

Level and determinants of pregnancy care in developing countries:
The case of Bangladesh, 1999 – 2000

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Abstract

This study explored the current state of pregnancy care in Bangladesh using data from the Bangladesh Demographic and Health survey (1999-2000), based on a nation-wide representative sample. Data were collected from women with reference to the most recent live birth occurring in the preceding five years. Findings revealed that 72% of the pregnant women did not have any ANC visit while only 8% completed 4 visits. Of those who visited, 77% were attended by health professionals (doctors, nurses, mid-wives). Most of the deliveries (92%) took place at home while only 4% took place in govt. health facilities. Untrained TBAs delivered more than half of the babies while only 7% of the deliveries were attended by qualified medical practitioners and 22% by relatives or other non-professionals. Deliveries by health professionals increased from 10% in 1993-94 to 14% in 1999-2000 ($p < 0.001$), due largely to increase in the proportion of delivery attended by doctors from 4.4% to 8.8% during this period. Logistic regression identified mother's age, education, religion, residence, ANC visits and wealth quintiles to be important predictors of the presence of skilled attendants at delivery. The programme implications of these findings are discussed.

1. Introduction

The international “Safe Motherhood Initiative” launched in 1987 and centred around high risk screening and traditional birth attendant training proved to be futile in reducing the high level of maternal mortality in the poor developing countries (Graham 1998). It happened because it ignored two crucial aspects of pregnancy-related complications: their frequently unpredictable and unpreventable nature, and their requirement for prompt medical interventions. It has been shown that maternal mortality is effectively addressed only by institutionally-based medical interventions (Maine and Rosenfield 1999). WHO defined a skilled attendant as “a doctor or person with midwifery skills who can diagnose and manage obstetrical complications as well as normal deliveries” (WHO 1993). More recently, the term ‘skilled attendance’ is used to capture the holistic nature of such care (Family Care International 2000). This high quality delivery care comprises care, which is effective, accessible, affordable, appropriate and acceptable. On the supply side, such care requires not only skilled personnel but also supplies, equipment, and a referral system, and on the demand side, women and their communities need to know about, value and have access to these facilities. Currently, ‘skilled attendance’ at deliveries is being advocated by WHO as a crucial intervention strategy to reduce maternal mortality and serious morbidity in the short to medium term (WHO 2000).

In Bangladesh, gender differences in health or the lack of health overwhelmingly reflect the low socio-cultural status of women in the society (Aziz and Maloney 1985). Malnutrition, infections and high fertility put women at high risk during pregnancy and childbirth. In the rural society, pregnant woman is discouraged to her natural mobility outside home, thus restricting her chances of seeking health care independently. She always has to depend on family members to accompany her or needs prior permission or consent from husband or in-laws to seek care. Ante-partum and post-partum care are not usually encouraged and supported by the family members as any associated morbidity is considered as normal consequences of pregnancy (Blanchet 1999). It is so much ingrained in the culture that often the women do not feel the necessity of attending ANC, as they think that they had no problem with the pregnancy (Goodburn et al 1994). Most deliveries in Bangladesh take place at home by traditional birth attendants (TBAs) or by family members. These untrained/medically non-competent birth attendants conduct about 85% of all

deliveries (Barkat et al 1998), and even when they are trained, the probability of postpartum infections does not decrease (Goodburn et al. 2000). In a study assessing the maternal and neonatal health services in 49 developing countries, Bangladesh was ranked as 'very weak' at par with Cambodia (Bulato & Ross 2002).

A recent survey based on a large national sample estimated the maternal mortality to be in the vicinity of 320 to 400 per thousand live births in Bangladesh (NIPORT 2001), which is still very high compared to the developed countries. Over the decades Bangladesh has struggled to reduce MMR through intensified efforts in the field of TBA (Traditional Birth Attendant) training and ANC services, without desired outcome. Bangladesh is committed to reducing maternal mortality to below 3 per 1,000 live births during the current Health and Population Sector Programme (HPSP) in 1998-2003. In the HPSP, the structure of government health services for reducing maternal mortality is re-designed focusing on the 'three delays model' (Maine 1997) to establish emergency obstetric care (EmOC)¹ and an enabling environment to access that care (MOHFW 1998). Currently, Comprehensive EmOC is available in 60% of the district hospitals, 27% Maternal and Child Welfare Centres (MCWCs) and only 3% Upazila (sub-district) Health Complexes (UHCs). Similarly, EsOC is available in 14% district hospitals, 19% MCWCs and 32% UHCs (UNICEF 2002).

