Factors associated with antenatal care in Senapati district, Manipur, India, 2008

By

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(MAE-FETP Scholar 2007-2008)

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Submitted in partial fulfillment of the requirements for the degree of

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CERTIFICATION

This is to certify that this dissertation, entitled "Factors associated with antenatal care in Senapati district, Manipur, India, 2008"submitted by **Lolee p Mao,** in partial fulfillment of the requirements for the degree of Master of Applied Epidemiology.

Date 31.1.09

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Date **Lolee P Mao**

Contents

Abbreviation

ANC: Antenatal care

ANM: Auxiliary Nurse and Midwifery

DLHS: District level household survey

IEC: Information, education and communication

IFA: Iron Folic Acid

Km: Kilometer

MCH: Maternal and child health

MDG: Millennium Development Goal

NFHS: National family health survey

NIE: National Institute of Epidemiology

NRHM: National rural health mission

RCH: Reproductive child health

SRS: Sample registration system

PHC: Primary health centre

TT: Tetanus toxoid

X^2: Chi-square trend

Section I

Dissertation

Factors associated with antenatal care in Senapati district, Manipur, India, 2008

ABSTRACT

Introduction: Antenatal care is an important determinant of maternal and child mortality. In Senapati district, the full ANC coverage during 2002-04 was zero percent while only 19% of pregnant women had three or more ANC visits. This study was conducted with the objective of determining the factors associated with the antenatal care coverage in Senapati district, Manipur.

Methods: We did a cross-sectional study among 420 mothers from 55 anganwadi centers selected using the WHO cluster survey methodology during March 2007-February 2008 in Senapati district. The female health workers used pretested structured questionnaire for interviewing the eligible mothers at their homes. We classified antenatal care into full, partial and none and compared the proportions of various characteristics of participants across the three categories using chi-square test.

Results: Out of 420 mothers, 54(13%) had full ANC coverage, while 130(31%) had no coverage. Compared to mothers with full ANC, significantly higher proportion of mothers with no ANC, lived in kutcha house (86% vs. 46%), were illiterate (34% vs. 9%), earning (76% vs. 52%), had illiterate husbands (21% vs. 7%) and monthly household income below Rs 1,500 (82% vs. 35%). Significant majority of mothers with no ANC (120 [92%]) had delivered at home compared to partial or full ANC ($p=0.0001$). Majority of the mothers with full ANC had correct knowledge about all aspects of the antenatal care compared to mothers with partial and no ANC ($p<0.001$).

Conclusion: The coverage of antenatal services in Senapati district of Manipur is very poor. There is a need for enhancing community awareness about the importance of antenatal care. Such activities need to be targeted towards the illiterate, working mothers belonging to low socioeconomic status in the difficult to reach, tribal areas. Improving quality of antenatal care will increase utilization of services and achieve better maternal health outcomes.

Key Words: cluster survey, antenatal care, epidemiological factors, Manipur

Introduction

Pregnancy and childbirth complications are the leading causes of death and disability among women of reproductive age in many developing countries.[1] Worldwide, every minute a pregnant woman died resulting in a loss of 500,000 women per annum in 2000.[2] One-third of these maternal deaths took place in south east Asia.[3] Millennium Development goal 5 (MDG5) is to improve maternal health with the target of reducing maternal mortality ratio (MMR) by 75% between 1990 and 2015. This target can be achieved only by a 5.5% annual decline in MMR from 1990. However, none of the MDG regions achieved the expected decline between 1990 and 2005. The realization of this goal will require increased attention to improve health care for women.[4] India accounts for the largest number of births per year (27 million) in the world.[5] With its high maternal mortality of about 300–500 per 100,000 births, about 75,000 to 150,000 maternal deaths occur every year in India.[6,7] This is about 20% of the global burden. India's progress in reducing maternal deaths is, thus, crucial to the global achievement of MDG 5.

Antenatal care is an important determinant of maternal mortality rate and one of the basic components of maternal care on which the life of mother and babies depends.[8] In recognition of the potential of care during the antenatal period to improve a range of health outcomes for women and children, the World Summit for Children in 1990 adopted antenatal care as a specific goal, namely "Access by all pregnant women to prenatal care, trained attendants during childbirth and referral facilities for high-risk pregnancies and obstetric emergencies". Similar aims have been voiced in other major international conferences, including the International Conference on Population and Development in 1994, the Fourth World Conference on Women in 1995, their five-year follow-up evaluations of progress, and the United Nations General Assembly Special Session on Children in 2002.[9]

Antenatal care plays a critical role in preparing a women and her family for birth by establishing confidence between the women and her health care provider and by individualizing promotional health messages.[5,10,11] 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.[12] As per the National Family Health Survey-3, conducted in 2005-06, only 52% pregnant women in India made three or more ANC visits.[21] It has also been documented that over 95% maternal deaths in the country occur among women who have never had antenatal care check-up.[13]

As per SRS, 2001 the maternal mortality ratio in Manipur was 374 per 100,000 births. This was well below the national figure of 540.[20] In Manipur, only 18% pregnant women in 1998-99[14] and 10.5% in 2005-06[21] had full ANC care (3 ANC visits + 2 TT injections and 100 IFA tablets). In 2006, the reported coverage of full ANC care in the state was 60%.[15]

In India, tribal population (70 million) is socio-economically the most disadvantaged group.[16] Senapati is a remote and hilly district of Manipur having a total population of 283,621, which is predominantly tribal. *Maos, Poumeis, Marams, Thadous and Thangals* are the main tribes in the district. Health care in the district is provided through one district hospital, two community health centers, 12 primary health centers and 60 primary health sub-centers. In spite of this, only 19% of pregnant women had three or more ANC visits while the full ANC coverage in the district during 2002-04 was zero percent[17]. This study was conducted with the objective of determining the factors associated with the low antenatal care coverage in Senapati district, Manipur.

