

MILLENNIUM DEVELOPMENT GOAL OF IMPROVING MATERNAL HEALTH IN BANGLADESH: A REVIEW OF CONCEPTS

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ABSTRACT

Bangladesh is one of the signatories to the Millennium Declaration 2000, of which, improving maternal health is one of eight goals. Along with the global targets of reducing maternal mortality rate by three quarters between 1990 and 2015, Bangladesh has set some additional targets for achieving the goal by 2015. The main objective of this paper is to make an extensive review on selected studies on maternal mortality, with particular reference to: (1) historical and present interventions to avert maternal mortality, and (2) the six targets of MDG Five set for Bangladesh. A conceptual framework has been developed where the global target is integrated into the targets set by Bangladesh. This paper concludes maternal mortality is a multifaceted and broad based issue to be considered. The inclusion of additional targets in MDG Five for Bangladesh also reflects this complex reality of maternal mortality.

Key Words: Millennium development goal, maternal mortality, skilled attendance at birth, fertility, health system.

I. INTRODUCTION

Improving maternal health with the target of reducing maternal mortality by three quarters between 1990 and 2015 is one of the Millennium Development Goals (Nanda, Switlick, Lule, 2005, p. 1; United Nations Millennium Declaration, 2000) [1]. The indicators that have been set by United Nations (UN) to measure the progress toward this goal are maternal mortality ratio (MMR) and proportion of birth attended by the skilled health personnel. Bangladesh, as a signatory to the Millennium Declaration 2000 has committed herself to improving the status of maternal health. In addition to the global target of reducing MMR,

the country has set five more targets to achieve the goal of improving maternal health (see table 1).

In order to take necessary steps for reaching the targets it is important to know the specific reasons and extent of maternal death. Learning from the historical and current measures for reducing maternal mortality rate is required to avert maternal mortality at the targeted rate. At the same time, it is also important to understand the significance of incorporating additional targets (i.e., reduce Total fertility rate, reduce maternal malnutrition, increase median age at marriage, eliminate violence against women) to MDG Five of improving maternal health in Bangladesh.

Table 1: Targets and indicators of MDG five in Bangladesh

Global goal	Global target	Bangladesh Targets	Bangladesh Indicators
Improving maternal health	Reducing Maternal Mortality rate by three quarters between 1990 and 2015	Reduce MMR from 570 per 100,000 live births in 1990 to 143 by 2015	MMR (deaths per 100, 000 live births)
		Increase proportion of birth attended by the skilled birth personnel to 50 % by 2010	Proportion of births attended by skilled health personnel
		Reduce TFR to 2.2 by 2010	Total fertility rate
		Reduce maternal malnutrition to <20% by 2015	Proportion of mothers who are malnourished
		Increase by 2 yrs median age of girls at first marriage	Legally stipulated age at girls' first marriage
		Eliminate violence against women	Proportion maternal deaths caused by violence

Source: GOB and UN 2005, p. ii [2]

This paper endeavours to make a review on selected studies on maternal mortality that have been conducted with particular reference to (1) historical and present interventions to avert maternal mortality, and (2) the six targets of MDG Five set for Bangladesh.

II. HISTORICAL AND PRESENT INTERVENTIONS TO AVERT MATERNAL MORTALITY

The inclusion of maternal health goal as one of the eight MDGs, with the explicit focus on the target of reducing maternal mortality indicates the importance of continuing the safe motherhood efforts (AbouZahr 2003) [3]. Hence, although we focus on reaching the MDG targets, strategies for reducing maternal mortality which were in force before the Millennium Declaration should be included in this review. Decades ago, studies (Chen, Melita, Geshche, Ahmed, Chowdhury and Mosley 1974; Khan, Jahan and Begum 1986) [4] [5] found that maternal mortality is significantly related to mother's age and her gravidity that maternal mortality is high in early and late age; and at prima gravida and multi gravida respectively. These studies recommended for extensive family planning services to reduce maternal mortality. The strategic response of United Nations' Fund for Population (UNFPA) also gives a prior focus on family planning, along with emergency obstetric care (EOC) and skilled attendance at birth (UNFPA 2002).

Some authors underscore the need for extensive community intervention to reduce maternal mortality. Using the example of community intervention of local female facilitators to educate women in Nepal about maternal and new born care, Barnett, Nair, Lewycka, Costello (2005) [6] argue that the intervention shortened delays in seeking health care for obstetric complications through better awareness of warning signs, less dependence on traditional remedies and the development of stretcher schemes and funds to allow transport of sick mothers and newborns to health facilities. However, to function effectively, community intervention has to be largely supported by the formal health care system. For example, effective functioning of a higher-level health system has played a major role in keeping the midwives functioning at the community level in Matlab (Maine, Akalin, Chakrabarty, Francisco and Strong 1996) [7].

