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The Effect of Socio-demographic Factors on the Utilization of Maternal Health Care Services in Uganda

Ishmael. Kalule-Sabiti (16450418@nwu.ac.za)

Acheampong Yaw Amoateng (yaw.amoateng@nwu.ac.za

Ngake K.M (mkeselwetse@yahoo.com)

School of Research and Post-Graduate Studies, North-West University, Mafikeng Campus, South Africa

Corresponding author: Acheampong Yaw Amoateng(16435621@nwu)

Abstract

The aim of this study was to investigate the effect of demographic and socio-economic factors on the utilization of maternal health care services using secondary data from the Uganda Demographic Health Survey undertaken in 2006 by Uganda Bureau of Statistics (UBOS) and Macro International Inc., 2007. Results of the analysis showed that level of urbanization affects the utilization of maternal health care services in that urban residents are more likely than their rural counterparts to use such services. In terms of educational attainment, we found a U-shaped relationship between education and use of services with women without education and those with secondary or more education being more likely than those with middle school education to use have tetanus toxoid injection.

Key words: Utilization, Maternal Health Care services

Introduction

Pregnancy-related complications are a leading cause of death among women in the reproductive age in the developing world. According to the United Nations (2005) more than half a million women in developing countries die each year during pregnancy or childbirth and twenty times that number suffer serious injury or disability. Some progress has been made in reducing maternal deaths in developing regions, but not in the countries where giving birth is most risky (United Nations, 2005). While global maternal deaths are in decline and women's health has at last become a global priority, the goal of reducing maternal mortality in the continent by 75% in 2015 is still a long way off as women and children are still dying needlessly.

Regionally, Africa has just 12% of the global population, it accounts for half of all maternal deaths and half the deaths of children under five. Nearly 4.7 million mothers, newborns, and children die each year in sub-Saharan Africa: 265,000 mothers die due to complications of pregnancy and childbirth (UNICEF, 2009); 1,208,000 babies die before they reach one month of age (Bryce & Requejo, 2010) and 3,192,000 children who survived their first month of life, die before their fifth birthday (UNICEF, 2009). As far as Uganda is concerned, the country was expected to reduce its maternal mortality ratio to 131 per 100,000 births in 2015 in line with the MDGs. However, according to the recent report of UDHS 2011, maternal mortality has increased to 438 per 100,000 births. Moreover, the expectation that all births would be attended by skilled health personnel by 2015 has similarly been elusive as only 59% of the births were attended by skilled personnel (United Nation, 2006).

Measures of maternal deaths are critical as they reflect a woman's access to and use of essential health care services during pregnancy and childbirth, their general health and nutritional status, as well as their access to reproductive care services, including family planning (Mokomane and Khan, 2009). However, there are factors that limit women, especially those living in rural areas from using maternal health care services such as cultural barriers in seeking access, maltreatment by medical personnel, limited reproductive health literacy, reliance on traditional medicine, malaria and pregnancy and the cost of transportation from their residence to the health facility. It is against this background of the slow progress in addressing the problem of access to maternal health care services in Africa that the present study seeks to understand the influence of demographic and socio-economic factors on maternal health care utilization.

Review of the Empirical Literature

Several studies have shown that socio-demographic factors affect the utilisation of maternal health care services (Celic & Hotchkiss, 2000; Gubhaju, 2001; Mekonnen & Mekonnen, 2003; Woldemicael & Tenkorang, 2009). Below we review the empirical evidence of the selected socio-demographic factors that influence the utilisation of maternal health care services.

Education:

Some studies have shown that women's education increases the use of Maternal care services (e.g. Celik and Hotchkiss, 2000; Gubhaju, 2000). Educated women are more likely than uneducated women to use antenatal care, to use it early and frequently, and to use trained providers and medical institutions. This is consistent with the findings of the Ethiopia DHS 2011 which indicates that 5 per cent of births to mothers with no education were attended by a health professional and delivered in a health facility compared with between 70 and 72 per cent of births to mothers with some secondary education (Central Statistical Agency and ICF Macro,

2011). It has also been found that education is positively associated with safe delivery. For example, in Nepal, one study found that women with more than primary level education were more likely to use anti natal care than those with no education (Gubhaju, 2000), while in Turkey it was found that women with six or more years of schooling were more likely to use antenatal care than those with no education (Celik and Hotchkiss, 2000).

