

DETERMINANTS OF ANTENATAL CARE SERVICES UTILIZATION IN NEPAL

By: Deepak Raj Paudel (Lecturer, School of Business, Pokhara University, Nepal)

ABSTRACT

This study aims to identify the determinants of antenatal care (ANC) service utilization in Nepal using data from 2006 Nepal Demographic and Health Survey. Analysis has been carried out by selecting 2785 currently married women aged 15-49 years who were usual residence and gave birth in the last three years preceding the survey. The socio-demographic factors, women empowerment factors, and service attribute factors have been identified as the plausible determinants of ANC in this study. Analysis has been done in three stages. First, descriptive analysis has been done calculating percentage of all independent variables and dependent variable, ANC. Second, association between dependent and independent variables have been observed using Chi-square test. Finally, logistic regression analysis has been employed to predict extent of association. The analysis of logistic regression reveals that socio demographic factors such as place of residence, religion, caste, education and occupation of husband, wealth rank of family ; women empowerment factors like education of women, decision making regarding household purchases, exposure to medias; and finally service attributes factors like cost ,distance and no faith in service are significantly influencing ANC service utilization. The study suggests policy makers and concerned stakeholders to give attention towards women education first and foremost followed by opportunities creation for raising the economic status of family by involving women and finally giving efforts towards provision of quality maternal services which are affordable, accessible and acceptable to women.

Key words: Antenatal Care, Women, Nepal, Service Utilization.

1. INTRODUCTION

1.1 Background

The maternal health services have a critical role to play in the improvement of women's reproductive health in developing countries.^{1,2,3,4} Every year nearly 500,000 women die of complications related to pregnancy and childbirth, and 99 percent of these deaths occur in developing countries.⁵ The maternal mortality ratio of Nepal is 281 per one hundred thousand live births which is considered to be high figure.⁶ Many of these deaths could have been avoided if the pregnant women had sought full antenatal care and timely delivery care. Delivery attendant by trained health personnel is also very low and only few receive the PNC services with in the recommended time. Women constitute slightly more than half of Nepal's population. Traditionally, their status compared to men has always been low. Issues such as the respect and dignity a woman commands within marriage, her level of education, and her vulnerability to violence affect her ability to make decisions about her well-being.⁷ Thus women in Nepal face alarmingly low health status in almost every stage of their life cycle because of various cultural,

religious and patriarchal norms, values and ethic. They even cannot access health care in emergency situations. Maternal health is an important part of the health care system aimed at reducing morbidity and mortality related to pregnancy and child birth. The health care that a woman receives during pregnancy, at the time of delivery and soon after delivery is important for the survival and wellbeing of both mother and child. Maternal health is one of the most important health indicators and it indicates the overall health status of a country. Improving the health status of a country and a place is not possible without improving the maternal health which is influenced by various socio-economic and demographic and several other factors. Hence this study aims to study the status and utilization of an indicator of maternal health services, namely; antenatal care (ANC) in Nepal. The empirical evidences of some of the influencing factors on maternal health service utilization are discussed herewith.

Women who have fewer children and have received antenatal care are more likely to use postnatal care as found elsewhere. Order of birth shows an inverse relationship on ante-natal check up and institutional delivery. Lower parity woman tend to give careful attention in seeking antenatal care due to their inexperience in pregnancy. Also, lower utilization of maternal health care services among higher parity women could be due to time and resource constraints faced by those with larger families.¹ Mothers' age has positive relationship with ante-natal care and institutional delivery. Occupation of the husband has been seen as an influential factor for utilization of postnatal care in the study.⁸ It is argued that the differential in access to health care facilities between rural-urban areas is an important factor for lower utilization of maternal health care services, particularly for institutional delivery and delivery assistance by health personnel in the rural areas. It also indicates that health workers might play a pivotal role in providing antenatal care in the rural areas. The rural-urban differential in the use of maternal health care services is likely to be due to differences in the availability of maternal health care facilities including the distance to the health care centre.⁹ Most of the studies have found marked rural urban differences in access to ante-natal care services and institutional delivery.¹⁰ A study conducted in Kenya shows that household wealth; education, parity, and place of residence were closely associated with frequency and timing of ANC and with place of delivery.¹¹ Family income and standard of living index have been found to be directly related to access to antenatal care services.¹ The results highlight the importance of antenatal care and counseling about pregnancy complications for increasing the likelihood of appropriate delivery care. Area-level factors explained a greater proportion of the variation in delivery care than in prenatal care.¹²

