# Utilization of Maternal Health Care Services and Reproductive Health Complications in Assam, India

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## Abstract

Maternal health services have a significant role in the improvement of reproductive health. Access to skilled assistance and well equipped health institutions during delivery can reduce maternal mortality and morbidity and improve pregnancy outcomes. Study tries to show the interrelationship between use of maternal health care services and having any reproductive health complications using third round of District level Household Survey conducted during 2007-08. Bivariate and multivariate analysis is used to examine the interrelationship between pregnancy complications and use of health care services. Finding shows, nearly half of the women reported complication of paleness/giddiness/weakness during pregnancy and 56 percent reporting of having obstructed labour. Result shows that women received full ANC has less pregnancy and delivery complications as compare to non receivers. Two-fifths of women reported any type of post delivery complication who had received full ANC checkups, most of them were reported of lower abdominal pain after delivery.

**Key words**: Antenatal care, Pregnancy Complication, Post delivery complications, Assam

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## Background

Pregnancy is an important stage in a woman's life. It is a period of expectant waiting and one that all women aspire to experience at least once in their lifetime. It is a fervent hope of all mothers-to-be to have a safe and healthy pregnancy. While most pregnancies and births are uneventful, all pregnancies are at risk. Around 15% of all pregnant women develop a potentially life-threatening complication that calls for skilled care and some will require a major obstetrical intervention to survive (WHO, 2000). Prevailing high maternal morbidity and mortality has always been source of concern. Antenatal and postpartum care aimed at reducing maternal morbidity and mortality have been components of the Family Welfare Programme in India since its inception. Through safe motherhood programmes national governments, multi-lateral and bilateral agencies and non-government organisations (NGOs) has given maternal health top priority. Necessary political and financial resources are dedicated to this effort by these national and international donors and contributors. It is very much essential to take care of pregnant women as this is the time women needs more care, support and proper nutrition for the mother and foetus. Poor care of the mother often means death of the child; even if the mother survives, poor maternal health jeopardizes a newborn's chances of survival. Women who receive good care during pregnancy and childbirth are more likely to put their trust in other health services for themselves and for their family.

Globally, about 8 million women suffer from pregnancy-related complications and more than half a million die from those complications. In developing countries, one woman in 16 may die due to pregnancy-related complications (WHO, 2004).The causes of maternal death are related to maternal care utilization during pregnancy, childbirth and postnatal periods. The safe motherhood conference in Nairobi (1987) focused attention on the high levels of maternal mortality in developing countries. Following this conference the WHO initiated the safe motherhood program to reduce maternal mortality in developing countries. These maternal causes may be due to the consequences of pregnancy and childbirth or the consequences of treatment received during pregnancy or childbirth.

In general, complications of pregnancy are the symptoms and problems that are associated with pregnancy. Many women face some minor health problems and pregnancy complications, but there are some women who unfortunately get faced with more serious complications during pregnancy. There are some pregnancy complications that pregnant women have no control. About 500,000 women die every year because of complications related to pregnancy and child

birth and maximum number of deaths occur in developing countries (WHO, 1999). The maternal mortality ratio is still high in India which is 301 per one hundred thousand live births (SRS, 2001-03). According to estimates by the World Health Organisation (WHO), each year an estimated 136,000 women die needlessly due to causes related to pregnancy, childbirth and abortion. It is unfortunate that a large number of maternal deaths occur due to haemorrhage, obstructed labor and unsafe abortions while safe and affordable technologies to prevent such deaths to exist. One of the studies reveals that MMR is an indicator of the quality of health care available during pregnancy, childbirth and in the postpartum period. Of all maternal deaths, 80% can be potentially avoided by interventions during pregnancy, childbirth and the postpartum period, that are feasible in most countries. The common causes of maternal death include haemorrhage, hypertension, infection, obstructed labour and unsafe abortion (Matthews Matha, 2005).

One of the studies reveals that, in each year over 50 million women experience pregnancy related complications. Fifteen million of which lead to long-term illness or disability often because they have no access to medical care, because pregnancy has exacerbated already existing malnourishment or illness, or because the medical care that they do manage to access is substandard (Datta KK, et al., 1980). It has also been ascertained that pregnancy-related problems have far-reaching consequences on the overall reproductive health of women, in addition to their contribution to maternal mortality (Bhatia and Cleland, 1995a).

