

Factors Associated with the Uptake of Health Facility Based Skilled Delivery Services in Kajiado Central District, Kenya

Christopher Onyango

Faculty of Tropical Institute of Community Health, Great Lakes University of Kisumu, P.O. Box 33163-00200
*Corresponding Author: chrisorao@yahoo.com

Copyright © 2014 Horizon Research Publishing All rights reserved.

Abstract In Kajiado Central District, the proportion of births delivered in a health facility is as low as 28% compared to the Kenya national average of 43% despite implementation of the community strategy in the area. The main objective of this study was to determine the factors associated with the uptake of health facility based skilled delivery in Kajiado Central District in Kajiado Kenya. This cross-sectional study used data from the project “Strengthening the Health System through Collaborative Research to Address Factors Influencing Scaling up of the Community Strategy towards Millennium Development Goals in Different Contexts in Kenya”. The unit of analysis was women of reproductive age 15-49 years (n=714). Knowledge of HIV status, use of modern family planning methods, ownership of livestock and education levels had significant associations with health facility delivery. The odds of a mother without livestock delivering in a health facility was 2.5336 times the odds of a mother with livestock (OD: 2.5336: 95% CI 1.818-3.533). More training should be done for the Community Health Workers in the area on health facility based skilled delivery with emphasis on the role of pastoralism on skilled delivery among the women of reproductive age.

Keywords Community Strategy, Community Health Workers, Health Facility Based Skilled Delivery

1. Introduction

Uptake of health facility based skilled delivery is one of the major factors affecting maternal health. Despite the presence of over 60 health facilities and implementation of the community strategy in Kajiado Central District, the region experiences one of the lowest health facility deliveries in the country at 28%. The World Health Organization (WHO) estimates that a lack of skilled attendants at birth accounts for two million preventable maternal deaths, still births and newborn deaths each year [1]. According to the Countdown

to 2015 Decade Report (2000-2010), nearly 50% of women in the 68 countries, most of which are in Sub-Saharan Africa and South Asia, still give birth without a skilled birth attendant. Delivery in a health facility is recommended as a means to reduce maternal mortality which normally results from postpartum hemorrhage, eclampsia, obstructed labor, and sepsis [2]. A review of the literature from various parts of the world shows that introduction of skilled birth attendant reduced direct obstetric mortality [3].

A joint report by WHO, UNICEF, UNFPA and the World Bank released in the year 2005 on maternal mortality estimates, revealed that sub-Saharan Africa and the south Asia account for 86% of the maternal mortality rate in the world. Kenya has an unacceptably high maternal mortality ratio at 488 maternal deaths per 100,000 live births in 2008, an increase from 414/100,000 in 2003 [4]. The importance of maternal health is best signified by its inclusion in the millennium development goals. The targets set are reduction in the maternal mortality ratio by three-quarters between the years 1990-2015. In order to efficiently monitor the progress towards meeting this particular Millennium Development Goal (MDG), several indicators such as proportion of births delivered in a health facility are being used.

The efforts made to reduce the maternal mortality ratio have therefore been focused at health facility based skilled delivery. In diverse contexts, maternal age, parity, education, family size, household wealth, socio-economic status, place of residence, availability and distance of health facilities have been found to determine the place of delivery [3]. In Kenya only 43% of births take place in a health facility [4]. With more than 50 per cent of newborn deaths occurring at home, the long term goal of ensuring all pregnant women deliver in health facilities will not be a reality in many countries for years to come.

2.1. Aim of the Study

The aim of the study is to examine the demographic, economic, and social factors that are associated with the

uptake of health facility based skilled delivery among women of reproductive age is in order to provide an understanding of the extent to which these factors affect accessibility and ability of mothers to seek skilled delivery in health facilities. Determining the knowledge and practices of women of reproductive age in the area in regards to uptake of health facility based skilled delivery, is important in establishing to what extent they affect uptake of skilled delivery services and how this information can be integrated in future interventions in the area and in the wider Sub Saharan Africa.

2. Materials and Methods

2.1. Study Design

The study was conducted using data from the project entitled “Strengthening the Health System through Collaborative Research to Address Factors Influencing Scaling up of the Community Strategy towards Millennium Development Goals in Different Contexts in Kenya”. This was a cross-sectional study in which quantitative data was collected using semi structured questionnaires. The data was collected from purposively selected community units in Kajiado Central District using the modified WHO 30 x 10 cluster sampling technique. The villages in the units formed the clusters. After the villages were identified, the enumerators moved toward the centre of the selected village, and chose a random direction by spinning a pen.

A starting household was identified at the centre of each village and enumerators interviewed qualifying index household and moved to the next nearest households until they covered at least 20 households. A household was defined as a family with one head of household, eating and sleeping under the same roof. The respondents were chosen by selecting a household and every eligible respondent in the household was included in the sample. The sampling was conducted on the household level, although the sampling unit was women of reproductive age with children under five years of age. A total of 714 households with eligible respondents were selected for the study

2.2. Study Population

The study population was women of child bearing age 15-49 years in Kajiado Central District who had a child in the past 5 years prior to the research.

2.2.1. Inclusion Criteria

Women with children under five years of age and who have been residents of Kajiado Central district for the last 3 months.

2.2.2. Exclusion Criteria

Women visiting the households in the study area at the time of data collection were excluded. All non-consenting mothers with children under five years of age were be excluded from

the study.

2.3. Selection and Training of Enumerators

Enumerators were selected from students from Great Lakes University of Kisumu. They were taken through a comprehensive training involving all aspects of the study as well as on how to administer the tool to respondents in the households.

