

Policy Options for Reducing Maternal Mortality

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## TABLE OF CONTENTS

<b>Abstract</b> .....	<b>3</b>
<b>Purpose</b> .....	<b>4</b>
<b>Introduction and Background</b> .....	<b>4</b>
Definition of maternal mortality .....	4
Statistics and importance of issue .....	5
Types of complications .....	6
Factors that contribute to death .....	7
<b>Methodology</b> .....	<b>9</b>
<b>Results</b> .....	<b>11</b>
Traditional Birth Attendants.....	11
Reasons for rejecting Western-style hospitals .....	12
Reasons for delayed care.....	14
<b>Discussion – Policy Options</b> .....	<b>15</b>
Worldwide initiatives .....	15
Successes.....	16
Training for TBAs.....	17
Other tactics.....	19
Health system changes .....	20
<b>Conclusions</b> .....	<b>22</b>
<b>References</b> .....	<b>25</b>

## ABSTRACT

Maternal mortality is large threat to women's health, with the risk varying around the world. Each year, an estimated 500,000 women die due to pregnancy- and childbirth-related causes. A large proportion of these deaths occur in the developing world. Many factors are related to maternal mortality, including overall fertility level, access to care, and women's status. Worldwide and country-level initiatives have had mixed success in decreasing maternal mortality. Policy options, including the training and use of traditional birth attendants, are discussed and recommended.

## Policy Options for Reducing Maternal Mortality

### **Purpose**

Reducing maternal mortality is one of the Millennium Development Goals (MDGs) of the United Nations. Even though the issue has been given this importance among the many health problems in the world, maternal mortality is still a devastating problem. Of the MDGs, the least amount of progress has been made on this goal. This paper seeks to identify the reasons behind that lack of progress. In doing so, the background of maternal mortality and related policies will be examined, as will be the current extent of the problem and possible policy solutions.

### **Introduction and Background**

#### *Definition of maternal mortality*

The World Health Organization uses the following definition of maternal death:

“A maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to- or aggravated by- the pregnancy or its management, but not from accidental or incidental causes” (1).

This definition will underlie the remainder of the discussion.

Three measures of maternal mortality are often used. The most commonly used in the literature is a maternal mortality ratio (MMR), which is the number of maternal deaths per 100,000 live births (2). Other measures of maternal mortality include the maternal mortality rate, which is the number of maternal deaths per the number of women aged 15-49, and a woman’s lifetime risk of death from childbirth, based on the current rates of fertility and the risk of maternal mortality (2).

In using the measures of maternal mortality, some skepticism about accuracy should be employed. Data issues include problems with estimating mortality, as it is not uncommon for maternal deaths to be under-reported (3). Statistics are often based on hospital reports, so they may not accurately represent areas where women do not usually use hospital services for childbirth, reflecting a selectivity bias (3). Problems collecting data are especially critical in developing countries, where infrastructure and reporting systems may be weak.

*Statistics and importance of issue*

The extent of maternal mortality varies greatly around the world. In general, the mortality ratio is very low in developed countries while it is usually high in developing countries. Africa bears much of the burden of maternal mortality, as it comprises 20 percent of the world's births while accounting for 40 percent of the maternal deaths (3). Looking to developing countries overall, 75 percent of females of reproductive age are in developing countries, but these countries account for 99 percent of maternal deaths (4). The lifetime risk of dying in childbirth ranges from 1 in 8 women in Sierra Leone to 1 in 48,000 in Ireland (with the United States at 1 in 4,800) (5).

As sobering as the statistics on maternal mortality are, the problem seems even more catastrophic when it is noted that many have estimated that a substantial number of these deaths are preventable (3). Estimates of preventability from one study were 90 percent of the rural deaths and 85 percent of the urban deaths (6). In addition, maternal mortality only addresses one part of a larger problem – maternal morbidity also has a devastating effect on women worldwide. Nonfatal injuries due to childbirth are estimated

to be even larger than maternal mortality and have short- and long-term effects on women both socially and physically (3).