Labour and delivery is the end of pregnancy and beginning of new life. Antenatal care plays an important role to achieve a successful labour and delivery process. Regular antenatal classes help in the physical and mental preparation of women and help them relax during those last months. Antenatal care ensures maternal foetal health wellbeing and also prepares women physically fit for labour, delivery and the postpartum period. Antenatal care is the care that a woman receives during pregnancy, helps to ensure healthy outcome for women and newborns (WHO/UNICEF 2003). The safe motherhood initiate proclaims that all pregnant women must receive basic, professional antenatal care (Harrison, 1990).

The Reproductive and Child Health programme recommends that antenatal care should cover the procedures to detect pregnancy complications apart from proving IFA tablets and TT injections (Ministry of Health and Family Welfare, 1997, 1998b). According to DLHS-3 report 75 percent women received any ANC check up in India and near about 74 percent in Assam. The use of full ANC (at least three visits of ANC check up, at least one TT injection received and 100 IFA tablets/syrup consumed) is increased from 16.4 percent (DLHS-2) to 18.8 percent

(DLHS-3). Only a few among the total women receives full ANC (8.5%) in Assam (DLHS-3, 2010).

**Need of the study**

India is one of the developing nations with a high rate of maternal mortality. So it is very much important to know the association between having any health problems or complications during the reproductive span and also the use of maternal health care services. Government of India launched many maternal health care programmes which are still lacking behind to fulfil the Millennium Development Goal (MDG). Promotion of MCH is one of the most important components of the RCH programme of the Government of India. The goal is each pregnant woman to receive atleast three antenatal checkups, two Tetanus Toxid (TT) injections and a full course of Iron and folic acid (100 tablets) supplementation. Despite rapid economic growth, India remains a land of great disparity. The status of the country's maternal health, which is affected by region, income, education, caste and religion, reflects the nation's socio-economic diversity.

Assam has the country's highest rate of maternal mortality, as per the latest official data. According to experts, insurgency which affects access to healthcare services is one of the main reasons for this (The Hindu, 5$^{th}$ March 2010). According to the Sample Registration Services (SRS) 2007-2009, the maternal mortality ratio (MMR) for Assam was 390 per 100,000 live births - the highest in the country which is 212 for India level. In the state of Assam 60% of mothers received one antenatal check up and 31% received 2 antenatal checkups. 52% of mothers received the TT injections and 55% of mothers received Iron and folic acid supplementation. The coverage is low. In Assam only 18% of births were delivered in a medical facility. Only 5% births among home delivered were assisted by a health professional, 39% deliveries assisted by TBA. 25% of births outside a medical facility were followed by a postpartum check up within two months of delivery.

**Data and Methods**

The present paper is totally based on secondary data and for that purpose third round of District Level Household and Facility Survey (DLHS-3) conducted during December 2007 to December 2008 has been used. The District Level Household and Facility Survey (DLHS-3) is a nationwide survey covering 601 districts from 34 states and union territories of India. In this study the work has done on currently married women which have been taken out from the ever married women's questionnaire. In this questionnaire ever married women aged 15-49 were

included and questions has been asked related to age, age at marriage and place of birth, educational attainment, number of biological children ever born and surviving status by sex etc. Details about antenatal checkups, experience of pregnancy related complications, place of delivery, delivery attendant and post-partum care, together with history of contraceptive use, sex preference of children and fertility intentions etc.

Bivariate analysis and cross tabulation has done to see the percentage of women having pregnancy complications and use of maternal health care services. For this particular study pregnancy related complications and all ANC check up (more than three ANC visit, consume IFA tablets and TT injections received) has been taken care off. Full ANC is considered as received all above mentioned three ANC variables. For the logistic regression analysis any delivery complications have taken as a dependent variable and pregnancy complications as independent variable to see the interrelationship between these two. The variables are categorised as 0 and 1, where 0=no and 1=yes.

**Results:**

***Reproductive health problems***

Figure 1 shows the problems or complications during pregnancy reported by women in Assam, where maximum number of women reported of having complications like paleness or giddiness or weakness (46.7 %), excessive fatigue (34.4%) and excessive vomiting (30.8%).

