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Millennium development goal on maternal health in Bangladesh: progress and prospects

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ABSTRACT

The main objective of the study is to provide an assessment of the feasibility of achieving the Millennium Development Goal on improving maternal health in Bangladesh (known as Millennium Development Goal Five or MDG Five). The study has found that there exists a considerable gap between the current and required rates of progress towards achieving the targets. The existence of such a gap poses a question about the feasibility of reaching MDG Five targets on time. The study has also identified notable variations among the six administrative regions of Bangladesh in terms of the rates of progress towards the targets. The study has identified some policy implications regarding the MDG Five targets. One of the major aspects of strategies to reduce maternal mortality in Bangladesh is to provide maternal health care services to all women, regardless of their socio-economic status. It is also important to promote community mobilisation activities,, provide education to women and build awareness, and satisfy unmet need for contraception.

1. 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 (United Nations Millennium Declaration, 2000; Nanda, Switlick, and Lule, 2005). 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 (People's Forum on MDG, 2005) has committed herself to improving the status of maternal health along with striving to achieve other development goals of eradicating extreme poverty and hunger, achieving universal primary education, promoting gender equality and empowering women, reducing child mortality, combating HIV/AIDS, malaria and other diseases, ensuring environmental sustainability and developing a global partnership for development (GOB & UN, 2005). But Bangladesh has a very high MMR of 320 per 100,000 live births. More than half of the pregnant women do not have access to necessary health care and 20 % of the total deaths of women aged 15 to 49 are caused by complications related to childbirth. The scenario of maternal health status is not similar in all the six administrative regions

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Bangladesh is divided into six administrative regions; namely Dhaka (capital City), Rajshahi, Chittagong, Khulna, Sylhet and Barisal. in Bangladesh. Rather there is a discernable variation in MMR and other maternal health indicators among these six administrative regions of Bangladesh.

Table 1
Variation in maternal health status in six administrative regions in Bangladesh

Administrative regions	Proportion of birth attended by skilled personnel	TFR*	MMR (per 100, 000 live births) (2001)
Barisal	19.2	2.9	387
Chittagong	23.7	3.7	325
Dhaka	26.4	2.9	320
Khulna	29.7	2.8	351
Rajshahi	22.0	2.6	223
Sylhet	16.8	4.2	471

Sources: NIPORT, Mitra and Associates and ORC Macro, 2003, P. 2 * NIPORT et. al., 2005

Table 1 shows that Rajshahi has the lowest level of MMR and Total fertility rate (TFR), while Sylhet has the highest rate of MMR and TFR. On the other hand, in terms of proportion of birth attendant by skilled personnel Khulna has the highest rate followed by Dhaka. Thus a wide variation persists among the regions. Although overall rates in all regions are not satisfactory, the higher rate of MMR in some regions, compared to others, consequently affect the national maternal health statistics.

A reduction in these region specific rates and in the differences among the regions would help in achieving an overall decline in the national MMR. But hardly any study has been done to identify the region specific causes of maternal death and to address the importance of region specific maternal health initiative to reach maternal health goal. Therefore, studies are necessary to identify the region specific factors contributing to maternal mortality as well as to develop the region specific strategies to address the problem.

Bangladesh in addition to the two global targets for MDG Five has set four more targets to achieve the goal of improving maternal health (Table 2). These are reduce fertility, increase age at marriage, stop violence against women and improve nutritional status of mother. The strategies can, in fact, act as preventive measures to reduce MMR in Bangladesh.

Table 2
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 10,000 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 Total fertility rate
		Reduce TFR to 2.2 by 2010	Proportion of mothers who are malnourished
		Reduce maternal malnutrition to <20% by 2015	Legally stipulated age at girls' first marriage
		Increase by 2 yrs median age of girls at first marriage Eliminate violence against women	Proportion maternal deaths caused by violence

Source: GOB and UN, 2005

Bangladesh has experienced good progress in some of those targets with different initiatives has taken to improve maternal health. Maternal Mortality Ratio (MMR) decreased from 410 to 320 deaths per 100,000 live births. However, progress has not occurred in all the sectors at the expected rate. Table 3 shows that Bangladesh is lagging far behind reaching the target of millennium development goal. MMR is reducing at the rate of 4.7 %, but to reach millennium goal by 2015 the expected rate has to be 5.53 %. Similarly in terms of proportion of birth attended by skilled personnel the rate of increase has to be 9.21 %, where as the current rate is 6.25 %.

