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Research Article

Quality of Prenatal-care Utilization in Bangladesh: Socioeconomic Factors

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Abstract: The delivery of prenatal-care services and its quality reduces mortality and morbidity in mothers and neonates. The current study has attempted to explore the socioeconomic determinants of quality of prenatal-care utilization in Bangladesh. Micro-data set comprising 22437 observations has been taken from Bangladesh Demographic Health Survey (BDHS) 2004 and 2007. Ordered logistic regression is applied to estimate the correlation between quality of prenatal-care utilization and explanatory variables. The quality of prenatal-care utilization is measured by simple additive index by taking six components of prenatal-care. The results have revealed that the woman's current age improves the probability of quality of prenatal-care utilization while age square decreases it. The number of died children and ratio of male to female children of a woman negatively influences the likelihood of quality of prenatal-care utilization. Age of the woman at first marriage, education of woman and her partner, household's wealth status and urban locality of the household and large/ capital city raise the probability of quality of prenatal-care utilization. The results about administrative divisions of Bangladesh have revealed statistically insignificant impact on quality of prenatal-care utilization which demonstrates that there exists no disparity among these divisions in the perspective of use of quality prenatal-care services by women.

Keywords: Healthcare quality, Woman health, Maternal health, child health, newborns, prenatal health-care

1. INTRODUCTION

The maternal mortality and morbidity due to complications of pregnancy in women may be reduced by good maternal health-care [1]. Maternal health-care comprised of prenatal-care, natal-care, postnatal-care and family planning. Prenatal-care is the first episode of maternal health-care. It is significant not only for the woman in duration of pregnancy but woman health in the whole of next life. It deters maternal morbidity and ultimately infant and maternal mortality [2]. The quality of prenatal-care availed by the mother during pregnancy is important for neonates and mothers. Prenatal-care is basically a preventive measure comprising of food and nutrition recommendations, advice for rest, basic awareness about the biological process and how to avoid pregnancy complications. The quality of services provided at prenatal visits fosters the woman's health during pregnancy. It is evident from the empirical literature that good quality provided during prenatal-care substantially improves not only the neonate' and mother's health but supports the growth of the neonates in coming years [3]. Nyamtema et al. concluded that twenty percent severe maternal morbidities are attributed to substandard quality of services provided during prenatal-care [4].

WHO acknowledged the requisite for standardization of contents of prenatal-care. The standard quality of prenatal-care is comprised of three components: (i) assessment, that is history taking, physical examination and laboratory tests, (ii) health promotion, that includes advice on nutrition, planning the birth, information regarding pregnancy, subsequent contraception and breastfeeding, and (iii) care provision that is comprised of folate supplements, tetanus toxoid

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immunization, psychosocial support and record-keeping) [5]. The developing economies are much behind developed economies in utilization of prenatal-care services. In these economies maternal mortality rate is fifteen times higher than their counterparts in developed economies. For instance in Bangladesh maternal mortality ratio is 176 per 100,000 live births as compared to developed economies of France, Germany and Greece having the ratio of 8, 6 and 3 respectively. On average the ratio is 12 in developed economies. The country is even much behind Iran, Turkey and Oman having the ratio of 25, 20 and 22 respectively. The quality of prenatal-care in Bangladesh is also in a bad shape. For example, only 54.6 percent women receive prenatal-care, a small ratio of the births, i.e. 37 percent go through the skilled birth attendant, and 61 percent of women ages 15-49 years are using contraceptive. As a result lifetime risk of maternal death is reached to 0.58 percent. The socioeconomic determinants that keep quality of prenatal-care utilization lower are needed to be probed and that is the emphasis of current analysis.

The quality of prenatal-care has been assessed by researchers in various ways. Most prevailing measures of quality of prenatal-care are the number of prenatal visits and the components covered during prenatal-care. The researchers have quarried the number of prenatal visits as a measure of quality of prenatal-care [6]. They stressed that number of visits is not sufficient but package of the component of prenatal-care is important [3]. Globally and regionally the number of optimal visits is varied. It is not entirely evidence-based. The optimum number of visits is lacking the consensus. It is as high as fifteen in Finland and six in Netherlands. Both of the countries are developed in medical-care of their population. Similarly, in Belgium ten prenatal visits are advised by the medical experts for primiparae and for multiparae seven visits are advised. In the developing economies Indonesia and Vietnam stresses on three to four visits for their expected mothers. There is an evidence of source of quality prenatal that has been taken as the public sector health institutions [7]. It may also be questioned as the private sector health institutions may also provide the quality services for prenatal-care. So the proper measure of quality of prenatal-care may the utilization of prenatal components. If a woman receives all the components of prenatal-care either from public or private sector health institution she is utilizing quality service of prenatal-care. In the current study the same criterion is used for quality utilization of prenatal-care service.

