.0 | 0.0 | 100.0 | 22.5 |

Table 4 presents the distribution of observed deliveries by the timing, mode of uterotonic administration, and dose. The choice of a uterotonic drug varied with the timing of its administration. Oxytocin was administered following the delivery of the fetus in nearly all deliveries (94 percent) in which it was used. In contrast, ergometrine was administered after delivery of the placenta in nearly 90 percent of deliveries in which it was used. Both drugs were primarily administered via intramuscular injection, as recommended. Ten IU of oxytocin was administered in nearly all of the deliveries in which oxytocin was used (94 percent); 0.5 mg of ergometrine was administered in three-quarters of the deliveries receiving this drug.

**Table 4. Timing, administration mode, and dose of uterotonic drugs.**

| | Among cases receiving oxytocin | | Among cases receiving ergometrine | |
|---|---|---|---|---|
| **Timing of administration (%)** | | | | |
| After delivery of the fetus | | 93.9 | | 9.4 |
| During delivery of the placenta | | 0.6 | | 1.3 |
| After delivery of the placenta | | 4.0 | | 87.5 |
| Unknown/missing data | | 1.5 | | 1.8 |
| **Mode of administration (%)** | | | | |
| IM | | 90.8 | | 100.0 |
| IV drip | | 4.2 | | 0.0 |
| IM and IV drip | | 4.4 | | 0.0 |
| Unknown/missing data | | 0.0 | | 0.0 |
| **Dose (%)** | | | | |
| Dose of: | 10 IU | 94.0 | 0.25 mg | 24.4 |
| Dose of: | 20 IU | 4.3 | 0.50 mg | 75.6 |
| Dose of: | 30 IU | 1.1 | | |
| Missing data | | 0.6 | | 0.0 |
| Number | | 221.5 | | 91.1 |

IM = intramuscular administration; IV = intravenous administration.

## Use of AMTSL

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/ergometrine within 1 minute following the delivery of the fetus, controlled cord traction, and immediate uterine massage following delivery of the placenta.
- **Definition B** follows the same criteria as Definition A but relaxes the time requirement for the uterotonic drug administration from 1 to 3 minutes.

Table 5 provides the percentage of observed deliveries using both definitions of AMTSL by background characteristics. In this table, only AMTSL use with oxytocin is included, as AMTSL with ergometrine was negligible. Overall, 29 percent of observed deliveries received AMTSL following the strict version of the FIGO/ICM definition. The percentage increases to 41

percent when using the definition allowing administration of oxytocin within 3 minutes of delivery of the fetus. The pattern of AMTSL use follows the pattern described for overall use of oxytocin in Table 3 fairly closely. Overall use of oxytocin was less common in Dire Dawa, Hareri, and Tigray relative to other regions, and use of AMTSL based on either definition is non-existent in observed deliveries in these regions.

Where all elements of the definition are met except the timing of administration of the uterotonic within 1 minute of fetal delivery, it was assumed that only one person was available to manage the delivery. Thus, a second definition was developed to allow administration of the uterotonic within three minutes. However, these data show that physicians, who are more likely to have assistance at a birth, were more likely to give the uterotonic within three minute, as compared with the midwives.

Obstetricians, midwives, and health assistants were the most frequent practitioners of AMTSL in this sample (48 percent, 34 percent, and 35 percent of observed deliveries, respectively), whereas none of the deliveries assisted by clinical medical officers and few of the nurse-assisted deliveries were observed to use AMTSL. The pattern of overall use of oxytocin shown by time of day persists in the use of AMTSL: a delivery is three times as likely to receive AMTSL between the hours of 6 am and 6 pm than later in the evening. Younger women (<20 years) are substantially less likely to receive AMTSL than older women.

**Table 5. Percent of deliveries using AMTSL Definitions A and B, by mother and facility characteristics.**

| | Definition A | Definition B | n |
|---|---|---|---|
| **Age of mother** | | | |
| <20 years | 8.0 | 9.9 | 25.5 |
| 20-34 years | 30.3 | 43.6 | 259.1 |
| 35+ years | 34.4 | 51.1 | 25.7 |
| **Gravidity** | | | |
| 1 | 22.7 | 35.0 | 126.3 |
| 2-5 | 34.8 | 48.5 | 164.3 |
| >5 | 18.1 | 24.3 | 19.7 |
| **Time of birth** | | | |
| 6pm - 6am | 9.1 | 14.5 | 47.1 |
| 6am - 6pm | 32.3 | 46.3 | 263.2 |
| **Facility type** | | | |
| Central referral hospital | 52.8 | 76.0 | 119.9 |
| Regional/ provincial hospital | 10.1 | 14.0 | 108.5 |
| District hospital | 19.4 | 27.7 | 64.3 |
| Health center | 14.2 | 25.5 | 17.5 |
| **Provider qualification** | | | |
| Obstetrician | 48.3 | 66.5 | 20.0 |
| Other physician | 21.7 | 49.2 | 38.2 |
| Clinical officer | 0.0 | 0.0 | 19.0 |
| Midwife | 34.0 | 46.4 | 188.6 |
| Nurse | 5.9 | 12.4 | 25.9 |
| Health asst. | 34.9 | 34.9 | 15.5 |
| Other | 0.0 | 0.0 | 2.0 |
| Missing data | 28.0 | 28.0 | 1.0 |

| | Definition A | Definition B | n |
|---|---|---|---|
| **Region** | | | |
| Addis Ababa | 46.0 | 68.3 | 87.5 |
| Amhara | 39.6 | 50.6 | 101.5 |
| Dire Dawa | 0.0 | 0.0 | 9.9 |
| Hareri | 0.0 | 0.0 | 45.2 |
| Oromiya | 18.6 | 36.9 | 47.4 |
| Tigray | 0.0 | 0.0 | 18.7 |
| **Deliveries per month** | | | |
| <100 | 11.7 | 11.7 | 39.6 |
| 100-199 | 26.1 | 36.9 | 169.5 |
| 200-299 | 45.4 | 66.1 | 78.7 |
| 300-399 | 21.0 | 42.0 | 22.5 |
| **Area** | | | |
| Urban | 31.6 | 45.5 | 282.3 |
| Periurban | 0.0 | 0.0 | 19.5 |
| Rural | 3.3 | 3.3 | 8.5 |
| **In-service training on AMTSL** | | | |
| For midwives | 21.8 | 31.0 | 171.5 |
| For nurses | 17.8 | 28.1 | 78.7 |
| For doctors | 47.3 | 60.2 | 61.4 |

## Patterns of cord clamping

Immediate cord clamping is not an element of the FIGO/ICM definition of AMTSL, and debate on the best timing for cord clamping for maximum benefit of mother and baby persists. Table 6 shows that cord clamping in less than 1 minute of delivery is the norm in facility-based deliveries in Ethiopia. The cord was clamped within 1 minute of fetal delivery in 93 percent of observed deliveries. The remaining deliveries had the cord clamped in less than 2 minutes.