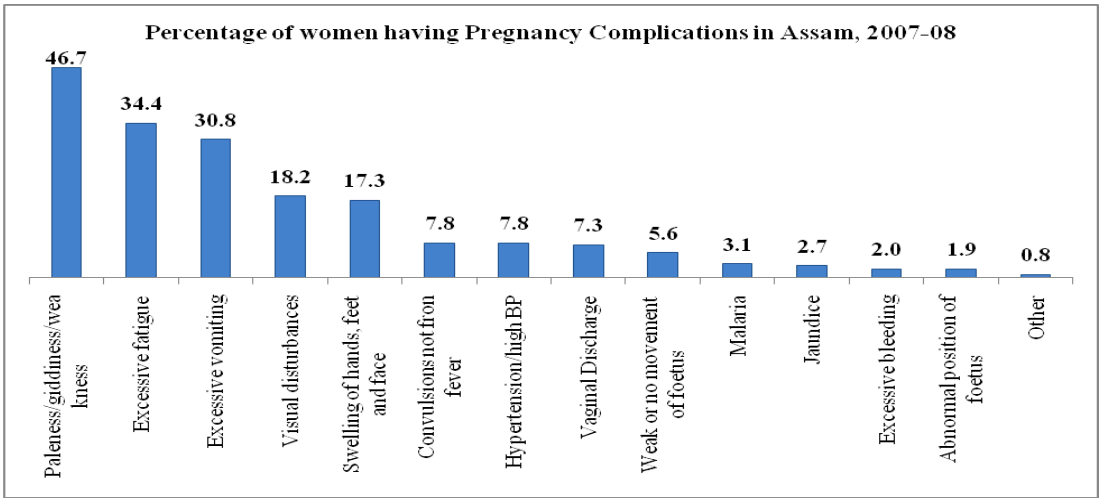


Fig1:Percentage of women having pregnancy complication in Assam, India, 2007-08

As maximum of the outcome are live births with women having complications during pregnancy but still there are few cases as still birth, which is high among those reported of abnormal position of the foetus (5.4%) (Table1).

Around 56 percent of women had reported of having obstructed labour at the time of delivery which is one of the common causes of complication. More than half (55%) of women have had premature labour and 29 percent had the complication of prolonged labour. Very few percent women had reported complication of excessive bleeding (15.5%), convulsion (12.1%) and presentation of breech (6.2%) during the time of delivery (Fig 2).