The Safe Motherhood Initiative (SMI) has adopted comprehensive steps to reduce maternal mortality by incorporating (1) provision of family planning services, (2) improvement in the socio-economic status of the women, (3) provision of safe legal abortion services, (4) provision of pre-natal care, (5) improvement in EOC, (6) training of TBA, and (7) education and mobilization of the community in its strategy (McCarthy and Maine 1992, p. 30) [8]. Nevertheless, since the launch of SMI most of the strategies to reduce maternal mortality have been

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focused on the promotion of safe abortion, training of traditional birth attendants and the risk-screening program (Freedman 2003). Although provision of safe abortion service has been an 'essential part of maternal mortality reduction efforts' the training of traditional birth attendants and risk screening program have failed to reduce the vast majority of maternal deaths (Freedman 2003, p. 99) [9].

Goodburn, Chowdhury, Gazi, Marshall and Graham (2000) [10] showed that in spite of an extensive TBA training program, in a BRAC TBA training area, no significant reduction in post partum infection had been achieved. The TBA training program in Bangladesh ended in 1998, twenty years after it was started and after training 52,000 traditional birth attendants, because it failed to contribute significantly to the reduction of maternal mortality due to poor selection of TBA trainees, insufficient supervision and inadequate content of the training program.

The risk screening programⁱ also failed as most of the life threatening complications are seen to occur in women with no risk factor (Murakami, Egami, Jimba and Wakai 2003) [11]. Despite the failure of producing expected outcome risk screening through ante natal care is still important as it monitors the health of the pregnant woman in terms of weight gain, hemoglobin and iron folate levels, blood pressure etc. and also make women educated and aware about the symptoms of obstetric complications and source of available medical facilities for complications.

Based on the failure of previous initiatives a consensus has been reached among policy makers, planners and activists not to spend scarce resources in trying to predict which women will have life threatening complications (Freedman 2003; Wardlaw and Maine 1999 [12], UNFPA 2003) [13]. Rather, it has been agreed to treat every pregnancy will be treated as risky and be given access to quality health care.

Freedman (2003) recommends three key elements of quality health care, namely (i) a skilled attendant at delivery, (ii) access to EOC in case of complications, and (iii) a referral system to ensure that those women who experience complications can reach life-saving EOC in time. The UN task force report on achieving the MDG (Freedman et. al. 2005) also recommends these three key

elements of healthcare to prevent maternal deaths. The prevalence, access and proper utilization of health care system with EOC facilities centres on these key elements of health care.

Although a skilled birth attendantⁱⁱ can help prevent some infections through the practice of good hygiene during child birth and can help manage the obstetric labour s/he would fail to manage sudden obstetric complications, if s/he is not backed up by a functioning health care system, which is facility based and has interaction with the community and individual it serves (Freedman et. al., 2005, p. 7). Similarly, access to EOC and an effective referral system also reflect that without a functioning health care system reduction of maternal mortality is not possible. The Task Force takes a rights based approach to healthcare and argues that

“A rights based approach will pay particular attention to the link between supply and demand, establishing constructive accountability mechanisms that involve community to ensure consistent 24-hours-a-day, 7-day-a-week functioning equitable access and high quality, responsive care” (Freedman et. al., 2005, p. 7).

Thus, the recent recommendations for reducing maternal mortality rely largely on a functioning health care system to treat obstetric complications.

Recognizing the paramount importance of EOC some authors recommend the inclusion of the availability of EOC as a monitoring indicator of MDG 5. The indicator of availability of EOC is defined as the number of facilities that provide basic and comprehensive EOC for every 500,000 population.

In conclusion to this section, it can be said that the strategies to reduce maternal mortality have taken different types of focus. One strategy is built on the experience of the previous strategy's outcome. For example, based on the inadequacy of the traditional birth attendant (TBA) and risk screening programs, a functioning health system approach to manage obstetric complications has been developed. But the functioning health system program may produce the best result only if it is implemented through an appropriate collaboration with community level initiatives.

III. MDG FIVE TARGETS SET FOR BANGLADESH.

As previously mentioned, along with the two global indicators of MDG Five, Bangladesh has incorporated four more targets for the goal of improving maternal health. In Bangladesh two thirds of the maternal death is caused by obstetric complication (Rahman, Akhter, Chowdhury, Yusuf and Rochat 2002, p. 1) [14]. Seventeen percent of maternal death is caused from indirect cause and 14 percent from domestic violence and injury (Rahman, Parkhurst and Normand 2000, p. 6) [15]. Apart from that, malnutrition, a high and slowly decreasing rate of fertility and early age at pregnancy have contributed to maternal health situation in Bangladesh going from bad to worse. Due to these reasons, indicators such as the reductions of TFR and proportion of malnourished women and increasing women's age at marriage have been included in the MDG Five targets for Bangladesh.