The principal objective of the current analysis is to scrutinize the socioeconomic determinants of quality use of prenatal-care services in Bangladesh taking index of components of prenatal-care as measure of quality of prenatal-care.

2. DATA AND METHODOLOGY

2.1 Data Set

For the estimation of socioeconomic determinants of quality use of prenatal-care services in Bangladesh, a data set comprising a sample of 22437 observations about ever married women in the reproductive age group (15-49 years) has been extracted from micro-data of BDHS 2004 and 2007.

2.2 Measuring Quality of Prenatal-care Utilization

Donabedian [8] proposed the assessing of quality of health-care by categorizing the indicators of quality as structure of care, the process of clinical-care and the process of interpersonal-care. The current study assessed the quality of prenatal-care utilization through questions asked during the BDHS regarding prenatal-care services provided to women during pregnancy. Due to data constraint they partially cover the Donabedian's [8] categorization as well WHO's [5] recommended contents. BDHS asked the respondent (woman) whether each of following services of prenatal-care was availed by her in the last pregnancy at least once during her visits. The questions about services of prenatal-care include: whether the woman was weighed, her blood pressure was measured, her blood sample was taken for test, her urine sample was taken for test, and she was told about the signs of pregnancy complication and whether she was told about where to go for pregnancy complication if she had. Same type of indicators has been included by Melo et al. for quality of prenatal-care [9].

The response of each question was coded as 1 if the woman availed that specific service and 0 if she did not. These responses were added to compute the additive index for the quality of prenatal-care utilization [3, 10, 11]. The value of index ranged 0-6.

2.3 Selection of Explanatory Variables

Grossman introduced the concept of demand for medical-care that is theoretically derived from the demand for good health [12]. We are mainly concerned with the quality of health-care that is derived from the idea of Grossman and framed on health behavior model presented and developed by Anderson and Newman [13, 14]. The model gives the theoretical foundation for the behavior of individual and/or household for health-care. The components of health-care (in the care of prenatal-care) are external environment, predisposing factors, enabling factors and need factors. The McCarthy and Maine approach for estimating the factors responsible for utilization of maternal health-care utilization overlaps these determinants but categorized as individual, household, community, and health system factors. Individual level factors contain age of the woman, woman's educational level and employment status, etc.

Table 1. Operational definitions of the variables.

Variables	Definitions
Dependent Variables	
QPNC (Quality of prenatal-care utilization)	Quality index of prenatal-care having values 0-6
Explanatory Variables	
Demographic Characteristics	
WAGE (Woman's age)	Woman's age in completed year
WAGESQ (Woman's age squared)	Woman's age squared
PAGE (Partner's age)	Partner' age in completed years
PAGESQ (Partner's age squared)	Partner's age squared
WAGEMAR (Woman's age at first marriage)	Woman's age at first marriage in completed years
HHSIZE (Household size)	Number of household members
RASD (Ratio of sons to daughters)	Ratio of sons to daughters in the household
Socioeconomic Characteristics	
WEDU (Woman's education)	If the woman has no education =0, Primary=1, Secondary=2, Higher=3
PEDU (Partner's education)	If the partner has no education =0, Primary=1, Secondary=2, Higher=3
WWS (Woman's work status)	If woman is working =1, otherwise=0
PWS (Partner's work status)	If Partner is working =1, otherwise=0
WINDX (Wealth Index)	Wealth index, i.e. Poorest=1, Poorer=2, Middle=3, Richer=4, Richest=5
GENHH (Gender of head of household)	If gender of head of household is male = 1, female = 0
Health Characteristics	
WBMI (Woman's Body Mass Index)	Woman's Body Mass Index
BORD (Birth-order)	Birth-order of the child of last pregnancy
DICHIL (Died children)	Number of died children of the woman
Regional Characteristics	
LOC (Locality of the household)	If the household is urban =1, rural = 0
LCITY (Large city)	If household is situated in large city=1, otherwise =0
BRSAL (Barisal)	If the household is situated in Barisal = 1, otherwise = 0
CHITG (Chittagong)	If the household is situated in Chittagong = 1, otherwise = 0
DHAKA (Dhaka)	If the household is situated in Dhaka = 1, otherwise = 0
KHULN (Khulna)	If the household is situated in Khulna = 1, otherwise = 0
RAJSH (Rajshahi)	If the household is situated in Rajshahi = 1, otherwise = 0
SYLHT (Sylhet)	If the household is situated in Sylhet = 1, otherwise = 0