In brief, pregnancy care is currently available at the following different levels:

Community level: The services at community level are provided from a static centre called the Community Clinic, serving a population of approximately 6,000 living within a distance reached by 30 minutes' walking. The core personnel in the service delivery team comprise of a Health Assistant (HA) and a Family Welfare Assistant (FWA) who are supervised by Family Welfare Visitor (FWV) and Medical Assistant (MA). The personnel are supported by and imparted with relevant training so that they are able to provide the obstetric first aid with normal delivery care closest to the community (MOHFW 1998). The service would ensure clean delivery at home, detect complications and refer them promptly and also mobilise community in arranging

¹ Comprehensive EmOC comprises: a) parenteral antibiotics b) parenteral oxytocics c) parenteral anticonvulsants d) manual removal of placenta e) manual removal of retained products f) assisted vaginal delivery g) caesarean section h) blood transfusion; basic or essential EmOC (EsOC) comprises functions a - f

transportation. There will be, on average, four clinics in a union (average population 27,465²) with 16 outreach centres. Following the change of government in 2001 there is some uncertainty as to the future of community clinics.

Union level: Union level facilities such as Health & Family Welfare Centre (H&FWC) provide obstetric first aid and all the 4500 unions will be covered by the year 2003. There are one Medical Officer (MO), one MA, and one FWV for each H&FWC. The services include antenatal care (ANC), postnatal care (PNC), health education particularly danger signals during pregnancy/delivery and after delivery, breast-feeding, diet, immunisation, cord care, and appropriate referral. The MA provides clinical services but the FWVs are for outreach population.

Sub-district (Upazila) level: The target for the Upazila levels are two-fold. About 280 *Upazilas* will be ready to provide EsOC care and 120 will provide comprehensive EmOC services in phases. There will be two MOs trained on EsOC, FWVs and trained blood technician.

District level: All the district hospitals will provide round the clock comprehensive EmOC services including caesarean section. There will be two consultant obstetricians, MO trained in anaesthesia and nurses/ FWVs.

Besides the Government of Bangladesh, there are other activities taken up by the development partners of Bangladesh such as the UNICEF/ROSA's Women's Rights to Life and Health (WRLH) initiative (UNICEF 2002). Launched in 2000, the WRLH is a collaborative initiative of the GoB, UNICEF/ROSA and Averting Maternal Death and Disability (AMDD) project of Columbia University, funded by the Gates Foundation. The overall strategy of the initiative is to promote a rights-based approach to the reduction of maternal mortality. It is based on three elements required for successful implementation of the programme: quality technology, excellence in management and respect for human rights. Through this initiative, geographic distribution of EmOC services will be increased by ensuring availability of Comprehensive EmOC services in 123 facilities (59 district hospitals and 64 UHCs) in four years through

² Population census 2001: Preliminary Report. Dhaka: BBS, August 2001

facility-based micro-planning, training and placement of medical officers (trained in Obstetrics and anaesthesiology); EmOC training of nurses; and, procurement and distribution of critical equipment. In the year 2001 the focus was on establishing comprehensive EmOC in 56 facilities located in 31 districts. A comparison of the baseline and 2001 status and performance of these facilities showed a 25% increase in births, 45% increase in complicated cases managed and 17% increase in caesarean section (UNICEF 2002).

As an add-on to address the challenge of how to ensure 'skilled attendance' in a resource-poor developing country like Bangladesh, the current SAFE (Skilled Attendance For Everyone) project is undertaken jointly by BRAC and the U of Aberdeen, funded by EC and DFID (Chowdhury et al. 2002). It is a multi-centre research study which aims to provide new knowledge on the identification, implementation and evaluation of effective, affordable and equitable strategies to increase skilled attendance at delivery in developing countries. Bangladesh is one of the five participants in the project. The SAFE study aims to develop a Strategy Development Tool (SDT) consisting of several modules (problem identification, situation analysis, needs assessment, monitoring system and synthesis) which explain how to collect, analyse and synthesise data on Skilled Attendance (SA). The SDT will provide policy planners and programme implementers with a structured framework to synthesise lessons learnt in relation to SA and to identify feasible and sustainable strategy options for the future, it is presumed. The current report is part of the situation analysis module and deals with demonstrative analysis of relevant Bangladesh Demographic and Health Survey data to provide a guideline for the users.