In a comprehensive overview on the maternal mortality situation in Bangladesh, the Government of Bangladesh and the United Nations (GOB and UN 2005) found that one significant factor behind high MMR in Bangladesh is a large proportion of adolescent mothers. The maternal mortality ratio (MMR) among adolescent mothers is 30-50 percent higher than the overall national rate. However, although this study has shown that the MMR has declined from 570 per 100,000 live births in 1990 to 400 in 2000, it is still at a very high level. One of the MDG targets, the proportion of births attendant by skilled health personnel has shown only a very modest increase (5% in 1990 to 12% in 2000) with a high variation by income group. Regarding TFR the study reported that in spite of a steady increase in the level of contraceptive prevalence rate (CPR) from 45% in 1994 to 58% in 2004, the TFR has plateaued, partly due to adolescent fertility, which is extremely high at 14.4 %. Assuming that there will be 40 million women of reproductive ages by 2015, the study (GOB and UN 2005) considers it as a big challenge to find the causes of the current stagnation of the fertility level and how to break through it.

Regarding Goal 5 of reducing maternal mortality ratio (MMR) to 143 per 100, 000 live births by 2015, the rate of reduction in MMR should be higher than it is now (4.07 %). It is critical to meet this challenge. However, the study has made no

mention of the variation in maternal mortality in terms of socio-economic class or regions. More surprisingly, although global attention to reduce maternal mortality is now focused on the functioning of the health system, this study (GOB and UN 2005) hardly emphasizes the improvement of the health system in Bangladesh.

The People's Forum on MDG (2005) [16] presents the people's views and perceptions about the progress towards MDG in Bangladesh. This study, which employs a participatory approach, has identified some contributing factors to maternal mortality as identified by local people. Key factors mentioned were improved medical science, increased number of doctors, nurses and TBAs, free immunization, increased awareness and improved education. People also have identified that issues such as illiteracy, lack of health education, family non-cooperation, domestic violence, early pregnancy, improper service provided by the medical personnel, malnutrition etc., are also challenges in meeting the MDG Five. The strategic recommendation that people consulted are proper training of health workers, family planning, awareness building, combating superstition, strong social and legal steps to stop early pregnancy. Although they have not given any particular focus on EOC or to the functioning of the health system, they have shown concerns regarding the components of health system like doctors, nurse, medical equipment, timely service etc.

The first two targets of MDG Five in Bangladesh are reduction of MMR by two thirds and increase in the proportion of births by skilled health personnel by two thirds by 2010. It has already been mentioned that skilled attendants alone cannot help much in reducing maternal mortality, unless they are backed up by a well functioning health system with effective EOC facilities. However, Buttiëns, Marchal and Brouwere (2004) [17] argue for skilled attendance at every delivery, firstly because the early detection and timely and appropriate management of obstetric complications is crucial to save women's lives; secondly, historical evidence shows that wherever maternal mortality was reduced, in the majority of cases the delivery was attended by skilled birth attendants.

But SAFEⁱⁱⁱ strategy argues that skilled birth attendants are parts of a functioning health system, as revealed in its schematic framework for 'Skilled

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Attendance at Delivery', which is a process through which a woman is provided with adequate care during labour, birth and the postpartum period (Bell et al., 2003, p. 228) [18]. This process has two components, one of which is skilled attendance at birth and the other is an enabling environment.^{iv}

Several studies have been done to assess various projects undertaken in Bangladesh for reducing maternal mortality, especially to improve the health system and manage obstetric complications. Islam, Hossain, Islam and Haque (2005) [19] assessed the effects of an intervention supported by UNICEF^v and UNFPA^{vi} on the UN (EOC) process indicators in Khulna division, Bangladesh. This study compared the EOC situation in the Khulna division before and after the intervention. There was an approximate 3.5 fold increase in the CEmOC after the intervention. Similarly compared to the base line data there was a 119 percent increase in institutional deliveries, 141 percent increase in met need and 151 percent increase in caesarean section (CS) as a proportion of all expected births in the division. Gill and Ahmed (2004) have examined the pilot project of the same UNFPA strategies to strengthen all 59 district hospital and selected 120 Union Health Complex (UHC) to provide 24-h CEmOC service in Rajshahi division. The study found that deliveries at the MCWCs increased three-fold as a result of strengthening health service delivery and infrastructure and improving linkage between the MCWCs and higher and lower level health care facilities. However, although these two studies depict a remarkable success in introducing and implementing EOC in Bangladesh, both of these studies found that there were many more obstacles yet to overcome. Islam et. al., (2005) in their study, mentioned a huge unmet need, especially for comprehensive EOC which could be explained not only by a dearth of services, but also by a lack of community spirit to seek care and to look for quality of care. On the other hand, according to Gill and Ahmed (2004) [20], infrastructure, human resources and socio-cultural barriers prevent many women from accessing the EOC services. Both of these studies suggest that community and social mobilisation and making of health facilities to increase the level of utilization should be parts of the drive to reduce maternal mortality in Bangladesh.