The effects of maternal mortality go beyond the immediate death. Maternal death influences the future of the woman's surviving children, as she is likely the main caretaker (7). Maternal death has been linked to an increase in deaths of newborns and the mother's other small children (7).

### *Types of complications*

Often, more than one complication causes death, especially in developing countries (3). Worldwide, more than 80 percent of maternal mortality is due to five causes – hemorrhage, sepsis, unsafe abortion, obstructed labor, and hypertensive disease associated with pregnancy (8). About 500,000 maternal deaths happen every year, and about 21 percent of them are due to severe bleeding (8). Bleeding is extremely time-sensitive, so access to emergency care is important (8).

In developing countries, hemorrhage and hypertensive disorders together comprise the largest share of complications that cause maternal death (1). In Africa, hemorrhage is the leading cause of death at 34 percent, and it is also the leading cause in Asia at 31 percent (1). However, other causes vary in importance for different regions, so programs and policies in different areas may need to focus on different causes.

One major cause of death is obstructed labor, which happens when the fetus cannot fit through the pelvis of the mother (3). This may happen because the fetus is in an abnormal position or is too large, or because the pelvis is too small or deformed (3). The size of the mother's pelvis is influenced by her nutrition and health while developing, as well as her age, so the health of girls and age at marriage and first birth are important

factors in the issue. Social status of females affects these variables and as such, should be examined in policies and initiatives.

#### *Factors that contribute to death*

A few demographic characteristics are associated with an increase risk of maternal death. Death is most common in women under age 15 and rates rise in women over age 30 (3, 9). In addition, the woman's health history has an effect, as a history of abortions or stillbirths, lack of family planning, or use of traditional medicine may contribute to the risk of death (9). Other factors include total fertility (total number of pregnancies a women has had, with five or more children leading to greater risk), lack of antenatal care or education, and certain religions (influenced by the religion's traditions and views on women) (9).

Social status and expectations are important. In one study that focused on Muslim Hausa women in Northern Nigeria, the people practiced purdah (wife-seclusion), where the men socially controlled the women (whose main purpose was to produce children) (3). There was also a division of labor and imbalance in the economic sense, and women were told throughout their lives that they are inferior (3). This may have had an effect on the psychology of the women and since they felt inferior, it may have affected the way in which they (did not) seek medical care. Social pressure to produce many children (which will bring honor) and to remain "modest" (which limits them in asking questions or seeking care) also had an effect since, especially for the first time mother, there was little information given about childbirth (3). In this society, women went to their birth family during their first delivery, but later were expected to deliver alone in their marriage family and felt pride in delivering alone (3).

In another study that focused on a north Indian city, women's autonomy played a major role in the utilization of healthcare. This study defined autonomy in three dimensions: financial control, decision-making control, and control of own movement (10). Women who had freedom in their movements used antenatal care and delivery care more frequently (10). A woman's age and the household structure influenced their movements, as a younger age and proximity to the husband's female kin decreased their freedom (10).

Under the evidence that a low utilization of healthcare leads to a high maternal mortality rate, a similar study in Nepal focused on women's positions within their households. The dimensions used to operationalize the idea of position include decision-making, employment and access to earnings, and discussion of family planning with the husband (11). Discussion of family planning with the husband was associated with increased use of antenatal and delivery care (11). Overall, gender equity needs to be realized in order to see a real decrease in maternal mortality (11).

Illiterate women accounted for about 70 percent of maternal deaths (4). Education is cited as important in one article for a variety of reasons. Increased education may decrease maternal mortality through promoting care-seeking behaviors. The authors proposed that education could increase women's self-worth and self-confidence in addition to increasing women's receptiveness to health information (11). Also, women may be more likely to want skilled care and may be more able to actually seek and find that care (11).

