

# Modes of Delivery and Delivery Assistance in Rural Bangladesh

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## Abstract

**Objectives:** This paper employs statistical methods to identify the factors associated with modes of delivery and delivery assistance in rural areas of Bangladesh. The principal objective of this paper is to suggest various policy options on the basis of study findings in order to provide guidelines to improve the overall delivery-related morbidity conditions in Bangladesh.

**Methods:** This study analyzes data from a followup study conducted by the Bangladesh Institute of Research for Health and Technologies (BIRPERHT) on maternal morbidity in rural Bangladesh in 1993. A total of 1020 pregnant women were interviewed in the followup component of the study. For the purpose of this study, we selected 993 pregnant women with at least one antenatal followup.

**Results:** It is observed that the mode of delivery is complicated (assisted or destructive) if the pregnancy is either first or fifth or higher order and if bleeding occurred during the antenatal period. More educated respondents, high-risk pregnancies, pregnancies with past history of anemia and respondents who reported marriage at a relatively higher age receive assistance from trained personnel at a significantly higher proportion. Some of the important findings are: (1) first pregnancy or fifth or higher prior pregnancies and hemorrhage during pregnancy increase the risk of assisted or destructive modes of delivery; and (2) first or fifth or higher prior pregnancies are more likely to seek assistance from trained health personnel; similarly, regular antenatal visits and past history of anemia are also positively associated with seeking assistance from trained personnel. However, still there is a substantial proportion of women who remain at risk of complicated deliveries assisted by untrained personnel, posing a formidable challenge to policymakers.

**Conclusion:** The results indicate several policy options: (1) the high-risk group, first or fifth or higher pregnancies, need special care and the existing health management system may be strengthened to create awareness among potential mothers for seeking appropriate measures from the beginning of pregnancy; (2) antenatal followup can be emphasized for high-risk pregnancies, and for respondents with a past history of anemia and other complications, a realistic referral system can be developed; (3) the campaign for increased age at marriage and increased age at first birth needs to focus the health

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issues more extensively; and (4) education for women needs to be given very high priority in order to bring about a lasting impact on the overall health condition of women.

### Introduction

Every pregnancy involves some risks, and the risks of pregnancy can be reduced to a great extent through appropriate measures throughout the periods of antenatal, delivery and postnatal care. The awareness of pregnant women, their relatives and utilization of healthcare facilities can contribute to reduction of maternal morbidity and maternal mortality. It is estimated that about 500,000 women die annually due to pregnancy-related complications, of which 99% of these mortalities occur in developing countries (Royston and Armstrong 1989). The leading causes of mortality, morbidity and disability in developing countries among women of reproductive age are associated with complications during pregnancy and delivery (World Bank 1993). A comparison between pregnancy-related deaths in developing and developed countries shows that the risk of dying is 40 times higher in developing countries than that in developed countries.

The maternal mortality rate in Bangladesh has been historically high. However, the estimates are not based on representative data from the whole country. The maternal mortality rate that was estimated from a hospital-based study in selected urban areas as high as 20 per thousand live births in 1950s (Chen, Gesche et al. 1974). However, the rate was thought to be 40 per thousand live births during 1962–65. It is surprising that according to two other studies (1968–70), based on a followup survey in a rural area (Matlab) of Bangladesh, the maternal mortality rate was in the range of 5.7–7.7 per thousand (Chen, Gesche et al. 1974). Akhter et al. (1996) reported that the maternal mortality rate was 4.3 per thousand live births.