Table 3
Progress towards achieving MDG Five in Bangladesh

Bangladesh targets	Indicators	Base year 1990	Goal year 2015	Required rate*	Current year 2000-2002	Current rate*
Reduce MMR from 570 per 10,000 live births in 1990 to 143 by 2015	MMR (deaths per 100, 000 live births)	570	143	5.53 %	322	4.07 %
Increase proportion of birth attended by the skilled birth personnel to 50 % by 2010	Proportion of births attended by skilled health personnel	5%	50%	9.21%	12%	6.25%
Reduce TFR to 2.2 by 2010	Total fertility rate	3.3	2.2	.02	3.3	0%
Reduce maternal malnutrition to <20% by 2015	Proportion of mothers who are malnourished	Na	<20%	-	45%	-
Increase by 2 yrs median age of girls at first marriage	Legally stipulated age at girls' first marriage	Na	20yrs	-	18yrs	-
Eliminate violence against women	Proportion maternal deaths caused by violence	Na	0	-	14	-

Source: GOB and UN, 2005
*Calculated from the given data

Research question

The wide gap (as shown in table 3) between the current and required rate of progress towards Millennium Development Goal Five sensibly raise a question of how far it is possible for Bangladesh to reach MDG within the time limit of 2015. This present research, therefore, has set the research question; what is the feasibility of reaching MDG Five in Bangladesh by 2015? It aims to analyse how far it would be possible to meet the target of reducing maternal mortality by three quarters between 1990 and 2015 in different administrative regions. The specific objective of the paper is to observe the trends and the regional variations in the indicators of MDG Five by country and regional divisions.

Method of the Study

The study is based on an analysis of secondary data. To examine the trends of progress for each indicator for the Millennium Development Goal of improving maternal health a comparison among the current rate of progress (between 2001-2004) for each target of maternal health goal, the expected rate of change (what rate of change was expected since 2001 to reach the goal by 2015) and required rate (what rate of change is required rate from now on to reach the goal by 2015) has been done in the analysis. In this study data have been directly taken from the report of Bangladesh Demographic and Health Survey (BDHS) 2004 and that of Bangladesh Maternal Health Service and Maternal Mortality Survey (BMMS) 2001 for the analysis. The best advantage of using these data is that, in

both of them, data have been collected and presented by administrative regions. This makes it convenient to use these data for looking at regional variations.

Findings

The findings of the analysis present the current situation of maternal health goals and their indicators in Bangladesh. It also presents the variations in terms of targets achievements in the six regional divisions of Bangladesh and the prospects of achieving the target goals by 2015.

Maternal and pregnancy related mortality ratios

BMMS 2001 (NIPORT et al., 2003) has produced regional data on Maternal Mortality Ratio (MMR). But the BDHS 2004 (NIPORT et al., 2005) does not provide any information on MMR. Therefore, the present study uses only the BMMS 2001 for data on MMR. In addition to regional variations on MMR, the BMMS (2001) survey presents data on trends of pregnancy related mortality ratio (PRMR), which is defined as the ratio of all deaths (not just maternal deaths) occurring during pregnancy, delivery and 42 days after the birth, irrespective of causes to 100,000 live births (NIPORT et al., 2003). Because, in practice it is not always possible to identify accurately those causes of death that are defined as maternal deaths. The Tenth Revision of the International Classification of Diseases (ICD-10) introduced the concept of pregnancy related deaths, which are defined as 'the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of cause of death' (WHO & UN, 2000). Pregnancy related deaths could include some deaths of women that are not strictly caused by maternal causes, and the PRMR, if used in place of MMR, could overestimate maternal mortality. Although the MDG target is about maternal mortality, PRMR can give a reasonably good estimate of maternal health status in the absence of cause specific maternal health data. The current PRMR in Bangladesh is 400 per 100,000 live births (NIPORT et al., 2003). Considering the MDG target of reducing maternal mortality by three quarters between 1990 and 2015, the PRMR has to decline to a level of 128 in 2015. In order to achieve this target, the PRMR should decline by 7.10 % per year But, the current rate of reduction in PRMR is 1.26 per year (based on estimates of PRMR in 1996-2001 and 1991-1995), and if this rate continues, then the PRMR in 2015 would decline only to 271.5 per 100,000 live births, more than twice the targeted ratio of 128 per 100,000 live births. .