Multiple facility-related factors are identified throughout the literature. One study proposed that the high maternal mortality in developing countries was due to social,

economic, and cultural factors, as noted above, along with health facilities. This study pointed to estimates that up to 90 percent of maternal deaths could be attributed to structure of health services and performance of providers, and these deaths could be prevented by improving quality and accessibility (12). Suboptimal care in both clinic and hospital setting was due to lack of appropriately trained staff, including inability to recognize severity of condition, which lead to delays in both treatment and referral to other facilities (6). Other facility-related risk factors include inadequate supply of antibiotics, intravenous drugs, and blood for transfusions, and the distance to the health facility (9). In addition, lack of basic equipment, poor staff attitudes, staff absences, and lack of anesthetists contribute to maternal mortality (9).

Lack of and delayed access to care is very important to maternal mortality. A lack of access to healthcare is related to a woman's risk of dying in childbirth (3). Lack of transportation (especially in rural areas) often affects access (6). The overall idea of delays can be broken down into three types: delays within the health system (which may be due to lack of available supplies and personnel), delays in the actual decision to seek care, and delays once the decision is made but due to problems actually accessing care (6). Delays in the decision may result from consultation with the TBA (delay in referral), husband, or other family or community members.

## **Methodology**

This paper was informed through a literature review. Journal articles, books, and websites were used as references. Key terms such as “maternal mortality,” “traditional birth attendants,” “childbirth complications,” “traditional midwives,” and “maternal health policy” were used in searches of various databases. Many of the journal articles,

from a variety of journals, were accessed through JStor. In addition, the library catalog database Aladin, which includes consortium schools such as George Mason University and George Washington University, was searched.

Websites were also utilized as sources. In many of the articles and books, the World Health Organization (WHO) was cited as a major source of both statistics and policy. As such, the WHO website was searched for relevant information. In addition, a BBC news website was accessed. This website was searched after a seemingly relevant film was named but not available in the Aladin search. The BBC had produced the film, so the website was accessed to search for an online source of the film. Though the film was not available anywhere online, some background information on maternal mortality was still available through the BBC website. Throughout the course of the literature review process, the Washington Post published a few articles on maternal mortality, which were also referenced.

Literature was selected based on timeliness and relevance. Sources produced before 1992 were not used to ensure recent information, which is especially important in the developing countries where unrest or war or development programs may have influenced the situation since the sources were published.

The literature search was considered complete when there were diminishing returns to further searching. That is, when additional articles or other sources did not reveal information not already presented in a reviewed source. The same methodology was used when writing the results – articles that were older and did not yield more new information were not included in the paper. Once the articles were examined in their entirety instead of reviewing the abstract in the initial literature search, articles of limited

relevance were excluded as were articles beyond the cutoff year of 1992. Following the literature review, policy recommendations are made.

## **Results**

### *Traditional Birth Attendants*

Traditional Birth Attendants (TBAs) were discussed in many sources. In one study of Swaziland it was found that, of those deliveries that take place outside of formal health facilities, TBAs assisted in 43.5 percent, relatives assisted another 16.3 percent, and friends or neighbors assisted with 15.1 percent (7). In some places, birth attendants are not in fact TBAs, but are instead the oldest woman in the household or community (13).

TBAs tend to be older women who have had multiple children themselves. Often, they do not receive any formal education, but gain knowledge through family tradition and through experience watching and assisting other TBAs. It was found in a Swaziland study that TBAs do want more information, as 91.6 percent were “willing and ready to upgrade their knowledge and clinical skills” (7, p. 145).

Some of the activities TBAs perform are actually harmful to the mother and child (3). In Botswana and in Swaziland, TBAs lack training and perform unsafe procedures (7). In Swaziland, TBAs perform a variety of activities: they may give herbs during pregnancy, assist in complicated deliveries, and make some preparations before the delivery. (Although, startlingly, it was found that clean water and soap was prepared by only 12.7 percent of TBAs (7).) TBAs may also cut the umbilical cord, refer patients to a formal health facility for care for excessive bleeding (done by 51.8 percent), give family

planning advice, and assist with retention of placenta or care for a distressed newborn (although methods may be questionable in terms of usefulness or harmfulness) (7).

Around the world, the status of TBAs varies dramatically. In one study, among Muslim Hausa, TBAs are respected among other women, but their role is more of social and ritual importance than actual medical assistance (3). Certain activities such as touching the placenta, touching and cutting the umbilical cord, delivering the baby and cleaning up the blood afterward are considered defiling and are done by the TBAs who themselves may be on the fringes of the community financially and socially (14, 15).

