Maternal Health Care Services and Its Utilization in Bihar, India

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ABSTRACT: *The utilization of maternal health care services is a complex phenomenon and influenced by several factors. Therefore, the objective of this study is to analyze the utilization of maternal health services and its determinant that affects at community and regional levels by using DLHS-III. Bi-variate and multiple logistic regressions have been used for analyzing all these things. Home Delivery was found more in rural (74.1) than urban (46%), but maximum delivery was found normal in both rural (94.5%) and urban (85.4%) setting, birth that had been conducted by unskilled persons was also high in rural (94%) and urban (87%) settings. The utilization of any ANC, Institutional delivery and PNC was 59 percent, 28 percent and 26 percent respectively. There was also a large significant variation in utilization of ANC services and services at the time of delivery used in between rural and urban settings. Households' socio-economic status, mother's education, caste and birth order was the most-important determinants associated with the use of any ANC and institutional delivery. Therefore, at community-levels, increase the utilization of maternal health services and there is also stable to focus on vulnerable section of the community (Poor and SC/ST groups) and regional-level awareness interventions.*

KEYWORDS: *any ANC, PNC, Institutional delivery, PNC, caste, wealth index*

I. INTRODUCTION

Utilization of maternal health care services was remained weak in most of developing countries like India in spite of increasing private and public sectors on the provision of advanced health care services. In view of high maternal mortality, inferior status of women besides questionable quality of services and exploring the factors that affecting utilization of maternal health care. It was special among young woman needs immediate attention in the context of reproductive rights and human ethics. Women of reproductive age group were the most-vulnerable part of the population in case of health issues, especially when they are going to be a mother. The maternal health refers to the health of women during pregnancy, childbirth and postpartum period. Due to complications during pregnancy or childbirth more than 350,000 women die annually. Among these almost, 99 percent death was in developing countries. The decline rate of maternal mortality is very slow, but the annual decline required rate is 5.5 percent to meet the MDG target of reducing by three-quarters the maternal mortality ratio by 2015 (MDG fact sheet, 2010).

The Maternal Mortality Ratio (MMR) estimate for the country indicates an overall decline from 212 in 2007-09 to 178 per one lack live births in 2012, resulting in saving lives of about 9,000 mothers per year (The Hindu, Bangalore, December 26, 2013). Maternal mortality is affected by a range of socioeconomic and cultural factors, such as women's status in the household and society, their educational and economic status, accessibility facility (distance, transport) and availability and quality of care (availability of staff and equipment in the health facility) (Singh et al., 2011). The aim of maternal health services in reducing infant and maternal morbidity and mortality was received in increasing recognition since the Cairo Conference on Population and Andersen's health care utilization and behaviour model have been adapted to consider more system-level measures and to focus on the availability, accessibility and organization of services during last 40 years (Aday & Andersen, 1974). Keeping it in mind the appropriate behavioural model for maternal health care utilization adopted for this study has included predisposing factors, enabling factors, need factors and environmental variables (Andersen, 1995). Existing studies have found that people living in the poorest neighbourhoods are least likely to receive adequate care (Pearl et al., 2001; Collins Schulte, 2003; Magadi et al., 2003). These deaths were unadjusted and might be avoided with essential health interventions, like provision of antenatal care and medically assist redelivery (Adam et al. 2005; MCcaw - Binns et al., 2007). Women's autonomy has also been found to be associated with lower child mortality and better maternal and child health (Kishor, 2000). Using data from interviews with matched couples collected in the 2001 in Nepal Demographic and Health Survey. This report also explores how incorporating both spouses' reports of household decision making may change the understanding of the determinant and consequences of women's freedom.

Thirty-two percent Indian ever-married women reported being deprived in one of the three dimensions, percent in two and percent in all three; 43 percent was deprived in none. A woman deprived in all three dimensions was less likely than those not deprived in any. Who received ANC or PNC? A birth occurred by medical assistance was smaller for deprived women in three dimensions than for those deprived in none. These patterns were correct for every larger Indian state. Differentials in utilization of maternal care services were higher across deprivation levels in the states where service coverage was low in states where service coverage was high (Mohanty, 2012). Moreover, income differences in access to maternal care were widening across and within countries as poor women were receiving fewer services than those who are better off. (Lawn et al., 2006).The decline in consumption poverty is not associated with a decline in starve or an improvement in the health of the population. For instances, more than two out of fifths of Indian children less than five are undernourished, and half of women are anaemic. Health care financing arrangements vary across countries and within a country over time, with changes of government. These variations not only have strong implications for income distribution, but also affect the manner of health care utilization (Wagstaff and Van Doorslaer, 2000). The integration of family planning was more acceptable in the primary underlying goal. The second objective was to make the efficient program and cost-effective through the better use of health centres and health personnel (Mosley and Sirageldin, 1988).