Empowerment is a process, by which women gain greater control over material and intellectual resources which will assist them to increase their self reliance, and enhance them to assert their independent rights, and challenge the ideology of patriarchy and the gender-based discrimination against women. This will also enable them to organize themselves to assert their autonomy to make decisions and choices and ultimately eliminate their own subordination in all the institutions and structures of society.¹³ Research conducted in 2004 found that empowerment measure such as education, occupation, exposure to mass media, economic status of household etc and autonomy measures like household autonomy (Cooking decision: Decision on going and staying with parents or siblings: Decision making on buying jewelry/important household items: Healthcare Autonomy) Control Over Economic Resources, mobility autonomy play major role in determining the maternal health service utilization.¹⁴ In the same way a study conducted in Kathmandu found that empowerment factors such as education, exposure to mass media and standard of living have been found to have positive relationship towards maternal health care utilization.¹⁵ Literature suggests that mass media are effective in information dissemination,

which increases awareness about innovations, and fosters inter-personnel communication, which could facilitate behavioral changes allowing for the adoption of new/different behaviors.¹⁶ Studies have shown that exposure to mass media promotes health-related behavior including contraceptive use, and reproductive preferences and treatment for children.¹⁷ Involving husband/partner and encouraging couple joint decision making in maternal health may provide an important strategy in achieving women's empowerment, which ultimately help to reduce the maternal morbidity and mortality.¹⁵ Low education and decision-making power of women in Nepal may restrict access to antenatal care. Many studies have found that education plays an important role in receiving antenatal care.¹⁸ The strong association of women's education with health care use highlights the need for efforts to increase girls' schooling and alter perceptions of the value of skilled maternal health care.¹⁹ Women with greater freedom of movement obtain higher levels of antenatal care and are more likely to use safe delivery care. The influence of women's autonomy on the use of health care appears to be as important as other known determinants such as education.²⁰ Lack of decision making power by a woman could result into lesser timely health seeking behavior and leads to greater adverse health consequences.²¹ A study carried out in Nepal found that non-working women utilized antenatal care services more than working women.²² In the summary, many studies have identified education, work participation, exposure to mass media and household standard of living as determinants or factors or sources for empowerment. Education enhances a woman's position through decision-making autonomy, control over resources, knowledge, exposure to the modern world and husband wife closeness.²³ Female work participation in non-agricultural sector and level of wage are also considered as determinants of empowerment. Woman's gainful employment outside home exposes her to the outside world; delays age at marriage, provide a sense of financial independence and increase her bargaining power and autonomy within the household and society.²⁴

Proponents of the health perspective have argued that several interventions may be critical to maternal mortality reduction, including antenatal care, family planning services, safe and legal abortion, trained medical attendants at delivery and emergency obstetric care.²⁵ Study done by Gage (2007) highlights a range of area-level influences on the use made of maternal health services. While the dearth of health facilities is a barrier to receipt of prenatal care in the first trimester, transportation barriers are more important for four or more prenatal visits.

Although the body of literature is rich elsewhere, evidence of the impact of maternal health services on utilization in Nepal is almost non-existent. Based on the above literature review it can be conceptualized that various socio demographic, women empowerment and service attributes factors influence the maternal health service utilization. Important socio demographic factors are place of residence, religion, caste, parity, education of husband, occupation of husband, household wealth etc. Similarly it has been recognized that women empowerment is very much essential for increasing women utilization of maternal health services. The important empowerment factors identified are education of women, their exposure to different media of communication, participation in household decision making, work status etc. The service attributes such as cost of service, distance of service, service quality or faith towards the service has also found influencing maternal health services utilization. With the light of above mentioned problems, the study tries to answer the following specific research question- what are the determinants of ANC service utilization in Nepal? The objective of this study is to examine the influence of various possible factors on ANC service utilization. The plausible research hypotheses to be tested are- (1) the socio-demographic factors such as age, parity, place of

residence, region, religion, caste, sex of HH head, education and occupation of husband and wealth index of family has positive impact on ANC utilization. (2) The women's autonomy variables such as education, head of HH, occupation, type of earning, place of work, exposure to mass media and house hold decisions are likely to affect on ANC utilization positively. (3) The cost of service and distance of service center and doubt in service negatively influence ANC utilization.

