Factors Associated With Home Maternal Deliveries in Rural Areas

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Abstract- Home maternal deliveries are deliveries conducted at home environment or any other place other than hospital. The MDG no. 5 targeted to increase women being attended by skilled health personnel to 90 %. In the year 2012-2013, 56 % of mothers in Kenya delivered at home and 488/100000 mothers died as a result of complications. Nakuru County recorded 58 % while Rongai had 73 % of the mothers who delivered at home. A case control study was conducted to find out the factors contributing to home maternal deliveries in Rongai. The objective of the study was to find out the factors influencing home maternal deliveries and data was collected using semi structured questionnaires where Stratified and purposive sampling methods were used to select subjects, 108 as cases and 42 as controls. Women between 19-49 years and brought their children for initial vaccination were included in the study. Filled questionnaires were analyzed using odds ratio and presented using frequency distribution tables and figures. The research findings indicated that knowledge, attitudes and practices during delivery were associated to home delivery. Lack of knowledge on safe delivery, negative attitude and bad practices influenced home delivery. The researcher recommends research on quality of hospital services.

ABBREVIATIONS AND ACRONYMS

CDC…….. Center of Disease Control
HIV ---- ----Human Immune Deficiency
KAIS ---- --Kenya Aids Indicators
KDHS ----- Kenya Demographic Health Survey
KEPH ----- Kenya essential package for health
KBS-------Kenya Bureau of Statistics
KSPA-------Kenya Service Provision Assessment
MDG--------Millennium Development Goals
MMR……Maternal Mortality Ratio
MOPHS…Ministry of Public Health and Sanitation.
NHSSP ---- National Health Sector Strategic Plan
HIS………Health Information System
SCMOH ------Sub County Medical Officer of Health
TBA----------Traditional Birth Attendant
WHO--------World Health Organization

DEFINITION OF TERMS

Emergency obstetric care

These are minimal health care elements which are given to all women during pregnancy and delivery including life saving an emergency care like manual removal of placenta, caesarean section, non emergency care like active management of third stage of labor and use of partogragh in monitoring. It can be basic or comprehensive care.

Home Maternal deliveries

These are maternal deliveries conducted at home environment or any other place other than hospital set up.

Maternal mortality

A maternal death is passing on of a woman while pregnant or within 42 days of termination of pregnancy irrespective of the duration and site of pregnancy from any cause related to or aggravated by the pregnancy or its management but not accidental or incidental.

Skilled attendant

This refers to exclusively people with midwifery skills who have been trained to proficiency in the skills to manage normal deliveries and diagnose or refer obstetric complications like doctors, nurses, clinical officers, midwives.

I. INTRODUCTION

Home maternal deliveries are deliveries conducted at home environment other than hospital without the assistance of a skilled attendant. Mothers who deliver their babies without a health worker server more complications than their counterparts who deliver in hospital. Therefore the survival and health of mothers including infants is a human right imperative (Kenya constitution 2010). The health of both the mother and the infant has enormous socio-economic ramifications and is a crucial international development priority as it indicated in the vision 2030 and in the MDGs. One of the strategies for the accomplishment of the goal was all pregnant women have access to skilled care at the time of birth and all those pregnant women with complications have timely access to quality emergency obstetric care (Mophs, 2008). Complications of pregnancy and childbirth are among the leading causes of morbidity and mortality among Kenyan women. In 1990 there were 523000 deaths of mothers and in 2013, 189 000 maternal deaths occurred, a decline of 2.6 % per year (WHO, 2014). Majority of these deaths were due to one or more preventable direct obstetric complications, such as Postpartum hemorrhage (PPH), puerperal sepsis/infections, hypertensive disorders, obstructed labor, ruptured uterus, and lifelong disabilities such as disteric fistula. These conditions mostly occur and come severe in home conducted deliveries or deliveries without skilled attendance mostly in rural areas (KSPA, 2011). Universal access to high quality pregnancy and delivery care including an appropriate and effective referral system and emergency obstetric care at the hospital are paramount to a pregnant woman (Saffron et al 2011, BMC public health).

Maternal health has been a global health priority and a target in MDG framework, which was a 75 % decrease in MMR

and 90 % of women having skilled attendance during delivery between 1990 and 2015. Globally, there were an estimated 289 000 maternal deaths in 2013 a decline of 45 % in 1990. Majority of these deaths occurred in low-resource settings and rural areas where only 50 % women get attended by health professional during pregnancy and child birth. Developing nations account for 99 %, sub-Saharan Africa accounted for 62 % of global deaths followed by Southern Asia at 24 %, Nigeria and India accounted for one third of those deaths (UNPF 2010). Sub-Saharan Africa accounted for (91 %) of the estimated 7500 maternal deaths attributed to AIDS worldwide. Globally MMR in 2013 was 210 /100000 and in developing regions was 14 times higher than in developed regions with sub Saharan Africa being the highest at 510 deaths (WHO, 1990-2013). Nationally 44 % were skilled deliveries and MMR was 488/100000 in the year 2012-2013. In the year 2014 Kenya had MMR of 495, maternal deaths of 6623 in which 48 % occurred during delivery and 15 out of 47 counties accounted for 98.7 % of the deaths (UNPF, 2014). Nakuru County had 42 % hospital deliveries in 2013, in 2014 the county was ranked number 4 out of 47 counties with 444 maternal deaths of which 40 % occurred during delivery with MMR of 374 (HIS, 2014,UNPF, 2014). Rongai had 24 % and 27 % hospital deliveries in 2013 and 2014 respectively. Every mother who dies, there are 20-30 women who suffer serious injuries and complications.