Household level factors include household wealth and size, etc. Community level factors are comprised of locality of the household (urban/rural) or geographic location in an economy and the health system available to the woman represented by birth-order of child and woman's body mass index [15].

The explanatory variables for the current analysis have been selected from the theoretical support from model presented by Andersen and Newman's model [13] but they partially overlap with those given by McCarthy and Maine [15].

2.4 Model Specification

The dependent variable i.e. quality index of prenatal-care utilization is ordinal or rank ordered so the ordered logit model is employed to investigate the probability for quality of prenatal-care utilization. The general model of the quality of prenatal-care utilization is expressed as:

Quality of prenatal-care = f (Demographic characteristics, Socioeconomic characteristics, Health Characteristics, Regional characteristics)

The functional form of the quality of prenatal-care utilization is given as below:

$$QPNC = f (\beta_0 + \beta_1 WAGE + \beta_2 WAGESQ + \beta_3 PAGE + \beta_4 PAGESQ + \beta_5 WAGEMAR + \beta_6 HHSIZE + \beta_7 RASD + \beta_8 WEDU + \beta_9 PEDU + \beta_{10} WWS + \beta_{11} PWS + \beta_{12} WINDX + \beta_{13} GENHH + \beta_{14} WBMI + \beta_{15} BORD + \beta_{16} DICHIL + \beta_{17} LOC + \beta_{18} LCITY + \beta_{19} BRSAL + \beta_{20} CHITG + \beta_{21} DHAKA + \beta_{22} KHULN + \beta_{23} RAJSH + \beta_{24} SYLHT) \ldots\ldots \quad (1)$$

The operational definitions of the variables have been given in Table-1.

3. RESULTS AND DISCUSSION

The ordered logit model results about quality of prenatal-care have been expressed in table-2.

Majority of the results are supported by theoretical interpretation of the variables. They have been discussed in the following.

3.1 Demographic Characteristics

In social perspectives, age of a woman influence the behavior of woman regarding health-care. Age of the woman is basically a proxy of awareness, information and mobility within the society. The results of ordered logit model expressed that woman's age increases the likelihood of quality use of prenatal-care in Bangladesh. It explains that increase in awareness, information and mobility of woman increases the use of quality use of prenatal-care [16]. Our estimation has shown non-linear relationship between the woman's age and quality use of prenatal-care. It is inverted U-shaped, that is by incremental change in the woman's age, the likelihood of quality use of prenatal-care services first increases but after specific age it decreases. It explains that the argument of over-confidence and ignorance of pregnancy complications by women becomes valid at later ages.

It is found that age of the woman at first marriage also enhance the quality use of prenatal-care services. It may be explained on the fact that the women who marry comparatively in higher age group are equipped with better fertility and motherhood awareness, knowledge about the health and maternal system of woman, and information regarding maternal health-care as well as components of prenatal-care and pregnancy complication. It increases the probability of quality of prenatal-care utilization. It is evidenced in literature that highly educated women generally marry in higher age group. The phenomenon is connected with the use of quality prenatal-care services. The women married at comparatively higher age group are assumed highly educated and educational status of these women transforms them to have good quality consultation from the medical experts and choose the best quality hospitals confidently. Another explanation of the relationship between age at first marriage and quality use of prenatal-care services may be that the women who marry later age are those who are generally employed in paid work particularly in the formal sector of employment. It makes their socioeconomic and financial status better resulting into stronger empowerment at household level. They have comparatively higher mobility within the society. The situation enhances the accessibility of these women to better quality medical consultants for the purpose of medical check-ups generally and prenatal-care particularly. They have better access to the good quality high cost hospitals and clinical labs. All such types of elements directly and indirectly amplify the likelihood for quality of prenatal-care utilization when women marry at comparatively later ages. In

Table 2. Result of ordered log it regression for quality of prenatal-care utilization in Bangladesh.

