

“Please Do Not Forget Us” - Views of Women, Nurses, and Traditional Birth Attendants on Community Distribution of Medications to Prevent Postpartum Hemorrhage and Sepsis: A Qualitative Pilot Study in Rural Tanzania

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Abstract

Background: Postpartum hemorrhage and sepsis are the most common causes of death for women in childbirth globally. In rural Tanzania where about one woman dies every hour from childbirth, over sixty percent of women deliver outside of health care institutions and therefore lack access to medications to prevent bleeding and infection. In this study, women delivering in rural Rorya District in northern Tanzania were provided with 600 micrograms of misoprostol and 500 mg of erythromycin to take immediately after delivery to prevent postpartum hemorrhage and sepsis. The purpose of the study was to assess the feasibility of distributing these medications.

Methods: Selected women, dispensary nurses and traditional birth attendants who were involved in deliveries where the two study medications were taken were interviewed by research assistants in the local language of Kiswahili about their views on community distribution of these two medications. The interviews were taped with digital recorders and the recordings were transcribed and translated into English. The English transcripts were independently coded by two researchers using a qualitative software analysis program, assessing for common and diverging themes between and within the three groups of interviewees.

Results: A total of 32 women, 17 dispensary nurses, and 13 traditional birth attendants were interviewed. There was strong support for community distribution of medications to prevent bleeding and infection after delivery amongst the participants. Other common themes from the research included family involvement in the decision of the women to take the medications, safe storage of the medications by the women, and minimal side effects of the medications. A variety of people administered the medications. Several participants observed that provision of the medications by dispensary nurses improved women's access to the dispensaries. Views differed on whether traditional birth attendants should be permitted to distribute the medications.

Conclusions: There is strong support from rural women, dispensary nurses, and traditional birth attendants for a community distribution program of medications to prevent postpartum hemorrhage and sepsis. Future research will focus on the distribution of misoprostol in clean delivery kits directly to rural women by local health providers, as there is insufficient evidence for prevention of sepsis by inclusion of a single dose of antibiotics.

Keywords: Misoprostol; Postpartum hemorrhage; Puerperal sepsis; Tanzania; Maternal mortality

Background

Across the globe, every day eight hundred women die in pregnancy and childbirth, and every year forty million women deliver at home without the assistance of skilled birth attendants such as doctors, midwives or nurses [1]. About one third of all deaths after delivery are caused by postpartum hemorrhage, while a second major cause of death is sepsis, contributing close to ten percent of all deaths of women in childbirth [2]. Improving access to skilled providers would help eliminate many of these deaths. While this should remain the goal where possible, many millions of women will continue to deliver in sub-Saharan Africa and Asia without trained attendants for years to come. Improvements in the safety of deliveries occurring outside of health facilities are urgently needed [3].

One such intervention that is starting to make a difference for women delivering at home in rural and remote locations is the community provision of misoprostol. The World Health Organization and the International Federation of Gynecologists and Obstetricians have both endorsed the use of misoprostol to prevent and treat postpartum hemorrhage in regions where there is no access to more effective medications such as oxytocin [4,5]. In their recent review of community distribution programs of misoprostol for home birth,

Smith and colleagues determined that these programs appear to be safe, and likely significantly reduce the number of women dying from postpartum hemorrhage [6].

It has been estimated that provision of medication to prevent hemorrhage and infection to women delivering without access to skilled providers could reduce maternal mortality by a third [7]. In order to access the feasibility of distributing oral medications to prevent postpartum hemorrhage and sepsis to a rural population in Africa, we conducted a pilot study in Rorya District, northern Tanzania. Rorya District is located in Mara Region, bordered by Lake Victoria to the

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west, Serengeti National Park to the east, and the Kenyan border to the north. Mara Region has one of the highest non-facility birth rates in Tanzania, with over sixty percent of women delivering in their villages where no skilled attendants are available [8]. This paper will report on how women, dispensary nurses, and traditional birth attendants experience the program of distribution of misoprostol and erythromycin to rural women to prevent hemorrhage and infection after childbirth.