Women may prefer TBAs for a variety of reasons, including privacy and performance of traditional techniques. In Swaziland, the deliveries that TBAs attend are viewed as very private and personal, so referral is limited to emergencies (7). In Uganda, TBAs are preferred because even though the TBAs may have shortcomings, the mothers know these people as community members, are familiar with and accept the activities the TBAs perform, and know that TBAs do not ask embarrassing questions and allow women to deliver and experience pain in their preferred method (16). In areas of India, much shame and embarrassment is associated with childbirth because it is evidence of a sexual relationship (14), and use of a non-TBA may increase these feelings. The mothers in a Mexican study preferred the TBAs because they performed activities, such as massage, that the mothers were familiar with and found comforting and useful (17).

#### *Reasons for rejecting Western-style hospitals*

Among Hausa women in Nigeria, a few reasons exist for resistance to seeking care in hospitals. These include a dislike of episiotomies and fear of shame in exposing themselves to strangers (3). In Swaziland, women prefer to deliver at home due to: a

quick labor where there was not time to go to the health facility, desire to deliver with a TBA (who would always be available), and feeling that the home was a more relaxing setting for labor and delivery (7). A few less common reasons were also given: lack of transportation or money to pay for care or previous bad delivery experience in the formal facility (7). They may also have a socio-cultural preference for delivering without help or with only assistance from a close female relative (7). In Uganda, cultural norms are a large influence, as women adhere to traditional birthing practices, believe in pregnancy as a challenge to endurance, and view maternal mortality as sad but normal (16). Women do not want to utilize facility care due to a lack of skilled staff, reports of abuse, neglect, and poor treatment, lack of understanding of reasons for care activities, and a perception by providers that the women are ignorant (16). The perception of childbirth and the status of women intersect in some sub-Saharan African countries to create a situation where childbirth is one - and possibly the only - way women can gain respect, honor, and power (16). In other countries, women may have to negotiate with husbands over finances to get money to pay for their care and supplies (16). Women do not like the sterile, efficient environment where they are turned into dependent patients whose emotions are devalued (16). In another country, further barriers to seeking care include a nomadic lifestyle, male staff caring for pregnant women (although this was not an issue in other sources), and lack of staff knowledge of the local language (12).

Among some women in South Asia, social and cultural reasons contribute to the restrictions in access to care, despite the fact that the government policy includes free antenatal care (excluding the cost of medicine) (11). Women's movements are restricted

in general, but this is especially so in the “shameful” state of pregnancy. Decisions include complex family negotiations (11), complicating access to care.

*Reasons for delayed care*

In Sawyerr-Kamara (18), three groups of delay factors were identified as contributing to maternal death. First, there are delays in the decision to seek care. These include: not recognizing danger signs, cultural or religious beliefs and taboos, traditional practices, household power structure, and lack of money. Additional factors identified include economic and child-care responsibilities that make it difficult for the woman to leave her home and the general status of women (6). Also, women who view childbirth as a test of endurance may not express their concerns until it is too late for them to receive attention for their complications (16). Second, there are delays in accessing care: distance, transportation, economic status, and a lack of communication (even in health center referrals to the hospital). Third, there are delays in receiving care once the woman has entered the formal health system. These challenges include: lack of drugs or supplies, lack of transfusion services, poor equipment, staff shortages, un- or under-skilled staff, and negative staff attitudes. Factors from these three groups were also found in studies from Zimbabwe and Nigeria (6, 4). In some cases patients’ families or friends must go to the pharmacy to buy things such as catheters, drugs, and other medical supplies in addition to paying for care. Operations might be delayed while “husbands run out to buy rubber gloves for the surgeon” (19). This is not the case in all places, however, as some countries provide basic care free of charge and other systems are present.

