



Factors influencing timing and frequency of antenatal care in Uganda

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RESEARCH

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Abstract

Background

Over 99% of mothers who die of complications related to pregnancy and childbirth each year are found in developing countries.³ In Uganda, maternal mortality is estimated at 435 deaths per 100,000 live births. We sought to understand the factors influencing frequency and timing of antenatal care in Uganda in order to inform policy on the key aspects that need to be influenced.

Method

We used data from the Uganda Demographic and Health Survey (UDHS) 2006 and employed both descriptive and quantitative approaches (probit estimation). After a probit estimation, we generated marginal effects to interpret the results as probabilities of utilisation of antenatal care given particular background characteristics.

Results

On average, only 17% and 47% of mothers initiate the first antenatal visit in the first trimester and attain at least four antenatal visits, respectively. The timing and frequency of antenatal visits were significantly associated with education of the mother and her partner, wealth status, regional disparities, religious differences, access to media, maternal autonomy in taking a health decision, occupations of the mother and her partner, timing of pregnancy, birth histories, and birth order.

Conclusion

Efforts are needed to educate girls beyond secondary level, establishment village outreach clinics with qualified staff to attract the hard-to-reach women, and to ensure universal access to prenatal care services irrespective of the ability to pay. Media penetration should also be increased amongst the population and this channel can be used to disseminate a standard piece of information concerning what pregnant women should expect and do during the prenatal period.

Key Words

Timing, frequency, antenatal care, Uganda

What this study adds:

1. Whereas literature is extensive in this area, our literature survey failed to identify a study, using a nationally representative survey, published for the case of Uganda.
 2. The study highlights the importance of birth histories in influencing the frequency and timing of prenatal care.
 3. Ability to pay is associated with more antenatal visits.
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Background

The role played by an early initiation and optimal frequency of antenatal visits in ensuring a safe motherhood and childhood cannot be underestimated. Early initiation of an antenatal care visit enables early screening for complications, referral, and treatment. On the other hand, the optimal number of visits ensures consistent physician follow-up of foetal development as well as the health of the mother. It also helps to create a 'rapport' between the prospective mother and the health provider which is an indispensable pre-condition for a safe childbirth. During antenatal sessions mothers undertake 'classes' where they are educated about danger signs during pregnancy, preventive and curative treatment, appropriate nutrition, breastfeeding, and contraceptive use for family planning. These issues demand early initiation of antenatal care and some good number of visits since learning is unlikely to be instantaneous. There is little wonder then that many countries are taking deliberate and purposive efforts to ensure provision and use of timely and adequate antenatal care. Indeed, antenatal care is one of the critical interventions that can enhance the attainment of Millennium Development Goals (MDGs) 4 (reducing child



mortality by two-thirds) and 5 (reducing the maternal mortality ratio by three-quarters) by the year 2015.

The new World Health Organization (WHO) model of antenatal care separates pregnant women into two groups: those likely to need only routine antenatal care (some 75% of the total population of pregnant women), and those with specific health conditions or risk factors that necessitate special care (25% of pregnant women). For the first group, a standard programme of four antenatal visits is recommended (with additional visits should conditions emerge which require special care).¹ It is also recommended that the first visit be initiated in the first trimester (first three months). Despite these guidelines, in Uganda, less than half of women (47%) attained at least four antenatal visits. This implies that more than half of women in Uganda attained less antenatal visits than is recommended by WHO and the national policy.² Additionally, only 17% of pregnant women initiated their first visits during the first three months of pregnancy. The median gestational age when women made their first visit was 5.5 months, when the opportunity may have passed to diagnose problems early, provide treatment, and prevent further complications.² This dismal utilisation comes in a situation where over 500,000 mothers die of complications related to pregnancy and childbirth each year and of these, over 99% occur in developing countries such as Uganda.³ In Uganda, maternal mortality is estimated at 435 deaths per 100,000 live births.² These scenarios threaten the achievement of MDGs by 2015.