2.4. Data Quality

Secondary unpublished data was used for this study. Before using the data, the researcher considered the reliability, suitability and adequacy of the data collected. . To ensure reliability, the researcher considered the competency of who collected the data by finding out their qualifications and experiences in qualitative data collection. Suitability was tested by the researcher scrutinizing the definition of the various terms used and the unit of collection. Similarly the researcher studied the scope and nature of the primary data. Hence the researcher found the secondary data reliable and suitable to be considered adequate for use.

2.5. Data Analysis

Statistical Package for Social Sciences (SPSS version 17) and Microsoft excel software were used for data analysis and presentation. The data was cleaned by running a frequency on all variables, identifying and correcting the wrong codes of particular questions or checking and verifying outliers. Descriptive data was presented using frequency tables and graphs. Cross tabulation involving chi-square test was used to compare variables.

2.6. Ethical Issues

The authority to conduct this study was obtained from the Institutional Research and Ethics Committee from Moi Teaching and Referral Hospital/ Moi University and Great Lakes University of Kisumu Ethical Committee. The health managers in the county were informed and authority obtained for the study. The purpose of the study was explained to the all authorities as well as the respondents who were assured of confidentiality, and only those who gave informed consent voluntarily were included in the study. The result of the study were disseminated to the relevant authorities and other interested groups.

2.7. Information Dissemination

The document will be shared and disseminated to the key stakeholders at the district and provincial level. Dissemination meetings for health managers at the district, provincial and national level will be organised to effectively share the result of the study. The Great Lakes University of Kisumu will also receive several copies of the report and

finally publishing of the research document will be arranged for wider sharing and circulation.

3. Results

3.1. Characteristics of Demographic Factors

As show in Table 1, the ages of the respondents varied, with 25.6% being between 20-24 years of age, 23.4 % being between 25-29 years of age and 18.1% being between 30-34 years of age. The lowest age group was between 45-49 years at 5.3%. The number of child varied among the respondents, with 40.6% of the respondents having between 3-4 children, and 35.9% of respondents having between 1-2 children. Only 1.3% of the respondents had between 9-10 children.

Table 1. Distribution of Demographic factors

Characteristics	Participants
Age group	
15-19	64 (9%)
20-24	183 (25.6%)
25-29	167(23.4%)
30-34	129 (18.1%)
35-39	89 (12.5%)
40-44	44 (6.2%)
45-49	38 (5.3%)
No. of Children	
1-2	256 (35.9%)
3-4	290 (40.6%)
5-6	138 (19.3%)
7-8	21 (2.9%)
9-10	9 (1.3%)
Relationship to Household Head	
Head	107 (15%)
Spouse	607 (85%)

When asked about their relationship to the household head, 85.01% of the respondents indicated that they were spouses, while 14.99% indicated they were the household head.

3.2. Characteristics of Economic Factors

Table 2 shows the distribution of economic factors. Only a small minority of the respondents (14.3%) had no source of income, with a majority (85.7%), had farming, remittances, self-employment, salaries, and others as their source of income. Most of the respondents (62.9%) were living in temporary houses, with only a minority (37.1%) living in permanent and semi-permanent houses. Most of the respondents do not have a kitchen garden (89.1%), while only 10.9% have kitchen gardens. However a majority of the respondents (70.3%) indicated that they had livestock which included cattle, goats sheep etc., while 29.7 % indicated that they did not have any type of livestock.as shown in Table 2. The results also indicated that a majority of the respondents (70%) had staple food, while only 30% indicated they did not

have staple food in the household.

Table 2. Distribution of Economic Factors

Economic Factors	Frequencies	Percent
Main source of income		
None	102	14.3%
Farming	143	20.0%
Self employed	193	27.0%
Salaried	96	13.4%
Remittances	17	2.4%
Others	163	22.8%
Type of Housing		
Temporary	449	62.9%
Semi-Permanent	210	29.4%
Permanent	55	7.7%
Have a kitchen garden		
Yes	78	10.9%
No	636	89.1%
Presence of Livestock		
Yes	503	70.3%
No	211	29.6%
Staple Food available		
Yes	500	70.0%
No	214	30.0%

3.3. Relationship between Demography Factors and Health Facility Delivery

Table 3 below shows the association between the demographic factors and health facility delivery, giving the percentage of women who delivered in the health facility per demographic factor as well as the corresponding p-value. The number of children had a significant association with health facility delivery at a p value of 0.001 as shown in Table 3. Most respondents did not deliver at the health facility across the board. However of note is that respondents with one or two children delivered more (43.8%) at the health facility than any other group as shown in Table 1 below. Age group of respondents was found to have no significant association with health facility delivery at a p-value of 0.908 (p>0.05). Relationship to household head was also found to have no significant association with health facility delivery at a p-value of 0.446 (p>0.005).

3.4. Relationship between Economic Factors and Health Facility Delivery

Table 4 shows the association between economic factors and health facility delivery. The presence of livestock had a significant association with health facility delivery at a p value of 0.000 as shown in Table 3 below. The odds of a respondent without livestock delivering in a health facility was 2.5336 times the odds of a respondent with livestock (OD: 2.5336: 95% CI 1.818-3.533). Respondents without livestock delivered more (50.2%) at the health facility than those who did not have livestock (28.5%). The presence of a kitchen garden (p-value 0.357) as well as availability of staple food (p-value 0.616) did not have a significant association with health facility delivery shown in Table 3.