2. Materials and Methods

This report uses Bangladesh Demographic and Health Survey datasets (1993-94, 1996-97 and 1999-2000) produced by Macro International in association with NIPORT and Mitra and Associates. For details on how the survey is conducted, see BDHS (1999-'00). Women who had had a live birth in the preceding five years were included in the survey, and data were collected with reference to the most recent birth. Beside socio-demographic data, pregnancy care related data such as antenatal care, place of delivery, and type of assistance during delivery were used in the analysis. Data were analysed in two stages: first, bi-variate analysis was done to characterize the influence of individual socio-demographic factors on the outcomes of interest. Next a logistic

regression was run to identify the predictors of skilled assistance during delivery. For analyzing time trends, all the three rounds of BDHS data were used while for the rest of the analysis, only the 1999-2000 data were used.

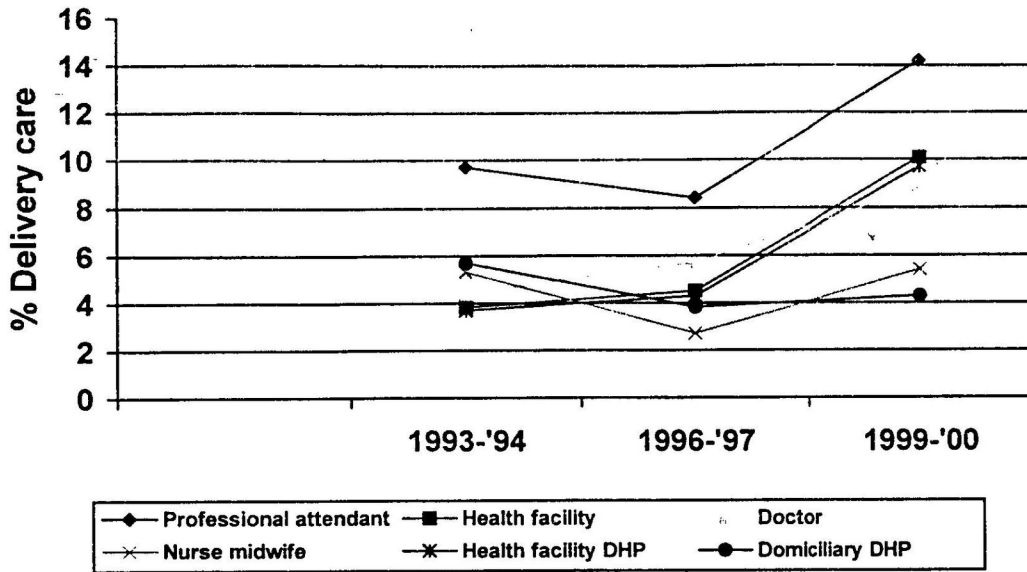
3. Results

Figure 1 represents time trends of different delivery care indicators during 1993-2000. Professional attendant at delivery i.e., delivery by doctors, nurses/mid-wives and FWVs, has risen from around 10% in 1993-94 to 14% in 1999-2000 ($p < 0.001$). This increase was largely due to increase in the proportion of doctors attending delivery (from 4.4% to 8.8%) during this period. The proportion of trained TBA attending delivery also more than doubled during the survey period (from 4.3% to 9.5%). Encouragingly, delivery at health facilities increased at each successive survey with increasing proportion of health professional delivering at health facilities. Interestingly, a reversal in trend with respect to delivery by health professional at home and health facilities respectively was noted during the period of observation.