Quality of health care for women in Bangladesh is seriously hampered by corruption, mismanagement and absence of cultural sensitivity among the

health care providers. Afsana (2004) [21] found that rural women coming for the treatment of obstetric complications face serious costs both in terms of time and money. At each and every step of getting service delivery at hospital they have to pay unusually high fees, which they are not prepared to pay. The author found serious amounts of corruption with involvement from high level officials to the lowly placed ward boys with the result that the ultimate ill effects go to the patients. In another similar study Afsana and Rashid (2001) [22] has shown how disrespect of cultural norms by the health care providers in health care centres discourages women to come to seek health care. This study, conducted to assess the performance of a BRAC health care centre found that in spite of an excellent rapport of BRAC with the community, their encouragement of women to utilize a BRAC Health Centre (BHC) for delivery has not succeeded. Lack of proper communication with the patients and disrespect for traditional birthing position practice, ignorance of the sense of privacy of patients and misconduct by the female paramedics (maternal health care provider in the BHCs) have made the women reluctant to go to BHCs for their health care. The two studies mentioned above provide appropriate examples of the need to address issues of cultural sensitivity in health care services, especially in rural areas of Bangladesh.

Bangladesh has incorporated total fertility rate (TFR), age at marriage, malnutrition and violence against women in its list of targets under the MDG Five. All the variables associated with these indicators have indirect effects on maternal mortality. But no significant study has been done to see the progress of these indicators and to establish the linkage of these variables with maternal mortality in the light of the MDG. However they have been studied extensively from different view points.

McCarthy and Maine (1992) show in their framework that one of the ways to lessen maternal mortality is to reduce the likelihood of a woman of being pregnant. Here lies the importance of TFR in mortality reduction. We have also found some studies in our previous discussion, which emphasize extensive family planning program to reduce maternal mortality. Fertility reduction can contribute to maternal mortality reduction in two possible ways; i) it reduces the likelihood of a woman to get pregnant and ultimately obstetric

complications, which lead them to death. ii) reduction of fertility through proper family planning program can reduce 'too early, too late, too many and too close' pregnancy, all of which increase the risk of maternal death. We have already seen in some studies that age, parity and gravida have a significant correlation with maternal mortality.

Bangladesh has achieved an exemplary reduction in fertility with the TFR falling from 6.3 in 1971-1975 to 3.3 in 1994-1996 (NIPORT et. al. 2005) [23]. However, the TFR plateaued for some time after 1994-1996, but the BDHS 2004 shows that after a decade-long stagnation the TFR has declined again from 3.3 to 3.0. This modest decline is observed in all administrative divisions of the country except Sylhet and Rajshahi. Recent studies on fertility focus mainly on the causes of fertility stagnation, especially to find out the reasons why the TFR had been stagnant even after continuous increases in contraceptive prevalence rates (CPR) from 8 percent in 1975 to 44.6 percent in 1993-94 and to 58 percent in 2004 (NIPORT et. al. 2005, p. 67). Various authors have identified different factors influencing fertility in Bangladesh, such as sex preference and desired family size, economic and social changes, especially growing aspirations in life (Caldwell and Khuda 2000) [24], women's participation in income generation activities and autonomy (Kabir, Khatun and Ahmed 1993) [25] and, of course the large scale family planning program in Bangladesh (Bairagi 2001) [26]. Amin and Llyod (2002) [27] explained the lower than expected level of fertility by the lower level of desired family size, the greater availability of abortion services and contraceptive services. Islam et al. (2003) [28] discussed the trends in regional variations in fertility in Bangladesh. According to their findings, Rajshahi and Khulna have the lowest levels of fertility due to, small desired family size, extensive use of contraception, better utilisation and availability of family planning outreach services. However, no firm conclusion has been found for the stagnation of fertility for several years.

Inclusion of increased age at first marriage as one of the MDG Five indicators in Bangladesh indicates its importance in reducing very early pregnancy. Early pregnancy is a well-known risk factor of obstetric complications. Especially since adolescent bodies are not sufficiently developed to carry a pregnancy safely. Their skeletal growth is

not complete until the age of 18 and birth canal is not matured until the age of 20 to 21 (Safe motherhood fact sheet; Delay marriage and first birth, 1998, p. 2) [29]. This physical immaturity increases the risk of prolonged or obstructed labour leading to maternal death (Safe motherhood fact sheet; Delay marriage and first birth, 1998, p. 2).

Nevertheless, not many studies have been done in Bangladesh with a particular focus on the relationship of maternal mortality and age at marriage. Available data show that the reason for higher MMR in Bangladesh, among others, is a large proportion of adolescent mothers. MMR among adolescent mothers is 30-50 percent higher than the national rate (UN and GOB 2005). Early age at marriage (median of 15 years) contributes to early pregnancy, as marriage is the usual entry point to sexual union in a traditional society like Bangladesh. Although the legal age at marriage of women has been increased from 14 to 18 years for girls, about 50% of women in Bangladesh are married by the time they are 15 years old, down from 60% three years earlier (WHO n.d). Still 80% of Bangladeshi women marry during their adolescence and increase the likelihood of high risk and ill-timed births and more births over their reproductive life. Fifty seven percent of Bangladeshi women have a child by age 19 (WHO n.d.). Early marriage is, to a large extent, related to the existing cultural norms and practices of the society. It is associated with a number of poor social and physical outcomes for young women and their offspring. On average, girls who marry as adolescents attain lower level schooling, have lower social status in husbands' families, have less reproductive control and suffer higher rate of maternal mortality and domestic violence (Field 2004, p.1) [30]. Thus age at marriage acts as an immediate factor to determine fertility rate. A study done in the Middle East found that mothers who married before the age of 16 were at about double the risk of chronic maternal illnesses and miscarriage during their childbearing period (Shawkey and Milaat 2001, p. 30) [31].