## **Discussion - Policy options**

### *Worldwide initiatives*

There are two major worldwide initiatives. The Safe Motherhood Initiative was first implemented in 1987 (20). This initiative has not worked so far (21). In fact, in some countries in sub-Saharan Africa, maternal mortality actually increased after the initiative was launched (4). The Millennium Development Goals were created in 2000 by the United Nations. The MDG related to maternal mortality set the goal of reducing mortality by 75 percent by 2015 (22). One measure of the progress of this MDG is skilled birth attendance, which has increased from less than 50 percent in 1990 to almost 61 percent in 2006 (8, 23). However, in areas that still have the highest rate of maternal mortality, Southern Asia and sub-Saharan Africa, rates of skilled birth attendance remain low at 40 percent and 47 percent, respectively (8). Clearly, much work remains to ensure the success of these worldwide initiatives.

WHO has created a Department of Making Pregnancy Safer that focuses on two MDGs, including the one related to maternal mortality. This department focuses on four main areas: advocacy, technical country support, partnership (with countries and other stakeholders), and monitoring and evaluation (to improve decision-making) (24). These four focus points build a sound foundation for future policies, and may be tailored to country-specific programs to reduce maternal mortality. Worldwide initiatives are important to create a basic policy framework and should not be eliminated due to present lack of progress.

## *Successes*

A few countries have had success in their initiatives. Honduras has seen a drastic decline in maternal mortality, dropping 41 percent from 1990 to 1997 due to better antenatal care, medical training for TBAs, and quicker and affordable ways to get care at facilities when complications arise (25). Sri Lanka and Malaysia have had success in reducing maternal mortality, and elements from their success may be translated to other countries (20). The main four steps that were taken were: introducing modern medical advances into services that already existed (including advocacy efforts, training midwives, and addressing other major diseases), improving access for those in rural areas, improving utilization, and improving quality multiple times (20). Authors who examined these successes noted that while there were similar critical elements, the specific tactics were different and used at different stages in developing the health system (20). In beginning stages, communication with women and communities was improved, and training and regulation for midwives was set up. Other systems included ability to track data, which increased the ability to perform advocacy activities. The major theme was to establish a network, then increase quality and then increase use (20). These countries also simultaneously focused on improving things like access to quality water and sanitation (20). The common factor in countries that have made progress has been skilled birth attendants (22).

In Sri Lanka and Malaysia, midwives were critical to be able to expand the quantity of services to rural areas (20). These midwives provided care that was accessible and culturally relevant, and they gained respect from the communities they served (20). The midwives received governmental training in an effort to improve services, and the

basic training lasted 18 to 24 months (20). These authors believe that traditional birth attendants will not be able to achieve dramatic reductions in maternal mortality (20).

Training, regulation, control, and supervision of midwives are necessary (20).

### *Training for TBAs*

Due to the prevalence of TBAs and the importance of skilled birth attendants, training of TBAs has been a major topic of discussion and experimentation. In 1972, WHO started systematic training of TBAs with the goal of improving perinatal services, hygiene, family planning, and referral to health centers while not actually integrating TBAs into the organized health system (26). In 1997, the Safe Motherhood Initiative stopped promoting use of training of TBAs as central to community-based programs and overall maternal health (27). The program claimed that there was a lack of evidence to support training TBAs, saying they were not having an effect on maternal mortality (although there was an effect on infant mortality) (27). WHO recently said efforts to train TBAs have not been effective, and resources should instead be used to train a mixture of providers who can work at various levels of the health system (28). They propose that TBAs' roles be redefined to provide supportive antenatal and postpartum care and to refer women in a timely manner (28).

There is, however, some support for training of TBAs. In some circumstances, training for TBAs has worked – trained TBAs were more likely than untrained to follow clean practices (washing hands with soap, clean cord care, and a clean surface) - and has created substantial reductions in maternal mortality in places like China where the TBAs are backed up by referral systems that can provide emergency care (however, in Bangladesh where the backup system was not available, the training did not have an

effect) (27). In another article, TBAs were supported, and it was proposed that they be linked to hospitals and have access to emergency forms of transportation so they could be empowered to refer their patients to higher levels of healthcare (6). However, usefulness of this might be limited in countries where women are unattended or attended only by family. Alternately, community members should be educated to recognize complications and to form transportation networks (12).