Therefore, more than ever before, government policy makers, global health actors, and stakeholders (especially donors) are interested in understanding the factors influencing the timing and frequency of antenatal visits for appropriate policy formulation and advocacy. There have been policy gaps in the country as a result of lack of reliable evidence that can add an empirical flavour into government policy analysis. We sought to fill this policy gap by providing answers to the following pertinent questions: does the level of education acquired by a woman influence her choice on early initiation and the number of antenatal visits? Does the qualification of the antenatal care provider influence the frequency of visits? Does the place of antenatal care provision influence the frequency of visits? Literature presents various factors influencing timing and frequency of antenatal care visits. These include location,⁴⁻⁷ religion, age of the mother,^{4,7,8} maternal education,^{5,8-11} region, wealth status, birth order, birth intervals, exposure to media, and birth histories,⁵ timing of pregnancy, wealth status,^{6,12} occupation,¹³ distance to health facilities,^{5,6} number of children,^{7,12} and education of the partner.⁹ This literature

survey informed our choice of variables used during the analysis. In addition, it exposed the fact that there had so far been no study in Uganda utilising a nationally representative survey in an attempt to address these issues.

Method

The data was obtained from the Uganda Demographic and Health Survey (UDHS) 2006 conducted by MACRO International on behalf of the Uganda Bureau of Statistics (UBOS).² The 2006 UDHS is a nationally representative survey of 8,531 women aged 15–49 and 2,503 men aged 15–54. The sample was designed to allow separate estimates at the national level and for rural and urban areas of the country. Three questionnaires were used, namely; a household questionnaire, a women's questionnaire, and a men's questionnaire. Sampling was done in two stages, in the first stage 321 clusters were selected from among a list of clusters sampled in the 2005-2006 Uganda National Household Survey (UNHS), however, additional clusters were selected to accommodate special regions of Karamoja and 30 internally displaced camps (IDPs).² In the second stage, households in each cluster were selected based on a complete listing of households as per UNHS listing, however, in addition to the UNHS sampled households an additional 20 households were randomly selected in the sample.² The UDHS provides a rich source of data on the demographic characteristics of the country. It contains information on household size, age and sex distribution, religious affiliation, occupation of household members, the number of children ever born by a woman, reproductive health (antenatal, childbirth, and postnatal), marital status, wealth status, and educational attainment of women and men.

The paper makes use of the specific antenatal questions asked to women about the care they received during the antenatal period within the last five years (2001–2006) prior to the survey. The following dependent variables were used in the analysis: (a) *Timing of antenatal care*: this was constructed as a binary variable equal to one if a mother initiated the first visit in the first trimester and zero otherwise. (b) *Frequency of antenatal care*: WHO recommends four visits for a normal pregnancy. We construct a variable equal to one if a mother made at least four antenatal visits and zero otherwise.

Table 1: Average percentage of women initiating an antenatal visit in the first trimester, and having at least four antenatal visits, by background characteristics

Characteristic	1 st trimester visit	At least four antenatal visits
Mother's education: No education	20	41
Primary	16	46
Secondary	19	61
Postsecondary	23	75
Partner's education: No education	20	43
Primary	16	43
Secondary	17	57
Postsecondary	22	69
Location: Urban	19	61
Rural	17	46
Region: Central	20	56
East	11	41
North	20	51
West	19	43
Religion: Catholics	18	47
Protestants	17	46
Muslims	18	56
Other	15	46
Health decision: Woman alone	19	47
Woman + Partner	18	50
Partner alone	15	46
Wealth status: Poorest	20	45
Poor	14	42
Medium	16	42
Rich	18	45
Richest	20	66
Media frequency (Radio): Not at all	17	45
Less than once a week	18	65
At least once a week	17	61
Almost every day	23	69
Age cohort: 15-19	20	47
20-24	19	49
25-29	17	47
30-34	16	49
35-39	16	46
40-44	18	47
44-49	18.5	48
Caesarean birth: Yes	27	70
No	17	47
Difficulty during pregnancy: Yes	19	50
No	17	47
Pregnancy wanted: Then	19	50
Later	17	46
Not at all	15	45
Birth order: First	21	55
Second	19	51
Third	17	45
Fourth and over	16	45
Mother occupation: White collar	20	62
Agriculture	16	43
Services	25	64