Antenatal Care

Proper care during pregnancy and childbirth is important for the health of both the mother and her child. During ANC visits, screening for complications (e.g., anaemia, pre-eclampsia and infections) is done and advice on a range of issues including place of delivery and referral of mothers with complications is given. Table 1 shows the distribution of the most recent live births in five years preceding the survey (1999-'00) by visits to ANC center and socio-demographic characteristics of mothers. Findings reveal that around 3/4th of the pregnant women (72%) did not visit any ANC while only 8% completed 4 visits. Of these visits, 77% was attended by health professionals (not shown). Analysis by sub-groups showed sharp differences in antenatal coverage. The latter was strongly associated with mother's age and education, child's birth order, and household's poverty status. Women in their second and third decade of life, women with some secondary education, and child's lower order birth (1st or 2nd child) accessed antenatal care much more frequently than others. Also residence in urban areas, especially in some specific regions like Khulna division, and higher wealth quintiles was significantly associated with increased use of antenatal care. Non-muslim women and women exposed to mass media (radio and/or TV and/or newspaper) were found to visit ANC ≥ 4 times much more frequently than

Figure 1: Delivery care indicators over time



muslim and unexposed women respectively. Substantial fall in the no. of ANC visits was noted with the increase in age and parity, illiteracy, rural residence, specific geographic location like Sylhet and Chittagong, and extreme poverty (e.g. lowest wealth quintile, the poorest).

Table 1: Distribution of most recent live births (in the five years preceding the survey) by ANC visits and background characteristics of mother, BDHS_1999-2000.

Background characteristics	No. of ANC visits*			no. of births (n)	
	none	1 - 3	4+	unweighted	weighted
Mother's age at birth					
<20	67.3	26.7	6.0	1107	1159
20 - 34	71.6	19.1	9.2	5042	5072
35+	81.5	13.8	4.7	683	708
Child's birth order					
1	66.3	22.2	11.5	2024	2041
2-3	68.7	21.9	9.4	2857	2913
4-5	80.0	16.0	4.0	1180	1205
6+	85.9	12.0	2.0	771	782
Mother's education					
None	83.2	14.6	2.2	3120	3285
Primary	73.3	21.3	5.4	1981	2012
Secondary+	47.6	28.7	23.7	1731	1641
Religion					
Islam	72.3	19.6	8.1	6063	6205
Others	68.2	22.4	9.4	769	733
Residence					
Urban	50.2	25.0	24.8	1737	1143
Rural	76.2	18.9	5.0	5095	5797
Division					
Barisal	71.7	20.7	7.6	610	435
Chittagong	77.3	16.9	5.8	1481	1522
Dhaka	72.3	18.6	9.1	1614	2128
Khulna	60.8	26.5	12.7	1003	716
Rajshahi	68.9	22.4	8.7	1238	1626
Sylhet	79.3	16.0	4.7	886	513
Media exposure					
No	81.9	15.4	2.7	3717	3990
Yes	58.4	25.9	15.7	3115	2950
Poverty status					
1 (Poorest)	83.5	14.8	1.7	1630	1789
2	81.8	15.4	2.8	1444	1563
3	74.7	20.9	4.5	1298	1362
4	67.0	25.3	7.7	1140	1160
5 (Richest)	39.8	27.7	32.6	1320	1066
Total	71.9	19.9	8.2	100.0	

* The association between no. of ANC visits and socio-demographic characteristics was highly significant ($p < 0.001$) except religion ($p = 0.06$).

Table 2: Distribution of most recent live births (in the five years preceding the survey) by place of delivery and background characteristics of mother, BDHS 1999-2000.