Methods

We conducted a cross-sectional study among mothers who had delivered a live baby and registered under anganwadi centers during March 2007-February 2008 in Senapati district of Manipur.

We used the cluster survey methodology[18] to select participants for our study. Using the three or more ANC visits of 19%,[17] confidence coefficient of 95%, confidence interval of ± 5% and rate of homogeneity of 0.1, we calculated the sample size to be 385. Taking 10% non-response we needed 423 mothers for the study. A total of 1098 anganwadi centers with 16856 live babies enrolled during March 2007-February 2008 in Senapati district were considered as the primary sampling units. Of these, we selected 55 centres by probability proportion to size. In each of the villages from the selected anganwadi centers, we chose the first household at random followed by the next nearest contiguous household until we interviewed 7 eligible mothers.

Using a pretested structured interview schedule we collected information from eligible mothers regarding their demographic characteristics, knowledge of antenatal care and the services received during the past pregnancy, awareness of antenatal services, reasons for not attending antenatal check up and information about the place of delivery. We trained the female health workers for interviewing the eligible mothers at the respective homes and the supervisors for maintaining quality control. We entered data into Excel software and analyzed it using Epi Info software 3.3.2[19]. We classified antenatal care (ANC) coverage (the outcome variable) into three categories, i.e. mothers with full antenatal check up (at least three antenatal visits, 2 tetanus toxoid (TT) injections and 100 iron-folic acid (IFA) tablets), mothers with partial antenatal check up (one or two antenatal visits, irrespective of number of TT injections or IFA tablets; less than two TT injections or less than 100 IFA tablets, irrespective of number of antenatal visits) and mothers with no antenatal check up before delivery. We compared the proportions of various characteristics of participants across the three ANC checkup categories using chi-square test. P-value less than 0.05 were considered statistically significant.

We obtained written informed consent prior to the interview from the participating mothers and provided them information on antenatal care service and its benefits after completion of the interviews. The study protocol was approved by the ethics committee of the National Institute of Epidemiology, Chennai.

Results

Characteristic of study population:

We interviewed 420 mothers in the district. Majority of them were Christians (384[(92%]) and between the age group of 21-30 years (301[72%]). In all, 118(28%) mothers were illiterate, 219(52%) were cultivators, 133(32%) had husbands who were cultivators and 221(52%) had monthly household income below Rs. 1,500 (Table 1). Compared to mothers with full ANC, significantly higher proportion of mothers with no ANC, lived in kutcha house (86% vs. 46%), were illiterate (34% vs. 9%), earning (76% vs. 52%), had illiterate husbands (21% vs. 7%) and monthly household income below Rs 1,500 (82% vs. 35%). Higher proportion of mothers with partial ANC had earning husbands (91% vs. 9%) and had less than two children (50% vs. 44%) compared to mothers with full ANC. Compared to partial or no ANC, significantly higher proportion of mothers with full ANC were linked with a road facility throughout the season (74%, $p = 0.0001$) and had a health centre within 3 km from their homes (57%, $p = 0.03$) (Table 3).

Antenatal care coverage:

Out of 420 mothers interviewed, 54 (13%) had full ANC coverage, while 130 (31%) had no coverage. Out of the 290 (69%) mothers who attended ANC clinic, 120 (42%) attended after 12 weeks of pregnancy, 226 (78%) had their ANC done in the public sector and 79 (19%) had three or more ANC visits. Out of 230 (79%) mothers who received IFA tablets, 107 (47%) received less than 100 IFA tablets. Overall, 272 (94%) mothers received at least one TT injection. The last delivery for 300 (71%) mothers took place at home and 145 (35%) deliveries were conducted by an untrained person (Table 2).

A significant majority of mothers with no ANC (120[92%]) had delivered at home compared to partial or full ANC ($p=0.0001$). The proportion of last deliveries conducted by a relative/friend among the mothers who had no ANC coverage (71[55%]) was significantly higher than those with partial (28%) or full ANC coverage (15%) ($p=0.0001$) (Table 3).

Knowledge about antenatal care:

Less than 50% of the 420 mothers knew that three ANC visits are necessary and the first visit should be within 12 weeks of gestation (Table 1).

Majority of the mothers with full ANC had correct knowledge about all aspects of the antenatal care compared to mothers with partial and no ANC coverage ($p<0.001$). Of the mothers with no ANC, 24 (19%) knew that three ANC visits were necessary (Table 3).

Reasons for non satisfaction of ANC services:

Out of the 111 (38%) mothers who were not satisfied with the ANC services, 68 (61%) gave the reason as lack of facilities. Even among the 21 mothers who completed full ANC, 33% were not satisfied due to the lack of attention given to them (Table 4).

Reasons for partial or no ANC coverage:

Out of the 211 mothers with partial ANC, 153 (70%) did not complete at least three ANC visits due to lack of money or time. Out of the 130 mothers with no ANC, 31 (24%) were of the opinion that pregnancy was a normal phenomenon not needing special care, 30 (23%) said ANC cost too much and 25(19%) had no knowledge of antenatal checkup (Table 5).