In a study of the utilization of maternal health care services in Ethiopia, a statistically significant difference was found for the effect of education even after controlling for the effect of other variables (Dagne, 2010). Specifically, the odds of using antenatal care services was three times higher if the woman had secondary education or more as compared to those with no education and a 1.5 times higher odds if the woman had primary education compared to women with no education. Furthermore, it was found that women with partners who had a secondary or higher education had two times higher odds of delivering with professional assistance when compared to those with partners having no education; similarly, women who had partners who were skilled workers had a 1.8 times higher odds of delivering with professional assistance than those with partners who were not skilled professionals. However, for the urban sample, the odds of using antenatal care were found to be statistically insignificant for the primary education group compared to those with no education (Dagne, 2010). In India, a study found that the standard of living and literacy of woman made a difference to the likelihood of delivering in an institution. Among women of medium and high standard of living, the

odds of delivering in an institution were 1·4 times and 2·3 times those of women with a low standard of living; illiterate women were less likely to go for an institutional delivery than literate women (Ram and Singh, 2006). In Uganda, in a study that used the 2006 and 2011 Demographic and Health Survey data to examine the socio-demographic factors that influence contraceptive use, the authors found that the likelihood of using contraception was associated with women's educational attainment. The more schooling a woman had, the more likely she was to report use of a modern contraceptive method. In each age group, over one-third of women with secondary or higher education, but far fewer women with no education, reported modern contraceptive use (Asiime, Ndugga and Mushomi, 2013).

Moreover, in Uganda, Vallieres et al (2013) similarly found a significant difference in skilled birth attendance between heads of households with some primary education and heads of household with some secondary education or higher whereby those with secondary or higher education were significantly more likely to seek a skilled birth attendant. The difference in health centre delivery between heads of household with a primary education and heads of household with a secondary or higher education was also significant; those with secondary or higher education were significantly more likely to deliver in a health facility. Education empowers women via a vis men in terms of not only knowledge about the availability and benefits of maternal health services but also autonomy to make independent decisions about their health. In view of this, we expect women who are educated to make more and frequent use of maternal health care services compared to those who are not educated.

Residence

Place of residence has been found to influence the utilization of maternal health care services For example, in Ethiopia, rural women have been found to be generally less likely to give birth in health facility compared to their urban counterparts (Mesfin Nigussie and Getnet, 2004), while a similar situation was observed in Nigeria (Babalola and Fatusi, 2009). Moreover, a study done in Ethiopia using the country's 2000 Demographic and Health Survey data, found that 27% of mothers who gave birth in the five years before the survey received antenatal care from health professionals and of this urban women showed higher use of antenatal care than their rural counterparts, 83% of women in Addis Ababa to 22% in the rural regions (Mekonnen and Mekonnen, 2003). And, in his study, Dagne (2010) found that women living in rural areas had a 69% less odds of delivering by assistance from

health professionals when compared to urban women. In a three-country study, Smith and Sulzbach (2008) observed that across all three countries, living in an urban area was associated with higher odds of delivering at a health facility; in Mali, living in an urban area (either Bla town or Sikasso) is positively associated with both prenatal outcomes. Because of the relatively poor infrastructure like roads and clinics in rural areas in most African countries, we expect that women the rates of use of maternal health care services will be generally lower in rural areas compared to those of women in urban areas.

Socio-Sconomic Status of Households

Economic stability has been identified as important in influencing utilization behaviour of a woman. For instance, the poorest women in the poorest regions of the world have the lowest service coverage. For example, a study in more than 50 countries showed that on average more than 80% of births were attended for the richest women compared with only 34% of the poorest women (Gill, Pande and Malhotra, 2007). In Ethiopia, Dagne (2010) found a statistically significant association between household wealth and assistance during delivery with women in the rich and richest wealth group more likely to have professional assistance during birth.