Background characteristics	Place of delivery*					no. of births (n)	
	Home	Govt. Hospital	Govt. Health Centre	Private hospital/ clinic	Lower facility (pub/priv)	unweighted	weighted
Mother's age at birth							
<20	93.6	3.0	0.8	1.8	0.9	1106	1159
20 – 34	91.1	4.1	0.8	3.0	0.9	5033	5062
35+	95.7	1.8	0.1	1.7	0.6	683	707
Child's birth order							
1	87.1	5.7	1.0	4.8	1.3	2021	2039
2-3	92.2	3.6	0.9	2.6	0.8	2852	2907
4-5	95.8	2.6	0.3	0.8	0.5	1179	1204
6+	98.2	0.8	0.1	0.5	0.4	770	780
Mother's education							
None	96.8	1.7	0.6	0.3	0.5	3117	3283
Primary	95.0	2.3	0.6	1.4	0.6	1979	2008
Secondary+	78.6	9.6	1.0	9.0	1.8	1726	1636
Religion							
Islam	92.9	3.5	0.7	2.6	0.7	6054	6196
Others	87.4	6.0	1.2	3.4	1.9	768	732
Residence							
Urban	74.8	11.8	0.3	9.7	3.3	1733	1140
Rural	95.7	2.1	0.8	1.3	0.3	5089	5790
Division							
Barisal	95.9	1.8	0.7	0.7	0.9	610	434
Chittagong	93.7	2.5	0.1	2.4	1.3	1480	1521
Dhaka	91.4	4.5	0.8	2.8	0.6	1612	2125
Khulna	85.6	6.2	1.4	5.9	1.0	1002	715
Rajshahi	92.7	3.5	1.1	2.0	0.7	1233	1620
Sylhet	93.6	3.1	0.6	2.1	0.6	885	512
Media exposure							
No	97.1	1.4	0.7	0.5	0.4	3715	3987
Yes	85.2	6.9	0.8	5.7	1.4	3107	2941
Poverty status							
1 (Poorest)	98.0	0.7	0.6	0.3	0.4	1628	1786
2	97.5	1.4	0.5	0.4	0.2	1440	1561
3	96.7	2.3	0.3	0.4	0.4	1298	1361
4	92.1	3.9	1.2	1.7	1.1	1140	1159
5 (Richest)	67.9	13.9	1.4	14.0	2.7	1316	1062
Total	91.9	3.7	0.7	2.7	0.8	100.0	

* The association between place of delivery and socio-demographic characteristics was highly significant ($p < 0.001$)

Delivery Care

Both place of delivery and kind of assistance during delivery are important factors for delivery outcome and health of the mother and the newborn. This is because the above factors determine the environment of delivery, i.e., whether or not management of complications is possible in a hygienic environment. Table 2 displays distribution of births by place of delivery, and socio-demographic characteristics of mother. Most of the deliveries (92%) took place at home while 4% of the deliveries occurred in any govt. health facilities. Women in their 2nd and 3rd decades of life, with five+ years of schooling and residing in urban areas, especially if from Khulna division, mostly used govt. health facilities for the delivery of their first child. However, contrary to common wisdom, government health facilities were more frequently used by women from the richest quintile (14%) compared to women from poorer quintiles (1-2%). Home delivery was much more common among Muslim women (93%) and women without exposure to any mass media (97%). Interestingly, health facilities, both government and non-government, were more frequently used by women who had used other health facilities like immunization, contraception and ANC in the past (Table 3).

Table 3: Distribution of most recent live births (in the five years preceding the survey) by place of delivery and mothers' previous use of health services, BDHS 1999-2000.

Previous use of health services	Place of delivery*					no. of births (n)	
	Home	Govt. Hospital	Govt. Health Centre	Private hospital /clinic	Lower facility (pub/priv)	unweighted	weighted
Full Immunisation for <5 child(ren)							
No	94.3	3.3	0.7	1.0	0.6	975	810
Yes	89.2	4.8	0.6	3.9	1.2	1608	1595
Contraception use							
No	94.8	2.4	0.6	1.6	0.7	3538	3648
Yes	89.0	5.2	0.9	3.9	1.0	3284	3281
ANC visits							
None	97.3	1.6	0.4	0.5	0.2	4731	4988
1-3	88.9	4.9	1.5	3.0	1.7	1408	1375
4+	53.3	19.3	1.9	21.6	3.9	683	566
Total	91.9	3.7	0.7	2.7	0.8	100.0	

* The association between place of delivery and previous use of health services was highly significant ($p < 0.001$)

The single most importance of traditional birth attendants (untrained TBAs) in providing assistance during delivery in contemporary Bangladesh was once again reiterated in the findings (Table 4). They assisted more than half of the deliveries in the study population. Only 7% of the deliveries were assisted by qualified medical practitioners and 22% of the births were assisted by relatives or other non-professionals. Lower order births (1st or 2nd child), mothers with some secondary education, better-off mothers, and mothers living in urban areas, were significantly more likely to be assisted by doctors and other health professional than others ($p < 0.001$). Also, non-Muslim women and women exposed to any mass media were found to be assisted by qualified professionals (doctors, nurses, mid- wives) including FWVs much more significantly than the Muslim women and women without any exposure to mass media ($p < 0.001$). The stark inequity in the presence of skilled attendant at delivery was shown when segregated by poverty quintiles: there was about 20 times difference between the lowest and the highest quintiles in case of assistance by doctors. Also, the highest proportion without any assistance at delivery was found among the poorest quintile. Interestingly, no urban/rural difference was found for trained TBAs in assisting deliveries. The positive impact of ANC visits during pregnancy is shown by the gradual increase in the proportion of professional (doctors, nurse/midwives) assistance at delivery with the increase in the number of visits.