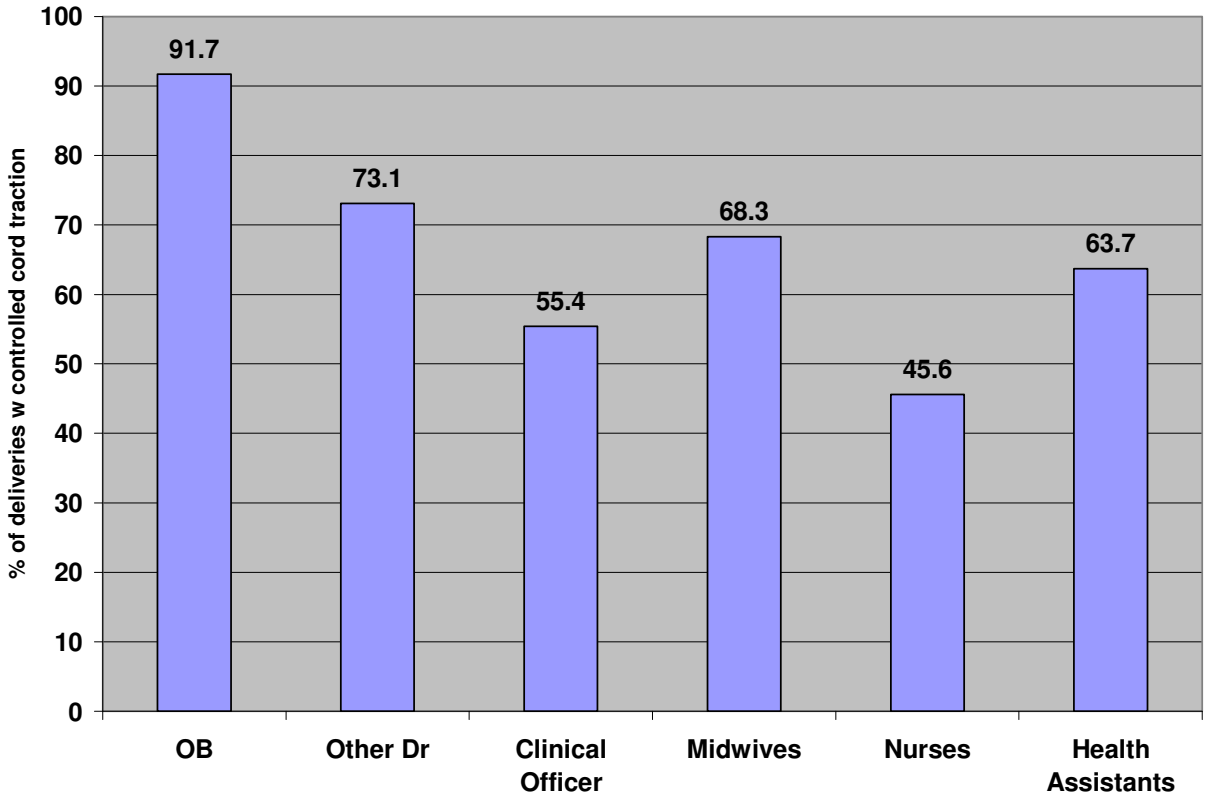
**Table 6. Distribution of time elapsed between delivery and cord clamping.**

| Time | % of cases | Weighted n |
|---|---|---|
| < 1 minute | 93.2 | 289.2 |
| 1 minute | 4.4 | 13.5 |
| 2 minutes | 0.9 | 2.8 |
| 3 minutes | 0.3 | 1.0 |
| Missing data | 1.2 | 3.7 |
| Total | 100.0 | 310.3 |

## Controlled cord traction

Controlled cord traction was practiced in 70 percent of observed deliveries. Figure 2 presents the use of controlled cord traction by provider qualification. Use of controlled cord traction is the norm for obstetricians (91 percent) and is used in approximately 70 percent of deliveries attended by other physicians and midwives (73 percent and 68 percent, respectively). Sixty-four percent of deliveries attended by health assistants also involved controlled cord traction. Clinical medical officers and nurses were the least likely to use controlled cord traction; this technique was practiced in approximately half of their deliveries.

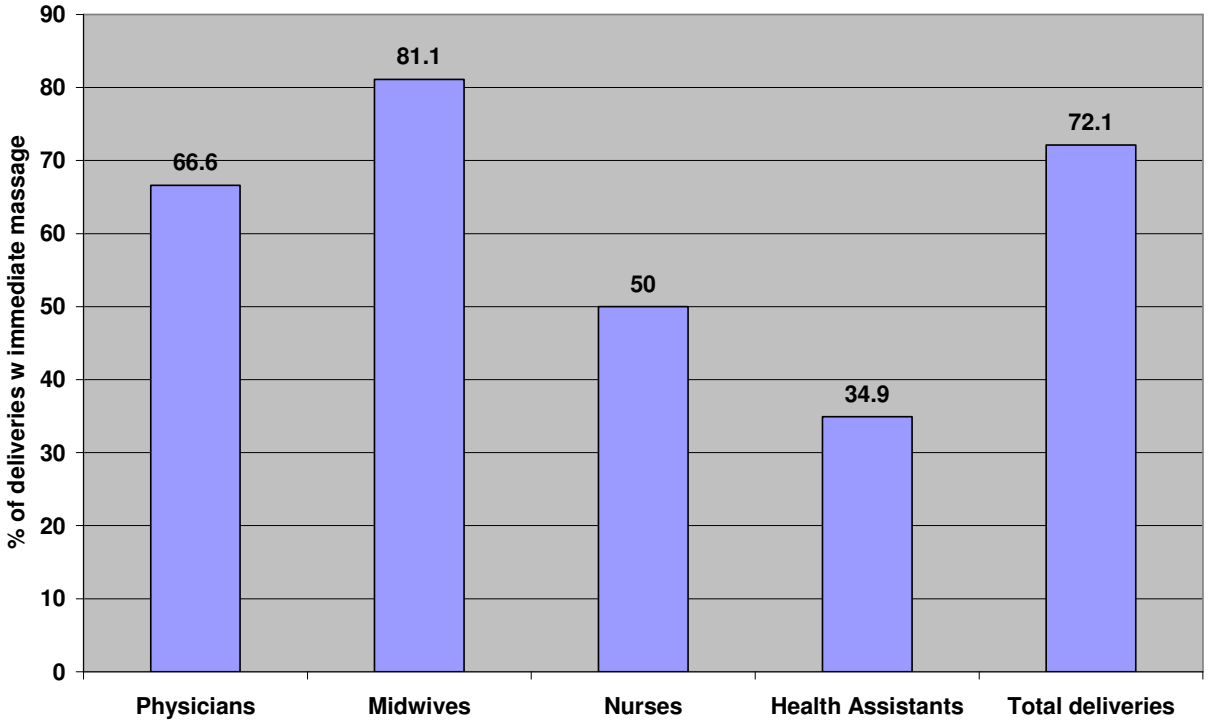
**Figure 2. Deliveries with controlled cord traction, by qualification of the provider.**



## Uterine massage

Overall, 72 percent of all deliveries benefited from uterine massage immediately following delivery of the placenta. Figure 3 presents the use of massage by provider qualification. Although the overall level of the practice of massage is similar to the practice of controlled cord traction, patterns in this practice varied by cadre of provider. Midwives were the most frequent practitioners of immediate uterine massage, as 81 percent of midwife-assisted deliveries received massage. Obstetricians and other physicians practiced massage in half of their deliveries, and clinical medical officers and health assistants practiced in about one in three deliveries.

**Figure 3. Deliveries receiving immediate uterine massage following delivery of the placenta, by qualification of provider.**



## Uterotonic drugs and overall use of AMTSL

The study team was surprised to find that correct use of AMTSL was so low in this study, given that the use of uterotonic drugs was universal in facility-based deliveries, that approximately 70 percent of observed deliveries received controlled cord traction, and that 72 percent received immediate uterine massage.