Table 3. Demographic Factors associated with uptake of Health facility based skilled delivery services

Demographic Factors	Health Facility Delivery		X ²	Df	p-value
	Yes	No			
Age group					
15-19	24 (37.5%)	40 (62.5%)	2.124	6	0.908
20-24	66 (36.1%)	117 (63.9%)			
25-29	62 (37.1%)	105 (62.9%)			
30-34	40 (31.0%)	89 (69.0%)			
35-39	32 (36.0%)	57 (64.0%)			
40-44	13 (29.5%)	31 (70.5%)			
45-49	13 (34.2%)	25 (65.8%)			
No. of children					
1-2	112 (43.8%)	144 (56.3%)	18.344	4	0.001
3-4	97 (33.4%)	193 (66.6%)			
5-6	36 (26.1%)	102 (73.9%)			
7-8	4 (19.0%)	17 (81.0%)			
9-10	1 (11.1%)	8 (88.9%)			
Relationship to Household head					
Head	34 (31.8%)	73 (68.2%)	0.580	1	0.446
Spouse	216 (35.6%)	391 (64.4%)			

Table 4a. Economic factors associated with uptake of health facility based skilled delivery services

Economic Factors	Health Facility Delivery		X ²	Df	Odds Ratio (95% CI)	p-value
	Yes	No				
Have a kitchen garden						
Yes	31 (39.7%)	47(60.3%)	0.861	1	1.256 (0.776-2.034)	0.357
No	219 (34.4%)	417 (65.6%)				
Presence of Livestock						
Yes	143 (28.5%)	359 (71.5%)	30.925	1	2.5336(1.818-3.533)	0.000
No	106 (50.2%)	105 (49.8%)				
Staple Food available						
Yes	178 (35.6%)	322(64.4%)	0.252	1	1.0 (0.778-1.528)	0.616
No	72 (33.6%)	142 (66.4%)				

Table 4b. Economic factors associated with uptake of health facility based skilled delivery services

Economic Factors	Health Facility Delivery		X ²	Df	P value (Correlation Coefficient)
	Yes	No			
Main source of income					
None	33(32.4%)	69 (67.6%)	23.389	5	0.000
Farming	54(37.8%)	89 (62.2%)			
Self employed	84 (43.5%)	109 (56.5%)			
Salaried	40 (41.7%)	56 (58.3%)			
Remittances	5 (29.4%)	12 (70.6%)			
Others	34 (20.9%)	129 (79.1%)			
Type of Housing					
Temporary	133 (29.6%)	316 (70.4%)	29.304	2	0.000 (0.171)
Semi-Permanent	81 (38.6%)	129 (61.4%)			
Permanent	36 (65.5%)	19 (34.5%)			

Table 5. Association between Social factors and health facility delivery

Social Factors	Health Facility Delivery		X ²	df	P value (correlation coefficient)
	Yes	No			
Level of Education					
None	79 (22.2%)	277 (77.8%)	60.894	2	0.000 (0.291)
Primary	98 (42.1%)	135 (57.9%)			
Secondary	73 (58.4%)	52 (41.6%)			
Religious Affiliation					
Anglican	42 (35.0%)	78 (65.0%)	23.609	6	0.001
Catholic	27 (46.6%)	31 (53.4%)			
SDA	21 (52.5%)	19 (47.5%)			
indigenous church	46 (28.2%)	117 (71.8%)			
Muslim	8 (80.0%)	2 (20.0%)			
None	5 (20.0%)	20 (80.0%)			
Others	101 (33.9%)	197 (66.1%)			
Affiliation to a social group					
Women/Men group	143 (34.0%)	278 (66.0%)	3.341	4	0.502
Youth	55 (39.6%)	84 (60.4%)			
Church	12 (44.4%)	15 (55.6%)			
None	36 (31.0%)	80 (69.0%)			
Others specify	4 (36.4%)	7 (63.6%)			

Table 4b also shows the association between economic factors and health facility delivery. The main source of income had a significant association with delivery in a health facility at a p-value of 0.000 with respondents who indicated self-employment as their main source of income delivering more in the health facility (43.5%) than any other group (Table 4b). The type of housing had a significant association with delivery in a health facility at a p-value of 0.000. There was a positive correlation between type of housing and health facility delivery (0.171) with respondents who had permanent housing delivering more in the facility (65.5%) than any other group. Respondents who lived in permanent housing were 4.5 times more likely to deliver in a health facility than respondents living in temporary housing (OD: 4.502; 95% CI; 2.492-8.134).

3.5. Relationship between Social Factors and Health Facility Delivery

Table 5 shows the association between social factors and health facility delivery. The level of education had a significant association with health facility delivery at a p value of 0.000 as shown in Table 5. There was a positive correlation between level of education and health facility delivery (Correlation coefficient 0.291) with respondents who had secondary level of education delivering more at the health facility (58.4%) more than any other group. Respondents who had no education had the lowest delivery rate at the health facility (22.2%). Respondents with secondary education were 4.922 times more likely to deliver

at the facility than respondents with no education (OD: 4.922; 95% C.I. 3.187-7.603).As shown in Table 5, there was a significant association between Religious Affiliation and health facility delivery at a p-value of 0.0001. Of noteworthy is that respondents of the Christian religion specifically SDA, delivered more in the health facility than any other group (52.5%). Although Muslims formed only 1.8% of the population, they had the highest percentage of respondents who delivered in a health facility at 80%, while the lowest percentage of respondents who delivered in a health facility was found to be among those who did not have any particular religious affiliation, at 20%.

There was no significant association between affiliation to a social group and health facility delivery at a p-value of 0.502 (Table 5). Respondents who belonged to a youth group marginally delivered more (39.6%) at the health facility than any other group.