Most of the studies on nutrition have been done in relation to child malnutrition. In other words, maternal malnutrition has been studied to understand its effect on a child's development. In that sense maternal malnutrition and its effect on maternal health itself has remained much less focused. At present in Bangladesh 45 % of mothers are malnourished and the goal has been set to

reduce it to less than 20 % by 2015 (GOB and UN 2005, p. 32). Malnutrition manifests in many forms in a woman's body, such as anemia, low body mass index (BMI), stunting, wasting, energy deficiency etc. However, the MDG progress report (GOB and UN 2005) has not particularly mentioned which of the manifestations are to be used as indicators of malnutrition. In Bangladesh mothers suffer from malnutrition due to poverty and gender-discriminatory food allocation within the family (Ahmed, Adams, Chowdhury, Bhuiya, A. 2000) [32]. Thus reaching the MDG target in terms of reduction of proportion of malnutrition calls for poverty reduction and building awareness and providing education on food and nutrition.

Bangladesh has also incorporated violence against women in its MDG Five target, as 14 percent of maternal death is caused by violence^{vii}. Human Development Report 2000 shows that approximately 54 percent of Bangladeshi women have been abused at sometimes or another by their partners (Haque and Clarke 2002, p. S45) [33]. However, few studies have been done to identify the relationship or cause effect analysis between domestic violence and maternal mortality. In fact, the definition of maternal death due to domestic violence is yet to be decided upon (Espinoza and Camacho 2005, p. 123) [34]. Neither the already agreed definition of maternal death nor the pregnancy related death includes the component of violence against women. However, different studies use the term differently regarding to the context of the research and study area. For example, Granja, Zacarias and Bergstrom (2002, p. 6) [35] consider violent maternal deaths as the 'subset of deaths of women while pregnant or within 42 days of termination of pregnancy due to intentional injury (suicide or homicide)'. The authors also include death due to unsafe abortion in this category. In most of the studies a strong association has been found between violent maternal death and a weak law and order situation of the country, less access to safe and legal abortion procedures and social stigma (especially due to being pregnant out of wed-lock) (Espinoza and Camacho 2005). Ahmed, Ginneken, Razzaque and Alam (2004) [36] considered the disadvantaged position of women in Bangladesh society as the key underlying social cause of violence. They found that death rates from violence against women in their study area (Matlab) remained unchanged between 1982 and 1998, indicating no reduction of ill treatment of women

and less focus on gender violence in Bangladesh. Ahmed (2005) [37] found that extreme poverty, patriarchy, systematic discrimination from birth, illiteracy, early marriage and unequal power relations make women vulnerable to gender based violence, especially domestic violence. In spite of the severity of violence against women in Bangladesh, its impact on women's health has not been addressed as discrete issue at the policy level (Afsana, Rashid and Thurston 2005, p. 1) [38]. The national health policy of Bangladesh does not state the issue of gender based violence. However, some initiatives have been taken to recognize and address gender violence in different programs, like HPSP, Women's Friendly Hospital Initiative (WFHI), One Stop Crisis Center (OCC) under the Ministry of Health and Family Welfare (MOHFW) etc (Afsana et. al., 2005, p. 2). WFHI has been taken as part of an overall strategy aimed at overcoming the situation of high maternal mortality in Bangladesh (Haque and Clarke 2002, p. S45). The OCC began at two tertiary hospitals in Bangladesh in 2001 to offer health service to the victims of violence (Afsana et. al., 2005, p. 2). But these initiatives are working slowly and poorly due to insufficient resources, existing social stigma, lack of political will, lack of security for those who are working against violence and reluctance of the health professionals (Afsana et. al. 2005, p 13-17). Domestic violence can be a threat against the initiatives for reducing maternal mortality in Bangladesh. Because, even if the obstetric complications had been managed by efficient health care services, the prevailing domestic violence against pregnant women would tend to keep the maternal mortality ratio high. Therefore it is very important that the problem of domestic violence is adequately addressed. However, further analysis and more in depth studies in relation to domestic violence and maternal mortality are required.