In the study population, only 8% of the women received both antenatal care and delivery care from any health-care provider for the most recent child birth (Table 5). It is interesting to note the wide gap between the proportion who received ante-natal care (20%) and who received only delivery care (4%) or both antenatal and delivery care (8%). The influence of socio-demographic characteristics on different types of pregnancy care received followed the usual trend noted earlier.

Table 4: Distribution of most recent live births (in five years preceding the survey) by type of assistance during delivery and background characteristics of mother, BDHS 1999-2000.

Background characteristics	Assistance during delivery %*							no. of births (n)	
	Doctor	Nurse/ mid-wife	Trained TBA	TBA	Other health worker	Relative/ other	None	un- weighted	weighted
Mother's age at birth									
<20	6.0	4.1	11.6	51.9	0.8	24.7	1.1	1106	1159
20 – 34	7.9	4.7	9.4	54.0	0.5	22.0	1.5	5028	5059
35+	2.7	3.8	8.9	58.4	0.4	22.3	3.4	681	705
Child's birth order									
1	12.1	5.7	10.5	51.0	0.8	19.2	0.6	2018	2035
2-3	6.8	4.6	9.9	52.6	0.4	24.4	1.4	2850	2906
4-5	3.0	3.7	9.6	58.3	0.2	22.8	2.5	1179	1204
6+	1.4	2.4	7.2	61.3	0.6	23.5	3.5	768	778
Mother's education									
None	2.6	2.5	8.9	58.0	0.3	25.4	2.3	3112	3279
Primary	3.8	4.0	9.4	57.6	0.3	23.6	1.2	1975	2004
Secondary+	20.1	9.2	11.8	42.0	1.2	15.2	0.6	1728	1639
Religion									
Islam	6.7	4.4	9.4	54.9	0.5	22.5	1.6	6047	6190
Others	10.4	5.9	12.7	96.9	0.5	22.0	1.6	768	733
Residence									
Urban	21.3	11.0	9.5	42.3	0.8	14.3	0.9	1731	1136
Rural	4.3	3.3	9.8	56.4	0.4	24.1	1.7	5084	5784
Division									
Barisal	5.3	4.6	7.8	60.3	0.9	19.7	1.4	610	436
Chittagong	5.9	5.4	9.9	64.2	0.6	13.7	0.3	1479	1521
Dhaka	8.1	3.9	12.0	54.8	0.3	19.5	1.5	1610	2123
Khulna	11.4	7.2	8.6	43.8	0.7	26.2	2.2	999	713
Rajshahi	5.7	3.9	8.0	43.6	0.6	35.4	2.7	1233	1621
Sylhet	6.4	2.7	9.0	62.9	---	17.0	2.0	884	512
Media exposure									
No	2.4	3.0	8.2	58.1	0.3	25.9	2.1		3979
Yes	13.4	6.6	11.7	48.6	0.8	17.9	1.0		2945
Poverty status									
1 (Poorest)	1.4	2.0	8.4	58.1	0.1	27.1	3.0	1626	1782
2	2.0	2.6	9.9	57.5	0.4	25.9	1.7	1440	1561
3	3.1	3.2	10.6	57.6	0.2	24.3	1.0	1295	1358
4	7.7	5.1	10.3	55.4	1.3	19.2	1.0	1139	1159
5 (Richest)	28.4	12.8	10.1	36.4	1.0	10.8	0.5	1315	1061
ANC visits									
None	2.5	3.0	8.3	59.4	0.2	24.7	1.9	4722	4976
1-3	9.3	6.6	14.4	47.8	1.1	19.9	1.0	1412	1378
4+	42.0	13.4	10.4	22.9	1.4	9.2	0.7	68	567
Total	7.1	4.5	9.7	54.0	0.5	22.5	1.6	100.0	

* The association between assistance during delivery and socio-demographic characteristics was highly significant ($p < 0.001$)

Table 5: Distribution of most recent live births (in the five years preceding the survey) by use of ANC/DC during delivery and background characteristics of mother, BDHS 1999-'00.