Reproductive health services and emergency treatment is a human right as stipulated in the Kenyan constitution of 2010. Maternal health is the 5th MDG which member countries target to achieve by having 75 % maternal mortality reduction and 90 % women being delivered by skilled personnel by the year 2015 which is in line with the development agenda of vision 2030. One of the key functions of the ministry of health in the presidential circular number 1/93 was to ensure good health of all citizens. The Kenya Demographic and Health Survey 2003 indicated that nearly all health indicators were deteriorating, 6000 women in Kenya die from pregnancy, delivery and post partum related complications and in which most of these conditions can be prevented by accessing skilled services. The maternal mortality rate was estimated to be 488 per 100000 live births and with hospital deliveries being 44 % in the year 2013-2014. The HIV /AIDS infections and nutritional status pose health risks to the pregnant mothers and their babies. A case study was conducted to find out the factors associated to home deliveries in Rongai Sub County where 58 % of the women delivered at home in that year. Data was collected using semi structured questionnaires, where 108 and 42 subjects were included in the study as cases and controls. The assessment will, enable the concerned stake holders to improve the health of mothers and infants and reduce morbidity/mortality rates resulting from obstetric complications due to home delivery. It will also help to eliminate the transmission of HIV from the infected mother to the child during delivery. The objective of the study was to assess some of the factors associated with home maternal deliveries among women aged 19-49 years .

Conceptual frame work
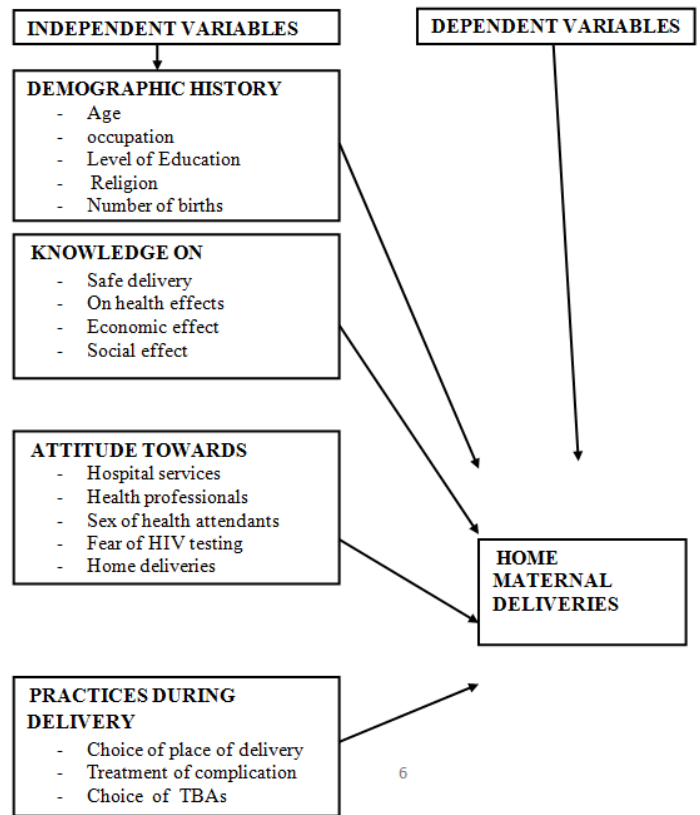
Theoretical framework

Can skilled attendance at delivery reduce maternal mortality and morbidity in developing countries (Wendy J Graham et al., 2000)?

It examines historical and epidemiological evidence at individual and population level. It examines skilled attendance and enabling environment. Complications and deaths which occur during home delivery can be avoided if all pregnant mothers can seek skilled attendance during pregnancy and delivery. The skilled attendants have enough skill to handle all obstetric emergencies and offer primary and secondary prevention measures to complications than TBA and other delivery assistants at home don't have. The environment encompasses availability of facilities, drugs and equipment referral facilities and conducive surrounding which lack in home environment. Therefore 16-33 % deaths caused by labor and delivery complication may be avoided by primary/secondary prevention measures at birth by being attended by a skilled health worker.

II.   LITERATURE REVIEW

Childbirth is the culmination period of pregnancy with the expulsion of one or more newborn infant from a woman's uterus. Health care providers assess a labouring mother's progress in labour which helps in early detection of complications and refer for further management. Home deliveries are conducted at home or elsewhere other than hospital, monitoring of the progress of labour and putting remedial actions in case of emergency is very minimal (www Child Health). Prevention and management of

obstetric emergencies during and after delivery is very critical to both the mother and the baby and should be done under skilled care (MOPHS 2004).

The complications during pregnancy and delivery cause deaths and lifelong disabilities, they become worse in home conducted deliveries where primary or secondary prevention measures are minimal. The direct complications and their magnititude include, postpartum hemorrhage (PPH, 27 %), puerperal sepsis/infections (11 %), hypertensive disorders (14 %), obstructed labor (dystocia) (9 %), blood clots/embolism (3 %) and pre-existing conditions (28 %), ruptured uterus, Pre-term delivery, vaginal birth injuries with visible tears or episiotomies, pelvic girdle pain, Mechanical injury and neonatal infections. Indirect causes are malaria, anemia, HIV/AIDS, and cardiovascular disease, all of which may complicate pregnancy or be aggravated by it, (Mophs 2004, Br. med 2003, wiki article, 2011, 095).

Reproductive Health is a state of complete, mental, physical and social well being and not merely the absence of disease or infirmity, in all matters relating to reproductive system and to its functions and processes (Ministry of Medical Services, 2012).Every human being has a right to life and is entitled to good and highest quality health care services as in article 26 and 43 of the Kenyan constitution (Kenyan constitution, 2011). To attain vision 2030, Kenya should be globally competitive and prosperous country with high quality of life by the year 2030 (Vision 2030).The millennium development goals address the health of mothers and their babies, the goal no. 5 aimed at reducing MMR by three quarter and increase the proportion of women who will deliver in the hospital to 90 % by the year 2015. To attain this goal, Kenya, through the National health plan for maternal and newborn health of 2010 adopted skilled attendance as one of the six pillars which support mothers and their babies' health (Kenya National Health Policy, 2010). The National Health Sector strategic plan 11 adopted the Kenya Essential Package of Health (KEPH). This focuses on the health needs of individuals throughout the stages of human life (NHSSP II, 2007).

To reverse the declining trend of skilled maternal delivery whereas home delivery were going up, community strategies were put in place by empowering the community and strengthening the referral systems (MOH, 2007) .

