

Training Traditional Birth Attendants in Sub-Saharan Africa

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Abstract

Even after many adjustments, recommended practice regarding traditional birth attendants (TBAs) and their contribution to lowering the maternal mortality rate (MMR) continues to be disputed among various stakeholders. Sub-Saharan Africa continues to see high maternal mortality rates, despite various attempts by the World Health Organization (WHO) and others at utilizing the formal health care system (Prata, et al., 2011). Considering all factors and variables behind the reason for this problem in Sub-Saharan African, it is reasonable to conclude that training traditional birth attendants (TBAs) in evidence-based practice, in conjunction with developing longer-term strategies, is an appropriate approach for the short and intermediate-term.

Training Traditional Birth Attendants in Sub-Saharan Africa

For the past few decades, the problem of and possible solutions to maternal and newborn mortality have been widely discussed around the world, with special regard given to developing countries—for good reason. According to the World Health Organization (WHO), 99% of all maternal deaths occur in developing countries, with half of these deaths in Sub-Saharan Africa (World Health Organization, 2015). Therefore, in order to achieve the ambitious Millennium Development Goals described by the United Nations at the start of 2000, researchers and health care workers across the globe have been studying the factors, challenges, theories, and changes in maternal health in order to arrive at a plausible and practical solution to countless avoidable maternal deaths (United Nations, 2015). This paper covers the following topics: strengths of skilled birth attendants, weaknesses of traditional birth attendants, difficulties present in developing countries, advantages of traditional birth attendants, possible traditional birth attendant interventions, using traditional birth attendants as referrals, evidence in favor of traditional birth attendant training, and areas for further research.

A successful strategy to lowering the global maternal mortality rate (MMR) has been to increase the number of educated and trained people helping and caring for women during pregnancy, delivery, and the critical time after pregnancy (postpartum) (World Health Organization, 2004). The main sources of these people come from two groups: skilled birth attendants (SBAs) and trained traditional birth attendants (TBAs). A skilled birth attendant, according to the World Health Organization (WHO, 2004),

is an accredited health professional—such as a midwife, doctor, or nurse—who has been educated and trained to proficiency in the skills needed to manage

normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns. (p. 1)

However, in many places around the world, pregnant women often rely on traditional birth attendants (TBAs) to help them with pregnancy and delivery for a multitude of reasons. According to the WHO, a TBA is “a person (usually a woman) who assists a pregnant woman at childbirth, and who initially acquired her skills delivering babies by herself or working with other TBAs” (World Health Organization, 1978, p 51). These women are usually an integral part of the local community with advanced knowledge about the culture and traditions of the community, thus allowing them to be influential on common local health practices and beliefs. Policy makers have realized that the close tie between TBAs and the communities they serve is a great link to reach pregnant women that are not easily accessible to SBAs. However, since TBAs may not be—and in some areas are probably not—using evidence-based practice in their care, it is necessary to make sure that the formal health care system properly trains TBAs in accepted obstetrics practices, frequently monitors and retrains when necessary, and establishes and maintains an effective referral system for the TBAs to rely on when necessary in complicated cases (Saravanan, et al., 2011; World Health Organization, 1978).

Increasing awareness and knowledge of maternal mortality and morbidity in developing countries has led to many studies indicating the importance of SBAs or trained TBAs being in attendance at all births. However, there are still many births that are not attended by either a skilled or traditional birth attendant, and despite ongoing efforts, the last 20 years may only indicate marginal improvement in lowering the number

of maternal deaths during delivery or perinatally. Training traditional birth attendants to have the skills necessary to adequately prepare and care for labor and delivery has shown positive outcomes in maternal and newborn health in various studies, and may be the answer to solve many problems surrounding this complicated issue. The shift toward training TBAs in developing countries, specifically those in Sub-Saharan Africa, is an important intervention that health care workers can utilize to increase the health of both mothers and children (Prata, et al., 2011).