India is a one in developing nations with a high rate of maternal mortality. Government launched many maternal health care (MHC) programmes to reduce MMR and some other maternal and child health complication. But, it still lacks behind to fulfil Millennium Development Goal (Gogoi, Unisa & Prusty, 2014). Progressing of MCH is one of the essential components of the RCH programme for woman to receive at least three antenatal check-up, two Tetanus Toxoid injections (TT) and a full course (100 tablets) of Iron and folic acid supplementation. Maternal health is more affects by the nation's socioeconomic diversity. However, according to the special bulletin on maternal mortality in India 2010-2012 (SRS, December, 2013), the maternal mortality ratio (MMR) for Bihar is 219 per 100,000 live births, but at India level is 178. Moreover, according to Indian census 2011, female Literacy Rate of Bihar is 53.33% and for India is 65.46 %. Healthcare Infrastructure of Bihar is not fulfilled the required target of both governments of India and Government of Bihar. Required sub-Centre in the state was 18533, but 9696 units were in a position, so that 8837 shortfalls was observed according to the latest estimates available through Health statistics of the Government of India 2012. Required Primary Health Centre was 1863 in the position of 3083, and shortfall was observed up to 1220. Required Community Health Centre in Bihar was 770, but only 70 in place so 700 shortfalls that were around 91 percent of the CHC infrastructure in the state. Female health worker, ANM at sub-centres & PHCs 11559 required 16943 in place. Male health Worker at sub-Centres 9696 required 1074 in position 8622 shortfall. Female health Assistant at PHCs 1863 required 358 in position 1505 shortfall. Male health Assistant at PHCs 1863 required (Ministry of Health & F.W., and GOI, RHS Bulletin, March, 2012). So, there is a need i) to analyze the utilization of maternal health care services and ii) determinants that affects utilization of maternal health care services in Bihar.

II.   DATA SOURCE AND METHODOLOGY

Data Source: Data from 46,840 ever married women and 7713 unmarried women aged 15-49 years residing in Bihar state of India who participated in the third round of District Level Household and Facility Survey (DLHS-III) 2007-08 were used for this study. Bihar is spread up to an area of 94,163 sq. km. and a population of 103.8 million. There are nine divisions, 38 districts, 101 subdivisions, 533 blocks and 45,098 villages. It has population density of 1102 per sq. km. (as against the national average of 382). The decadal growth rate of the Bihar is 25.07 (against 17.64 percent for the India). The population of Bihar has been continued to increase as much faster rate than the country rate.

Variable used: Antenatal Care (ANC) is the main programme of National Rural Health Mission (NRHM) to strengthen Reproductive and Child Health (RCH) care. ANC provided by an Auxiliary Nurse Midwife (ANM), doctors or another health professional comprises of physical checks, checking position and growth of the fetus of women and giving Tetanus Toxoids injection (TT) at periodic intervals during the time of her pregnancy. Three check-up are expected to complete the course of ANC to safeguard women from pregnancy-related complications.

Institutional delivery and post-natal care in a health facility are promoted in NRHM through the Janani Suraksha Yojana (JSY) to prevent maternal deaths (DLHS-III, 2007-08).Any ANC, Full ANC, Institutional Delivery and PNC are the dependent variables used in the study and age of the respondent, birth order, education level, religion, caste, wealth quintiles and areas were the independent variables used in the study. Wealth index shows socio-economic status. It divided into five quintile, which was computed based on the data

from DLHS-III survey by combining household amenities and assets. Households were categorized as poorest, poorer, middle, richer and richest groups. State has thirty-eight districts. It divided into six major regions for convenient of the study i.e. North, North East, North West, South, South East, South West regions, according to NFHS-III. North region included nine districts; north-west included five-district and north east included five districts in the state. Likewise, south region included six districts, south-west region included five- and south-east region include seven districts in the present study (International Institute for Population Sciences, 2007).

III. DEFINITIONS

Any Ante Natal Care: Those women who receive any antenatal care like four and above antenatal visits or received two or more tetanus toxic (TT) vaccine during pregnancy or took 100+-iron folic acid (IFA) tablets were considered as Any Ante Natal Care.

Full ANC: Those women who had taken four and above antenatal visits, received two or more tetanus toxic (TT) vaccine during pregnancy and took 100+-iron folic acid (IFA) tablets are considered as full Ante Natal Care.

Institution Delivery: Those women who delivered their baby in any health institution (public or private) were considered as Institutional delivery in the current study.

Post-Natal Care (PNC): Those women who received postnatal care within two weeks after delivery is taken as women with Post-Natal Care.

IV. STATISTICAL ANALYSIS

The study has been used bi-variate and multivariate techniques. Logistic regression analysis was used for accounting for individual, community and regional level factors associated with the use of maternal health care services. Now, first we want to present the proportion of women who used each of the four maternal health services for each category of independent variables. Logistic model was fitted to assess the influences of measured individual, household local factors (fixed effects) on the use of maternal health services, using the SPSS 20-versions. These four-resultant variables (utilization of any antenatal care, full ANC, Institutional delivery and postnatal care) are used as dependent in the analysis. The outcomes of measures of association are shown as odds ratios with 95 percent confidence interval (CI).

