

# **Prevention and treatment of postpartum hemorrhage at the community level:**

A guide for policy makers,  
health care providers,  
donors, community leaders,  
and program managers

**Second Edition**



**USAID**  
FROM THE AMERICAN PEOPLE



Maternal and Child Health  
Integrated Program

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**Maternal and Child Health Integrated  
Program (MCHIP)**

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## Table of contents

Background.....	1
Method .....	2
Definitions.....	3
Prevention of postpartum hemorrhage.....	6
Treatment of postpartum hemorrhage .....	12
Research needs .....	17
End Notes .....	22

## List of tables

Table 1. PPH prevention at the community level.....	7
Table 2. PPH treatment at the community level.....	13
Table 3. PPH prevention and treatment interventions with a recommendation of A or B by type of birth attendant .....	17

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This second edition of this document was developed by the MCHIP Community-Based Task Force for the prevention of postpartum hemorrhage: Susheela Engelbrecht, PATH; Ndola Prata and Martine Holston, Venture Strategies Innovations; and Niamh Darcy, RTI.

### About MCHIP

MCHIP is the USAID Bureau for Global Health's flagship maternal, neonatal and child health (MNCH) program which focuses on reducing maternal, neonatal and child mortality and accelerating progress toward achieving Millennium Development Goals (MDGs) 4 and 5. Awarded to Jhpiego and partners in September 2008, MCHIP works with USAID missions, governments, nongovernmental organizations, local communities and partner agencies in developing countries to implement programs at scale for sustainable improvements in MNCH.

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

## Acronyms

<b>AMTSL</b>	active management of the third stage of labor
<b>CCT</b>	controlled cord traction
<b>EOC</b>	essential obstetric care
<b>HLD</b>	high-level disinfection
<b>IM</b>	intra-muscular
<b>IU</b>	international units
<b>MCHIP</b>	Maternal and Child Health Integrated Program
<b>MNH</b>	maternal and newborn health
<b>MPS</b>	Making Pregnancy Safer
<b>NGO</b>	non-governmental organization
<b>PPH</b>	postpartum hemorrhage
<b>RCT</b>	Randomized controlled trial
<b>SBA</b>	skilled birth attendant
<b>TBA</b>	traditional birth attendant
<b>USAID</b>	United States Agency for International Development
<b>WHO</b>	World Health Organization

# Background

The World Health Organization (WHO) and other international organizations have implemented strategies to meet the United Nations Millennium Development Goals to reduce maternal and newborn mortality. Despite these efforts, hundreds of thousands of women and babies die or become disabled due to complications of pregnancy and childbirth every year; half of these maternal deaths occur within 24 hours of childbirth.<sup>1</sup>

Postpartum hemorrhage (PPH) is the leading direct cause of maternal death in developing countries and results from problems during and immediately after the third stage of labor.<sup>2</sup> PPH is an **unpredictable** and **rapid** cause of maternal death worldwide, with two-thirds of women with PPH having no identifiable risk factors. Seventy to ninety percent of immediate PPH is attributed to uterine atony (failure of the uterus to properly contract after birth).<sup>3, 4</sup>

Research shows that using simple, low-cost interventions can help avoid most of these tragic outcomes. Current evidence indicates active management of the third stage of labor (AMTSL), which includes administration of an uterotonic drug, controlled cord traction with simultaneous countertraction of the uterus, and fundal massage after delivery of the placenta, can reduce the incidence of PPH by up to 60 percent in situations where:

- National guidelines support the use of AMTSL.
- Health workers receive training in using AMTSL and administering uterotonic drugs.
- Injection safety is ensured.
- Necessary resources (uterotonic drugs and cold chain for storage of uterotonic drugs; equipment, supplies, and consumables for infection prevention and injection safety) are available.<sup>5</sup>

Women need to have access to a skilled birth attendant to benefit from interventions to either prevent or treat PPH. Unfortunately, more than 50% of women in the developing world face birth alone, with a family member, or with a traditional birth attendant (TBA) who may or may not be trained. Given this statistic, it is therefore imperative that women, men, families and communities take an active role in contributing to improvements in maternal and newborn health (MNH). WHO has recommended key interventions that are grouped under four priority areas:

- developing capacities at the household and community level to improve MNH and to respond to obstetric and MNH emergencies,
- increasing awareness of rights and needs related to maternal and newborn health,
- strengthening social networks and linkages between communities and health services, and
- ensuring that efforts to improve services take the needs and perspectives of women and communities into account<sup>6</sup>.

This document examines evidence related to the prevention and treatment of PPH, or one or more of its components, at the community level and when a skilled or non-skilled birth attendant is assisting the birth. The purpose of the document is to guide policy makers, health practitioners, donors, community leaders, and program managers who are developing community-based interventions to address the need to increase capacities at the household and community level to improve MNH and to respond to obstetric and MNH emergencies.

Women continue to risk death in order to give life. Unfortunately, the requisite changes in maternal and neonatal care are slow in reaching the majority of women in developing countries — more than half the world's women and babies. Until all women have access to

life-saving interventions, communities need access to interventions that can potentially save the life of a woman or baby.

## Methods

The POPPHI community-based task force developed the first edition of this document and the MCHIP community-based task force developed the second edition of this document using the following methodology:

1. A list of possible interventions for prevention and treatment of PPH was developed.
2. Each intervention was classified as a practice, device, or medication.
3. A non-exhaustive list of persons who could potentially carry out the intervention was made. (It is important to note that this will vary by country.)
4. For each intervention, the community-based task force assessed studies for size, design, quality, and setting. The level of evidence is categorized as follows:<sup>7</sup>
  - I. Evidence of no benefit. Interventions for which evidence exists showing they have no important benefits—either singly or in combination with other measures—for postpartum hemorrhage;
  - II. No evidence of benefit. Interventions for which evidence for or against an effect on PPH was absent;
  - III. Uncertain evidence of benefit. Interventions for which there was some evidence of benefit, but contradictory evidence, or issues such as study design, location, or size precluded any firm conclusions. These interventions merit further assessment in low-income and middle-income countries;
  - IV. Evidence of efficacy. Interventions effective in preventing or treating PPH, but there is a lack of data on effectiveness in large-scale community-based programs;
  - V. Evidence of efficacy and effectiveness. Interventions of incontrovertible efficacy and which seem feasible for large-scale implementation based on effectiveness trials.
5. For each intervention, the community-based task force made a recommendation for its use:<sup>8</sup>
  - A. Recommendation based on consistent and good quality patient-oriented evidence;
  - B. Recommendation based on inconsistent or limited quality patient-oriented evidence;
  - C. Recommendation based on consensus, usual practice, opinion, disease-oriented evidence, and case series for studies of diagnosis, treatment, prevention, or screening.