Dependent Variable: QPNC
Method: ML - Ordered Logit (Quadratic hill climbing)
Sample (adjusted): 2 10996
Number of Ordered Indicator Values: 7
Convergence Achieved after 8 Iterations

Variable	Coefficient	Std. Error	z-Statistic	Prob.
WAGE	0.076396	0.046335	1.648783	0.0992*
WAGESQ	-0.004850	0.000767	-6.327076	0.0000**
PAGE	-0.011457	0.020081	-0.570539	0.5683
PAGESQ	3.12E-05	0.000200	0.155639	0.8763
WAGEMAR	0.185529	0.015567	11.91844	0.0000**
HHSIZE	0.033696	0.011268	2.990411	0.0028**
RASD	-0.141270	0.050916	-2.774589	0.0055**
WEDU	0.383094	0.066282	5.779781	0.0000**
PEDU	0.184239	0.044079	4.179716	0.0000**
WWS	-0.008319	0.081896	-0.101583	0.9191
PWS	0.501747	0.179043	2.802379	0.0051**
WINDX	0.170855	0.033764	5.060204	0.0000**
GENHH	-0.177525	0.111377	-1.593915	0.1110
WBMI	1.63E-05	3.88E-05	0.420148	0.6744
BORD	0.408507	0.044000	9.284161	0.0000**
DICHIL	0.155883	0.086527	1.801557	0.0716*
LOC	0.225485	0.084127	2.680279	0.0074**
LCITY	0.117038	0.112131	1.043765	0.2966
BRSAL	-0.547399	0.542407	-1.009203	0.3129
CHITG	-0.556463	0.542776	-1.025217	0.3053
DHAKA	-0.561933	0.549432	-1.022753	0.3064
KHULN	-0.488850	0.550554	-0.887925	0.3746
RAJSH	-0.349743	0.548845	-0.637233	0.5240
SYLHT	-0.489495	0.553936	-0.883666	0.3769
		Limit Points		
LIMIT_1:C(25)	2.721744	0.826798	3.291910	0.0010
LIMIT_2:C(26)	2.947079	0.826760	3.564612	0.0004
LIMIT_3:C(27)	3.446420	0.826933	4.167713	0.0000
LIMIT_4:C(28)	3.854416	0.827305	4.659004	0.0000
LIMIT_5:C(29)	4.845762	0.828726	5.847245	0.0000
LIMIT_6:C(30)	5.309897	0.829731	6.399539	0.0000

Pseudo R-squared = 0.148928	Akaike info criterion = 2.191080
Schwarz criterion = 2.234296	Log likelihood = -4836.388
Hannan-Quinn criter. = 2.206317	Restr. log likelihood = -5682.703
LR statistic = 1692.630	Avg. log likelihood = -1.088786
Prob(LR statistic) = 0.000000	

* Significant at 10 percent level of significance
**Significant at 5 percent level of significance

Bangladesh (as well as South Asia) marriage in adolescent is still widespread affecting more than one third of girls. It is consequence of the tradition, culture and social set up which force the parents to marry off their girls at early age. The girls married in the earlier life cycle remained least empowered at household level. Due to their lower empowerment and say in the decision-making of their health-care they cannot avail the quality services of prenatal-care.

Conceptually, the household size may affect the quality of health-care including the prenatal-care negatively. The household economics explained the income dilution effect of larger households on quality of health-care. Such type of effect has another aspect that is of household composition. If the household is composed of larger number of children instead of adults the negative affect may emerge. The larger number of children not only dilute per-capita expenditures for health but it also results into diminishing marginal utility of quality services of prenatal-care. The quality concept is related with cost of the services. If the household is comprised of more adults and they are earning hands for the household the impact of household size may be positive. Our results have shown that the larger family size increases the likelihood for use of quality services of prenatal-care. The explanation may be that larger households or larger families may pool the household resources which cover the burden of use of quality services for prenatal-care. It increases the probability of quality of prenatal-care. The larger household size is connected with combined family system in Bangladesh as the fertility rate has declined drastically in the last three decades reaching almost at one. The combined family is prevalent in South Asia and pooling of income is one of the characteristics of combined family system.

