Realized Access to Antenatal Care Utilization in Uganda: Household Welfare and Governance Implications

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Abstract

This study explores into realized access to antenatal care utilisation in Uganda. This emanates from the fact that access to antenatal care is still a national nemesis, (National Service Delivery Survey Report, 2005). In Uganda, the Ministry of Health (MoH) recommends that a pregnant woman should attend antenatal care at least four times during pregnancy. Also she should attend antenatal care monthly during the first seven months, every two weeks in the eighth month, then weekly until birth. On the whole however, 42 percent of expecting women sought for antenatal care at least four times during pregnancy, 52 percent of them one to three visits which of course is below the MoH recommendation while six percent did not seek care at all, (Uganda Demographic Household Survey, 2000/2001). This clearly indicates the under utilization of antenatal care; with such a state of affairs, no wonder Uganda's maternal mortality rate of 505 per 100,000 live births is high given the Millennium Development Goals maternal mortality rate target of 131 per 100,000 live births by 2015 (UNDP, 2007). Against that background, this study sought to establish the factors which determine realized access to antenatal care. More importantly the paper unearths the interaction between realised access to antenatal care, governance and household welfare. The study unearthed that both governance and household welfare to a great extent explain antenatal care utilisation.

Keywords: Antenatal Care, Household Welfare, logit analysis, Maximum Likelihood Estimation, Uganda

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1.0 Motivation of the study
In the recent past, the world leaders coalesced with a vision in which developed and developing countries would operate in a partnership for better of all, Millennium Development Goals (MDGs) report, (2006). Within the vision a healthier world population was envisaged. This is to be partly reflected in greater survival prospects for mothers and infants. Note that Maternal Mortality rate per 100,000 deliveries is targeted at 131 while that for infants per 1,000 live births is 41 by 2015. However as reported by the Uganda Demographic and Health Survey (2001/02) Maternal Mortality rate is 505 per 100,000 deliveries while infant mortality rate per 1,000 live births is 88, this implies that the MDG target seems difficult to achieve.

It is imperative to note that of the live children born to mothers who have died, 95 percent of them also died, Chen et al. (1974). Other studies have estimated that for every mother who dies, on average, two children are left motherless such that the likelihood that they will receive optimal care and protection probably diminishes, Winikoff et al. (1987). Therefore given the negative effects of maternal mortality, it is henceforth rational to minimise it as much as possible. Success in achieving the MDGs maternal mortality rate target is contingent upon enhancing realised access to antenatal care and family planning. Antenatal care is essential in the prevention and management of complications associated with pregnancy and child birth. Since adequacy in antenatal care access improves maternal health and therefore a reduction in child mortality[13], it is thus significant in guiding Uganda on its path to development.

In its commitment to enhancing antenatal care utilisation, Government of Uganda (GoU) through the Ministry of Health (MoH) recommends that a pregnant woman should attend antenatal care at least four times during pregnancy. Also a pregnant woman should attend antenatal care monthly during the first seven months, every two weeks in the eighth month, then weekly until birth. On the whole however, 42 percent of pregnant women seek for antenatal care at least four times during pregnancy, 52 percent of them one to three visits which of course is below the MoH recommendation while six percent did not seek care at all, Uganda Demographic Household Survey, (2000/2001).

Therefore given the under utilization of antenatal care, it may rather be unsurprising that Uganda's maternal mortality rate of 505 per 100,000 deliveries is high given the MDGs maternal mortality rate of target of 131 per 100,000 deliveries by 2015. Furthermore, with only 24.4 percent of deliveries taking place in health facilities (Government and private non-profit facilities) the situation is bound not to change at least in the interim, Uganda Poverty Status Report (2005).

Against that background, it is clearly visible that enhancing realized access in utilization of antenatal care will probably expedite Uganda's accomplishment of the MDGs maternity mortality rate target. However that will only be possible through a comprehensive and systematic study on the determinants of realized access to antenatal care.

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[13] Research in human capital and development (1983), vol 3, pg 128.