Multiple logistic regressions: This analysis was applied to obtain the odds of children having any ANC, full ANC, Institutional delivery and Post-Natal Care. The dependent variable in the model is also any ANC, full ANC, Institutional delivery and Post-Natal Care. Logistic Regression models are commonly estimated by maximum likelihood function. For these outcome variables, multiple logistic regression models have taken into the form as

$$P = \frac{\exp(a0 + a1X1 + a2X2 + a3X3 \ldots\ldots\ldots\ldots\ldots anXn)}{1 + \exp(a0 + a1X1 + a2X2 + a3X3 \ldots\ldots\ldots\ldots\ldots anXn)}$$

The multiple logistic models were sometimes written in a different way as given below

$$\ln\left(\frac{p}{1-p}\right) = a_0 + a_1X_1 + a_2X_2 + a_3X_3 \ldots\ldots\ldots\ldots\ldots a_nX_n$$

Where X_i's are covariates and a_i's are coefficients. P is the predicted probability and log odds of p and (1-p) provides the odds ratios with respect to the reference category.
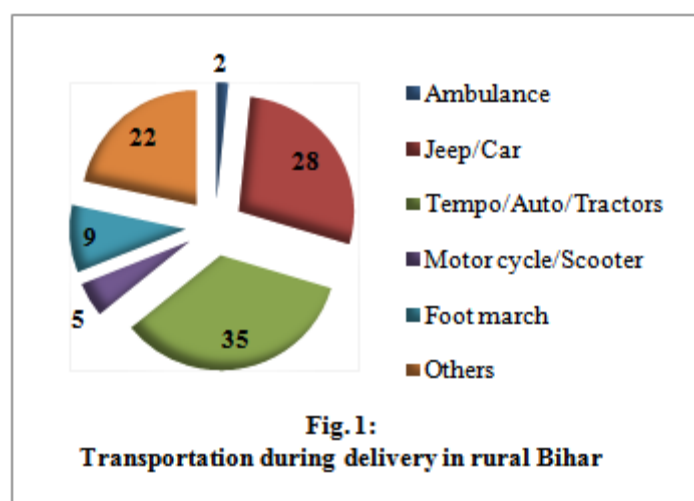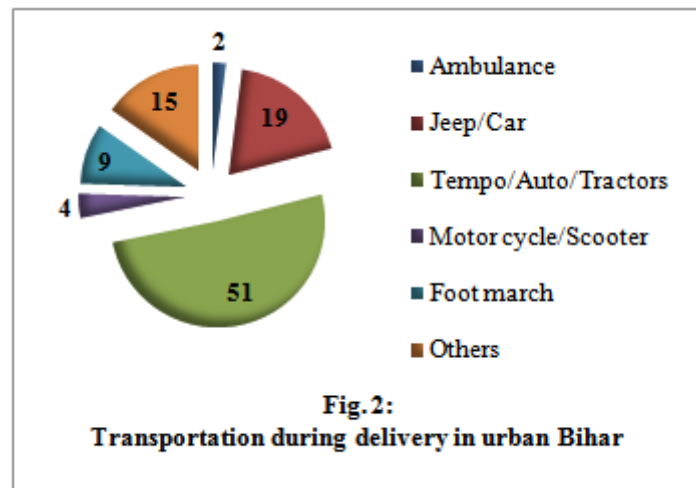
V. KEY FINDING

Table 1 revel the utilization of antenatal care services at the time of pregnancy and delivery. Findings suggest every fifth woman in rural Bihar and every third woman in urban Bihar reported about their registration at the time of pregnancy. Tetanus injection (TT) has been found as a strong predictor for ANC services, and no variation has been found in rural as well as urban settings, where data shows a strong believe in receiving minimum 2 TT injections i.e. more than 60 percent women were utilized 2TT injection in the state. Iron folic acid (IFA) tablets were used to reduce the anaemic disorder among pregnant women. The IFA tablet intake was found most significant in the state as nearly half of the women in urban areas, and only 33 percent women in rural areas were reported about their consumption.