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In their study of Uganda, Asiimwe, Ndugga and Mushomi (2013) found that in both 2006 and 2011 surveys, modern contraceptive use was positively associated with level of household wealth. For both age groups, use of modern methods was highest among women from the richest households; wealth-related disparities in contraceptive use are greater among younger women. In a three-country study of Ghana, Mali and Senegal in which the authors examined the relationship between Community-Based Health Insurance (CBHI), they found across all study areas that household SES was positively and, in some cases, significantly, associated with the use of prenatal care. Education of the household head is also positively associated with the use of prenatal care, but only significant in the Senegal model (Smith and Sulzbach, 2008). Moreover, as was found with prenatal care, household SES is positively related to delivery at a health facility across all three study areas, but only significant for Ghana. Besides paying for the direct services offered by clinics, women also have to pay for indirect and related costs such as transportation and food. Because of these costs involved in the utilization of maternal health services, we expect wealth index to be positively associated with the utilization of such services in the present study.

Religion

Religion has been found to have a negative effect on the use of maternal health care services. For example, in a study of the 2000 Ethiopian Demographic and Health Survey data, it was found that individuals professing orthodox/catholic, Muslim and protestant tended to use more maternal health services than those following traditional belief (Mekonnen and Mekonnen, 2003). Corroborating the effect of religion in Ethiopia, Dagne (2010) found that women who follow traditional beliefs had a 50% lower chance of receiving antenatal care compared with those who follow orthodox/catholic Christianity. In their study of the utilization of maternal health services in a district in the Indian state of Utter Pradesh, Ram and Singh (2006) found that with exception of institutional deliveries, utilisation of health services was higher among Muslims; only institutional deliveries was higher among Hindus. Because of the historical ties of Christianity to Western cultures, Christians in most African societies tend to have western, modernising outlook while Muslims, because of their historical accommodation of African cultural values, tend to be traditional in outlook. Because of these cultural differences, we expect Christians to be frequent users of maternal health care services than both Muslims and Traditional African believers and other believers.

Birth Order

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Birth order has been shown to influence the use of maternal care services in several studies. In Ethiopia, birth order of the child showed significant association with the use of antenatal care services and use of assistance during delivery; use of these maternal care services was shown to decrease with increase in birth order (Dagne, 2010). In a study in Rwanda, a strong association between birth order and use of health care services was observed by the authors. For example, compared to the first child, subsequent children are more likely to be born at home without assistance rather than at health facility or at home with professional assistance. (Jayaraman, Chandrasekhar and Gebreselassie, 2008). Children are a constraint on time and money and therefore represent opportunity costs involved in this kind of transaction. We therefore expect women with more children to have lower rates of use of maternal health care services because of the constraints of time and money.

Data and Methodology

Data for the study were obtained from a probability sample of 9,864 households selected for the 2006 UDHS survey. The sampling technique was in two stages. The first stage involved the selection of clusters from the list of samples, while in the second stage households were selected from each of the clusters. Data were collected from 8531 women aged 15-49 and 2503 men aged 15-59 (Uganda Bureau of Statistics and Macro International Inc. 2007). However, the present study focuses on women who gave live births prior to the survey and accounted for 5004 out of a total national representative sample of 8531.

The data were analyzed using the Statistical Package for Social Sciences. Univariate, bivate and multivariate analyses were used for the present study. Specifically, for the multivariate analysis, the logistic regression model was employed. This model requires the dependent variable to be measured at the nominal (Categorical) level. Since the log odds can be any number between minus and plus infinity, it can be modeled as a linear function of the predictor set and thus making the logistic regression model as follows:

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$$\log \frac{(\pi)}{1-\pi} = \alpha+\beta 1X1+\beta 2X2+.....+\beta kXk$$

This is analogous to the linear regression model, except that the dependent variable is a log odds the estimation of which proceeds via maximum likelihood. The exp(bk) therefore is the estimated odds ratio for those who are a unit apart on Xk, net of other predictors in the model. For dummy coefficients, a unit difference in Xk is the difference between membership in category Xk and membership in the omitted category. In the present study, the log odds of women utilising maternal health care services in Uganda are regressed on selected socio-demographic factors (Park, 2009:6). The independent variables are represented by X_1, X_2, X_3..... X_k. In this analysis, the predictors include type of place of residence, birth order, educational level and wealth index. The reference categories of each dichotomous independent variable have an odds ratio value of '1.00'. Exponential β of dichotomous independent variables less than '1.00' means that the category of the variable has a decreasing likelihood of using maternal health care services compared to the reference category. Odds ratio value greater than '1.00' means increasing likelihood of using maternal health care services.

