Delayed response to pregnancy care and its impact on child survival in EAG states

Study Completed by

Dr. Nikhilesh Parchure

(Research Investigator)

Honorary Director

Prof. K. K. N. Sharma

Population Research Centre

Dr. Harisingh Gour Vishwavidyalaya

(A Central University)

Sagar (M.P.) 470003

March, 2022

Contents

Abbreviations

ANC	Antenatal Care
BIH	Bihar
CG	Chhattisgarh
EAG	Empowered Action Group
IFA	Iron Folic Acid
IMR	Infant Mortality Rate
JH	Jharkhand
MCH	Maternal Child Health
MCP	Mother Child Protection Card
MMR	Maternal Mortality Ratio
MP	Madhya Pradesh
NFHS	National Family Health Survey
NHM	National Health Mission
NRHM	National Rural Health Mission
OBC	Other Backward Caste
OD	Odisha
RAJ	Rajasthan
SDG	Sustainable Development Goals
TFR	Total Fertility Rate
UK	Uttrakhand
UP	Uttar Pradesh

List of Tables and Figures

Delayed Response to Pregnancy Care in EAG States

1. Introduction

There has been a consensus on improving the health status of mothers and children among Indian population. National Health Mission (NRHM) has thrived to bring about a change in the health scenario of the country by providing basic health infrastructure and quality health services in order to improve the accessibility and affordability of health services among rural masses. The immediate goal of the NHM is to improve the health infrastructure in rural areas and increase the service accessibility. In long term objectives of the NHM, is to reduce Infant Mortality Rate (IMR) and Maternal Mortality Ratio (MMR) along with Total Fertility Rate (TFR) by the year 2030 that is target for achieving sustainable development goals (SDGs). In this scenario many innovative steps have been taken by the government in different states. There is a significant gap in health conditions of mothers and children at the state level, which is why the government has chosen to provide more focused interventions in 18 High Focus States of the country and especially eight Empowered Action Group (EAG) States. EAG states are under pressure for improving IMR and MMR and maintaining momentum of reduction of adverse health care indicators. It is necessary to achieve SDGs at large.

Under NHM, primary objectives is to provide all health care services for all pregnant women and new born children. For identifying high risk cases of pregnancy, and critical health problems among pregnant women, all pregnant women is registered under the MCH programme. Prenatal care or Antenatal Care is health care provided to an expectant mother and her developing, unborn baby. It also encompasses a mother's self care, which includes following her health care provider's advice, practicing good nutrition, getting plenty of rest, exercising sensibly, and avoiding things that could harm her or her baby (i.e. drugs, alcohol, excessive caffeine). Prenatal care can reduce a baby's risk for health problems including low birth weight, mental retardation, and heart problems. It is especially important because babies born to mothers who received no prenatal care are three times more likely to be born at low birth weight, and five times more likely to die than those whose mothers received prenatal care (Maternal and Child Health [MCH] Bureau, 2003).

It is found that majority of infant death occur due to lack of care of mothers during pregnancy, in Madhya Pradesh nearly one-third of pregnancies did not go for any health care services and most these births take place at home, where no adequate care is available for child care. Early prenatal care is important to identify and treat health problems and influence health behaviours that can compromise foetal development, infant health and maternal health. Women receiving late or no prenatal care are at increased risk of having infants who are low birth weight, who are stillborn or who die within the first year of life. Prenatal care offers the opportunity to screen for and treat conditions that increase the risk for poor birth outcomes. Effective prenatal care also detects for and intervenes with a range of conditions including maternal depression, smoking, substance use, domestic violence, nutritional deficiencies, and unmet needs for food and shelter. Women who receive adequate prenatal care are more likely to obtain preventive health care for their children, such as scheduling well-baby visits, immunizations, and regular health checkups. Early prenatal care is especially important for women who face multiple risks for poor birth outcomes, including poverty and low maternal education. Several studies indicate that low-income women who receive enhanced prenatal care services experience improved birth outcomes. Enhanced prenatal care services may include outreach, case management, risk assessment, smoking cessation, nutritional and psychosocial counselling, health education, guidance on infant and child development, referrals to social services, and home visits.

High maternal mortality and pregnancy complications are the prime consequences of poor maternal care. Over the period since launch of NHM the focus is on providing enough care and support to pregnant women. Programmatic interventions for quality, timely and complete antenatal care are placed in primary health care services. Despite the fact that improved maternal health care has inverted the high maternal deaths and pregnancy complications. However, the role of timely and sufficient maternal care in providing safeguard to child health is required to be analysed in the changing pattern of maternal and child health scenario. Malnutrition and anaemia during pregnancy, malnutrition among young children are the newer challenges that need to be addressed.

NFHS-4 (2015-16) reveals that despite the best efforts of NHM, two-fifths of pregnant mothers did not register pregnancy in the first trimester and more than half of women did not receive mandatory 4 ANC visits during pregnancy. Delay in pregnancy care can be

detrimental to the overall health of women during pregnancy and has lasting ill-effect on the new-born. There are large cross-sectional variations in the antenatal care coverage across EAG states. Ample amount of evidence on associated factors of in-complete pregnancy care needs to be reassessed in the light of new data available and its correlates with information such as availability of health care services and impact of incomplete antenatal care on child health and child survival.

In this background it is significant to see differentials among pregnant women who go for late ANC or does not take ANC at all. It also of the immense interest to understand the socio-economic, demographic and health contours of consequences of delay in pregnancy care on child survival and health condition of the child.

2. Objectives

a. Study the magnitude of delayed response to pregnancy care in EAG states.

b. To ascertain the determining factors responsible for delay in pregnancy care.

c. To assess the impact of delay in pregnancy care on child survival.