Blue collar	19	57
Partner occupation: White collar	20	58
Agriculture	17	43
Services	18	52
Blue collar	16	49
Total	17	47
Source: author's own calculations from UDHS 2006		

Following the literature survey, we controlled for various socioeconomic, demographic, and behavioural factors. Specifically, we captured variables related to the provider and place of antenatal care; whether the provider was trained or not and whether the care was given in a hospital or not. Education included that of the mother and her partner, divided into different levels of attainment; 0=no education, 1=primary education, 2=secondary education, 3=postsecondary education (university and tertiary education). Related to education is the occupation of the mother and her partner categorised as; 1=white collar job, 2=agriculture, 3=services, and 4=blue collar job. Mother's age was divided into five-year cohorts; 1=15-19, 2=20-24, 3=25-29, 4=30-34, 5=35-39, 6=40-44, and 7=45-49. The wealth status of the household was divided into five equal groups (quintiles); 1=poorest, 2=poor, 3=middle, 4=rich, and 5=richest. To capture the traits and traditions of individuals, we included the four different religious groups; 1=Catholic, 2=Protestant, 3=Muslim, and 4='Other' religion that include Evangelicals, Adventists, Orthodox, and Traditionalists. We captured the birth history of women by including a variable on whether a mother experienced pregnancy complications and whether the previous birth was by caesarean section. We also included a variable capturing media (radio) penetration amongst the population; 1=no access at all, 2=less than once a week, 3=at least once a week, 4= every day. We also included the autonomy of the mother in taking health decisions in the household; 1=mother alone, 2=mother and partner, and 3=partner alone.

For location, we constructed a dummy variable equal to 1 if a mother dwells in the rural area and zero otherwise. We constructed regional dummy variables; 1=central, 2=east, 3=north, and 4=west, to control for the community peculiarities especially relating to availability and accessibility to healthcare facilities. In Uganda there is a heavy urban-rural imbalance in the distribution of human resources for health. For example 70% of all medical doctors are found in the urban environment. Additionally, 58%, 75%, 80%, and 68% of nurses and midwifery professionals, dentists, pharmacists, and other health professionals respectively, are found in the urban areas.¹⁴ On the other hand, the majority of associate professionals including clinical officers (61%), registered and enrolled nurses and midwives (59%) are found in the rural areas. There are also



significant regional imbalances with an extremely heavy bias towards the central region. The central region hosts 27% of the population but employs 71% of all medical doctors, 76% of all dentists, 81% of all pharmacists, and 64% of all nurses and midwifery professional cadres (degree holders and specialist registered nurses).¹⁴ The eastern, northern, and western regions, respectively, employ 11%, 7%, and 10% of all medical doctors; 14%, 10%, and 11% of all nurses and midwifery professionals; 9%, 8%, and 7% of all dentists; 7%, 6%, and 6% of all pharmacists.¹⁴ These regional differences in human resource distribution have indeed yielded maternal health disparities in the country with a bias towards the central region. In the central region, 18% of women received antenatal care from a medical doctor compared to 4.3%, 4.5%, and 9% of women in the eastern, northern, and western regions respectively.¹⁵ Additionally, 76% of women in the central region received antenatal care from a nurse/midwife compared to 90%, 87%, and 80% of women, respectively, in the eastern, northern, and western regions.¹⁵ Looking at the antenatal care content, in the central region, 63% of women had their blood pressure measured compared to 47%, 50%, and 50% in the eastern, northern, and western regions respectively.² Additionally, 22% of mothers in the central region had their urine samples taken compared to 9%, 11%, and 9% in the eastern, northern, and western regions respectively. In the central region 40% had their blood sample taken compared to only 16%, 28%, and 28% in the eastern, northern, and western regions respectively. Also in the central region 57% received a tetanus injection at least twice compared to only 45%, 54%, and 48% in the eastern, northern, and western regions respectively. Finally, 58% in the central region delivered with the assistance of medical personnel compared to only 40%, 27%, and 25% in the eastern, northern, and western regions respectively.²

During the analysis, we employed both descriptive and quantitative approaches. The descriptive approach involved generating average percentages of women that utilised antenatal care services by background characteristics. Under the quantitative approach, a maximum likelihood probit technique was used. After a probit estimation, we generated marginal effects to interpret the results as probabilities of utilisation of antenatal care given particular background characteristics.