Several studies have been undertaken to explore the determinants of realized access in the utilization of antenatal care these among others include; Andersen (1998), Fosu (1994) Griffiths et al. (2001), Karen (1991), and Allin (2006). Factors studied have broadly been categorized into; Demographic, Social Structural, Health beliefs, and lately Genetic factors. Unfortunately, except for Kyomuhendo (2003) and Ndyomugyenyi et al. (1998) such studies have not been undertaken using data from Uganda. The inadequacy with both Ndyomugyenyi et al. (1998) and Kyomuhendo (2003) is that the two studies were based on a similar rural district (Hoima district) in Uganda; therefore, it becomes difficult note only to generalise their findings but also draw policy recommendations across the entire country given that their study sample is not representative of Uganda. In that regard this study seeks to investigate the determinants of realized access to antenatal care in Uganda with specific reference to household welfare and governance using the rather nationally representative data set. The following section is an overview of both the theoretical and empirical literature. It will then be followed by the methodology.

2.0 An Overview of the Literature.
2.1 Conceptual definitions
Health as defined by the World Health Organization is the optimal level of physical, mental and social well-being. Access to health as adopted from Andersen (1994) in its multifacetedness is as below;
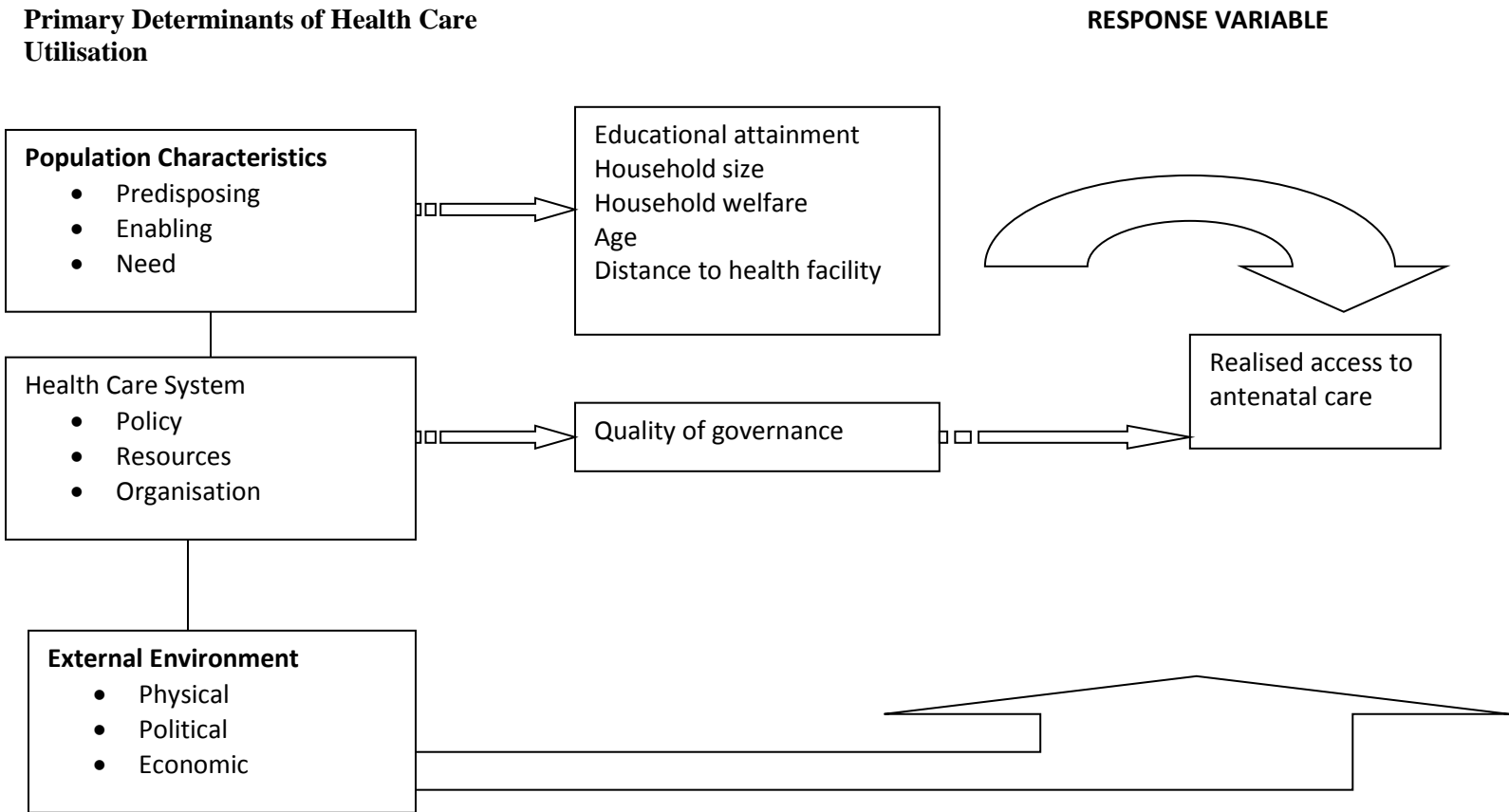
- Potential access: this refers to the available enabling resources.
- Realized access: this refers to the use of antenatal care.