Table I: Utilization of selected maternal health care services according to place of residence in Bihar, India

Utilization of antenatal care services			
Service utilized	**Rural**	**Urban**	**Chi-square**
Registration	19.7	29.1	471.88*
TT injectionreceived			
1	5.4	3.1	
2	61.1	63.2	63.53*
3+	33.6	33.7	
Iron Folic Acid (IFA)	33.1	49.6	717.85*
ANC Visit			
1	13.4	10.4	
2	43	33.1	
3	29.8	24.2	1569.62*
4+	13.8	32.4	
Any ANC	58.2	70.5	542.11*
Full ANC	4	11.6	1127.78*
Intuitional Delivery	25.4	54	3516.28*
Post Natal Care			
PNC within 48 hours after delivery	24.3	41.4	1322.5*
Post Natal Care within two weeks	24.8	42.5	1391.81*
Supplementary Nutrition Received from Aganwani	7.3	5.8	29.79*
Utilization of service at the time of delivery			
Place of delivery			
Government/NGO/Trust	12.1	20.1	
Private/hospital/Clinic	13.8	34.3	3755.85*
Home/Parents home/other	74.1	45.6	
Delivery assisted by			
Doctors	2.6	2.8	
ANM/Nurse/Midwife/Other health personal	3.1	9.6	512.34*
Dai/Relative/Friends	94.2	87.6	
Type of delivery			
Normal	94.4	85.4	
Caesarean	3.4	9.6	1224.19*
Instrument or Assisted	2.1	5	
Received govt. assistance under JSY	6.5	9.1	96.68*
Total	19643	1817	

Note: *= Level of significance at 1%.

Fig. 1:
Transportation during delivery in rural Bihar

Fig.2:
Transportation during delivery in urban Bihar

Fourteen percent women in rural and 32 percent women in urban reported as more than four ANC visits in the state. More than half of women were received any ANC services while only 4 percent women received full ANC services in rural Bihar during her pregnancy. However, three out of ten women had visited institutional delivery in rural while five out of ten women were in urban settings. These differences were happened because of lack of implementation and utilization of various schemes like Janani Suraksha Yojana (JSY). Figure 1 & Figure 2 suggest that four women among ten in rural and every second woman in urban Bihar prefer to use tempo/auto/ or tractor as a mean of transportation during delivery while ambulance facility was much poorer in both rural and urban settings. The health status of a mother and her new-born child, not only depends on the health care receives during her pregnancy and delivery, but also the care, she and her infant receive during the first few weeks after delivery. Postnatal Care soon after the delivery is particularly important for births that taken place. Table-I also indicates that Post Natal Care (PNC) within 48 hours after birth was found significantly low in rural setting (24.3%) and the supplementary nutrition received from aganwani was reported very low in both rural (7%) and urban (6%) settings. Home Delivery was also found more in rural (74.1) than urban (46%) setting. Elsewhere, maximum delivery was normal in both rural (94.5%) and urban (85.4%) setting, and birth that had been conducted by unskilled persons (Dai/Relative/Friends) was also high in rural (94%) and urban (87%) respectively. Figure 3 reveals that utilization of full ANC was worst in all regions of Bihar. It was followed by home delivery assisted by skilled person. Almost in all the regions, home delivery was much more than other delivery. It was highest in north-east region (84%) and lowest in the south-west region (55%) of the state. Every second woman of south west region reported having safe delivery. Nearly three among ten women had taken post natal care (PNC) within 48 hours of delivery. Table II showed that out of 59 percent; about 66 percent women used any ANC services in the age group 15-24. It was highest among all another age - group. Moreover, full ANC (5.8 percent), institutional delivery (34.7 percent) and PNC (30 percent) was also highest in the same age group. It was decreased as age of woman's increases (table-III, IV, and V). Table-II, III, IV, & V also indicates that Women education, wealth index, was positively associated with any ANC visit, institutional delivery, and PNC visits. The women having ten plus years of schooling had visited for any ANC (86 percent), Institutional delivery (64 percent), PNC (52 percent) but very few women (22 percent) visited for full ANC in Bihar. Rural area was more affected from lack of full ANC visits, Institutional delivery and post natal care. The further findings showed that the mothers used more any ANC during the first-order birth in comparison with the second, third, and fourth-birth order, but the use of any ANC decreased with birth order more than four. The institutional delivery and postnatal care declined steadily with increased birth order. Full ANC was also decreased with increased birth order. This analysis also indicated that women from higher economic status were more likely to use maternal health services. It was also high in the urban community than the rural community. It was also shows that in the south-west region, utilization of full ANC, institutional delivery and PNC was highest. Women from SC/ST population were less used of maternal health care services than from OBC and others women. Hindu and Muslim were used approximately same any ANC and full ANC, but institutional delivery and PNC was high in Hindu religion. Levels of the utilization of maternal health services were low in the region with a high percentage of tribal area population. Remaining variables used in this study were significantly associated with the use of the four maternal health care services. Households' socio-economic status was an important associated factor with the use of the four maternal health service indicators.