Research varies in opinion as to the best strategy in lowering the global maternal mortality rate (MMR). Some suggest improving and utilizing TBAs rather than using limited resources to add more SBAs to underserved populations in the world. Others argue the opposite. Instead of getting mired in the middle ground of this debate in order to try and settle the disagreements, this literature review will focus on reviewing the benefits of training TBAs that are already in place to perform at a high-quality of childbirth care (Ana & Harrison, 2011). While the training and utilization of SBAs has worked in many parts of the world since the UN Millennium Goals were set forth, the infrastructure and resources necessary to adequately instill SBAs is simply not present in many parts of the world—specifically those who exhibit high MMR (Okonofua & Ogu, 2014; United Nations, 2015). Half of the countries that require dramatic changes in the MMR to meet satisfactory levels have shown next to no change in the proportion of women accessing SBAs. Therefore, new and creative strategies must be investigated and properly implemented if policymakers want to make effective change in areas where SBA utilization is not practically applicable in the near future (Prata, et al., 2011).

Strengths of Skilled Birth Attendants

It is not without significant reason that the leading policymakers in maternal health have advocated for skilled birth attendants (SBAs) to be the mainstay of maternal and newborn health delivery. According to the WHO, ICM, and FIGO, SBAs are individuals who have been specifically trained to care for the woman during the pregnancy, birth, and immediate postnatal periods. These individuals include midwives, nurses, and physicians (World Health Organization, 2004). In parts of the world where SBA coverage is high, the MMR is within accepted levels. For example, in Sweden, Finland, and the Netherlands where SBA saturation is near 100%, the MMR is much lower than other countries (Okonofua & Ogu, 2014). Also, throughout Europe, North America, and Australia where formal health care—including SBAs—is well-established, the MMR is at the lowest tier for MMR across the world (World Health Organization, 2015). The only times that the MMR in the United States has risen above the lowest tier are when women in various regions began using traditional and/or non-evidence based methods for pregnancy and birthing techniques, indicating that deviation from SBA use is correlated with an increase in MMR (Okonofua & Ogu, 2014).

The WHO therefore conjectures that because the global MMR declined between 1990 and 2013 as the proportion of births attended by SBAs increased from 59% to 68% worldwide, SBA utilization is a leading factor in lowering the MMR in every region of the world. Unfortunately, the South-East Asia and African regions still exhibit a SBA utilization percentage of less than 50% in many places where the MMR is still elevated (World Health Organization, 2016). As developing countries continue to aim toward other Millennial Development Goals that are associated with building functional health

care systems, the WHO encourages these countries to institutionalize SBA use as a common practice for women in all regions (World Health Organization, 2004).

Many stakeholders recognize that a contributing factor to an unacceptably high maternal mortality rates in developing countries is the insufficiency of health systems in each country. The scarcity and unequal distribution of midwives, nurses, doctors, and obstetricians skilled enough to care for the pregnant woman is a grave factor that large portions of the world, especially Sub-Saharan Africa, must address in order to lower the MMR (Gerein, Green, & Pearson, 2006). However, if simply adding more skilled individuals was the immediate answer, then surely by now Sub-Saharan Africa would be taking the initiative to add more SBAs to their health care system, thus lowering the MMR. Unfortunately, such is not the case, and the answer to this problem may include contributions from TBAs (Okonofua & Ogu, 2014).

Weaknesses of Traditional Birth Attendants

When it comes to TBAs, conclusions about their effectiveness vary considerably, which does not allow strong convictions to fully rest in support of complete TBA training and utilization. While there are clear signs that SBA utilization has a strong connection with a lower MMR, this correlation is not the case when observing TBA trends. This could be in part due to significant barriers that make gathering information in sub-Saharan Africa and similar regions of the world difficult, resource-consuming, and complicated. Barriers against improving the TBA research base include limited funds, significant cultural variations, a lack of governmental support, differences in health care systems across the globe, and lack of interest, among others. Consequently, research is still not conclusive as to whether TBA utilization has made a strong enough impact on

the MMR to warrant policy makers' full support and approval (World Health Organization, 2004).