Regional variations in Maternal Mortality Ratio (MMR)

There is a wide variation in MMR among the administrative regions of Bangladesh (Table 4), with Sylhet having the highest level of 471 and Rajshahi the lowest (223). The capital city Dhaka, in spite of having better hospital and maternal health care facilities, has a higher level of maternal mortality than Rajshahi. A reduction in this large regional variation in maternal mortality can certainly bring down the national MMR.

Table 4

Regional variation of MMR ratio in Bangladesh 2001

Regions	MMR per 100,000 live births
Barisal	387
Chittagong	325
Dhaka	320
Khulna	351
Rajshahi	223
Sylhet	471
National	322

Source: NIPORT et al., 2003

Proportion of deliveries performed by skilled health personnel

The Government of Bangladesh has set the goal of increasing the percentage of deliveries by skilled attendants by 50 % by the year 2010 (GOB & UN, 2005). In the medically trained skilled attendant category, the Bangladesh Maternal Health Service and Maternal Mortality Survey 2001 includes doctors, nurses, midwives, family welfare visitors, medical assistants, sub-assistance community medical officers, health assistants and family welfare assistants. In Bangladesh, doctors perform only 6.8 % of the deliveries and midwives or nurses only 5.2 % (NIPORT et al., 2003). The remaining 88 % of deliveries are done by the trained or untrained traditional birth attendants or by relatives. The progress towards achieving the target of 50 % deliveries by skilled health personnel is very slow in all the regions, and in Chittagong and Rajshahi divisions, it has shown almost no change of the level of skilled assistance at delivery (Table 5). As of 2004, only 13.4 % of deliveries is assisted by skilled health personnel (Table 5). To reach the target of 50 % skilled assistance at delivery from the level of 13.4 % estimated for the year 2001, the rate of increase in skilled assistance at delivery should be 14.27 % per annum. However, as the percentage of skilled assistance at delivery has progressed at much smaller rates in the various divisions, the required rate of change for the country during the rest of the period i.e., 2006-2010 has to be 18.81 % per annum (Table 5).

There are also variations in the percentage of births attended by skilled health personnel according to regional division. Surprisingly, in spite of having the lowest MMR, Rajshahi has the lowest proportion of births attended by skilled attendants and it has shown almost no change over the period of 2001 to 2004. On the other hand, although Sylhet has the lowest level of skilled assistance at delivery in 2004 (11.1%), it has recorded one of the faster increases (5.34 % per annum) in the same. However, the current rate of progress in skilled assistance at delivery is the highest in the Barisal division. The regional MMR and skilled delivery data do not show that region with high proportion of birth with skilled attendant has low MMR. This may raise a question of how much contribution skilled birth attendants can make in reducing maternal mortality.

Table 5
Trends and variations in proportion of birth attended by skilled personnel in Bangladesh.

Regions	Proportion of births attended by skilled personnel (observed)		Target skilled attendant at birth (by 2010)	Current rate of change (2001-2004)	Expected rate of change (between 2001-2010)	Required rate of change (between 2004-2010)
	2001*	2004**				
Barisal	8.7	11.4	50 %	6.76	17.49	21.12
Chittagong	11.7	11.7	50 %	0.00	14.52	20.75
Dhaka	13.3	14.9	50 %	2.84	13.24	17.30
Khulna	16.9	21.2	50 %	5.67	10.85	12.26
Rajshahi	10.8	10.6	50 %	-0.47	15.32	22.16
Sylhet	9	11.1	50 %	5.24	17.15	21.50
National	12	13.4	50 %	2.76	14.27	18.81

Source: * NIPORT et al., 2003
** NIPORT et al., 2005

Place of delivery

Delivery by skilled attendants should be accompanied by delivery at a health facility to ensure the safe delivery.

