



## Determinants of antenatal care utilization in rural areas of India : A cross-sectional study from 28 districts (An ICMR task force study)

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**OBJECTIVE(S):** To analyze the possible factors contributing to women obtaining antenatal care services and to determine whether these services influence their decision regarding the place of delivery.

**METHOD(S):** A cross-sectional survey of 7005 pregnant women was carried out in the sampled areas of 28 districts in 14 states.

**RESULTS :** Since early reporting of pregnancy in rural areas is rare, a detailed analysis was carried out on 5344 pregnant women with a gestation of more than 4 months. Of these, 73.9% had at least one antenatal contact with a auxiliary nurse midwife (ANM) or had visited a Government Health Facility for antenatal services or problems. There was a statistically significant reduction in the proportion of women obtaining antenatal care services with increasing age, parity, and number of living children. No association was observed with outcome of previous pregnancy and presence of health facility in the village. Awareness of care during pregnancy and knowledge of pregnancy related complications were associated with increased utilization of antenatal care services. However, knowledge of serious complications was found to be lacking even in women who availed of the care. In both the groups – those who availed of antenatal care services and those who did not – about 14% had not decided about the place of delivery. 51.7% of the women with antenatal care preferred institutional delivery as compared to 27.6% of those who had not availed antenatal care services.

**CONCLUSION(S) :** There is a need for improving community awareness on maternal health and for motivating women to utilize maternal care services.

**Key words :** antenatal care, utilization of antenatal care, rural India

### Introduction

Promotion of maternal and child health has been one of the most important components of the Family Welfare Programme of the Government of India and the National Population Policy-2000 <sup>1</sup> reiterates the government's commitment to the safe motherhood program within the wider context of reproductive health.

Maternal care includes care during pregnancy and should begin from the early stages of pregnancy. Women can access

antenatal care services either by visiting a health center where such services are available or from health workers during their domiciliary visits. The former gives an idea about the voluntary utilization of the services by women while the latter is related to the quality aspect of the services. One of the most important component of antenatal care is to offer information and advice to women about pregnancy related complications and possible curative measures for early detection and management of complications. Antenatal care can also play a critical role in preparing a woman and her family for birth by establishing confidence between the woman and her health care provider and by individualizing promotional health messages <sup>2</sup>. Further antenatal visits may raise awareness about the need for care during delivery <sup>3</sup> or give women and their families a familiarity with health facilities that enables them to seek help more efficiently during a crisis <sup>4</sup>. However, uptake of these services is far from universal even in settings where they are widely available.

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While antenatal care is considered essential for the health of both the mother and the child, it is important to analyze the possible factors contributing to its utilization.

The Indian Council of Medical Research (ICMR) has been engaged in studies focusing on developing strategies for improving maternal and child health (MCH) and family planning (FP) services at grass root levels for over a decade. With a shift in focus from MCH and FP towards comprehensive reproductive health care, the ICMR initiated a project on Integrated Reproductive Health Care Delivery through its network of Human Reproduction Research Centers (HRRCs) located at medical colleges in various regions of the country. This paper is based on observations related to knowledge, perceptions and utilization of antenatal care services during a large reproductive health survey of married women of age 15-45 years. The objective of this paper is to analyze the possible factors contributing to women obtaining antenatal care services and to determine whether these services influence their decision regarding the place of delivery.

**Methods**

A multi-indicator cluster survey of eligible women (married women of 15-45 years of age), covering various reproductive health issues including antenatal services, was conducted in 28 districts from 14 major states / union territories of the country, between January 1996 and February 1997. For the survey a three stage stratified random cluster sampling was adopted for selection of villages from the rural areas. Selection of districts was done by the HRRCs, in consultation with the district health authorities. Stratification for sampling of villages was done at two stages on the basis of distance from the health facilities. In the first stage blocks were stratified into two groups, based on the distance from the District Hospital and one block was selected randomly from each group. In the second stage villages were stratified into three groups on the basis of the distance from the Primary Health Center (PHC) and presence of a subcenter (SC) in the village, thus forming six strata. At the third stage random clusters (villages) were selected from each stratum to provide a coverage of about 4000 eligible women from the district. The sample size was decided on the basis of prevailing birth rate to provide about 50 currently pregnant women in each stratum.