While it might be difficult to see clearly what the effects of endorsing TBA training would be on the most rural parts of the world, it is comparatively much easier to see why it would be a challenging feat to accomplish. Since TBAs are essentially average participants in their community with only the skills taught to them by previous TBAs, they need to be properly trained in theory, knowledge, and skills that are generally accepted by the formal health care system in order to give quality, evidence-based care (Pathmanathan, et al., 2003).

In the past, policymakers and leading stakeholders originally supported TBA training. In 1952, the United Nations Children's Fund (UNICEF) focused on supplying delivery kits to TBAs and was in full support of TBA training along with the WHO. Before this initiative, only 20 countries had TBA training programs, but as of 2006, 85% of developing countries have launched TBA training programs that have positively contributed to maternal and newborn health. However, since 1972, as research could not prove that the TBA training was lowering the MMR to the standards of the Safe Motherhood Initiative, the WHO and other organizations began to advocate more for an emphasis on formal health care and stimulating SBA utilization (Sibley & Sipe, 2006). Unfortunately, as new research continues to come out, it is becoming evident that relying solely on SBA utilization has still not lowered the MMR in certain specific regions of the world where SBA saturation is markedly lower than what it should be in order for this intervention to become effective (Prata, et al., 2011).

No policymaker would argue with the fact that deploying and utilizing SBAs for safe, effective care to mothers and newborns is the ideal strategy in order to lower the MMR. SBAs obviously provide more reliable, effective, and licensed care to mothers than do even trained TBAs (World Health Organization, 2004). However, there are a few key obstacles in the way of achieving this goal in the hardest-to-reach areas of the world, where the formal health care is less accessible and/or accepted than other parts of the world. In order to achieve safe motherhood practices around the globe, both individualized and global strategies will need to be synthesized, creating a dynamic approach to lowering the MMR (Prata, et al., 2011).

Difficulties Present in Developing Countries

As mentioned before, 99% of maternal deaths occur in developing countries, where education is limited, qualified personnel are scarce, and resources are spread thin. On top of these factors, one must also be aware of a wide array of cultures represented in the broad term “developing countries.” The countries that are most severely affected by poor maternal health include many countries in Sub-Saharan Africa, Asia and the Pacific, and also Yemen, Guatemala, and Haiti. Most of these countries contain (are comprised of) large rural areas, where factors impeding satisfactory maternal health are even more pronounced. A large rural population contributes to a higher MMR, as evidenced by a study done in 2011 (Prata, et al., 2011). Therefore, the presence of large, underserved rural populations in the countries with some of the highest MMRs must be a predominant factor to be considered as policy makers and health care workers strive to lower the global MMR. While many of the past initiatives have made considerable strides in

lowering the MMR, now is the time to possibly redirect the focus onto initiatives that can work and succeed in rural areas around the world.

In extremely rural areas around the world, multiple factors contribute to the unsatisfactory improvement of the MMR. Women living in rural areas have little access to mass media, through which governments and agencies often promote initiatives to connect the population with formal health care. These women are also grossly disconnected from the formal health care infrastructure itself due to living farther away from populated areas (like cities and larger towns) where it is more likely to have SBAs working in formal health care settings like established clinics and hospitals. These women are also more likely to not have the resources or transportation to gain access to the city, which may contribute to a reason why pregnant women in rural areas would much rather seek out TBAs in their local community to help with birth and perinatal support, rather than SBAs (Prata, et al., 2011).