3.6. Distribution of Knowledge and Practice Factors

Table 6 below shows the distribution of knowledge and practice factors. In this study, only 35% of the respondents delivered in the facility, while 65% did not deliver at the health facility. When asked about whether they knew about their HIV Status, 56.7% of respondents knew about their HIV status, while 43.3% of the respondents did not know about their HIV status (Table 6 below). More than half of the respondents indicated they had knowledge of modern family planning methods (56%) however only 16.9% indicated that they use modern family planning methods..

Table 6. Distribution of knowledge and practice factors

Knowledge and Practice Factors	Frequencies	Percent
Knowledge of HIV status		
Yes	405	56.7%
No	309	43.3%
Knowledge of family planning methods		
Yes	400	56.0%
No	314	44.0%
ANC Attendance		
None	115	16.1%
Less than 4 Times	132	18.5%
4 times	326	45.7%
More than 4 times	141	19.7%
Use of Modern Family Planning methods		
Yes	121	16.9%
No	589	82.5%
TT Injection		
Yes	659	92.3%
No	51	7.6%
ITN Use		
Yes	341	47.8%
No	373	52.2%
Place of Seeking Treatment		
No Treatment	22	19.5%
Health Facility	78	69%
TBA/CHW	1	0.9%
Self-Medication	11	9.7%
Others Specify	1	0.9%
Time taken to reach facility		
Less than 30 min	31	27.4%
30min - 1 hr	50	44.2%
More than one hour	32	28.4%

When asked about the number of ANC visits made in the last pregnancy, 45.7% of the respondents had attended ANC 4 times while only 16.1% had not attended ANC at all (Table 6 above). More than half of the respondents were not using Insecticide Treated Nets (ITNs) (52.2%) with 47.8% of the respondents using ITNs. A majority of the respondents (71.6%) did not take more than an hour to reach the health facility, while only 28.4% took more than an hour

3.7. Relationship between Knowledge and Practice Factors and Health Facility Delivery

Knowledge of HIV Status

Table 7 shows the association between knowledge and practice factors and health facility delivery. There was a significant association between knowledge of HIV Status and health facility delivery at a p-value of 0.000. Respondents did not deliver at the health facility across the board, however respondents who had knowledge of their HIV status delivered more at the health facility (47.2%) than those who did not have knowledge of their HIV status (19.1%). The results in Table 7 below showed that the odds of respondents who had knowledge of their HIV status delivering at health facility was 3.782 times the odds of respondents who did not have knowledge of their HIV Status (OR: 3.782; 95% CI :2.680-5.336)

Knowledge of Modern Family Planning Methods

There was a significant association between knowledge of modern family planning methods and health facility delivery at a p-value of 0.000 (Table 7). Respondents did not deliver at the health facility across the board. However respondents who had knowledge of family planning methods delivered more at the health facility (43.8%) more than respondents who did not have knowledge about family planning methods. The odds of delivering at the health facility among respondents who did had knowledge about family planning methods was 2.479 times that of respondents who did not have knowledge about family planning methods (OD: 2.479; 95% CI:1.789-3.439) as shown in Table 7.

Use of Modern Family Planning Methods

There was a significant association between use of modern family planning methods and health facility delivery at a p-value of 0.002 (Table 7). Respondents who use modern family planning methods delivered more at the health facility (47.1%) more than respondents who did not use modern family planning methods. The odds of delivering at the health facility among respondents who used modern family planning methods was 1.856 times the odds of respondents who did not use modern family planning methods (OD: 1.856; 95% CI:1.248-2.759) as shown in Table 7.

Use of Insecticide Treated Nets (ITNs)

There was a significant association between the use of ITNs and health facility delivery at a p-value of 0.002 (Table

7). Respondents who used ITNs delivered more at the health facility (41.3%) more than respondents who did not use ITNs. The odds of delivering at the health facility among respondents who used ITNs was 1.708 times the odds among respondents who did not use ITNs (OD: 1.708; 95% CI: 1.252-2.329) as shown in Table 7.

ANC Attendance

There was a significant association between ANC attendance and health facility delivery at a p-value of 0.000 as shown in Table 7. The number of respondents who did not deliver at the health facility varied across the board, however respondents who attended ANC 4 times delivered more at the health facility (49.1%) more than any other group (Table 7). Women who attended ANC four times were 12.6 times more likely to deliver in a health facility than women who did not attend ANC at all (OD: 12.588; 95% C.I 4.365-36.303).

TT Injection

There was no significant association between TT injection

and health facility delivery at a p-value of 0.107 as shown in Table 7. Respondents did not deliver at the health facility across the board, but of noteworthy is that respondents who had TT injection in their last pregnancy delivered more at the health facility (36%) than those who did not have TT injection in their last pregnancy (24.5%).

Time Taken to Reach the Facility and Place of seeking Treatment

There was no significant association between time taken to reach the facility and health facility delivery at p-value of 0.085 as shown in Table 7. Of noteworthy is that respondents who took less than 30 minutes to reach the facility delivered more at the health facility (41.7%) than any other group. There was no significant association between where treatment was sought and health facility delivery at a p-value of 0.732 as shown in Table 7. 29.5% of respondents who went for treatment at the health facility also delivered at the health facility while 70.5% of respondents who sought treatment at the health facility did not deliver at the facility.