2. METHODOLOGY

2.1 Data Source

The data for this study is from the Nepal Demographic and Health Surveys (NDHS), 2006 which is the third comprehensive survey conducted in Nepal as part of the worldwide Demographic and Health Surveys (DHS) project. It is conducted by the Ministry of Population and Health in collaboration with the USAID and New Era. The 2006 Nepal Demographic and Health Survey (NDHS) is a nationally representative survey of 10,793 women age 15-49 and 4,397 men aged 15-59. The sample for the survey is based on two-stage, stratified, nationally representative sample of household. At the first stage 260 primary sampling units (PSUs, 82 in urban areas and 178 in rural areas) were selected using systematic sampling with probability proportionate to sample size. In the second stage complete household listing operation was carried out in all the selected PSUs and systematic samples of about 30 household per PSU in urban areas and about 36 household in rural areas were selected in all the regions. Cases of 2785 have been selected from 10,793 women of reproductive age. Married women who gave birth in last three years and who were usual residence at the time of survey have been selected. The software program, Statistical Packages for Social Sciences version 11.5 has been used for further processing the data.

2.2 Data Analysis

Chi square test has been used to observe the association of dependent variable to each independent variable. Chi square test is a non parametric test which is used when data are in frequencies such as in number of responses in two or more categories. It is used for test of proportion, test of association or independence and test of goodness of fit. Also for predicting the most contributing factors affecting dependent variable logistic regression analysis has been done. It is form of regression in which dependent variable is dichotomous and independent variables are of any type. In univariate analysis the percentage analysis of dependent variable (ANC utilization) and all independent variables have been carried out individually. In bivariate analysis, first of all cross tabulation of dependent and independent variable has been done then by using the Chi square test the significance of association between dependent and independent variables have been observed. In multivariate analysis the extent of association between dependent and independent variables have been tested by calculating the odds ratio using logistic regression analysis. Logistic regression is a form of regression, originally applied to survival data in the health sciences. It has been developed to enable us to use regression models to predict the probability of a particular categorical response for a set of explanatory variables. Logistic regression model is based on the odds ratio, which represents the probability of a success compared to the failure. The odds ratio is defined as

$$\text{Odds ratio} = \frac{\text{probability of success}}{1 - \text{probability of success}} = \frac{p}{1 - p}$$

The model for binary logistic regression is based on the natural logarithm of the odds ratio and can be expressed as

$$\text{logit}\left(\frac{p}{1-p}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_i X_i + \varepsilon$$

Where, ‘i’ is the number of independent variables and ε is the stochastic random error.