IV. CONCEPTUAL FRAMEWORK OF MATERNAL MORTALITY AND MDG FIVE IN BANGLADESH

From the discussion above, one can realize that reaching the target of millennium development goal in Bangladesh has taken a complicated feature, as it has incorporated some different targets and indicators, which are not directly related to maternal mortality but are important indirect contributory factors. The conceptual framework presented in figure 1 is an attempt to present the relationship of Bangladesh MDG Five

targets (i.e., MMR, proportion of skilled birth attendant, TFR, malnutrition, violence against women, age at marriage) with its target of reducing maternal mortality ratio. The area of strategic response to these indicators has also been addressed in this framework. This framework is developed based on the literature review presented here. While a number of maternal mortality framework have already been developed by different authors (e.g., IMMPACT^{viii} framework, McCarthy and Maine framework, Thaddeus and Maine's three delay model), the significance of this particular framework lies in its own characteristics;

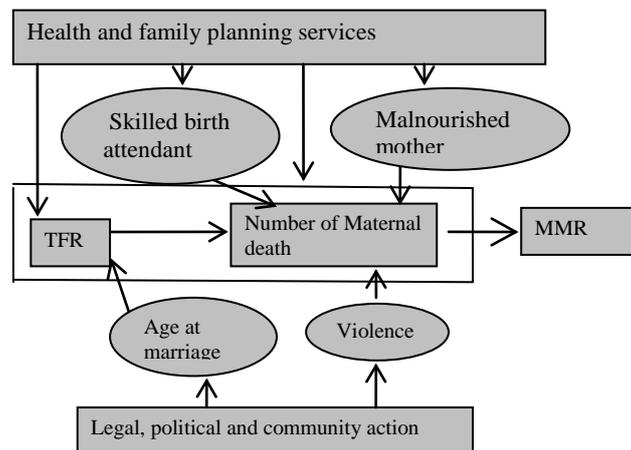
(1) This is a framework of MDG Five of particularly of Bangladesh. Although, some studies have been done to analyze the

situation, progress and to address the complexity of MDG five in Bangladesh, no framework inclusive only of the given indicators has not been developed yet.

(2) The previous frameworks, although have explained maternal death or disability or addressed how to reduce maternal mortality, none of them has particularly shown, how the MMR is being affected. This framework endeavors to show how the given indicators are related not only maternal death, but also to MMR, the global as well as national target of MDG Five.

(3) This framework reveals the underlying importance of inclusion of additional indicators to MDG Five in Bangladesh.

Figure 1: Conceptual framework of the millennium development goal of improving maternal health in Bangladesh



By definition MMR is a function of number of maternal death and number of live birth, which is expressed in TFR; so, in other words, MMR is a direct function of TFR and number of maternal death. We have already known from McCarthy and Maine framework (1992) that reduced likelihood of falling pregnant, in other words reduced rate of fertility, is the first step to reduce the risk of developing obstetric complication. Moreover fertility rate indicates the lifetime risk of maternal mortality. Every time a woman becomes pregnant, she runs the risk of death. A woman's risk of maternal death accumulates over her reproductive life time (UNICEF, WHO and UNFPA 1997, p. 16) [39]. Thus fertility rate affects the number of maternal death in two ways, it indicates the number of births (each time a woman gets pregnant, she is in the risk of obstetric complication at anytime

during pregnancy or child birth) and it determines the lifetime risk of maternal mortality.

The other four targets (skilled birth attendants, malnutrition, marriage and violence) contribute to maternal mortality by influencing either fertility rate or maternal death. Age at marriage plays an important role in determining TFR. Fifty seven percent of Bangladeshi women have their child by age 19 (WHO n.d.) and have a significant contribution to the high rate of fertility. However that might be offset by an extensive use of contraception. Adhikari (2001, p. 63) [40] has shown in a comparative study that although teenage contribution to TFR (18%) is high in Bangladesh than in Nepal (13%), the lower overall TFR in Bangladesh (3.3) may be due to the higher prevalence of contraceptive use among adolescents in

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Bangladesh (33%) compared to Nepal (7%). Regarding maternal mortality in Bangladesh where mortality rate among adolescent mothers are 30-50 percent higher than the national rate, increased age at marriage can have a significant role in reducing MMR in two ways; firstly, increased age at marriage lengthens time, women could stay outside the activities of marital union, bearing and giving birth to child. So, in the long run, they produce less number of children and have less lifetime risk of maternal mortality. Secondly, increased age at marriage can largely reduce the risk of teenage pregnancy, which is more vulnerable to obstetric complication due to physical immaturity. If the target of legally stipulated marriage of 20 years was applied throughout the country, the women would be out of risk of adolescent pregnancy and obstetric complication.

Violence against women, causing 14 percent of maternal death in Bangladesh deserves a great concern in maternal mortality reduction program and activities. Violence against woman, especially beating during pregnancy and unsafe abortion can directly cause maternal death. However, violence has not been incorporated in the conventional definition of maternal death or pregnancy related death. Even no clear ideas on which type of violence are contributing to maternal death has been revealed in the already done studies.