Several studies demonstrated the relationships between maternal morbidities and maternal mortality and the factors associated with both (Fortney and Smith 1999; Jejeebhoy 1997; Okolocha, Chiwuzie et al. 1998). The information on the maternal morbidity, however, is very scanty in a country like Bangladesh. According to Rochat et al. (1981), a large proportion (about one-fourth) of all pregnancy-related deaths occur in Bangladesh due to induced abortion (Okolocha, Chiwuzie et al. 1998). It has been observed that the major causes of maternal deaths in Bangladesh are eclampsia, septic abortion, postpartum sepsis and obstructed labor (Chen, Gesche et al. 1974; Rochat, Jabeen and Rosenberg 1981; Khan, Jahan and Begum 1986; Koenig, Fauveau et al. 1988; Fauveau, Wojtyniak et al. 1989). Most of the pregnancies are either not attended at all or attended by traditional practitioners in the rural areas of Bangladesh. Most of the women do not have access to trained personnel during antenatal or delivery care. It is revealed in a recent study that 71.4% of the live births did not receive any antenatal care at all in Bangladesh (Mitra, Al-Sabir et al. 1997). The deliveries had taken place at home almost universally (95%). Only 16% of the deliveries were assisted by trained personnel such as doctor, nurse/midwife and trained TBA (traditional birth attendant), but 57% of the deliveries were assisted by untrained TBAs and 26% of the deliveries were assisted either by relatives or others. These facts reveal that the maternity care in Bangladesh is still far from an acceptable standard. Bhatia and Cleland (1995) presented an analysis of self-reported symptoms of genealogical problems among recent mothers in South India. They observed that approximately one-third of the women reported at least one current symptom and the most frequently reported current symptoms were anemia, menstrual disorders, vaginal discharge, lower abdominal pain and discharge with fever. A hospital-based study on maternal morbidity among women admitted for delivery at a public hospital in Kathmandu found that 94% of the respondents suffered from some problem or illness either during pregnancy or during labour and delivery (Smith, Lakhey et al. 1996). It is noteworthy that maternal health is greatly affected by a lack of adequate nutritional intake. Mcdonagh (1996) suggested the necessity of identifying procedures that could be included in the antenatal process. Kulier et al. (1998) showed that nutritional intervention during pregnancy with calcium supplementation could reduce the risk of high blood pressure and preeclampsia. Bhatt showed that at least 50% of the Indian women suffer from anemia during pregnancy. The pregnant women become anemic due to increased demand of iron during pregnancy,

preexisting negative iron balance attributable to frequent pregnancy, blood loss during menstruation and inadequate diet.

Patwardhan and Mukherjee (1995) indicated that pregnancy-induced hypertension may result in major causes of maternal morbidity and mortality as well as perinatal morbidity and mortality. Patwardhan observed that eclampsia is typically preceded by pregnancy-induced hypertension for many days, and even weeks. In a special issue on Safe Motherhood of the *Journal of Indian Medical Association*, Rao (1995) reported that women should be advised to avoid pregnancy too early, too late, too frequently and too close, and that female education needs to be emphasized. According to Choolani and Ratnam (1995), female literacy can play the most vital role in order to reduce maternal mortality. Education empowers women to take better care of themselves, with improvement in economic power and better social and legal status.

In this paper, an attempt is made to identify the factors associated with modes of delivery and delivery assistance. Findings from this study can lead to policy implications necessary to provide important guidelines to improve the situation concerning risks of delivery in rural areas of Bangladesh.

### Data and Methods

This study employs data from the survey on Maternal Morbidity in Bangladesh conducted by the Bangladesh Institute for Research for Promotion of Essential and Reproductive Health Technologies (BIRPERHT) during November 1992 to December 1993. This study is based on the prospective component of the survey. A multistage sampling design included districts, thanas and unions were considered as the stages. Districts were selected randomly in the first stage, one district from each division. Then thanas (a thana is comprised of several unions, comprising of a population of size 0.2 million to 0.25 millions) were selected randomly in the second stage, one thana from each of the selected districts. At the third stage, two unions (unions are comprised of several wards which are small geographical boundaries comprising of villages in rural areas) were selected randomly from each selected thana. The subjects comprised of pregnant women with less than six months duration in the selected unions. All the selected pregnant women from the selected unions were followed on regular basis (roughly at an interval of one month) throughout the pregnancy. Again the subjects were followed at the time of delivery for a full-term pregnancy and 90 days after delivery or 90 days after any other pregnancy outcome. A total of 1,020 pregnant women were interviewed in the followup component of the study. The survey collected information on socioeconomic and demographic characteristics, pregnancy-related care and practice, morbidity during the period of followup as well as in the past, information concerning complications at the time of delivery and during the postpartum period. For the purpose of this study, we have selected 965 pregnant women, with at least one antenatal followup and information on delivery.