The new study titled "A Price Too High to Bear" reveals that every two hours in Kenya, a woman dies during pregnancy or childbirth, the new research puts heart-breaking stories behind a message advocating maternal health " when women die, children suffer and families fall apart", said Ann Stars, president of FCI (Bewott, 2014, standard media).

Women who have home deliveries suffer complication 3 times more than those who deliver in hospital set ups and 3.4 births/1000 suffer serious complications generally. When it comes to hospital births, they are more controlled. The environment is pretty sterile although delivery of a baby is considered to be a "clean" procedure, a woman is placed under fetal monitors and a transducer that monitors the contractions for safe delivery (metro, 2011).

About 20 % of home births were among women ages 35 and over, compared with 14 % of hospital births in 2009, the rate of home births was three to five times higher among white women than any other race, according to the CDC report (phylama, 2012). In a recent study, babies born at home were more likely to have seizures and health problems because monitoring is not as rigorous, compared with hospital delivery, Cheng said (Phylama, 2012).

In an analysis babies born at home have more than twice the risk of dying during their first month, 0.2 % compared with 0.09 % of babies born in hospitals (Credit, 2010).

Maternal health services are not consistently available as in Rift valley region, transportation support for maternity services is 50 % and post natal care was at 51 % (KSPA, 2011).

A study done in Pakistan indicated that 529,000 maternal deaths worldwide occur annually in which majority are from developing countries. Women in both rural and urban slums belief that childbirth is a normal process which does not need medical attention and hence it should be conducted at home. This attitude together with poverty, illiteracy and ignorance regarding complication of delivery is responsible for majority of women delivering at home in Pakistan. It also pointed out that family tradition, lack of time, inaccessibility to hospital, social economic issues and physical factors like geography of the area, politics, poor services and weak health systems contributed to home deliveries. WHO indicated that immediate professional care at the time of delivery creates a difference between life and death of both the mother and baby (Nusrat Shal et al., July 2010 JPMA).

Delays in decision making to seek health care, to reach health care and getting treatment lead to about 26 % deaths of women during delivery in India and all these are due to social cultural beliefs, physical barriers and poor services (Diracan et. Al., May 2013, GLG).

The main direct causes of maternal death in developing countries include hemorrhage, sepsis, obstructed labor and hypertensive disorders. The risk of death from hemorrhage is one in 1,000 deliveries in developing countries, compared with one in 100,000 in developed countries, and accounts for one third of the maternal deaths in Africa (www biomed central, 2014).

"Home deliveries are one of the causes of fistula in women which leads to social isolation, depression poverty and divorce. The women do not go to hospital due negative attitude and deliver their babies at home (Reject issue 87, July 2013).

It has been noted that women giving birth at home are more likely to be assisted by traditional birth attendants, a friend or relative other than by a trained health provider. Their babies are roughly four times higher risk of neonatal deaths than babies delivered in hospital by midwife, the higher risk is associated with the location of the delivery than the person delivering the baby and the risk is more increased in the 1st pregnancy and pregnancy of after 41 weeks (www Science daily, 2014).

A mother in North Eastern said "I cannot stand a sight of a man helping me in delivery, I would put up any resistance not to be taken to hospital" (Boniface, March 12th 2012, Sabahi) in Wajir. A woman from Nairobi said 'most women prefer TBA because they fear mandatory HIV test required by health personnel in health facilities" and another woman, Anyango said, "the problem which makes mothers deliver at home instead of health facility is how nurses mishandle women. They are rude, inconsiderate, and unrealistic and even call women names

instead of sympathizing with ones situation" (Duncan, 2012 article).

A study carried out in Ottawa hospital in Asembo bay Kenya by Omni research group in 2012 indicated that social physical factors and economic factors contributed to women delivering at home. These include physical distance of health facilities, negative attitude from health care workers, stigma of HIV /AIDS, discrimination and economic status (Laura et al., 2012).

About 44 % of recent births were delivered with the assistance of health professional and only 42 % of women received any postnatal care from a skilled health provider within two days of delivery (Kenya 2008-2009).

In Rongai sub-County there are six health care facilities which over maternity services namely; Mogotio health center,Upper Solai health center, Rongai health center, Sisto Mazoldi dispensary, Maji tamu Dispensary and Kandutura dispensary. Only 23 of the facilities offer immunization services and the ownership is as indicated (Table 1) (dhis-2014- Rongai).

Table 1: Number of health facilities and their ownership.

