

Deliveries Among Adolescent Mothers in Rural Bangladesh: Who Provides Assistance?

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Abstract

Objectives: This paper sought to identify factors associated with modes of delivery assistance among adolescent mothers in rural Bangladesh.

Methodology: Bangladesh Demographic and Health Survey of 2004 data for the last 5 years ($N = 867$) were used. Univariate statistical analysis and multivariate logistic regression methods were employed in analyzing the data.

Results: We observed that almost all adolescent deliveries (93.6 %) took place at home, and most (80.1%) were assisted by untrained traditional birth attendants, relatives or neighbours. Only 8.8% were attended by medically trained persons. Main factors affecting delivery practices among adolescents were mass media exposure, parents' education, antenatal care received, type of toilet facilities and visits by family planning workers (FPW), wanted last child and told about pregnancy complications.

Conclusions: Results indicate several policy options to improve outcomes for adolescent mothers: (a) create awareness of appropriate behaviours during pregnancy, delivery and post-partum period, (b) ensure maternal healthcare centres are available, especially rurally, for antenatal care, expand and improve the quality of home births by trained providers and introduce post-partum visits, (c) increase the number of visits by family welfare visitors/family welfare assistants (FWV/FWA), and (d) emphasize adolescent education to make a lasting impact on the overall health of adolescent mothers.

Introduction

Safe motherhood programs have repeatedly called for delivery under the supervision of qualified health professionals in order to reduce the risk of infection and manage complications that may

otherwise lead to death or serious illness of mother and neonate (Safe Motherhood 2001). One of the main problems in Bangladesh in achieving good reproductive health is access to effective information on sexuality and reproductive health for adolescents; such access is impeded by socio-cultural factors. In this country, pregnancy in adolescence constitutes about 20% of all pregnancies. These are often “at-risk” pregnancies. The current level of maternal mortality in Bangladesh is also very high, even by the standards of other developing countries. The maternal mortality ratio ranges from 320 to 400 per 100,000 live births, and approximately 320,000 women suffer annually from injuries or disabilities caused by complications during pregnancy and childbirth (National Institute of Population and Training [NIPORT] 2001). One of the main causes of these injuries is that most mothers go to unqualified persons during delivery (Mitra et al. 1994). Bangladesh is a developing country, and maternity hospitals are inadequate. Most pregnant mothers are accustomed to getting help from qualified or unqualified traditional birth attendants (TBAs) during delivery, or from their relatives or neighbours. Adolescents often lack choices in whether they can study and learn, work or earn, keep their own earnings or give them to their elders or spouses, or send their children to school (Singh 2003).

Other recent statistics indicate that among adolescent births only 1.8% were by Caesarean section (NIPORT 2001). The majority of adolescents delivered at home, although the percentage was higher for girls living in rural areas than in urban areas (91% versus 75%, respectively). Regardless of place of delivery, 32% of rural and 37% of urban deliveries were conducted by trained persons such as doctors, nurses or trained TBAs (International Center for Diarrhoeal Disease Research, Bangladesh 2003). According to the Bangladesh Demographic and Health Surveys (BDHS) for 1996–97 and 1999–2001, almost all adolescent births (95.4% and 93.1%, respectively) were at home, often under unsafe and unhygienic conditions (Mitra et al. 2001). Among the total adolescent births, 63.7% were assisted by TBAs, 28% by relatives/others, 4.8% by a physician and only 2.6% by a trained midwife. There was a great difference regionally, with a higher proportion of professionals attending deliveries in urban than in rural areas (33% versus 8%, respectively) (NIPORT 2001).

Although Bangladesh has achieved substantial gains in the field of health during the last three decades, there is an enormous gap between rural and urban areas in utilization of reproductive healthcare. Also, this country is still performing poorly with respect to skilled attendance at births and essential obstetric care. In this study, we investigated the characteristics and trends of rural adolescent mothers (aged 15 to 19 years) receiving delivery assistance over the 5 years preceding the survey and identified the factors that influenced them in seeking that assistance. Study findings were envisaged as providing important guidelines for improving the rate of seeking assistance among this group.