Results

We present findings from both descriptive and quantitative analysis of the determinants antenatal care timing and frequency (Tables 1–3). On average, only 17% and 47% of mothers initiated the first antenatal visit in the first trimester and attained at least four visits, respectively

(Table 1). It is not surprising that these average percentages tally with those found in the UDHS report² since we used sample weights to generate them. Mother's education is revealed to be significant in influencing the frequency of antenatal care. Mothers with at least secondary education are 6–11% more likely to attain at least four visits compared to counterparts with no education at all (Table 2). These quantitative results are in line with the descriptive findings in Table 1. Conversely, mothers with primary education are about 5% less likely to initiate the first visit in the first trimester compared to counterparts with no education (Table 3). These findings still tally with the descriptive findings where there is a higher percentage of women with no education (20%) initiating the first visit in the first trimester compared to those with primary education (16%), and secondary education (19%). The percentage of those with postsecondary education (23%) is just slightly above those with no education.

Partner's education is revealed to be significant in influencing the frequency of antenatal care visits but not the timing of antenatal care. Mothers whose partners have at least secondary education are 10–23% more likely to attain at least four visits compared to counterparts whose partners have no education (Table 2). This is consistent with the descriptive findings in Table 1. Our results show significant regional differences. Mothers in the eastern region are 9–10% and 10–11% less likely to attain at least four visits and to initiate the first visit in the first trimester, respectively, compared to counterparts in the central region (Tables 2 and 3). Conversely, mothers in the northern region are 5–6% more likely to attain at least four visits compared to counterparts in the central region (Table 2). The western region and rural location do not yield any robust findings. Household wealth status significantly influences the frequency but not the timing of antenatal care. Mothers in the richest quintile are 9–15% more likely to attain at least four antenatal visits compared to counterparts in the poorest quintile (Table 2). These findings are consistent with the descriptive statistics in Table 1.

Religion is important in influencing access to antenatal care services. Muslims are 5–6% more likely to attain at least four antenatal visits compared to Catholics (Table 2). Yet, other religions (including Evangelicals) are 5% less likely to initiate the first antenatal visit in the first trimester compared to Catholics (Table 3). The party responsible for taking a health decision in the household is important in influencing the timing of care but not the frequency of care. A situation where it is a partner alone taking a health decision in the household reduces the probability of initiating the first visit in the first trimester by 4% compared



to a situation where it is the mother alone taking the decision (Table 3). Birth history is very significant in influencing both the timing and frequency of care.