TYPE	GOK	FBO	PRIVATE	TOTALS
HOSPITALS	0	0	0	0
HEALTH CENTERS	5	0	0	5
DISPENSARIES	18	3	0	21
CLINIC	0	0	3	3
TOTALS	23	3	2	29
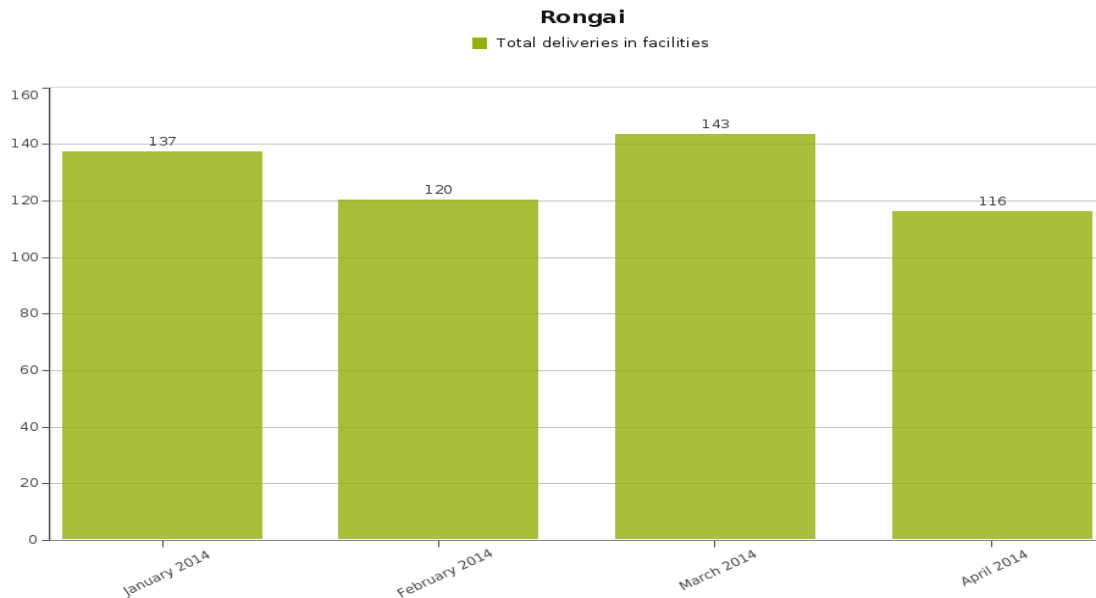
Figure 1: Rongai maternal deliveries 2014.　(dhis-1014)
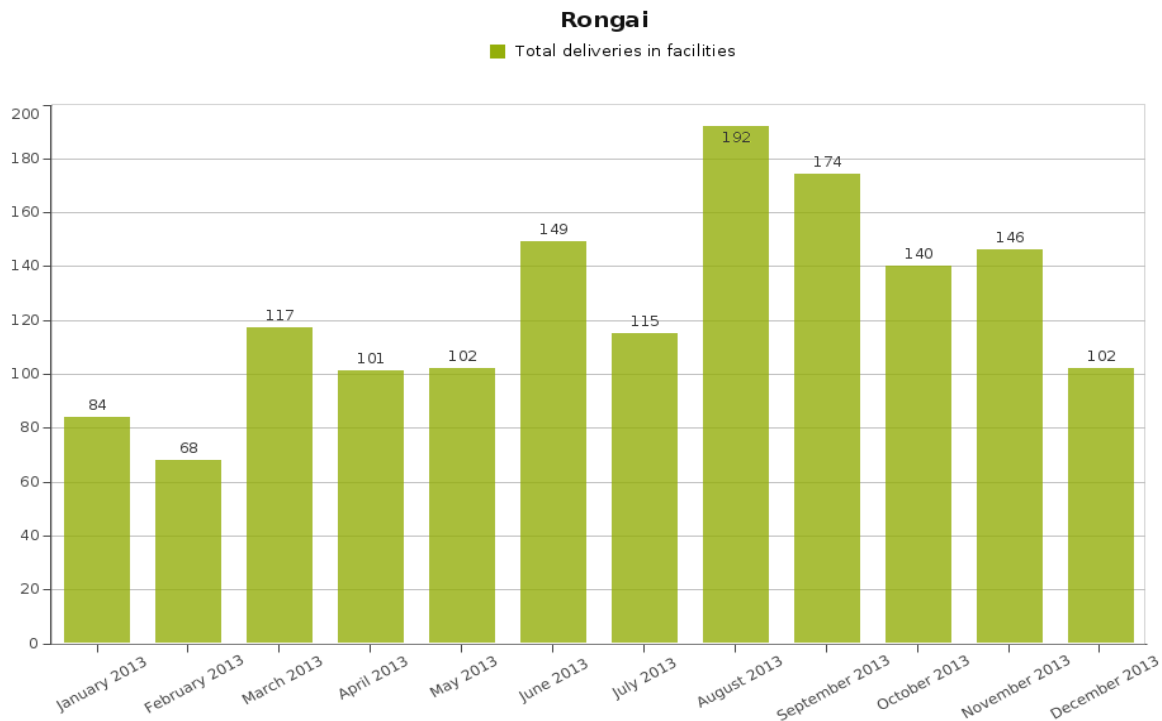
Figure 2: Annual deliveries for Rongai sub county (dhis 2014).

The two figures above 1 and 2 indicate the number of deliveries conducted in various health facilities in Rongai Sub County in the years 2014 and 2013 respectively.

The period from July 2013 the maternal delivery services were made free in all government supported health care facilities in the country. In Rongai the above named facilities implemented the free maternal delivery services and the progress of responsiveness of mothers attending hospital for delivery was as indicated resulting into 3 % increase from the previous data of 24 per cent totaling to 27 % percent (dhis 2014). Hence the prevalence of hospital deliveries was 27 % =1629 and home deliveries was 73 % = 4405.

III. METHODOLOGY

Study area

The study was carried out in Rongai Sub County, within Rift Valley region. The Population projection for 2014 was 150852 people with a growth rate of 3.4 % and 30170 households as per the population census of 2009 with four administrative divisions namely; Ngata, Solai, Kampi ya Moto and Rongai.

It is characterized by peri urban settlements and rural areas and borders other sub-counties of Nakuru North, Nakuru Town, Njoro and Kuresoi to the West. The proportion of women expected to be pregnant and deliver life births within one year is 4 % of the total population which was 6034 women. It has 29 health facilities with 23 which offer immunization services and out of those six give maternity services and immunization services throughout the month and the rest offer once a week.

Research design

The researcher used case-control design, where the women who brought their babies for first vaccination at the child welfare clinic were interviewed. Those who gave birth in the hospital as controls while those who gave birth at home as cases were interviewed for comparison. Matching was also done in both cases, women who have had one delivery and those who have had more than deliveries. The women who met the criteria were given the questionnaires to fill with the help of research assistants for those who required help.

Study population and target population

About 4 % of the total population are women who are expected to be pregnant and have life births in a specific year which was estimated to be 6,034 women and which made the target population.

The women who actually had delivered at home or hospital by the period of data collection made the study population. Home deliveries were (73 %) which were the cases and hospital deliveries were (27 %) which were the controls (4404 and 1629 respectively) as per the medical records. The estimate data for one month was;

(73 % cases = 367, and 27 % control =135) =502.

Determination of sample size
It was calculated using Fitchers general formula of 1998 when the study population is less than 10000 people.

$$nf = \frac{n}{1 + \frac{n}{N}}$$

Where   n $=$ Sample size when population is less than 10000 given as 384.

nf $=$ required sample size

$$N = \text{study population}$$

$$nf = \frac{384}{1 + \frac{384}{502}}$$

Therefore $nf =$

$nf = 384/1 + 0.7649$

$nf = 384/1.7649$

$nf = 218$ subjects expected sample size.