A non-exhaustive list of practical issues that might affect using the intervention was developed. Whether or if these issues present a barrier will depend upon each country's norms and protocols.

This document is revised periodically to reflect the most recent published research. Go to the MCHIP website, <http://www.mchip.net>, for the most up to date information.

# Definitions

- **Active management of the third stage of labor (AMTSL):** A combination of actions performed during the third stage of labor to prevent PPH. AMTSL speeds delivery of the placenta by increasing uterine contractions and prevents PPH by minimizing uterine atony. The three components of AMTSL are:

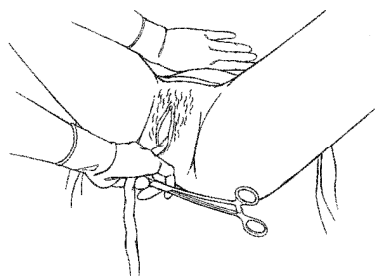


*Administration of a uterotonic drug<sup>4</sup>*

1. **Administration of a uterotonic drug** (ten international units (IU) of oxytocin administered by intramuscular (IM) injection is the uterotonic of choice).

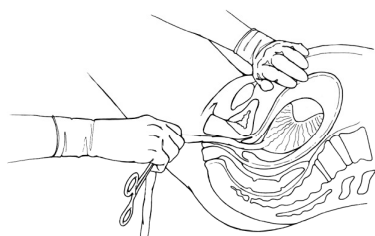
Before performing AMTSL, the provider will gently palpate the woman's abdomen to rule out the presence of another baby. At this point, the provider will NOT massage the uterus.

If there is not another baby, the provider will begin the procedure by giving the woman a uterotonic drug (oxytocin 10 IU IM, Syntometrine 1 mL IM, ergometrine 0.2 mg IM, or misoprostol 600 mcg orally). This should be done within one minute of childbirth.



*Applying controlled cord traction with counter traction to support the uterus<sup>10</sup>*

2. **Controlled cord traction (CCT):** Controlled traction on the cord during a contraction combined with counter-traction upward on the uterus with the provider's hand placed immediately above the symphysis pubis. CCT facilitates expulsion of the placenta once it has separated from the uterine wall.



*Applying controlled cord traction with counter traction to support the uterus<sup>8</sup>*

**Countertraction (counter pressure):** The action of lifting or elevating the uterus toward the mother's head during CCT to help prevent uterine inversion.



*Massaging the uterus immediately after the placenta delivers<sup>11</sup>*

3. **Uterine massage:** An action used after the delivery of the placenta in which the provider places one hand on top of the uterus to rub or knead the uterus until it is firm. Sometimes blood and clots are expelled during uterine massage.

- **Bimanual compression of the uterus:** Bimanual compression techniques are applied postpartum when uterine bleeding persists and the placenta is either partially adhered to the uterine wall or separated and the uterus is atonic. When previous management – uterine massage, giving a uterotonic drug, and emptying the bladder – has been unresponsive, the provider will need to choose a method of compressing the uterus. Internal bimanual compression is more effective than external but should only be attempted if the provider is trained in its use and has sterile, elbow-length gloves.
  - External bimanual compression of the uterus:** The uterus is compressed externally between two hands to constrict uterine blood vessels and stop bleeding.
  - Internal bimanual compression of the uterus:** The uterus is compressed between one hand inserted into the vagina and a second hand supporting the uterus externally to constrict uterine blood vessels and stop bleeding.
- **Community-based interventions:** Interventions that can be administered at the community level either by qualified health care providers or by people that have received basic training and are supported by the health system. These interventions occur outside of facility-based care.
- **Community health worker (CHW):** A widely accepted blanket definition was proposed by WHO:
 

*Community health workers should be members of the communities where they work, should be selected by the communities, should be answerable to the communities for their activities, should be supported by the health system but not necessarily a part of its organization, and have shorter training than professional workers.*<sup>9</sup>

CHWs are trained to carry out one or more functions related to health care. CHWs may receive training that is recognized by the health services and national certification authority, but this training does not form part of a tertiary education certificate. The profile of community health workers internationally is very diverse. While there are some broad trends, they can be men or women, young or old, literate or illiterate. In almost all cases they come from the communities they serve. Most importantly, there is broad agreement that who can be a CHW and their activities must respond to local societal and cultural norms and customs to ensure community acceptance and ownership.
- **Delayed PPH:** Excessive vaginal bleeding (vaginal bleeding increases rather than decreases after delivery), occurring **more than** 24 hours after childbirth.
- **Immediate PPH:** Vaginal bleeding in excess of 500 mL, occurring **less than** 24 hours after childbirth. Blood loss in excess of 1000 ml is categorized as **Severe PPH**.
 

N.B. Estimates of blood loss at the time of childbirth are subjective and generally inaccurate. Studies have suggested that caregivers and providers consistently underestimate actual blood loss. The identification of PPH is based on the pregnant woman and/or her family’s perception of excessive bleeding. Because it is often underestimated, it is recommended to err on the side of caution.
- **Nipple stimulation:** Gentle rubbing or rolling of the nipple, or suckling of the nipples to encourage uterine contractions.
- **Prophylaxis:** A medical or public health procedure whose purpose is to prevent, rather than treat or cure, disease. Roughly, prophylactic measures are divided between *primary* prophylaxis (to prevent the development of a disease) and *secondary* prophylaxis (to protect against the disease worsening when it has already developed).
- **Randomized controlled trial (RCT):** A type of scientific experiment most commonly used in testing healthcare services (such as medicine or nursing) or health technologies (such as pharmaceuticals or surgery). Trials are used to establish average efficacy of a

treatment as well as learn about its most frequently occurring side-effects. RCTs are considered the gold standard of scientific evidence in healthcare. As their name suggests, RCTs involve the random allocation of different interventions (or treatments) to subjects. This ensures that known and unknown confounding factors are evenly distributed between groups.