Discussion

Only 13% mothers in Senapati district received full antenatal care for their last birth, while almost one-third did not avail any. There was poor delivery of nearly all components of antenatal care services in the district. Women with no or partial ANC tended to be below 20 or above 30 years old, Christians, illiterate, of poor socioeconomic status, cultivators, and had poor knowledge about antenatal care. They had to travel for longer distance to ANC services, more so on inaccessible roads. Nearly two out of five women in the study area registered for ANC in the second or third trimester of their pregnancy. Studies on the timing of the initial antenatal check-up, however, show that even when antenatal care is initiated as late as the third trimester, there is a substantial reduction in perinatal mortality.[22]

An important thrust of the Reproductive and Child Health Programme is to encourage deliveries in proper hygienic conditions under the supervision of trained health professionals. Less than a third of the deliveries in this tribal area took place in health institutions, similar to the national scenario for rural areas as reported in NFHS-3. Women in the study area preferred to deliver at home for reasons such as support, familiarity, tradition, and belief that birth is a natural phenomenon for which an institutional delivery is not required. A substantial proportion of women in Senapati who had no or partial antenatal care are not convinced about the need to have a delivery in a health facility. These results suggest the need to inform parents and families more about the benefits of antenatal care and subsequent delivery in a health facility and to help overcome traditional attitudes and other hurdles that discourage institutional births. This also points to the important role of traditional birth attendants in conducting these births at home.

For incomplete antenatal care, more than one-third of women gave reasons dealing with the cost of services and problems of accessibility. Cultivators from low socioeconomic status have to earn for their living giving them relatively less time to visit the health centres and use antenatal services.[23]

Women who reside far away from the health centers could not afford the money and time to travel to health centers to avail the antenatal services. Similar findings were reported from other studies in the country.[24, 25, 26, 27] Utilization of health facilities for deliveries subsequent to antenatal services could also be increased by lowering direct and indirect costs and making services more accessible. For the difficult to reach areas, such as the hilly regions of Senapati, outreach services may be provided by ANM and mobile ANC clinics utilizing the financial resources available under RCH

II, NRHM. Incentives and reimbursement of transportation charges may be provided to women for availing antenatal check up in the health facilities.

Majority of the women with full ANC had correct knowledge of various aspects of antenatal care. Mothers who did not avail any antenatal services had substantially poor knowledge of various components of antenatal care compared to even those who got partial services. Poor knowledge could be due to low education of women and inadequate antenatal counseling given to pregnant women. It is more likely that the difference in knowledge between the three groups of mothers may have been an impact of attending antenatal clinics than otherwise. A study in Manipal also found that the proportion of antenatal care increased with increased counseling during antenatal visit.[28]

The Reproductive and Child Health Programme in India envisages the involvement of men in women's reproductive health. Health workers are supposed to provide expectant fathers with information on several aspects of maternal and child care during their contacts with expectant fathers. Husbands of two-third women in the study area accompanied them during the ANC visit. We did not explore further involvement of these husbands in terms of their interaction with health workers and their extent of knowledge and attitude regarding maternal and child care.

The coverage of antenatal services in Senapati district of Manipur is very poor. There is a need for enhancing community awareness about the importance of registering with 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. Hence efforts should be made to have information, education and communication (IEC) activities targeted to educate the illiterate, working mothers belonging to low socioeconomic status in the difficult to reach, tribal areas of Senapati district. Under the NRHM, district health administration should lay greater emphasis on improving the quality of antenatal care, among other things, to increase utilization of antenatal care and achieve better maternal health outcomes.

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Table 1. Characteristics of 420 mothers, Senapati District, Manipur, India 2008

Characteristics		#	%
Demographic characteristics			
Age	<20	31	7
	21-25	135	32
	26-30	166	40
	31+	88	21
Religion	Christianity	384	92
	Hinduism	22	5
	Others	14	3
Mother's education	Illiterate	118	28
	Literate till 5th	151	36
	Till 12th	126	30
	Graduate+	25	6
Husband's education	Illiterate	61	15
	Literate till 5th	105	25
	Till 12th	171	41
	Graduate+	83	20
Mother's occupation	Agriculture	219	52
	Housewife	84	20
	Government service	41	10
	Unemployed	29	7
	Private	28	7
	Student	8	2
	Laborer	7	2
	Business	4	1
Husband's occupation	Agriculture	133	32
	Business	80	19
	Government service	72	17
	Private	60	14
	Unemployed	45	11
	Laborer	26	6
	Student	4	1
Monthly household income	<Rs500	102	24
	Rs500 to Rs1500	119	28
	Rs1500 to Rs3000	100	24
	>Rs3000	99	24
Number of children	One	57	14
	Two	134	32
	Three+	229	54
Road throughout the season	Yes	237	56
Distance of hospital from home	Within 1 km	55	13
	2-3 km	79	19
	4-5km	195	46
	5km and above	91	22
Type of house	Kutcha	302	72
	Pucca	118	28
Knowledge about ANC	ANC care is necessary	290	69
	Know MCH services	272	65
	Inj.TT is necessary	271	65
	Know warning signals of	253	60
	pregnancy	229	55
	IFA tablet supplement is needed	197	47
	1st visit within 12 weeks	191	46
	Correct no. of 3 ANC visits		

Table 2: Characteristics of ANC services among mothers, Senapati, Manipur, India, 2008