These large rural areas found in Sub-Saharan Africa and Southeast Asia also represent incredibly diverse cultures. According to the Joshua Project, there are 3,096 different people groups in Sub-Saharan Africa and over 3,058 people groups in South Asia. In comparison with other parts of the world, these numbers show an incredibly dense and varied population. A people group is “a significantly large grouping of individuals who perceive themselves to have a common affinity with one another” (Joshua Project, 2016). This definition takes into account differing languages among groups of people, along with dialect, cultural variations, caste, location, and common histories. Therefore, within the regions that are having the most difficulty lowering the MMR using approved and recommended strategies, there is the possibility of over 6,000

different types of groups of people, along with their diverse languages and customs, needing to be reached with the short arm of the formal health care system. It is no wonder that the most diverse parts of the world may have the hardest time connecting with the formal health care system, and thus reaching the Millennium Development Goals of the United Nations (United Nations, 2015).

Another factor that has been shown to correlate with a high MMR is the health expenditure per capita and the general economy for each country represented. The more money and effort a country can and is willing to spend on health care, the better chance that the country's formal health care system will be able to provide competent and reliable birth attendants to help women stay healthy throughout their pregnancy and postpartum periods. In addition, adequate resources aid the formal health care in reaching out to women who would otherwise have difficulty connecting with SBAs due to a lack of transportation, money, education, or time. This is evidenced by the modest decline in the MMR in virtually all other parts of the world, excluding Sub-Saharan Africa. While countries like Sri Lanka, Thailand, Iran, Malaysia, and Afghanistan have been able to increase the education and mobilization of SBAs into underserved areas and thus lower the MMR; many countries in Sub-Saharan Africa have not experienced the same success in political and economic initiatives effectively reducing the MMR by sending out SBAs to the least-reached areas of their countries. This is likely due to many factors, including sparse resources to spend on expensive initiatives, lack of willingness to support, fund, and maintain programs among local policy makers and participants, lack of transportation and communication between the formal health care system, and others (Prata, et al., 2011).

Advantages of Traditional Birth Attendants (TBAs)

A few prominent factors that are special to Sub-Saharan Africa are causing conventional and recommended interventions in lowering the MMR difficult to implement. The untapped potential to creatively incorporate and utilize TBAs could contribute to solving this problem. One advantage that TBA utilization offers is that TBAs are already connected to the communities they serve. These women, while untrained and uneducated in the standards set by the formal health care system, have already established a trusting relationship with women in need of a birth attendant. Much of the logistical problems associated with SBAs, like travel, expensive services, and low density are overcome by TBAs already being incorporated into their communities. In rural parts of Africa, 60 to 90% of pregnant women are using TBAs during their deliveries, not SBAs. If these TBAs could be taught rather than replaced, then the formal health care system would not need to exert time, money, and strategy in getting SBAs into these underserved places (Mbiydzonyuy, 2012).

In 2004, the WHO stated that research does not support the hypothesis that training TBAs could contribute to lowering the MMR, largely due to governments not involving TBAs in the formal health care system. Therefore, the WHO, and other international policy makers, began to shift its focus off of TBAs and onto establishing a strong SBA base. The WHO recommended taking TBAs out of their “care role” and into more of an advocate for skilled care, acting as referrals for both patients and the health care system (World Health Organization, 2004). However, after 11 years of experience, the MMR is still staying stubbornly high in Sub-Saharan Africa, despite these efforts. In addition, the past ten years represents significant progress in technology and development

in the area of obstetrics, including a few key interventions that could easily be taught to TBAs. One such intervention is the administration of a relatively cheap, thermostable, tablet form of misoprostol that could easily be used on the community level. In this setting, misoprostol has been shown to effectively treat postpartum hemorrhage when other interventions are unsuitable. This development shows that while in 2004 it might have been impractical to try to incorporate TBAs into health delivery, there are now safe and effective interventions, including the administration of misoprostol, with which TBAs could easily be trusted (Prata, et al., 2011).