Table 2: Factors influencing the attainment of at least four antenatal visits

	Model (1)	Model (2)	Model (3)	Model (4)
Mother's education: primary	0.01 (0.469)			
Secondary	0.06* (0.06)			
Postsecondary	0.11* (0.07)			
Region: East	-0.09*** (0.00)	-0.10*** (5.97e-05)	-0.08*** (0.00)	-0.08*** (0.00)
North	0.05* (0.06)	0.03 (0.19)	0.01 (0.53)	0.05* (0.051)
West	-0.03 (0.18)	-0.041 (0.12)	-0.01 (0.51)	-0.048* (0.089)
Location: rural	0.02 (0.48)	0.02 (0.35)	0.05* (0.08)	0.03 (0.34)
Wealth status: poor	-0.02 (0.37)	-0.02 (0.39)	-0.01 (0.61)	-0.01 (0.52)
Middle	-0.03 (0.26)	-0.02 (0.40)	-0.03 (0.21)	-0.02 (0.46)
Rich	-0.02 (0.34)	-0.02 (0.42)	-0.04 (0.18)	0.00 (0.78)
Richest	0.09** (0.01)	0.097*** (0.00)	0.05 (0.12)	0.14*** (0.00)
Partner's education: primary	0.01 (0.52)	0.02 (0.40)	0.01 (0.59)	
Secondary	0.11*** (0.00)	0.12*** (5.35e-05)	0.095*** (0.00)	
Postsecondary	0.20*** (1.38e-06)	0.22*** (2.02e-08)	0.19*** (2.95e-06)	
Religion: Protestant	-0.00 (0.76)	-0.00 (0.80)	-0.00 (0.81)	-0.00 (0.88)
Muslim	0.06** (0.02)	0.05** (0.03)	0.05** (0.04)	0.05* (0.09)
Other	-0.02 (0.42)	-0.02 (0.35)	-0.00 (0.76)	-0.01 (0.54)
Caesarean birth	0.21*** (4.21e-06)	0.19*** (3.39e-05)	0.19*** (2.85e-05)	0.23*** (5.26e-06)
Health decision: mother + partner	0.02 (0.291)	0.02 (0.19)	0.01 (0.42)	0.01 (0.40)
Partner alone	-0.00 (0.90)	0.00 (0.94)	-0.00 (0.89)	-0.00 (0.83)
Media frequency (Radio): less	0.00	0.00	0.00	0.01

than once a week				
	(0.84)	(0.93)	(0.96)	(0.70)
At least once a week	0.03	0.03	0.03	0.04
	(0.15)	(0.13)	(0.16)	(0.13)
Every day	0.05**	0.05**	0.05**	0.05**
	(0.01)	(0.02)	(0.03)	(0.02)
Birth order: 2	-0.01	-0.01	-0.01	-0.00
	(0.64)	(0.74)	(0.59)	(0.84)
3	-0.07**	-0.06**	-0.07**	-0.07**
	(0.01)	(0.03)	(0.01)	(0.02)
4+	-0.02	-0.02	-0.02	-0.04
	(0.35)	(0.29)	(0.41)	(0.13)
Prenatal assistance: trained person		0.10*** (0.00)		
Prenatal place: hospital/clinic			0.07*** (0)	
Mother's occupation: agriculture				-0.09*** (0.00)
Services				-0.10* (0.06)
Blue collar				-0.02 (0.61)
Partner's occupation: agriculture				-0.06** (0.02)
Services				-0.05 (0.26)
Blue collar				-0.05* (0.06)
Observations	4,088	3,982	4,088	3,731

p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Mothers who gave birth by caesarean section are 20–23% and 10–11% more likely to attain at least four antenatal visits and to initiate the first visit in the first trimester respectively (Tables 2 and 3). Similarly, mothers who experienced difficulty during the previous pregnancy are about 4% more likely to initiate the first visit in the first trimester compared to counterparts (Table 3).

The timing of pregnancy is another important factor influencing the timing of care. Mothers who wanted pregnancy later and those who did not want it at all are, respectively, 3% and 4–5% less likely to initiate the first visit in the first trimester compared to counterparts who wanted it then (Table 3). These findings are in line with the descriptive findings in Table 1.

Access to media (radio) significantly influences the frequency but not the timing of care. Mothers who have access to media every day, compared to counterparts who have no access at all, are 5–6% more likely to attain at least four antenatal visits (Table 2). Mothers with a higher birth



order, compared to the first, are less likely to attain at least four visits and to initiate the first visit in the first trimester.

Table 3: Factors influencing the initiation of the first antenatal visit in the first trimester