2.2 Theoretical Overview.
With the aid of the three-phased health behavioural model an attempt was made to theoretically understand access to antenatal care (see figure 1). Andersen (1995) posits that the model is an improvement of the previous behavioural models in the sense that it allows the researcher to extend the measures of access to include dimensions which are particularly important for health policy and health reform. Furthermore, while the model maintains its primary role of measuring the use of antenatal care, it also captures the role of the external environment (including physical, political, and economic concepts). It also acknowledges the role of individual specific health practices such as diet, exercise and self care as interacting with the use of formal antenatal care to influence health outcomes (Evans et al. 1990; Lalonde 1975; Public Health Service 1990).

The model suggests that access to antenatal care is explained by a combination of primary determinants, health behavior and health outcomes. Primary determinants are further disaggregated into predisposing characteristics, demographic characteristics, health beliefs, and social structure. Predisposing characteristics include age and gender and these are representative of biological imperatives suggesting that individuals will need heath services. Social structure encompasses a spectrum of factors that proxy the status of a person in the community, his or her ability, to cope with presenting problems and commanding resources to deal with these problems, and how healthy or unhealthy the physical environment is likely to be. It is generally reflected in education, occupation and ethnicity. Also, social networks, social interactions, culture, psychological factors (e.g. mental dysfunction and cognitive impairment) and genetic factors have been acknowledged as substantive inputs of the social structure (True et al. 1994;

Rosnau 1994; Andersen 1994; Kyle, Postes and Eaton 1992; Bass et al., 1987). Health beliefs encompass attitudes, values and knowledge that people have about services that might influence their subsequent perception of need and use of antenatal care. Where people live and stay (community factors). Also income, health insurance, travel time and waiting times too account for the enabling resources however, they are personal (Andersen 1994). Cognate (1993) and Kelly et al. (1992) argue that organizational factors too ought to be given more attention amongst the enabling factors.

Primary Determinants of Health Care Utilisation   **RESPONSE VARIABLE**

Population Characteristics
- Predisposing
- Enabling
- Need

Educational attainment
Household size
Household welfare
Age
Distance to health facility

Realised access to antenatal care

Health Care System
- Policy
- Resources
- Organisation

Quality of governance

External Environment
- Physical
- Political
- Economic

Source: Andersen (1994) and modifications by the author.

Figure 1: Health Behavioral Model

With reference to need, Andersen (1994) argues that effort must be made to consider how people view their own general health and functional state as well as how they experience symptoms of illness, pain, and worries about the problems to be of sufficient importance and magnitude to seek professional help. Furthermore, Hulk and Wheat (1985) argue that beyond the perceived need for health is a biological imperative that accounts for some individual's help-seeking and consumption of services. Biological imperatives are seen to be better represented by the evaluated[14] component of need (Andersen and Krants 1975).

 Among the primary determinants of access to antenatal care is the health system. Its capture basically reflects the importance of the national health policy and the resources and their organization in the health care system as important predictors of the population's use of services as well as changes in the use patterns overtime (Andersen 1994). Slack et al. (1989) indicate that the effect of policy is evident in influencing patterns of realized access since it affects financing, organization, regulation and information within the health system. Finally, there is also the external environment which is composed of the physical, economic and political environment.

In conclusion the behavioural model avails a ground breaking initiative into the understanding of the entire concept of access to antenatal care. In the following section we will have a look at the methodology.