- **Risk factor:** Something that increases a person's chances of developing a disease or a complication. Risk factors may be associated with but do not necessarily cause a particular disease or complication, because association does not imply causation.
- **Skilled birth attendant (SBA):** A "skilled" birth attendant refers exclusively to people with midwifery skills (for example, midwives, doctors and nurses) who have been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer complications. Skilled attendants must be able to manage normal labor and delivery, recognize the onset of complications, perform essential interventions, start treatment and supervise the referral of mother and baby for the interventions that are beyond the attendants' competence or not possible in the particular setting. Depending on the setting, other health-care providers – such as auxiliary nurse/midwives, community midwives, village midwives and health visitors – may also have acquired appropriate skills if they have been specially trained. **"Non-skilled"** birth attendants are those care providers who do not satisfy the above conditions.<sup>10</sup>
- **Stages of labor:**
  1. **First stage of labor** - The first stage of labor begins with the onset of contractions and ends when the cervix is fully dilated (10 cm). This stage is divided into two phases, known as latent and active phases of labor. During latent phase (0 to 4 cm dilatation), the uterine cervix gradually effaces (thins out) and dilates (opens). This is followed by active labor (4 to 10 cm dilatation), when the uterine cervix begins to dilate more rapidly and contractions are longer, stronger, and closer together.
  2. **Second stage of labor** - The second stage of labor begins when the uterine cervix is fully dilated and ends with the birth of the baby. This is sometimes referred to as the pushing stage.
  3. **Third stage of labor** - The third stage of labor begins with birth of the newborn and ends with the delivery of the placenta and its attached membranes.
  4. **Fourth stage of labor (also known as the "immediate postpartum" period)** - The fourth stage of labor begins with delivery of the placenta and goes from one to six hours after delivery of the placenta, or until the uterus remains firm on its own. In this stabilization phase, the uterus makes its initial readjustment to the non-pregnant state. The greatest numbers of women die from PPH during this period.
- **Traditional birth attendant (TBA):** Traditional, independent (of the health system), non-formally trained and community-based providers of care during pregnancy, childbirth and the postnatal period.<sup>15</sup>
- **Uterine atony:** Loss of tone in the uterine muscle. Normally, contraction of the uterine muscles compresses the uterine blood vessels and reduces blood flow, increasing the chance of coagulation and helping to prevent bleeding. The lack of uterine muscle contraction or tone can cause an acute hemorrhage. Clinically, 70 to 90 percent of PPH cases are due to uterine atony.<sup>11</sup>
- **Uterine inversion:** A turning of the uterus inside out, whereby the uterine fundus is forced through the cervix and protrudes into or outside of the vagina.
- **Uterotonic drugs:** Substances that stimulate uterine contractions or increase uterine tone. Uterotonic drugs include oxytocin, misoprostol. Another uterotonic drug is ergometrine, which helps prevent bleeding after childbirth by causing smooth muscle tissue in the blood vessel walls to narrow, thereby reducing blood flow.

## Prevention of postpartum hemorrhage

Predicting who will have PPH based on risk factors is difficult because **two-thirds of women who have PPH have no risk factors.**<sup>12</sup> Therefore, all women are considered at risk, and hemorrhage prevention must be incorporated into care provided at every birth.

**Note:** Every woman is at risk for PPH.

Actions can be taken during the antenatal period that will improve the pregnant woman's hemoglobin level and thus increase her ability to tolerate blood loss in childbirth. It is important to ensure that each woman give birth with a skilled birth attendant who is trained and skilled in preventing PPH, and has access to uterotonic drugs.

The following table reviews actions that can be taken at the community level during the third stage of labor and the immediate postpartum period to prevent PPH. The interventions are listed according to when they are used in pregnancy and delivery (e.g. preconception, before delivery of the placenta, etc.) and not by order of importance.

**Table 1. PPH prevention at the community level**

Interventions practiced in the community for prevention of PPH	Category (practice, devices, medications)	Persons who can provide the drug, device or practice	Level of evidence (I, II, III, IV, V)	Recommendations for the intervention (A, B, C)	Practical issues
<b>Family planning</b>	Medications	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ Community-based distributors</li> <li>▪ Community-based providers can sensitize women and their families</li> </ul>	<b>V</b> (evidence not available for PPH in particular but preventing pregnancy is primary prevention for PPH)	<b>A</b>	<ul style="list-style-type: none"> <li>▪ Presence of authorized provider of services</li> <li>▪ Timing, dose, storage, supply chain for contraceptive supplies</li> <li>▪ If using injectables: Authority to administer injection, Infection prevention measures, Injection safety.</li> <li>▪ If IUD, Norplant, sterilization: Training, infection prevention, equipment, infrastructure</li> <li>▪ Accurate knowledge to bolster user-compliance</li> </ul>
<b>Birth preparedness to ensure birth with an SBA to prevent and treat PPH</b>	Practice	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ CHW</li> <li>▪ TBA</li> <li>▪ Family</li> <li>▪ Self</li> </ul>	<b>V</b> <sup>13, 14</sup>	<b>A</b>	<ul style="list-style-type: none"> <li>▪ Training in use and follow-up on subsequent antenatal care visits</li> <li>▪ Links needed between facility-based and community-based providers</li> <li>▪ Need for male partner involvement</li> </ul>
<b>Creating community awareness about the importance of giving birth with an SBA to prevent and treat PPH</b>	Practice	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ CHW</li> <li>▪ Community mobilizers</li> <li>▪ TBA</li> </ul>	Anecdotal	<b>A</b>	<ul style="list-style-type: none"> <li>▪ Links needed between facility-based and community-based providers to ensure consistency in messages</li> <li>▪ Services at the facilities must live up to expectations of the population, and potentially integrate community beliefs and preferences (e.g. allowing TBAs in delivery rooms)</li> <li>▪ Linking government-trained community-based health workers with TBAs</li> </ul>
<b>Inclusion of male partners</b>	Practice	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ CHW</li> <li>▪ Community</li> </ul>	Anecdotal	<b>A</b>	<ul style="list-style-type: none"> <li>▪ Maternal services that facilitate the presence of male sexual partners during provision of care</li> </ul>