As mentioned previously, the SBA density in Sub-Saharan Africa is the lowest in the world, with less than 50% of births being attended by an SBA. Unfortunately, large, rural areas that are far away from health care infrastructure, under the poverty line, and provide inadequate transportation are not popular places to live and practice as an SBA. Some countries have been able to train and deploy capable midwives to rural areas, but these countries have had the available resources—including human, monetary, and political interest—to perform such an incredible feat. Countries which lack the infrastructure and manpower to increase their numbers of SBAs are also the countries that have the highest MMRs. Training SBAs can be very expensive and requires many years of investment. Midwives usually complete about 10 years of education, and each midwife can cost thousands of US dollars to train. After completing training, SBAs often want to migrate to more urban areas—and sometimes different countries—where they can receive a higher salary and more amenities. This would require governments to step in and offer incentives to stay in the very areas in which the SBAs have been sought out and trained to serve (Prata, et al., 2011).

Practically speaking, deploying SBAs and counting on them to stay in underserved areas is a task that only highly involved and fairly lucrative countries can commit to do. Alternatively, training TBAs to perform safe and effective interventions during uncomplicated pregnancies is a viable intermediate option available to countries who have large, underserved populations of pregnant women. It is no secret that women will always be safer in the hands of a skilled and trained professional, but it is also no secret that thousands of women are dying each year due to a few problems that could easily be prevented or at least reduced with the help of a trained TBA. The leading causes of maternal mortality across the globe, according to the WHO, include hemorrhaging, infections, pre-eclampsia and eclampsia, delivery complications, and abortions. These major complications contribute 75% of all maternal deaths in the world, with the remainder of deaths being associated with malaria, AIDS, and other such diseases (World Health Organization, 2015). In the meantime while the WHO and other policy-makers work on long-term strategies to improve coverage and sustainability of a strong SBA force, trained TBAs would be able to learn and apply simple and effective measures to address most of the above-mentioned complications in some way. It is a reasonable short-term strategy to utilize TBAs in areas in which there are already many TBAs and a lack of SBAs (Sibley & Sipe, 2006).

Possible TBA Interventions

Hemorrhaging, or excessive bleeding, is defined as a loss of more than 500 ml of blood. This often occurs after delivery, or in the acute postpartum time. The highest prevalence rate of mortality due to postpartum hemorrhage is in Sub-Saharan Africa, excluding Southern Africa, which actually provides hope that if TBAs could contribute to

lowering the rate of postpartum hemorrhages (which they can), they could make a significant impact on the regional and global MMRs (Smith & Ramus, 2014). A few researchers have discussed the possible interventions that TBAs could be trained to perform and for which to be responsible during a woman's pregnancy, and as hemorrhaging is a leading cause of maternal death, TBAs could be trained to responsibly distribute and administer misoprostol to prevent postpartum hemorrhage (Prata, et al., 2011). Now that a low-cost, thermostable, oral form of misoprostol is available, researchers have indicated that this drug can decrease the rate of acute postpartum hemorrhage by 5.6% or saves 1 in every 18 women from postpartum hemorrhaging, according to a randomized controlled trial performed in rural India (Derman, et al., 2006). Multiple other studies have demonstrated the effectiveness of trained TBAs utilizing oral misoprostol to prevent postpartum hemorrhaging, a leading cause in maternal mortality in underserved rural areas throughout the world (Prata, et al., 2011).

Another intervention for which TBAs have the capacity to be trained to prevent postpartum hemorrhage would include properly hydrating the pregnant woman, keeping the bladder empty during labor, and stimulating the uterus after delivery. According to a meta-analysis describing the future role for trained TBAs, these interventions have been proven to reduce newborn and maternal mortality (Sibley & Sipe, 2006). Hydrating the woman would help normalize her blood pressure, which would help prevent any spikes or drops; keeping the bladder empty during labor would relieve pressure on the uterus; and uterine massage has been included in evidence-based practice for safe delivery for many years, as it helps stimulate uterine contractions after delivery to promote the vessels in the uterus to shrink, which would slow down bleeding (Hofmeyr, Abdel-Aleem, Abdel-

Aleem, 2013). Professionals could easily train TBAs to perform these three easy tasks, along with other safe and accepted delivery principles, which would contribute to a lower MMR (Prata, et al., 2011).