ANC services		#	Total	%
ANC check-up	No	130	420	31
	Partial	236		56
	Full	54		13
No. of ANC visits	Zero	130	420	31
	One	106		25
	Two	105		25
	Three	65		16
	More than three	14		3
Place of antenatal check-up	Public sector	226	290	78
	Private sector	46		16
	Home	18		6
Time of ANC registration	Within 12 weeks	170	290	58
	13-23 weeks	92		32
	24-37 weeks	28		10
Services received during ANC visit	Blood pressure recorded	244	290	84
	Physically examined	243		84
	Weight measured	198		68
	Haemoglobin checked	69		24
Received IFA tablets and TT injection	IFA tablets	230	290	79
	TT injection	272	290	94
No. of IFA tablets received	10 tablets	43	230	20
	50 tablets	64		37
	100 tablets	123		43
Doses of TT injection received	One	128	272	46
	Two	144		54
ANC visit advised by	Self	112	290	38
	Nurse/ANM	93		32
	Husband	63		22
	Others	22		8
Husband accompanied for ANC visit		193	290	67
Facility at health center	Electricity supply	246	290	85
	Privacy for examination	243		84
	Waiting room	225		77
	Toilet	171		59
	Drinking water	105		36
Home visit by Lady health visitor		49	290	17
No. of home visits by lady health visitor	One	25	49	51
	Two	24		49
Place of delivery	Home	300	420	71
	Govt. Hospital	81		19
	Private hospital	32		8
	Govt. Health center	7		2
Delivery conducted by	Relative/Friend	145	420	35
	Nurse	103		25
	Doctor	89		21
	Trained Dai	63		15
	Health worker	20		5
Satisfied with the ANC services	Yes	179	290	62

* Full ANC = 3 or more visits +2 TT inj. +100 IFA tablets, Partial ANC = 1 or 2 visits irrespective of the number of TT and IFA tablets, No ANC = no ANC visit

Table 3: Factors associated with ANC checkup, Senapati, Manipur, India, 2008

Factors		No ANC (n=130)		Partial ANC (n=236)		Full ANC (n=54)		P value (chi-sq)
		#	%	#	%	#	%	
Socio-demographic								
Kutcha house vs. Pucca house		112	86	165	70	25	46	0.0001
Mother's age <20 or >30 vs. 21-29 years		46	35	59	25	14	26	0.09
Christianity vs. other religions		126	97	208	88	50	93	0.01
Illiterate mothers vs. literate mothers		44	34	69	29	5	9	0.002
Earning mothers vs. not earning mothers		102	76	169	72	28	52	0.001
Illiterate husbands vs. literate husbands		27	21	30	13	4	7	0.03
Earning husbands vs. not earning husbands		108	83	214	91	49	9	0.08
Monthly household income<Rs1500 vs>1500		106	82	96	41	19	35	0.0001
Number of children<2 vs >2		49	38	118	50	24	44	0.07
Accessible road throughout the year		55	42	142	60	40	74	0.0001
Distance of house from hospital<3km vs >3km		30	23	84	36	20	57	0.03
Last delivery								
Place of delivery	Home	120	92	160	69	20	37	0.0001
	Govt. hospital	6	7	55	23	24	44	
	Pvt.hospital	1	1	21	9	10	19	
Conduct of delivery	Doctor/Nurse	23	18	129	55	40	74	
	Health worker/Dai	36	28	41	17	6	11	0.0001
	Relative/Friend	71	55	66	28	8	15	
Knowledge of ANC								
ANC care necessary		53	41	189	80	48	89	0.0001
3 ANC visits necessary		24	19	129	55	38	70	0.0001
1st visit within 12 weeks		33	25	128	54	36	67	0.0001
Injection TT necessary		54	42	169	72	48	89	0.0001
IFA tablet supplement necessary		44	34	147	62	38	70	0.0001
Mother and child health services in ANC clinic		70	54	163	69	39	72	0.006
Know warning signals of pregnancy		74	57	135	57	44	86	0.002

Table 4: Main reasons for non satisfaction with ANC services according to ANC status among mothers, Senapati, Manipur, India, 2008

Reasons	ANC status				Total (n=111)	
	Partial ANC (n=90)		Full ANC (n=21)			
	#	%	#	%	#	%
Lack of facilities	57	63	11	52	68	61
Lack of attention	12	13	7	33	19	17
Irregularity of health staff	16	18	2	10	18	16
Rude manner of the staff	5	6	1	5	6	6

Table 5: Main reasons for incomplete or no ANC visits by the mothers of Senapati, Manipur, India, 2008

Reasons	#	%
Not completing 3 or more ANC visits (n=211)		
No money	78	35
No time to go	75	35
Forgot	31	15
Ill	27	13
No ANC visit (n=130)		
Pregnancy is normal	31	24
Cost too much	30	23
Lack of knowledge	25	19
Too far/no transport	15	12
No time to go	14	11
Not necessary	6	5
Poor quality service	6	5
Family did not allow	3	2

ANNEXURE I

Informed Consent form

Greetings,

I am_____ working in the department of health, Government of Manipur. You might be aware that we have a low attendance of pregnant women in the antenatal clinics in our district. You might also know that not getting antenatal check up leads to many risks during pregnancy and after childbirth. So we are conducting a study in the district to know the reasons of mothers for not coming for antenatal check up in Senapati district, Manipur. So between _____to _____ we would be coming to your place for asking some questions regarding your opinion in this regard. Your response in this regard will help us to identify the problem and thereby, we will be able to suggest remedial measures in the district. The National institute of epidemiology, Chennai is also working with us on the investigation. Taking part in the interview will hardly take 20-30 minutes. Participating in the survey is purely voluntary. You may choose not to take part. You are also free to quit answering these questions any time during the interview. This will not affect your right to health care. However, taking part in the study eventually benefit you and the community.