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			<ul style="list-style-type: none"> <li>mobilizers</li> <li>TBA</li> </ul>			<ul style="list-style-type: none"> <li>Communities that understand the importance of male involvement for maternal survival</li> </ul>
Uterotonic use <b><i>ONLY</i></b> (before delivery of the placenta)	<b>Oxytocin injection – 10 IU IM</b>	Medication: Oxytocin ampoules  Medication and Device: Oxytocin in Uniject™	<ul style="list-style-type: none"> <li>SBA (in situations where the birth attendant is not trained to perform controlled cord traction)</li> </ul>	Efficacy: IV	<b>B (Recommended in the absence of AMTSL)</b>	<ul style="list-style-type: none"> <li>Infection prevention measures, injection safety.</li> <li>Timing, dose, storage, supply chain, authority to administer injection; possible misuse of medication.</li> <li>For Uniject™: In addition to the above, registration and procurement; safety and administration issues are minimized with Uniject use.</li> </ul>
	<b>Misoprostol – 400 sublingually or -600 mcg by mouth</b>	Medication	<ul style="list-style-type: none"> <li>SBA</li> <li>CHW</li> <li>TBA</li> <li>Family</li> <li>Self</li> </ul>	Efficacy: V Community / home use	<b>B (Recommended in the absence of AMTSL)</b>	Finding a distribution strategy that reaches large numbers of women (who distributes the drug, who they distribute it to, and when, (e.g. during pregnancy, at delivery), i.e.  <ul style="list-style-type: none"> <li>Dose, storage, supply chain, correct administration; Possible misuse of medication.</li> <li>Drug registration, procurement.</li> <li>IEC campaign focusing on correct use; side effects and warning signs for correct and timing of administration</li> <li>To ensure proper use of medication: community-based health workers should be trained in misoprostol use and in how to educate women / families to use it.</li> </ul>
Uterotonic use <b><i>ONLY</i></b> (before delivery of	<b>Ergometrine injection</b>	Medication	<ul style="list-style-type: none"> <li>SBA</li> </ul>	Efficacy: IV	<b>Not recommended before delivery of the placenta in the absence of AMTSL</b>	
	<b>Ergometrine</b>	Medication		Efficacy: II	<b>Not recommended in the absence of AMTSL</b>	

**Table 1. PPH prevention at the community level**

Interventions practiced in the community for prevention of PPH		Category (practice, devices, medications)	Persons who can provide the drug, device or practice	Level of evidence (I, II, III, IV, V)	Recommendations for the intervention (A, B, C)	Practical issues
<b>the placenta)</b>	<b>tablets</b>					
<b>AMTSL</b> (oxytocin 10 IU IM is the uterotonic of choice but ergometrine 0.2 mg IM, Syntometrine 1 mL IM, or misoprostol 600 mcg orally may also be used)		Practice Medication	<ul style="list-style-type: none"> <li>SBA<sup>15</sup></li> </ul>	Efficacy: IV <sup>16</sup>	<b>A</b>	<ul style="list-style-type: none"> <li>Presence of SBA at time of birth.</li> <li>Timing, dose, storage, supply chain.</li> <li>If using injectable uterotonic: Authority to administer injection, Infection prevention measures, Injection safety.</li> <li>If ergometrine – knowledge of contraindications, side effects, and management of side effects.</li> <li>If misoprostol or oxytocin in Uniject™ - registration, procurement.</li> </ul>
<b>CCT Only</b>		Practice	<ul style="list-style-type: none"> <li>SBA</li> </ul>	II	<b>Not recommended</b>	
<b>Uterotonic use after delivery of the placenta (if uterotonic is not administered before delivery of the placenta)</b>	<b>Ergometrine injection – 0.2 mg IM</b>	Medication	<ul style="list-style-type: none"> <li>SBA</li> </ul>	Efficacy: IV	<b>B</b>	<ul style="list-style-type: none"> <li>Infection prevention measures, injection safety</li> <li>Timing, dose, storage, supply chain</li> <li>Authority to administer injection</li> <li>knowledge of contraindications, side effects, and management of side effects</li> </ul>
	<b>Ergometrine tablets</b>	Medication		No evidence	<b>Not recommended</b>	

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Uterotonic use after delivery of the placenta (if uterotonic is not administered before delivery of the placenta)	Oxytocin injection – 10 IU IM	Medication: <ul style="list-style-type: none"> <li>▪ Oxytocin ampoules</li> </ul> Medication and Device <ul style="list-style-type: none"> <li>▪ Oxytocin in Uniject™</li> </ul>	<ul style="list-style-type: none"> <li>▪ SBA</li> </ul>	Efficacy: IV	<b>B:</b> Uterotonic administration <b>before</b> delivery of the placenta is preferable	<ul style="list-style-type: none"> <li>▪ Infection prevention measures, injection safety</li> <li>▪ Timing, dose, storage, supply chain Authority to administer injection</li> <li>▪ Possible misuse of medication</li> <li>▪ For Uniject™: In addition to the above, registration and procurement; safety and administration issues are minimized with Uniject use.</li> </ul>
	Misoprostol – 400 sublingually or 600 mcg by mouth	Medication	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ Community Health Worker</li> <li>▪ TBA</li> <li>▪ Family member</li> <li>▪ Self</li> </ul>	Efficacy: III	<b>B:</b> Uterotonic administration <b>before</b> delivery of the placenta is preferable	<ul style="list-style-type: none"> <li>▪ Timing, dose, storage, supply chain, correct administration</li> <li>▪ Timing of distribution</li> <li>▪ Drug registration, procurement</li> <li>▪ Possible misuse of medication</li> <li>▪ To ensure proper use of medication Community-based health workers should be trained in misoprostol use and in how to educate women / families to use it</li> <li>▪ Women / families need to be educated in correct use of misoprostol</li> </ul>
Nipple stimulation (manual or breastfeeding)	Practice	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ Community Health Worker</li> <li>▪ TBA</li> <li>▪ Family member</li> <li>▪ Self</li> </ul>	III	<b>C:</b> Nipple stimulation stimulates oxytocin production in the mother and is likely to play a role in reducing postpartum bleeding <sup>17</sup>	<ul style="list-style-type: none"> <li>▪ Requires no access to medication or other specialized services</li> </ul>	
Uterine massage after	Practice		IV	<b>B:</b> Routinely		