Analysis and Results

Table 1 shows the distribution of the sample characteristics. About 70% of the respondents are in the 20-34 age group, slightly less than a quarter are 35 year old or above, while only 7.3% are in the teen years of 15 to 17 years. The majority (87%) of the women are resident in rural areas, while an equal number of are Christian (87%); only 2% belong to other religious groups. Eighty-four per cent of the women are married compared to only 4% who have never been married. In terms of educational attainment, the bulk of the women (61%) have only primary education, while more than a fifth of the women (23%) have no formal education; only 16% have secondary or more education. Finally, 46% of the women are poor, while more than a third (36%) is fall in the rich wealth index category.

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Table 1 about here
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Tables 2a to 2g about here

Tables 2a to 2g show the results of the bivariate analysis of the relationship between the background socio-demographic factors and the utilization of maternal health care services. Place of residence, education, birth order, wealth index were all strongly associated with all three dimensions of maternal health care services, while age, marital status and religion were either moderately or insignificantly associated with maternal health care services. For example, with regards to place of residence, majority of the urban women (60.6%) had visited antenatal care service more than 4 times compared to only 46.3% of their rural counterparts. Moreover, while 84% of the urban residents delivered either at public or private health facilities, less than 4 out 10 (38%) delivered at these health facilities; the bulk of the rural women (61%) delivered at home.

While the effect of age was almost non-existent with regards to antenatal care visit, it was strongly related to both tetanus toxoid injection and place of delivery. For these two dimensions of maternal health services, age was strongly and negatively associated with the utilization of such services. For example, while 82% of women aged 15-19 had received tetanus injection only 71% of those aged 35 and older had received the injection. In the case of place of delivery, 57% of those aged 15-19 delivered either at a private or public health facility compared to slightly over a third (34%) of the women aged 35 years and older.

Like age, the effects of marital status and religious affiliation were observed for only place of delivery, whereby single, never married women were most likely to deliver their babies either at a public or private health facility than women who were, married/living together, widowed and divorced. Sixty-seven percent of single, never married women delivered either at a public or private health facility compared to 48%, 43% and 38% of women who were divorced, married and widowed respectively. On the other, Muslim women were most likely to deliver either at a public or private health facility (78%), while women who professed other religions were more likely to deliver at home (66%), followed by Christians (56%). Finally, wealth index is strongly and positively associated with utilization of maternal health care services in that wealthy women are more likely to visit antenatal clinics more often, likely to receive tetanus toxoid injection and likely to deliver either at a public or private health facility. For example, 55% of wealthy women visited antenatal care clinic 4 or more times compared to 45% and 43% of poor and middle-income women respectively. Moreover, while two-thirds of the rich women delivered either at a public or private health facility, only 30% and 37% respectively of poor and middle-income women delivered at these health facilities; the bulk of poor and middle income women deliver at home (68% and 62& respectively).

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Table 3 presents the results of the binary logistic regression model which essentially confirmed the bivariate analyses. Table 3 (Panel I) shows that the effect of place of residence on the utilisation of maternal health care services by women. Specifically, it shows that the odds of urban women receiving visiting for antenatal care services are 1.62 times higher than the odds of rural women visiting antenatal care clinics. Moreover, the odds of urban women receiving tetanus toxoid injection are 1.66 times higher than those of rural women. And, shown in Table 3 (Panel III), like antenatal care visits and tetanus toxoid injection, level of urbanisation is positively associated with place of delivery by women in Uganda. For instance, the odds of urban women giving birth in health facilities are 3.67 times higher than those of their rural counterparts.