We will not write your name on the form, instead we will use a code. The code will be with the principal investigator and will be destroyed after the analysis. If you need more information on the project you can also contact Dr. Lolee P. Mao at the following contact No. 0385-2421700.

Undertaking

"I have read the forgoing information or it is has been read to me. I have received sufficient information about the project. I have had opportunities to ask questions about any doubt and have been answered to my satisfaction. I consent voluntarily to this assessment and understand my right to withdraw at any juncture without any consequence on the type of medical care I receive".

Name _____ *Signature/Left thumb impression* _____

Date _____ *Witness*_____

ANNEXURE II

QUESTIONNAIRE

ID No_____ **Cluster ID No**_____ **Household ID**_____

Date of interview____/____/____ **District: Senapat**

Section A: Demographic characteristics

1	Type of house.	1) Kutcha 2) Pucca
2	How old are you?	1) Within 20 2) 21-25 years 3) 26-30 years 4) 31 and above
3	What is your religion?	1) Christianity 2) Islam/Muslim 3) Hinduism 4) Others
4	What is the highest level of education you attained?	1) Illiterate 2) Literate and till 5th 3) Till 12th 4) Graduate and above
5	What is your occupation?	1) Agriculture 2) Laborer 3) Student 4) Government service 5) Private 6) Business 7) unemployed 8) Housewife
6	What is your husband's educational status?	1) Illiterate 2) Literate and till 5th 3) Till 12th 4) Graduate and above
7	What is the occupation of your Husband?	1) Agriculture 2) Labourer 3) Student 4) Government servant 5) Private 6) Unemployed 7) Business
8	What is your average monthly household/ family income?	1) < Rs.500.00 2) Rs 500 to Rs 1500 3) Rs 1500 to Rs 3000 4) > Rs 3000.00
9	How many children do you have?	1) One 2) Two 3) three and more
10	Is there an all season road to your locality?	1) Yes 2) No
11	How far is your house from the nearest health center?	1) Within 1 km. 2) 2-3 km. 3) 3-4 km. 4) 5km & more

Section B: Past history of pregnancy/delivery

12	How many time were you pregnant?	1) First 2) Second 3)Third 4) More than three
13	How many time you delivered?	1) First 2) Second 3) Third 4) More than three
14	How many time you delivered live birth?	1) First 2) Second 3) Third 4) More than three
15	How many abortion you had?	1)One 2) More than one 3) None

Section C: Knowledge, attitude and practices

16	Do you think that ANC care is necessary during pregnancy?	1) Yes 2) No
17	How many ANC visit is necessary?	1) One 2) two 3) three

18	At what month of pregnancy should the first visit be?	1) Within 12 weeks 2) 13-23 weeks 3) 24-37 weeks
19	Is TT injection necessary during Pregnancy?	1) Yes 2) No
20	Do you think it necessary to take IFA supplement during pregnancy?	1) Yes 2) No
21	What services are provided in the ANC clinic?	1) About mother and child health 2) About father and son 3) About husband and wife 4) All
22	Do you know about the warning signals of pregnancy?	1) Yes 2) No

Section D: Details of Antenatal care check-up

23	Did you have any antenatal checkup?	1) Yes 2) No (If yes, go to next .If not skip to question no. 53)
24	When did you register for ANC? (Write in weeks)	1)Within12 weeks 2) 13-23 weeks 3) 24-37 weeks
25	Where was it done?	1) Public sector 2) Private hospital 3) Home 4) Quacks 5) Others
26	How many times have you received?	1) One 2) Two 3) Three 4) More than three
27	Who did the ANC?	1) M.O. 2) Staff nurse 3) ANM 4) ASHA 5) Others
28	Were you examined physically?	1) Yes 2) No
29	Was your Blood pressure recorded?	1) Yes 2) No
30	Was your weight taken?	1) Yes 2) No
31	Was your haemoglobin level measured?	1) Yes 2) No
32	Were you given IFA tablet before the delivery?	1) Yes 2) No (If yes, go to question No.33)
33	How many tablets do you received?	1) 10 tabs 2) 50 tabs 3) 100 tabs
34	Have you received TT injection before the delivery?	1) Yes 2) No If yes (Go to question No. 35)
35	How many TT doses you had received?	1) One 2) Two
36	Were you told about the minimum number of ANC visits?	1) Yes 2) No
37	Were you told about the expected date of delivery?	1) Yes 2) No
38	Were you told to deliver in the	1) Yes 2) No

	hospital?	
39	Who advice you to attend the ANC clinic?	1) Self 2) Husband 3) ANM/Health worker 4) Others
40	Have you completed the full ANC check-ups before the delivery?	1) Yes 2) No (If yes, go to question 42 and if not, go to question No. 41)
41	Why not you completed?	1) Forgot 2) Ill 3) No money 4) No time to go
42	Did the Health Worker/LHV visit you before delivery?	1) Yes 2) No (If yes, go to question No. 43)
43	How many times?	1) One 2) Two 3) > Two
44	Does your husband accompany you for ANC visit?	1) Yes 2) No
45	Were you given advice on nutrition?	1) Yes 2) No
46	Is there waiting room?	1) Yes 2) No
47	Is there toilet facility?	1) Yes 2) No
48	Is there drinking water facility?	1) Yes2) No
49	Is there electricity supply?	1) Yes 2) No
50	Is there privacy for examination?	1) Yes 2) No
51	Are you satisfied with the service provided?	1) Yes 2) No (If not, Go to question 52)
52	Give reasons, why?	1) Lack of attention 2) Rude manner of Health worker 3) Lack of facility 4) Irregularity of health staff
53	Why did you not go for an antenatal check-up?	1) Not necessary 2) Pregnancy is normal 3) Too far/No transport 4) Cost too much 5) Poor quality service 6) No time to go 7) Family did not allow 8) Lack of knowledge 9) Customary 10) Rude behavior of the health worker