Background Characteristics	Women with most recent live birth in the last 5 years					
	Received no ANC/DC	Received ANC only	Received DC only	Received both ANC/DC	no. of women (n)	
					unweighted	weighted
Mother's age						
<20	63.5	25.8	3.8	6.9	1107	1158
20 – 34	67.3	19.6	4.3	8.8	5042	5073
35+	78.7	14.4	2.8	4.1	683	708
Birth order						
1	59.5	21.9	6.8	11.9	2024	2041
2-3	65.3	22.9	3.4	8.4	2857	2913
4-5	77.6	15.6	2.4	4.4	1180	1205
6+	83.7	11.8	2.3	2.2	771	781
Mother's education						
None	80.2	14.5	3.1	2.3	3120	3286
Primary	69.6	22.3	3.6	4.5	1981	2011
Secondary+	40.9	28.7	6.6	23.8	1731	1642
Religion						
Islam	68.4	20.1	4.0	7.6		6206
Others	63.2	20.1	5.0	11.7		733
Residence						
Urban	42.6	24.4	7.7	25.3	1737	1142
Rural	72.8	19.2	3.4	4.6	5095	5797
Division						
Barisal	67.6	21.8	3.9	6.7	610	435
Chittagong	72.3	15.8	5.1	6.8	1481	1522
Dhaka	68.5	19.2	3.8	8.5	1614	2127
Khulna	54.6	26.3	6.1	13.0	1003	716
Rajshahi	65.9	23.8	3.0	7.3	1238	1627
Sylhet	76.4	14.5	3.1	6.1	886	512
Media exposure						
No	78.5	15.8	3.4	2.3		3990
Yes	53.4	25.8	5.1	15.8		2999
Poverty status						
1 (Poorest)	81.5	15.0	2.0	1.5	1630	1788
2	78.8	16.3	2.9	2.0	1444	1563
3	71.3	22.2	3.4	3.1	1298	1362
4	61.2	24.7	5.8	8.3	1140	1160
5 (Richest)	31.5	26.7	8.3	33.9	1320	1066
Total	67.8	20.1	4.1	8.0	100.0	

*The association between women's ANC visit and delivery care by professional, and socio-demographic characteristics was highly significant ($p < 0.001$)

Logistic regression

Finally, a logistic regression was done to identify the predictors of delivery with a health professional (coded 'skilled attendant =1, no skilled attendant=0) for the most recent birth. 'Skilled attendant' comprised of assistance during delivery by doctors, nurse/mid-wives, and FWVs. All variables found significant in the bi-variate analysis were entered into the model simultaneously.

The results of logistic regression identified age (probability highest for the 20-34 years age group), birth order (probability decreased successively for the latter childs), mother's education (probability increased beyond primary education), religion (probability increased for non-Muslims), residence (probability decreased for rural areas), ANC visits (probability sharply increased with the number of visits), and wealth quintiles (probability sharply increased with richer quintiles) as the most significant predictors of delivery by a health professional in the study population. Thus the probability of a skilled attendant assisting delivery is increased if the women is about 20-34 years of age, have some secondary education, non-Muslim, resides in urban area, have visited ANC centre during pregnancy, and of course, hails from a better-off family!

4. Discussion

It is now known that about two-thirds of maternal deaths occur around the time of delivery. However, in most of the cases, the conventional risk-screening fails to identify cases requiring professional interventions (Vanneste et al. 2000), sometimes due to non-specificity of the screening procedure itself (Chowdhury and Chowdhury 1998) and sometimes due to the unpredictability of developing a life-threatening complication at any time during pregnancy. Once a woman develops complications she needs prompt access to emergency obstetric care services (EmOC) if death or disability is to be prevented. The traditional birth attendants simply do not have the skills to deal with life-threatening problems such as haemorrhage, eclampsia or obstructed labour which together account for the majority of maternal deaths. Neither training them had had any significant influence on maternal health outcomes (Donnay 2000). Also, historical evidence from both industrialised and transitional countries indicate the essential role played by the improved delivery care in reducing maternal mortality (Dugald Baird Centre

1999). Thus, the focus has shifted from training of traditional birth attendants (who are not professionals by definition) to making professional care accessible. “The single most critical intervention for safe motherhood is to ensure that a health worker with midwifery skills is present at every birth, and transportation is available to a more comprehensive level of obstetric care in case of emergency” (UNFPA 1998).