This study makes an attempt to address two important and related issues concerning delivery: (1) mode of delivery (normal or assisted), and (2) delivery assistance from trained or untrained personnel. These are the outcome variables of interest in the present study. The explanatory variables are: duration of pregnancy at the time of delivery, number of pregnancies prior to the index pregnancy (0, 1-4, 5+), level of education (no schooling, primary, secondary or higher), economic status (low, high), age at marriage (15 years or lower, more than 15 years), involved with gainful employment (no, yes), index pregnancy was wanted or not (no, yes), history of haemorrhage during antenatal period (no, yes), history of anemia (no, yes), history of fit and convulsion (no, yes), history of abdominal pain during antenatal period (no, yes), history of edema during antenatal period (no, yes), history of excessive vomiting during antenatal period (no, yes), and taken special food during pregnancy (no, yes). Two logistic regression models are fitted for analyzing modes of delivery and delivery assistance.

## Results

### Differential Patterns of Factors Associated with Delivery

In this section, differential patterns of the factors associated with delivery are presented. Two outcome variables – namely, mode of delivery and delivery assistance from trained or untrained personnel – are analyzed here for selected explanatory variables.

### Mode of Delivery

The respondents were asked about the mode of delivery. The reported categories of mode of delivery were (1) normal delivery; (2) trial labor; (3) breech; (4) forcep-assisted delivery; (5) C-section; and (6) destructive procedure. Due to the small number of cases in our analysis, we regrouped (2)–(6) as complicated delivery. In other words, trial labour, breech and assisted deliveries, C-section and destructive procedures are considered as delivery complications. The differential patterns of delivery complications for selected variables are presented in Table 1.

Table 1. Differential of Modes of Delivery and Delivery Assistance by Selected Characteristics

| Characteristics   | Modes of Delivery (%) |          | Delivery Assistance (%) |           | N   |
|---|-----------------------|----------|-------------------------|-----------|-----|
|   | Normal                | Assisted | Trained                 | Untrained |     |
| <b>Education</b>  |                       |          | •                       |           |     |
| No Education  | 90.8                  | 9.2      | 11.8                    | 88.2      | 532 |
| Primary   | 93.8                  | 6.2      | 11.0                    | 89.0      | 272 |
| Secondary or Higher                                       | 90.7                  | 9.3      | 19.9                    | 80.1      | 161 |
| <b>Economic Status</b>                                    |                       |          |                         |           |     |
| Low   | 91.8                  | 8.2      | 12.2                    | 87.8      | 773 |
| High  | 90.6                  | 9.4      | 16.1                    | 83.9      | 192 |
| <b>Gainful Employment</b>                                 |                       |          |                         |           |     |
| Yes   | 93.5                  | 6.5      | 14.4                    | 85.6      | 306 |
| No  | 90.7                  | 9.3      | 12.3                    | 87.7      | 659 |
| <b>Age at Marriage</b>                                    |                       |          | **                      |           |     |
| ≤15 years   | 91.5                  | 8.5      | 10.8                    | 89.2      | 627 |
| > 16 years  | 91.7                  | 8.3      | 16.9                    | 83.1      | 338 |
| <b>Pregnancy Wanted</b>                                   |                       |          |                         |           |     |
| Yes   | 91.5                  | 8.5      | 13.2                    | 86.8      | 667 |
| No  | 91.9                  | 8.1      | 12.4                    | 87.6      | 298 |
| <b>Number of Pregnancies Prior to the Index Pregnancy</b> | ••                    |          | ••                      |           |     |
| 0   | 86.6                  | 13.4     | 17.6                    | 82.7      | 261 |
| 1-4   | 94.7                  | 5.3      | 10.3                    | 89.7      | 551 |
| 5 or more   | 88.9                  | 11.1     | 14.4                    | 85.6      | 153 |