Regarding place of delivery there has been a negligible change between 2001 to 2004 with the rate of change of only 0.27 % per year (Table 6). To reach the target the expected rate should have been 16.93, which itself is far away from the current rate of progress. However, at present the required rate of progress to reach the target of increasing proportion of hospital delivery up to 50 % is 24.3% per year. Khulna is in better position than any other division with the 15.2% (NIPORT et al., 2005) delivery at medical facility. The BMMS 2001 medical facility category includes Government Hospitals, Upazila Health Complexes, Maternal and Child Welfare Centres, Union Health and Family Welfare Centres,, Private Hospitals/Clinics, and NGO Health Facilities. Again, Rajshahi, in spite of having lowest rate of MMR shows the most negative rate of change (-2.41). A downward trend is found in Barisal and Chittagong. Barisal also needs the highest level of change (33.18) during the years 2001-2010.

Table 6
Percentage of deliveries in health facilities in Bangladesh

Regions	percentage of delivery in health facility (observed)		Target place of delivery (by 2010)***	Current rate of change (2001-2004)	Rate of change expected during 2001 – 2010	Rate of change required during 2004 -2010***
	2001*	2004**				
Barisal	5.1	4.9	50 %	-1.00	22.83	33.18
Chittagong	8	7.3	50 %	-2.29	18.33	27.49
Dhaka	10.7	11.4	50 %	1.58	15.42	21.12
Khulna	12.6	15.2	50 %	4.69	13.78	17.01
Rajshahi	8.7	7.9	50 %	-2.41	17.49	26.36
Sylhet	6.1	6.2	50 %	0.41	21.04	29.82
National	9.2	9.3	50 %	0.27	16.93	24.03

The BMMS 2001 medical facility category includes Government Hospitals, Upazila Health Complexes, Maternal and Child Welfare Centres, Union Health and Family Welfare Centres,, Private Hospitals/Clinics, and NGO Health Facilities.

Source: *BMMS, 2001
**BDHS, 2004
*** This target was not set by GOB. However as place of delivery is closely related with delivery assistance, the target of proportion of delivery at health facilities up to 50 % has been considered here.

Total Fertility Rate

The total fertility rate (TFR) is one of the additional components of the targets that Bangladesh has set in terms of reaching the MDG of improved maternal health. The specific target with respect to the TFR is to "reduce the total fertility rate to 2.2 by 2010". Reduced fertility rate indicates reduced exposure of women to pregnancy, which in turn reduces the probability of maternal death. Thus, a reduction in TFR does not only contribute to reducing the population growth rate, but it also helps the mothers to be less exposed to the risk of maternal death. A reduction in the TFR can also be seen as an outcome indicator of the success of the Bangladesh family planning program. It indicates not only a reduction in the number of pregnancies and pregnancy-related health risks, but it also helps avoid unwanted pregnancies, and too old or too young ages women at pregnancy (UNFPA, 2003)

Table 7
Trends and variations in TFR in Bangladesh

Regions	TFR (Observed) 2001*	TFR (Observed) 2004**	TFR target (by 2010)	Current rate of change (2001-004)	Expected rate of change between (2001-2010)	Required rate of change (2004-2010)
Barisal	3.3	2.9	2.2	-3.23	-4.05	-3.95
CHT	3.7	3.7	2.2	0.00	-5.20	-7.43
Dhaka	3.2	2.9	2.2	-2.46	-3.75	-3.95
Khulna	2.6	2.8	2.2	1.85	-1.67	-3.45
Rajshahi	2.9	2.6	2.2	-2.73	-2.76	-2.39
Sylhet	4.3	4.2	2.2	-0.59	-6.70	-9.24
National	3.2	3	2.2	-1.61	-3.75	-4.43