**Table 1. PPH prevention at the community level**

Interventions practiced in the community for prevention of PPH	Category (practice, devices, medications)	Persons who can provide the drug, device or practice	Level of evidence (I, II, III, IV, V)	Recommendations for the intervention (A, B, C)	Practical issues
delivery of the placenta (without uterotonic and CCT)				recommended in textbooks	
Bladder emptying	Practice		Anecdotal	<b>C:</b> Routinely recommended in textbooks	

## Treatment of postpartum hemorrhage

The loss of some blood during childbirth and postpartum is normal and cannot be avoided. However, losing any amount of blood beyond normal limits can cause serious problems even for the woman with normal hemoglobin levels.

**Note:** The importance of a given volume of blood loss varies with the woman's health status.

*A woman with a normal haemoglobin level may tolerate blood loss that would be fatal for an anaemic woman.*

—WHO 2007<sup>18</sup>

For many anemic women, even the normal amount of blood loss might be catastrophic. PPH is defined as vaginal bleeding in excess of 500 mL; severe PPH is blood loss exceeding 1,000 mL. Because it is difficult to measure blood loss accurately, research shows that blood loss is frequently underestimated. For instance, nearly half of women who deliver vaginally often lose at least 500 mL of blood, and those who give birth by cesarean delivery normally lose 1,000 mL or more. For many women, this amount of blood loss does not lead to problems; however, outcomes are different for each woman. For severely anemic women, blood loss of as little as 200 to 250 mL can be fatal. This is especially important for women living in developing countries, where significant numbers of women have severe anemia.

Despite the best efforts of health providers, women may still suffer from PPH. If PPH does occur, positive outcomes depend on how healthy the woman is when she has PPH (particularly her hemoglobin level), how soon a diagnosis is made, and how quickly effective treatment is provided after PPH begins. Reliably assessing and identifying PPH is important to facilitate timely action and appropriate referral of women experiencing PPH, particularly at the community level. It is therefore critical that measuring blood loss be standardized at a country and/or district level. In Tanzania, for example, a definition of "too much bleeding" was provided to women, their families, CHWs, TBAs, and SBAs as "any bleeding that exceeds 2 *kangas*".<sup>19</sup> Similar household items have been used to educate communities to identify PPH in Mozambique, Kenya, Zambia, and Nigeria.

The following table reviews interventions that can potentially be carried out in the community level for women with PPH. Providers and managers should refer to WHO and national guidelines for dosage and timing of administration of medications used to manage PPH.

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\* A *kanga* is a 2-meter piece of cloth, usually made of cotton.

**Table 2. PPH treatment at the community level**

Interventions practiced in the community for treatment of PPH	Category (practice, devices, medications)	Persons who can provide the drug, device or practice	Level of evidence (I, II, III, IV, V)	Recommendations for the intervention (A, B, C)	Practical issues
<p><b>Complication readiness plan (CRP) to ensure timely recognition and treatment in case of PPH, with emphasis on recognition of PPH using tools available in the community</b></p>	Practice	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ CHW</li> <li>▪ TBA</li> <li>▪ Family</li> <li>▪ Self</li> </ul>	V	A	<ul style="list-style-type: none"> <li>▪ Training on development of CRP</li> <li>▪ Providers must take time to educate women during ANC, including how to assess postpartum blood loss using a local tool</li> <li>▪ Links needed between facility-based and community-based providers</li> <li>▪ Communities that understand the importance of male involvement for maternal survival</li> </ul>
<p><b>Community transport / emergency plans to facilitate transfer to a facility</b></p>	Practice	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ CHW</li> <li>▪ Community mobilizers</li> <li>▪ TBA</li> </ul>	Anecdotal	A	<ul style="list-style-type: none"> <li>▪ Development of co-operatives or other initiatives to make transport available</li> <li>▪ Need for male partner involvement</li> <li>▪ Links needed between facility-based and community-based providers</li> <li>▪ Strengthen referral networks to reduce delays</li> </ul>
<p><b>Prevent, detect, and treat anemia</b></p> <p>Note: Women with hemoglobin &lt; 10 g/dL are less likely to survive PPH</p>	Medication (iron/folate, broad spectrum anti-helminthics, anti-malarials, insecticide impregnated bednets)	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ Community-based distributors</li> <li>▪ Community-based providers can sensitize women and their families</li> </ul>	V	A	<ul style="list-style-type: none"> <li>▪ Presence of authorized distributor of medications</li> <li>▪ Training in use and follow-up</li> <li>▪ Presence of SBA with ability to detect anemia</li> <li>▪ Timing, dose, storage, supply chain for medications and bednets</li> <li>▪ Education of women to bolster user compliance</li> </ul>
<p><b>Use of mobile phone technology to access assistance</b></p>	Device	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ CHW</li> <li>▪ TBA</li> </ul>	<p><b>Research on mobile phone technology is ongoing</b></p>	<p><b>C, Referral recommended</b></p>	<ul style="list-style-type: none"> <li>▪ Mobile phone capacity available</li> <li>▪ Programs developed for responding to PPH</li> <li>▪ Literacy most likely needed to read algorithms and other tools</li> <li>▪ Cost: Phones, batteries, ability to recharge, phone time</li> <li>▪ Training in use</li> </ul>