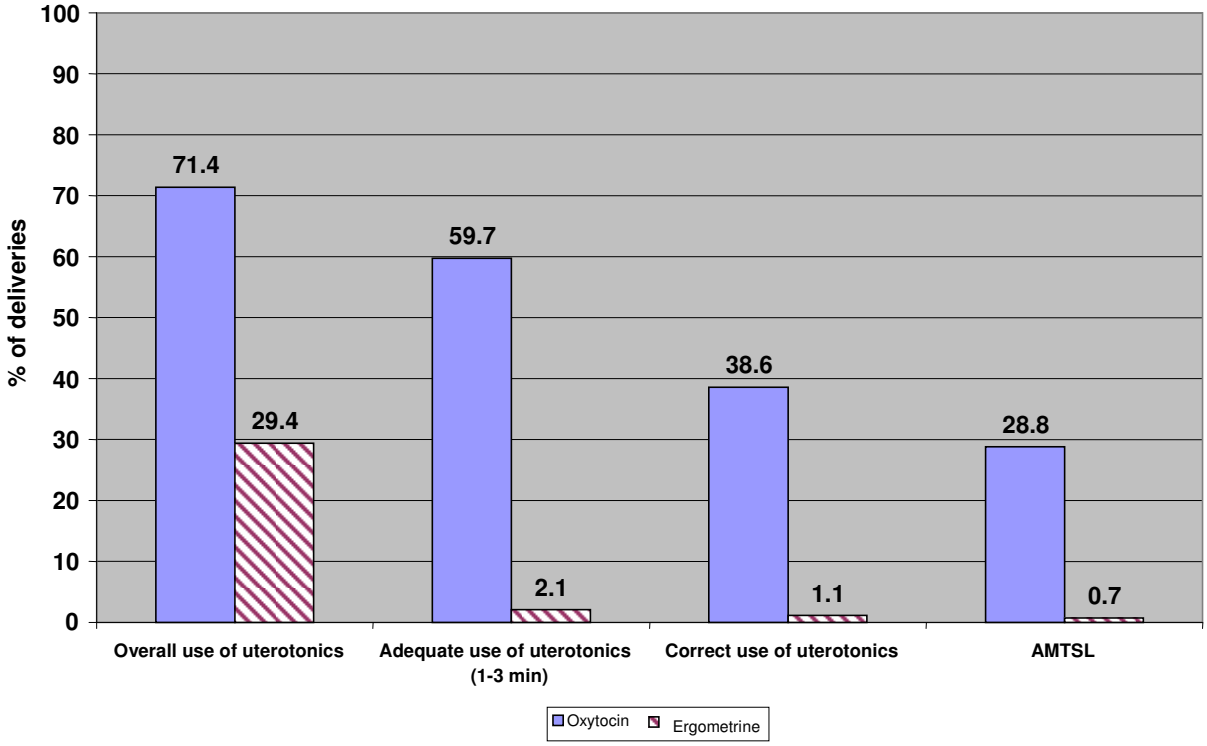
To isolate which practice or practices are responsible for the relatively low percentage of deliveries meeting the criteria for correct use of AMTSL, Figure 4 shows the practice by the individual components. In the figure, adequate use is defined as using the correct dose of the uterotonic drug, correct mode of administration, and administration of the uterotonic drug within 3 minutes of delivery of the fetus. The restrictions included in the definition of adequate relative to overall use cause a drop of 11 percentage points among births with oxytocin (dropping from 71 percent to 60 percent). Use of oxytocin following delivery of the placenta and in doses of 20 IU or more both contribute to this decrease. These restrictions reduce AMTSL use among deliveries with ergometrine to only 2 percent, with decreases primarily due to the practice of administering ergometrine after delivery of the placenta, as opposed to following delivery of the fetus.

The correct use of uterotonic drugs is based on the same definition as adequate use, with the restriction that the uterotonic drug must be administered within 1 minute of the delivery of the fetus. Among deliveries involving oxytocin, this leads to a further decrease in AMTSL use of 20 percentage points; among deliveries with ergometrine, this decreases AMTSL use to 1 percent.

When Definition A—that is, correct use of a uterotonic drug, plus controlled cord traction and immediate massage following delivery of the placenta—is applied, an additional 10 percentage points are lost in AMTSL use among deliveries receiving oxytocin; use among deliveries receiving ergometrine drops below 1 percent.

Therefore, no single practice accounts for the decrease from approximately 70 percent of deliveries receiving oxytocin to 29 percent meeting the criteria for correct use of AMTSL. Use of AMTSL decreases incrementally as each restriction regarding timing, administration mode, oxytocin dose, and controlled cord traction and massage are added to the definition. In contrast, the use of ergometrine in this sample of deliveries is primarily used in the fourth stage of labor and thus does not contribute to use of AMTSL as defined by FIGO/ICM.

**Figure 4. Deliveries with use of uterotonic drugs (oxytocin and ergometrine) and AMTSL.**



## Duration of the third stage of labor

Table 7 presents the time elapsed between the delivery of the fetus and the placenta. The average duration of the third stage of labor among deliveries in which AMTSL was used was 5.9 minutes, compared to 8.7 minutes in deliveries in which AMTSL was not used. Using the AMTSL definition with a more relaxed timing requirement for oxytocin administration, the difference between deliveries with and without AMTSL use is 6.5 and 8.8 minutes. These differences are highly statistically significant.

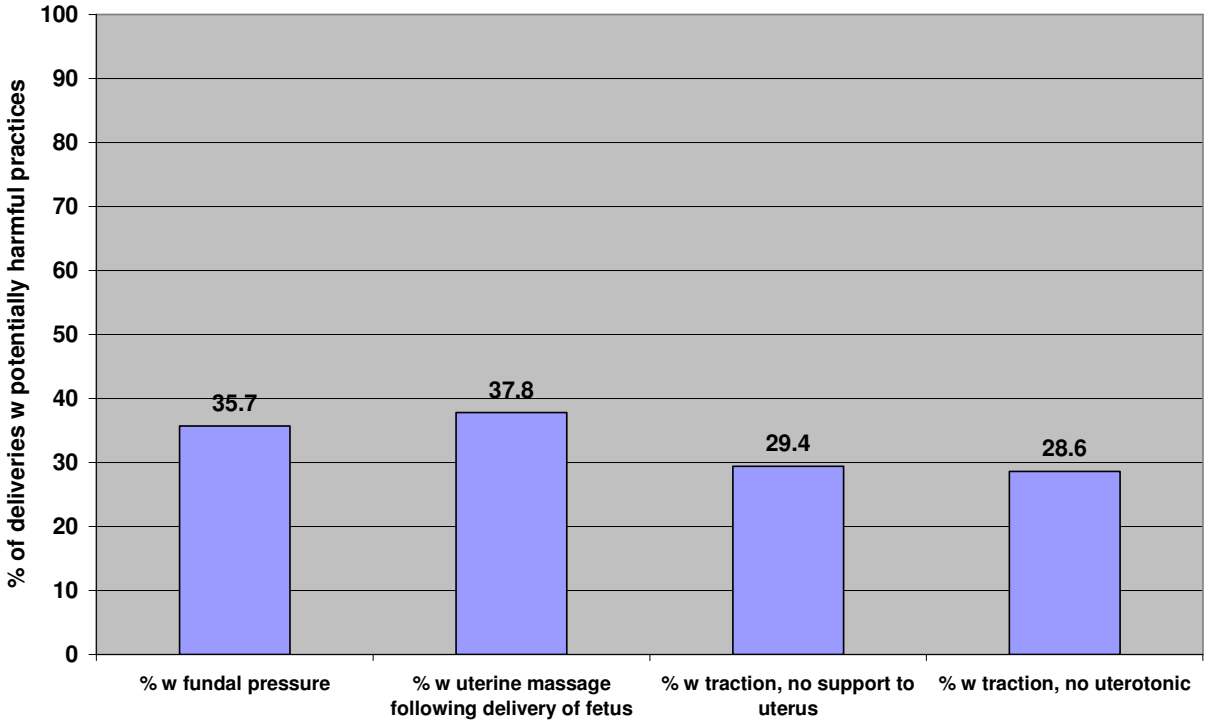
**Table 7. Average duration of the third stage of labor among deliveries, with and without use of AMTSL.**