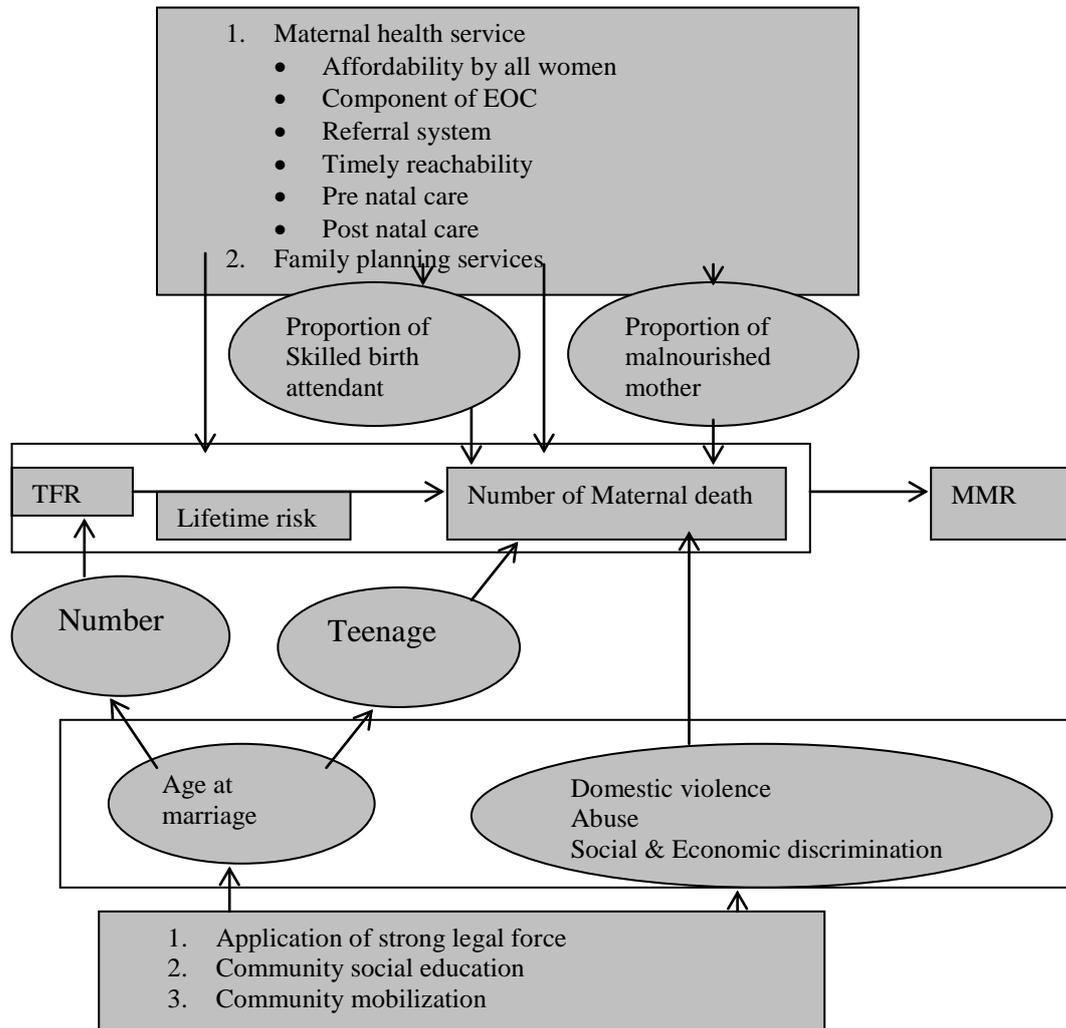
The other two targets, skilled attendants at birth and proportion of malnourished mother also cause maternal death. We know from the literature review that skilled attendants at birth supported by proper referral system and health service equipment can manage obstetric complication, thereby the risk of maternal death. Because they are trained to manage uncomplicated delivery safely, recognise complications, treat those they can and refer women to health centers or hospitals if more advanced care is needed (Safe Motherhood Fact Sheet; Ensure Skilled attendance at delivery 1998, p.1) [41]. Malnutrition revealed in anemia, Body mass index (BMI) (less than 18.5), height (less than 145 cm) of women are one of the causes of increased risk of developing obstetric complications.

The strategic response to the relationship of these indicators with the MDG targets of reducing MMR

comes from health and family planning services as well as from legal, and community actions. In this framework health system has two components, maternal health and family planning services. Maternal health service refers to equal, available, quickly reachable and affordable maternal health service with an efficient referral system, particularly in the case of managing obstetric complication. In other words this health system must have the components of EOC (Figure 2). To be specific it should work with sufficient equipment, skill and management in such a way that all the women with obstetric complications get timely, appropriate and affordable treatment. According to mother baby package this health service along with quality antenatal care and postpartum care reduce the number and severity of obstetric complication (WHO n.d., p. 6). Moreover, prenatal care contributes to provide knowledge on importance of nutrition of maternal health as well as on its source. Freedman et. al. (2005) mentioned it as 'functioning' and 'rights-based' health system. Thaddeus and Maine (1992) [42] in their three-delay model mentioned the importance of quickly reachable health service to avoid maternal death due to delay. The other component, Family planning service aims at reducing the likelihood of women's falling pregnant and reducing the number of high risk and unwanted pregnancies.