Table 7. Association between knowledge and practice factors and health facility delivery

Knowledge and Practice Factors	Health facility delivery		X ²	df	Odds Ratio (95% CI)	P value
Knowledge of HIV status						
Yes	191 (47.2%)	214 (52.8%)	60.678	1	3.782(2.680-5.336)	0.000
No	59 (19.1%)	250 (80.9%)				
Knowledge of family planning methods						
Yes	175 (43.8%)	225 (56.3%)	30.506	1	2.479 (1.789-3.439)	0.000
No	75 (23.9%)	239 (76.1%)				
Use of Modern Family Planning methods						
Yes	57 (47.1%)	64 (52.9%)	9.517	1	1.856 (1.248-2.759)	0.002
No	191(32.4%)	398 (67.6%)				
ITN Use						
Yes	141 (41.3%)	200 (58.7%)	11.513	1	1.708 (1.252-2.329)	0.001
No	109 (29.2%)	264 (70.8%)				
ANC Attendance						
None	4 (3.5%)	111(96.5%)	80.099	3		0.000
Less than 4 Times	42 (31.8%)	90 (68.2%)				
4 times	160 (49.1%)	166 (50.9%)				
More than 4 times	44 (31.2%)	97 (68.8%)				
TT Injection						
Yes	236(36.0%)	420(64.0%)	4.641	3		0.107
No	13 (24.5%)	40 (75.5%)				
Don't Know	0 (.0%)	3 (100.0%)				
Don't Remember	1 (50.0%)	1 (50.0%)				
Place of Treatment						
No treatment	8(36.4%)	14 (63.6%)	2.02	4		0.732
Health facility	23(29.5%)	55 (70.5%)				
TBA/CHW	0(,0%)	1(100.0%)				
Self-Medication	2 (18.2%)	9 (81.8%)				
Others Specify	0(.0%)	1 (100.0)				
Time taken to reach facility						
Less than 30 min	78 (41.7%)	109 (58.3%)	4.930	2		0.085
30min - 1 hr	128 (32.8%)	262 (67.2%)				
More than one hour	44 (32.4%)	92 (67.6%)				

4. Discussion

4.1. Respondent's Age

In this study there was no significant relationship between the age of the respondent and delivery in a health facility at a p-value of 0.908. This concurs with a study which found no significant association between maternal age and place of delivery [5]. Majority of the respondents were young, falling between the ages of 20-34 (67.1%), this may be because of the fact that most of the women are married at a young age, and therefore begin having children early probably as a result of cultural expectations which regard childbearing as an enhancement to women's status in the society as well as circumcision rites which facilitate entry to adulthood. However the finding contrast with a study done by Wanjira [6] which found that younger mothers were more likely to utilize skilled attendants during delivery than their elder counterparts.

4.2. No. of Children

There was a significant relationship between the number of children per respondent and the uptake of health facility skilled delivery services in this study at a p-value of 0.001. Most respondents did not deliver at the health facility across the board. However of note is that respondents with one or two children delivered more (43.8%) at the health facility than any other group. This may be due to a woman with more children having a greater experience of childbirth, having limited resources or having a busy schedule. On the other hand women pregnant with their first child or with fewer children tend to be more careful about pregnancy, due to their limited experience in child birth, and are therefore more willing to seek skilled attendance at the health facility. This corresponds to a study done in Uganda which showed statistical significance between parity and skilled delivery [7]. Women who had parity of one or two were more likely to choose assistance by skilled birth attendance at the health facilities than those who had parity of five or more.

4.3. Relationship to Household Head

While only a small minority (14.99%) of the women were household heads, with a majority (85.11%) being spouses, there was no significant relationship between household head and health facility delivery (p=0.446). The study indicated that there was no significant difference in uptake of health facility based delivery between women living in male-headed households and those who were household heads. This shows that uptake of health facility based skilled delivery is not associated with the position of the woman in the household in the study, however other factors such as experience in child birth may play a more significant role as to whether or not the woman delivers in a health facility. However this contrast is shown in a study done in rural Tanzania [8], which found that women, who lived in

male-headed households, were less likely to deliver in a health facility than women in female-headed households.

4.4. Main Source of Income

There was a significant association between the main source of income in the respondent's household and household delivery at a p-value of 0.000 (Table 4). The highest percentage of those who delivered at the health facility was among respondents whose main source of income was either from self-employment (43.5%), or salaries (41.7%). The highest percentage of those who did not deliver at the health facility were those who did not have any source of income (67.6%) and among those who did not have a definite source of income (79.1%). This may be because respondents in households with poor source of income may not be able to deal with cost associated with health facility delivery such as transport to the facility, and hiring someone to stay in the household to take care of the remaining child and tend to household chores. The findings concurred with a study done in Northwest Ethiopia [8] which found that women living in kebeles with mixed (farming and trading) source of income were utilizing significantly more skilled delivery and postnatal care than those living on farming only. The finding indicates that the presence of different sources of income for covering payments of transportation and other services contributed to the existence of higher rate of expensive maternal services in the communities.

4.5. Type of Housing

There was a significant association between the type of housing and delivery in the health facility (p-value=0.000). A majority of the respondents (62.9%) were living in temporary housing, while 29.4 % were living in semi-permanent housing and only 7.7% were living in permanent houses. The highest percentage of respondents who delivered in the health facility were among those who live in permanent houses (65.5%), while the lowest percentage was among the respondents who live in temporary houses (29.6%). Type of housing is an indicator of the economic status, therefore respondents living in permanent houses have a better economic status than those in temporary houses, and hence more likely to deliver in a health facility.

4.6. Presence of a Kitchen Garden

The study found that there was no significant relationship between presence of a kitchen garden and delivery in a health facility at a p-value of 0.357. A majority of the respondents did not have a kitchen garden (89.1%), while only 10.9% have kitchen gardens. Among the respondents who had kitchen gardens, 39.7% delivered in a health facility, while among those who did have kitchen gardens, 34.4% delivered in a health facility.