3.0 Methodology
3.1 Data source
This study used the 2004 National Service Delivery Survey data[15]. It was a cross sectional survey which employed the multi-stage cluster sampling technique. Overall a total of 18,000 households were targeted; however, 17,708 were covered, the shortfall was attributed to insecurity in some northern districts of Uganda and also as a result of the pastoral nature of the Karamajongs[16]. Information was collected on inter alia: age, sex, household particulars, education, health services, immunization of children under five, housing and sanitary conditions, governance, and agricultural services.

3.2 Modelling Utilization of antenatal care.
3.2.1 Definition of variables and how they were estimated.
The dependent variable (Prenat) antenatal care utilization was measured by use and non- use of the antenatal care; such that if a respondent utilized antenatal care in the last 12 months then one (1) was assigned to them otherwise zero (0) was assigned.

With regard to the explanatory variables, they were generated as follows:

Household welfare

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[14] Evaluation is performed by a health professional about people's health status and their need for antenatal care.
[15] The choice of NSDS (2004) over UDHS is because the later does not capture institutional factors for instance the health sector management index, staffing position of health units to mention but a few yet the former captures both the demographic and institutional variables.
[16] This is a pastoral society.

Household wellbeing (welf_pre) was proxied using the household dwelling type and sanitary conditions. Key characteristics were; the type of roofing, walls, floor and toilet[17]. They were all ranked as either 0 or 1. For instance if the household occupied a house with the roof grass thatched or made of tin, they would be assigned 0 on the contrary those with for example iron sheets, cement or even tiles were assigned 1. With regard to the walls, if they were composed of for example grass, mud and poles, or unburnt bricks '0' zero was assigned; on the contrary if the walls were composed of burnt bricks with mud, burnt bricks with cement, timber, cement blocks, concrete or stone '1' was assigned. Regarding the floor, if the floor was made of either earth or cow dung '0' was assigned on the contrary if the floor was made of either cement screed, mosaic or tiles, bricks , stone, wood, or concrete then '1' was assigned. Finally was the toilet: if the household used either a covered pit latrine private , covered pit latrine shared, Ventilated Improved Pit Latrine (VIP) private, VIP latrine shared, flush toilet private, flush toilet shared or Ecosan toilet, '1' was assigned. However, if it was either uncovered pit latrine or lack of a toilet facility then zero was assigned. Thereafter a summation of a household's housing and sanitary condition was attained with the highest rank being '4' and the lowest being '0'.

Distance to the nearest health facility (dist2group)
With respect to distance to a health facility, I considered the distance to the nearest health unit measured in kilometres; however I went further and grouped the households, for instance those that were utmost 5 kilometres from the nearest health facility were assigned 1 while those who were beyond 5 kilometres were assigned 0.

Governance
Here reference was made to the allocative efficiency of the Local Government System. Four variables for governance were constructed based on the response of the individuals on how the quality of services offered by the local government had changed in the past two years. The implied assumption was that if the operations of the Local government were spot on then health care provision among other public services would be efficiently availed. The variables were thus constructed as below; Gov1 captured households who perceived the services of the Local Government to have improved and they were consequently assigned 1 otherwise, they were assigned 0. Gov2 captured households that perceived the Local Government services to have remained the same and were consequently assigned 1 otherwise zero was assigned. Gov3 captured households that perceived the Local Government services to have worsened and were consequently assigned 1 otherwise 0 was assigned. Gov4 captured those that who did not know; they were consequently assigned 1 otherwise 0 was assigned.

Rural-Urban (rur_urb)
This is a binary variable in that individuals that stayed in the rural setting were assigned '0' while those that reported to be living the urban setting were defined with 1.

Age: with regard to this variable, the actual age of all individuals was squared; this was basically aimed at eking out a clear-cut effect of age.

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[17] The choice of these characteristics to proxy household welfare was because the NSDS data did not capture household income.

3.2.2 Model specification for the determinants of realized access to antenatal care.

$$Y_i = \beta_o + \beta_i \chi_i + \upsilon_i \qquad\qquad (1)$$

Where, Y_i is the dependent variable (use or non-use of antenatal care). X_i is a vector of independent variables and υ_i is the error term.