| | Average duration of third stage of labor | 95% confidence intervals | n | P value |
|---|---|---|---|---|
| **Definition A** | | | | |
| Use of AMTSL | 5.88 minutes | 5.13–6.62 | 82 | <0.0001 |
| Non-use of AMTSL | 8.67 minutes | 8.00–9.34 | 204 | |
| **Definition B** | | | | |
| Use of AMTSL | 6.55 minutes | 5.85–7.27 | 118 | <0.0001 |
| Non-use of AMTSL | 8.80 minutes | 8.04–9.55 | 168 | |

## Potentially harmful practices

In addition to documenting AMTSL use, data from this study also identified four practices considered potentially harmful (Figure 5). These practices include the application of fundal pressure while awaiting the placenta (36 percent), uterine massage following delivery of the fetus (38 percent), application of cord traction without manual support of the uterus (29 percent), and application of cord traction without having administered a uterotonic drug to contract the uterus (29 percent, of which more than half did not have manual support to the uterus). All of these practices can increase the risk of postpartum hemorrhage or cause problems such as uterine inversion.

**Figure 5. Deliveries in which potentially harmful practices were used.**



## 5. Findings regarding provider knowledge of AMTSL

To complement the data on use of AMTSL during deliveries, the study team conducted face-to-face interviews with 69 labor and delivery professionals in facilities selected for this study (Table 8).

Approximately one quarter of the interview participants worked in central referral hospitals, and one half worked in regional hospitals. Midwives accounted for the majority of interviewees, although physicians, health assistants, and other types of providers were also well represented. Seventy percent reported having received some training in AMTSL. Among these, 77 percent reported receiving AMTSL training during pre-service education. The providers had worked in obstetric wards for an average of 9 years. There was great variation in their experience, however, ranging from less than 1 year to 30 years of experience. They had worked on average of 6.3 years at the facility in which they were interviewed, (range: 1 to 28 years).

**Table 8. Characteristics of interviewed providers.**

| Provider characteristics | % of cases | n (Total = 65) |
|---|---|---|
| **Interviews by facility type** | | |
| Central referral | 28.0 | 18 |
| Regional | 45.6 | 30 |
| District | 18.4 | 12 |
| Health center | 8.0 | 5 |
| **Qualification** | | |
| Obstetrician | 6.4 | 4 |
| Family physician | 2.9 | 2 |
| Other physician | 5.1 | 3 |
| Clinical officer/medical assistant | 2.7 | 2 |
| Midwife | 67.2 | 44 |
| Other | 15.7 | 10 |
| **Training** | | |
| Any training in AMTSL | 69.9 | 45 |
| No training in AMSTL | 30.1 | 20 |
| Pre-service training | 64.5 | 29 |
| In-service training | 22.9 | 10 |
| Both pre- and in-service training | 62 | 6 |

The study team interviewed providers regarding their knowledge of the AMTSL definition (Figure 6). More than two-thirds of the 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 (the prevention of postpartum hemorrhage). Over half (54 percent) made correct statements regarding controlled cord traction, including the purpose of controlled cord traction, and approximately one third (31 percent) mentioned correct statements regarding external massage of the uterus for prevention of or decrease in postpartum bleeding.

**Figure 6. Providers making correct statements regarding uterotonic drugs, controlled cord traction, and uterine massage.**

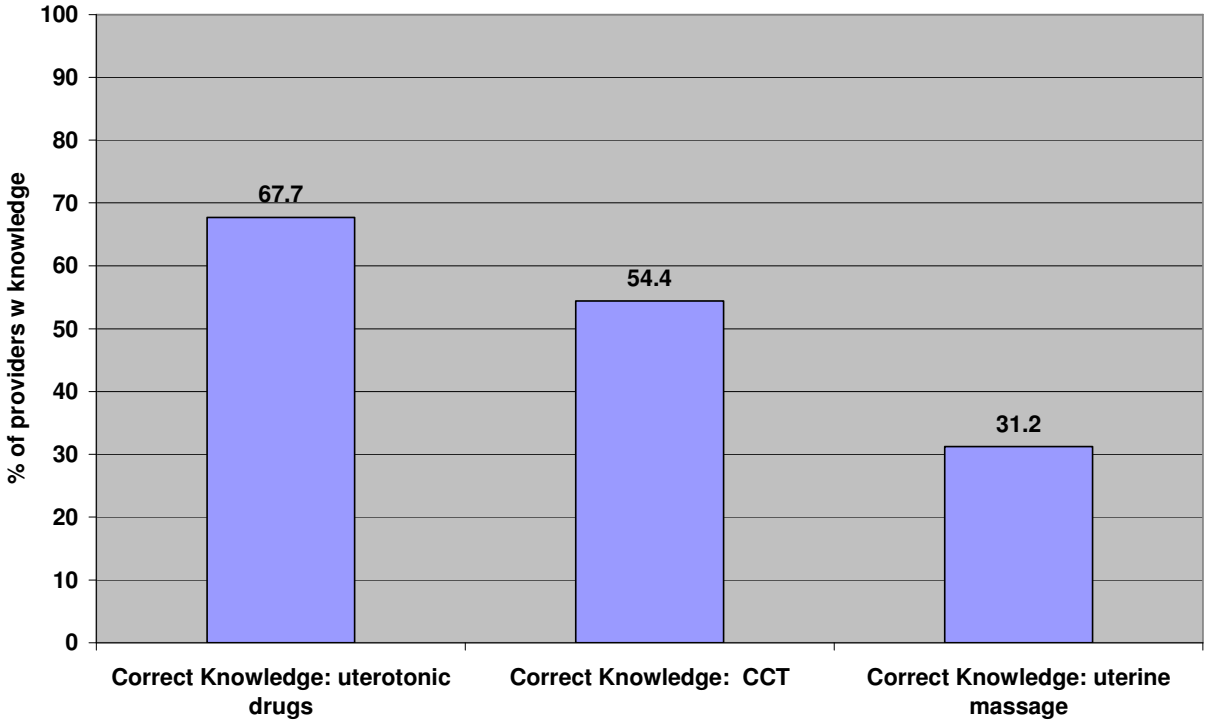
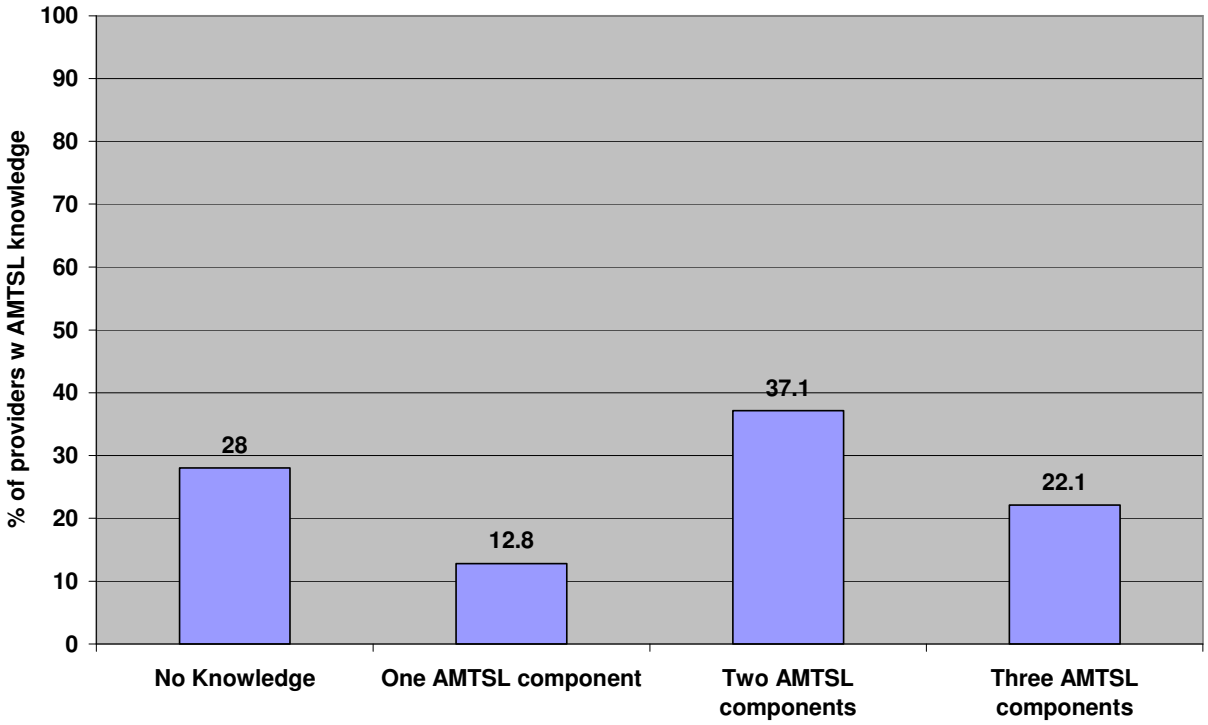