In contrast to other studies, a study about Swaziland noted “meaningful progress in the Safe Motherhood Initiative can only be realized when there is a corresponding improvement in the formal health sector as well as the information or traditional midwifery system currently being promoted by TBA” (7, p. 139). In this study, it was suggested that community leaders work with TBAs to create transportation capabilities to be used in referrals (7). Due to the multitude of reasons listed above that women resist seeking care from the formal health system, it is likely that it would be difficult to change attitudes and behaviors in favor of maternity care in facilities (7). Because of this, and because of the dangerous practices TBAs still sometimes use, it is important to improve the knowledge and skills of TBAs and create ways for them to work with modern providers (7). This may actually benefit the modern providers, because if TBAs provided better service, they would be able to handle routine deliveries, easing work for hospitals and preventing them from overcrowding and allowing them to handle more complicated cases (7).

Limits of TBA training programs have also been noted, especially if that training is restricted to identifying complications and making referrals. One article proposed that training would not combat transportation and actual treatment of complications (12). One

training program for TBAs did not have much effect on the actual care they gave. Modern ideas of care were valued more in training and trainers did not understand the position of TBAs, which decreased the effectiveness. Trainers should recognize the knowledge, perspective, and status of the TBAs in order to combat this in programs (17). The TBAs may be illiterate and therefore may not gain much from the training (27). Potentially, modified forms of training, with picture books, might have a greater effect.

#### *Other tactics*

Some preventive tactics that have been proposed include family planning, antenatal care, waiting shelters, active management of the labor, and surveillance during the postpartum period (6). A study found that antenatal care was inadequate in its effect on reducing maternal mortality (6). One article proposed that women with high-risk pregnancies who had difficulties accessing care should be admitted to one of these waiting facilities at 36 weeks of pregnancy (29). Waiting shelters are questionable, as “the single, poor, highly parous mother living in a remote area who would benefit most from a waiting shelter would probably be the least likely to use it because of the financial and child-care difficulties her absence from home would bring” (6, p. 325). In addition, women who, for cultural reasons, prefer a home birth might be unlikely to choose this setting for the end stages of pregnancy and for childbirth. WHO designated maternal waiting homes as essential to maternal care, and a good outcome has been found (29). However, the idea of separating women from their communities may come under fire, especially in communities that place a high importance on births as a community event. One way to keep the women in the community would be to train community members,

health workers (including home visit workers), and family members to recognize signs of complications (6).

Infrastructure also needs to be addressed. Transportation networks should be improved and alternate transportation like a collective transportation or loan fund should be explored in the mean time (6). By including these issues in maternal mortality programs, other benefits, such as better general health and economic opportunities, related to higher quality infrastructure will likely result. This increases the cost-effectiveness of the program as a whole. In addition, if better living conditions were provided, women would be healthier and better able to deal with and recover from pregnancy, birth, and complications.

Women's freedom of movement is important. If they may leave their homes when they decide they need to and are able to do so unescorted, they may be more likely to seek care or seek it early when faced with a complication (10). Women should be made aware of the importance of skilled birth attendants and empowered to value their health and choose to use healthcare (11). A focus on women's educational opportunities is not enough and policies must also include women's status and autonomy, possibly through empowerment programs that are increasingly being used in economic development programs.

### *Health system changes*

One article proposed that the best method of service delivery was at the community level. The authors believed that even though gains may be made through primary, secondary, or tertiary levels of the healthcare system, preventive care done at the community level has the ability to reach the most women, thereby creating the best

results (30). In one program that increased use of healthcare, educational information was presented in community meetings in settings comfortable to community women (30). This increased the trust between the women and providers, which set the stage for a dialogue and decreased wariness of the clinic setting.