**Table 2. PPH treatment at the community level**

Interventions practiced in the community for treatment of PPH		Category (practice, devices, medications)	Persons who can provide the drug, device or practice	Level of evidence (I, II, III, IV, V)	Recommendations for the intervention (A, B, C)	Practical issues
<b>Administration of a uterotonic drug</b>	<b>Oxytocin injection</b>	Medication: Oxytocin ampoules  Medication and Device: Oxytocin in Uniject™	<ul style="list-style-type: none"> <li>SBA</li> </ul>	<b>V</b>	<b>A</b>	<ul style="list-style-type: none"> <li>Infection prevention measures, injection safety.</li> <li>Timing, dose, storage, supply chain.</li> <li>Authority to administer injection.</li> <li>Possible misuse of medication.</li> <li>For Uniject™: In addition to the above, registration and procurement; safety and administration issues are minimized with Uniject use.</li> </ul>
	<b>Misoprostol tablets</b>	Medication	<ul style="list-style-type: none"> <li>SBA</li> <li>CHW</li> <li>TBA</li> </ul>	<b>III-IV</b>	<b>B</b>	<ul style="list-style-type: none"> <li>Timing, dose, storage, supply chain.</li> <li>Correct administration.</li> <li>Timing of distribution.</li> <li>Drug registration, procurement; possible misuse of medication.</li> <li>Means of assessing blood loss and identifying PPH</li> </ul> <p>N.B. To ensure proper use of medication: community-based health workers should be trained in how to identify PPH and use misoprostol for treatment; and in how to educate women / families to identify PPH.</p>
	<b>Ergometrine injection</b>	Medication	<ul style="list-style-type: none"> <li>SBA</li> </ul>	<b>V</b>	<b>A</b>	<ul style="list-style-type: none"> <li>Infection prevention measures, injection safety.</li> <li>Timing, dose, storage, supply chain.</li> <li>Authority to administer injection.</li> <li>Knowledge of contraindications, side effects, and management of side effects.</li> </ul>
	<b>Ergometrine tablets</b>	Medication		<b>II</b>	<b>Not recommended</b>	

Table 2. PPH treatment at the community level					
Interventions practiced in the community for treatment of PPH	Category (practice, devices, medications)	Persons who can provide the drug, device or practice	Level of evidence (I, II, III, IV, V)	Recommendations for the intervention (A, B, C)	Practical issues
<b>Nipple stimulation / Breastfeeding</b>	Practice	<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ CHW</li> <li>▪ TBA</li> <li>▪ Family member</li> <li>▪ Self</li> </ul>	<b>III</b>	<b>C<sup>22</sup></b>	<ul style="list-style-type: none"> <li>▪ Requires no access to medication or other specialized services.</li> </ul>
<b>Uterine Massage</b>			<b>III</b>	<b>B</b>	
<b>Bladder emptying</b>			<b>III</b>	<b>B</b>	
<b>If uterine atony: External bimanual compression</b>					<b>III</b>
<b>If uterine atony: Internal bimanual compression</b>	Practice	<ul style="list-style-type: none"> <li>▪ SBA</li> </ul>	<b>IV</b>	<b>A</b>	<ul style="list-style-type: none"> <li>▪ Presence of SBA.</li> <li>▪ Infection prevention measures, Elbow-length sterile or HLD gloves.</li> </ul> <p>(N.B. if an SBA is managing PPH, external bimanual compression should not be attempted before internal compression as precious time may be lost)</p>
<b>If retained placenta: Administration of uterotonic followed by CCT (when AMTSL was not practiced)</b>	Practice Medication		<b>IV</b>	<b>A</b>	<ul style="list-style-type: none"> <li>▪ Presence of SBA.</li> <li>▪ Timing, dose, storage, administration of uterotonic (injection/tablet).</li> <li>▪ Infection prevention measures.</li> <li>▪ Injection safety</li> <li>▪ Authority to administer injection</li> </ul>
<b>If retained placenta: Removal of placenta / fragments</b>	Practice Medication		<b>IV</b>	<b>A</b>	<ul style="list-style-type: none"> <li>▪ Presence of SBA.</li> <li>▪ Infection prevention measures, Elbow-length sterile or HLD gloves.</li> <li>▪ Injection safety.</li> <li>▪ Time, dose, storage, administration of prophylactic antibiotics, valium, pethidine.</li> </ul>
<b>If genital lacerations: Perineal / vaginal Compression to stop bleeding (with no suture)</b>	Practice		<ul style="list-style-type: none"> <li>▪ SBA</li> <li>▪ CHW</li> <li>▪ TBA</li> <li>▪ Family member</li> </ul>	<b>III</b>	<b>A, Referral recommended</b>

Table 2. PPH treatment at the community level					
Interventions practiced in the community for treatment of PPH	Category (practice, devices, medications)	Persons who can provide the drug, device or practice	Level of evidence (I, II, III, IV, V)	Recommendations for the intervention (A, B, C)	Practical issues
<b>If genital lacerations: Suturing of genital tract laceration</b>	Practice	<ul style="list-style-type: none"> <li>SBA</li> </ul>	V (No studies available)	<b>A</b>	<ul style="list-style-type: none"> <li>Presence of SBA trained to diagnose and suture genital tract tears.</li> <li>Infection prevention measures.</li> <li>Injection safety.</li> <li>Sterile suture needles and suture thread.</li> </ul>
<b>Oral fluids for fluid replacement to prevent shock*</b>	Practice	<ul style="list-style-type: none"> <li>SBA</li> <li>CHW</li> <li>TBA</li> <li>Family member</li> </ul>	IV (No studies available)	<b>A, Referral recommended</b>	<ul style="list-style-type: none"> <li>Oral fluids should not be administered if the woman is in shock</li> <li>Training on use of fluids to prevent shock and recognition of when oral fluids should not be used</li> </ul>
<b>IV infusion for fluid replacement*</b>	Practice Medication	<ul style="list-style-type: none"> <li>SBA</li> </ul>	<b>IV</b>	<b>A</b>	<ul style="list-style-type: none"> <li>Presence of SBA.</li> <li>Infection prevention measures.</li> <li>Injection safety.</li> <li>Time, dose, storage, administration of IV fluids.</li> </ul>
<b>Anti-shock garment**</b>	Practice Device	<ul style="list-style-type: none"> <li>SBA</li> <li>CHW</li> <li>TBA</li> <li>Family member</li> </ul>	Research is ongoing to study use for treatment of PPH and prevention of shock.		<ul style="list-style-type: none"> <li>Training for application, removal, and washing.</li> <li>Cost implications.</li> <li>Operational issues.</li> </ul>
<b>Position woman to prevent and/or treat shock**</b>	Practice	<ul style="list-style-type: none"> <li>SBA</li> <li>CHW</li> <li>TBA</li> <li>Family member</li> </ul>	<b>IV</b>	<b>A, Referral recommended</b>	<ul style="list-style-type: none"> <li>Requires no access to medication or other specialized services</li> <li>Requires training on steps to prevent / treat shock</li> </ul>

\*This is not a treatment strategy but will replace fluid loss, prevent shock, and improve the chances that the woman will survive PPH.