Figure 7 shows the number of AMTSL components that providers spontaneously mentioned when asked to define AMTSL. Twenty-two percent made correct statements regarding all three components of AMTSL (uterotonic drugs, correct timing, controlled cord traction, and uterine massage), and slightly more (28 percent) made no correct statements regarding the definition.

**Figure 7. AMTSL components mentioned by providers.**




## Women's consent to the practice of AMTSL

During the interview, providers were asked if women in their facilities were consulted about receiving AMTSL. None of the providers indicated that the women had been consulted.

## 6. Findings from the qualitative study

Information on community-based bleeding after birth is lacking. In order to learn the realities in the communities, a qualitative study was carried out to complement the quantitative national study on PPH. The main areas addressed included perceptions, referral practices, and suggestions for improvement of existing practices pertaining to bleeding immediately after birth.

A total of 68 persons from urban and periurban areas participated in the qualitative study. Of these, 32 were women who delivered at home or alone, 18 were TBAs, and 18 were community leaders. The educational status of respondents represented all categories: 9 uneducated participants, 18 who could read and write, 19 who had completed primary school, 17 who had completed secondary school, and 5 who had attended school beyond the secondary level (Table 9).

**Table 9. Educational status of study participants.**

| Types of interviewee | Unable to read or write | Able to read and write | Completed primary school | Completed secondary school | Attended school above secondary level | Total |
|---|---|---|---|---|---|---|
| **Debre-Birhan** | | | | | | |
| Birth attendants | 2 | 2 | 2 | | | 6 |
| Community leaders | | 1 | 2 | 1 | | 4 |
| Women who deliver at home | 2 | 3 | 3 | 1 | | 9 |
| Subtotal | 4 | 6 | 7 | 2 | 0 | 19 |
| **Ambo** | | | | | | |
| Birth attendants | 1 | 3 | | | | 4 |
| Community leaders | | 1 | 2 | 1 | | 4 |
| Women who deliver at home | 1 | 4 | 2 | | | 7 |
| Subtotal | 2 | 8 | 4 | 1 | 0 | 15 |
| **Addis Ketema (Addis Ababa)** | | | | | | |
| Birth attendants | | | | 3 | 1 | 4 |
| Community leaders | | | 1 | 3 | | 4 |
| Women who deliver at home | 1 | 2 | 2 | | | 5 |
| Subtotal | 1 | 2 | 3 | 6 | 1 | 13 |
| **Nifas-Silk Lafto (Addis Ababa)** | | | | | | |
| Birth attendants | | | | 3 | 1 | 4 |
| Community leaders | | | 2 | 3 | 1 | 6 |
| Women who deliver at home | 2 | 2 | 3 | 2 | 2 | 11 |
| Subtotal | 2 | 2 | 5 | 8 | 4 | 21 |
| **Total** | | | | | | |
| | **9** | **18** | **19** | **17** | **5** | **68** |

## Perceptions of bleeding after delivery

### Community leaders

Community leaders described becoming concerned if a woman experiences excessive bleeding[***] after delivery at home with a TBA. A few felt that it is an unpleasant situation for the delivering mother and a great concern for others when the placenta is delayed more than the usual expected time. There is also increased tension and concern if the bleeding continues after the delivery of placenta.

The majority of community leaders perceive excessive bleeding after delivery to be a great problem in their community, whereas some consider it as an occasional problem. These community members underscored that the problem of excessive bleeding is decreasing or less of a problem in towns and cities, compared to the countryside.

The leaders perceive the magnitude of excessive bleeding to be very high. In addition, they are aware that such bleeding is dangerous and can lead to death. The study found that 3 of 10 mothers can be affected by excessive bleeding after delivery. They also pointed out that the problem becomes severe for families who are in low-income brackets or in low-income areas where significant proportions of mothers suffer from the problem. One respondent noted that he remembers four mothers who had passed away due to excessive bleeding. Another respondent underlined the problem being "catastrophic for women who are involved in commercial sex, who at all times undertake illegal abortion at the expense of their life and face severe consequences of bleeding."

Community leaders identified the likely causes of excessive bleeding (in order of frequency) as mothers' workload in domestic activities, a lack of proper diet and malnutrition, partial delivery of the placenta from the womb, womb is dislodged from its position or the vagina is damaged or torn, lack of proper medical follow-up during pregnancy, lack of referral to medical facilities for proper medical support, advanced age and/or too many births, illegal abortion, improper position of the baby during delivery, and other conditions such as blood pressure.

Community leaders interviewed in all study sites indicated that the condition in four-fifths of the women who experience excessive bleeding at home or at a TBA's place are usually found to be dangerously ill and in critical condition. Almost all of these community leaders advised families to take women to a location where she could receive life-saving medical treatment; in some cases, they took the women there themselves. All of the leaders facilitate transportation or raise funds (e.g., collecting money from neighbors or arranging loans) to help the husbands overcome financial problems. In urban areas, about 6 percent of community leaders were willing to donate blood to the bleeding mother if required. Some participants noted that, in some countryside neighborhoods, it is impossible for family members to take a bleeding mother to a facility because there is no such facility in the vicinity, even if they were willing to carry the woman on a bed.