In terms of age at marriage and violence against women the strategic response should come from the legal and community action. A functioning and transparent legal force could place some exemplary punishment against those who perform domestic violence. Similar can be done for age at marriage. In Bangladesh, the median age at marriage is 15, although legally stipulated age at marriage has already been set as 18. This prevailing gap between legally stipulated and median age at marriage indicates, among others, the inefficiency of law enforcement agency. However, legal action is not enough to stop violence against women or to increase age at marriage, unless it is accompanied by a strong community education and mobilization. Both male and female within the family should be provided with education on the danger and ill effect of violence and discrimination against women and early marriage.

Figure 2: Detailed conceptual framework of the millennium development goal of improving maternal health in Bangladesh



V. CONCLUSION

It may be noted that the framework suggested in this paper incorporates only the given indicators of MDG Five in Bangladesh. Therefore, theoretically it does not cover all aspects of maternal mortality or factors related to it. However, the framework underscores that any reduction in maternal mortality in Bangladesh needs to be addressed from a multidimensional perspective.

From the literature review it can be concluded that although maternal death occurs during pregnancy, delivery or post delivery period, there are numerous socio-economic, cultural and demographic factors that contribute to it. In that

sense maternal mortality is a multifaceted and broad based issue to be considered. The inclusion of additional four targets in the millennium development goal Five for Bangladesh, namely total fertility rate, age at marriage, violence against women and malnutrition also reflects this complex reality of maternal mortality. The world wide and country specific response to maternal mortality also grasp a wide range of program, starting from small scale community intervention to formal national health care system. However the importance of management of obstetric complication through an efficient and functioning health system, particularly to reach the MDG Five target of reducing maternal mortality by three quarters by 2015, is on the top priority in maternal mortality reduction strategy.

Millennium Development Goal of Improving Maternal Health in Bangladesh

Reducing maternal mortality in Bangladesh has also taken multidimensional programs. However, the importance of skilled attendance at delivery and management of obstetric complication has been on priority. The improvement of maternal health and related indicators in Bangladesh can be attributed by the expansion of maternal health service with Emergency obstetric care facilities (EOC) facilities, community mobilization and awareness about health problem and importance of seeking health care, female education and empowerment, extensive family planning service and the like. However, in Bangladesh to provide improved maternal health care with the aim of reducing maternal mortality, there are many gaps still to fill such as high unmet need for EOC and other obstacles. We could identify lack of resources, both at the community and health care centres, poor allocation of equipment and staff in the health care centres, the misunderstanding of cultural sensitivity in the health care centres, poor infrastructure, especially transport, corruption, low motivation of women and their families to seek care as some of the obstacles.

The conceptual framework establishes a relationship among the targets, and between the targets and reduction of maternal mortality. It underscores the fact that the MDG targets set for Bangladesh, some way or others are affecting maternal mortality. In addition to that, it is also to be mentioned that each targets are again influenced by various other socio-economic, demographic and cultural factors, which are presented in the analytical framework of fertility, age at marriage and skilled attendance at birth. It has to be recognised that not all the targets for MDG Five in Bangladesh has been well studied much in relation with maternal mortality. For example violence against women, although is an important cause of maternal death, is yet to be studied, particularly which type of violence and how causes maternal mortality. The literature review also reveals a lack of sufficient study in relation to the progress, variations, evaluation of MDG Five and its targets in Bangladesh.

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APPENDIX

Endnotes

- i. An enabling environment is defined by adequate supplies and equipment, functional infrastructure, supportive regulations and policies, and communication and referral mechanisms to reach a higher level of care (Bell et al., 2003, p. 228)
- ii. A skilled attendant is a medically qualified provider with midwifery skills (midwife, nurse or doctor) who has been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer obstetric complications. Ideally, skilled attendants live in, and are part of, the community they serve. They must be able to manage normal labour and delivery, perform essential interventions, start treatment and supervise the referral of mother and baby for interventions that are beyond their competence or not possible in a particular setting (UNFPA 2004, p.7).
- iii. Skilled Attendance for Everyone.
- iv. An enabling environment is defined by adequate supplies and equipment, functional infrastructure, supportive regulations and policies, and communication and referral mechanisms to reach a higher level of care (Bell et al., 2003, p. 228)
- v. UNICEF along with GOB and AMDD implements Women's Right to Life and Health (WRLH) project, through out the country for reduction of maternal mortality and morbidity. The project strategy is to strengthen all 59 district hospital and selected 120 UHC to provide 24-h CEmOC services. Major WRLH intervention includes needs assessment, minor renovation of the facilities, human resource development, and supplying necessary equipment and logistics. The project also has undertaken activities of providing health education in the communities (Islam et. al., 2005, p. 300)
- vi. UNFPA in 1993, has taken the similar intervention through directorate of family planning, Bangladesh to establish CEmOC services at 64 MCWCs through out the country (Islam et. al., 2005, p. 300).

- vii. Hardly any study has been done regarding the type of violence that casues maternal death. However considering the context of Bangladesh, wife beating during pregnancy, gender discrimination in food allocation, illegal abortion can be considered as the violence that causes maternal death.
- viii. Initiative for Maternal Mortality Program Assessment