Materials and Methods

The study utilized data from the 2004 BDHS, which was conducted under the authority of the National Institute of Population Research and Training of the Ministry of Health and Family Welfare. BDHS 2004 is a nationally representative survey of 11,440 ever-married women aged 10 to 49 years and 4297 men aged 15 to 54 years. It covered 10,500 households and 361 sample points (clusters) throughout Bangladesh, with 122 in urban and 239 in rural areas. Of the 11,440 ever-married samples, 2586 and 8854 were women from urban and rural areas, respectively. The study considered only adolescent mothers with a live birth in the 5 years preceding the survey. Very few ever-married adolescent women in the age group 10 to 14 years had given live birth (only three cases, at the exact age of 14). These women were therefore removed from the data set, and the study considered only adolescents in the 15 to 19 age group.

In order to fulfill our objectives, we classified respondents who received delivery assistance during different years into five groups – 2000, 2001, 2002, 2003 and 2004. Bivariate analysis was performed to determine the differentials of modes of delivery assistance by explanatory variables. Pearson’s Chi-square test of independence was performed to test the existence of significant association between categories of delivery assistance and selected risk factors. A bivariate analysis between

a dependent and an independent variable shows a simplified view of an association in isolation from other independent variables. However, a multivariate analysis between a dependent variable and several independent variables can show associations that reflect the real situation, where many independent variables are operating together. To determine which factors are most strongly associated with the choice of treatment from a medically trained provider, a binary logistic regression was employed (Cox 1970). One model has been considered in this study. The response variable for this model has two categories: mothers who received delivery assistance from medically trained providers (coded 1) and mothers who did not (coded 0). The study considered 19 independent variables (risk factors) in bivariate analysis. Significant risk factors depicted from bivariate analysis were considered for multivariate modelling to assess the net effect of each factor on delivery assistance from medically trained personnel among adolescent mothers with live births in the 5 years preceding the survey. Significant variables ($p < .05$) found from bivariate analyses were included in the logistic regression model to assess delivery assistance from medically trained providers. The statistical package program SPSS, Version 12.0, was used for all statistical analysis.

Results

Trend for Delivery Assistance and Place of Delivery

Table 1 shows that a larger proportion of the adolescents sought delivery assistance from non-medically trained personnel (NMTPs; untrained traditional birth attendants, relatives, neighbours, etc.) than from qualified health professionals during 2000–2004. Delivery care from medically trained providers (MTPs) such as doctors or nurses increased gradually from 2000 to 2003 (7.7% to 8.8%) and more quickly in 2004 (18.2%). Table 1 also depicts that child delivery among adolescents mostly occurred at home (93.6%). An increasing trend was found for delivery assistance from private hospitals from 2000 to 2004, and the percentage of mothers who received assistance from public hospitals decreased from 2000 to 2003 but increased in 2004.

Table 1. Trend analysis of maternal delivery assistance and their place of delivery

Characteristics	2000 N = 117	2001 N = 198	2002 N = 235	2003 N = 273	2004 N = 44	2000–2004 N = 867
Delivery assistance						
MTP	7.7	8.1	8.1	8.8	18.2	8.8
NMTP	76.9	83.3	83.0	78.4	70.5	80.1
No one	15.4	8.6	8.9	12.8	11.4	11.1
Place of delivery						
Home	93.2	94.9	94.0	93.8	86.4	93.6
Public	6.0	2.0	3.0	3.3	9.1	3.6
Private	0.9	2.0	2.1	1.5	2.3	1.7
Other	0.0	1.0	0.9	1.5	2.3	1.0

MTP = medically trained provider (doctor, nurse/midwife, family welfare visitor, medical assistant/sub-assistant medical officer; health assistant or family welfare assistant).

NMTP = non-medically trained provider (traditional birth assistant [TBA]), untrained TBA, unqualified doctor, relatives, friends, other.

Delivery-Related Complications

Table 2 shows the incidence of delivery-related complications reported in the sample. A total of 40.3% of adolescent mothers reported having experienced delivery-related complications. These included prolonged labour (20.3%), excessive bleeding (8.3%), high fever (6.0%), convulsions

(4.1%) and hands and feet came first (1.3%). According to the final 2004 BDHS report, about 25.9% of women between the ages of 15 and 49 suffered at least one of those complications. Most common was prolonged labour, associated with 17% of live births. Eleven percent of the mothers experienced excessive bleeding and 3% had convulsions. The results are similar to our findings (BDHS Final Reports, 2004).