Source: *NIPORT et al., 2003
** NIPORT et al., 2005

Table 7 underlines the fact that Bangladesh is lagging far behind in terms of the expected rate of reduction of TFR. Moreover, there is a large regional variation in TFR. The current rate of reduction in TFR at the national level is 1.61 % per annum. For reaching the target of a TFR of 2.2 by 2010, the rate of reduction needs to be 4.43 % per year. Chittagong has not recorded any change in its TFR between 2001 and 2004. Sylhet, along with the highest level of MMR, also has the highest level of TFR in the country. The gap between the current and required rate of reduction in TFR is also the highest in Sylhet. On the other hand, Rajshahi, which has the lowest level of MMR, also has the lowest level of TFR and this is the only region among the six, whose current rate of reduction is higher than the expected rate as well as the required rate to reach the MDG target. The situation is worse in Khulna, where the TFR has increased between 2001 and 2004 (Table 7).

The rate of reduction of fertility rate can be attributed, among others, to meeting the need of family planning (Bairagi, 2001). In spite of large-scale family planning services in Bangladesh, it still has 11.3 % unmet needs, again with a large regional variation (Table 8). Table 8 presents that meeting the unmet need of FP could contribute to reducing the TFR from 3 to 2.5. Sylhet would get the highest benefit from it as this division has the highest level (21 %) of unmet need, the fulfilment of which could reduce the TFR in Sylhet from 4.2 to 2.5.

Table 8
Trends in unmet need of family planning by regions in Bangladesh

Regions	Unmet need for family planning (%) 1996 -1997*	1999 -2000**	2004***	Current TFR	Expected TFR if unmet need is fulfilled	Required rate of change (2004-2010)
Barisal	18	15	13	2.9	2.3	-3.95
Chittagong	21	20	17	3.7	2.7	-7.43
Dhaka	17	16	11	2.9	2.4	-3.95
Khulna	11	11	8	2.8	2.5	-3.45
Rajshahi	11	13	7	2.6	2.4	-2.39
Sylhet	21	22	21	4.2	2.5	-9.24
National	16	15	11	3	2.5	-4.43

Source: *NIPORT et al., 1997
** NIPORT et al., 2001
***NIPORT et al., 2004

Median Age of Girls at First Marriage

Pregnancy at early age (before 20 years) leaves a high risk of complications and increases the risk of maternal death. Usually zero parity women have a higher MMR (511 in Bangladesh in 2001). The situation becomes worse if it is accompanied by early age pregnancy. In Bangladesh 57 % of the married adolescent girls become pregnant before they reach age 19 (GOB & UN, 2005). Considering this GOB and UN have recommended an increased legal minimum age at marriage from 18 years (at present) to 20 years by 2015 as one of the Millennium Development targets (GOB & UN, 2005). However, in Bangladesh the median age at marriage is 14.8 years. Table 9 shows a decreasing trend in median age at marriage from 15 in 2001 to 14.8 in 2004. There is not much regional variation in age at marriage. In all the divisions except Barisal and Rajshahi, the median age at marriage has decreased. Thus, the median age at marriage is still far away even from the current legally stipulated age at marriage of 18 years. Reaching 20 years is a long way to go.

Table 9
Trends and Variation in Median age at marriage in Bangladesh (Women aged 20-49)

Region	Median age at marriage (observed)		Target median age at marriage (by) 2015	Current rate of change (2000- 2004)	Expected rate of change (2000-2015)	Required rate of change (2004- 2015)
	1999-2000*	2004**				
Barisal	14.9	15.0	20	0.17	1.95	2.40
CHT	15.8	15.6	20	-0.32	1.57	2.07
Dhaka	15	14.9	20	-0.17	1.92	2.45
Khulna	14.6	14.5	20	-0.17	2.10	2.68
Rajshahi	14.2	14.2	20	0.00	2.28	2.85
Sylhet	16	15.9	20	-0.16	1.49	1.91
National	15	14.8	20	-0.34	1.92	2.51

Source: * NIPORT et al., 1999-2000
** NIPORT et al., 2004

The table shows that in most of the regions in the four-year period between 1999-2000 and 2004, the median age at marriage has not changed.