|  |      |      |      |      |     |    |
|--|------|------|------|------|-----|----|
| <b>Taken Special Food During Pregnancy</b> |      |      |      |      |     | •• |
| Yes  | 92.4 | 7.6  | 18.9 | 81.1 | 238 |    |
| No   | 91.3 | 8.7  | 11.0 | 89.0 | 727 |    |
| <b>Antenatal Visits</b>                    |      |      |      |      |     | •• |
| No   | 94.6 | 5.4  | 10.8 | 89.2 | 555 |    |
| Irregular Visits                           | 89.1 | 10.9 | 10.9 | 89.1 | 119 |    |
| Regular Visits                             | 86.8 | 13.2 | 17.8 | 82.2 | 287 |    |
| <b>Past History of Anemia</b>              |      |      |      |      |     | •  |
| Yes  | 91.2 | 8.6  | 14.8 | 85.2 | 594 |    |
| No   | 92.2 | 7.8  | 10.0 | 90.0 | 371 |    |
| <b>Complications During Pregnancy</b>      |      |      |      |      |     |    |
| Hemorrhage                                 |      |      |      |      |     | •• |
| Yes  | 79.8 | 20.2 | 8.4  | 91.6 | 119 |    |
| No   | 93.2 | 6.8  | 13.5 | 86.5 | 842 |    |
| <b>Lower Abdominal Pain</b>                |      |      |      |      |     |    |
| Yes  | 91.4 | 8.6  | 12.8 | 87.2 | 845 |    |
| No   | 93.1 | 6.9  | 13.8 | 86.2 | 116 |    |
| <b>Odema</b>                               |      |      |      |      |     |    |
| Yes  | 90.1 | 9.9  | 10.4 | 89.6 | 212 |    |
| No   | 92.0 | 8.0  | 13.6 | 86.4 | 749 |    |
| <b>Excessive Vomiting</b>                  |      |      |      |      |     | •  |
| Yes  | 88.6 | 11.4 | 12.1 | 87.9 | 272 |    |
| No   | 92.7 | 7.3  | 13.2 | 86.8 | 689 |    |
| <b>Fits/Convulsion</b>                     |      |      |      |      |     | •• |
| Yes  | 86.0 | 14.0 | 10.5 | 89.5 | 171 |    |
| No   | 92.8 | 7.2  | 13.4 | 86.6 | 790 |    |

\*\* Significant at 1 % level; \* Significant at 5 % level

The extent of delivery complications is observed to be higher (9.2% to 9.3%) among the respondents with no schooling or with highest level of schooling (secondary or higher level of education). However, the higher proportion of delivery complications to the respondents with no schooling and among the respondents with highest level of schooling might be attributable to the opposite nature of underlying reasons. The respondents with no schooling experience suffering from delivery complications during delivery due to lack of awareness and knowledge about maternity-related health care. While the respondents with highest level of schooling are expected to have better awareness and knowledge, due to their lifestyle they want to avail more assistance during delivery, resulting

in different complications. It is a common practice in the developing countries in particular that the assisted deliveries are positively associated with level of schooling.

The high-risk group is comprised of the first pregnancy and prior pregnancies of order five or higher. This is reflected in the findings of this study. We observe that 13% of the first pregnancies and 11% of the fifth or higher prior pregnancies are reportedly trial labour or assisted deliveries. The proportion of complicated deliveries is much lower (5%) among the respondents having had 1–4 pregnancies prior to the index pregnancy.