Another leading cause of maternal mortality is infection. In the most rural parts of the world, there is a lack of true and proper hygiene even in formal health care facilities, let alone an average woman's home. It is common knowledge that infection is the most preventable cause of disease in hospitals in already developed countries, and easy, free, and conscientious interventions are the best ways to prevent it. Hand washing, wearing gloves, proper sterile technique, boiling water, and clean utensils are some of the easiest ways to prevent infection while delivering health care. In a randomized controlled trial performed in Pakistan, squatter settlements that used soap (whether antibacterial or plain) experienced 50% lower incidence in respiratory infections in their children than those in the control group (Luby, 2005). Various other studies have indicated the incredible efficacy of promoting hand-washing in developing countries to reduce infection rates. A variety of studies, including one assessing TBA training in South Africa, indicate that training TBAs in safe and effective practices has a positive effect on the MMR in that region, if the training program includes follow-up, maintenance, and other factors in place to help the TBAs retain information (Peltzer & Henda, 2006). These studies indicate that if hand washing and other easy hygiene practices were to be incorporated into training programs for TBAs, maternal deaths associated with infections would likely decrease.

While washing hands is an easy, primary intervention that can be used to prevent infection, administering immunizations can also be a skill to incorporate into TBA

training programs. In 1995, 36 TBAs were given prefilled tetanus toxoid injections, or UniJect devices, to administer tetanus immunizations to 2,240 pregnant women in Santa Cruz, Bolivia. The study revealed that this innovative intervention was extremely well accepted by TBAs, as it was easy to use, sterility-guaranteed, and easy to store and transport (Quiroga, et al., 1998). If researchers could come up with other thermostable forms of other vaccines, the efficacy of this community-based intervention could be replicated with other immunizations. This could include that year's influenza vaccine, the Tdap (tetanus, diphtheria, and acellular pertussis) vaccine, and other adult vaccines that would protect the mother and baby from common infections (<http://www.cdc.gov/vaccines/adults/rec-vac/pregnant.html>). Immunizations have been proven to give protection against certain diseases that could easily affect anyone, including a pregnant woman.

When primary prevention fails and a woman or child contracts an infection, TBAs can be trained to respond to this situation as well with easy and evidence-based interventions. TBAs could be taught the risk factors, unsafe cultural habits, and other warning signs to avoid, and signs of a developing infection like fever, pain, and any lesions. TBAs could also be trained to refer any patients of whom they feel uncomfortable taking care to the formal health care system. In cases of infection, this would be incredibly important, as a prompt referral will prevent many serious complications, like pelvic inflammatory disorder (PID) in the woman or pneumonia in the child (Mbiydenyuy, 2012).

In summary, there are many interventions that TBAs could be taught to perform that would aid tremendously in lowering the MMR in underserved areas in Sub-Saharan

Africa. These interventions include, but are certainly not limited to, administering oral misoprostol, staying properly hydrated, massaging the uterus, utilizing proper hygiene in caring for the pregnant woman and newborn, administering vaccines, and being aware of the warning signs of infection. Lastly, another area in which TBAs need to be trained is proper umbilical cord care. In many areas of the world, cultural practices regarding cord care following birth can be harmful to both the mother and the child, as evidenced by multiple studies, including studies performed in Bangladesh, Ethiopia, and Nepal (Alam, et al., 2008; Amare, 2013; Mullany, et al., 2006). By training TBAs to appropriately care for the umbilical cord according to evidence-based practice, this is yet another way in which TBAs could not only help lower the MMR, but also the neonatal mortality rate as well (World Health Organization, 2011).