4.7. Presence of Livestock

There was a significant relationship between presence of livestock and delivery in a health facility (p -value=0.000). Further analysis showed that the odds of a respondent without livestock delivering in a health facility was 2.5 times the odds of a respondent with livestock (OD: 2.5336; 95% CI 1.818-3.533). A majority of the respondents (70.3%) indicated that they had livestock which included cattle goats sheep etc, while 29.7% indicated that they did not have any type of livestock. Among the respondents who had livestock, 28.5% delivered in a health facility, while 50.2% of those who did not have livestock delivered in a health facility. The traditional Maasai lifestyle centres on their cattle, their primary source of food. Maasai women are responsible for building their homes, which are made from mud, sticks, grass, cow dung and urine. Women also milk the cows, collect water, cook and look after the children. Hence a woman living in a household with livestock may prefer to deliver at home because of her crucial role of providing for the household through milking of the cows which she may not be able to do if she spends time away in the facility after delivery. The childbirth process is also symbolically described using cattle. Once the TBA confirms to the father the sex of the child, different celebrations take place. For a boy, a bull will be slaughtered so that the mother can drink the blood and be able to breastfeed him well, while a calf will be slaughtered for a mother who has given birth to a girl so that she is fed on its blood. However no quantitative study was found that investigated the relationship between the livestock and health facility delivery. A study done by found that place of delivery was significantly associated with pastoralism [9].

4.8. Availability of Staple Food

The study found no significant relationship between availability of staple food and delivery in a health facility. A majority of the respondents (70%) had staple food, while only 30% indicated they did not have staple food in the household. Among the respondents who had staple food, 35.6% delivered in a health facility while 33.6% of those who did not have staple food delivered in a health facility. This contrasts to a study which was done by in Uganda [10], which revealed that food as an economic factor was viewed as a basic need, which once its available the women are able to have time and peace of mind of considering delivering in the facility.

4.9. Education Level

The level of education had a significant association with health facility delivery at a p value of 0.000. Most of the respondents (49.9%) did not have any form of education, while 32.6% had primary level of education, while 17.5% had secondary level of education. Further analysis showed there was a positive correlation between level of education

and health facility delivery (Correlation coefficient 0.291) with respondents who had secondary level of education delivering more at the health facility (58.4%) more than any other group. The lowest percentage of health facility delivery was among respondents who had no form of education (22.2%). This may be because education is likely to enhance health education on the importance of delivery in a health facility and pregnancy complications, hence the higher the level of education, the more likely a woman will deliver in a health facility. This finding corresponds to a study done in Ghana [11] which found maternal education was strongly associated with use of skilled delivery.

4.10. Religion of Respondents

The study found a significant association between religion and delivery in a health facility with a p -value of 0.001. Most of the respondents belonged to other religions such as Pentecostal churches, Lutheran, Methodist etc. (41.7%), while 22.8% belonged to an indigenous church, and 16.6% belonged to the Anglican church. 52% of SDAs and 48% of Catholics delivered in the health facility, compared to 28.2% of respondents belonging to the indigenous church and 20% who had no particular religious affiliations. These findings concur with a qualitative study from Tigray region, which revealed a major impact of religion where women relying on God's will during delivery decided to stay at home [12]. However a study done in Nepal [13] did not find any significant association between religious affiliation and place of delivery.

4.11. Affiliation to a Social Group

The study found no significant association between affiliation to a social group and delivery in a health facility ($p > 0.05$). While 16.2% of the women were not in any social group, 59% of the respondents were affiliated to a women group, with 19.5% being affiliated to a youth group.

4.12. Knowledge of HIV Status

The study found a significant association between knowledge of HIV status and health facility delivery at a p value of 0.000. Among the respondents who had knowledge of their HIV status, 47.2% delivered in the health facility, while only 19.1% of those who did not have knowledge of their HIV status delivered in the health facility. 52.8% of respondents who had knowledge of their HIV status did not deliver at the health facility while 80.9% of those who did not have knowledge of their HIV status did not deliver at the health facility. Further analysis showed that the odds of respondents who had knowledge of their HIV status delivering at health facility was 3.782 times the odds of respondents who did not have knowledge of their HIV Status (OR: 3.782; 95% CI :2.680-5.336). This may be because women who did not know their HIV status did not go to the health as a result of fearing they may have to undergo a HIV

test. A study conducted in Migori [14] found that health facility birth is commonly viewed as most appropriate for women with pregnancy complications, such as HIV. The study found that women with more negative attitudes about people living with HIV were less likely to deliver at a health facility than those with more positive attitudes towards HIV-positive people.

4.13. Knowledge of Modern Family Planning Methods

There was a significant association between knowledge of modern family planning methods and skilled delivery in the study at a p value of 0.000. Among the respondents who had knowledge about modern family planning methods, 43.8% delivered in the health facility, compared to only 23.9% of respondents who did not know about family planning methods, while 76.1% of respondents who did not know about modern family planning methods did not deliver at the health facility compared to 56.3% of respondents who knew about modern family planning methods. Further analysis showed that the odds of delivering at the health facility among respondents who did have knowledge about family planning methods was 2.479 times that of respondents who did not have knowledge about family planning methods (OD: 2.479; 95% CI:1.789-3.439) as shown in Table 7. This may be because women who have knowledge about the different modern family planning methods are also more likely to accept what can be perceived as modern health practices such as health facility delivery. This concurs with a study done in Ethiopia [5], which showed that knowledge of modern family planning methods was a determinant of skilled birth attendance.