In Bangladesh age at marriage is largely associated with age at first childbirth, as childbirth mostly occurs within marital union. Median age at 1st first child in Bangladesh is 17.7 years (NIPORT et al., 2004). This statistic indicates a high prevalence of teenage fertility in Bangladesh, which is highly associated with high maternal mortality. Table 10 shows the trends and regional variations in teenage (15-19) pregnancy in Bangladesh indicating a slightly declining trend in teenage pregnancy except in the Chittagong, Rajshahi and Sylhet divisions. However, no particular reason has been found why some regions have experienced in increase teenage fertility. Even the increase in the use of contraception (increases 53.8 % to 58.1 % during the four year period) may not be a possible explanation. Because Rajshahi (from 58.6 % to 68.3 % from 2001-2004) and Chittagong (44.1% to 47.1% during the same time) experienced increase of rate of contraception use (NIPORT et al., 2001; NIPORT et. al., 2004).

Table10
Trends and variation in teenage (15-19) pregnancy in Bangladesh

Region	% Who have begun child bearing between age 15-19	
	2001*	2004**
Barisal	32.5	29.5
CHT	25.7	27.7
Dhaka	34.6	31.5
Khulna	40.1	37.7
Rajshahi	39.7	42.3
Sylhet	24.6	29.0
National	33.7	32.7

Source: * NIPORT et al., 2001
** NIPORT et al., 2004

Maternal Malnutrition

The target set for mother's nutritional status in Bangladesh is to reduce the proportion of mothers who are malnourished from 45% in 2000 to less than 20% by 2015. A BMI less than 18.5 indicates wasted and undernourished women (Hellen Killer International, 2001). Wasted mothers are more likely to have obstetric complications and to give birth to small infants. Malnutrition can be measured in different way, like anemia, height, weight, and calorie intake, BMI etc. However, in terms of maternal malnutrition, BMI data have been used here, as these are only available in the BDHS surveys. Instead of comparing data between 2001 and 2004, this table compares the data of BMI of mothers with under 5 children between 1996-1997 to 1999-2000, Because the 2004 BDHS presents data for all women of reproductive age, not for mother. Table 4.8 presents the proportion of mothers who have BMI less than 18.5 and the expected and required rate of change in the nutritional status of mother in terms of BMI to reach the MDG. Data presented in the table indicates a mentionable gap between the current rate and the required rate of reduction in proportion of malnourished mothers. Sylhet needs the maximum rate of reduction in the proportion of malnourished mothers (-7.3), followed Barisal (-6.5).

Table 11
Trends and variation in Status of BMI among the women in Bangladesh

Region	% of mothers of children under 5 with BMI <18.5		Current rate of reduction between 1996-2000	2015 target % of mothers of children under 5 with BMI less than 18.5	Expected rate of reduction between 1996-2015	Required rate of reduction between 2000-2015
	1996-1997*	1999-2000**				
Barisal	52.8	45.8	-3.6	<20	-4.9	-6.5
CHT	52	40.3	-6.4	<20	-4.8	-6.4
Dhaka	51.8	46.5	-2.7	<20	-4.8	-6.3
Khulna	47.6	38.9	-5.0	<20	-4.3	-5.8
Rajshahi	52.4	48.4	-2.0	<20	-4.8	-6.4
Sylhet	59.6	55.4	-1.8	<20	-5.5	-7.3
National	52.0	45.4	-3.4	<20	-4.4	-6.4

Source: * NIPORT et al., 1997
** NIPORT et al.,2001

DISCUSSION

Targets for the Millennium Development Goal (MDG) Five in Bangladesh are still far from being reached as evident from the slow rate of progress towards the targets. The wide gap between the current and required rates of progress in terms of each of the MDG Five targets questions the feasibility of reaching the goal by the scheduled time.