	Model (1)	Model (2)	Model (3)
Mother's education: primary	-0.04*** (0.00)	-0.05*** (0.00)	
Secondary	-0.01 (0.46)	-0.02 (0.25)	
Postsecondary	-0.00 (0.82)	-0.03 (0.46)	
Region: East	-0.09*** (1.78e-07)	-0.09*** (2.58e-07)	-0.10*** (3.56e-08)
North	-0.01 (0.55)	-0.01 (0.49)	-0.02 (0.34)
West	-0.01 (0.41)	-0.01 (0.38)	-0.02 (0.14)
Location: rural	0.02 (0.33)	0.02 (0.29)	0.01 (0.71)
Wealth status: poor	-0.04** (0.02)	-0.04** (0.01)	-0.05*** (0.00)
Middle	-0.02 (0.26)	-0.02 (0.24)	-0.04* (0.05)
Rich	-0.00 (0.93)	-0.00 (0.91)	-0.01 (0.43)
Richest	-0.03 (0.26)	-0.03 (0.22)	-0.04 (0.15)
Partner's education: primary	-0.02 (0.27)	-0.01 (0.31)	
Secondary	-0.00 (0.74)	-0.00 (0.73)	
Postsecondary	0.00 (0.89)	0.00 (0.91)	
Religion: Protestant	-0.01 (0.27)	-0.01 (0.28)	-0.02 (0.17)
Muslim	0.02 (0.23)	0.02 (0.20)	0.02 (0.26)
Other	-0.04** (0.02)	-0.04** (0.02)	-0.05** (0.01)
Caesarean birth	0.11*** (0.00)	0.10*** (0.00)	0.11*** (0.00)
Health decision: mother + partner	-0.02 (0.16)	-0.02 (0.16)	-0.02 (0.17)
Partner alone	-0.03** (0.01)	-0.03** (0.01)	-0.03** (0.03)
Media frequency (Radio): less than once a week	0.02 (0.36)	0.02 (0.40)	0.00 (0.83)
At least once a	0.00	8.75e-05	-0.00

week			
	(0.98)	(0.9)	(0.72)
Every day	0.03 (0.10)	0.02 (0.112)	0.02 (0.14)
Age cohorts: 20-24	-0.04* (0.07)		
25-29	-0.06*** (0.00)		
30-34	-0.06*** (0.00)		
35-39	-0.06** (0.02)		
40-44	-0.03 (0.28)		
45-49	-0.04 (0.28)		
Pregnancy difficulty	0.03** (0.02)	0.03** (0.02)	0.02 (0.11)
Pregnancy wanted: later	-0.02** (0.03)	-0.02* (0.07)	-0.02* (0.06)
Not all	-0.05*** (0.00)	-0.04** (0.02)	-0.03* (0.05)
Birth order: 2		-0.01 (0.6)	0.00 (0.91)
3		-0.04** (0.04)	-0.03 (0.17)
4+		-0.05*** (0.00)	-0.04** (0.02)
Mother's occupation: agriculture			0.00 (0.96)
Services			0.00 (0.82)
Blue collar			0.02 (0.48)
Partner's occupation: agriculture			-0.01 (0.59)
Services			-0.02 (0.57)
Blue collar			-0.03 (0.10)
Observations	3,937	3,937	3,589
p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1			

Mothers with a third birth order, compared to those with the first, are about 6-7% less likely to attain the four antenatal visits (Table 2). Yet, mothers with at least the third birth order, compared to those with the first, are 4-5% less likely to initiate the first visit in the first trimester (Table 3). Mothers obtaining prenatal care from a trained person and hospital or clinic are 8-10% more likely to attain four antenatal visits compared to counterparts who obtain care from untrained persons and from home. Mother's and partner's occupation significantly influence the frequency



but not the timing of care. Mothers in agriculture and services, compared to those having white collar jobs are 10% less likely to attain the four visits (Table 3). Yet, mothers whose partners are in agriculture and blue collar jobs, compared to counterparts having white collar jobs, are 6% less likely to attain the four visits (Table 3). These findings are confirmed by the descriptive results found in Table 1.