Methods

Ethical approval for the study was obtained from the Ottawa Hospital Research Ethics Board in Canada and from the National Institute for Medical Research in Tanzania. We chose to conduct the study in the villages serviced by twelve rural dispensaries in Rorya which were located farthest from the district hospital. From February to July 2012, the research assistants visited the study villages and with the assistance of local health workers, they met with women who were currently pregnant and due to deliver before August 2012. The local dispensary nurses were also provided with the study medications and were instructed how to enroll women in the study who came to the dispensary for antenatal care. The research assistants and dispensary nurses explained the purpose of study to eligible women in the local language of Swahili or Luo, and provided an information letter in Swahili to the women. The women were asked to sign a consent form indicating their agreement to participate in the study. The consent form was read to women who lacked the literacy skills to read it themselves. Women who consented to be part of the study were provided with a bag containing 600 micrograms of misoprostol and 500 mg of erythromycin. A misoprostol dose of 600 micrograms was used as this is the recommended dose for prevention of postpartum hemorrhage by the World Health Organization (WHO) [4]. Erythromycin was chosen as the antibiotic as it is on the WHO's essential drugs list and can be used to treat Group A streptococcus, historically a common cause of puerperal sepsis [9]. The women were instructed to store the medication in a safe location, to take it with them where-ever they chose to deliver, and to swallow the medications immediately after the

birth of the infant and not before. The women were also warned about the possible side effects of the medications, particularly shivering and an upset stomach.

The medications were distributed to over six hundred women by dispensary nurses and research assistants. The women were surveyed after using the medications and the findings of the survey are documented elsewhere [10]. Ninety percent of the women took the medications as instructed. The remaining ten percent of the cohort appropriately did not take the medication because they delivered in a health care facility where superior medications were available (oxytocin or ergometrine for prophylaxis of postpartum hemorrhage) and where a clean delivery was possible (health care providers using gloves and woman delivering on a clean surface).

A subset of women who participated in the study agreed to be interviewed about their experiences taking the medications. In addition, a number of the Dispensary Nurses (DNs) who distributed the medications and Traditional Birth Attendants (TBAs) who attended births where the study medications were used also agreed to be interviewed. The participants in this qualitative component of the study were selected by convenience sampling, however, there was an attempt to enroll participants from a variety of villages. All research participants were provided with an information letter about the study and were asked to sign a consent form before the interview. If the participant could not read the Kiswahili form, it was read to her. The participants were informed that all quotations used in the report would not reveal their identities. The interviews of the women, DNs and TBAs were conducted by the research assistants in the local language of Kiswahili, using digital recorders to document the interviews. The English translations of the interview guides are documented in Questionnaire 1 (for the women) and Questionnaire 2 (for the DNs and TBAs).

The taped interviews were transcribed verbatim and were translated into English. The translated interviews were independently analyzed using N-Vivo version 9 software for common and diverging themes both within and between the different types of participants by one of the

1. How did you find out about this study?
2. When you first heard about this study, what did you think? Did you wish to participate?
3. Were you worried about taking this medication? Why or why not?
4. What did your family members feel about this? Did they encourage or discourage you from this?
5. Who was involved in the decision to take the medication? (How did your husband feel about this?)
6. Where did you store the medication at home? Was it safe from the children and others?
7. Who gave you the medication to take after the baby was born? Did you take it immediately after delivery as instructed? Were there any problems with taking it? What were these?
8. Did you have any side effects from taking this medication? What were they?
9. If you have another baby would you want to take this medication again to help prevent bleeding and infection after delivery? Why or why not?
10. We are interesting in helping women elsewhere in Africa have access to this medication after giving birth at home to prevent bleeding and infection. We are interested in your thoughts about this. Is this a good plan or not? Why do you think so?

Questionnaire 1: Interview Guide for the Women.

1. How did you find out about this study?
2. When you first heard about this study, what did you think? Did you think it is a good idea for women delivering at home/dispensary to take these medications?
3. Do you have concerns about women taking this medication at home/dispensary? What are these?
4. What did the women and their family members feel about this medication? Were they interested in participating in the study?
5. Who was involved in the decision to take the medication? (Was it the women mostly, or did her husband make the decision for her?)
6. Where did the women store the medication at home? Was it safe from the children and others?
7. Who administered the medication to take after the baby was born? Was it taken immediately after delivery as instructed? Were there any problems with administering it? What were these?
8. Did the woman have any side effects from taking this medication? What were they?
9. Do you think traditional birth attendants should be providing this medication at home births? Would you give this medication to other women after childbirth at home/dispensary? Why or why not?
10. Are there any problems with using this medication for women delivering at home or at a dispensary in Tanzania? Please describe these. What barriers do you see to expanding this program to other communities in Africa?