3. RESULTS

3.1 Univariate Analysis

The distribution of age reveals that nearly one in ten are 15-19 years age group and about four-fifths in age group of 20-34 (Table 1). The mean age is 26 years; median age is 25 years with standard deviation of 6 years. Most of the respondents (78.3%) are residing in rural area. Higher percentage age of the respondents (23.6%) are from central development region followed by eastern development region (21.7%). Majority (87.3%) are Hindus. Most of the family have male as household head. About 40% of the husbands have acquired secondary level education followed by primary education. About 23% are illiterate and only 8% have acquired higher level education. More than half of the husbands are of age group 25-34 years and 22.5% are of age group 15-24 years. With regard to the parity, even though respondents are selected who have given birth in the last three years, 1% of respondents are in zero parity because of death of child. About 29% are in first parity and about 28% in second parity. Those who are in fourth and above parity account about 24%. Most of the husbands are engaged in agriculture (40%) followed by service (31.2%), and then by labor (25.5%). While categorizing the economic status of family by wealth index in five categories (as poorest, poorer, middle, rich and richer), most of them (29.2%) fall in first category, followed by second category (21%). About 18% are of middle and rich wealth rank. Only 14.2% are richest group. This shows that majority of respondents have poor economic status. More than half of the respondents have no formal schooling. Only 20% of the respondents acquired secondary level education, 18.6% primary level education and only about 3% acquired higher level education. Only about 14% of respondents are leading the family as household head. Most of the respondents (74.3%) are engaged in agriculture. Only 5.5% are service holder and 2.3% are laborer. About 18% of the respondents are not working. Of those who worked 71.2% are working away and about 11% are working at home. About 40% are paid in kind only, for their work. Regarding decision making autonomy of women, four important household decisions have been assessed to observe whether the respondents are participating in the decision or not. It shows that 60 % of respondents do not have decision making autonomy on their own health. Similarly, 59.1 % and 53.1 % of the respondents depends on other’s decision on matters of large household purchases and daily household purchases respectively and more than half (53.9%) of respondents can not decide self for their mobility. It also shows that out of four important decisions, 29.4 % of respondents decide in all four.

Women’s exposure to mass media is also an important indicator to assess the status of women empowerment. It is found that about 76% of respondents do not have habit of reading newspaper. However, most of them listens radio and about 70% of respondents watch television. Respondents not exposed to any of the media comprise of 7.2%. To identify the reason of not visiting health facility for using the ANC, three different indicators: cost of service, distance of health facility and no belief/doubt in health facility have been explored. Among those who deliver at home, the reasons have been asked and it is shown in. It shows that cost is the reason for not delivering at health facility for only about 9% of the respondents delivering at home. Similarly about 10 % of respondents distance is the main barrier for not delivering at health

facility. About 2% of respondents said that no faith in health facility is the main cause for not visiting health facility for delivering baby. Only 29.3% of the respondents do at least four visits for ANC services.

Table 1: Operationalization, Number and Percentage Distribution of all Studied Variables

Variable name	Descriptions with (Measurement scale)	Categories	Number	Percent
Independent Variables: Socio-demographic Characteristics				
Age	Women are classified in three age groups in terms of safe and risky ages to give birth to baby. Age 20-34 is considered as normal. (Ordinal)	<ul style="list-style-type: none"> • 15-19 • 20-34 • 35-49 	282 2194 309	10.1 80.8 11.1
Place of residence	Women residence in urban or rural areas (Nominal with dichotomous)	<ul style="list-style-type: none"> • Urban • Rural 	605 2180	21.7 78.3
Region	Residence of women by ecological zones (Nominal)	<ul style="list-style-type: none"> • Eastern • Central • Western • Mid western • Far Western 	606 657 488 489 545	21.8 23.6 17.5 17.6 19.6
Religion	Women following either Hindu or other religion (Nominal with dichotomous)	<ul style="list-style-type: none"> • Non Hindu • Hindu 	354 2431	12.7 87.3
Ethnicity	Women from Brahmin/Chhetri or from other caste (Nominal with dichotomous)	<ul style="list-style-type: none"> • Other • Brahmin/Chhetri 	1885 900	67.7 32.3
Sex of HH head	Whether the household head is male or female (Nominal with dichotomous)	<ul style="list-style-type: none"> • Female • Male 	557 2228	20.0 80.0
Education of husband	Education attainment of husband (Ordinal)	<ul style="list-style-type: none"> • No education • Primary • Secondary • Higher 	649 800 1108 228	23.3 28.7 39.8 8.2
Occupation of husband	Working status of husband (Nominal)	<ul style="list-style-type: none"> • Not working • Service • Agriculture • Labor 	92 869 1114 710	3.3 31.2 40.0 25.5
Wealth index	Five categories falling in every 20 % of population determining economic status of family (Ordinal)	<ul style="list-style-type: none"> • Poorer • Poorest • Middle • Richer • Richest 	812 585 498 495 395	29.2 21.0 17.9 17.8 14.2
Parity	Number of children women has given birth in last three years (Ordinal)	<ul style="list-style-type: none"> • Zero • First • Second • Third • Fourth and above 	31 800 776 511 667	1.1 28.7 27.9 18.3 23.9
Independent Variables: Empowerment/Autonomy Factors				
Education of women	Education attainment of women (Ordinal)	<ul style="list-style-type: none"> • No education • Primary • Secondary • Higher 	1631 517 557 80	58.6 18.6 20.0 2.9