The model was estimated using a logit analysis which uses the Maximum Likelihood Estimation (MLE) technique. Logit modelling is based on logistic probability function. In logit modelling the deterministic variable in the regression equation is the logarithm of the odds that a particular choice will be made (Greene, 2000). Upon estimating the logit model, I went further to estimate the marginal effects and these were the basis of the study analysis.

4.0 Presentation and discussion of results:
This part of the paper contains descriptive statistics of the variables presented. Also presented are the marginal effects of the association between realized access to antenatal care, governance and welfare as well as other control variables.

4.1 Descriptive statistics of the variables.
Of the 4644 individuals that required antenatal care, 5.35 percent (248 individuals) reported not to have utilised antenatal care while 94.66 per cent (4396 individuals) utilised it. Taking care of rural-urban dimension, of the 248 that did not utilise antenatal care, 89.92 per cent reported to be rural dwellers while the 10.08 per cent reported to have been in the urban setting. Furthermore, of the 4396 that utilised antenatal care, 80.21 per cent of them were rural dwellers while 19.79 percent reported to be staying in the urban setting. Therefore with more than 90 per cent of persons not able to access antenatal care living in rural areas, it is in that regard that this study emphasised rural households.

Governance
With regard to governance, more so with respect to rural dwellers, the proportion of the rural population that reported that the quality of governance improved and thus utilised care was 45.77 (1,614 individuals) while for those that reported that it remained the same were 28.25 per cent. Furthermore, those that reported that the quality of governance had deteriorated but still used antenatal care were 7.74 per cent while those reported that they did not know but still utilised care were 18.4 per cent. In this case, it is thus clear that the utilisation of antenatal care increased with increased household satisfaction about the quality of governance. Note that the quality of governance implies better service delivery, in terms of timely availability of drugs, lesser waiting times, community participation, availability of trained health personnel to mention but a few.

On the contrary, out of the 1,689 individuals who reported the quality of governance to have improved, 4 per cent of them did not utilise antenatal care. With regard to those who reported that the quality remained the same, 5.5 per cent did not use antenatal care, while for those that reported deterioration in the quality of service, 12.5 per cent of them did not use care. Regarding

those that did not know 14 per cent of them did not utilise antenatal care. It is thus evident that inability to access antenatal care is higher amongst individuals that are unsure about the quality of governance and those that perceived that the quality of governance actually dropped. Furthermore, with respect to those who could not qualify the quality of governance it is likely that some of them were either not satisfied by the quality of service and that they thus sought for other options of antenatal care service providers.

Household welfare
Household welfare was ranked from 0, 1, 2, 3, and 4; where by 0 was the lowest household welfare while the 4 was the highest household welfare. In this regard, 14.31 per cent of the individuals' ranked 0, 27.23 per cent individuals with a rank of 1, 30.75 per cent with a rank of 2, while 10.78 per cent with a rank of 3 and 16.92 per cent with a rank of 4.

With regard to utilising antenatal care, of the individuals who belong to the '0' household welfare group 7.55 per cent did not utilise antenatal care. While those in group '1' 6.5 per cent of them did not utilise antenatal care. For group two, 4.8 per cent did not utilise antenatal care. Furthermore, those in group 3 '0' per cent non-utilisation of antenatal care while those ranked highest that is in group '4', 2.8 per cent individuals who did not utilise antenatal care. It is therefore clear that as the household welfare improves, non-utilisation of antenatal care reduces.

Distance to the nearest health centre (dist2group)
Note that in Uganda, if a household is within 5 kilometres radius from a health centre it is assumed that the health facility is accessible, Kasirye et al. (2004). In that regard therefore, 36.13 per cent of the individuals reported to be more than 5 kilometres away from a health facility while 63.87 per cent reported to have been within the 5 kilometre radius. With regard to the actual utilisation of antenatal care, for those that lived more than 5 kilometres from the health facility, 4.85 per cent of them did not access antenatal care as compared to 6.48 per cent of those who lived within the 5 km radius.