3. Data and Methods

This study has used data from NFHS-4 (2015-16) for EAG States Madhya Pradesh, Orissa, Bihar, Jharkhand, Chhattisgarh, Uttar Pradesh, Rajasthan and Uttrakhand. For the analysis, all India kids data file has been used. Analysis is based on a sample of 92123 births that have taken place during five years preceding the survey and for whom information on ANC care, delivery care and survival status is asked in the survey. To analyze the effects of delayed ANC bi-variate descriptive and logistic regression analysis have been used.

Definitions: Depending on the timing of first ANC and number of ANC visits during pregnancy all the births are categorized as follows –

Timely ANC: If first ANC in 1st trimester and at least three ANC during pregnancy

Late ANC: If first ANC in 2nd or 3rd trimester or less than three ANC during pregnancy

No ANC: No ANC taken at all

Delayed ANC is further defined as combined proportion of late ANC and no ANC.

It is imperative to mention that complete ANC is also taken as the indicator for assessing quality of ANC, which include, prescribed number of 4 ANCs, consumption of 100 IFA tables and two tetanus toxoid injections during pregnancy. However, this indicator has not been used for the present analysis, since desegregated state level analysis did not have sufficient sample size.

4. Differentials in response to ANC care

Table 1 describes the status of ANC care among women in EAG states. It revealed that nearly three-fourths of all the women had either not taken any ANC or registered ANC after first trimester. More than two-fifths of women from Chhattisgarh and Odisha have taken timely ANC. Nearly nine out of ten women in Bihar had either not taken ANC or had late ANC. In Madhya Pradesh nearly two-thirds of all the women had either not taken ANC or had late ANC. Gap in proportion of women who had no ANC at all and had late ANC is higher in all the EAG states except Bihar. It is noteworthy, that at national level nearly six out of ten women had either no ANC or late ANC whereas in EAG states it is seven out of ten women who had no or late ANC. In Jharkhand, MP, UP and Uttrakhand about 20 percent of women had not taken any ANC.

Table 1: Proportion of women by status of response to antenatal care in EAG states, NFHS-4 (2015-16)

State	Response to ANC Care			Total Women
	No ANC	Late ANC	Timely ANC	
Bihar	43.9	44.5	11.6	20758
Chhattisgarh	3.8	47.6	48.5	4460
Jharkhand	23.5	51.1	25.4	5450
MP	22.5	48.6	28.9	12103
Odisha	5.8	47.9	46.3	6662
Rajasthan	14.1	52.8	33.1	10404
UP	23.7	56.0	20.3	30806
Uttarakhand	21.8	52.3	25.9	1480
All EAG States	**24.7**	**50.7**	**24.6**	**92123**
All India	**16.5**	**43.1**	**40.4**	**184627**

A closer observation about response to pregnancy care differentiated by socio-economic, demographic and health care characteristics of women point towards more revealing gaps. Table 2 shows that older women are more prone to delay or miss antenatal care as compared to younger women.

Table 2: Proportion of women by status of response to antenatal care in EAG states by background characteristics, NFHS-4 (2015-16)

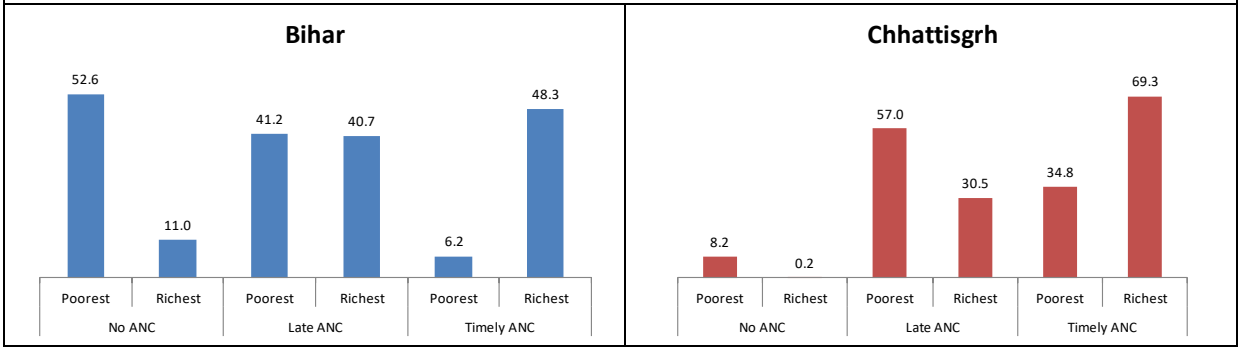
Socio-Demographic Characteristics	Response to ANC Care			Total Women
	No ANC	Late ANC	Timely ANC	
Age				
15-19	24.4	52.6	23.0	2645
20-24	20.4	53.1	26.5	27717
25-29	22.9	51.2	25.9	33751
30-34	27.8	48.6	23.7	17589
35-39	33.1	47.9	19.1	7304
40-44	45.3	42.3	12.5	2318
45-49	52.1	38.6	9.3	796
Highest Education				
No education	37.6	49.3	13.2	37458
Primary	22.9	54.7	22.4	13498
Secondary	15.5	52.7	31.9	32983
Higher	6.4	43.0	50.6	8184
Caste				
Schedule caste	28.4	52.3	19.3	19530
Schedule tribe	25.1	49.4	25.5	10342
OBC	25.2	51.4	23.3	46672
None of them	17.1	47.8	35.1	14462
Don't know	43.9	39.4	16.8	468
Religion				
Hindu	24.1	50.9	25.0	77397
Muslim	28.5	50.0	21.5	13302
Christian	13.5	51.4	35.2	474
Sikh	13.8	43.8	42.3	261
Buddhist/Neo-Buddhist	14.3	39.3	46.4	28
Jain	4.3	39.1	56.5	115
Jewish				0
Parsi/Zoroastrian	0.0	100.0	0.0	1
No religion	38.1	38.1	23.8	20
Other	41.7	45.0	13.3	523
Type of Residence				
Urban	13.0	46.5	40.5	18163
Rural	27.6	51.8	20.6	73957
Wealth Index				
Poorest	39.3	48.4	12.3	34009
Poorer	23.9	55.4	20.7	21587
Middle	16.6	54.8	28.5	15052
Richer	10.8	51.8	37.5	11581
Richest	5.1	41.0	53.9	9894