Household headship	Women self as HH head or other member in the family (Nominal with dichotomous)	<ul style="list-style-type: none"> • Self • Other 	2400 385	13.8 86.2
Occupation	Occupation of respondents (Nominal)	<ul style="list-style-type: none"> • Not working • Service • Agriculture • Labor 	499 152 2070 64	17.9 5.5 74.3 2.3
Place of work	Respondents working at home or outside (Nominal)	<ul style="list-style-type: none"> • Not working • Home • Away 	499 304 1982	17.9 10.9 71.2
Type of earning	Respondents type of earning indicating the in terms of no payment, cash only, cash and kind and in kind only (Ordinal)	<ul style="list-style-type: none"> • Not paid • Cash only • Cash and kind • In kind only 	648 229 324 1085	23.3 8.2 11.6 39.0
Decision making	Decision making index of women on four aspects , namely; own health care, daily HH purchases, large HH purchases and mobility (Ordinal)	<ul style="list-style-type: none"> • None • Any one • Any two • Any three • All four 	1169 279 257 262 818	42.0 10.0 9.2 9.4 29.4
Exposure to mass media	Mass media exposure index of respondents' on three media, namely ; news paper reading, listening radio and watching TV at least once in a week (Ordinal)	<ul style="list-style-type: none"> • No exposure • Exposure to any one • Exposure to any two • Exposure to all three 	201 805 1175 604	7.2 28.9 42.2 21.7
Independent Variables: Service Attributes (Reason of not Visiting Health Facility for Giving Birth) #				
Costly service	Whether the cost of service matters in utilizing health facility or not (Dichotomous)	<ul style="list-style-type: none"> • No • Yes 	2062 217	90.5 9.5
Far distance	Whether the distance of service matters in utilizing health facility or not (Dichotomous)	<ul style="list-style-type: none"> • No • Yes 	2036 243	89.3 10.7
Doubt(no faith/trust)	Whether the low faith in service matters in (Dichotomous)	<ul style="list-style-type: none"> • No • Yes 	2237 42	98.2 1.2
Dependent variable: ANC service				
Use of ANC service	Visiting health facility during pregnancy at least four times (Dichotomous)	<ul style="list-style-type: none"> • Less than four visits • At least four visits 	1970 815	70.7 29.3
Total of each variable			2785	100

506 cases were missing because of delivery at health facility

3.2 Bivariate Analysis

Antenatal visits with respect to the age of the respondents have been found high disparity ranging from 40% with the age of 15-19 years to only 8% among those who are 35-49 years. Respondents of age group 15-19 have found of taking ANC mostly (39.7%) (Table 2). As age increases, women taking at least four ANC visits have been decreased. Respondents living in urban areas are found using ANC services more comparatively to those living in rural areas. From the observation it has revealed that there is high proportion of respondents taking ANC visit who are in western region (32.8%). Hindus are more likely to use ANC service than Non Hindus. About 30% of Hindus are using at least four ANC visits where as it is 20% for Non

Hindus. It has been noted that Brahmin/Chhetri are using ANC service better (39%) than other caste (24.6%). About 29% of the respondents are utilizing ANC service in both type of family where household head are either male or female. As the education level of husband goes on increasing use of ANC service is also increasing. There is negative relation between age of husband and utilization of ANC service. As age of husband goes on increasing respondents utilizing ANC service are decreasing. Those whose husbands are engaged in service sector are more utilizing ANC service than those whose husbands are having other occupation. In terms of parity, those respondents who are in the parity one and two are more utilizing the ANC service than those who are zero and more than two parity. There is positive relation between wealth index and utilizing ANC service. As economic status of respondent is increasing percentage of respondents utilizing ANC service is also increasing. For example those women who are in richest category, 62.5% of them utilize the ANC services where as from poorest category only 11% of them utilize the services.