Section E: Information about place of delivery

54	Where was the child delivered?	1) Home 2) Hospital 3) Health centre 4) Private Hospital
55	Who conducted the delivery?	1) Doctor 2) Nurse 3) Health worker/LHV 4) Dai 5) Relative/Friend

Remarks if any:

Signature of Interviewer_____ Signature of Witness_____

Signature of Principal Investigator_____

Section II

Literature Review

Review of literature

To identify the articles related to factors associated with antenatal care services, using manual and computerized methods to identify useful articles and books from National Institute of Epidemiology, Chennai related to key words antenatal care, antenatal coverage, factor that affect utilization of services, socioeconomic and distance and education. For this we searched Pub Med (www.pubmed.gov), MEDLINE[1] important sources and constructed the outline of literature review.

INTRODUCTION

Saving mothers live is widely recognized as an imperative for social and economic development, as well as human rights imperative, although until recently there has been limited evidence mapping such links. It is the right of every mother and baby to have the best available care to enable them to survive pregnancy and childbirth in good health[2]. Pregnancy is a special event, and the family and community should treat a pregnant woman with particular care. During Antenatal visit pregnant woman know the danger signs which may arise during pregnancy, labour, delivery, and after delivery so that help for the mother and the baby can be sought early from the most appropriate place. Also they receive iron/folic acid supplementation, tetanus toxoid vaccination and advise on good nutrition during the contact. So woman can improve her own health and that of her child, and the risks of maternal and prenatal complications can be reduced. Antenatal visits promoting healthy behaviors in women and increasing knowledge about complications among women, they become life-saving, however. Dialogue between the woman and her health care provider should augment the information that the family has already learned from health promotion messages in the community, so that she and her family may make the most appropriate decision about the place and conditions for delivery. Antenatal care plays a critical role in preparing a women and her family for birth by establishing confidence between the women and her health care provider and by individualizing promotional health messages.[3,4,5]

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. 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.[6,7] The primary aim is to achieve at the end of pregnancy a healthy mother and healthy child. Ideally this should begin soon after conception and continue throughout pregnancy.[6]The contact for antenatal care provides an opportunity for the mother to come very close to the medical team, laboratory and the facilities as well as various equipments used in medicine. It also raises awareness about the needs at delivery[8], or gives women and their families a familiarity with health facilities that enables them to seek health care more efficiently during a crisis[9].

Global scenario: Pregnancy and childbirth complications are the leading causes of death and disability among women of reproductive age in many developing countries.[10] Worldwide, every minute a pregnant woman died resulting in a loss of 500,000 women per annum in 2000.[11] One-third of these maternal deaths took place in south east Asia.[12]

Indian scenario: India accounts for the largest number of births per year (27 million) in the world.[13] With its high maternal mortality of about 300–500 per 100,000 births, about 75,000 to 150,000 maternal deaths occur every year in India.[14,15] This is about 20% of the global burden. India's progress in reducing maternal deaths is, thus, crucial to the global achievement of MDG 5.

ANC coverage in Manipur: As per SRS, 2001 the maternal mortality ratio in Manipur was 374 per 100,000 births. This was well below the national figure of 540.[16] In Manipur, only 18% pregnant women in 1998-99[17] and 10.5% in 2005-06[18] had full ANC care (3 ANC visits + 2 TT injections and 100 IFA tablets).

ANC coverage in Senapati district: Health care in the district is provided through one district hospital, two community health centers, 12 primary health centers and 60 primary health sub-centers. In spite of this, only 19% of pregnant women had three or more ANC visits while the full ANC coverage in the district during 2002-04 was zero percent[19].

Coverage of antenatal services[20]

We reviewed the fact sheet on maternal mortality and morbidity. Every 5 minutes, one woman somewhere in India dies from complications of childbearing, 15 percent of all pregnant women in India develop life-threatening complications, 65 percent of deliveries occur at home, Only 41 percent of women have a skilled birth attendant at the time of delivery 60 percent of all maternal deaths occur after delivery but only 1 in 6 women receive postnatal care. The risk of maternal death is one in 37 in India while it is one in 230 in neighboring Sri Lanka compared to one in 5000 in Singapore and one in 7300 in Norway. With 16% of the world's population, India accounts for over 20% of the world's maternal deaths. The maternal mortality ratio, defined as the number of maternal deaths per 100,000 live births, is incredibly high at 408 per 100,000 live births for the country (GOI 1997), All of these estimates imply that more than 125,000 women in India die every year from causes related to pregnancy and childbirth.[20]

Antenatal visits: About 89% of the pregnant women had antenatal visits and 62% had made three or more ANC visits. There were about 11% pregnant women who had no ANC visits at all during their pregnancy. About 86% of pregnant women received only one doses of TT while about 77.9% of the pregnant women received two doses of TT or a booster dose. As much as 13.6% of the pregnant women did not get themselves immunized for TT. About 73% of the pregnant women received IFA tablets during their pregnancy. A pregnant woman was considered to have received full package of ANC if she availed 3 or more ANC visits for check-up, received two doses of TT or booster and received IFA tablets. Only 52.5% of the pregnant women received full package of ANC[21]. Change in the demographic scenario is being witnessed in developing countries like India. There are indications that family size is declining. Accordingly, the profile of pregnant women also seems to be changing. It is important to document such changes in

order to give feedback to the planners. Government of India has launched reproductive and child health-II (RCH-II) program. One of its main focuses is on quality of antenatal care (ANC). It is also vital to document the existing quality of ANC in various parts of India. Such information helps in indirectly gauging the progress and impact of the program. Against this background this study was done with an objective to ascertain the fate of pregnancies registered in the study area in order to study the profile of pregnant women and the quality of antenatal care received by them.