[***] Throughout this section, community members reported on "bleeding after delivery." Since all women bleed to some degree after childbirth, we have interpreted this to mean "excessive bleeding."

Regarding the perceptions of the danger of postpartum bleeding, community leaders described the condition to be very dangerous—a crisis that can lead to the death of the delivering woman. In addition, one-fifth of the respondents recalled mothers who died from excessive bleeding immediately after delivery. They acknowledged that a mother's death impacts the baby, other family members (including other children and the husband), neighbors, and close relatives.

The majority of the respondents (about 80 percent) said they advise the family to take the bleeding mother to a health facility. In addition, they indicated that community members take several actions when a woman bleeds immediately after delivery. Among other intervention, the primary traditional approach to protect the mother from excessive bleeding is providing porridge and honey. Administering herbal medicine to the bleeding mother is believed to stop the bleeding. Advice may be sought from a magician to stop the bleeding. The woman's neighbors and local TBAs may also make her sleep without a pillow and put cloths under her back or buttocks so that the bleeding decreases and eventually stops. Some do nothing except pray.

**Traditional birth attendants**

Most of the TBAs worry if the bleeding after delivery of the placenta is much more than usual. However, a few stated that they start worrying if the bleeding occurs both before and after delivery of the placenta. None of the respondents expressed any objective quantification of the blood loss. One TBA pointed out that she becomes concerned if the cord is torn even if the mother is not bleeding.

Most TBAs think that excessive bleeding is associated with fatal consequences. One exception was a TBA in Ambo who thinks that the magnitude is uncommon and the associated problems are not serious. The TBAs stated that the dangers—even death—only pertain to the mother.

Mostly TBAs described the causes of excessive bleeding as strenuous activity at home or on the farm that leaves women weak and vulnerable. A few mentioned other causes such as bodily exhaustion from work and labor, those who do not have enough to eat, those who are relatively old, the use of traditional medicines, the presence of any condition such as hypertension or anemia, and not following instruction given to them during pregnancy. One TBA said that, in addition to the strenuous chores, women will bleed excessively if they are malnourished, the cord is torn, and there is genital tear during delivery. Another TBA from Addis expressed that frequent delivery will thin out the uterus, making women susceptible to bleeding.

All TBAs correctly stated that all women bleed after delivery, although serious bleeding affects only some of the mothers. They provided conflicting responses with regard to the magnitude of bleeding after delivery. Some mentioned that they have attended 3 to 10 deliveries in the last six months but did not encounter any excessive bleeding. However, two TBAs said that they observed more than the usual severe bleeding in two of the three births they attended in the six months prior to this interview. Two TBAs from Addis Ketema admitted that they did not attend any deliveries in the past six months because of their fear of contracting HIV.

All TBAs also agreed that bleeding differs from woman to woman. They also stated that, if severe postpartum bleeding occurs, it does not usually stop on its own. They therefore will

immediately take the woman to a health facility. In the meantime, they put pillows under her buttocks and give her hot drinks. One TBA mentioned providing assistance by putting cold water on the feet and genitals. Another TBA gives herbal medicine with tea, although she did not describe the type of herb. Some TBAs said that they advise and even provide porridge and butter for the mothers. A few TBAs also advise older women to stop bearing children and advise others to space their children and follow up on antenatal care.

**Women who delivered at home or alone**

Women's perception of excessive bleeding after delivery is that it presents a fatal risk and threatens the life of the mother, especially if the amount of flow doesn't decrease. Most women will not be at ease if they are bleeding heavily. They believe that continuous bleeding greatly harms the mother.

Most respondents had similar feelings about excessive bleeding after delivery. Most women described the following feelings after delivery, in order of their degree and frequency: being weak and tired and having back pain, dizziness, headache, chills, cold, anorexia, joint pain, and a 'weak heart' (extreme fatigue). They agreed that most mothers experience bleeding after delivery.

The majority of women identified a lack of proper nutrition during pregnancy or malnutrition as the major cause of bleeding. They also identified physical weakness due to routine domestic/household work during pregnancy and injury during labor (e.g., womb damage and vaginal tears) as causes of bleeding.

All women involved in the study recognized the problem of excessive bleeding as "immense/critical." There was a unanimous perception that bleeding that occurs immediately after delivery differs from women to women, affecting some more than others.

Participants across the study areas perceived bleeding immediately after delivery as very dangerous. The majority had strongly believed that excessive bleeding might lead to the woman's death and that it is a primary cause of death among delivering mothers. They felt that the condition primarily affects the delivering mother and then the newly born baby, other children, the husband, other family members, and neighbors and the community at large.

The women pointed out that, before being referred to a health facility, various actions can be taken when a woman bleeds after delivery at home or at a TBA's site. The actions include making the mother sleep with her head down, putting cushions below her back to reduce the volume of bleeding, placing clothes with cold water on her chest, and massaging her head and feet.

## Referrals to health facilities

### Community leaders

The majority of community leaders said that women who bleed at the TBA's site and/or at home are referred to a health center or hospital. According to the respondents, the decision to refer the bleeding mother is primarily given by the husband, other family members, or neighbors.

Community leaders indicated that the decision to take or send the bleeding mother is reached after waiting 15 to 30 minutes after delivery, by which time they can tell whether the bleeding is improving or not. In urban areas and their periphery, people take women to health facilities immediately after the decision is made—that is, within 15 to 60 minutes. In rural areas, the situation can be entirely different; the decision to take a bleeding mother to a health facility might take up to 8 hours, if not days. One respondent mentioned a situation in which there was a lapse of 2 days between making the decision and taking the women to the health facility.

Some community leaders believe that taking the bleeding mother to a health facility depends on the income/financial status of the family. Respondents indicated that this is because most families do not have the finances at hand. Only some families in rural areas have the money and resources to take a bleeding mother to a health facility immediately after the decision is made. To this effect, significant numbers of families are obliged to sell cattle or find loans to take the mother to the facility.

Survey respondents indicated that there is always consultation about a bleeding woman before a referral is made. The consultation is usually made with the husband, other family members (including elder children), parents and in-laws, and neighbors.

The respondents revealed that health facilities located in towns could be 1 to 3 kilometers away, reachable within 30 minutes by foot or within 15 minutes by vehicle. In rural areas, a minimum of 1 to 2 hours and a maximum of 7 to 8 hours of walking is required to reach the nearest health facility. The patient is usually carried to the nearest health facility on a bed by up to 20 men. According to the majority of the interviewees, the husband, relatives, and occasionally neighbors arrange and cover the transportation costs.

### Traditional birth attendants

All TBAs said they refer mothers with excessive postpartum bleeding because the mothers become weak and the bleeding may even lead to death. They also expressed concern about being held accountable for a bad outcome. If the bleeding does not stop, the TBAs refer the mother to a health facility within 10 to 30 minutes. Most agreed that even if the family has financial constraints, the mother will be taken to a health facility after the family collects or borrows money from relatives, neighbors, or other members of the community. One TBA said that there are occasions in which the poor and those who do not have people to carry them will not go to the health facility.

The TBAs estimated the distance between many mothers' homes and the nearest health facility to be 5 to 7 kilometers, a distance that takes about 2.5 hours. Some live in closer proximity to the facility.