The trend and variation in the targets of Millennium Development Goal (MDG) Five in Bangladesh do not show any consistency. Rajshahi Division has the lowest MMR but estimates of the related indicators of Maternal Mortality Ratio (MMR) for this division, namely proportion of births attended by skilled personnel, proportion of delivery in health facility, median age at marriage, proportion of malnourished mother show that the MMR for Rajshahi should be higher. Thus to reach a straight forward conclusion that better MMR will be associated with the improved situation in the related indicators may not be easy.

The trend in most of the indicators shows very slow progress. Some regions and some indicators even show a downward trend. For example, in Rajshahi the trends in proportion of births attended by skilled personnel is negative, Barisal, Chittagong and Rajshahi show a downward trend in the proportions of deliveries in health facilities. In all the regions the Total Fertility Rate (TFR) has declined only slightly except Khulna. A very negligible change has been found in all the regions in terms the median age at marriage. The proportion of maternal malnutrition shows an improving trend in all the regions. Overall, there exists a huge gap between the current and required rate of change in the MDG indicators to reach the target set for 2015. The gap is wide enough to throw a serious challenge to Bangladesh for meeting the MDG Five.

Regarding the target of 50% of all births to be attended by skilled health personnel by the year 2010, the gap between the current rate and required rate of progress towards the goal is large. The Government of Bangladesh and the United Nations GOB and UN (2005) predict that to meet this target 1.26 million deliveries will have to be assisted by skilled personnel. Currently only 559,048 births Calculated from the current proportion of skilled attendants at delivery and the crude birth rate (CBR) from the Bangladesh Demographic and Health Survey (NIPORT et. al. 2004).are being delivered by skilled health personnel. Given the existing barriers of resource constraints, cultural barriers and poor infrastructure this situation poses a great challenge for Bangladesh to reach the MDG Five target of skilled attendance within the next four years (2006-2010) remaining before the end of the target period.

The gap between current and required rate of progress regarding the total fertility rate (TFR) is less than that of other indicators and in many regions (except Chittagong and Sylhet) the TFR is not far from the target of replacement level of 2.2. However, it is to be noticed that the higher levels of TFR in Sylhet and Chittagong have pulled up the national rate to a higher level (TFR = 3), whereas, in all the other regions, the TFR is less than 3. Although the family planning program in Bangladesh has been successful, there is still some unmet need in all the regions (with the highest in Sylhet followed by Chittagong). In Sylhet the unmet need for family planning is 21% and in Chittagong it is 17%. There will be a still better progress in the TFR target if this unmet need is met (Table 4.5). Studies are needed to be done to find out the reasons behind the high TFR in these two regions, at the same time more extensive strategies are needed to fulfil the unmet need of family planning.

Age at marriage shows almost no change over the four-year period 2000-2004, whereas the required rate of change to reach the target minimum age at marriage of 20 years is an increase in age at marriage at the rate of 2.5 years each year. The most feasible way to increase the age at marriage is to promote girls' education. In MDG Two, Bangladesh has set the goal of achieving primary school enrolment rate and completion rate up to 100%

by 2015 (GOB & UN, 2005). However, primary education by itself may not be enough to increase the age at marriage, as the girls completing primary school are still too young (i.e., less than 15 years of age). Thus delaying marriage requires girls to have higher than primary education, perhaps at least secondary education. The BDHS (NIPORT et al., 2005) finding supports this argument as women with completed secondary education or higher have the median age at marriage of 19.8 years, whereas women completing primary education have a median age at marriage of is 14.8 years.

The rate of reduction in the proportion of malnourished women indicates a steady progress towards reaching the MDG Five goal and unlike the goals about skilled delivery assistance and age at marriage, there is a much smaller gap between the current and required rates of progress to towards the MDG Five target of reducing the proportion of malnourished mothers to less than 20%. The BDHS (NIPORT et al., 2000) shows consistently lower proportions of women with Body Mass Index (BMI) less than 18.5 as educational level increases. The BDHS (NIPORT et al., 2005) also shows that the higher the wealth index, the lower is the proportion of women with a BMI less than 18.5. This confirms the relationship of nutritional status with socio-economic status of women, as found in other studies (see for example, Haseen, 2005). Therefore, devoting more attention to the less educated women as poor women would help achieve the MDG Five target of reducing malnutrition much faster.