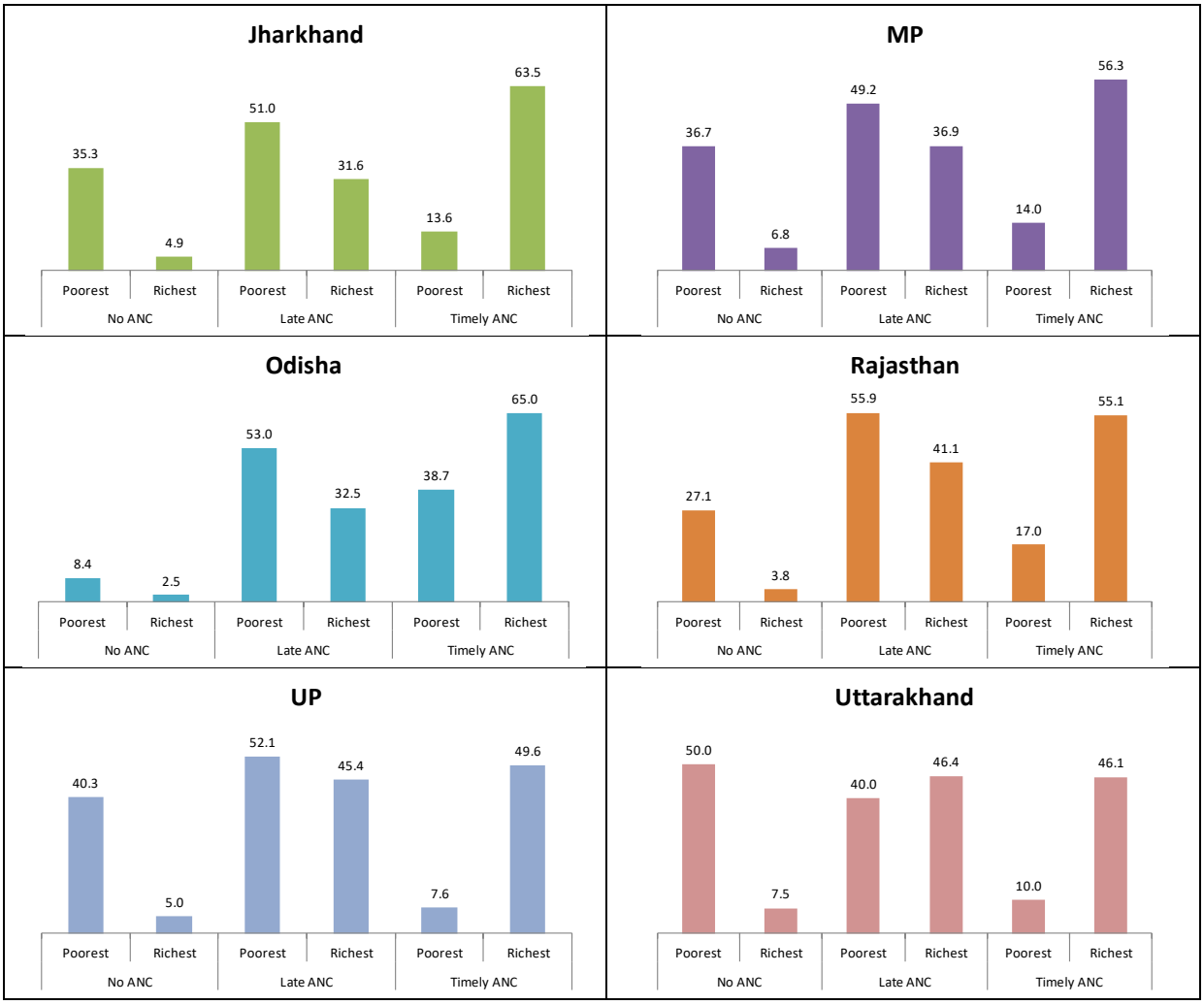
Nearly one out of four women in age groups 15-19 through 30-34 year have availed timely ANC and nine out of ten women in age group 40-44 and 45-49 years either did not have ANC care at all or had late ANC. No ANC or late ANC was highest (87 percent) among illiterate women compared to 68 percent for women having schooling upto secondary level and 49 percent for having studied upto higher secondary level. More than three-fourths women among scheduled caste, scheduled tribe and OBC had no ANC or late ANC in EAG states. As compared to other religions, more women belonging to Hindu and Muslim religion have either not taken ANC or had late ANC.

There is a gap of 20 percentage points between proportion of women taking timely ANC with respect to their place of residence. In urban area 60 percent women had no or late ANC as compared to 80 percent women in rural area had not gone for ANC at all or had late ANC. Majority (88 percent) among poorest women had not taken any ANC or taken late ANC, while 53 percent among richest women had taken timely ANC.

Stark differences in access to ANC can be seen among poorest and richest across EAG states as shown in Figure 1. It shows that while there is not much proportion of poorer and richest women having not gone for ANC at all in Chhattisgarh and Odisha, it is significantly apart in other EAG states. Nearly half among poorest women had not gone for ANC at all is Bihar and Uttarakhand. About one-third among poorest women in Jharkhand, MP and UP had no access to ANC are.