Questionnaire 2: Interview Guide for TBAs and Dispensary Nurses.

authors and a research assistant using constant comparative method. All interviews were included in the analysis. The separate analyses were compared to determine strong emerging themes from the data, and these findings are documented here with illustrative quotations from the research participants. We have used an eco-social conceptual framework as our theoretical model [11,12]. By this we mean that women are viewed as making choices within the environmental and social contexts in which they live their lives.

Results

A total of 32 women, 17 dispensary nurses, and 13 traditional birth attendants were interviewed for this study. Several common themes emerged from the data. Firstly, there was strong support for the research from all three categories of participants. In addition, community and family members also were supportive and encouraged women to participate in the research. A third theme was the safe storage of the medication by the women. In addition, women experienced minimal side effects. Another theme was that the administration of the medication was by whoever was convenient at the delivery including the DN's, TBA's, family members or even the woman herself if she was alone. We have termed this theme administration of medications by 'convenient care-providers'. Finally, a community program of distribution of medications appeared to increase access to health care services for the women. Amongst the DNs and TBAs interviewed, however, there was disagreement about permitting TBAs to distribute the study medications. In the following paragraphs we will illustrate these themes through quotations from the participants.

Strong support for medication distribution program from all participants

Amongst the women, DNs and TBAs interviewed, there was universal support for this program of community distribution of medications to prevent postpartum hemorrhage and sepsis. When asked about her views on the research, one woman participant

emphasized how important the project was based on the challenges rural women experience accessing health care services. She exhorted us not to forget the women of Rorya District as the project evolves in the future:

"That is a good idea to help other Tanzanians and Africans because this problem of postpartum hemorrhage is serious and it kills many women, especially those staying in the villages far from dispensaries or hospitals, and the roads passing by those areas are also very bad. My request is that if you go to other places please do not forget us in Rorya District. Most of us stay far from health centers." (Woman #16, Panyakoo Dispensary)

The DNs were also very supportive of community distribution of the study medications. The DNs appreciated the availability of drugs to prevent postpartum hemorrhage for while the dispensaries were supposed to be stocked with oxytocin or ergometrine to use after delivery, it was not always available when needed.

"Yes, I thought [the research study] is a good idea because we are saving women's lives delivering at homes, and even dispensaries, because at times there are no medicines at the dispensary. When I heard of this research I was very happy I knew it will help many women and I know many women will be happy to continue with the study." (DN #8, Ochuna Dispensary)

Similarly, the TBAs who participated in deliveries where the study medications were used were enthusiastic about the research project. The TBAs recognized the value of misoprostol at preventing hemorrhage over their traditional practices. The two TBAs quoted below note the risks to women of delivering in rural areas, and their pleasure at being able to help prevent deaths with the medications.

"On my side, when I heard about the research I was very happy because many women do not deliver at hospitals, and some traditional medicines are not helpful drugs, hence women bleed much which leads to death." (TBA #11, Sokorabolo Dispensary)

"When I heard about this research for the first time, I was happy because I saw it is one way of improving my job as a TBA to the mothers who find it difficult to reach the hospital. I had no opportunity of having injectable medicines because I have no refrigerator and electricity to store medicines like ergometrine. I am grateful to see that you have given medicine to women and the women brought them when coming to us ready to give birth." (TBA #5, Buturi Dispensary)

Thus, amongst the participants we interviewed, there was strong support for the research from the women, DNs and TBAs. All of the participants were very aware of the risks to women delivering in the rural areas, for death from childbirth is a relatively common event in this region. The provision of a medication which could reduce this risk for women was highly appreciated by all participants.

Family and Community Support for Participation in the Research

In addition to support from the women themselves, the DNs and the TBAs, there was much support from family members and the community at large for the study. The quotes below illustrate how women's husbands and mothers encouraged them to use the medication and how the community wanted the research to continue.