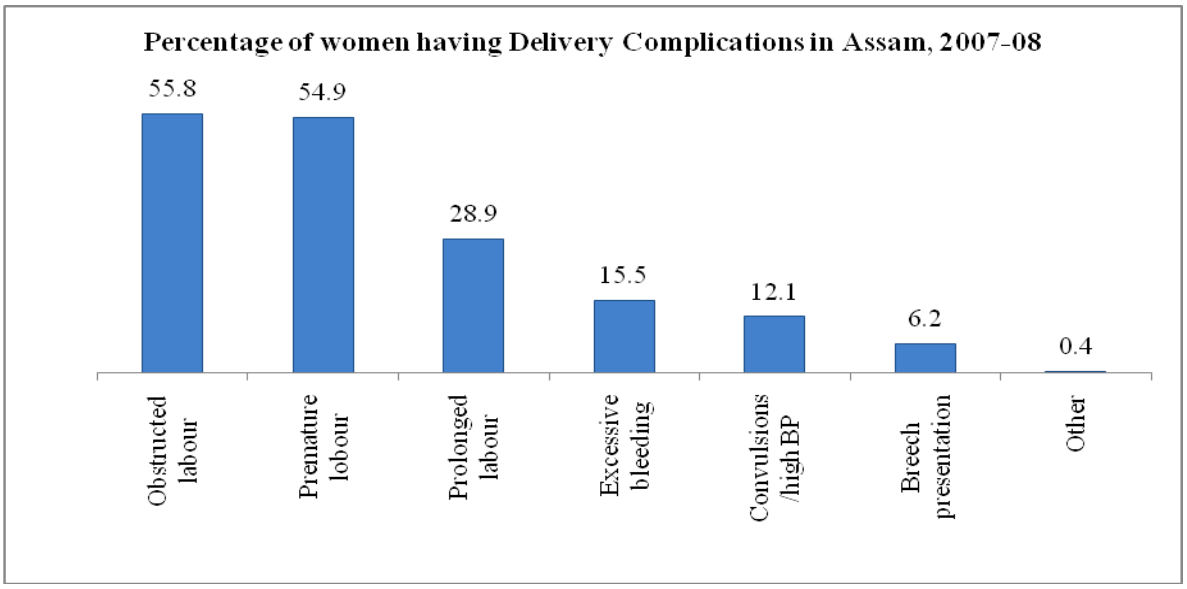


Fig 2: Percentage of women having delivery complication in Assam, India, 2007-08

***Socio-demographic differentials in reproductive health complications***

Table 2 represents the socio-demographic differentials as well as use of full ANC i.e., three or more ANC check up during pregnancy, receive atleast two Tetanus Toxid (TT) vaccine and having more than 100 Iron Folic Acid (IFA) tablets. Results shows that with the increasing in age of the women the complications related to pregnancy, delivery and post delivery is decreasing. Young women (aged 15-24) had reported more pregnancy complications (37%), delivery complications (41%) as well as post delivery complications (26%). Whereas very few women aged more than 30 reported of any reproductive complication which is about 5 percent, 6 percent and 4 percent for any pregnancy, delivery and post delivery complications respectively. Of course there is a rural urban differential exist among the women suffering from reproductive health complications during and after pregnancy. Here, in the state of Assam women belongs to rural communities are less vulnerable of reproductive complications than its urban counterpart. It may be because of lifestyle pattern or some other unidentifiable causes. The educational status of women does not show much differential in reproductive health complications. Any pregnancy and delivery complications have been reported more by unemployed women rather than employed women.

The result also shows the religious differentials of reproductive health complications. Hindu women were comparatively less in number in terms of reporting pregnancy as well as delivery and post delivery complications as compare to Muslim women in Assam. Women belong to Christian and other religion also reported less complication than Muslims. Women from low wealth quintile suffers more from pregnancy, delivery and post delivery complications as compare to women from high wealth quintile. When we see the women suffering from any pregnancy complications 29 percent of them were from poor wealth quintile and 14 percent richest wealth quintile. Thirty percent of poor women reported any delivery complication whereas only 16 percent were from rich quintile. In use of maternal health care services it is found that women who were suffering from any pregnancy complications 64 percent of them visits full ANC checkups. About 69 percent of women who visits full ANC checkups are reported of any delivery complications and 40 percent of having any post delivery complications. In both of the cases (any pregnancy and any delivery complications) it is seen that women not visiting full ANC checkups were reported less complications then those who use full ANC checkups. These may happen because women having more complications during pregnancy and at the time of delivery needs more health care and treatment for the mother and foetus.

***Multivariate Analysis***

It has already been clear that there is a socio-demographic differential in women's reproductive health complications in Assam. Besides these, it is quite important to examine the impact of use of maternal health care services like full ANC visit along with other covariates. For these purpose we performed multivariate analysis to understand the association between pregnancy, delivery and post delivery complications with use of full ANC service after adjusting other covariates. We have used three separate types of models for both of the outcomes as well as the reproductive health complications like pregnancy, delivery and post delivery complications in different context. For example: in table 3, model-I is used to understand the direct relationship between pregnancy complications and full ANC visit without taking into account of socio-economic characteristics. In model-II, adjustment is made for women's age, residence, education and employment characteristics, and finally model-III is adjusted for socio-economic status of household, religion and caste etc. But in table 5 in model-I along with the full ANC visit, safe delivery have also been adjusted and the rest of the models such as model-II and model-III are same as for the table 3 and 4.

Binary logistic regression is used for any pregnancy complications and results were shown as odds ratio (table 3).The first model shows (i.e., model-I) significant relationship between utilization of full ANC check up and any type of pregnancy complications. For example, women having any type of pregnancy complications were more likely (1.19, $p<0.05$) to be visit ANC checkups. In model-II, a similar result has been observed after adjusting the variables like age of the women, residence, educational level and work status. After adjusting all the socio-demographic variables (model-III) there is no change has been found in use of full ANC and having any pregnancy complications among women in Assam.