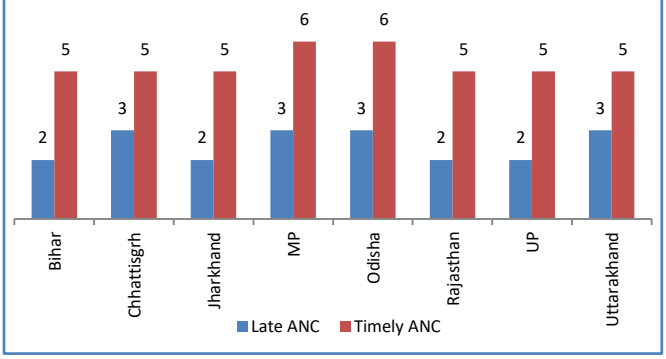
Figure 1: Proportion of women responding to ANC Care among poorest and richest group in EAG states, NFHS-4 (2015-16)





In Bihar, four out of ten women had late ANC irrespective of their economic status. In Chhattisgarh, twice as much poorest women tend to delay ANC care as richest women. In Chhattisgarh and Odisha nearly one-third among poorest women had gone for timely ANC, while in rest of the EAG states less than 10 percent of poorest women had timely ANC. Among richest women also proportion of women taking timely ANC varies, in Uttrakhand 46 percent and in Chhattisgarh 69 percent. Timely response to ANC care has benefits as seen in figure 2. Median number of ANC is twice for the women who had timely ANC. There are differences in median number of ANC visits across

Figure 2: Median number of ANC visits by response to ANC Care in EAG states, NFHS-4 (2015-16)



EAG states. In Bihar Jharkhand, Rajasthan and Uttar Pradesh half of the women who had late ANC had only 2 ANC visits during pregnancy as compared to women having 5 ANC visit when timely ANC is taken. In Madhya Pradesh and Odisha half of the women take 6 ANC visits when ANC is taken timely.

5. Correlates of delayed ANC care

In NFHS, every woman who gave birth during three years preceding the survey was asked about the prenatal care received for every birth that occurred in that period and the status of survival of child and asked about the various health problem of the surviving child. Based on the data, births are categorized according to socio-demographic and ANC related characteristics. Table 3 shows the distribution of births according to the ANC characteristics the mother had received.

Table 3: Percentage distribution of births according to some ANC characteristics in EAG states, NFHS - 4 (2015-16)

ANC Characteristics	BIH	CG	JH	MP	OD	RAJ	UP	UK
Received ANC								
At Home	18.7	2.4	7.1	12.6	7.1	3.0	7.7	9.5
At Govt Health Facility	45.1	74.5	50.5	65.1	78.0	63.2	51.3	61.9
At Pvt Health Facility	36.2	23.1	42.4	22.4	14.9	33.8	41.0	28.6
Timing of First ANC								
1st Trimester	61.6	73.7	68.0	68.5	68.0	73.4	60.2	68.5
2nd Trimester	33.1	24.4	28.2	26.1	27.4	23.2	34.7	26.7
3rd Trimester	5.3	2.0	3.9	5.5	4.7	3.4	5.2	4.8
Number of ANC Visits								
1	19.7	3.0	10.0	8.1	2.6	8.3	11.3	10.1
2	32.1	12.1	23.9	20.2	10.2	23.8	29.9	22.6
3	21.8	23.0	26.3	23.3	20.1	22.6	24.0	26.4
4+	26.4	61.9	39.8	48.4	67.1	45.3	34.8	41.0
Received IFA								
Not Received	44.2	8.7	30.6	16.9	9.5	35.4	37.3	21.7
Received but not Consumed	0.0	1.1	1.6	0.0	1.3	3.0	0.3	0.0
Received and consumed	55.8	90.2	67.8	83.1	89.2	61.6	62.4	78.3
Received Tetanus injection								
Not Received	5.5	2.4	4.3	5.1	4.2	5.5	6.9	4.6
At least 1 received	94.3	97.5	95.5	94.4	95.2	94.3	92.9	95.1
Don't Know	0.3	0.2	0.2	0.5	0.6	0.2	0.2	0.2

At least one out of ten women in Bihar and Madhya Pradesh women had taken ANC at home. Nearly half of the women had taken ANC at government health facilities in all EAG

states. About 40 percent of women had taken ANC at private health facilitiy. More than three-fifths of all the women had taken their 1st ANC check-up in first trimester of pregnancy. Marginal proportion of women had their 1st ANC check-up very late in third trimester. More than one-third of women had only upto 2 ANC check-ups in Jharkhand, Madhya Pradesh, Rajasthan and Uttrakhand. In Bihar and Uttar Pradesh nearly 40 percent of women had upto 2 ANC check-ups. In Chhattisgarh and Odisha more than 60 percent women had four or more ANC visits during their pregnancy.

In Bihar, Jharkhand, Rajasthan and Uttar Pradesh more than 30 percent of women had not received IFA tablet or syrup during pregnancy. At least eight out of ten women in Chhattisgarh, Odisha and Madhya Pradesh had received and consumed IFA during pregnancy. Gap in proportion of women getting IFA and consuming IFA is two times in Rajasthan, Jharkhand and Uttar Pradesh. Almost 90 percent of women had taken at least one tetanus injection before giving birth. This phenomenon is obvious, because each pregnancy when examined for the first time receives mandatory does of tetanus injection.

State level differentials in correlates of delayed response to pregnancy care shows that in rural Bihar 90 percent of women had delayed ANC compared to only 55 percent among their counterpart in Chhattisgarh and Odisha (Table 4). In Chhattisgarh, Madhya Pradesh and Uttar Pradesh, less proportion of Muslim women had delayed pregnancy care compared to Hindu women. In Chhattisgarh, which is also a tribal dominated state, 60 percent tribal women delayed their ANC care compared to 52 percent scheduled caste women and 45 percent of other caste women.