Fig. 3:
Utilization of services According to regions
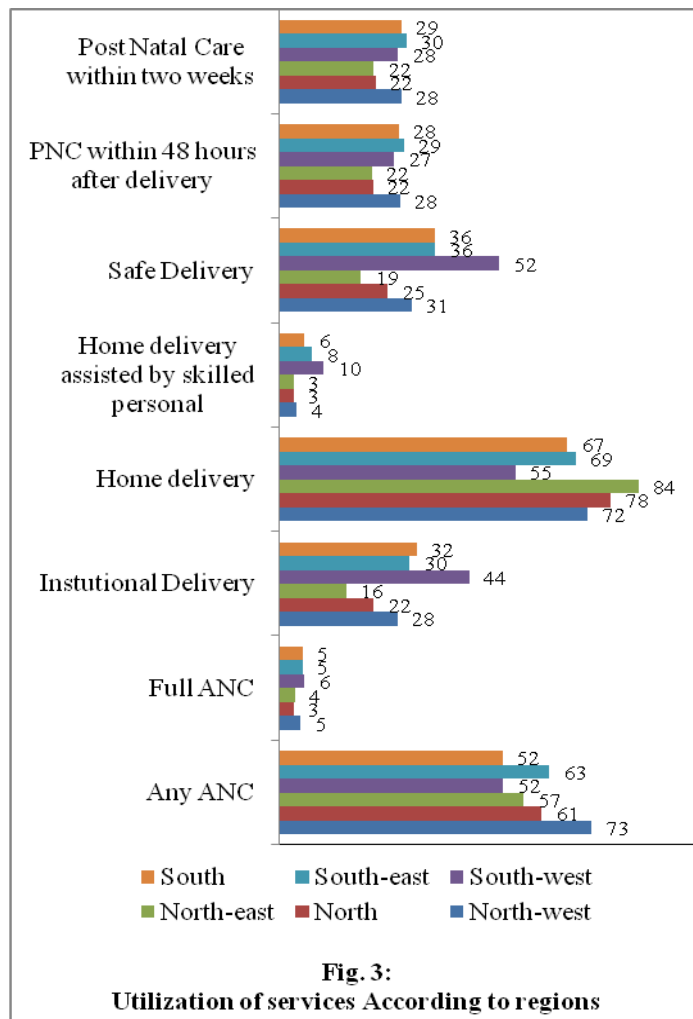
Any ANC: Age of women, women education, caste, wealth index, region and birth order were statistically insignificant in use of any ANC. Age of mothers was negatively associated with the use of any ANC in the bivariate model whereas the results of regression analysis showed negative relationship of this variable with the use of any ANC. It was greater in the age group 15-24 but less in remaining age group than the reference group. Moreover, results of the bi-variate model and the regression analysis showed that women's education, caste, region, birth order and households socio-economic status were the most influential individual level factors related to the use of any antenatal services. The results of the regression model also showed that women from the richest quintile had more than three times more likely to receive any ANC during pregnancy than the women from the poorest households of the society. The odds of using any ANC by women with five to nine years of education were 26 percent more than the less than five years of education. At the community level, urban residence was considerable positive association with the use of any ANC. It indicates that the urban residence has an independent effect on any antenatal care, over and above the well-known effects of different factors.

Full ANC: Table III show that the women's education, cast, wealth index (richer & richest), and birth order were statistically significant, and others are insignificant. Higher educated women's were significantly more using full ANC than the less than five years of education. Another caste was approximately four times more likely to use full ANC than the SC/ST. Working women were 13 percent more likely to use full ANC as comparison to non-working women in Bihar. This state also having regional variation in the full ANC user; north-east region 41 percent more and another region was less likely to use full ANC than north-west region. We can also see that full ANC, wealth index, women's education strangely related to each other. The women who were 30+ years at the time of age at last birth were 39 percent more likely to use full ANC than the reference category.

Institutional delivery: Table IV shows that odds of institutional delivery according to different background characteristics. Age, women's education, caste, religion, wealth index, working status, 2nd 3rd & 4th-birth order and regions were significantly affecting the institutional delivery. These determinants were the strongly associated with of the use institutional delivery. The results of given model showed that women with ten plus education were 41 percent more likely to receive institutional delivery in comparison with less than five years of educated women. Women from the richest quintile of the household were 2.27 times more likely to use institutional delivery than women from the poorest quintile. Women belonging to SC/ST, Hindu and to be lower educated husband were associated with lower institutional delivery. Urban areas were found to be positively associated with receiving institutional delivery.

Postnatal Care: The overall use of PNC services by women was very low in Bihar. As table-V shows that variables such as husband's level of education, birth order, women being from the middle, richer and richest quintile remained to be statistically significant. The result of logistic regression analysis also showed that the stronger determinant related to the use of PNC was institutional delivery. Further, the results also showed that women from the poorest and poorer households had a lower likelihood of using PNC than women from the middle, richer & richest families. Women had ten plus year's education was about 25 percent more likely to use PNC than less than five years educated women. Moreover, the use of PNC & birth order was associate between each other. PNC was also regulated by the place of residence as the previous two maternal health indicators shows. Moreover, regional level variables also show a significant association with the use of PNC in this analysis.