A literature on Women's Health, Western Pacific Regio*n Improving the quality of health care in reproductive health* (A Pacific Island Countries 'Perspective) We observed pregnant mothers are routinely screened in the antenatal care (ANC) and family planning clinics for a selected number of STIs, breast and cervical cancers. However, this screening programme depends heavily on the availability of the necessary supplies.[22] A Country Case Study: Chad, June 2001, *Constraints to Scaling Up Health.*intensity of use of pre-natal consultations 2.1,For pre-natal consultations, 123,000 pregnant women were recorded and visited the service on average 2.1 times. The number of child deliveries assisted by health service providers reached 26,000 in 1999, which corresponds to coverage of approximately 7% of all expected child births. Within Chad, however, the variations in the use of medical services are considerable. For example a better coverage with assisted deliveries is observed in the South of the country.[23]

In Madhya Pradesh, DLHS survey 2004 was reported that only 34.5% pregnant women have received three antenatal checkups (PW consuming 100 IFA tablet by 5.9% and 2 T.T. by 77.5%). The percentage of women receiving any ANC has increased from 52.4 (1998-99) to 74.1 (2004). 17.6% deliveries take place in govt. institutions and 10.6% in private institutions. Still 71.5% are domiciliary deliveries and 35.5% deliveries are attended by Skilled Birth Attendant. The percentage of safe delivery has gone up from 27.5 (1998-99) to 35.5 (2004)

The Reproductive and Child Health Programme seeks to promote institutional delivery conducted by Skilled Birth attendants. The Survey has also noticed inter-district variations in the coverage of the antenatal care services. Strengthening Antenatal and Postnatal Services activities to improve the coverage and quality of ANC Rendering effective and quality ANC services through fixed day (Friday).clinic approach with focus

on women of BPL/SC/ST, primigravidas and adolescent mothers. Anganwadi workers will be involved for improving the coverage. Orientation of community (integrated with BCC module).Skill training of ANMs in Obstetric First Aid with focus on emergency drugs approved for the use by ANM.200 Additional ANMs will be recruited in the year 2006-07 for SHCs and 321 ANMs of RCH I for SHC will be continued.313 Dai Sammelans are planned (one in each block) in the year 2006-07 for orientation of TBAs for promoting institutional deliveries and creating referral linkages with health system[24]

Education of women

A study on Antenatal Care of Pregnant Women in India ,WHO method 30 cluster survey methodology with certain modifications incorporating information on female literacy and distance of the village has been used. The characteristics of sample households for pregnant women were broadly in proportion to the characteristics of the all India population. About 89% of the pregnant women availed antenatal visits of which 62% had received three or more ANC visits. Those receiving the second dose of TT or booster dose were about 78%. About 73% of the pregnant women received IFA tablets during their pregnancy. About 53% of the pregnant women had full package of ANC i.e. availed 3 or more ANC visits, both the doses of TT/boster and IFA tablets. The proportion of pregnant women who availed full ANC package was lower in rural as compared to urban areas, lowest for ST followed by SC; higher for literate women as compared to illiterate women. The proportion of Institutional deliveries managed by hospitals and health centres were about 41%, it being higher among literate women and in urban areas. The literacy of women is the key to improve antenatal care of pregnant women[25].

Husband's education and the standard of living of the family also have some effect on the practice of antenatal check up, place of delivery and assistance of health professional. While most of the family background variables have significant effect on the practice of antenatal check up, these variables do not have much effect on the choice of delivery or seeking assistance of health professionals. The status of literacy of mothers and standard of living of the family are of prime importance in improving the obstetric health care practices.[26]

Knowledge and coverage

The development of 111 women's groups in a population of 86 704 in Makwanpur district, Nepal is described. The groups, facilitated by local women, were the intervention component of a randomized controlled trial to reduce perinatal and neonatal mortality rates. Through participant observation and analysis of reports, we describe the implementation of this intervention, the community entry process, the facilitation of monthly meetings through a participatory action cycle of problem identification, community planning, and implementation and evaluation of strategies to tackle the identified problems. In response to the needs of the group, participatory health education was added to the intervention and the women's groups developed varied strategies to tackle problems of maternal and newborn care[27].

Poor knowledge could be due to low education of women and low antenatal counseling given to pregnant women. Low education was the barrier in understanding the importance of antenatal visits. It was seen that the proportion of antenatal care increased with increased counseling during antenatal visit[28].