Wealth index shows large inter-state variation in proportion of women among poorest category who delayed pregnancy care, which ranges from about 90 percent in Bihar, Uttar Pradesh and Uttrakhand followed by around 60 percent in Chhattisgarh and Odisha. In all the EAG states, low (30 percent) to moderate (50 percent) proportion among richest women delaying ANC care. Compared to middle aged women (age 20-29), more younger (age below 20) and older (age above 30) had delayed response to pregnancy care in Bihar, Rajasthan and Uttar Pradesh.

In Madhya Pradesh and Odisha equal proportion of women in all the age groups had delayed ANC. Higher proportion of women giving birth of order 4 and above had delayed ANC compared to women who had their first birth in all the EAG states. In case of unwanted

or mistimed births, higher proportion of women had delayed ANC across all the EAG states. Lesser proportion among women having exposure to some media had delayed ANC care.

Table 4: Percentage of women who delayed ANC Care by different correlates in EAG state, NFHS-4 (2015-16)

Correlates	BIH	CG	JH	MP	OD	RAJ	UP	UK
Type of Residence								
Rural	89.7	55.5	79.9	76.9	55.3	71.3	84.0	79.2
Urban	77.3	37.5	53.4	56.0	44.9	51.8	64.1	64.2
Religion								
Hindu	88.3	51.6	73.1	72.0	53.5	66.9	80.2	73.1
Muslim	88.9	42.2	72.2	63.4	58.0	68.0	78.3	80.9
Other	90.7	55.5	85.6	48.3	56.3	57.5	38.2	55.7
Caste								
Scheduled Caste	93.6	52.3	77.9	72.3	57.0	69.8	85.5	78.1
Scheduled Tribe	90.0	60.1	81.8	82.0	57.6	74.8	89.7	77.9
Other Casts	86.7	45.9	70.4	66.6	50.3	64.0	77.5	73.2
Wealth Index								
Poorest	93.8	65.2	86.4	86.0	61.3	83.0	92.4	89.7
Poorer	87.9	54.5	74.3	76.7	54.2	75.3	86.2	89.8
Middle	82.0	45.5	65.4	67.6	49.9	68.6	78.4	83.5
Richer	69.7	41.9	49.5	59.9	42.8	58.7	69.6	72.7
Richest	51.7	30.7	36.4	43.7	34.9	44.9	50.4	53.9
Age at Child Birth								
Less than 20	84.9	57.5	72.7	73.9	55.4	69.6	81.2	81.5
20-24	87.0	50.5	73.2	70.3	51.9	64.7	77.6	76.7
25-29	88.4	51.4	74.2	70.1	53.6	66.2	78.1	69.9
30 & above	91.7	50.6	78.3	72.4	55.9	72.0	84.1	73.6
Birth Order								
1	80.6	46.9	66.8	64.0	49.2	59.4	69.4	64.9
2	87.0	48.3	72.3	68.5	52.2	63.4	76.4	72.5
3	90.6	58.0	78.9	76.0	59.4	71.6	83.3	81.9
4+	94.2	61.3	85.7	84.2	67.2	80.6	89.9	88.2
Birth Wanted								
Yes	87.9	50.7	73.8	70.3	52.9	66.5	78.9	73.0
No	91.7	60.0	83.7	81.2	61.8	72.2	84.0	82.2
Media Exposure								
Yes	82.2	48.4	64.5	65.8	51.4	61.2	72.7	72.4
No	93.0	67.9	87.0	85.7	61.9	82.4	90.5	90.3
Role in Decision Making								
Yes	85.3	50.1	71.4	69.1	48.5	63.3	78.0	71.6

Binary logistic regression results for assessing the effect of correlates on delayed response to pregnancy care shows that in wealth index and birth order have significant

bearing on effecting delayed response to pregnancy care in most of the EAG states. In Bihar scheduled caste women is 60 percent more likely to delay her ANC compared to other cast women and this is significant. In all other EAG states, caste is not the significant correlate associated with delayed response to pregnancy care. As compared to urban area, rural women are slightly less likely to delay pregnancy care in all the state. In Uttar Pradesh, both Hindu and Muslim women are twice as likely as other religion to delay ANC care.

Table 5: Logistic regression results [Exp (β)] showing effect on delayed response to pregnancy care

Correlates	BIH	CG	JH	MP	OD	RAJ	UP	UK
Type of Residence								
Rural	0.976	0.826	0.758**	0.847**	0.834	0.753*	0.808*	0.729
Religion								
Hindu	0.985	0.654	0.628*	1.189	1.007	0.935	2.934*	0.949
Muslim	1.052	0.848	0.665	1.193	1.507	1.020	2.978*	1.318
Caste								
Scheduled Caste	1.600*	1.100	1.062	0.957	1.077	0.994	1.086	1.034
Scheduled Tribe	0.968	1.176	0.875	1.051	0.963	0.857	1.522	1.076
Wealth Index								
Poorest	7.396*	2.677*	5.096*	4.710*	2.140*	3.198*	5.669*	3.368
Poorer	4.306*	2.092*	3.087*	3.181*	1.740*	2.417*	3.640*	4.278*
Middle	3.301*	1.541*	2.423*	2.204*	1.534*	2.021*	2.508*	2.996*
Richer	1.946*	1.435**	1.452	1.752*	1.276	1.464*	1.822*	1.735*
Age at Child Birth								
Less than 20	1.428*	1.699**	1.302	1.322	1.321	1.565*	1.953*	2.377
20-24	1.394*	1.287	1.207	1.120	1.093	1.174	1.423*	1.795
25-29	1.131*	1.198	1.025	1.053	1.056	1.068	1.102	1.169
Birth Order								
1	0.306*	0.707**	0.479*	0.497*	0.564*	0.471*	0.334*	0.341*
2	0.502*	0.745	0.666*	0.589*	0.633*	0.568*	0.533*	0.494
3	0.672*	1.010	0.818	0.706*	0.811	0.729*	0.699*	0.727
Birth Wanted								
No	1.155	1.389	1.745*	1.617*	1.211	1.294	1.067	1.092
Media Exposure								
No	1.460*	1.428*	1.761*	1.472*	1.126	1.622*	1.546*	1.420
Total births	16123	6529	8653	16443	8616.000	11568	27333	4091
-2Log LL	12845.05	5638.14	5269.08	12510.52	8592.64	11840.51	25866.51	1429.60
R^2 %	14.7	8.9	19.0	15.7	4.4	12.6	19.6	17.3