VI. DISCUSSION

The use of maternal health services in Bihar remains low in comparison with remaining Indian states. For instances, the analysis in this study shows that women received any ANC, full ANC, institutional delivery and PNC was 59.0 percent,4.6 present, 27.7 percent and 26.1 percent respectively in Bihar. However, Kerala had almost universal coverage in the use of maternal health services, including any ANC (99.8%) and the use of institutional delivery (99.4%). In the same way, high figures were also found in Tamil Nadu and Andhra Pradesh (DLHS-3, 2007-08).A study based on the of community-level influence the usage of reproductive and maternal health services conducted in Uttar Pradesh (U.P) state of India reported strong community-level regulates on service use, although the type of the community effect varied according with service type. This study further demonstrates the role individual, and household factors in determining a person's usage of services were arbitrate by the characteristics of the community in which the individual resides. The outcome of this study demonstrated the need to look beyond individual when examining health-care seeking behaviour (Stephenson & Tsui, 2002). The study shows very strong positive act upon higher household socio-economic status on the usage of all four indicators of maternal health services. Earlier studies have also reported a positive association between socio-economic status and any antenatal care, institutional delivery and postnatal care (Bhatia & Cleland, 1995; Navaneetham & Dharmalingam, 2002).Findings related with high influence of higher levels of women education on the usage of maternal health services are uniform with other studies in India and other countries. The higher educated women are, more aware about their health, availability of maternal health care services and usage this awareness and information in accessing the health care services (Pallikkadavath et al., 2004). Husband Education might play a similar function in accompanying the women's access to the health services. In the rural settings, maternal health services are delivered through government run CHCs, PHCs and Sub-Health Centres. In urban settings, these services are performed by medical colleges, district & civil hospitals and urban health posts. Maternal health services from nursing homes, private hospitals, health centres and private practitioners are also helped in both rural and urban settings. Access to and availability of healthcare services is anticipated to be greater in the urban settings. The findings of this study regarding stronger influences of urban residence on the use of any ANC services and institutional delivery are consistent with the results of previous studies (Bhatia & Cleland 1995). No considerable differences in the use of any ANC were found between Hindu and Muslim woman.

The usage of any ANC and institutional delivery services play a significant role in age, women education, caste, wealth index, region and birth order whereas there was remarkable influence in place of residence, caste, wealth index, region and birth order was found in postnatal care in our study. A multi-stage study conducted in southern India demonstrated that the caste had varied on the use of maternal health care services in a different state. Lower caste was a stronger correlate from institutional delivery in Andhra Pradesh whereas in other states scheduled caste or scheduled tribe decreased the likelihood of using maternal health services (Navaneetham, 2002). This study found that the use of PNC was not much regulated by the place of residence. It might be because all women who delivered their babies in health facilities were given PNC before discharge them and providing or seeking PNC was negligible in the cases of home deliveries regardless of

residence in urban or rural settings. Apart from these qualified paramedical and medical personnel, a huge network of unqualified practitioners also establishes an enormous part of private health care sector in the state. The function of private health care providers in regulating the usage of maternal health services needs to be further researched. It is also surprising that contempt is having high deficit of health facilities and human resources for health care in SC/ST population. This issue needs to be further research. Further research is also required to describe the regional level factors associated with the utilization of maternal health services. Moreover, the function of economic development, status of gender equity, population-health personnel ratio and empowerment of women at district level may be researched in this regard. The outcome of this study has conditional relation on evidence-based programmes for maternal health care. These outcomes highlighted the need of adopting multilevel approaches along with discussing the factors affecting the usage of maternal health services at individual, community and regional levels. The amount of variation at community level found in this study demonstrates the need to contextualize attempts for increasing the usage of maternal health services. This study also revealed the existence of some unmeasured factors at community level influencing the utilization of maternal health services. Hence, adopting district-specific strategies along with describing and addressing district level factors affecting the usage of maternal health services will give better output.

VII. LIMITATION OF THE STUDY

This study has few limitations that need to be considering when interpreting the outcomes. Third round of DLHS is a data source for this study is based on the self-reported information of respondents. Although there are concerns about self-reported behavior, it is fairish to consider that biases are less likely in maternal health care related issues in the comparison of other sensitive issues such as sexual behavior. Secondary data used for this analysis were from a cross-sectional survey. So, we could only examine the association between explanatory variables and four indicators of the usage of maternal health services. It could not demonstrate the conclusion about causality. It might be clear that the relationships found are due to the regulate of unmeasured individual, community and regional level variables that are related with both dependent and independent variables in our estimated models. Some correlates of maternal health care utilization are missing from this analysis such as distance of health facilities from the place of residence, and this could have influenced the patterns of utilization of maternal health services.