"My family was very happy about [the study medications] because even my mother knew about them and she was the one telling to attend clinic so that I could be given the medicines. Honestly they really liked it and encouraged me a lot to participate in the research." (Woman #18, Nyamasanda Dispensary)

"I involved my husband in the decision of taking medication and he felt very good, because he knew my problem of heavy bleeding after delivery, 'but this time the problem was treated' my husband said." (Woman #28, Masike Dispensary)

"The community and pregnant women liked the research so much, they asked for more time to continue with the research and distribution of medicines." (DN #6, Buturi Dispensary)

As the previous quotations suggest, family members were often involved in the decision to participate in the study. While the women research participants reported family support and encouragement to participate in this study, one of the DNs voiced concerns about the prevalence of traditional beliefs preventing some women from taking medications. This nurse also felt that not all husbands may be supportive of their wives' participation in the research:

"My doubt is that pregnant women believe that if they take these drugs they won't give birth again, and also some religions do not believe in taking drugs or going to the hospital. Another doubt is that some men are arrogant and if they realize their wives have taken drugs, they take the drugs and throw them away..." (DN #2, Sakawe Dispensary)

Thus, while there was significant support for the study amongst those who agreed to participate, there remain those in the community who may require further education about the safety and efficacy of medications to assist women at the time of home birth.

Safe storage of the medications

In addition to the themes of strong support for the research by the women, DN's, and TBA's, and community and family support for decision-making about participation in the research, a third theme that emerged from the research was safe storage of the medications. As the women live in very basic accommodations with limited areas for safe storage, we questioned the participants on where the medications were

stored. Many of the participants had young children in the home, and we wished to ensure the medications were kept safe from others who should not have access to them. Women reported that they kept the study medications in their handbag on the wall, or in a locked suitcase. They often engaged other family members in the storage plans, as they did not want to forget where the medications were kept when it came time to deliver.

"I kept my meds in my handbag and hung the bag in my bedroom at the wall. After I showed my husband the place I hung my bag so that in case I forgot, he may remind me. He didn't forget." (Woman #27, Bubombi Dispensary)

"Most of them kept the drugs in different places like in the clinic card, inside the suitcase, in the hand bag, in the cupboard in the box because every woman has place of keeping, they were safe for everybody and the children, and no dust went in the drugs." (DN #1, Sokorabolo Dispensary)

Minimal side effects

The participants were questioned about side effects from taking the medications. Misoprostol is known to cause the feeling of chills in some women, and this was explained to them prior to enrollment in the study. In fact, very few women reported experiencing side effects, and if they did, they were generally minor.

"All women who used medication didn't get any serious side effects, except a very few women complained of feeling chills and shivering for a very short period." (DN #9, Masike Dispensary)

The woman quoted below gave the most detailed description of her experience of side effects of the medications, however, she did not appear to be distressed by this.

"After delivery at the TBAs place I showed her my bag where I keep the medicine she washed her hands and gave me those medicines for the purpose of swallowing, as I was instructed by researchers, and after that I felt cold which forced me to cover myself with bed sheets, but it did not continue for a long time, like two hours then it was over." (Woman #7, Buturi Dispensary)

Administration of Medications by 'Convenient Care-providers'

The medications were distributed directly to the women, and the women were instructed to bring the medications with them when they were in labour so that they could take them immediately after delivery. Women delivered in a number of different circumstances and thus there were a variety 'convenient care-providers' who were involved in the administration of the medications. For women delivering in the dispensaries, the DN gave her the medication to take. At home deliveries where the TBA was present, the women instructed the TBA to administer the medication to them after delivery. At other deliveries, where the woman was attended by only family members, neighbours, or she was alone, the medication was given to her by those present or she self-administered it. The following quotations illustrate the range of situations in which the medications were administered.

"I am the one who administered the medication after the baby was born to women who gave childbirth at my health facility. I gave immediately after childbirth and before expulsion of placenta as it was instructed." (DN #9, Masike Dispensary)

"The TBA is the one who gave me the meds after delivery. I told her that I had my medicine so she was not supposed to give me the

local ones that she always gave to women after the delivery, and she gave me the meds even before the placenta come out." (Woman #23, Nyanchabenkye Dispensary)

"I was given medicine by my husband immediately after delivery and I used the way I was instructed." (Woman #3, Kuruya Dispensary)

"I took the drugs by myself after delivering the baby. I took them immediately the way I was told and placenta did not take a long time to come out." (Woman #17, Nyanchabenke Dispensary)

Increased Access to Health Care Services

An important concern about establishing a community distribution program of medications to women delivering in rural settings is that it may be a disincentive for women to pursue antenatal care and deliveries with skilled providers in health care facilities. If women are provided with medications to take at their home, they and their families may not understand the necessity to use their scarce resources to seek transportation to a distant health facility. In fact, the nurses in our study found that provision of medications to prevent postpartum hemorrhage was an incentive for women to come to the dispensaries to seek out the medications. Thus a program of distribution of misoprostol which includes the dispensary nurses may in fact improve attendance at antenatal care clinics as women may perceive greater value to the clinic visit if the medication is offered there.