Despite, utilization of full ANC, age of the women has also a significant impact on pregnancy complications. It shows that older women were less likely to have any pregnancy complication than young women (0.76, $p<0.01$ for women aged 25-19 years). In case of standard of living of women, it shows that there is no significant relationship with pregnancy complications. It means women belongs to any condition can have complications during pregnancy.

In table 4 the multivariate analysis has done to see the effect of ANC visit and other covariates with delivery complications. In model-I the use full ANC services has considered and no significant relationship has found in between them. After adjusting some other variables in model-II, but no changes were found in delivery complications. Women belong to age in between 25-29 were less likely to have delivery complications than women aged 15-24 (0.82, $p<0.01$). After adjusting all the covariates in model-III, no variation has found between use of full ANC as well as other covariates does not appear to be a significant determinant on delivery complications.

On the other hand, in case of post delivery complications (table 5) to see the effect full ANC and safe delivery has been adjusted. After adjusting these to determinants it shows that women gone for full ANC and safe delivery has less complications after delivery but also shows no significance relationship. In model-II not much variation has been found after adjusting some of women's characteristics in use of full ANC and safe delivery on post delivery complications. In case of women's age again it shows that older women face less complication than young aged women (0.84, $p<0.01$). By residence it is found significant that rural women were less likely to have post delivery complication than urban women (0.68, $p<0.01$). Education level of women also shows a significant relationship in having of post delivery complication. Women with 10 and more years of education has less chance of getting any type of post delivery complications as compare to women with no education (0.87, $p<0.10$). Working status of women has also a significant relationship with post delivery complication

and findings shows that not employed women were less likely to have complications than employed women (0.71, $p<0.01$). After controlling all socio-demographic variables in model-III not much variation has come out. The same result is found that elder women, with more than 10 years of educations and not employed women have a significant correlation between post delivery complications. The standard of living of women (i.e., wealth index) shows that rising of wealth quintile complications is going down but it is not significant determinant of post delivery complications.

**Discussion and Conclusion**

This study attempts to understand the relationship between use of RCH services and reproductive health complications (during pregnancy, delivery, and post delivery) in state of Assam (one of the North-Eastern states of India) using the data of third wave of District Level Household and Survey, conducted during 2007-08. Assam is selected because of highest maternal mortality rate among the India states (Office of Registrar General, 2009).

Result shows that level of reproductive complication (pregnancy, delivery, and post delivery complications) is higher in the state, particularly delivery complication highest than other form of complications. Moreover proportion of severe complication is highest in the state. For instance, more than half of the pregnant women reported obstructed and premature labour in the state.

We also observed cross-section variation in pregnancy complication (pregnancy, delivery, and post delivery complications) in the states. For instance, reproductive complication is reportedly higher among urban women than rural women. Similarly it is higher among non-Hindu (particularly among Muslims). It may be because among Muslims fertility level is higher and birth-interval is comparatively shorter (Office of Registrar General 2001). It may prone them on higher complication, as many studies shows higher fertility with short birth interval is associated with pregnancy complication (Papia, 2005). Moreover, the education level of Muslim women are lower as compared with the Hindu women and this in turn has an adverse impact on them during pregnancy in terms of knowledge and utilisation of ANC services. Similarly, reproductive complication is higher among SCs in the country. As we know that Indian society is stratified into various societal layers on the basis of castes. Membership to a particular caste has an impact on the economic status of the people and economic status is one of the major factors explaining the differential health-seeking behaviour in the household.

It is also observed that reproductive complication is higher among educated women than that of less educated women. Educated women are more aware about the problems that might occur during pregnancy and they are in a better position to take care of such problems. This is perhaps because of the fact that most of these women might be engaged in economic activities outside the house, which demands a considerable amount of their time and energy and prevent them from taking adequate rest. Another reason might be that women being more conscious about their health reporting of their health might be better. If women are engaged in work that requires professional skill and educational qualifications then they have higher chances of interacting with the outside world and are therefore more aware about their health problems and its precautions. Reproductive complication is higher among women belong to poor economic household than that of rich household. It may probably because among poor prevalence of unplanned pregnancy is higher which may lead higher pregnancy complication (Osmolska, 2011).