VIII. CONCLUSIONS

This study based on beyond the individual factors and searched the effects of community and regional level factors on the utilization of maternal health services. An urban area was consistently associated with an increased likelihood of the utilization of maternal health services. We found a sufficient amount of variation at community of residence and region of residence on each of the four indicators of the utilization of maternal health service. There was a large significant variation in utilization of ANC services and services at the time of delivery used in between rural and urban settings. The usage of maternal health services revealed interesting outcomes in affecting factors. That has significant conditional relation from evidence-based programme for maternal health. The households socio-economic status and mother's education, caste and birth order was the most-important determinants associated with the use of any ANC and institutional delivery. Therefore, promoting mother's education will yield greater outcome in increasing the usage of maternal health services. The outcome of this study showed that the usage of any ANC increases the odds of institutional delivery. That in later increases the usage of PNC. Hence, it is crucial to promote the use of any ANC among pregnant women. The access of certain groups such as SC/ST, poorest & poorer and higher birth order groups are important so that maternal health services should be further emphasized. In addition to individual-levels, increase the utilization of maternal health services in Bihar. So that there is a stable need to focus on vulnerable section of the community (Poor and SC/ST groups) and regional-level interventions. There is a need of future investigation of those determinants that account the unexplained community and regional variations in the usage of maternal health services.

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Table II: Percentage and odds of women received any ANC during pregnancy according to selected background characteristics, Bihar, 2007-08, India

Background Characteristics	Any ANC	OR	95% C.I.	
			Lower	Upper
Age				
15-24®	65.6	1.00		
25-34	56.9	0.99	0.86	1.14
35+	43.7	0.74**	0.58	0.95
Residence				
Rural®	58.2	1.00		
Urban	70.5	1.04	0.83	1.30
Women Education				
Less than 5 years®	53.1	1.00		
5-9.	71.7	1.26***	1.08	1.46
10+	86.4	1.11	0.81	1.51
Caste				
SC/ST®	48.8	1.00		
OBC	59.9	1.22***	1.07	1.40
Others	72.6	1.55***	1.27	1.90
Religion				
Hindu®	58.9	1.00		
Muslim	59.6	0.90	0.77	1.06
Others	42.2	0.44	0.11	1.70
Wealth Index				
Poorest®	46.4	1.00		
Poorer	58.7	1.36***	1.19	1.55
Middle	68.0	1.78***	1.51	2.10
Richer	79.7	1.91***	1.51	2.43
Richest	90.8	3.47***	1.81	6.65
Husband Education				
Illiterate®	59.0	1.00		
1-5.	57.1	0.70	0.41	1.17
6-9.	60.2	0.72	0.43	1.22
10+	61.9	0.72	0.42	1.23
Working Status				
Non-working®	59.1	1.00		
working	58.3	0.92	0.79	1.06
Region				
North-west®	73.0	1.00		
North	61.4	0.66***	0.55	0.80
North-east	57.2	0.63***	0.51	0.78
South-west	52.3	0.31***	0.25	0.39
South-east	63.1	0.62***	0.51	0.75
South	52.2	0.40***	0.33	0.49
Birth order				
1®	59.7	1.00		
2	64.6	0.75***	0.64	0.88
3	59.7	0.71***	0.60	0.85
4+	48.7	0.51***	0.42	0.62
Total (%)	**59.0**			
N	**21460**			

Note: Significance: ***$p<0.01$, **$p<0.05$, and *$p<0.10$, N: Number of samples, OR: Odds Ratio, CI: Confidence limit, ®: Reference category.

Table III: Percentage and odds of women received full ANC during pregnancy according to selected background characteristics, Bihar, 2007-08, India

Background Characteristics	Full ANC	OR	95% C. I.	
			Lower	Upper
Age				
15-24	5.8	1.00		
25-34	4.2	1.04	0.73	1.47
35+	1.7	1.39	0.63	3.06
Residence				
Rural	4.0	1.00		
Urban	11.6	0.95	0.58	1.54
Women Education				
Less than 5 years	1.7	1.00		
5-9.	8.0	1.89***	1.39	2.58
10+	22.0	2.50***	1.51	4.14
Caste				
SC/ST	1.7	1.00		
OBC	3.9	2.40***	1.44	4.03
Others	11.8	3.80***	2.13	6.76
Religion				
Hindu	4.8	1.00		
Muslim	3.2	0.98	0.67	1.43
Others	4.1	0.00	0.00	
Wealth Index				
Poorest	1.1	1.00		
Poorer	2.7	1.35	0.88	2.07
Middle	5.3	1.36	0.85	2.17
Richer	14.4	2.35***	1.38	3.98
Richest	29.6	5.13***	2.31	11.37
Husband Education				
Illiterate	5.3	1.00		
1-5.	2.0	0.45	0.13	1.54
6-9.	3.4	0.58	0.17	1.95
10+	5.1	0.73	0.21	2.51
Working Status				
Non-working	4.9	1.00		
working	1.7	1.13	0.72	1.77
Region				
North-west	4.9	1.00		
North	3.2	0.72	0.46	1.14
North-east	3.6	1.41	0.89	2.24
South-west	5.9	0.83	0.49	1.43
South-east	5.3	0.93	0.58	1.47
South	5.3	0.97	0.61	1.56
Birth order				
1	4.9	1.00		
2	5.7	0.73*	0.52	1.03
3	3.3	0.67*	0.44	1.02
4+	1.4	0.31***	0.18	0.53
Total (%)	**4.6**			
N	**21460**			

Note: Significance: ***p<0.01, **p<0.05, and *p<0.10, N: Number of samples, OR: Odds Ratio, CI: Confidence limit, ®: Reference category.