"This research enables or has made many women come to the clinic in large numbers, when they heard of these medicines which prevent heavy bleeding after delivery... many women are happy for that service and even now many of them they are coming to clinic to ask for those medicines after getting information from others who have used them." (DN #4, Nyamasanda Dispensary)

Disagreement about permitting TBA's to distribute medications

The DN's and TBA's were questioned about the potential benefits and risks of using TBAs to distribute the study medications. This was a theoretical question only, for currently TBA's are being discouraged to participate in deliveries in Tanzania, and likely the government would not support a distribution program through these providers. However, we asked this question to determine the perceived benefits and barriers to using TBAs for this purpose. Some of the TBAs thought that it would be very beneficial to have the opportunity to provide these medications to the women:

"It is good for TBAs to be giving out these medicines for those women delivering at home so as to prevent transportation problems for those going to hospital and for those who are not able to reach to the hospital and delivering on the way without help. Medicines have helped them a lot." (TBA #4, Buturi Dispensary)

"It is my view that TBAs should give out the drugs because they deliver more women compared to those who deliver at the hospital or dispensary. And those who stay far away deliver in their own houses. Nurses also should be given the drugs because there are no drugs at the dispensary." (TBA #9, Sokorabolo)

There were others, however, who did not agree that TBAs should be given this right. Nurses were concerned that if medications were provided by TBAs then women would not attend the health facilities. One TBA raised the point that TBAs were not equipped to store medication safely, and may not be in a position to handle the medication appropriately.

"I as a nurse, I will attend to those coming to deliver at the dispensary, but if you give the TBA those medicines to stay with them at home it will make many women to stop attending clinic." (DN #3, Nyahongo Dispensary)

"According to my opinion concerning this research if TBAs would continue to provide these medications to women, I am sure none of the women would come to give childbirth at health facilities. I know we are going to reduce the problem of severe bleeding after delivery, but in case of difficult labour such as abnormal lie of the baby, is the woman going to go to health care services?" (DN #9, Masike Dispensary)

"We TBAs are not able to store medicine, because we don't have a safe place to store medicine. Some of the TBAs are very old and they have lost their memory. I think if you give her medicine to store she might forget to give it to women when they come to deliver, and may keep it until the medicine expires." (TBA #4 Masike Dispensary)

Thus, there was no consensus on using TBAs to distribute the study medications amongst the DNs and TBAs we questioned. Nurses raised concerns that TBAs may not encourage women to seek facility births at the time of delivery. In addition, one TBA astutely noted that TBAs are not equipped to store medication safely and administer it appropriately.

In summary, there was strong support for the community distribution of medications to prevent bleeding and infection after delivery amongst the women, DNs and TBAs we interviewed. Community and family members also were supportive and encouraged women to participate in the research. The women stored the medication in a safe location in their homes, sometimes engaging family members to help them remember where they kept it. There were few side effects experienced by the women. The women were administered the medications by whoever was convenient at the delivery including the DNs, TBAs, family members or even by self-administration. A community program of distribution of medications appeared to increase the number of women accessing health care services, however, there were concerns expressed that if TBAs were permitted to distribute the medications that women would not access health care services for antenatal visits and at the time of delivery.

Discussion

The eco-social factors affecting women's participation in a community-based distribution program of medications to prevent postpartum hemorrhage and infection are reflected in the themes uncovered by this qualitative study. Impacts vary from community level, health care providers, through to individual factors. Women's ability to access the medications is directly related to family and community support for the program. Safe storage of the medications and appropriate administration may be individual or may involve family members and health care providers. The availability of the medications may facilitate women accessing health care services in order to obtain them, however, allowing TBAs to distribute the medications could negatively impact on women accessing health care facilities for antenatal care and deliveries. Thus, the ecologic context in which women live, including their relative power within the family, impacts on how effective the program of distribution of medications will be.