Cases $= \frac{73}{100} * 218 = 159$

Controls $= 218 - 159 = 59$

Sampling methods and procedure

The stratified sampling method was used to select subjects equitably from the 23 immunizing facilities where the sample sizes were distributed to each facility using their monthly expected home or hospital deliveries and total expected deliveries for a month.

The expected deliveries in a year was calculated using the 4 % proportion of the catchment population per facility, the presumed home and hospital deliveries were then calculated using the proportions of 73 % and 27 % respectively. The presumed monthly home and hospital deliveries were then divided proportionally to all the facilities which offer immunization services where the mothers bring their babies for vaccination.

Table 2: Estimates of home deliveries per facility

Facilities	Total catchment population-y	Expected delivery/year-x	home delivery/year-w	Monthly home delivery-z	Monthly hospital Delivery-Z
1. LowerSolai Disp.	8355	334	244	21	8
2. Banita Disp.	6653	266	194	16	6
3. Maji Tamu	6508	260	190	17	6
4. Nyamamithi H/C.	6783	271	198	17	6
5. Rongai H/C.	25239	1010	737	62	23
6. Kandutura Disp.	6434	257	188	17	6
7. Lelechwet Disp	7677	307	224	18	7
8. Sisto/Mazoldi Disp.	3636	145	106	10	3
9. Lengenet Disp.	6899	2760	200	16	6
10. Sumek Disp.	5131	205	150	13	4
11. Moricho Disp.	5123	205	150	12	5
12. Mogotio Rhdc	15239	609	445	37	13
13. Kabarak H/C.	3131	121	88	7	3
14. Ol-Rongai Disp.	5776	231	168	14	5
15. Kipsyenan	5987	239	174	14	5
16. Gsu Kabarak Disp.	4331	173	126	10	4
17. Kapsetek Disp.	4332	173	126	10	4
18. Mogotio Plantation Disp.	4123	1650	120	10	4

19. Mangu Disp.	4176	167	122	11	4
20. AgcBaby Centre	3155	126	92	8	3
21. Okilgei Disp.	4062	162	118	9	3
22. StarliteMed. Clinic	4021	161	116	9	3
23.Pcea Mwangasa	4081	163	118	9	4
Total-23	150852	6034	4405	367 per month	135per Month

Women between the ages of 19-49 years who had given birth once or gave birth more than once either at home or hospital and brought their babies for first vaccination formed the sample size of both the cases and controls respectively. The selection was done during the clinic days in the facilities.

Using the sample size of 159 and 59 as cases and controls, stratified sampling was used to distribute subjects to each facility as per the monthly expected deliveries as in table 3.

Table 3: Estimate of subjects who were to be interviewed per facility.

Facility	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Home Delivery	8	7	7	7	29	7	8	4	7	6	5	16	3	6	6	4	4	4	5	4	4	4	4
Hospital delivery	3	3	3	3	10	3	3	1	2	2	2	6	1	2	2	2	2	2	2	1	1	1	2
Total	11	10	10	10	39	10	11	5	9	8	7	22	4	8	8	6	6	6	7	5	5	5	6

Purposive sampling method was used to select all immunizing facilities (23 out of 29) and the subject who had delivered once or more than once and had come to the clinic for the initial vaccinations for the baby. Women who come for 2nd or routine immunization and those below 19 years and above 49 years were excluded from the study. Every woman who met the criteria within the study period (one month) was included in the study.

Study instrument and data collection tools

The study subjects were interviewed using a pre-tested semi structured questionnaire which was administered by the help of 23 trained research assistants.

Data collection methods and procedure

Data was collected by trained research assistants where each was based in each facility under the supervision of the research consultant. The questionnaire was given to the legible subjects after simple instructions were given to the respondent to reassure on confidentiality. The respondents were free to ask for clarification or assistance when filling the questionnaire. The filled questionnaires were being handed over to the research assistants and then to the research consultant on a weekly basis. The research assistants were based in all the immunizing facilities in all days in the month, either daily or once a week.

Matching of subjects was done, cases and controls.
Data quality control

Questionnaires were pre-tested in Baruti division of Nakuru with respondents of similar characteristics of the study population. This was to ensure validity and reliability of the data collection tool. The information obtained was to used to modify the tool where needed. All filled questionnaires were then scrutinized for completeness and reliability of data obtained. Complete and reliable questionnaires were rightly coded before analysis.

Data analysis presentation and interpretation

The data variables and their indicators will be analyzed using odds ratio matched case control study and presented using pie charts, bar graphs, frequency distribution tables and interpretation done per outcome having a confidence level of 95 %.

Ethical clearance/ ethical considerations

Authorization letter for data collection was issued from the University and the ethical committee. The National Commission of sciences and Technology issued a research permit to authorize the researcher to undertake a study within the specific field and scope. The researcher then obtained permission from local authorities concerned at the study area to collect data. Data was then collected from respondents after seeking their consent.

IV. RESEARCH FINDINGS/ANALYSIS

The data collection was done within a span of one month after receiving the permission from relevant authorities and pre-testing the data collection tools. The researcher nominated research assistants from respective health facilities totaling to 23 in number as per the targeted health facilities, being assisted by the community gate keepers. The research assistants were trained for one day in a central place and were given tools. During the period the researcher did supervisory and monitoring the data collection exercise.