Interestingly, reproductive complication is reportedly higher those women who received higher maternal healthcare services. It may be probably that higher complications need higher healthcare services. It calls a need to promote the institutional delivery in the state. At the same time it also calls to enforcement of *Janani Suraksha Yojana* in the state.

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Table 1: Percentage distribution of women having pregnancy complications in Assam, 2007-08.

| **Pregnancy complications** | **Percent** | **N** |
|---|---|---|
| Swelling of hands, feet and face | 17.3 | 1172 |
| Paleness/giddiness/weakness | 46.7 | 3154 |
| Visual disturbances | 18.2 | 1227 |
| Excessive fatigue | 34.4 | 2322 |
| Convulsions not from fever | 7.8 | 525 |
| Weak or no movement of foetus | 5.6 | 379 |
| Abnormal position of foetus | 1.9 | 129 |
| Malaria | 3.1 | 207 |
| Excessive vomiting | 30.8 | 2079 |
| Hypertension/high BP | 7.8 | 528 |
| Jaundice | 2.7 | 180 |
| Excessive bleeding | 2.0 | 134 |
| Vaginal Discharge | 7.3 | 492 |
| Other | 0.8 | 54 |
| **Delivery complications** | | |
| Premature lobour | 54.9 | 3720 |
| Excessive bleeding | 15.6 | 1049 |
| Prolonged labour | 28.9 | 1949 |
| Obstructed labour | 55.8 | 3769 |
| Breech presentation | 6.2 | 419 |
| Convulsions /high BP | 12.1 | 819 |
| Other | 0.4 | 28 |

Table 2: Percent distribution of women having reproductive health complications by socio-demographic variables (last birth) in Assam, 2007-08

| Background Characteristics | Any Pregnancy complication | Any Delivery complication | Any Post Delivery complication |
|---|---|---|---|
| **Age** | | | |
| 15-24 | 37.4 | 41.4 | 26.4 |
| 25-29 | 23.7 | 27.0 | 16.8 |
| More than 30 | 4.9 | 5.5 | 3.8 |
| **Residence** | | | |
| Urban | 21.7 | 24.4 | 15.8 |
| Rural | 16.0 | 18.2 | 8.8 |
| **Education** | | | |
| No education | 20.6 | 23.7 | 15.6 |
| Less than 5 years | 19.7 | 21.6 | 15.8 |
| 5-9 years | 22.3 | 24.8 | 15.2 |
| 10 or more years | 20.3 | 22.9 | 12.6 |
| **Employment** | | | |
| Employed | 18.9 | 21.8 | 15.7 |
| Not employed | 21.4 | 24.2 | 15.0 |
| **Religion** | | | |
| Hindu | 18.4 | 21.1 | 12.2 |
| Muslim | 27.9 | 30.3 | 22.4 |
| Christian | 19.3 | 22.2 | 11.8 |
| Others | 18.2 | 21.2 | 15.2 |
| **Caste** | | | |
| Scheduled Caste | 23.0 | 25.0 | 15.0 |
| Scheduled Tribe | 17.3 | 20.8 | 11.5 |
| Other Backward Class | 19.1 | 21.3 | 12.7 |
| Others | 22.7 | 26.3 | 16.8 |
| **Wealth Index** | | | |
| Poor | 29.4 | 33.3 | 22.6 |
| Middle | 20.9 | 23.4 | 14.9 |
| Rich | 13.8 | 15.8 | 8.0 |
| **Full ANC check up** | | | |
| No | 59.9 | 67.7 | 43.1 |
| Yes | 64.0 | 68.6 | 39.9 |
| **Safe Delivery** | | | |
| No | 58.5 | 65.0 | 43.5 |
| Yes | 63.0 | 71.9 | 42.0 |
| **Total** | **21.0** | **23.6** | **14.9** |