Even though contrary to expectation birth order does not make any difference in terms of the utilisation of antenatal care visits, it is significantly associated with tetanus toxoid injection and place of delivery in Uganda as depicted by Table 3(Panels II and III). On the whole, women with lower birth order are more likely than their counterparts with higher birth order to receive tetanus toxoid injection and also to give birth in a health facility. For example, the odds of women with first birth order receiving tetanus toxoid injection and giving birth in a health facility are 1.95 and 2.36 times higher

than their counterparts with 6+ birth order . And the odds of women with second birth order receiving tetanus toxoid injection and giving birth in a health facility are 1.86 and 1.40 times higher than those with 6+ birth order.

Formal education impacts positively on women's decision to seek maternal care services in Uganda as shown by the findings of the present study. For example, women without any formal education are less likely than their counterparts with primary education to visit antenatal care clinics and to deliver in a health facility. For example, the odds of women with no education visiting an antenatal clinic are .49 times lower than those of their counterparts with primary education, while their odds of delivering in a health facility are .64 times lower than those with primary education.

On the other hand, women with secondary or higher education are much more likely than their counterparts with primary education to not only visit antenatal care clinics, but also to receive tetanus toxoid injection and to deliver in a health facility. For instance, the odds of women with secondary or higher education visiting an antenatal care clinic and receiving tetanus toxoid injection are 1.36times higher than those of women with primary education, while the odds of women with secondary or higher education delivering in a health facility are more than twice higher than those of their counterparts with primary education. As expected, wealthy women are more likely than poor women to utilize maternal health services, although wealth does not make any difference between these two groups of women with regards to tetanus toxoid injection. The odds of wealthy women visiting antenatal care clinic are 1.70 times higher, while their odds of delivering in a health facility are almost five times higher than those of their poor counterparts. As observed earlier, wealth does not appear to be a motivating factor in tetanus injection as women in the middle wealth category are less likely to receive the injection compared to poor women. Specifically, the odds of women in the middle wealth category receiving tetanus toxoid injection are .83 times lower than those of their poor counterparts).

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Table 3 about here
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Summary and Conclusion

The present study sought to examine the effect of selected socio-demographic factors on the utilisation of maternal health care services by women in the childbearing ages in Uganda, using the country's 2006 Demographic and Health Survey data. Three measures of maternal health care services, namely, visits to antenatal clinic, tetanus toxoid injection and place of delivery were

examined to see how they are impacted by such socio-demographic factors as level of urbanisation, educational attainment, birth order, religion, wealth index, marital status, and age. Using the binary logistic regression model, we found that variation in the utilisation of maternal health care services among women of childbearing age in Uganda is explained by level of urbanisation, educational attainment, birth order and wealth index. In terms of the level of urbanisation, we found that women resident in urban areas are more likely than their rural counterparts to use antenatal care services, receive tetanus toxoid injection and deliver their babies in public health facilities. The same positive association was observed between a woman's educational attainment and visit to antenatal care clinic, place of delivery and tetanus toxoid injection. Finally, wealth index was positively associated with both antenatal care and place of delivery. However, with regard to tetanus toxoid injection women in the poor wealth index group are most likely to have the injection than their counterparts in the middle and wealthy groups.

Discussion

As a region, sub-Saharan Africa is relatively lagging behind regions of the world as far as 'inclusive' development in the continent is concerned. In other words, the region is yet to recognize the necessity for the development of a social policy framework which combines economic dynamism with an active role for government in the provision of basic social and other services at local and national levels. Notably, this failure of social policy has been manifested in the health sectors of most African countries with the prevalence of such challenges as high infant and child morbidity and mortality rates, high maternal mortality, high prevalence of HIV/AIDS, and low life expectancy with serious implications for socio-economic development in the continent.