Table IV: Percentage and odds of women received advice on institutional delivery according to selected background characteristics, Bihar, 2007-08, India

Background Characteristics	Institutional Delivery	OR	95% C.I.	
			Lower	Upper
Age				
15-24	34.7	1.00		
25-34	23.6	0.78***	0.673	0.912
35+	16.6	0.69***	0.515	0.925
Residence				
Rural	25.4	1.00		
Urban	39.4	1.96***	1.579	2.421
Women Education				
Less than 5 years	20.2	1.00		
5-9.	35.1	1.23***	1.062	1.418
10+	47.7	1.41**	1.053	1.896
Caste				
SC/ST	24.4	1.00		
OBC	26.6	1.16*	0.994	1.355
Others	35.2	1.86***	1.506	2.294
Religion				
Hindu	29.1	1.00		
Muslim	19.0	0.86*	0.724	1.018
Others	19.6	0.45	0.055	3.645
Wealth Index				
Poorest	16.0	1.00		
Poorer	23.5	0.93	0.795	1.08
Middle	35.7	1.31***	1.098	1.552
Richer	40.9	1.25*	0.987	1.581
Richest	51.0	2.27***	1.339	3.838
Husband Education				
Illiterate	28.3	1.00		
1-5.	21.5	1.29	0.675	2.451
6-9.	27.9	1.51	0.789	2.871
10+	33.8	1.73	0.899	3.326
Working Status				
Non-working	28.5	1.00		
working	19.1	1.30***	1.093	1.539
Region				
North-west	27.5	1.00		
North	22.0	0.67***	0.551	0.806
North-east	15.5	0.56***	0.452	0.702
South-west	44.3	1.74***	1.393	2.168
South-east	30.4	1.00	0.826	1.219
South	32.1	1.22*	1	1.493
Birth order				
1	28.3	1.00		
2	31.3	0.67***	0.575	0.785
3	24.8	0.62***	0.512	0.743
4+	18.3	0.62***	0.504	0.754
Total (%)	**27.7**			
N	**21460**			

Note: Significance: ***$p<0.01$, **$p<0.05$, and *$p<0.10$, N: Number of samples, OR: Odds Ratio, CI: Confidence limit, ®: Reference category.

Table V: Percentage and odds of women received PNC according to selected background characteristics, Bihar, 2007-08, India

Background Characteristics	Post Natal care	OR	95% C.I.	
			Lower	Upper
Age				
15-24	29.9	1.00		
25-34	24.2	1.01	0.871	1.175
35+	19.5	1.03	0.778	1.356
Residence				
Rural	24.8	1.00		
Urban	42.5	1.29**	1.035	1.596
Women Education				
Less than 5 years	21.1	1.00		
5-9.	34.9	1.12	0.966	1.293
10+	52.1	1.25	0.935	1.682
Caste				
SC/ST	20.6	1.00		
OBC	25.3	1.26***	1.076	1.468
Others	38.0	1.70***	1.377	2.088
Religion				
Hindu	26.6	1.00		
Muslim	23.3	1.01	0.858	1.191
Others	17.8	0.43	0.053	3.426
Wealth Index				
Poorest	18.1	1.00		
Poorer	23.2	1.02	0.873	1.182
Middle	31.4	1.46***	1.227	1.729
Richer	45.1	1.40***	1.109	1.774
Richest	61.1	2.54***	1.53	4.206
Husband Education				
Illiterate	26.6	1.00		
1-5.	23.0	0.46***	0.283	0.756
6-9.	25.0	0.50***	0.308	0.825
10+	30.1	0.54**	0.326	0.894
Working Status				
Non-working	26.6	1.00		
working	21.8	1.06	0.905	1.252
Region				
North-west	28.4	1.00		
North	22.4	0.70***	0.585	0.849
North-east	21.9	0.72***	0.582	0.882
South-west	27.9	0.76**	0.603	0.961
South-east	29.6	1.05	0.87	1.272
South	28.5	1.01	0.817	1.22
Birth order				
1	26.6	1.00		

2	28.9	0.76***	0.652	0.892
3	24.1	0.73***	0.607	0.877
4+	19.7	0.65***	0.534	0.797
Total (%)	**26.1**			
N	**21460**			

Note: Significance: ***p<0.01, **p<0.05, and *p<0.10, N: Number of samples, OR: Odds Ratio, CI: Confidence limit, ®: Reference category.