Questionnaires for the survey were prepared centrally in English and were translated into regional languages at the respective HRRCs. The questions pertaining to women’s perceptions, opinions, knowledge, attitudes etc. were open-ended and the probable responses were listed to facilitate recording and minimizing interview time. No leading or

suggestive questions were asked in order to avoid courteous responses and over estimations. Women were interviewed at their homes by female interviewers. Only volunteered responses were recorded. Necessary instruction manuals were prepared and regional workshops of HRRC medical officers were held for discussing the conduction of the survey. Selection of the interviewers was done locally by the HRRCs. Training of the interviewers was carried out by the HRRC medical officers. Data analysis was carried out at the ICMR headquarters. Statistical analysis was carried out using the statistical package SPSS for Windows. Standard statistical technic was used for test of significance.

**Results**

A total of 1,17,465 eligible women were covered in this survey. Of these, 7005 (5.9%) women who reported pregnant at the time of survey were interviewed in detail regarding their knowledge and perceptions about what needs to be done when pregnant, awareness about health problems that could occur during pregnancy, their own initiative in utilization of antenatal care services, and decision about place of delivery. Of these, 16.6%, 42.8% and 33.5% had a gestation of less than 4 months, 4-6 months and more than 6 months respectively (Figure 1). Information on period of gestation was not available in 498 (7.1%) women. Generally speaking early reporting of pregnancy in rural areas is rare and so we excluded women who had a gestation of less than 16 weeks from further analysis on the assumption that they might access antenatal care services as their pregnancy progresses. Hence analysis of factors contributing to antenatal care was carried out on 5344 pregnant women who had a gestation of more than 4 months. Of these, nearly three-quarters (73.9%) expressed that they had at least one antenatal contact with the ANM or had visited a Government Health Facility during this pregnancy for antenatal services or problems (Figure 2). The responses elicited from women were further analyzed separately for both the groups.

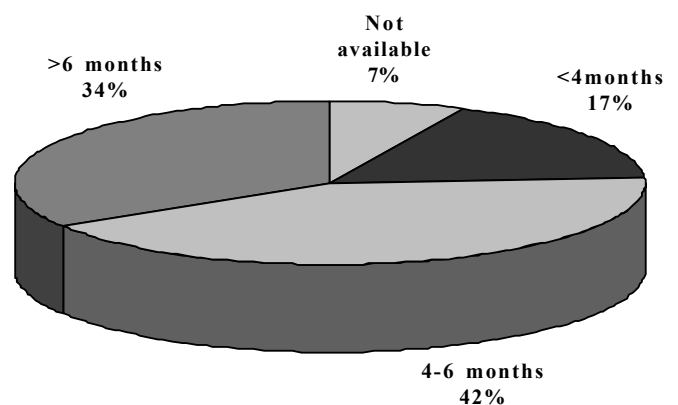


Figure 1. Period of gestation (n=7005).

No antenatal  
care  
26%

Antenatal  
care  
74%

**Figure 2. Antenatal care in women with >4 months gestation (n=5344).**

There was a statistically significant reduction in the proportion of women obtaining antenatal care services with increasing age ( $P=0.007365$ ), parity ( $P=0.026$ ) and number of living children ( $P=0.0001$ ). However, no association was observed with other factors like outcome of previous pregnancy and presence of health facility in the village (Table 1).

Information on women's knowledge and perception about what needs to be done during pregnancy was obtained by asking pregnant women the question what do you think should be done when pregnant. Overall the level of knowledge was low in both the groups – those having antenatal care and those not having it. It needs to be mentioned that only volunteered spontaneous responses were recorded. Large variations between districts were observed. Even within states there were variations between districts. In Rajasthan nearly twice as many women from Bikaner district mentioned the need to take inj. tetanus toxoid (TT) (76.2%) and iron folic acid (IFA) tablets (72.6%) when compared to those from Jaipur district (39.3% and 34.7% respectively). Similar observations were reported from Uttar Pradesh, where larger percentage of women from Kanpur and Meerut districts mentioned the need to take TT and IFA compared to districts of Barabanki, Allahabad and Ghaziabad. In all the districts fewer women mentioned the need to take IFA than those who mentioned the need to take (TT). In addition, a significantly larger number of women who had antenatal contact with a health functionary at home or at the health facility, as compared to those who did not have it, mentioned

**Table 1. Age, parity, number of living children, outcome of last pregnancy and presence of health facility in the village in relation to antenatal care services.**