The three remaining leading causes of maternal mortality rate, pre-eclampsia, delivery complications, and unsafe abortions, represent the second half of what TBAs can offer to reach the fifth point of the Millennium Development Goals. Pre-eclampsia—which is characterized by high blood pressure, peripheral edema, and proteinuria—can quickly turn into a medical emergency and is often a reason to induce labor in order to prevent the mother or the baby from developing further complications. Delivery complications often need advanced equipment which can usually only be afforded by the formal health care system. And the best way to avoid unsafe abortions is to avoid unsafe pregnancies through safe and effective family planning. While training programs should offer instruction and teaching on how the TBA herself can properly care for a pregnant woman, the program should also make the TBA capable and comfortable with referring

complicated pregnancies or situations to the formal health care system when necessary (Sibley & Sipe, 2006).

Traditional Birth Attendants Referrals

As stated above, TBAs are not only valuable for their potential to deliver easy and safe care to pregnant mothers. TBAs are also an invaluable link for the formal health care system to utilize in reaching the communities who need skilled care the most. During their training, TBAs could be taught to refer any complicated or confusing cases that they may have to the formal health care system, and with their sufficient experience as a birth attendant in the community, will presumably gain enough respect from the community to be heard. For many years, TBAs have served as consultants as soon as a woman becomes pregnant, giving advice garnered from their predecessors' and own experiences in assisting births. They also educate pregnant women on what diet to follow, which taboos to follow and which to avoid, and how to take care of their newborn infant. Most TBAs will also be able to recognize physiologic risk signs during pregnancy, and might try to guess at how to avoid those signs (Kayombo, 2013). TBAs and the care they provide are usually accepted by pregnant women in developing countries, as they are seen as knowledgeable and skilled, but still a familiar part of the community (Mahiti, et al., 2015).

The WHO and other policy makers recognize that TBAs will not go overlooked in health care delivery, and the stakeholders in charge will be forced to utilize these resources already in place if they want to build momentum in lowering the MMR in Sub-Saharan Africa. The WHO states that because TBAs have not been linked to the formal health care system, they failed to deliver safe care to pregnant mothers. Any training

programs in the future should have a strong commitment to link the trainee TBAs into a referral system, as this will give them an outlet for updated information, follow-ups, accountability, complicated cases, and resources (World Health Organization, (2004). It has been evidenced that training programs that utilize a follow-up system to make sure that TBAs are conducting safe deliveries according to evidence-based practice are more effective than those that do not offer this service (Sibley & Sipe, 2006).

As TBA training continues to develop and include both guidance on safe techniques in delivery and also correct referral protocols, the link between the formal health care system and underserved women in the community will be able to grow in coverage and quality. A few countries are already implementing this strategy, including Sierra Leone, where a TBA is paid one pound for every woman brought to the hospital; and Cameroon, where TBAs are given modern communication tools to link them to formal health care providers. Utilizing TBAs as a referral system can be counted on to make a positive impact on the MMR by improving the general education of women, linking women to skilled care, and providing additional resources like money and equipment (Okonofua & Ogu, 2014).

Evidence in favor of TBA training

Research has proven that incorporating training and support of TBAs into strategies aimed at reducing perinatal and maternal mortality reduces perinatal and neonatal deaths (Wilson, et al., 2011). This support, however, is firmly contingent upon the quality of TBA training programs. Some programs last a few days, while some can last up to months, and the best programs offer follow-up training times in which trained professionals can reevaluate and sustain evidence-based practices in TBA care

(Haarsager, 2008). If policy makers could systemize TBA training programs to focus on key interventions that have proven to be effective under the supervision of a TBA, then the MMR of those regions would predictably decrease. These interventions would include the above-mentioned areas, including proper hygiene, preventing postpartum hemorrhage, safe delivery protocols, and a strong referral system between TBAs and SBAs (Prata, et al., 2011).

These interventions have been proven to make a difference in the quality of TBA training, and thus lowering the MMR. A study conducted in India over one year revealed that both untrained and trained TBAs benefited from the training program, which further supports follow-up sessions in training programs (Satishchandra, et al., 2013).