In Bangladesh, the improvement in MMR has been dramatic in the last few decades; from 30 in 1972-73 to 4 in 1999-2000 (Ahmed et al. 2001). However, it is still high, even compared to some developing countries, and therefore, not acceptable. Following the failure of Safe Motherhood Initiative during the 90s to reduce MMR further, current emphasis is placed on the provision of ‘skilled attendance’ during all kinds of deliveries. This report analysed the current situation regarding the presence of ‘skilled attendant’ at delivery using 1999-2000 BDHS data, to assist policy planners and programme implementers in developing a SAFE (Skilled Attendance For Everyone) strategy for reducing pregnancy related deaths in Bangladesh.

The study findings presented a dismal picture regarding status of pregnancy related care currently existing in Bangladesh. This is true for both antenatal and delivery care. Women who had previous contact with health services were found to avail ANC services more frequently and again, women who received ANC services more frequently both gave birth at health facilities, and were assisted by skilled attendants during delivery, in a much greater proportion than others. Personal characteristics like age (second and third decade of life), parity, religion and geographical location emerged as significant predictors of presence of skilled attendants at delivery. More in-depth studies are needed to explore how attendance at ANC is translated into delivery into a health facility by skilled attendant, for identifying strategic components of effective intervention.

In the long term, the importance of social engineering to improve the SES of women for reducing maternal mortality cannot be overemphasized. In this study, the highly significant effect of education, residence, and wealth quintiles on the presence of a skilled attendant at delivery is found. Here a point should be made about education beyond primary level. Education empowers

Table 5: Odds ratios of factors predicting skilled assistance at delivery for the most recent live birth (in the five years preceding the survey), BDHS 1999-'00.

Characteristics	Skilled attendant at delivery (n=6815)	
	Odds (n=6815)	SE
Mother's age at birth		
<20	1.00	
20 – 34	1.40*	0.13
35+	1.39	0.24
Birth order		
1	1.00	
2-3	0.53***	0.11
4-5	0.47***	0.16
6+	0.40***	0.24
Mother's education		
None	1.00	
Primary	0.89	0.13
Secondary+	1.63***	0.13
Religion		
Islam	1.00	
Others	1.53**	0.13
Residence		
Urban	1.00	
Rural	0.45***	0.11
Division		
Dhaka	1.00	
Barisal	1.21	0.20
Chittagong	1.24	0.12
Khulna	1.78***	0.14
Rajshahi	1.31*	0.13
Sylhet	1.30	0.20
Media exposure		
No	1.00	
Yes	1.09	0.10
ANC visits		
None	1.00	
1-3	2.17***	0.10
4+	6.91***	0.12
Poverty status		
1 (Poorest)	1.00	
2	1.29	0.18
3	1.29	0.18
4	2.35***	0.17
5 (Richest)	4.69***	0.19
<i>-2log likelihood</i>		3650.40
<i>Model Improvement</i>		1464.19***
<i>Overall predicted</i>		90.4%

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

women through social networking, increased self-confidence and capacity to use information and available resources (including, of course, health resources) in the society, besides being translated into income-earning. To tap the full potential of education, 'schooling for women should be extended beyond primary level. The question of equity is also important, as the problems faced in seeking care by the poorest women are different from those of non-poor women. It is quite possible that if adequate 'safety nets' are not provided, the existing inequities in skilled attendance at delivery would widen (Dugald Baird centre 2000).

From the above discussion, some areas of focus in a strategic planning for increasing the proportion of skilled attendance at delivery in Bangladesh can be identified:

- focusing attention on both the demand and the supply side requirements of professional pregnancy care.
- extension of pregnancy care services through qualified practitioners in the rural areas, especially in the Sylhet, Chittagong and Barisal region, and in the urban slum areas;
- breaking the barriers of culture and religion in availing "skilled attendance" at delivery both at health facilities as well as home; and finally,
- improving women's status through education and involvement in income-generating activities.

In this way can Bangladesh take up the challenge of reducing MMR in foreseeable future.

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