The following were the findings;

Table 4: Number of Women interviewed per Facility

HEALTH FACILITY	HOME DELIVERY		HOSPITAL DELIVERY	
	ONE CHILD	MORE THAN ONE CHILD	ONE CHILD	MORE THAN ONE CHILD
1. LowerSolai Disp.	1	4	1	1
2. Banita Disp.	1	4	1	0
3. Maji Tamu	0	5	1	1
4. Nyamamithi H/C.	1	3	1	1
5. Rongai H/C.	5	17	4	5
6. Kandutura Disp.	1	6	1	1
7. Lelechwet Disp	1	5	1	1
8. Sisto/Mazoldi Disp.	0	2	0	1
9. Lengenet Disp.	0	3	1	1
10. Sumek Disp.	1	4	1	1
11. Moricho Disp.	0	4	1	1
12. Mogotio Rhdc	3	7	2	2
13. Kabarak H/C.	0	1		1
14. Ol-Rongai Disp.	1	5		1
15. Kipsyenan		5		1
16. GSU Kabarak Disp.	0	1	0	1
17. Kapsetek Disp.	0	3		1
18. Mogotio Plantation Disp.	0	2	0	1
19. Mangu Disp.	1	4	1	1
20. AgcBaby Centre	0	1	0	1
21. Okilgei Disp.	0	3		1
22. StarliteMed. Clinic	1	1	0	1
23. PCEA Mwangaza	0	1	0	1
Total	**17**	**91**	**16**	**27**

Socio- demography information of the respondent
Ages of Respondent

	Age	Home delivery	Hospital delivery
One child	19-35 years	14	13

	36- 49 years	3	3
More than one child	19-35 years	40	12
	36- 49 years	51	14

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Two table analysis
Respondents of one child

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Exposure{age}	Home delivery{case}	Hospital delivery{control}
Exposed{36-49 years}	3	3
Non exposed{19-35 years}	14	13

$$3 * 13/3 * 14 = \frac{39}{42} = 0.9$$

Odds ratio

Age was not a contributing factor in this category of women, whether they were above 35 years or below they could still deliver their either at home or hospital.

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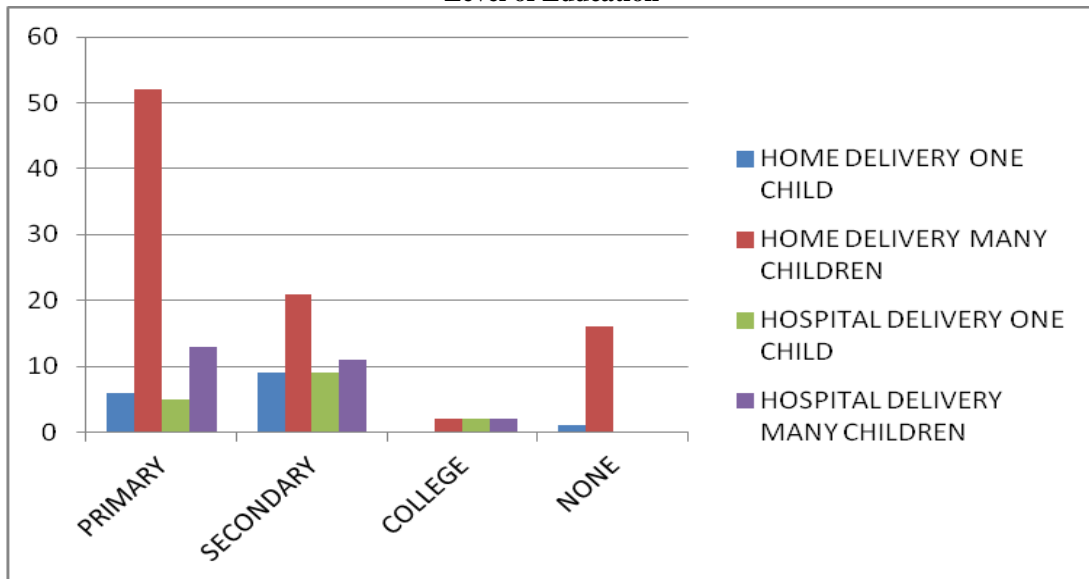**Respondents of more than one child**

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Exposure{age}	Home delivery{case}	Hospital delivery{control}
Exposed{36-49 years}	51	12
Non exposed{19-35 years}	40	14

$$51 * 14/12 * 40 = \frac{714}{480} = 1.4$$

Odds ratio

Women who had deliveries more than once and were above 35 years were likely to deliver their subsequent babies at home.

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Level of Education

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Two table analysis

Not educated include those who never attended school and who had primary school education while educated attended secondary and college education.

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Respondents of one child

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Exposure{level of education}	Home delivery{case}	Hospital delivery{control}

| Exposed{not educated} | 7 | 5 |
| Non exposed{educated} | 9 | 11 |

$$7 * 11/5 * 9 = \frac{77}{45} = 1.7$$

Odds ratio

Respondents of one child

Exposure{level of education}	Home delivery{case}	Hospital delivery{control}
Exposed{not educated}	7	5
Non exposed{educated}	9	11

$$7 * 11/5 * 9 = \frac{77}{45} = 1.7$$

Odds ratio

Respondents of more than one child

Exposure{level of education}	Home delivery{case}	Hospital delivery{control}
Exposed{not educated}	68	13
Non exposed{educated}	23	13

$$68 * 13/13 * 23 = \frac{884}{299} = 2.9$$

Odds ratio

There was association between level of education and home deliveries or hospital deliveries. Illiteracy contributed to home deliveries to both women of one child and those with more than one child as indicated in the ratio of 1.7 and 2.9 respectively.

Occupation of respondent

		Civil Servant	Student	Farmer	Business person
Home delivery	One child	0	7	8	2
	More than one child	2	7	67	15
Hospital delivery	One child	3	0	3	10
	More than one child	3	1	19	3

Two table analysis
Respondents of one child

Exposure{ income}	Home delivery{case}	Hospital delivery{control}
Exposed{no income}	15	3
Non exposed{income}	2	10

Religion of Respondents

		Muslim	Traditionalist	Christian	Others
Home delivery	One child	0	7	10	0
	More than one child	2	8	81	0
Hospital delivery	One child	0	0	16	0
	More than one child	0	0	26	0

Two table analysis
Respondents of one child

Exposure{ religion}	Home delivery{case}	Hospital delivery{control}
Exposed{ religion}	10	16
Non exposed{no religion}	7	0

Odds ratio $10 * 0/16 * 7 = 0/112 = 0$

Respondents of more than one child

Exposure{religion}	Home delivery{case}	Hospital delivery{control}
Exposed{religion}	83	26
Non exposed{no religion}	8	0

Odds ratio $83 * 0/26 * 8 == 0/208 = 0$

Religion was not associated to home delivery to both women of several births or first delivery thus influencing them to give birth at home.