4.14. Number of ANC Visits

There was a significant association between the number of ANC visits and health facility delivery at a p value of 0.000 in the study as shown in Table 7. A majority of the respondents had attended ANC four or more times (65.4%) while 18.5% had attended ANC less than four times and 16.1% had not attended ANC at all during their last pregnancy. Among women who attended ANC at least four times, 49.1% delivered at the health facility, while only 3.5% of women who did not attend ANC at all delivered at a health facility.

However, 50.9% of women who attended ANC 4 times did not deliver at the health facility, this may be attributed to abrupt delivery, forcing the mother to give birth at home, without skilled attendance. Widely held beliefs among Maasai women that pregnancies labeled as normal during ANC visits will result in successful deliveries at home may also be a contributing factor. The findings of this study corresponds with the KDHS 2008-9, which showed that children whose mothers had more antenatal care visits during the pregnancy were less likely to deliver at home. This may be because women who receive less antenatal care visit during pregnancy were more likely to choose home delivery. Women, who receive ANC visits, are able to interact with the

health facilities, know the current pregnancy status including possible risks and feel the importance of skilled care attendance during delivery, which in turns discouraged them to deliver at home without skilled birth attendant..

4.15. Use of Modern Family Planning Methods

The study revealed that there was a significant association between use of modern family planning methods and Health facility delivery ($p=0.002$). Among respondents who use modern family planning methods, 47.1% delivered in the health facility compared to 32.4% who do not use modern family planning methods. This is may be because women who use modern family planning methods visit the health facility more often to obtain contraceptives, where they also get more health education regarding importance of ANC as well as delivery in a facility. This concurs with a study done in Northwest Ethiopia [5] which showed an association between family planning and delivery in a health facility.

4.16. Tetanus Injection

There was no significant association between tetanus injection and delivery in the health facility ($P=0.107$). In practice, Tetanus toxoid (TT) immunization is given to pregnant women to prevent neonatal tetanus and can be an indicator as to whether or not the pregnant woman actually went to the health facility during pregnancy or actively attended ANC before delivery. A majority of the respondents (91.9%) received the tetanus toxoid immunization during their last pregnancy. Among these, 36% of respondents who received tetanus injection in their last pregnancy delivered in the health facility while 24.5% of respondents who did not receive tetanus injection delivered in the health facility. A study done in Bangladesh [15] found that while women were not keen about having regular antenatal check ups, they were eager to have the tetanus toxoid injection. This shows that they understand the importance of the injection the safety of their pregnancy.

4.17. Use of Insecticide Treated Nets (ITNs)

The study found a significant association between use of ITNs and health facility delivery at a p-value of 0.0002 . 41.3% of the respondents who use ITNs delivered in the health facility while 29.2% of respondents who do not use ITNs delivered in the health facility. Further analysis showed that the odds of delivering at the health facility among respondents who used ITNs was 1.7 times the odds among respondents who did not use ITNs (OD: 1.708; 95% CI: 1.252-2.329) as shown in Table 7. Scaling up the use of ITNs and protecting 80 percent of children under five and pregnant women against malaria in Africa by the year 2010 is one of the targets set at the Abuja summit by African Heads of State in 2000. In an effort to scale up the use of ITNs, different mechanisms of delivering ITNs to vulnerable groups have been used in Kenya. Delivery mechanisms used include

routine clinic delivery, mass campaigns, retail social marketing, and the commercial sector. Most of the respondents in the study received their ITNs through the health facility, due to the prevalent low economic status. As a result, out of the 47.6% of respondents who indicated they use ITNs, a good number (41.3%) indicated they delivered in the health facility. This may be because of receiving information on importance of delivering in the health facility, when they were given ITNs. A study done in Uganda [15] found that ITNs were used by 239 (31.3%) of women during pregnancy and 314 (40.8%) delivered their most recent pregnancy outside a health facility.

4.18. Time Taken to Reach the Facility

The study found no significant association between time taken to the health facility and health facility delivery ($p > 0.05$). 44.2% of the respondents indicated they took 30mins-1hr, 28.3% took more than one hour, while 27.4% took less than 30min. 41.7% of respondents who delivered take less than 30min to reach the health facility, delivered at the health facility, while 32.8% of respondents who take 30min-1 hour to reach the health facility delivered at the health facility. However the findings contrast to a study done in Nepal [17] which found that distance to the health facility was one of the reasons that the mothers did not seek skilled delivery.

4.19. Place of Seeking Treatment

The study found no significant association between where treatment was sought during illness and Health facility delivery ($p = 0.732$). 29.5% of respondents who sought treatment at the health facility when a household member was sick 2 weeks prior to the study had delivered their last child under 5 years at the health facility, while 70.5% of respondents who sought treatment at the health facility did not deliver at the facility. This shows that a large majority of the women were willing to go to the facility in case of illness, but were not ready to go to the facility to give birth. No study was found which had investigated the relationship between place of seeking treatment during illness and health facility delivery.

5. Conclusions

In conclusion, this study demonstrated that there is a high percentage of women not delivering at health facilities in the district despite interventions both by the government and NGOs especially through the implementation of the community strategy. Among the demographic factors, the number of children per respondent was found to be significantly associated with the uptake of health facility based skilled delivery ($p = 0.001$) while age of respondent ($p = 0.908$) and relationship to the household head (0.446) were not significantly associated with uptake of health

facility based delivery.