Table 1: Marginal effects

Logit Model	1	Marginal Effects of 1 at mean values	2	Marginal Effects of 2 at mean values
Number of observations	4511		3633	
LR chi	59.72		41.96	
Prob >chi2	0.0000		0.0000	
Pseudo R2	0.0000		0.0257	
Log Likelihood	-907.7096		-795.4004	
Prenat	Coef.	dy/dx	Coef.	dy/dx
gov1	0.574 (3.30)**	.0253	0.550 (2.89)**	.028 (2.96)**
gov2	0.622 (3.23)**	.0254	0.432 (2.11)*	.021 (2.29)*
gov3	-0.462 (2.17)*	-.0251	-0.584 (2.57)*	-.038 (-2.11)*
welf_pre	0.150 (2.52)*	.0068	0.178 (2.77)**	.009 (2.80)**
rur_urb	0.700 (2.99)**	.0266		
dist2group	-0.354 (2.30)*	-.0151	-0.335 (2.16)*	-0.016 (2.26)*
pre_agesq	-0.000 (0.42)	-1.52e-06	-0.000 (0.43)	.000 (-0.43)
Constant	2.451 (12.65)**		2.473 (12.08)**	

1 includes both rural and urban households
2 includes of only rural households
Absolute value of z-statistics in parentheses
*significant at 5% level; ** significant at 1% level

With regard to governance[18] and in particular the dummy gov3 that is 1 for those whose perception of the quality of Local Government services had worsened and 0 otherwise. This variable has a marginal effect of 2.5 percent with an inverse relationship with regard to access to antenatal care. Note that much as this variable is insignificant in the overall model; when only rural individuals are captured, its significant with a probability of 3.7 per cent that an individual will not seek for antenatal care as a result of deteriorating governance. Note that this inverse relation is verified by the descriptive statistics where actually individuals that perceived the quality of governance had dropped reported the highest percentage (12.5 per cent as compared to 4 per cent for those who reported improvement in the quality of governance) of non-utilisation of antenatal. On the contrary, individuals who perceived the Local Government system to be efficiently operating in terms of service delivery pretty much accessed antenatal care. Actually the probability that they would access antenatal was 2.5 percent. This probability is the same for households that perceived the quality of the services offered by the Local Government to have

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[18] Gov 4 was the base considered as the base category and thus was not included in the regression.

remained the same. It is no wonder the case that they reported the lowest levels of non-utilisation of antenatal care of 4 per cent and 5.5 per cent respectively.

With regard to the rural-urban dimension, the impact of governance is pronounced in the rural areas with marginal effects of 2.7 per cent, 2 per cent and 3.7 per cent for gov1, gov2 and gov3 respectively. It is worth mentioning that the probability of not accessing antenatal care as a result of deteriorating governance increases by 1.2 per cent for the case of rural individuals as compared to the overall model that includes both urban and rural dwellers. These findings imply probably that if governance is inefficient which is reflected in a poor   health system, its inefficiency is likely to trickle down into poor quality of health services offered to the population. In such a way that health centres will be dogged with drug shortages, absentee health personnel, non-participation by the communities that are served by the health centres. Note that if the community participation is not encouraged in local government decision making, then it's likely that there will be a mismatch between the services offered by Local Government and the community needs. Furthermore, if say the procurement process is inefficient then it's likely that the health facilities shall not have drugs either on time or the drugs might never be bought. Note that inadequacy of drugs in its self is a major hindrance to antenatal care utilisation as is vindicated in a study by Ndyomugyenyi et al. (1998); they noted that some women did not utilise antenatal care because hardly were they availed any drugs they thus saw no reason to seek for antenatal care.

The findings on governance support those by Hutchison et al. (1999) who found out that in Uganda, government hospitals rank low with regard to quality and efficiency in health care provision. Note that the importance of the quality of governance is further illuminated by Sohani et al. (2005) who in a baseline study in Kenya found out that effective leadership by District Health Committees and increased level of community ownership and involvement particularly the village representatives taking control of marketing the health services and ensuring the availability of medicines and supplies resulted into increased health service utilization. The importance of quality of governance is re-echoed by Slack et al. (1989) who implied that effective governance and therefore policy is evident in financing, organization, regulation and information flow within the health system. That effective governance greatly influences health care utilization patterns

Welfare: with regard to welfare the wellbeing of a household to a greater extent impacts on antenatal care utilisation. In this study as one moves from 0 to 4 that is the movement from lower household welfare to better off household welfare the probability that antenatal care utilisation shall increase is 0.7 percent. However for rural areas in particular the probability is 18 per cent that a household will utilise antenatal care with improved welfare. This thus implies that the at higher household welfare levels, utilisation of antenatal care increases on the contrary the poorer the household is the less likely that they will utilise antenatal care.