\*\* This is not a treatment strategy but will prevent shock and improve the chances that the woman will survive PPH until she receives definitive treatment at the appropriate level of care.

## Overview of interventions

The following table provides an overview of recommended interventions that can be implemented in the community by type of birth attendant present at the birth.

<b>Table 3. PPH prevention and treatment interventions with a recommendation of A or B by type of birth attendant</b>		
	<b>PPH Prevention</b>	<b>PPH Treatment</b>
<b>SBA</b>	<ul style="list-style-type: none"> <li>• Counseling on and provision of FP services</li> <li>• Develop birth preparedness plans with pregnant women and their male partner to ensure birth with an SBA to prevent and treat PPH</li> <li>• Sensitize the community on the importance of giving birth with an SBA to prevent and treat PPH</li> <li>• Facilitate inclusion of male partners during antenatal visits</li> <li>• Perform AMTSL (Oxytocin injection 10 IU IM - in ampoules or the Uniject device, misoprostol - 400 or 600 mcg by mouth or sublingually, ergometrine injection)</li> <li>• Administer a uterotonic drug after delivery of the placenta if not administered prior to delivery of the placenta (Oxytocin injection 10 IU IM - in ampoules or the Uniject device, misoprostol - 400 or 600 mcg by mouth or sublingually, ergometrine injection)</li> <li>• Perform uterine massage after delivery of placenta</li> </ul>	<ul style="list-style-type: none"> <li>• Complication readiness plan (CRP) to ensure timely recognition and treatment in case of PPH</li> <li>• Teach women and male partner/family member to recognize PPH using tools available in the community</li> <li>• Work with community workers and members to develop community transport / emergency plans to facilitate transfer to a facility</li> <li>• Work with community workers and members to ensure links between community-based and facility-based providers and</li> <li>• Prevent, detect, and treat anemia</li> <li>• Administer a uterotonic drug (Oxytocin, misoprostol, ergometrine injection)</li> <li>• Perform uterine massage</li> <li>• Assist the woman to empty her bladder</li> <li>• Perform internal bimanual compression</li> <li>• Remove placenta/fragments</li> <li>• Perform perineal/vaginal pressure to stop bleeding (with no suture for genital lacerations)</li> <li>• Suture genital tract laceration</li> <li>• Provide IV infusion for fluid replacement (also medication)</li> <li>• Apply the anti-shock garment</li> <li>• Position the woman to prevent and/or treat shock</li> </ul>

	<b>PPH Prevention</b>	<b>PPH Treatment</b>
<b>CHW/ TBA</b>	<ul style="list-style-type: none"> <li>• Sensitize community members on benefits and types of FP services</li> <li>• Deliver limited types of FP methods</li> <li>• Assist with development and implementation of the birth preparedness plan</li> <li>• Sensitize the community on the importance of giving birth with an SBA to prevent and treat PPH</li> <li>• Sensitize the community on the importance of male partner involvement in maternal health services</li> <li>• Manage the third of labor with administration of a uterotonic drug without controlled cord traction (Oxytocin injection 10 IU IM - in ampoules or the Uniject device or misoprostol - 400 or 600 mcg by mouth or sublingually)</li> <li>• Perform uterine massage after delivery of placenta</li> <li>• Administer a uterotonic drug after delivery of the placenta if not administered prior to delivery of the placenta (Oxytocin injection 10 IU IM - in ampoules or the Uniject device or misoprostol - 400 or 600 mcg by mouth or sublingually)</li> </ul>	<ul style="list-style-type: none"> <li>• Assist with development and implementation of the complication readiness plan</li> <li>• Teach women and male partner/family member to recognize PPH using tools available in the community</li> <li>• Work with community members to develop community transport / emergency plans to facilitate transfer to a facility</li> <li>• Work with facility-based providers and community members to ensure links between community-based and facility-based providers and</li> <li>• Sensitize pregnant women and their families on the importance of preventing and treating anemia</li> <li>• Administer a uterotonic drug (Oxytocin, misoprostol)</li> <li>• Perform uterine massage</li> <li>• Assist the woman to empty her bladder</li> <li>• Perform external bimanual compression</li> <li>• Perform perineal/vaginal pressure to stop bleeding (with no suture for genital lacerations)</li> <li>• Provide oral fluids for replacement to prevent shock</li> <li>• Position woman to prevent and/or treat shock</li> </ul>
<b>Woman</b>	<ul style="list-style-type: none"> <li>• Seeking out FP services</li> <li>• Develop birth preparedness plan with health care providers and their male partner to ensure birth with an SBA to prevent and treat PPH</li> <li>• Include male partner</li> <li>• Administer a uterotonic drug before delivery of the placenta (misoprostol - 400 or 600 mcg by mouth or sublingually)</li> <li>• Perform uterine massage after delivery of placenta</li> <li>• Administer a uterotonic drug after delivery of the placenta if not administered prior to delivery of the placenta (misoprostol - 400 or 600 mcg by mouth or sublingually)</li> </ul>	<ul style="list-style-type: none"> <li>• Develop complication readiness plan with health care providers and their male partner</li> <li>• Include male partner</li> <li>• Take prescribed treatments for prevention and/or treatment of anemia</li> <li>• Perform uterine massage</li> <li>• Empty her bladder</li> <li>• Perform perineal/vaginal pressure to stop bleeding (with no suture for genital lacerations)</li> <li>• Take oral fluids for replacement to prevent shock</li> <li>• Position self to prevent and/or treat shock</li> </ul>