The economic factors that were significantly associated with the uptake of health facility based skilled delivery included main source of income ($p = 0.000$), type of housing ($p = 0.000$), and presence of livestock (0.000) while presence of a kitchen garden (0.357) and availability of staple food (0.616) were not significantly associated with the uptake of health facility based skilled delivery. There was a positive correlation between the type of housing and uptake of health facility based skilled delivery (0.171)

Among the social factors found to be significantly associated with the uptake of health facility based skilled delivery includes level of education of respondents (0.000) and religious affiliation (0.001) while affiliation to a social group was found not to be significantly associated with the uptake of skilled delivery. There was a positive correlation between the level of education and uptake of health facility based skilled delivery (0.291)

In terms of knowledge and practice, knowledge of HIV status (0.000), knowledge of modern family planning methods (0.000), number of ANC visits, use of modern methods of family planning (0.002), use of ITNs (0.001), had a significant relationship with the uptake of health facility based skilled delivery while receipt of tetanus injection (0.107), place of treatment (0.732), and time taken to reach the facility (0.805) had no significant relationship with the uptake of health facility based skilled delivery. The study found that the odds of a woman using modern family planning methods delivering in a health facility was 1.856 the odds of a woman not using modern family planning methods delivering at the health facility (OD: 1.856, 95% CI: 1.248-2.759). Further analysis showed that the odds of a respondent who has knowledge of her HIV status delivering at the health facility was 3.782 times the odds of a respondent who does not have knowledge of her HIV status delivering at the health facility.

Acknowledgements

My sincere gratitude to my wife, Gladys Chebet who has been very supportive during the time I conducted this study and its subsequent publication. Thanks to the staff at Great Lakes University of Kisumu, who were very instrumental in this study, as well as to the community of Kajiado, from whom the data used in this study was collected.

REFERENCES

- [1] World Health Organization, Pregnancy, childbirth, postpartum and newborn care: a guide for essential practice. WHO, Geneva.2010
- [2] M. Nawal, An Introduction to Maternal Mortality, Rev Obstet Gynecol, 1(2): 77-81, 2008

- [3] Yalem, Determinants of Antenatal Care, Institutional Delivery and Skilled Birth Attendant Utilization in Samre Saharti District, Tigray, Ethiopia Umeå International School of Public Health Department of Public Health and Clinical Medicine Epidemiology and Global Health. Umeå University. Sweden, 2010
- [4] Kenya Demographic and Health Survey 2008-09. Calverton, Maryland: KNBS and ICF Macro.
- [5] Mengesha ZB, Biks GA, Ayele TA, Tessema GA, Koye DN. Determinants of skilled attendance delivery in Northwest Ethiopia: a community based nested case control study, *BMC International Health and Human Rights*, 13: 111-122, 2010
- [6] C. Wanjira, M. Mwangi, E. Mathenge, G. Mbugua, Z. Ng'ang'a, Delivery Practices and Associated Factors among Mothers Seeking Child Welfare Services in Selected Health Facilities in Nyandarua South District, Kenya, *BMC Public Health* 2011, 11:360, 2011
- [7] K. Jerome, Kabakyenga, P. Östergren, E. Turyakira, K. Pettersson, Influence of Birth Preparedness, Decision-Making on Location of Birth and Assistance by Skilled Birth Attendants among Women in South-Western Uganda. *PLoS ONE* 7(4): e35747. doi: 10.1371/journal.pone.0035747, 2012.
- [8] M. Mrisho, J. Schellenberg, AK Mushi, B. Obrist, H. Mshinda, M. Tanner, D. Schellenberg, Factors affecting home delivery in rural Tanzania, *Trop Med Int Health*, Jul;12(7):862-72, 2007
- [9] M. Mekonnen, K. Yalew, J. Umer, M. Melese, Determinants of delivery practices among Afar pastoralists of Ethiopia. *Pan Afr Med J.* 17, 2012
- [10] T. Mutyaba, E. Faxelid, F. Mirembe, E. Weiderpass, Influences on uptake of reproductive health services in Nsangi, *Reproductive Health* 4:4 doi:10.1186/1742-4755-4-4, 2007
- [11] R. Ekena, M. Sappor, Factors Associated With The Utilization Of Skilled Delivery Services In The Ga East Municipality Of Ghana: Demographic Characteristics, *International Journal Of Scientific & Technology Research* Volume 2, pp 55-64, 2013
- [12] Y. Baral, K. Lyons, J. Skinner, E. Tejjingen, Determinants of skilled birth attendants for delivery in Nepal, *Kathmandu Univ Med J*, 31:324-332, 2010
- [13] J. Turan, H. Abigail, J. Medema-Wijnveen, M. Onono, S. Miller, A. Elizabeth, B. Turan, R. Craig, Cohen, The Role of HIV-Related Stigma in Utilization of Skilled Childbirth Services in Rural Kenya: A Prospective Mixed-Methods Study. DOI: 10.1371/journal.pmed.1001295, 2012
- [14] A. Mushtaque R. Chowdhury Amina Mahbub Anita Sharif Chowdhury, Skilled Attendance at Delivery in Bangladesh: an Ethnographic Study. *Research and Evaluation Division, BRAC*, 75, 2003
- [15] S. Kiuwua and P. Mufubenga, Use of antenatal care, maternity services, intermittent presumptive treatment and insecticide treated bed nets by pregnant women in Luwero district, Uganda, *Malaria Journal*, 7:44 doi:10.1186/1475-2875-7-44, 2008
- [16] S. Dhakal, E. Tejjlingen, E. Raja1, K. Bahadur Dhakal, Skilled Care at Birth among Rural Women in Nepal: Practice and Challenges. *J Health Population Nutr Aug;29(4):371-378*, 2011