Reference Category: Urban, Other, Other Casts, Richest, 30 & above, 4+, Yes, Yes; ***Significant at*** * p<0.01 ** p< 0.05

Poorest women have more than five times chances that she will have late or no ANC compared to richest women in Bihar, Jharkhand and Uttar Pradesh. In Bihar, Madhya Pradesh, Uttar Pradesh and Uttrakhand even richer women are 1.5 times more likely to

delay ANC care compared to richest women. Women of age below 20 at the time of child birth in Bihar, Chhattisgarh, Rajasthan and Uttar Pradesh are significantly more likely to have delayed response to pregnancy care as compared to older women by 1.9 times to 1.4 times in Uttar Pradesh and in Bihar respectively. Birth order has significant impact on delayed ANC. Women is less likely to delay ANC for first to third order birth as compared to four or higher order births. It is evident from the fact that in India first birth always brings more attention and more likely to have access to health care health care services. Women in Madhya Pradesh and Jharkhand tend to delay pregnancy care by 1.7 and 1.6 times respectively when their pregnancy is unwanted or mistimed. Response to ANC is significantly influenced by media exposure of women in EAG state. It is found that in Jharkhand women who do not any media exposure, in terms of reading news paper at least once in a week and watching television etc. are 1.7 times more likely to have delayed pregnancy care compared to women having media exposure. It is significant in other EAG states Rajasthan (1.6 times), Uttar Pradesh (1.5 times) and Bihar, Chhattisgarh, Madhya Pradesh (1.4 times) as compared to women having exposure to media.

Overall, the logistic model explains variability in showing effect on delayed response to pregnancy care to the tune of 20 percent in Uttar Pradesh, 19 percent in Jharkhand, 17 percent in Uttrakhand, 16 percent in Madhya Pradesh and 15 percent in Bihar. It is only 4 percent in Odisha, which reflects presence of other correlates affecting delayed response to pregnancy care.

6. Consequences of delayed ANC

It is very well understood that not taking ANC during first trimester or less ANC visits impacts on preparation of delivery care. During ANC visits health workers are supposed to check women for any complications or likelihood of any such complications, which warns for effective care and timey referral and treatment for pregnant women. Effects of delayed ANC on critical health care received by the women and advices on delivery care and new born care is assessed for all the EAG states for response to ANC Care. Table 6 provide distribution of births for which these health care services and advices are given by the ANC status.

Table 6: ANC Services Received by Response to Pregnancy Care in EAG states, NFHS-4 (2015-16)

ANC Services	ANC Delayed															
	BIH		CG		JH		MP		OD		RAJ		UP		UK	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Told about Pregnancy Complications*																
Vaginal bleeding	57.8	53.9	80.1	73.5	80.6	62.3	80.3	72.4	67.9	66.8	72.5	70.3	62.0	55.1	67.0	65.6
Convulsions	63.7	62.0	77.8	68.0	79.1	60.7	79.5	70.7	79.5	80.0	63.6	65.7	65.5	62.2	72.1	70.3
Prolonged labour	75.4	71.0	87.1	79.7	81.0	68.0	85.8	80.5	86.2	84.3	72.9	71.2	69.1	67.6	77.8	76.3
Severe abdominal pain	77.6	75.4	87.4	85.8	84.6	72.7	88.4	85.4	88.7	87.5	77.3	75.1	72.0	70.0	81.0	82.4
High blood pressure	67.0	66.5	91.2	84.5	86.2	76.9	88.9	82.6	84.2	82.4	81.5	79.4	79.0	67.9	86.2	78.3
Given Advice about*																
Institutional delivery	85.6	86.8	94.7	91.9	85.8	82.6	92.2	87.8	94.2	92.1	86.6	85.6	82.7	81.0	90.3	86.7
Cord care	74.4	75.9	85.7	81.2	79.7	69.5	82.7	77.5	87.9	88.8	75.4	68.6	61.4	61.6	79.2	74.9
Breastfeeding	83.8	84.3	95.7	93.0	89.9	81.3	92.4	86.9	95.2	94.8	86.8	79.7	74.0	72.7	86.0	81.1
Keeping the baby warm	78.9	78.2	90.1	86.2	85.2	76.9	85.4	80.9	94.3	93.0	76.3	65.9	62.6	60.4	82.0	77.4
Family planning	67.7	65.4	84.6	80.0	79.6	67.0	83.3	73.0	87.5	83.8	82.3	71.0	62.2	54.1	72.7	64.0
Abdomen examined	88.0	66.5	95.5	85.5	92.1	71.8	94.0	81.6	95.4	89.8	93.9	81.2	92.3	75.2	92.0	82.0
Received MCP Card	79.0	80.0	93.9	88.9	90.7	85.5	96.3	90.2	97.4	97.0	93.8	91.5	77.6	80.4	91.9	94.0