Table 2. Percentage of adolescent mothers with delivery-related complications

Experienced complications	Percentage (%)
Yes	40.3
No	59.7
Type of complications	
Prolonged labour	20.3
Excessive bleeding	8.3
High fever	6.0
Convulsions	4.1
Hands and feet came first	1.3

Differentials in Receiving Delivery Assistance

Table 3 shows that about 8.5% of mothers who received antenatal care sought assistance from non-medically trained providers (NMTPs) during delivery, whereas 79.6% sought assistance from MTPs. A higher proportion of women who were undecided about fertility preference sought assistance from MTPs than their counterparts. More mothers who had wanted their last child received assistance from MTPs than their counterparts. Mothers who had ever used contraception received delivery assistance more from non-medically trained personnel and less from MTPs. Mothers who gave a positive response for their pregnancy complications sought more assistance from MTPs. Almost the same response was observed from mothers who knew where to get proper healthcare services for pregnancy-related complications (Table 3).

Table 4 shows delivery assistance by socio-economic characteristics. More adolescent mothers in Chittagong (12.8%) and Khulna (12.7%) divisions sought assistance from MTPs than those from the other divisions. The largest proportion of adolescents assisted by NMTPs was in Sylhet division (83.8%). Muslim mothers sought less assistance from MTPs than non-Muslim mothers. Seeking assistance during childbirth was positively related with mother's education. More mothers with secondary education were assisted by MTPs than mothers with less education. All adolescent mothers who were working for cash received delivery assistance from NMTPs, and 7.6% of those who were working, but not for cash, received assistance from MTPs. Of mothers whose husbands had secondary/higher or primary levels of education, 12.5% and 8.8% respectively received assistance from MTPs. Wives whose husbands were professional workers took more assistance from MTPs; the opposite was observed when husbands were involved in manual or other activities. Mass media exposure also had a positive effect: Mothers who had been visited by an FPW prior to pregnancy were more likely to be assisted by qualified persons than those who have never been visited by an FPW.

Table 5 shows delivery assistance according to household characteristics. About 10.0% of adolescent mothers whose household had electricity received assistance from MTPs. A greater proportion of women from households with piped drinking water were assisted by MTPs than those using well water or water from other sources such as rivers or lakes.

Table 3. Adolescent mothers' delivery assistance (%) according to their demographic and health-related characteristics

Characteristics	Response	MTP	NMTP	No one	No. of cases	χ^2 , df, <i>P</i> -value
Antenatal care received***	Yes	79.6	8.5	11.9	457	13.27, 2, < .001
	No	9.0	80.7	10.3	410	
Future fertility intention	Wants	9.4	78.9	11.7	630	3.67, 4, .160
	Undecided	15.8	84.2	0.0	19	
	Does not want	7.2	83.1	9.7	195	
Ever used contraception	Yes	8.3	81.1	10.7	664	1.09, 2, .577
	No	10.3	77.4	12.3	203	
Wanted last child***	Yes	25.0	50.0	11.0	863	115.03, 2, < .001
	No	8.7	80.3	25.0	4	
Told about pregnancy complications**	Yes	9.9	79.2	10.9	260	13.27, 2, < .01
	No	6.2	82.3	11.5	607	
Told where to go for pregnancy complications	Yes	23.1	76.9	0.0	247	3.75, 2, .466
	No	5.3	82.6	12.1	13	

df = degrees of freedom; MTP = medically trained provider (doctor, nurse/midwife, family welfare visitor, medical assistant/sub-assistant medical officer; health assistant or family welfare assistant).

NMTP = non-medically trained provider (traditional birth assistant [TBA]), untrained TBA, unqualified doctor, relatives, friends, other.

*** $p < .001$, ** $p < .01$, * $p < .05$.

About 9.6% and 80.3% of mothers with modern toilet facilities sought assistance from MTPs and NMTPs, respectively. The proportion who sought assistance from MTPs was higher among mothers in the upper category of the household quality index (16.7%).

Determinants of Receiving Assistance during Delivery from Medically Trained Providers: A Multivariate Logistic Regression Analysis

Table 6 shows that mothers who had received antenatal care (ANC) were 1.170 times more likely to be assisted by MTPs during childbirth than women who had not received ANC. Mothers who had wanted their last pregnancy were 2.212 times more likely to receive assistance from MTPs than those who had not wanted their last child. Mothers who told others about their pregnancy complications were 1.543 times more likely to seek assistance from MTPs than among who had not told. Table 6 also reveals that the chance of seeking assistance from MTPs increased with the respondent's level of education. Adolescents with secondary education were 2.209 times more likely to receive assistance from MTPs than those with no education. The same result is found for husbands' education. Mothers whose husbands were not manual workers (that is, who were service/businessman/managerial/technical) were 1.781 times more likely to take assistance from MTPs than those whose husbands were manual workers (farmers/domestic servants/day labourers).