In most instances, the TBAs consult family members for referral and obtain a response in 15 to 30 minutes (although one TBA said that it may take up to an hour). One TBA once consulted a health care provider. Some TBAs mentioned that they have never referred women without consulting with family members. This approach ensures that they share responsibility in case there is an unfavorable outcome. Other TBAs cited instances in which they have referred women without consulting anyone because the women had difficult labor and could have bled significantly.

TBAs in the city described the main means of transport as a taxi or ambulance; TBAs in rural areas described a stretcher carried by shoulder as the main way of transporting women. In Addis Ababa, some TBAs request help from neighbors who own a car. People who transport the women to health facilities include close members of the family (e.g., the husband and elder children) and relatives as well as neighbors.

The TBAs identified the main constraint to referrals—particularly in rural areas—to be problems related to transportation. Few mentioned financial problems as the main constraint. As mentioned earlier, people close to the family can raise money or lend the husband some money for this purpose.

**Women who delivered at home or alone**

The participants stated that almost all women with excessive bleeding who delivered outside of health facilities are taken to a nearby health institution. It is worth mentioning that prior to the decision of referring women to a health facility, attempts to use cloth, gauze, or other materials to minimize the bleeding are used and can actually conceal serious bleeding. Women said that decisions to take women to a facility are made by their spouse, elder children, mothers and mothers-in-laws, close friends, and neighbors.

In addition, the majority of the participants indicated that mothers who delivered at home, alone, or with TBAs are referred to health facilities within 1.5 hours. About one-tenth of participants said that mothers who bleed excessively after delivery are immediately referred to a health facility. It should be noted that terms like "soon" or "immediately" are relative, and definitions of these time spans differed from participant to participant. The women said that consultations are usually conducted before referrals, occurring among family members, close relatives, and neighbors when the spouses are not available.

Women described the role of spouses and in-laws as offering every support to take care of the baby, looking after what the mother consumes (food and drink) after delivery, and facilitating her referral to health institutions.

The mothers stated that all family members, friends, neighbors, and relatives try their best and contribute their share in taking the bleeding mother to a nearby health institution. Even if the

delivering mother, husband, and close family members lack the financial resources required for transportation, the woman is by all means taken to health institution with the support and contribution of neighbors and other community members. No one leaves her by herself or at home alone where the eventual outcome is very predictable (that is, death). The women reported that the husband, elder children, family members, and neighbors arrange transportation to take the bleeding mother to health institutions.

The majority of mothers agreed that, in urban areas, there are no times in which women bleed at home or at the place of delivery without being referred to a health facility. In rural areas, however, there are few cases in which women who deliver at home alone and bleed after delivery are not taken to health facilities. The women described the reasons for not being referred to health facilities as either lack of finances for transportation or lack of a close relative who can stand by their side to facilitate and influence people in the community. The women indicated that, in urban areas, mothers experiencing excessive bleeding after delivery are referred to health facilities—even with the support and cooperation of a passerby, if not by their neighbors. In rural areas, mothers do not have such opportunities due to the scattered settlement pattern of households.

## Comments on quality of care

### Community leaders

Three-fourths of the community leaders agreed that traditional care is insufficient and risky when compared to care given in health facilities. A few community leaders noted that there are times when it is hard to get new blades in rural areas. They also mentioned that TBAs are older, not trained, and lacking the skill and knowledge needed to provide a relatively minimum standard of care to bleeding mothers.

They also noted that the usual care provided to mothers experiencing excessive bleeding at home or by TBAs include giving hot porridge, soft drinks, and *atmit, shameta*—a drink locally made from barley.

The interviewees suggested that measures be taken by concerned government institutions, NGOs, and private-sector entities in cooperation with the community. Suggestions included providing continuous training for TBAs and raising mothers' awareness of the benefits of delivering at health centers; obtaining regular check-ups during pregnancy at health institutions; providing health education about bleeding immediately after delivery for women, husbands, and the community; establishing or increasing the number of health institutions within the proximity of neighborhoods and the community; discouraging illegal abortion and encouraging those involved in commercial sex to have legal abortion by arranging necessary facilities; enhancing the economic status of women and assisting them in having a better economic life (e.g., by involving them in gainful economic activities); improving and expanding services for mothers at health institutions; providing and facilitating extensive education on family guidance and services to the community; and spacing children.

According to community leaders, the major points mentioned as possible reasons for delivering babies outside of formal health facilities included lack of income, lack of awareness/health education, transport issues, the distance between health facilities and places of residence, women's fear of showing their bodies to others, husbands' aversion to having their wives be seen naked in front of strangers, being traditional and sentimental (wondering why, if their mothers, grandmothers, and ancestors delivered at home, a couple would spend money on health facilities), and holding beliefs that they shouldn't go to health facilities (and instead delivering at home like their ancestors, who used traditional medicine for any problem).

The respondents emphasized that medical follow-up is important to reducing bleeding after delivery, and thus mothers have to be aware of it through trained TBAs. In addition, health education must be provided to mothers, including what they should and should not do during their pregnancies.

Community leaders described proper diet as very important for mothers during their pregnancies and something that should be looked after by the husband. In addition, they felt that husbands must be advised to decrease and/or share their wives' workload, particularly household activities like caring for the children.

The other important comment underscored by community leaders is that the government should pay attention to the expansion of family planning guidance and consider the fear of HIV/AIDS that hinders TBAs from attending bleeding mothers immediately after delivery.

### Traditional birth attendants

TBAs mentioned a range of actions that can improve bleeding after delivery, including helping women care for themselves during pregnancy, receive care during pregnancy, ensure a balanced diet, limit their chores, limit births, and practice child spacing; establishing health facilities in rural areas; and facilitating immediate transport to health facilities. Although she did not provide a good description, one TBA also mentioned cleaning the womb (*mahthsen masateb*) as a way to improve the condition.

TBAs also mentioned improving living standards to avoid malnutrition and educating mothers help to reduce the consequences of bleeding after delivery. Providing training and replenishing delivery kits would reduce TBAs' fear of contracting HIV and enhance attendance of delivery—thereby improving the management of bleeding after delivery. TBAs also mentioned using women's associations and community-based organizations as additional ways of providing family planning and helping reduce bleeding after delivery.

### Women who deliver at home or alone

Women felt that the existing care to women who deliver at home or with TBAs and experience excessive bleeding are usually traditional and insufficient compared to the care provided by health institutions. About three-quarters of the participants agreed that care provided at their place of delivery depends on the income and social status of the delivering mother.

They also indicated that the current care practices usually include checking the placenta in water to determine whether it is full or not, checking the volume of bleeding (to determine if it is normal or whether the flow is decreasing), giving her hot porridge prepared from cereals, and protecting her from cold, wind, and light.

Moreover, almost all participants believe that care provided for mothers bleeding at health institutions is far better than care provided to their counterparts who deliver at home. Maternal care provided at health institutions has a difference in neatness and in safety.

The participants identified measures that concerned government bodies, the private sector, and the community could undertake, including:

- Conducting awareness-raising sessions among community members regarding postpartum hemorrhage and the importance of referrals to health institutions.
- Establishing new health posts and health centers that could provide services to the community in relation to existing population size.
- Mobilizing women and mothers in the community to have proper follow-up care during their pregnancy and, if possible, to deliver at health facilities.
- Providing training and refresher courses for TBAs and trained TBAs, respectively.
- Implementing awareness-raising activities for health professionals and other health service providers on professional ethics and proper handling and management of delivering mothers; providing incentives and other benefits to establish and maintain efficient services.
- Increasing the number of ambulances at every health facility (and establishing the service in those health facilitates that don't have one) to facilitate efficiency of transportation during emergency situations.