Table 3: Odds ratios from logistic regression for any pregnancy complication by background characteristics in Assam, 2007-08

| Variables | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| **Full ANC** | | | |
| No ® | | | |
| Yes | 1.12 | 1.16** | 1.15 |
| **Age** | | | |
| 15-24® | | | |
| 25-29 | | 0.76*** | 0.77*** |
| More than 30 | | 0.89 | 0.88 |
| **Residence** | | | |
| Urban® | | | |
| Rural | | 0.86** | 0.86* |
| **Education** | | | |
| No education ® | | | |
| Less than 5 years | | 1.13* | 1.19** |
| 5-9 years | | 1.13** | 1.19*** |
| 10 or more years | | 1.06 | 1.23** |
| **Employment** | | | |
| Employed ® | | | |
| Not employed | | 0.91 | 0.85 |
| **Religion** | | | |
| Hindu® | | | |
| Muslim | | | 1.30*** |
| Christian | | | 1.16 |
| Others | | | 1.01 |
| **Caste** | | | |
| Scheduled Caste® | | | |
| Scheduled Tribe | | | 0.70*** |
| Other Backward Class | | | 0.92 |
| Others | | | 0.84* |
| **Wealth Index** | | | |
| Poor ® | | | |
| Middle | | | 1.01 |
| Rich | | | 0.91 |

® Reference category *** p<0.01, ** p<0.05, *p<0.1

Table 4: Odds ratios from logistic regression for any delivery complication by background characteristics in Assam, 2007-08

| Variables | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| **Full ANC** | | | |
| No ® | | | |
| Yes | 0.92 | 0.98 | 0.95 |
| **Age** | | | |
| 15-24® | | | |
| 25-29 | | 0.82*** | 0.83*** |
| More than 30 | | 1.00 | 1.03 |
| **Residence** | | | |
| Urban® | | | |
| Rural | | 0.82*** | 0.85* |
| **Education** | | | |
| No education ® | | | |
| Less than 5 years | | 1.03 | 1.04 |
| 5-9 years | | 1.05 | 0.99 |
| 10 or more years | | 0.98 | 1.00 |
| **Employment** | | | |
| Employed ® | | | |
| Not employed | | 0.87 | 0.88 |
| **Religion** | | | |
| Hindu® | | | |
| Muslim | | | 1.16* |
| Christian | | | 1.20 |
| Others | | | 1.10 |
| **Caste** | | | |
| Scheduled Caste® | | | |
| Scheduled Tribe | | | 0.79*** |
| Other Backward Class | | | 0.90 |
| Others | | | 1.05 |
| **Wealth Index** | | | |
| Poor® | | | |
| Middle | | | 1.02 |
| Rich | | | 0.89 |

® Reference category *** p<0.01, ** p<0.05, *p<0.1

Table 5: Odds ratios from logistic regression for any post delivery complication by background characteristics in Assam, 2007-08

| Variables | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| **Full ANC** | | | |
| No ® | | | |
| Yes | 0.89 | 0.98 | 0.95 |
| **Safe delivery** | | | |
| No ® | | | |
| Yes | 0.95 | 1.03 | 1.20*** |
| **Age** | | | |
| 15-24® | | | |
| 25-29 | | 0.84*** | 0.90** |
| More than 30 | | 1.10 | 1.12 |
| **Residence** | | | |
| Urban® | | | |
| Rural | | 0.68*** | 0.69*** |
| **Education** | | | |
| No education ® | | | |
| Less than 5 years | | 1.28*** | 1.36*** |
| 5-9 years | | 0.99 | 1.07 |
| 10 or more years | | 0.87* | 0.99 |
| **Employment** | | | |
| Employed ® | | | |
| Not employed | | 0.71*** | 0.66*** |
| **Religion** | | | |
| Hindu® | | | |
| Muslim | | | 1.55*** |
| Christian | | | 0.88 |
| Others | | | 1.45 |
| **Caste** | | | |
| Scheduled Caste® | | | |
| Scheduled Tribe | | | 0.85* |
| Other Backward Class | | | 1.08 |
| Others | | | 1.05 |
| **Wealth Index** | | | |
| Poor ® | | | |
| Middle | | | 0.99 |
| Rich | | | 0.83 |
| **Any pregnancy complications** | | | |
| No® | | | |
| Yes | | | 4.33*** |
| **Any delivery complications** | | | |
| No® | | | |
| Yes | | | 1.82*** |

® Reference category *** p<0.01, ** p<0.05, *p<0.1