This study is unique in that it reports on the views of participants and health care providers about the introduction of a research study to provide medications to reduce maternal mortality in rural Tanzania. The overwhelming support of the women for the community provision

of medications is not surprising: in a district where access to facility births are limited by long geographic distances and costs of travel, the supply of any services to women directly is greatly appreciated. The fact that the DNs and TBAs participating in our study also supported the provision of medications, confirms their awareness of their inability to prevent many deaths from postpartum hemorrhage, and the reality that the dispensaries often lack basic supplies such as oxytocin.

While the women we interviewed were very positive about the research, it should be noted that the study was limited by voluntary participation. We sought the views of women who participated in this pilot study: those who chose not to participate may have been less supportive of a community distribution program of medications. According to the DNs, almost all women were keen to have access to the medications, however, from our larger study we are cognizant of at least one woman who refused the medications [13]. Future researchers need to document the number of women who decline to accept the medications and the reasons for refusal. As one nurse noted, fears that medications will prevent pregnancy, religious beliefs preventing access to health care services, or lack of cooperation of male partners may be limiting factors for some in this population, although this was not demonstrated amongst the thirty two women we interviewed.

We chose to distribute the medications directly to the women using DNs and research assistants. In their review of eighteen programs of misoprostol distribution, Smith and colleagues demonstrated that distribution of the medications was most effective if given to the women directly for self-administration [6]. While these authors also noted that providing the medications through community-based agents may be more effective than relying on women to get these medications during antenatal care visits, some of the DNs we interviewed were concerned that distribution of the medication through TBAs may prevent women from attending antenatal visits with the nurses. Other researchers in Tanzania have found, however, that reliance strictly on distribution of misoprostol through DNs at antenatal visits is unsatisfactory. In a study of over 12,000 women in Kigoma Urban, Kilombero, Ulanga and Rufiji Districts, 44 percent of women did not return for antenatal visits after 32 weeks gestation and thus missed receiving their misoprostol [14]. In future research, we intend to combine distribution of misoprostol through DNs with a community distribution program using village health workers for those women who have not received the medication from the DNs by late pregnancy. Our hope is that this will increase women's engagement with skilled health care providers during antenatal care, and encourage them to seek health care facilities at the time of delivery, if possible. For those who are unable to reach a facility, their possession of misoprostol to be administered by 'convenient care-givers' may limit their risks of postpartum hemorrhage in the community setting.

Unlike misoprostol for the prevention of postpartum hemorrhage, there is no empiric evidence for the use of oral antibiotics to prevent puerperal sepsis. In fact, in a trial based in four sub-Saharan African cities, there was no difference between women who received a one week course of antibiotics beginning once labour was established versus those who did not receive antibiotics, regardless of HIV status [15]. The prevention of sepsis should likely focus on a "clean delivery", possibly through the use of birth kits, though further research on how to distribute these kits in low income countries and educate women to use them appropriately is needed before widespread implementation occurs [16].

Conclusions

In this study in Rorya District, northern Tanzania we have demonstrated that a community distribution program of misoprostol to prevent postpartum hemorrhage is supported by women, DNs and TBAs who experienced the program. Amongst those involved in the Rorya program, women have family support to take the medications and the medications were stored appropriately in safe locations. Women used whoever was available to administer the medications to them: DNs, TBAs, family members and, when no one else was available - by self-administration. A few women reported minor and temporary side effects; generally the medications were well-tolerated. Finally, in this cohort of women and providers there was some disagreement as to who should be permitted to distribute the medications. DNs maintained that women were more likely to access the DNs for prenatal care if they were also provided with misoprostol at these visits. TBAs maintained that they should also be permitted to distribute the misoprostol as many women attended them for birth. DNs and one TBA were concerned about using TBAs for distribution as it may prevent women from seeking facility births, and TBAs are not trained to deliver medications. It is unlikely in the current political context of Tanzania, that TBAs would be given the privilege of dispensing medications.

In future research we intend to continue to provide rural women directly with misoprostol to prevent postpartum hemorrhage. We will not include an oral antibiotic for lack of evidence, however, the misoprostol will be provided in a safe birth kit, to reduce the chance of infection at delivery. The best method of distribution of misoprostol in a safe birth kit remains to be established; likely a combination of distribution through dispensary nurses and village health workers will be the most effective in our context.

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