Knowledge of the respondent on the effects of home maternal deliveries
Women who have heard about safe delivery
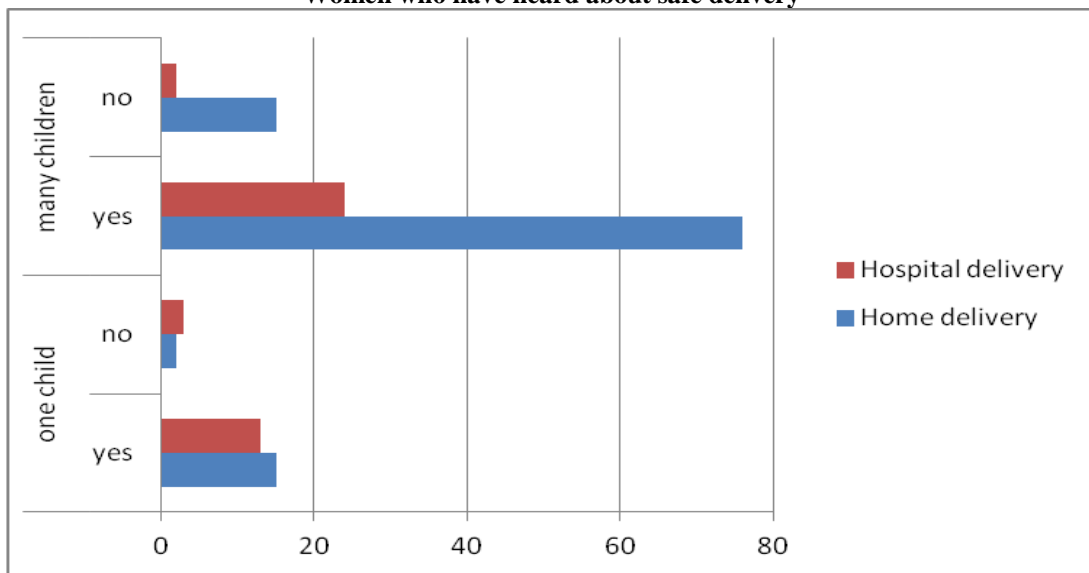
Two table analysis
Respondents of one child

Exposure{ Awareness}	Home delivery{case}	Hospital delivery{control}
Exposed{ not aware}	2	3
Non exposed{ aware}	15	13

Odds ratio $2 * 13/3 * 15 = 26/45 =$ 0.7

Lack of awareness on issues about safe delivery did not contribute to home delivery in mothers who had their first delivery with the ratio of 0.7. These mothers may be aware or not and having no experience in delivery hence it did not influence their decision in giving birth at home.

Respondents of more than one child

Exposure{awareness }	Home delivery{case}	Hospital delivery{control}
Exposed{not aware}	15	2
Non exposed{ aware}	76	24

Odds ratio $76 * 2/24 * 15 = 360/152 = 2.3$

In women who had more than one child, lack of awareness was associated to home delivery .They were not fully informed what it entails with safe delivery to both the mother and the baby, though they be knowing the dangers involved with unskilled attended delivery.

Source of Information

		Hospital	Media	CHV	Church
Home delivery	One child	17%	13%	58%	12%
	More than one child	64%	16%	19%	1%
Hospital delivery	One child	67%	0	33%	0
	More than one child	50%	8%	42%	0

Pregnant women receive health information majorly at the hospital during ANC clinics and from community health volunteers and a few who delivered at home get the information in the church and some from the media.

Total children born either in hospital or at home
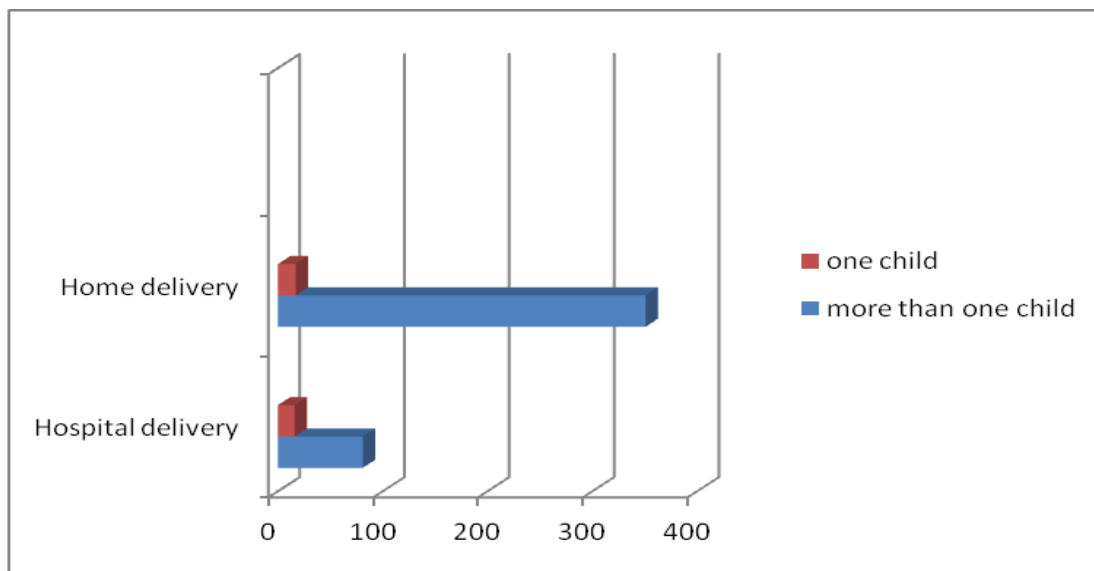
Two table analysis

Exposure(Number of children given birth)	Home delivery	Hospital delivery
Exposed (More than One child)	351	81
Non exposed (one child)	17	16

Odds ratio $351 * 16/81 * 17 = 5616/1377 = 40.9$

Giving birth more than once had a great relationship to giving birth at home in the subs equate children born after the first child thus giving a ratio of 40.9.Once a mother has given birth the first child either in hospital or at home there was a very high likelihood of her continuing to give birth at home the rest of the children.