Women empowerment variables like education, occupation, mass media exposure, household decisions etc and its effect in ANC service utilization has been shown in Table 2. It shows that ANC utilization increases with increasing the education level. Those who are acquiring higher education are 53 % for utilizing ANC service while it is just 15% for women who are illiterate. There are some differences in utilization of ANC service in women with regard to household head. Respondents who are themselves household head, a quarter of them utilizes the ANC services where as only 30 % of respondents who are not household head utilize the ANC service as recommend by WHO. We can say that women who are not household head are slightly better as compared to the women who are themselves household head. Those women who are service holder are more likely (44.1%) to use ANC service than those who are doing agriculture work (18.9%) and not working women (27.5%). Utilization status of women who are not working is better than those who are engaged in agriculture. Among those who work, status of those working at home is better (35.5%) than those who work away (24.7%). Similarly those who are paid in cash only (43.2%) and who are not paid (32.9%) is more. Those women who are exposed to medias either radio, TV or news paper are far more better in utilizing ANC service than those who are not exposed to. It is 59.4 %, 30.7 % and 30.8 % for those reading newspaper, listening radio and watching TV respectively. Those who are exposed to all three medias are better (61.6%) than who are exposed to two (27.3%), one (12.2%) and who are not exposed to any one (11.9%). Among those who said cost is not the reason for not delivering at health facility, about 22% are found utilizing ANC service. It is just about 15 % for those who say cost is reason for not delivering at health facility. In case of distance also who said it is not a problem utilized more ANC service (21.9%) than those who said it is problem (14%). Among those who said sex is the problem none of them are found using ANC service. Similarly among those who said they do not deliver at health facility due to not having faith in services at health facility, about 12% are utilizing ANC service. For whom faith in health facility is not the reason utilizing ANC service is more (21.2%). There is significant difference in utilizing the ANC service in terms of cost and distance of service.

Percentage Distribution of Women Who Utilizes the ANC by their Selected Factors

	Use of ANC service		Use of ANC service	
	Less than 4 visits	4 or more visits	Less than 4 visits	4 or more visits
Sociodemographic Factors			Empowerment Factors	
Age***			Education attainment***	
15-19	60.3	39.7	No education	85.0 15.0

20-34	71.9	28.1	Primary	64.8	35.2
35-49	92.0	8.0	Secondary	59.3	40.7
Place of residence***			Higher	47.1	52.9
Urban	53.6	46.4	Household head**		
Rural	75.5	24.5	Self	75.3	24.7
Region			other	70.0	30.0
Eastern	68.8	31.2	Occupation of respondent***		
Central	70.6	29.4	Not working	72.5	27.5
Western	67.2	32.8	Service	55.9	44.1
Mid Western	74.8	25.2	Agriculture	81.1	18.9
Far Western	72.5	27.5	Place of work***		
Religion***			Home	64.5	35.5
Hindu	69.4	30.6	Away	75.3	24.7
Non Hindu	79.7	20.3	Type of earning***		
Caste***			Not paid	67.1	32.9
Brahmin/Chhetri	61.0	39.0	Cash only	56.8	43.2
Other	75.4	24.6	Cash and kind	80.2	19.8
Household head*			In kind only	79.6	20.4
Male	70.6	29.4	Number of HH decisions		
Female	71.3	28.7	No	71.0	29.0
Education of partner***			At one	67.0	33.0
No	88.3	11.7	At two	68.5	31.5
Primary	81.4	18.6	At three	69.1	30.9
Secondary	59.4	40.6	All four	72.9	27.1
Higher	38.6	61.4	Number of Mass Media exposure***		
Occupation of partner***			No exposure	88.1	11.9
Not working	83.7	16.3	Exposure to one	87.8	12.2
Service	55.6	44.4	Exposure to two	72.7	27.3
Agriculture	81.1	18.9	Exposure to three	38.4	61.6
Labor	71.3	28.7	Service Attribute Factors		
Parity***			Cost of service**		
Zero	71.0	29.0	No	78.3	21.7
One	53.8	46.3	Yes	85.3	14.7
Two	66.8	33.2	Distance***		
Three	78.9	21.1	No	78.1	21.9
Four and above	89.5	10.5	Yes	86.0	14.0
Wealth index***			Doubt in service (no trust)		
Poorest	89.0	11.0	No	78.8	21.2
Poorer	78.5	21.5	Yes	88.1	11.9
Middle	70.7	29.3			
Richer	58.2	41.8			
Richest	37.5	62.5			