It is noteworthy that there is a positive statistically significant association ( $p < 0.001$ ) between antenatal visits during antenatal period and complicated delivery. This is indicative of the fact that the pregnancies with some prior symptoms of complications visit for antenatal care more often than those without having such symptoms.

All the selected complications during the pregnancy period appear to have increased the risk of complicated delivery, although all the associations are not statistically significant. However, haemorrhage during antenatal period increases the risk of complicated delivery almost three times, 20% among those who experienced bleeding during antenatal period as compared to 7% among those who did not experience haemorrhage ( $p < 0.001$ ). Fits/convulsion during pregnancy doubled the risk of complicated delivery ( $p < 0.01$ ). Excessive vomiting during pregnancy may also cause increased risk of complicated delivery ( $p < 0.05$ ).

### Delivery Assistance

Trained personnel assist only very small proportions of pregnancies (13%) at the time of delivery, although this is an important issue for ensuring safe motherhood. The differential patterns by selected characteristics reveal that there exist large variations by different characteristics of the pregnant women (Table 1).

We observe that there is significant positive association between delivery assistance by trained health personnel and level of education ( $p < 0.02$ ). There is no much difference between pregnancies among the subjects with primary or no schooling in using services of trained personnel (11% to 12%), but a substantially higher proportion of subjects with secondary or higher level of schooling appear to be assisted by trained personnel at the time of delivery (20%).

Both for first (18%) and fifth or higher pregnancies (14%), the respondents appear to seek help from trained personnel more frequently as compared to that of respondents with 1–4 previous pregnancies (10%). The association between number of previous pregnancies and seeking delivery assistance from trained personnel is statistically significant ( $p < 0.02$ ).

Those who reported their age at first marriage 15 years or lower take delivery assistance from trained personnel (11%) at a significantly ( $p < 0.01$ ) lower proportion than those who reported their age at first marriage 16 years or higher (17%). It is expected that the respondents from higher economic status can afford to have assistance from trained personnel more than respondents from a lower economic status. This is reflected in the results, but the difference is not statistically significant. Similar results are obtained for gainful employment and whether the index pregnancy was desired or not.

The respondents who had taken special food during pregnancy appeared to have sought delivery assistance from trained personnel at a greater proportion (19% among those who had taken special food as compared to 11% of those who did not take any special food) ( $p < 0.01$ ). It is observed that regular antenatal visits can increase the delivery assistance from the trained personnel ( $p < 0.02$ ). Previous history of anemia increases the likelihood of seeking help from trained personnel.

Table 2 presents the association between delivery assistance and mode of delivery. The association is significant ( $p < 0.001$ ). It is evident that 18% of the deliveries assisted by trained personnel as compared to that of 7% of the deliveries assisted by untrained personnel were complicated deliveries (assisted or destructive). It indicates that still a substantial proportion of complicated deliveries are assisted by untrained personnel that might cause serious health hazards to the mothers during and after delivery.

**Table 2. Percent Distribution of Respondents by Delivery Assistance and Modes of Delivery**

| Delivery Assistance | Modes of Delivery |             | N   |
|---------------------|-------------------|-------------|-----|
|                     | Normal            | Complicated |     |
| Untrained           | 93.1              | 6.9         | 840 |
| Trained             | 81.6              | 18.4        | 125 |
| N                   | 884               | 81          | 965 |

Chi-square = 18.70 (p-value = 0.000)

**Multivariate Analysis**

Model 1 takes into account the mode of delivery as the outcome variable (Table 3). Two categories of modes of delivery are considered: (i) normal (0), if head presentation is observed, and (ii) complication of delivery (1), if C-section, forceps-assisted delivery, destructive procedures, breech presentation or trial labour are observed. The multivariate logistic regression model is fitted to the outcome variable, modes of delivery. Selected socioeconomic, demographic and past medical history of the respondents is taken into account in the model.