As far as maternal mortality is concerned, study after study has indicated that while generally in poorer or disadvantaged regions of the world it remains a major challenge, higher rates of utilization of maternal health care services helps in the reduction of such deaths. As the findings of the present study have clearly shown, like most sub-Saharan African countries, despite the efforts made by governments in the area of social policy since the early 2000s under the auspices of the African Union (AU), the situation regarding the status of maternal health care in the continent is still dire. In fact, apart from the case of tetanus toxoid injection where 77% of the women in the sample said they had received it, the rates for the remaining measures of maternal health care utilization are simply too low

(48% attended antenatal clinics, while 55% did not use health facilities for delivery). Moreover, the findings of the study about the effects factors like urbanization, education, and wealth index illustrate the elusiveness of the policy of 'inclusive' development in the continent. Specifically, they show how some communities and sections of populations within countries have been excluded from having access to such basic social services as maternal health care services.

What this study has highlighted is the need for African governments to intensify efforts to engage with the social policy regime in the continent to ensure the socio-economic development of their peoples, especially, in the health sector, to arrest the situation where women and children die needless because of lack of access to quality health care. As already indicated, since the inception of the AU in 2002 these efforts have been intensified following

the adoption of several strategies with the aim of improving the health status of people in the African region. Among such strategies in the health sector are: *The African Health Strategy: 2007-2015, the Gaborone Declaration of 2005, the Alma Ata Declaration on Health for All through primary healthcare.* Moreover, following *The Abuja Commitment of 15% of national budget to health*, several African countries have intensified efforts to develop strategies for health care financing including delivering on the community participation and mobilization for health care provision, extensive training for community health workers, and the establishment of district health committees; restructuring of government expenditure in the health sector in favour of preventive and community health care, paying particular attention to maternal and child health services, especially immunization; family planning programmes; public health education; nutrition; sanitation; and provision of safe drinking water; and ensuring an equitable access to health for everybody via adequate social protection mechanisms (AU, 2008). Making these commitments is indeed laudable within the context of where we have come from as a continent. What is needed now is the political will to deepen the actualization of such commitments.

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Table 1: Socio-demographic characteristics of the sample in the study

Variable	Frequency	Percent
Age		
15-19	366	7.3
20-34	3498	69.9
35+	1140	22.8
Residence type		
Rural	4359	87.1
Urban	645	12.9
Religion		
Christian	4341	86.8
Muslim	569	11.4
Other	94	1.9
Marital status		
Never married	219	4.4
Married/Living together	4183	83.6
Widowed	156	3.1
Divorced/Not Living together	446	8.9
Birth order		
1	794	15.9
2-3	1371	27.4
4-5	1152	23.0
6+	1687	33.7
Educational level		
No education	1160	23.2
Primary	3060	61.2
Secondary	784	15.7
Wealth index		
Poor	2276	45.5
Middle	910	18.2
Rich	1818	36.3

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Table 2a: Relationship between Residence and Utilisation of Maternal Health Care Services

Maternal health care	Place of residence		X^2	p
	Urban	Rural		
Antenatal care visit				
no antenatal care	2.0	4.6		
1	4.7	5.6		
2	7.0	13.3		
3	22.8	29.4		
4+	60.6	46.3	**89.7**	**0.000**
Don't know	2.9	0.7		
Total	**100**	**100**		
N	**645**	**4359**		
Tetanus injection				
Received no inject.	13.5	23.9		
received	85.7	76..0	**64.0**	**0.000**
Don't know	0.8	0.1		
Total	**100**	**100**		
N	**644**	**4356**		
Place of delivery				
Home	15.7	60.5		
Public health facilities	59.4	27.1		
Private health facilities	24.8	11.0	**474.3**	**0.000**

Others	0.2	1.0
Total	**100**	**100**
N	**645**	**4357**

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Table 2b: Relationship between Age and Utilisation of Maternal Health Care Services

	Age groups				
Maternal health care	**15-19**	**20-34**	**35+**	**X^2**	**p**
Antenatal care visit					
no antenatal care	3.3	4.1	5.4		
1	6.6	5.1	6.6		
2	16.9	12.4	11.4	**22.2**	**0.014**
3	26.0	29.1	27.6		
4+	47.3	48.2	48.2		
Don't know	0.0	1.1	0.8		
Total	**100**	**100**	**100**		
N	**366**	**3498**	**1140**		
Tetanus injection					
Received no inject.	17.5	21.1	28.5		
received	82.4	78.6	71.1	**50.2**	**0.000**
Don't know	0.0	0.2	0.4		
Total	**100**	**100**	**100**		
N	**366**	**3495**	**1139**		
Place of delivery					
Home	43.2	52.5	65.2		
Public health facilities	42.3	32.5	23.8	**87.8**	**0.000**