Violence against women is an important cause of maternal mortality and reducing violence against women an important MDG Five target for Bangladesh. However, neither any study nor any data are available which could indicate levels and trends in violence against women. Although several studies have recommended empowerment of women, advocacy against domestic violence and law enforcement as strategies to reduce violence against women, further studies are needed to analyse the present situation with respect to socio-economic factors and monitor the progress towards the target of reducing violence against women to 0% by 2015.

Although there are large regional variations in terms of progress towards the targets of each of the MDG Five indicators, no firm conclusion can be drawn that the level of any specific indicator is associated with the level of Maternal Mortality Ratio (MMR), the reduction of which is the overall goal of MDG Five. For example, the Rajshahi division has the lowest estimated MMR, but according to the estimated high levels of the indicators related to MMR in this division, namely proportion of births attended by skilled health personnel, proportion of deliveries performed in health facilities, median age at marriage and the proportion of malnourished mothers the MMR for Rajshahi should be higher than its estimated level. Although hardly any study has been done to make out the reasons behind this inconsistencies in the trends and regional variations in MMR and its related target, some reasons can be suggested. For example, in spite of highest proportion of births attended by skilled personnel, Sylhet produces the highest level of MMR. This might be explained by 'three delay model' (Thaddeus & Maine, 1994) that although the women is seeking skilled attendance during pregnancy, they might not seeking it on time. We know from three delay model (see Thaddeus & Maine, 1994) how failure to decide, reach and avail of the on time skilled delivery attendance can cause maternal death. For Sylhet, even higher proportion of skilled delivery might have failed to produce reduction in MMR due to this factor. A proper investigation of this anomaly is urgently required regarding the health system and its timely availability to women in Sylhet. Similarly in terms of age at marriage and proportion of mothers starting child bearing at teenage, Rajshahi is in worse position than that of most other divisions. However a better condition in maternal malnutrition in Rajshahi (particularly) than that of Sylhet, might lessen the effect of early age at marriage and teenage pregnancy on maternal death. However, a further investigation is required in this regard.

Policy Implications

- The findings of the study have some important policy implications, especially to make progress towards the Millennium Development Goal (MDG) Five targets in Bangladesh.

- One of the unique characteristics of MDG is that it is people-centred (UN 2005). This characteristic implies that to reach the target of MDG Five of improving maternal health care, all women need to be brought under the maternal mortality reduction strategy. In doing so the existing inequality in health services has to be minimised. Although Bangladesh has adopted a rights-based approach in its Maternal Health Strategy 2001 (BMMS 2001), the existing maternal health service lacks the implication of that approach. So it is suggested to promote health service for all more vigorously.

- It should be kept in mind that the MDG is time bound and target oriented. Thus to reach the goal on time requires the adoption of the fastest way towards the target. For example, although education and improved economic status are found important for skilled attendance at birth, it might take longer to reach the delivery assistance target by providing education to women and improving economic status. Rather, it would be more feasible to spread antenatal care services so that the same can be accessed by all women at low cost and in a culturally acceptable way. These strategies would be more important for Rajshahi than Sylhet, as Rajshahi has the lowest proportion of skilled birth attendants, whose association with ante natal care services is strong.

- For most MDG targets, education of women has been found to be a significantly contributing factor. Therefore, it is suggested to bring girls to schools. Strategies should also need to be directed towards increasing higher education of women to delay marriages. At the same time, as age at marriage is legally defined, it is important to properly enforce the legal minimum age at marriage.

- For fertility reduction the use of contraception needs to be increased further in Sylhet, as the unmet need for family planning and fertility rate is the highest in Sylhet.

- Finally, to meet the Millennium Development Goal Five it would definitely require policies and programs that would well address the poor sections of women. Therefore, pro-poor policy in maternal health is a basic requirement for achieving the goal of MDG Five.

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