** Total percentage add up more than 100 due to multiple response*

In all the EAG states higher proportion of women who had received timely ANC, had their abdomen checked during pregnancy. In Bihar 88 percent women having timely ANC were given abdomen check-up, whereas only 66 percent women got abdomen check-up if ANC was delayed. In Jharkhand, a gap of 20 percentage points was found in case of abdomen check-up during pregnancy when ANC is delayed compared to ANC taken timely. Nearly three-fifths to four-fifths of all the women were told about pregnancy complications that may occur during pregnancy irrespective of their timing or frequency of ANC check-up. This is a welcome sign, informing and counselling pregnant women regarding risks involved is an important aspect of birth preparedness which can reduce complicated pregnancies. Specifically, in Madhya Pradesh and Odisha, more than 80 percent of women were told about pregnancy complications such as prolonged labour, severe abdomen pain and high blood pressure irrespective of whether women had timely or delayed ANC.

In NFHS all the women who had a birth during three years preceding the survey, whether they were given certain advice during pregnancy? Analysis shows that women having delayed pregnancy care have slight disadvantage of not getting proper advice on institutional delivery cord care, breast feeding, keeping baby warm and on family planning. In Chhattisgarh, nearly four-fifths of all the women had received advice on health and family planning, while slightly more proportion of women got advice if they had timely ANC. In Jharkhand, 88 percent of women having timely ANC had received advice on cord care and family planning compared to only 70 percent and 67 percent who had late ANC respectively for cord care and family planning. Similarly, among women having late ANC 81 percent had received advice on breast feeding compared to 90 percent women who had timely ANC care.

In Rajasthan also a significant gap is found in proportion of women who had timely ANC and delayed ANC in terms of various health advice received during pregnancy. Nearly three-fifths of women who had delayed ANC got the advice on cord care and keeping baby worm compared to three-fourths of women receiving both advices when taken timely ANC. In Uttar Pradesh, only about 60 percent women had received advice on cord care and keeping baby worm for women having timely ANC and who delayed ANC alike. In Uttrakhand, only 64 of women having delayed ANC had received advice on family planning during ANC visit compared to 73 percent women who had timely ANC. Among women who

had delayed ANC, 87 percent were advised about institutional delivery compared to 90 percent who had timely ANC in Uttrakhand.

Analysis shows that there is no systematic difference in women receiving MCP card during pregnancy based on the status of timing of ANC care. In Bihar four-fifths and in Odisha 97 percent of women received MCP card during their pregnancy. In Chhattisgarh, Jharkhand and Madhya Pradesh more proportion of women had received MCP care in case of timely ANC compared to women having delayed ANC. In contrast, more women in Uttar Pradesh and Uttrakhand who had delayed ANC received MCP care compared to women who had timely ANC.

Differentials in getting specific counselling, advice, information and MCP card has importance for proper ANC care throughout the pregnancy. In all the EAG states, women having timely ANC have advantage over women receiving / getting delayed ANC in terms of getting services during pregnancy. Clearly, more focus is needed to attract women to get timely and complete ANC coverage in terms of early ANC registration and prescribed number of ANC visits. Timely ANC also influence various health care services, birth preparedness, treatment of pregnancy related complications and ultimately safe delivery and happy child bearing experiences. majority services are in EAG states. Although, these factors also influenced by the availability of proper health infrastructure and trained human resources but these findings indicate that both demand side and supply side need to be strengthened.

It is known fact that the mothers who had not received any ANC are more likely to experience child loss and are less attentive to the necessary health care for their children. It Table 7 shows the percentage of births according to the survival status in EAG states accordingly to the status of ANC – Timely or delayed. It is found that across all the states more proportion of births did not survive if the mother had delayed ANC. In Bihar there is a gap of 4 percentage points in proportion of surviving and dead children for whom ANC was taken timely. A similar gap in percentage of proportion in surviving and dead children was found in case ANC is delayed in Bihar.

Table 7: Proportion of births by survival status according to response to ANC care in EAG states, NFHS-4 (2015-16)

States	Timely ANC		Delayed ANC	
	Child Survived	Child Dead	Child Survived	Child Dead
Bihar	11.8	7.1	88.2	92.9
Chhattisgarh	48.8	40.5	51.2	59.5
Jharkhand	25.7	17.3	74.3	82.7
MP	29.2	20.2	70.8	79.8
Odisha	46.5	39.4	53.5	60.6
Rajasthan	33.3	27.4	66.7	72.6
UP	20.5	15.0	79.5	85.0
Uttarakhand	26.2	13.6	73.8	86.4

It is observed that there is 8 percentage point difference in survival status of births with delayed ANC and timely ANC in Chhattisgarh and Jharkhand. Similarly, this difference is about 9 percent point for Madhya Pradesh, 7 for Odisha, 6 for Rajasthan, 5 for Uttar Pradesh and 13 percentage points difference for Uttrakhand.

7. Conclusion

This study presents the pattern of ANC by women for the most recent birth that has occurred during five years preceding the NFHS-4 survey considering a total of 92123 births in EAG states. The study has revealed that in Bihar most women tend to delay ANC compared to the other EAG states.

The study has found that 44 percent women in Bihar and one-fourth in Jharkhand and Uttar Pradesh did not have ANC at all. In Chhattisgarh and Odisha, more than 90 percent of women had received ANC. Median number of ANC is twice for the women who had timely ANC. In Bihar Jharkhand, Rajasthan and Uttar Pradesh half of the women who had late ANC had only 2 ANC visits during pregnancy as compared to women having 5 ANC visit when timely ANC is taken. Nearly six out of ten women have their first ANC in 2nd or 3rd trimester in Uttar Pradesh. Nearly one out of four women in age groups 15-19 through 30-34 year have availed timely ANC and nine out of ten women in age group 40-44 and 45-49 years either did not have ANC care at all or had late ANC.