Mass media exposure also showed a positive effect on utilization of government healthcare facilities at delivery. Mothers with mass media exposure were 1.241 times more likely to receive delivery assistance from MTPs than who had none. Adolescents who had been visited by an FPW prior to their pregnancy were more likely (odds ratio 1.544) to have their deliveries conducted by qualified persons than those who had never been visited. Mothers with modern toilet facilities were 1.636

times more likely to receive assistance during delivery from government-trained personnel than those with no toilet facilities. Mothers in better-quality houses were 1.763 times more likely to receive assistance from MTPs than those in lower-quality houses.

Table 4. Adolescent mothers' delivery assistance (%) according to socio-economic characteristics

Characteristics	Response	MTP	NMTP	No one	No. of cases	χ^2 , df, P-value
Division	Barisal	6.4	82.6	11.0	109	102.31, 8, .160
	Chittagong	12.8	79.5	7.7	156	
	Dhaka	6.7	83.0	10.3	165	
	Khulna	12.7	74.6	12.7	134	
	Rajshahi	6.1	79.5	14.4	229	
	Sylhet	9.5	83.8	6.8	74	
Religion	Muslim	8.6	80.5	11.0	792	2.09, 2, .665
	Non-Muslim	11.1	76.4	12.5	72	
Mother's education ***	No education	4.1	83.1	12.9	171	44.48, 4, < .001
	Primary education	7.7	81.1	11.1	297	
	Secondary education	11.5	78.2	10.3	399	
Mother's earning status	Working for cash	0.0	100.0	0.0	60	4.87, 2, .221
	Working not for cash	7.6	82.9	9.5	105	
Husband's education **	No education	6.9	81.0	12.1	116	55.18, 6, < .01
	Primary education	8.8	82.5	7.9	80	
	Secondary/higher education	12.5	76.3	11.3	240	
Husband's occupation ***	Manual	8.1	82.2	9.7	258	42.48, 4, < .001
	Not manual	10.5	81.5	8.0	162	
	Other	5.9	70.6	23.5	17	
Mass media exposure *	Yes	12.5	79.1	8.4	603	6.03, 2, < .05
	No	7.3	80.2	12.6	262	
Visits of FPW in the last 6 months**	Yes	19.3	74.1	6.6	552	15.77, 2, < .01
	No	11.2	69.7	19.1	365	

df = degrees of freedom; FPW = family planning worker; MTP = medically trained provider (doctor, nurse/midwife, family welfare visitor, medical assistant/sub-assistant medical officer; health assistant or family welfare assistant); NMTP = non-medically trained provider (traditional birth assistant [TBA], untrained TBA, unqualified doctor, relatives, friends, other.

*** $p < .001$ (highly significant), ** $p < .01$ (significant), * $p < .05$ (less significant).

Discussion

This study has been designed to assess delivery assistance among the adolescent mothers in rural Bangladesh. The increasing trend for receiving delivery assistance from medically trained personnel

over the period was probably due to an increase in the number of health centres in recent years. In our study, however, we found that Bangladesh is still a poor performer with regard to delivery assistance among rural adolescents. Among that group, almost all births took place at home (93.6%). Only 3.6% of adolescent mothers went to public hospitals for childbirth.

Table 5. Adolescent mothers' delivery assistance (%) according to household-related characteristics

Characteristics	Response	MTP	NMTP	No one	No. of cases	χ^2 , df, P-value
Having electricity	Yes	10.0	78.8	11.2	259	5.67, 2, .150
	No	7.9	81.0	11.1	605	
Source of drinking water	Piped water	9.9	67.9	22.2	09	8.83, 4, .177
	Tube-well	8.8	80.2	11.1	830	
	Others	4.0	88.0	8.0	25	
Type of toilet facility***	No facilities	6.1	74.3	19.7	132	55.64, 4, < .001
	Modern	9.6	80.3	10.0	478	
	Open /hanging/ other	7.9	83.5	8.7	254	
Household asset index	Lower	7.4	79.4	13.2	68	14.76, 4, .556
	Middle	9.5	73.8	16.7	42	
	Upper	0.0	100.0	0.0	4	
Household quality index**	Lower	8.3	78.7	12.9	448	12.53, 4, < .01
	Middle	8.8	81.8	9.3	408	
	Upper	16.7	83.3	0.0	6	