Variables	Number	Antenatal Care		No antenatal Care		$\chi^2$	P value
		Number	Percent	Number	Percent		
<b>Age (years)</b>							
<19	636	491	(77.2)	145	(22.8)		
20-24	2154	1626	(75.5)	528	(24.5)		
25-29	1773	1282	(72.3)	491	(27.7)		
30 +	781	555	(71.1)	226	(28.9)	12.01	0.007365
<b>Parity</b>							
0	1446	1102	(76.2)	344	(23.8)		
$\geq 1$	2852	2852	(73.2)	1046	(26.8)	4.92	0.026
<b>Number of living children</b>							
0	1629	1241	(76.2)	388	(23.8)		
$\geq 1$	3815	2713	(71.1)	1102	(28.9)	14.49	0.0001
<b>Outcome of last pregnancy</b>							
Live birth	3584	2616	(73.0)	968	(27.0)		
Still birth / abortion	147	115	(72.4)	32	(27.6)	1.72	0.1899015
Not known	167	121		46			
<b>Type of village</b>							
Primary health center village	1918	1409	(73.5)	509	(26.5)		
Subcenter village	1811	1352	(74.7)	459	(25.3)	0.71	0.7025781
Remote village	1615	1193	(73.9)	422	(26.1)		

the need for taking TT (91.3 vs 61.7%,  $P < 0.001$ ) and IFA (79.7 vs 49.9%,  $P < 0.001$ ) during pregnancy (Table 2). Nearly one third of women without antenatal care expressed that there is nothing to be done when pregnant. This was 10 times more than the number of women with antenatal care who expressed it (33.7% vs 3.4%,  $P < 0.001$ ). The need to register with ANM or to visit any health facility, primary or higher level, was mentioned by significantly fewer ( $P < 0.001$ ) women with no antenatal care than those with antenatal care (Table 2). Only a small percentage of women in both the groups mentioned the need to decide about the place of delivery (Table 2).

**Table 2. Awareness about what needs to be done when pregnant in relation to antenatal care services.**

Responses	Antenatal care n=3954	No antenatal care n=1390
Nothing	3.4	33.7
Register with ANM	29.7	6.7
Take TT	91.3	61.7
Take IFA	79.7	49.9
Visit SC	27.2	5.4
Visit PHC	24.5	5.5
Visit CHC	4.6	1.7
Visit hospital	22.8	14.8
Decide about the place of delivery	12.3	3.6
Go to mother's house	4.4	2.4

All the differences were statistically significant ( $P < 0.001$ )

ANM – Auxilliary nurse midwife

SC – Subcenter

IFA – Iron folic acid tablets

CHC- Community health center

PHC – Primary health center

TT – Tetatus toxoid

The pregnant women were also asked whether they were aware that they might develop some problems during pregnancy and to specify the kind of problems. On the whole the awareness was observed to be low in both the groups. However, it was seen that the awareness in women who had availed of antenatal care services was significantly higher than in those who had not ( $P < 0.001$ ). More than half the pregnant women who had availed antenatal services mentioned at least one problem as compared to less than 1/3<sup>rd</sup> of women with no antenatal care. Excessive vomiting was mentioned by 19.9% of women without care and by twice as many (39.7%) with antenatal care. Fewer women in both the groups mentioned complications that could impinge on the life of the mother and child, namely bleeding or loss of fetal movements (Table 3).

**Table 3. Knowledge about problems during pregnancy in relation to antenatal care services.**

Problem	Antenatal care n=3954	No antenatal care n=1390
Excessive vomiting	40.0	19.9
Bleeding	21.2	10.7
Edema	24.9	8.3
Vaginal discharge	14.4	5.6
Fever	16.3	5.3
Abdominal pain	24.2	12.3
Loss of fetal movement	14.0	5.5
Any problem	56.6	29.1

All the differences were statistically significant ( $P < 0.001$ ).

Majority of pregnant women (50-90%) from all the study districts of Uttar Pradesh, Bihar, Orissa, J & K, Haryana, Gujarat and Assam, and from Bikaner district in Rajasthan and 24 Parganas in West Bengal said that they plan to have their delivery at home. On the whole 34.2% of pregnant women who had antenatal care services planned to deliver at home and 51.7% at a government or private health facility. In comparison, 58.6% and 27.6% of women without antenatal care planned to deliver at home and at a health facility respectively. The differences are statistically significant ( $P < 0.001$ ). Nearly an equal percent of women in both the groups expressed that they have not decided yet. Mostly women from the districts of Tamil Nadu, Trivandrum, and North Goa planned hospital delivery. It may be noted that on asking a direct question almost 80% had plans about where they would have their delivery as compared to only 9% mentioning it when asked about what needs to be done when pregnant (Table 4).