Nearly half of the mothers do not go to health facilities primarily because of fear of showing their private parts to unfamiliar health professionals, particularly males. In this regard, the study also indicated that there are women who do not go to health facilities because of fear of delivering their child by operation (e.g., episiotomy and/or cesarean section). There are also a significant number of mothers who do not like to go to health facilities in order to avoid the pain of being mishandled and mismanaged by health professionals.

Moreover, the participants pointed out that no bleeding woman is prevented from being referred to a health facility because of lack of money, other than the problem of transportation and the distance of health facilities from the place of delivery (which is mostly an issue in rural areas).

In addition, the women suggested that efforts to improve ambulance services are critical. Introducing these and other services that meet women's needs could contribute a great deal to the reduction of fatal postpartum hemorrhage. Other examples include establishing a mechanism through which health workers learn from experiences of other knowledgeable health workers and providing advice to health professionals, assisting them in upgrading their ability to manage postpartum hemorrhage.

## 7. Conclusions and recommendations

This study documented practices during the third and fourth stages of labor in a nationally representative sample of facility-based, vaginal births in Ethiopia. The results show that 100 percent of such births receive a uterotonic drug during the third or fourth stages of labor. Oxytocin was used in more than two-thirds of the deliveries, and ergometrine was used in less than a third.

Use of AMTSL according to the recommendations of FIGO/ICM was observed in 29 percent of deliveries, virtually all of which used oxytocin. A variety of factors account for the relatively low use of AMTSL as compared to the overall use of oxytocin. These include the delayed administration of oxytocin following the delivery of the fetus, lack of controlled cord traction, and lack of uterine massage immediately following delivery of the placenta. If the definition of AMTSL is relaxed to allow administration of the uterotonic drug within the first 3 minutes (as opposed to 1 minute) following delivery of the fetus, 40 percent of deliveries received AMTSL. Furthermore, use of AMSTL using the correct or adequate definition varies dramatically by region, with three of six regions showing no deliveries for either definition.

In Ethiopia, the policy environment is mixed in its support of AMTSL. At the national level, the standard treatment guidelines do not include postpartum hemorrhage. The national drug formulary describes appropriate use of oxytocin and ergometrine for the prevention of postpartum hemorrhage, putting oxytocin as first-line drug, but it is based on outdated information that promotes use of uterotonic drugs following the delivery of the placenta. This formulary also states that oxytocin should be stored at room temperature, versus 2°C to 8°C, as recommended by the drug manufacturers and FIGO/ICM. (It should be noted that 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.) In 2004, the Society of Obstetricians and Gynecologists in collaboration with MOH, ENMA and Prime II produced updated guidelines that reflect the FIGO/ICM recommendations; these guidelines have not been distributed as widely as needed.

Given this policy environment, it is not surprising that correct use of AMTSL is not being consistently emphasized in pre- or in-service training of physicians and midwives and that knowledge and practice of the AMTSL components is very low among providers.

Regarding drugs and supplies, the mean months of stock on hand was 6.5 months for both uterotonic drugs (range: 0-60 months), but five facilities had no stock of oxytocin, and three facilities had no stock for ergometrine. The stock-out periods ranged from 7 to 90 days, affecting mainly district and regional hospitals. The most common reasons for stock out (in order of their frequency) were the delay in ordering the supplies and consumption exceeding expectation. In addition, families were requested to buy uterotonic drugs in 8 of 23 facilities, syringes in 11 of 23 facilities, and both uterotonics and syringes in 8 of 23 facilities.

Data from the qualitative study show that the community and some TBAs correctly and appropriately perceive postpartum hemorrhage as a critical obstetric problem that is tantamount to death of the mother. However, there are TBAs who do not understand the gravity of bleeding after delivery. Mothers in the community correctly identified that death of the mother will have negative consequences on the newborn, other children, and family members. In contrast, TBAs stated that the danger, which may include death, is limited only to the mother.

Procedures that are not beneficial—or even, in some cases, harmful—are practiced in the community and by TBAs. Apart from the harm these practices inflict on the mother, they also contribute to lost time that could be spent on useful measures, including facilitating urgent transfer of the mother to a health facility.

Decision-making is mainly performed by the husband, mother-in-law, and other involved people, limiting the mother's opportunity to exercise her reproductive rights. Decisions are made late (1 to 1.5 hours after delivery), although postpartum hemorrhage can kill quickly—in some cases, within 2 hours. It was also noted that health system-related issues like a negative provider response and lack of emergency readiness contribute to underutilization of modern obstetric care.

Based on the findings from this national study, the study team proposes the following recommendations.

## Recommendations

### Policy

1. Standard treatment guidelines should be updated to be in line with the 2004 MOH/ESOG guidelines and the FIGO/ICM recommendations for AMTSL.
2. Pre-service and in-service training materials should be developed and incorporated into the curricula for physicians and midwives. A specific plan for increased provision of in-service training that includes the updated guidelines for AMTSL should be developed and implemented.
3. The 2004 MOH/ESOG guidelines for AMTSL should be disseminated to all health facilities in the country. If possible, they should be distributed to all providers and accompanied by a memorandum from top-level officials. Health facilities with a low volume of deliveries should be targeted for special attention, as the study found that use of AMTSL in such facilities was lower than in higher-volume facilities in this study.
4. AMTSL job aids should be developed and disseminated to all health facilities.
5. A mechanism to inform every nongovernmental reproductive health training initiative about AMTSL must be established.
6. Women who deliver at home should be encouraged to seek a skilled birth attendant, and training for health care workers is essential. In addition, educating the community about antenatal care, family planning, and nutrition; facilitating referrals; and making health care accessible to the rural population should be given due attention by the responsible authorities.

7. Educating TBAs about the serious consequences of postpartum hemorrhage and their role in rapid transfer of such women is important.
8. Strengthen the system of emergency obstetric care.

### Providers/practice

9. Regions with particularly low use of AMTSL should be prioritized in this plan.
10. Provider types with particularly low use of AMTSL should also be prioritized.
11. A national-level, standard reproductive health/safe motherhood training document for use by all regions must be developed.

### Logistics

12. Procedures for procurement and distribution of uterotonic drugs, particularly oxytocin, should be reviewed and updated to ensure that all facilities have adequate supplies of oxytocin to provide AMTSL to all women having a vaginal birth.
13. Oxytocin, a life-saving drug, should be made available to all women. If women can not pay for oxytocin for AMTSL, it should be provided to them at no cost.

### Monitoring and evaluation

14. A grading system for facilities that monitors the routine use of AMTSL should be developed. Supervisors should be trained in ATMSL, and supervision checklists should be included as an indicator of quality.
15. A column should be added to labor and delivery logbooks to monitor the use of AMTSL.
16. Clinical audits focused on AMTSL should be implemented.

In summary, AMTSL has a strong foothold in Ethiopia, with between 30 and 40 percent of births benefiting from this practice. Yet there is substantial room for improvement. Given that there are numerous providers implementing this practice correctly, these providers constitute an important resource that can be used to expand the practice to additional providers and to facilities in regions where AMTSL is not the norm.

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