df = degrees of freedom; MTP = medically trained provider (doctor, nurse/midwife, family welfare visitor, medical assistant/sub-assistant medical officer; health assistant or family welfare assistant); NMTP = non-medically trained provider (traditional birth assistant [TBA]), untrained TBA, unqualified doctor, relatives, friends, other.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Maternal mortality is commonplace in Bangladesh, and delivery-related complications are a leading cause, especially among adolescents. Our study found that about 40.3% of adolescent mothers reported having experienced delivery-related complications at some time during their pregnancy. Among those adolescents who reported delivery related complications, prolonged labour was found to be higher (20.3%). In our study we observed that NMTPs conducted most rural adolescent deliveries. Qualified persons such as doctors, nurses, midwives, family welfare visitors and trained birth attendants conducted only 8.8% of deliveries.

The observation that Muslim mothers sought less assistance from MTPs and more from NMTPs than non-Muslim mothers can most likely be attributed to religious beliefs. Muslims husbands do not give their wives permission to go to doctors or go outside their home (World Health Organization 2001). The element of choice is important in Bangladesh's socio-cultural climate, where women are reluctant to be examined by a male physician or an unfamiliar nurse in healthcare facilities. Health facilities in Bangladesh still lack sufficient female health personnel, and the demand for women's medical care to be provided by women is increasing. For women who observe the traditional rules of modesty or Islamic purdha, TBAs may appear to be a better alternative.

In this study we found that husbands' education and occupation was a strong predictor of seeking

Table 6. Logistic regression estimates for significant characteristics of adolescent mothers receiving assistance during delivery from medically trained providers, 2000–2004

Characteristics	Response	Assistance from MTP		Confidence interval	
		Coefficient β	Odds ratio	Lower	Upper
Antenatal care received	No ^a	-	1.000	-	-
	Yes	0.157	1.170***	0.71	1.72
Told about pregnancy complications	No ^a	-	1.000	-	-
	Yes	0.483	1.543**	0.91	2.31
Wanted last child	No ^a	-	1.000	-	-
	Yes	0.587	2.212***	0.95	3.12
Mother's education	No education ^a	-	1.000	-	-
	Primary	0.793	2.044**	1.21	3.92
	Secondary	0.715	2.209***	1.29	4.43
Husband's education	No education ^a	-	1.000	-	-
	Primary	0.482	1.015*	0.70	1.53
	Secondary	0.015	1.620**	1.19	2.91
Husband's occupation	Manual ^a	-	1.000	-	-
	Not manual	0.577	1.781*	0.85	2.04
	Others	-0.595	0.551	0.49	1.48
Mass media exposure	No ^a	-	1.000	-	-
	Yes	0.216	1.241***	0.63	1.86
Visits of FPW in the last 6 months	No ^a	-	1.000	-	-
	Yes	0.434	1.544***	0.94	2.67
Type of toilet facility	No facilities ^a	-	1.000	-	-
	Modern	0.492	1.636**	0.81	2.21
	Open /hanging/ others	0.098	1.103	0.63	1.86
Household quality index	Lower ^a	-	1.000	-	-
	Middle	-0.393	0.675	0.42	1.22
	Upper	0.567	1.763*	0.97	3.29

^a Reference category.

FPW = family planning worker; MTP = medically trained provider (doctor, nurse/midwife, family welfare visitor, medical assistant/sub-assistant medical officer; health assistant or family welfare assistant).

*** $p < .001$, ** $p < .01$, * $p < .05$.

delivery assistance from well-qualified persons. Well-educated people know the risks of taking assistance from TBAs or other untrained people. Professional workers are usually more educated and conscious of the health of their family members, and encourage and help their wives to seek assistance from health professionals (Rafiqul et al. 2006). Mass media exposure also had a positive effect

on assistance during delivery. In recent years, a number of governmental and non-governmental organizations have enriched their maternal and child health-related programs on television, on radio and in newspapers; this is likely to have increased mothers' knowledge about safe motherhood. The observation that women who received ANC services sought assistance more from MTPs may be due to the fact that antenatal visits and care may raise awareness of the need for care at delivery, or may give women and their families a familiarity with health facilities that enables them to seek care more efficiently during a crisis (Sai and Measham 1992; Palaniappan 1995). Different retrospective studies have found that lack of antenatal care is an important risk factor for maternal death (Kwast and Liff 1988; Garenne et al. 1997). Household economic indices and hygienic conditions also have implications in seeking care from healthcare facilities. It has been shown that better hygienic conditions, such as use of potable water and type of toilet facilities, are positive indicators of seeking maternal healthcare (Goodburn et al. 1995). Women using piped water for safe drinking purposes had taken assistance more from medically qualified persons than mothers using water from other sources. Type of toilet facility positively affected seeking delivery assistance: adolescent mothers using modern toilets were more interested in assistance from MTPs.