The utilization of quality services of prenatal-care may be influenced by composition of sons and daughters in the household. In the South Asian nations there is high preference for sons. If there are more daughters in the household as compared to sons the mothers demand high quality prenatal-care for the coming baby hoping for a son. To detangle the puzzle of quality of prenatal-care utilization and composition of sons and daughters in the household we have included the explanatory variable of ratio of sons to daughters in the analysis. The results from ordered logit estimation have revealed that ratio of sons to daughters negatively impacts the likelihood of quality of prenatal-care utilization. The phenomenon explains the preference for sons as the hope of son in the presence of more number of daughters have increased the quality of prenatal-care utilization.

3.2 Socioeconomic Characteristics

The women's education as a categorical variable has a substantial impact in household welfare including household health, education, nutrition and environment. The regression results have revealed that woman's education expands the probability of use of quality services of prenatal-care. It explains that educated women obtain good quality of prenatal-care and take all necessary components of prenatal-care as they have better capability for utilization of good health-care inputs [16, 17, 18]. The educated women have the capacity to take decisions about their own and their children health-care. It enhances the chances of quality of prenatal-care utilization.

In South Asian economies the social and cultural norms which are basically determined by the religion and myths make the male members of the household dominant in household decision-making. In this scenario the educational status of the male heads/husbands and their working status act as catalyst for rational decision-making. These decisions also include the health-care of women. To which source of health-care provider the woman will go for check-up or even the woman will go for check-up or not is determined by the male head that is influenced by his educational status and work status. In our results the age of the partner has shown insignificant effect. However, the probability for quality use of prenatal-care services improves through the incremental change in the educational level of the partner. It explained that education of the partners helps their wives for attaining good awareness, information and know how about different components of the prenatal-care as well as the quality source of these components. They themselves have feelings of carefulness of their wives during pregnancy. The wives of the educated husbands feel relaxed while discussing the prenatal affairs with their husbands. These women have comparatively high social and physical mobility so they have more exposure to the social world and ignore the bad social and household norms. The adaptation of modern technology regarding health-care is generally

associated with education of the head of household. The positive approach of the educated partner helps to adopt modern health-care facilities [16]. It increases the use of quality of prenatal-care services. The partner's work status has been found to affect the utilization of quality of prenatal-care positively. The household's financial status and income risk depends upon the working status of the partner. On the other hand quality utilization of prenatal-care services and generally the quality use of health-care services are costly. They include the hospitalization charges, consultant's fee and lab tests. It established the link between the working status of the partner and the quality utilization of prenatal-care services. The public sector employees and employees of big corporations and organizations receive the medical funds for health-care of themselves and their families. It also augments the use of quality of prenatal-care services. By working status of partner the woman has higher probability to have quality use of prenatal-care [1, 17].

The results regarding the wealth index as a factor of quality use of prenatal-care revealed that it enhances the likelihood of the phenomenon. It explained that good socioeconomic status households have approach to good quality health-care providers. The members of families from good socioeconomic status households are generally well-educated and are well aware of the quality services of health-care. These families are financially strong so they can easily afford the good quality services of consultants and hospitals. The women from good socioeconomic status households have strong financial status and stability in the income. These women can face the fluctuations in income without disturbing the utilizations of health-care services. The situation boosts the utilization of all components of prenatal-care [3, 11]. Due to their financial status they use all basic components of prenatal-care along with optional components from medically trained health-providers.

3.3 Health-related Characteristics

The need factors as described by the Alderman and Newman's model [12] have been transformed into health-related factors. The results of current analysis have revealed that child's birth-order positively influences the probability of quality of prenatal-care utilization. It seems hard to explain that why the woman having higher birth-order have good quality utilization of prenatal-care. During the earlier pregnancies the women give good attention in seeking the prenatal-care services and due to the higher birth risk during the pregnancy of earlier birth-order children they should obtain the high quality prenatal-care services. The explanation of the positive effect of birth-order on quality of prenatal-care utilization is particularly supported by the results of age of woman in section 3.1. This section explains that initially the increase in age results into high utilization of quality of prenatal-care. It may be inferred that increase in the awareness and mobility of the woman at the time of higher birth-order children enhances the likelihood of quality utilization of prenatal-care. Furthermore by the experience of the pregnancies they got more awareness and knowledge of the quality of prenatal-care. It explains the process of having experience and knowledge about prenatal-care and its quality components and well as source of quality prenatal-care by having higher number of pregnancies. It results into increased quality of prenatal-care utilization.