Distance (Transportation facility) and Social economic factor:

A study on antennal care Support care seeking behavior, including recognition of danger signs for the woman and the newborn as well as transport and funding plans in case of emergencies.[29]

Given the low attendance at ANC by women in the study areas, there is a need for qualitative research to investigate why women do or do not attend for ANC and could help to identify the effect of ANC on behavioral decisions. Qualitative research in a rural area of Zambia, for example, revealed that long distances, lack of transport, user fees, lack of health education and poor quality care deterred women from delivering in a clinic[30].[18]. Three potential factors deserve particular attention. First, there appears to be a significant proportion of women who live some way from the dispensary and who have no ANC. Hence lack of good roads or transport may be the barrier to attendance and this factor should be explored in qualitative research. If this is the case, women in distant areas could be encouraged to attend for ANC by providing transport or arranging an out-reach ANC service in certain areas. Alternatively, an attempt could be made to provide

more health facilities to reduce the need for women to travel long distances while pregnant or to consider the use of maternity waiting homes.[31]

Socio-economic status:

Antenatal care, provision and inequality in rural north India study. The objectives of this paper are to examine factors associated with use of antenatal care in rural areas of north India, to investigate access to specific critical components of care and to study differences in the pattern of services received via health facilities versus home visits. used the 1998–1999 Indian National Family Health Survey of ever-married women in the reproductive age group and analysed data from the states of Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh (n=11,369). Overall, about three-fifths of rural women did not receive any antenatal check-up during their last pregnancy. Services actually received were predominantly provision of tetanus toxoid vaccination and supply of iron and folic acid tablets. Only about 13% of pregnant women had their blood pressure checked and a blood test done at least once. Women visited by health workers received fewer services compared to women who visited a health facility. Home visits were biased towards households with a better standard of living. There was significant under-utilisation of nurse/midwives in the provision of antenatal services and doctors were often the lead providers. The average number of antenatal visits reported in this study was 2.4 and most visits were in the second trimester. Higher social and economic status was associated with increased chances of receiving an antenatal check-up. The findings indicate substantial limitations of the health services in overcoming socio-economic and cultural barriers to access.[32]

Semi-urban community in Entebbe Uganda and to examine the range of antenatal and delivery services received in health care facilities and at home. retrospective community survey among women using structured questionnaires to describe the use of antenatal services and delivery care. In total 413 women reported on their most recent pregnancy. Antenatal care attendance was high with 96% attending once, and 69% the recommended four times. Blood pressure monitoring (95%) and tetanus vaccination (91%).A significant improvement in the reported quality of antenatal services received was observed by year ($p < 0.001$). Financial and transport limitations are important factors in women's inability

to access skilled delivery care and this will need to be addressed if we are to improve delivery service.[33]

A study in rural northern Ghana, in a multilevel logistic model, physical access factors {such as availability of public transport, odds ratio (OR) = 1.50 (1.15–1.94), travel distance to the district hospital [for 20+ km, OR = 0.31 (0.23–0.43)] as well as community perception of access to the nearest health facility [for highest quintile, OR = 4.44 (2.88–6.84)]} showed statistically significant associations with use of health professionals at last delivery. Women who knew that delivery care was free of charge were 4.6 times more likely to use health professionals. Physical access factors remain strong determinants of use of professional delivery care in rural northern Ghana[34]

Home delivery:

One study in three clinics in Maputo, Mozambique (one each urban, peri-urban and rural) found that though many women were successfully assessed, referred end cared for, less than half of those in the high risk group were actually seen at the referral centre, and from the rural clinic only 11% of women referred for delivery in hospital actually delivered there compared to 66% of those referred from the other two clinics (Jelly and Madeley, 1983). Distance appeared to be a stronger determinant of place of delivery than risk screening. In a four year community based study of pregnancy and delivery in a rural area of Kenya (Voorhoeve, Kars and Ginneken, 1984), 84% of women attended an antenatal clinic at least once but only 27% delivered in hospital. In fact, only just over a third of women intending to deliver in hospital actually did so, and distance from the hospital town and the rainy season were shown to have a strong negative effect on the percentage of women delivering in hospital[35].

In Nepal, over 80% of deliveries take place at home. Most of the births are assisted by family members and neighbors, with only one-fifth of deliveries attended by health workers (CBS 2004). Births attended by skilled births attendants (doctors, nurse, and auxiliary nurse, midwives) are as low as 11% (NDHS 2001). Another 10% of births were attended by traditional births attendants (TBAs), who may be trained or untrained, however they do not qualify as skilled birth attendants. There was a gradual increase in

the number of deliveries conducted by trained TBAs from 2% in 1995 to more than 11% in 2003/04. It was found that some ethnic groups prefer TBAs for delivery. Home deliveries are usually opted for in anticipation of the care and support from family and community. Besides, pregnancy and childbirth are still perceived as natural phenomenon, not requiring formal health services[36] (UNICEF1998).

One study in three clinics in Maputo, Mozambique (one each urban, peri-urban and rural) found that though many women were successfully assessed, referred end cared for, less than half of those in the high risk group were actually seen at the referral centre, and from the rural clinic only 11% of women referred for delivery in hospital actually delivered there compared to 66% of those referred from the other two clinics (Jelly and Madeley, 1983). Distance appeared to be a stronger determinant of place of delivery than risk screening. In a four year community based study of pregnancy and delivery in a rural area of Kenya (Voorhoeve, Kars and Ginneken, 1984), 84% of women attended an antenatal clinic at least once but only 27% delivered in hospital. In fact, only just over a third of women intending to deliver in hospital actually did so, and distance from the hospital town and the rainy season were shown to have a strong negative effect on the percentage of women delivering in hospital.

Adopt and implement policies that protect poor families from the catastrophic consequences of unaffordable maternity care, including through access to health insurance or free services. Protect pregnant women from domestic violence; and involve men in maternal health and wider reproductive health. Increase access to contraception and sexual and reproductive health counseling for both men, women and adolescents. Increase efforts to prevent child marriage and ensure that young women postpone their first pregnancy.

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