Discussion

We set out to investigate the factors influencing the timing and frequency of antenatal care being motivated by a suboptimal utilisation and a very high maternal mortality. We used a nationally representative UDHS 2006 and employed both descriptive and probit techniques during the analysis. A striking finding is that only 17% and 47% initiated the first visit in the first trimester and attained at least four antenatal visits, respectively. Government policy should make known the importance of these two elements of antenatal care in averting pregnancy-related problems. This can be achieved through outreach village-level seminars/sensitisation campaigns that can capture the hard-to-reach remote and illiterate women. Our study revealed other interesting findings that are in line with the previous studies. Mother's education was revealed to be significant in influencing the attainment of the four antenatal visits. This is corroborated by previous studies.^{5, 8-11} However, it appears astonishing that mothers with primary education are less likely to initiate the first visit in the first trimester. This result still agrees with other studies⁸ which found that mothers with primary and lower education were more likely to book late for antenatal care compared to those with at least secondary education. The government's programme of free secondary education is therefore paramount in uplifting the education of girls, but should be propelled to higher levels. Wealth status of the household significantly influenced frequency and not timing of care. This may be conventionally expected since frequency is more related with the ability to pay for transport and care than the timing of care. Wealth status did matter in other previous studies as well.^{6,12} Therefore government should ensure accessibility to antenatal care irrespective of the ability to pay.

As expected, mothers in the eastern region, compared to the central region, were less likely to attain the four antenatal visits and to initiate the first visit in the first trimester. Unexpectedly, mothers in the northern region, compared to the central region, were more likely to attain the four visits. In Uganda, the central region is the most developed and it houses the capital city of the country and hence high quality social amenities are concentrated in this

region compared to other regions. A special case is the northern region which was devastated by a civil war for over two decades since 1986. Its superior performance compared to the central region is remarkable and can be attributed to enormous efforts by government and other stakeholders to rebuild social services provision. The role of regional disparities in explaining healthcare utilisation has also been documented in previous studies.⁵ The importance of partner's education in influencing the frequency of healthcare utilisation is articulated in our findings. This is in line with previous literature that has found partner's education important.⁹

Religious differences that capture traditions and beliefs of mothers are found to be significant in influencing both the timing and frequency of care. Our results find support in the previous literature.^{4,7,8} Our findings reveal the significance of birth histories, media penetration, and birth order in influencing the health-seeking behaviour of mothers. This is also supported by other studies.⁵ It is noteworthy that the results on birth order and age cohorts of mothers yield similar conclusions. The higher the birth order or age cohort, the lower the probability that mothers will seek healthcare. This is attributed to experience and knowledge accumulated over time on how to behave during pregnancy which leads to some sort of self-medication. This finds some support in the literature where it is argued that women tend to give greater attention to the first pregnancy due to lack of experience.¹¹ Our findings also reveal that occupation types of mothers and partners yield differences in the utilisation of antenatal care. This can be attributed to differences in the productivity of jobs in terms of income earned, which in turn influences the ability to pay for healthcare. The importance of occupations in influencing healthcare utilisation is documented in the previous literature.¹² Just as^{6,12} we find timing of pregnancy important in influencing antenatal care utilisation.

The greatest virtue of our study is its use of a nationally representative survey which enhances the generalisation of results for the entire country. However, the primary source of limitation is the recall bias. Data was collected retrospectively for the past five years and hence mothers may not be in a position to recall very well all the events that took place during pregnancy and childbirth especially minor events. This bias does not occur in the case of significant events that took place in a mother's reproductive life.

Conclusion

This study has provided insights into the factors influencing the timing and frequency of antenatal care seeking-



behaviour of mothers in Uganda. Understanding these factors will inform policy makers on how to influence mothers to do an early booking for antenatal care as well as to attain a minimum of four visits. Efforts are needed to educate girls beyond secondary level for the achievement of admirable health outcomes in the future. There is also need for an outreach programme that will bring prenatal care services nearer to women and this will go a long way in removing the regional and location disparities. Village outreach clinics with qualified staff are important in this case. In order to target poor women, the government should ensure universal access to prenatal care services irrespective of the ability to pay. There should also be standardisation of the skills of prenatal care providers across the country to ensure a homogenous type of service received by each woman irrespective of location. Media penetration should also be increased amongst the population and the government can use this channel to disseminate a standard piece of information concerning what pregnant women should expect and do during the prenatal period. A further study is needed to examine the factors influencing access to a skilled healthcare provider and to a health institution like a hospital/clinic.

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I declare that there are no conflicts of interest

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