**Table 4. Decision about place of delivery in relation to antenatal care services.**

	Antenatal care <sup>a</sup> (n=3954) Percentage	No antenatal care <sup>a</sup> (n=1390) Percentage
<b>Decided about place of delivery</b>		
No	14.1	13.9
Yes	85.9	86.1
<b>Decided place of delivery</b>		
Home	34.2 <sup>b</sup>	58.6 <sup>b</sup>
SC/PHC/CHC	19.7 <sup>c</sup>	3.7 <sup>c</sup>
Hospital	24.8 <sup>d</sup>	11.7 <sup>d</sup>
Private clinic	7.2 <sup>e</sup>	12.2 <sup>e</sup>

<sup>a,b,c,d,e</sup>  $P < 0.001$ .

## Discussion

Antenatal care allows for the management of pregnancy, detection and treatment of complications, and promotion of good health. However, women rarely perceive childbearing as problematic and therefore do not seek care. This affects the utilization of maternal health services in regions of the country where poverty and illiteracy are widespread. But the possibility of complications occurring is there and routine checks are highly desirable. In our series  $\frac{3}{4}$ <sup>th</sup> of pregnant women with a gestation of more than 4 months had at least one antenatal contact. The level of utilization of antenatal care services was not the same across states. This is likely to be due to differences in availability and accessibility of care among the states. Since the time of antenatal registration is determined by traditional customs in rural areas, repeated information, education, and communication (IEC) activities are required to motivate pregnant women to register early.

Contrary to expectation, access to health services as measured by a health facility within the village and availability of an ANM did not have a statistically significant effect on utilization of antenatal care services thus indicating that outreach of services is good. Similar findings were observed in other studies <sup>5,6</sup>. However, a study carried out in Ethiopia indicated that antenatal care was positively associated with living within 10 km of the health center <sup>7</sup>. High utilization of antenatal care facilities was associated with low parity and adverse obstetric history, short distance to healthcare facilities, and literacy in a rural population in Tamil Nadu <sup>8</sup>. Das et al <sup>9</sup> concluded that utilization of maternal services in rural areas is mainly driven by socioeconomic factors such as media exposure, standard of living and education, and much less by physical access and availability of health care and family welfare services <sup>9</sup>.

On the whole our study indicated that knowledge and awareness about what needs to be done when pregnant is low in rural women in India. However, women utilizing antenatal care services had significantly more knowledge as compared to those not utilizing them. It is encouraging to note that pregnant women are aware of inj. TT and IFA supplementation. This is mainly because government health functionaries provide these but carry out very few other recommended procedures <sup>10</sup>. A matter of concern is that a third of women with no antenatal care expressed total lack of knowledge and only 1-6% mentioned the need to either register with ANM or visit a health facility. Lack of concern about safe delivery was seen in large percentage of women from both the groups who also did not feel the need to decide about the place of delivery before hand.

Critical in resource poor settings is the opportunity that antenatal care providers have in transmitting information to pregnant women which enables them to recognize problems when they occur, decide when to seek help, and identify where to go for the attention they might need. How women themselves perceive the risks during pregnancy is an important question. Perception about problems that could occur during pregnancy was significantly higher in women who had antenatal care services than in those who did not have it. However, what was lacking was increased awareness about problems that required immediate medical aid like bleeding, increase in blood pressure, convulsions, and loss of fetal movements. Even though a strong association was observed between increased knowledge and awareness with antenatal care services, it is difficult to comment whether it led them to access antenatal care services or vice versa. Low level of knowledge of antenatal well being and desire for hospital or assisted delivery was also observed in other studies <sup>11</sup>.

It has been suggested that one of the best things that antenatal care could accomplish is to influence women to have an institutional delivery with a trained attendant at birth, a factor known to promote child survival and decrease maternal mortality. Several studies have explored this relationship with conflicting results. An association between the use of antenatal care services and health facility delivery was observed in India and in other developing countries <sup>12-14</sup>. An analysis based on data from India's first and second National Family Health Survey concluded that mothers who received antenatal checkups are two to five times more likely to give birth in a medical institution than mothers who did not receive any antenatal check-up <sup>15</sup>. In our study, a majority of women with antenatal care planned an institutional delivery. It may, therefore, be possible to promote institutional delivery by promoting antenatal check-ups and associated counseling. In general, women prefer to deliver at home for reasons such as support, familiarity, tradition, and belief that birth is considered a natural phenomenon for which an institutional delivery is not required. This also points to the important role of traditional birth attendants in conducting these births at home. Major obstetric complications can strike unpredictably making planning for delivery important, but it was not done by around 14% of women in both the groups.

## Conclusion

There is a need for enhancing community awareness about the importance of registering with an ANM early for antenatal care, educating women about early detection of complications during pregnancy and promptly seeking

care, and about the importance of giving birth in a health facility.

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