Duration of pregnancy at the time of delivery seems to have negative association with complications of delivery, although it was not significant. In other words, if the mother completes the full-term of pregnancy, there then is a lesser likelihood of complications at the time of delivery. However, there are increased risks of complications of delivery for the respondents either having their first pregnancy or having had five or more pregnancies before the index pregnancy under consideration. The risk of complicated delivery appears to be about 3.3 times higher (p<0.01) for the first pregnancy and about 2.6 times higher (p<0.01) for the fifth or more prior pregnancies, as compared to that of 1–4 prior pregnancies. Respondents having had a history of haemorrhage during the antenatal period appear to have increased risk (3 times) of complicated delivery (p<0.001). Women who visit regularly for antenatal care had higher risk of having complicated delivery, which might be attributed to the fact that the pregnancies with prior symptoms of complications during pregnancy visited for antenatal care at a higher proportion.

Model 2 addresses the issue of utilization of trained delivery cares assistance (Table 3). If trained health personnel are reported to have assisted the delivery, the outcome variable takes value 1, and if untrained persons assisted the delivery then the outcome variable is observed to be 0. It is interesting to note that the high-risk pregnancies (first pregnancy and five or more pregnancies before the current pregnancy) are likely to be assisted by trained personnel at a higher proportion (p<0.05). As compared to the respondents having no schooling, respondents having a secondary or higher level of education appear to have more frequent access (1.6 times) to trained delivery assistance (p<0.10). The respondents who reported their age at first marriage as more than 15 years receive assistance from trained personnel at a higher proportion (1.5 times) as compared to those who get married at an earlier age (p<0.10). Past history of anemia (p<0.01) increases the likelihood of seeking delivery assistance (1.8 times) from trained personnel. If visits are made on regular basis during the antenatal period, then the respondents are more likely (1.9 times) to seek assistance from trained health personnel.

**Conclusion**

This paper makes an attempt to focus on the important concerns associated with delivery. Two related outcome variables are analyzed in this paper: (1) mode of delivery, and (2) delivery assistance. It is demonstrated in this study that trained health personnel assist complicated deliveries at a much higher proportion than that of untrained personnel. However, still a substantial proportion (7%) of the deliveries assisted by the untrained personnel are seen to be complicated in a manner that might have caused serious health hazards.

It is observed that the mode of delivery is complicated (assisted or destructive) if the pregnancy is either first or fifth or higher order, and if there was bleeding during antenatal period. It is noteworthy that the respondents who visited for antenatal care have increased risk of complicated delivery.