Private health facilities	14.5	14.1	9.8
Others	0.0	0.9	1.1
Total	**100**	**100**	**100**
N	**366**	**3495**	**1139**

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Table 2c: Relationship between Education and Utilisation of Maternal Health Care Services

Maternal health care	**Educational attainment**				**X^2**	**P**
	No education	**Primary**	**Secondary**	**Higher**		
Antenatal care visit						
no antenatal care	7.7	3.8	2.4	1.4		
1	7.2	5.7	3.0	2.1		
2	13.5	14.0	7.4	5.0	**166.1**	**0.000**
3	27.3	30.4	26.3	15.6		
4+	43.4	45.4	59.1	73.0		
Don't know	0.9	0.7	1.8	2.8		
Total	**100**	**100**	**100**	**100**		
N	**1160**	**2533**	**623**	**141**		
Tetanus injection						
Received no inject.	25.6	24.3	16.4	7.1		
Received injection	74	75.5	83.1	92.8	**128.8**	**0.00**
Don't know	0.3	0.1	0.5	0.0		
Total	**100**	**100**	**100**	**100**		
N	**1158**	**2531**	**623**	**141**		

Place of delivery						
Home	73.3	58.8	23.1	11.3		
Public health facilities	19.0	29.5	49.6	51.8		
Private health facilities	6.8	10.7	26.5	36.9	**627.2**	**0.000**
Others	0.9	1.0	0.6	0.0		
Total	**100**	**100**	**100**	**100**		
N	**1159**	**2532**	**623**	**141**		

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Table 2d: Relationship between Marital Status and Utilisation of Maternal Health Care Services

Maternal health care	**Marital status**				**X^2**	**P**
	Never married	**Married/living together**	**Widowed**	**Divorced/not living together**		
Antenatal care visit						
no antenatal care	4.6	4.3	3.8	4.7		
1	5.5	5.7	5.1	4.3		
2	14.2	12.7	12.2	9.9	**18.2**	**0.252**
3	21.5	28.3	35.9	31.6		
4+	52.5	48.2	41.7	48.2		
Don't know	1.8	0.9	1.3	1.3		
Total	**100**	**100**	**100**	**100**		
N	**219**	**4183**	**156**	**446**		
Tetanus injection						
Received no inject.	18.7	22.8	22.4	22.0		
received	81.2	77.0	77.6	77.7	**32.7**	**0.111**
Don't know	0.0	0.2	0	0.2		

Total	**100**	**100**	**100**	**100**		
N	**219**	**4179**	**156**	**446**		
Place of delivery						
Home	32.9	56.0	60.9	51.3		
Public health facilities	49.8	30.1	24.4	35.4	**58.5**	**0.000**
Private health facilities	17.4	13.0	13.5	12.3		
Others	0.0	0.9	1.3	0.9		
Total	**100**	**100**	**100**	**100**		
N	**219**	**4181**	**156**	**446**		

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Table 2e: Relationship between Birth Order and Utilisation of Maternal Health Care Services

	Birth order					
Maternal health care	**1**	**2-3**	**4-5**	**6+**	**X^2**	**P**
Antenatal care visit						
no antenatal care	2.5	4.3	3.8	5.5		
1	4.5	5.8	5.0	6.1		
2	12.8	11	12.6	12.8	**41.2**	**0.000**
3	23.4	28.6	30.6	29.6		
4+	55.3	48.3	47.0	45.5		
Don't know	1.4	1.2	1.0	0.6		
Total	**100**	**100**	**100**	**100**		
N	**794**	**1371**	**1152**	**1687**		
Tetanus injection						
Received no inject.	15.7	17.2	23.2	29.8		
received	84.3	82.6	76.4	70.0	**117.7**	**0.000**
Don't know	0	0.1	0.4	0.2		
Total	**100**	**100**	**100**	**100**		
N	**794**	**1370**	**1152**	**1684**		

Place of delivery						
Home	35.0	50.5	56.8	65.9		
Public health facilities	49.0	33.5	28.2	23.1		
Private health facilities	15.7	15.1	14.1	9.8	**249.3**	**0.000**
Others	0.3	0.9	1.0	1.1		
Total	**100**	**100**	**100**	**100**		
N	**794**	**1371**	**1152**	**1685**		

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Table 2f: Relationship between Religious Affiliation and Utilisation of Maternal Health Care Services.