There is a gap of 20 percentage points between proportion of women taking timely ANC with respect to their place of residence. Majority (88 percent) among poorest women had not taken any ANC or taken late ANC, while 53 percent among richest women had taken timely ANC. There is not much proportion of poorer and richest women having not gone for ANC at all in Chhattisgarh and Odisha, it is significantly apart in other EAG states. Nearly half among poorest women had not gone for ANC at all is Bihar and Uttarakhand. About one-third among poorest women in Jharkhand, MP and UP had no access to ANC are. In Bihar, four out of ten women had late ANC irrespective of their economic status.

Nearly half of the women had taken ANC at government health facilities in all EAG states. In Bihar and Uttar Pradesh nearly 40 percent of women had upto 2 ANC check-ups. In Chhattisgarh and Odisha more than 60 percent women had four or more ANC visits during their pregnancy. In Bihar, Jharkhand, Rajasthan and Uttar Pradesh more than 30 percent of women had not received IFA tablet or syrup during pregnancy. At least eight out of ten women in Chhattisgarh, Odisha and Madhya Pradesh had received and consumed IFA during pregnancy.

In rural Bihar 90 percent of women had delayed ANC compared to only 55 percent among their counterpart in Chhattisgarh and Odisha. In Chhattisgarh, which is also a tribal dominated state, 60 percent tribal women delayed their ANC care compared to 52 percent scheduled caste women and 45 percent of other caste women. Wealth index shows large inter-state variation in proportion of women among poorest category who delayed pregnancy care, which ranges from about 90 percent in Bihar, Uttar Pradesh and Uttrakhand followed by around 60 percent in Chhattisgarh and Odisha. In Madhya Pradesh and Odisha equal proportion of women in all the age groups had delayed ANC. In case of unwanted or mistimed births, higher proportion of women had delayed ANC across all the EAG states.

In Bihar scheduled caste women is 60 percent more likely to delay her ANC compared to other cast women and this is significant. As compared to urban area, rural women are slightly less likely to delay pregnancy care in all the state. In Uttar Pradesh, both Hindu and Muslim women are twice as likely as other religion to delay ANC care. Poorest women have more than five times chances that she will have late or no ANC compared to richest women in Bihar, Jharkhand and Uttar Pradesh. In Bihar, Madhya Pradesh, Uttar Pradesh and Uttrakhand even richer women are 1.5 times more likely to delay ANC care

compared to richest women. Women in Madhya Pradesh and Jharkhand tend to delay pregnancy care by 1.7 and 1.6 times respectively when their pregnancy is unwanted or mistimed. It is found that in Jharkhand women who do not have any media exposure, in terms of reading news paper at least once in a week and watching television etc. are 1.7 times more likely to have delayed pregnancy care compared to women having media exposure.

In all the EAG states higher proportion of women who had received timely ANC, had their abdomen checked during pregnancy. In Bihar 88 percent women having timely ANC were given abdomen check-up, whereas only 66 percent women got abdomen check-up if ANC was delayed. Nearly three-fifths to four-fifths of all the women were told about pregnancy complications that may occur during pregnancy irrespective of their timing or frequency of ANC check-up. This is a welcome sign, informing and counselling pregnant women regarding risks involved is an important aspect of birth preparedness which can reduce complicated pregnancies. In Chhattisgarh, nearly four-fifths of all the women had received advice on health and family planning, while slightly more proportion of women got advice if they had timely ANC. Similarly, among women having late ANC 81 percent had received advice on breast feeding compared to 90 percent women who had timely ANC care. In Uttar Pradesh, only about 60 percent women had received advice on cord care and keeping baby worm for women having timely ANC and who delayed ANC alike. In Uttrakhand, only 64 of women having delayed ANC had received advice on family planning during ANC visit compared to 73 percent women who had timely ANC.

Differentials in getting specific counselling, advice, information and MCP card has importance for proper ANC care throughout the pregnancy. In all the EAG states, women having timely ANC have advantage over women receiving / getting delayed ANC in terms of getting services during pregnancy. Clearly, more focus is needed to attract women to get timely and complete ANC coverage in terms of early ANC registration and prescribed number of ANC visits.

In Bihar there is a gap of 4 percentage points in proportion of surviving and dead children for whom ANC was taken timely. A similar gap in percentage of proportion in surviving and dead children was found in case ANC is delayed in Bihar.

Among all the delayed ANC births important ANC services are lacking. Women going late for ANC are less likely to receive IFA and TT as compared to women receiving timely ANC. More than two-fifths of women from Chhattisgarh and Odisha have taken timely ANC. Delayed Response to ANC has serious consequences on child survival and health. Higher proportion of newborn deaths are registered among women with late ANC.

This study clearly highlighted the consequences of underutilization of ANC services by women in EAG states where different health settings are prevailing. Historically, all the EAG states had poor indicators for maternal health. In the recent years more focused interventions such as JSY and JSSK has influenced the improvements in access to maternal health care services. Despite the intervention of NHM, Bihar and Uttar Pradesh are lagging in maternal health indicators, as simple as access to ANC care. Chhattisgarh and Odisha, have shown significantly higher access to ANC care and thereby has very marginal proportion of women being left out of ANC services. Women going late for ANC should be given more focused services with all necessary advice and health checkups.

Though, the maternal care programme has settled in overall umbrella of reproductive health, but access to fullest of services still a challenge. In all the EAG states not only existing health care services but expansion of services need to be taken seriously. The study has clearly highlighted that access to maternal health services for women belonging to lower socio-economic and marginalized communities need more focus for bringing improvement in quality of services.