Complications during pregnancy are a vitally important issue (HSDP-MHR 2003). Mothers cannot tell others of their problems during pregnancy because of societal attitudes. We have to reduce this situation. Our study elucidates that mother's attitude during pregnancy highly significantly affects her decision to seek assistance from MTPs. Mothers who told others of their pregnancy complications received birth assistance from MTPs more than adolescents who could not tell. Adolescent mothers who had ever been visited by an FPW prior to pregnancy were more likely to be assisted at delivery by qualified persons than those who have never been visited by an FPW.

In conclusion, findings from this study confirm the importance of education, antenatal care, telling others about pregnancy complications, assets, wanted pregnancy, husband's occupation, mass media exposure and the number of visits by an FWA/FWV to adolescent women during pregnancy in the utilization of healthcare services. Respondents who had a higher level of education, who received antenatal care, used modern toilet facilities, whose household quality index was higher, and whose husband had a higher level of education and engaged in non-manual work were more likely to use healthcare facilities provided by trained personnel at the time of delivery. This reflects the reality that only people from a higher economic or educational group can afford to seek healthcare from trained personnel, irrespective of their needs. The findings convey the essential message that as the vast majority (93.6%) of births were at home, major efforts should be taken to provide traditional birth attendants in remote areas with basic midwife training.

References

- Bangladesh Demographic and Health Survey Final Reports. 2004. Dhaka: NIPORT and Calverton (MD): Bureau of Statistics and Macro International. National Institute of Population Research and Training, Mitra and Associates, and Macro International.
- Cox, D.R. 1970. "The Analysis of Binary Data." London: Methuen.
- Goodburn, E.A., R. Gazi and M. Chowdhury. 1995. "Beliefs and Practices Regarding Delivery and Postpartum Maternal Morbidity in Rural Bangladesh." *Studies in Family Planning* 26: 22–32.
- Garenne M., K. Mbaye, M.D. Bah and P. Correa. 1997. "Risk Factors for Maternal Mortality: A Case Control Study in Dakar Hospitals (Senegal)." *African Journal of Reproductive Health* 1: 14–24.
- HSDP-MHR. 2003. "Health System Development Program – Maternal Health Review." Bangladesh. HSD/WP/02/03.
- International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR, B). 2003. "Reproductive Health Knowledge, Attitude and Practices of Adolescents." ICDDR, B. Center for Health and Population Research.
- Kwast, B.E and M. Liff. 1988. "Factors Associated with Maternal Mortality in Addis Ababa, Ethiopia." *International Journal of Epidemiology* 17: 115–21.
- Mitra, S.N., M.N. Ali, S. Islam, A.R. Cross and T. Sha. 1994. Bangladesh Demographic and Health Survey, 1993-94. Calverton, Maryland and Dhaka, Bangladesh: National Institute of Population Research and Training (NIPORT), Mitra and Associates and Macro International Inc.

Mitra, S.N., A. Al-Sabirand, A.R. Cross. 2001. Bangladesh Demographic and Health Survey 1996-1997. Dhaka: NIPORT.

NIPORT. 2001. Bangladesh Maternal Health Services and Maternal Mortality Survey. *Final Report*. Calverton, MD: ORC Macro.

Palaniappan, B. 1995. "Role of Antenatal Care in Safe Motherhood." *Journal of the Indian Medical Association* 93: 52-4.

Rafiqul, I., M. Chowdhury, A. Islam, J. Gulshan and N. Chakraborty. 2007. "Delivery Complications and Healthcare-Seeking Behavior: The Bangladesh Demographic and Health Survey, 1999-2000." *Health and Social Care in the Community* 15(3): 254-64.

Sai, F.T and D.M. Measham. 1992. "Safe Motherhood Initiative: Getting Our Priorities Straight." *The Lancet* 339(8791): 478-80.

Singh, E. 2003. "Adolescent Reproductive Health in South Asia: Key Issues and Priorities for Action." Geneva: World Health Organization.

World Health Organization. 2001. *Maternal and Newborn Health/Safe Motherhood (MSM) — Indicators*. Geneva: World Health Organization. Retrieved April 10, 2001. <http://www.who.int/rht/msm/msm_indicators.htm>.