Maternal health care	**Religion**			**X^2**	**P**
	Christian	**Muslim**	**Other**		
Antenatal care visit					
no antenatal care	4.5	2.5	7.4		
1	5.7	3.9	7.4		
2	12.6	12.0	12.8	**17.5**	**0.064**
3	28.8	27.2	24.5		
4+	47.4	53.8	47.9		
Don't know	1.0	0.7	0.0		
Total	**100**	**100**	**100**		
N	**4341**	**569**	**94**		
Tetanus injection					
Received no inject.	22.5	21.3	33		
received	77.2	78.6	67.0	**22.0**	**0.142**
Don't know	0.3	0	0		
Total	**100**	**100**	**100.**		
N	**4338**	**568**	**94**		

Place of delivery					
Home	56.8	36.6	66.0		
Public health facilities	30.0	41.0	28.7		
Private health facilities	12.2	22.0	5.3	**103.6**	**0.000**
Others	1.0	0.4	.0		
Total	**100**	**100**	**100**		
N	**4340**	**568**	**94**		

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Table 2g: Relationship between Wealth Index and Utilisation of Maternal Health Care Services.

Maternal health care	**Wealth index**			**X^2**	**P**
	Poor	**Middle**	**Rich**		
Antenatal care visit					
no antenatal care	5.4	3.8	3.2		
1	6.5	5.2	4.4		
2	13.6	14.7	10.0	**94.7**	**0.000**
3	29.2	32.7	25.7		
4+	44.7	43.3	54.9		
Don't know	0.6	0.2	1.8		
Total	**100**	**100**	**100**		
N	**2276**	**910**	**1818**		
Tetanus injection					
Received no inject.	22.6	26.2	20.7		
received	77.2	73.7	79.0	**52.3**	**0.000**
Don't know	0.2	0	0.4		
Total	**100**	**100**	**100**		
N	**2274**	**910**	**1816**		

Place of delivery					
Home	68.7	61.6	33.6		
Public health facilities	23.3	27.0	43.3		
Private health facilities	7.0	10.4	22.3	**559.7**	**0.000**
Others	1.0	0.9	.8		
Total	**100**	**100**	**100**		
N	**2275**	**910**	**1817**		

Table 3: Logistic Regression Analysis of Utilisation of Maternal Health Care Services

VARIABLES	PANEL I		PANEL II		PANEL III	
	Antenatal care visit		Tetanus injection		Place of delivery	
	S.E.	Exp(B)	S.E.	Exp(B)	S.E	Exp(B)
Type of place of residence						
Urban	0.31	1.62**	0.13	1.66***	0.12	3.67***
Rural	1.00	1.00	1.00	1.00	1.00	1.00
Birth order						
1	0.26	1.58	0.12	1.95***	0.10	2.36***
2-3	0.18	1.04	0.09	1.86***	0.08	1.40***
4-5	0.19	1.28	0.09	1.33***	0.09	1.21*
6+	1.00	1.00	1.00	1.00	1.00	1.00
Educational level						
No education	0.16	0.49***	0.08	0.96	0.08	0.64***
Primary	1.00	1.00	1.00	1.00	1.00	1.00
Secondary+	0.28	1.36*	0.12	1.42*	0.11	2.60***
Wealth index						
Poor	1.00	1.00	1.00	1.00	1.00	1.00
Middle	0.20	1.42	0.09	0.83*	0.08	1.38***
Rich	0.16	1.70***	0.08	1.12	0.09	4.43***

*Note 1.00 is a reference category, ***P<0.001, **P<0.01 and *P<0.05, S.E- standard error, Exp(B) - odds ratios*