*p<0.10 **p<0.05 ***<0.01(p value is based on Chi- square statistics)

3.3 Multivariate Analysis

Women who are residing in Western Development Region are 27 percent less likely to utilize ANC service compared with women residing in Eastern Development Region after controlling all other variables (odds ratio=0.73) (Table 3). Compared to Non Hindu women Hindu are 1.32 times more likely to use ANC service. Brahmin/Chhetri are more likely to use ANC service than women with rest other caste (odd ratio =1.36). Similarly, women whose husband have acquired secondary education are 1.66 times more likely to use ANC service than women whose husbands are illiterate (odd ratio=1.66). Higher education of husband has not retained any effect after accounting all the variables. Occupation of husband and wealth ranking of family has positive effect in the utilization of ANC service.

Table 3: Odd Ratios from Logistic Regression Analysis Determining ANC Service Utilization

Variables				
Socio demographic		Exp(B)	Empowerment variables	Exp(B)
Age group (15-19 =R)			Women's education (No education =R)	
	20-34	1.073	Primary	1.536***
	35-49	0.957	Secondary	1.724***
Place of residence (Rural =R)			Higher	10.246***
	Urban	0.883	Who is HH head (Other =R)	
Region (Eastern =R)			Self	0.997
	Central	0.917	Occupation of respondents	
	Western	0.735**	Service	1.015
	Mid western	0.991	Labor	1.353
	Far western	1.306	Agriculture	0.758
Religion (Non-Hindu =R)			Place of work (Not working =R)	
	Hindu	1.326*	Home	1.089
Caste (Other =R)			Away	0.957
	Bhramin/chhetri	1.362***	Type of earning (Not paid =R)	
Sex of HH head (Female =R)			Cash only	0.742
	Male	0.972	Cash and kind	0.778
Education of Husband (No education =R)			In kind only	0.850
	Primary	1.008	Number of HH decisions (No =R)	
	Secondary	1.667***	At one	1.159
	Higher	1.209	At two	1.017
Occupation of Husband (Not working =R)			At three	1.028
	Service	3.415***	At four	1.091
	Labor	2.416***	Number of media exposure (Not exposed=R)	
	Agriculture	3.274***	At one	0.786
Wealth Index (Poorest =R)			At two	1.497
	Poorer	1.977***	At three	2.151***
	Middle	2.532***	Service Attributes Factors	
	Richer	2.964***	Distance (No =R)	
	Richest	3.978***	Yes	0.581***
Parity (Zero =R)			Cost (No =R)	
	First	1.576	Yes	0.916
	Second	0.963	Doubt in HF (No =R)	
	Third	0.713	Yes	0.348**
	Fourth and above	0.533		

-2 Log likelihood= 2535.83

&

Nagelkerke R Square= 0.367

Significant at *p<0.10 **p<0.05 ***p<0.01 R= reference category HH =Household

Compared to women whose husbands are not working, those women whose husbands are service holder are 3.41 times more likely to use ANC service. Similarly whose husbands are engaged in labor are 2.46 times and whose husbands are engaged in agriculture is 3.27 times more likely to use ANC service. Women from poorer family are 1.97 times more likely to use ANC service than women from poorest family. Similarly middle, richer and richest group of family are 2.53, 2.96 and 3.97 times more likely to use ANC service than poorer segment of family respectively.

Women empowerment variables such as education of women and exposure to Media have effect in utilization of ANC service. Compared to illiterate women, those women who have acquired primary education are 1.53 times more likely to use ANC service. Similarly women who have acquired secondary education are 1.72 times and who have acquired higher education is 10.24 times more likely to use the service in comparison to illiterate women. Those women

who are exposed to any of three Medias (TV, Newspaper & Radio) are 2.15 times more likely to use ANC service than women who are not exposed to any. Distance of health facility and no faith (doubt) in services are other important factors determining use of ANC service. Those women who said distance as the cause of not visiting health facility they are 42% less likely to use ANC service (odds ratio=0.58). Similarly those women who have no faith in health facility are 66 percent less likely to use ANC service (odds ratio=0.34).