**Table 3. Estimates of the Parameters of Logistics Regression Model for Modes of Delivery and Delivery Assistance**

| Characteristics                                    | Modes of Delivery (Model 1) |       |             | Delivery Assistance (Model 2) |       |              |
|--|-----------------------------|-------|-------------|-------------------------------|-------|--------------|
|  | Estimates                   | O.R.  | 95 % C. I   | Estimates                     | O.R.  | 95 % C. I    |
| Constant   | -1.662                      | 0.190 |             | -3.688***                     | 0.025 |              |
| Education  |                             |       |             |                               |       |              |
| Primary  | -0.351                      | 0.704 | 0.385-1.288 | -0.033                        | 0.968 | 0.599-1.563  |
| Secondary or Higher                                | -0.088                      | 0.916 | 0.457-1.838 | 0.468*                        | 1.597 | 1.016-2.511# |
| (Reference: No Education)                          |                             |       |             |                               |       |              |
| Economic Status (High=1)                           | -0.172                      | 0.842 | 0.456-1.554 | 0.157                         | 1.170 | 0.713-1.920  |
| Gainful Employment (Yes=1)                         | -0.288                      | 0.749 | 0.427-1.315 | 0.327                         | 1.387 | 0.905-2.126  |
| Age at Marriage (>15 Years=1)                      | 0.108                       | 1.114 | 0.654-1.897 | 0.387*                        | 1.472 | 1.044-2.077# |
| Pregnancy Wanted (Yes=1)                           | 0.095                       | 1.100 | 0.604-2.002 | 0.033                         | 1.033 | 0.638-1.672  |
| Number of Pregnancies Prior to the Index Pregnancy |                             |       |             |                               |       |              |
| 0  | 1.179***                    | 3.251 | 1.800-5.873 | 0.597***                      | 1.817 | 1.136-2.905  |
| 5 or more  | 0.942***                    | 2.564 | 1.253-5.250 | 0.669**                       | 1.952 | 1.065-3.575  |
| (Reference: 1-4 Pregnancies)                       |                             |       |             |                               |       |              |
| Antenatal Visits                                   |                             |       |             |                               |       |              |
| Irregular Visits                                   | 0.397                       | 1.487 | 0.702-3.149 | 0.206                         | 1.229 | 0.629-2.402  |
| Regular Visits                                     | 0.631**                     | 1.880 | 1.068-3.310 | 0.661***                      | 1.937 | 1.249-3.003  |
| (Reference: No Visits)                             |                             |       |             |                               |       |              |
| Duration of Pregnancy (months)                     | -0.250                      | 0.779 | 0.568-1.068 | 0.093                         | 1.097 | 0.839-1.434  |
| Past History Anemia (Yes=1)                        | 0.262                       | 1.300 | 0.763-2.214 | 0.609***                      | 1.839 | 1.172-2.883  |
| Complications During Pregnancy                     |                             |       |             |                               |       |              |
| Haemorrhage (Yes=1)                                | 1.101***                    | 3.008 | 1.651-5.478 | -0.513                        | 0.599 | 0.290-1.238  |
| Lower Abdominal Pain (Yes=1)                       | 0.119                       | 1.126 | 0.499-2.543 | -0.226                        | 0.798 | 0.437-1.457  |
| Odema (Yes=1)                                      | -0.023                      | 0.977 | 0.545-1.752 | -0.159                        | 0.853 | 0.506-1.438  |
| Excessive Vomiting (Yes=1)                         | 0.263                       | 1.301 | 0.772-2.193 | -0.092                        | 0.912 | 0.579-1.438  |
| Fits/Convulsion (Yes=1)                            | 0.304                       | 1.355 | 0.742-2.473 | -0.276                        | 0.759 | 0.425-1.355  |
| Chi-square (p-value)                               | 55.908 (0.000)              |       |             | 40.731 (0.001)                |       |              |

\*\*\* Significant at 1 % level; \*\* Significant at 5 % level; \* Significant at 10 % level  
# 90 % C.I.

This might be attributed to the fact that in rural settings of Bangladesh the visit for antenatal care is generally made only if it is deemed necessary for the pregnancy, or in case of early symptoms of complication during antenatal period.

The high-risk group (first pregnancy and five or more prior pregnancies) respondents are likely to get assistance from trained personnel at higher proportions. Similarly, more educated respondents, as well as the respondents who reported to have gotten married at a relatively higher age, receive assistance from trained personnel at a significantly higher proportion. It is also noteworthy that the respondents having anemia have increased likelihood of receiving better delivery care.

Several policy options emerged from the findings of this paper. First, it is clearly evident that the high-risk groups, first or fifth or higher pregnancies, need special care, and the existing health management system may be strengthened to create awareness among the potential mothers for seeking appropriate measures since the beginning of a pregnancy. Both awareness and service providing system for the high-risk groups need to be based on the hard realities of prevailing socio-economic conditions and cultural and religious beliefs. Secondly, the process of antenatal followup needs to be strengthened to identify the high-risk pregnancies as well as to identify the pregnancies with past history of anemia and other complications, and a realistic referral system needs to be developed. Thirdly, the campaign for increased age at marriage and increased age at first birth need to focus the health issues more extensively so that a consensus develops at the grassroots level concerning the basic needs for a newly wed girl to be in good health. Finally, education for women needs to be given high priority in order to bring about a lasting impact on the overall health condition of women.

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