In the health-related characteristics it has been found that the women who have suffered the death of their children previously are more likely to have quality prenatal-care. The explanation is based on the fact that increased number of died children enhances the demand for safe pregnancies. Furthermore, the died children confound the woman's health and affect the woman psychologically. The phenomenon increased the demand for quality of prenatal-care utilization.

3.4 Regional Characteristics

Among the regional variables of the model which fall in the external environment component of the Anderson and Newman's model, only a single variable has shown significant result. It revealed that urban women are more likely to have good quality utilization of prenatal-care. The rural urban disparity is one of the major characteristic of developing economics. Women belonging to urban areas have options to choose good quality service [1]. The urban women have higher level of information and knowledge [19]. They are generally more educated as compared to their rural counterparts and have well awareness about quality and basic components of prenatal-care. Formal sector employment particularly for the women is more prevalent in urban areas. These

women have easy access to quality source of prenatal-care. National health promotion programs are generally more frequently existed in urban areas. Urban women have more access to general and particularly electronic media in the form of television and internet and have better information, awareness, and knowhow about quality of prenatal-care as compared to their rural counterparts [20].

In Bangladesh there occurs rural-urban disparity in the perspective of quality of prenatal-care utilization but the current analysis has resulted that there exists no regional disparity among the divisions of the country. It is established on the results of ordered logit regression that the dummy variable of each division has shown statistically insignificant effect on the probability of use of quality of prenatal-care.

4. CONCLUSIONS AND POLICY IMPLICATIONS

The focus of the study was to determine the factors of quality of prenatal-care utilization by the women in the age group of 15-49 years in Bangladesh.

The clues of gender preference in children emerged from the analysis regarding quality of prenatal-care utilization. The mother having comparatively higher number of daughters are found more inclined towards the use of quality of prenatal-care. Their desire for sons instigates them for this act. The gender discrimination in children regarding health, nutrition and education is a problem not only in Bangladesh but in majority of the developing economies, and particularly in South Asia. The education and awareness along with provision of social security may alleviate the problem. However to enhance the utilization of quality of prenatal-care, the information that the quality is necessary for both mother and newborns' health should be propagated.

Some of the policy proposals have been suggested from the empirical evidence of the current study. Firstly, the legal age of marriage for girls has been established in law, but it is not properly implemented. It should be strongly materialized that under age marriages are penalized. Secondly education programs for females should have the priority in the policy framework. It has the spillover effects not only on the general health of women but children's health and education as well. Thirdly the media, more precisely the electronic media and social campaign can impart their role for awareness rising about maternal health-care generally and quality components of prenatal-care particularly.

The wealth index of the household that basically captures the socioeconomic status of the household has shown encouraging effect on the use of quality service of prenatal-care. A number of studies have proposed the poverty alleviation, increase in income of the household, boosting the resources of the household, improving the financial status of the household and the woman for better maintenance of maternal health-care. All such type of measures need a long-time span but some immediate and urgent measures may also be adopted particularly for the prenatal-care. For instance the provision of public sector low cost quality service of prenatal-care, the introduction of the insurance, conditional distribution of child's and woman's supplementary nutrition to have full components of prenatal-care may be introduced. So fourthly it is proposed to the policy makers to work for such type of measures.

Fifthly we have seen in our results that birth-order of child enhances the utilization of quality of prenatal-care. For the earlier birth-order particularly for first birth there should be specific incentives like the first delivery would be free of cost if all the components of the prenatal-care (quality of prenatal-care) are covered. Furthermore, by covering the complete set of components of prenatal-care services the first-born child may have the free medical checks up in the first year. Bangladesh is a developing economy, the international donors specifically the WHO and the World Bank should play their part for the purpose.

The analysis demonstrated the existence of inequality in quality use of prenatal-care in rural and urban communities. Sixthly, health department may decrease this disparity by providing all components of quality of prenatal-care through mobile health units in rural areas. For the rural areas of the country awareness about the quality components of prenatal-care needs attention of policy makers.

Last but not the least we have analyzed the demand side determinants but the supply side

factors are equally important. In the further research the supply side factor should also be the part of the analysis. The demand side incentives may only be the successful if supply side elements of prenatal-care are available at satisfactory level.

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