4. RESULT DISCUSSIONS AND CONCLUSIONS

Several factors have been identified from the analysis that determines the utilization of ANC services in Nepal. Socio-demographic factors that have influence in ANC service utilization includes region, religion, caste, place of residence, education of husband, occupation of husband and wealth rank of family as hypothesized. Other socio demographic factors have no significant influence in the ANC service utilization. It has been found that eastern development region is better than western in utilizing ANC service. Most of the development indicators of eastern region are better than western,²⁶ so it may have influence in service utilization status. Religion has significant influence on the utilization of ANC. Hindu are far better than non-Hindu in service utilization. This indicates that there could be a lack of accessibility and acceptability to health care services due to the socially backwardness and due to rigidity in their customs and norms. The study shows that caste has significant influence on utilization of ANC service utilization but not in case of delivery. Bhrahmin/Chhetri (which is considered as high caste) is more likely to use ANC service than other caste. This finding is consistent with the finding of Navaneetham (2000). It also shows that sex of household head has no influence in utilizing ANC or place if delivery. But significant influence has been found in case of husband's education and occupation in utilizing ANC service as found in the study conducted in rural Bangladesh.²⁷ Husband's education (secondary and higher) has positive influence for ANC utilization. It is also revealed that husband's occupation has significant influence in ANC service utilization. It was hypothesized in the study that economic status of family has positive influence in the utilization of ANC services. This hypothesis has been accepted as significant positive influence has been observed in this case. As the wealth rank of family increases utilization of ANC service has been remarkably increased. This finding is also consistent with the study of Fotso, Ezeh,& Oronje (2008). This could be because as economic status increases choices increases and consciousness regarding health and wellbeing also increases.

It has been set in the hypothesis that women empowerment has positive influence in utilization ANC. This is true for only certain variables of women empowerment like education of women, number of media exposure has positive influence on utilizing ANC service. This is similar to finding of Nepal Demographic and Health Survey data based study conducted in 2006.²⁸ Rest other empowerment variables have no significant influence in ANC service utilization. It may be that among the educated women, the decision making power within the household, awareness, knowledge and acceptance of modern medical treatment and health care institutions varies by their level of education. So their health status is better. In case of household decisions women who can make decisions on household matters may easily decide on their health and hence their health status is better.

The analysis also highlights some of the service attributes variables that have influence in ANC service utilization. In this case, no faith in service and distance of service center has negative influence. It shows that as doubt in service and distance of service center increases than

utilization of ANC service decreases. These findings have been supported by findings of many researchers. The hypothesis that cost, distance and no faith in health facility have negative influence have been accepted but it shows no influence of sex in service utilization.

It can be concluded that socio demographic factors that have significant influence in the use of ANC services are region, religion, caste, place of residence, education and occupation of husband and wealth rank of family. In case of women empowerment variables, education of women, household decision making power of women and exposure to communication has significant influence in maternal health care utilization. Similarly, cost of service, distance of service center and no faith in services of health facility also have influence in the use of ANC services. Based on the study findings, it is suggested that regional disparity need to be removed in terms of service provision in order to meet the goals for improving maternal health. Special attention should be given to the backward region such as Midwestern and Far western development regions that have low service utilization. This can be done by launching different educational campaign in these regions. Awareness program to increase the status of backward people (based on caste, religion, place of residence) need to be strengthened to alter perceptions of the value of skilled maternal health care. The association of women's education with ANC use highlights the need for efforts to increase girls' schooling. Since economic status of family has strong influence ANC utilization, programs that raise household economic status need to be encouraged. Services need to be made affordable, accessible, and acceptable through effective policy measures in order to increase the maternal health service utilization. Further study can be carried out incorporating other rest socio demographic, women empowerment and service attributes variables of which has not been included in this study but may have significant influence in ANC service utilization.

Author Contact: deepakpaudel@yahoo.com

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