Note that because antenatal care is an inevitable requirement during pregnancy, in this case therefore, because the poor might not be able to afford it, they are likely seek for some form of self care and most probably Traditional Birth Attendants (Ndyomugyenyi et al. 1998) as compared to the better off households that are thus economically sound to access quality

antenatal care irrespective of its price, Akin and Hutchinson (1999). Much as poor households find it financially difficult to actually use care, its imperative to point out that when the services are good; the quality of health care overshadows its price. In this particular regard, Cockcroft (1996) posits that individuals have a tendency to go to facilities where they know someone in order to expedite service provision. This argument further reinforces the importance of governance in utilisation of antenatal care.

With regard to the distance to nearest health facility, the findings are rather mixed. The findings imply that the probability of not accessing antennal for those that are within five kilo meters from the nearest hospital is 1.5 per cent in the overall model. The probability increases for the case of rural households by 32 per cent. Note that proximity to facilities implies low costs of accessibility; this finding however asserts that being within proximity of the health facility does not guarantee antenatal care utilisation. It is thus evident that physical accessibility to a health facility is on the whole a necessary but not sufficient condition if a country seeks to optimise utilization of health care among its citizens. In that regard therefore, physical accessibility ought to be accompanied with adequate service delivery.

On the contrary, Mwaniki et al. (2002) in a cross-sectional study of 200 mothers in Mbeere district, eastern Kenya established that mothers who lived within a radius five kilometres to the heath facility utilized the services more than did those who were in the periphery. Furthermore, Heard et al. (2004) in the study on use of and proximity to reproductive health services in Malawi hardly found any association contrary to findings by other studies. With regard, to the rural-urban variable movement from a rural to an urban setting increases the probability of antenatal care utilisation by 2.6 per cent. This is rather not surprising since urban areas are usually well served with regard to services such antenatal care. Note that both the education and the marital status of these household members that required antenatal care were not included in model because the two variables had so many missing observations implying that including them would be at the cost of losing the precision of the models estimated.

5.0 Conclusions.
In this paper I sought to particularly unearth the impact of governance and household welfare on antenatal care utilisation. This was driven by the low utilisation levels of antenatal care as earlier indicated for instance, 42 percent of women afford four or more visits during pregnancy, 52 percent of then one to three visits which of course is below the MOH recommendation while six percent did not seek care at all, Uganda Demographic Household Survey, (2000/2001). The study unearthed the importance of governance in influencing antenatal care utilisation. As the finding suggests, good governance implies better health care delivery and thus increased utilization. Good governance implies timely supply of drugs, availability of skilled medical staff, and community participation in matters concerning health care provision. Note that even when a household is poor, given quality care, the quality of health care will over shadow the cost of health care, Cockcroft (1996).

Again the paper highlights the importance of improving the quality of lives of household's more so in the rural areas. Note that improving the quality of governance in service delivery and thus improving the quality of antenatal care is not enough; avenues to enhance household incomes

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Appendix 1: Logit regressions.

Variables	Prenat (Both rural and urban individuals)	Prenat (only rural individuals)
gov1	0.574***	0.550***
	(0.174)	(0.19)
gov2	0.622***	0.432**
	(0.193)	(0.205)
gov3	-0.462**	-0.584**
	(-0.213)	(-0.227)
welf_pre	0.150**	0.178***
	(0.0593)	(0.0642)
rur_urb	0.700***	
	(0.234)	
dist2group	-0.354**	-0.335**
	(-0.154)	(-0.155)
pre_agesq	-3.34E-05	-3.60E-05
	(-7.96E-05)	(-8.34E-05)
Constant	2.451***	2.473***
	(0.194)	(0.205)
Observations	4511	3633
R-squared		
Standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		