However, due to many design limitations in studies conducted in the past and the vast complexity of the issue at hand, the literature is still mixed in opinions on whether TBAs make an impact strong enough to support with research claims. Older research indicates a lack of support for TBA utilization, as the TBAs were resistant to change, but newer research indicates that there is a possibility for improving training programs to address this barrier (Satishchandra, et al., 2013). There is subtle evidence that TBA training can be effective, but this effectiveness relies heavily on the quality and duration of each specific training program. Since setting up a clear, standardized formula to how a TBA training program should be orchestrated would take years to formulate, there is a wide variety in the quality of each program that stakeholders have produced (Kamal, 1998). There is actually more empirical evidence to support the claim that TBA training reduces neonatal mortality, rather than maternal mortality, although there is significant data supporting the later as well (Sibley & Sipe, 2006). In one study researching the

impacts of TBA training in Ghana, there was not compelling evidence supporting this intervention, and the researchers recommended being realistic in expectations of the training program's goals (Smith, et al., 2000). However, this claim has now seen 15 years of growth and development in TBA training, and in 2011 another meta-analysis revealed a stronger correlation between increased maternal health and TBA training (Wilson, et al., 2011).

Disputing research results actually supports training TBAs to stand in the gap for underserved regions of the world in which SBA utilization is a daunting and costly task, because it shows the necessity of a changed mindset toward how TBAs will affect the MMR—in a more indirect, sustained, and long-term approach (Prata, et al., 2011). More recent literature reviews do indicate an improvement in TBA training outcomes, including decreases in maternal mortality due to postpartum hemorrhage, and neonatal mortality due to birth asphyxia and pneumonia. An increase in women's use of antenatal care and emergency services has also increased over recent years (Sibley & Sipe, 2006).

Areas of Further Research

Continuing research in TBA training promises the potential to further refine and establish an accurate job description for TBAs in Sub-Saharan Africa and other underserved populations throughout the world. Many questions are still left unanswered in the realm of global maternal mortality, and many more issues have been standing between reaching Millennium Development Goal 5 and our current situation than what was previously envisioned (United Nations, 2015). However, as more researchers and curious policy makers take the time and effort to really get to know the women suffering the most from an outrageous MMR in Sub-Saharan Africa, stakeholders will have a more

realistic picture of the situation. This will then allow more realistic goals for both community-based and formal health care delivery models.

One specific area of further research would include how each specific intervention impacts the MMR of a region, especially in regards to using misoprostol in community-based care to prevent postpartum hemorrhage, as this specific strategy is relatively new. The research would need to be conducted in various areas throughout the world to control variables related to geography and government. Policy makers will assuredly also want to discover the impact of the other interventions as well.

Another area of further investigation and implementation would be to discover the best building blocks for a TBA training program and to institute general guidelines and standards with which program directors can consult. These general guidelines could include recommendations for the duration, placement, and depth of training, as well as any individualized techniques for each region or even each TBA, based on experience and aptitude. Guidelines could also address different variations in cultural taboos or practices that can be modified to follow evidence-based practice. Lastly, these guidelines should be flexible enough to adjust with any updates in best practice or stronger research about specific interventions or techniques.

Conclusions

Traditional birth attendants and all of the conversations that they stimulate in the academic community will continue to be an integral part of saving lives through the Millennium Development Goal 5, whether or not policy makers agree. While research may not clearly indicate that training TBAs is the simplest route toward lowering the MMR, it certainly does indicate that TBAs have an important role in this venture, and

that they truly do have something valuable to offer in saving women's and children's lives. The most rural parts of the world, and especially Sub-Saharan Africa, offer a diverse set of obstacles and barriers for which the formal health care system is having a difficult time overcoming. However, the evidence suggests that TBAs can and will be able to provide some relief from this global tragedy, if they can be trained to provide safe and effective care to their patients. As stakeholders continue to unveil the complexity of the issue of lowering the MMR in Sub-Saharan Africa, TBAs will continue to attend and support women in their pregnancies and deliveries, just as they always have done. Will policy makers realize that training TBAs in evidence-based practice in the most rural parts of the world is a key intervention to lowering the MMR? Only time will tell.

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