	<b>PPH Prevention</b>	<b>PPH Treatment</b>
<b>Family member</b>	<ul style="list-style-type: none"> <li>• Support use of FP services</li> <li>• Assist with development and implementation of the birth preparedness plan</li> <li>• Take initiative to be involved in maternal health services</li> <li>• Administer a uterotonic drug before delivery of the placenta (misoprostol - 400 or 600 mcg by mouth or sublingually)</li> <li>• Perform uterine massage after delivery of placenta</li> <li>• Administer a uterotonic drug after delivery of the placenta if not administered prior to delivery of the placenta (misoprostol - 400 or 600 mcg by mouth or sublingually)</li> </ul>	<ul style="list-style-type: none"> <li>• Assist with development and implementation of the birth preparedness plan</li> <li>• Take initiative to be involved in maternal health services</li> <li>• Perform uterine massage</li> <li>• Assist the woman to empty her bladder</li> <li>• Perform external bimanual compression</li> <li>• Perform perineal/vaginal pressure to stop bleeding (with no suture for genital lacerations)</li> <li>• Provide oral fluids for replacement to prevent shock</li> <li>• Position woman to prevent and/or treat shock</li> </ul>

## Programmatic Implications

As evidenced by this review, several interventions exist to both prevent and treat PPH at the community-level, ranging from medical interventions to more distal community-readiness, education, and preventive measures. When choosing strategies to implement at the community level, it is important to assess existing maternal and primary care services, strategies, programs and resources, and to integrate PPH prevention and treatment interventions into those efforts.

However, introducing several interventions to prevent and treat PPH at the same time in a community has its own implications. There is potential for community-members to confuse messages (e.g. correct regimen for misoprostol for prevention vs. treatment of PPH). With several interventions, community members may not be aware of the most effective intervention, and inadvertently cause delays (e.g. wait for an intervention to work rather than send to a referral). Therefore, interventions introduced at the community-level must be chosen and implemented so that the most effective interventions are highlighted and emphasized. For example, misoprostol for PPH prevention and treatment is the most effective uterotonic at the community level, and should be bolstered by a strong referral network and knowledge of when it is appropriate to refer.

## Research needs

Severe PPH occurs in approximately 11% of live births.<sup>20</sup> The incidence is thought to be much higher in developing countries where many women do not have access to a skilled attendant at delivery and where active management of the third stage of labor may not be routine. Of the women who suffer severe blood loss postpartum, approximately 1% of these die as a result.<sup>21</sup> A community-based study of maternal mortality in Zimbabwe found that 50% of women dying from PPH did not have access to any treatment before their death—i.e. they died at home or in transit to, or between, institutions<sup>22</sup>.

Important clinical interventions and technologies are available to prevent and treat PPH but are either underutilized or not accessible to women giving birth in communities or peripheral health care facilities. Operations research and pilot projects have demonstrated how the interventions from RCTs operate at the community-level. The available evidence from these projects need to be translated into programs. To add to the evidence base, organizations should focus on the following research and programmatic needs:

1. Comparison of safety, efficacy, acceptability, cost effectiveness, and feasibility between oxytocin-Uniject and misoprostol at the community level for prevention and treatment of PPH

2. Effectiveness of community-based behavior change campaigns to increase use of skilled birth attendants during labor and childbirth
3. Safety, feasibility, and effectiveness of introducing non-pneumatic anti-shock garments at the community level
4. Safety, feasibility, and effectiveness of use of a uterine compression belt for treatment of PPH at the community level
5. Effectiveness of community-based transport systems in reducing time to treatment of PPH and maternal mortality due to PPH
6. Effectiveness of male involvement in development of birth preparedness and complication readiness for increasing use of skilled birth attendants and reducing maternal mortality due to PPH
7. Effectiveness in reducing mortality due to PPH of training traditional birth attendants and community health workers to provide initial management of PPH at the community level
8. Effectiveness of the use of mobile phone technology by women and community-based providers to reduce mortality due to PPH
9. Acceptability of introducing blood collection tools and its effect on PPH prevention and treatment.

## End Notes

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- <sup>1</sup> World Health Organization (WHO) *Mother-Baby Package: Implementing Safe Motherhood in Countries*. WHO/FHE/MSM/94.11. Geneva: WHO; 1994.
- <sup>2</sup> AbouZahr C. Antepartum and postpartum haemorrhage. In: Murray CJL, Lopez AD, eds. *Health Dimensions of Sex and Reproduction*. Boston, MA: Harvard University Press; 1998:165–190.
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- <sup>15</sup> This revised definition of an SBA is broader and considers the variable conditions in many low and middle-income developing countries. Available at: [www.who.int/making\\_pregnancy\\_safer/publications/WHOREcommendationsforPPHaemorrhage.pdf](http://www.who.int/making_pregnancy_safer/publications/WHOREcommendationsforPPHaemorrhage.pdf).

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<sup>16</sup> A Cochrane review of these trials recommends AMTSL for all women delivering in a hospital and anticipating a vaginal birth. It is strongly recommended that AMTSL only be performed by a skilled birth attendant or those health workers trained to perform the skill.

<sup>17</sup> Kroeger, M., & Smith, L. (2004). Impact of birthing practices on breastfeeding: Protecting the mother and baby continuum. Boston: Jones and Bartlett. "The authors concluded that in resource-poor settings where Syntometrine and other uterine contractor medicines are not available, nipple stimulation is an effective way to reduce postpartum bleeding." In summary she wrote: "Breastfeeding, nipple stimulation, and skin-to-skin contact all stimulate oxytocin production in the mother and are likely to play a role in reducing postpartum bleeding."

<sup>18</sup> World Health Organization (WHO) Department of Making Pregnancy Safer. Prevention of Postpartum Haemorrhage by Active Management of the Third Stage of Labor. *MPS Technical Update*. Geneva, Switzerland: WHO; October 2007. Available at: [http://www.who.int/making\\_pregnancy\\_safer/publications/PPH\\_TechUpdate2.pdf](http://www.who.int/making_pregnancy_safer/publications/PPH_TechUpdate2.pdf).

<sup>19</sup> Prata N, Mbaruku G, Campbell M. Using the *kanga* to measure postpartum blood loss. *International Journal of Gynecology and Obstetrics* 2005a;**89**:49-50.

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<sup>22</sup> Fawcus S, Mbizvo M, Lindmark G, Nystrom L and the Maternal Mortality Study Group . A community-based investigation of maternal mortality from obstetric haemorrhage in rural Zimbabwe. *Tropical doctor* 1997;27:159-163.