The Eritrea Ministry of Health has implemented a National Protocol on Safe Motherhood to address levels of maternal mortality. This includes a pyramid structure to the health system. Community health workers and trained birth attendants form the base, with health stations staffed by nurses or assistants providing antenatal and routine delivery care, health centers staffed by nurses able providing higher level care, and provincial hospitals where caesarean sections and blood transfusions can be performed at the top of the pyramid (12). Due to a lack of trained staff, the pyramid structure had limited effects, so there is an emphasis on upgrading staff and training TBAs (12).

One study identified the most important element in decreasing maternal mortality as a health system that can handle complications surrounding pregnancy and childbirth (20). Two levels of essential obstetric care are identified: basic and comprehensive. Basic obstetric care (performed at health centers) includes antibiotics, uterotonics, anticonvulsants, assisted vaginal delivery (including removal of a retained placenta), and ability to treat an incomplete abortion. Comprehensive care (performed at the hospital level) includes the basics plus the ability to perform major surgery and blood transfusions, and the ability to treat pregnancy complications (20). In addition to increasing skilled birth attendance, affordability of that care is also crucial (20). Health system changes should be the foundation of any policy.

## **Conclusions**

Out of the above research and policy ideas, three common aspects stand out: formal health systems need revision, the use of TBAs is still unresolved, and any policy needs to be culturally appropriate. Because delay in seeking treatment is often related to maternal mortality, events both inside and outside of the formal health system need to be examined and addressed in any proposed policy. Multiple aspects of healthcare should be addressed, preferably in comprehensive programs that will allow for efficiency and coordination of care.

As a first step, data should be collected to increase awareness and make maternal healthcare a priority (12). An understanding of community needs is important, as is using data to guide decision-making (30). Countries should assess the status of the problem and their health system. The costs of data collection and programs may be warranted because they may be less than the cost to the family and society of losing the women's contributions to the work force, home, and child-rearing.

In many articles and studies, the need for political will in solving this problem was highlighted (31). So, the next step is to utilize data to increase awareness and garner support for the cause. Then advocates, policymakers, and communities can collaborate to develop plans that include packages of services. This should be tailored to the context, since even within a country different processes may work better in different settings. Policies formed for a main urban area may not work in a rural area because the challenges to health and access to care may be different. For example, health facilities are often concentrated in urban areas (9), so urban areas may not have transportation

difficulties like rural areas, but might be more focused on actual quality of care or other barriers.

A common policy should include dissemination of knowledge (to TBAs, women, and the community at large) regarding reproduction and the physiology of the body and childbirth. Monitoring can be used to combat things like pre-eclampsia once people are aware of signs of complications. To combat sepsis, basic hygiene knowledge should be included and antiseptic techniques, such as providing clean soap and water kits, should be employed.

At a larger level, socio-cultural influences need to be addressed to really have an effect on maternal mortality. Healthcare workers and women may place blame on each other for a dissatisfying experience, but education of both groups may allow them to get past this barrier. As part of this, providers should be able to communicate in the local language (30). This can increase trust and decrease frustration and tension. In addition, it may decrease delays in treatment once at the clinic or hospital, as a translator does not need to be found. Broader social change (for example increasing female education and status) and attacks on underdevelopment (for example improving infrastructure like transportation and sanitation) are needed to have an effect on maternal mortality. Cultural and delay reasons women do not use the formal system can be addressed through the use of trained TBAs with an adequate referral system for complications and emergencies.

Health systems will also need major improvements. Adequate drugs and supplies and adequate and skilled staff are critical. Basic and comprehensive care should be provided in a system of levels to maximize resource efficiency.

The main lesson learned from this paper is that

“maternal mortality reduction strategies should include building the capacity of skilled attendants (doctors and midwives) at childbirth to provide quality care to pregnant women and women in labor. It should also include retraining traditional birth attendants (TBAs) and community health extension workers (CHEWs) to recognize the early signs of complications. This is to encourage early and appropriate referrals to health facilities. Health facilities should be stocked with sufficient equipment and supplies to receive and manage obstetric emergencies promptly” (4, p. 36).

How this is accomplished in each country will be influenced by the local context, especially in terms of the role of the TBAs. Because of the mix of responses to TBAs in the literature, this is clearly one area where a case-by-case analysis of programs and policies is needed.

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