Whether the respondent know any maternity hospital
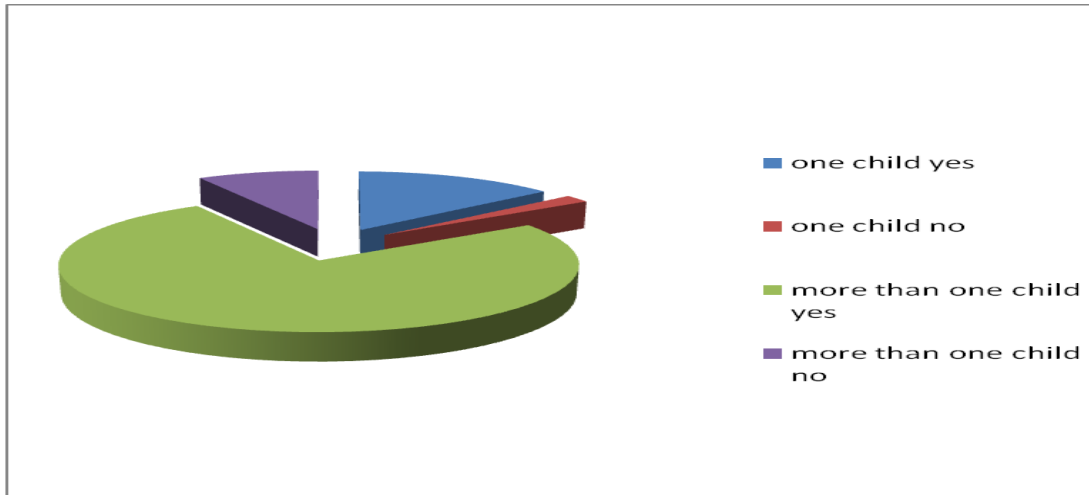
Two table analysis
Respondents of one child

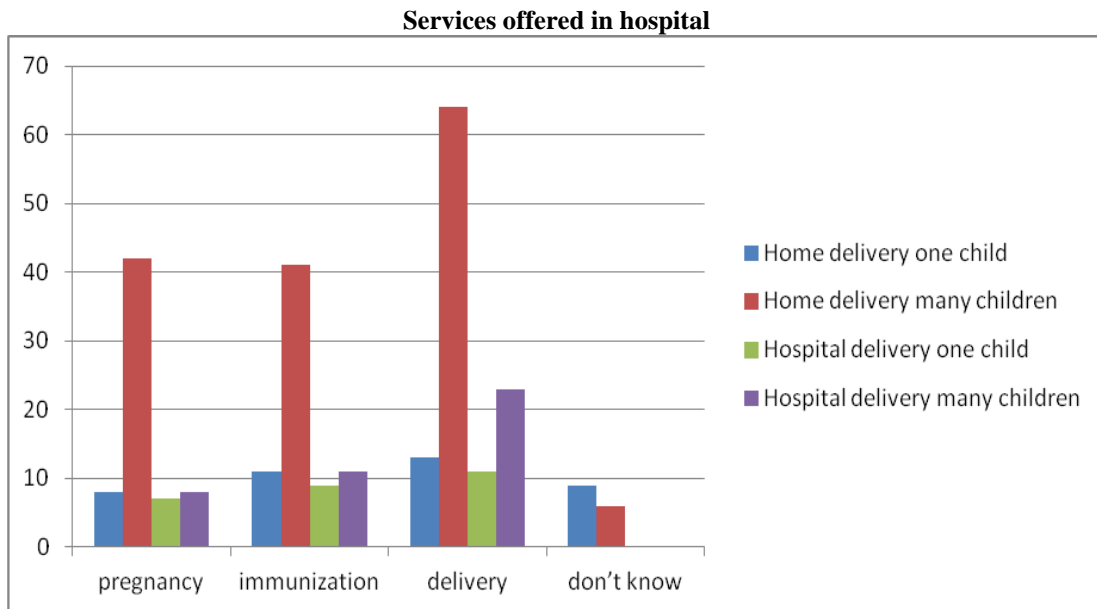| Exposure{ Awareness of maternity hospital}	Home delivery{case}	Hospital delivery{control}
Exposed{ not aware}	2	0
Non exposed{ aware}	15	16

Odds ratio $2 * 16/0 * 15 = 32/0 = 32$

Lack of awareness of availability of maternity hospital had relationship to home delivery among women of one child and women who had more than one child as it was indicated by the ratios of 32 above and 234 below. Women were no aware of maternity hospital near them where they can get maternity services.

Respondents of more than one child

Exposure{awareness of maternity hospital}	Home delivery{case}	Hospital delivery{control}
Exposed{not aware}	9	0
Non exposed{ aware}	82	26

Odds ratio $9 * 26/0 * 82 = 234/0 = 234$

Services offered in hospital

Two table analysis
Respondents of one child

Exposure{ Awareness on hospital services}	Home delivery{case}	Hospital delivery{control}
Exposed{not aware}	9	0
Non exposed{aware}	32	27

Odds ratio $9 * 27/0 * 32 = 243/0 = 243$

Lack of awareness of services offered in hospital was associated to home delivery among women who had one child , expectant women who were not aware of services offered in hospital were likely to give birth at home.

Respondents of more than one child

Exposure{ Awareness of hospital services}	Home delivery{case}	Hospital delivery{control}
Exposed{ not aware}	6	0
Non exposed{ aware}	147	27

Odds ratio $6 * 27/0 * 147 = 162/0 = 162$

The factor of not being aware of services given in the hospital had a direct relationship to giving birth at home by women who have had more than one delivery. Women would continue giving birth at home due to lack of knowledge on services being offered in various hospitals.

Knowledge on health problems associated with home delivery

	Home delivery		Hospital delivery	
	One child	More than one child	One child	More than one child
Excess bleeding	10	47	10	17
Death of mother or baby	7	49	7	8
Urine/feces leakages	0	4	0	4
TOTAL	**17**	**100**	**17**	**29**
Don't know	0	4	0	0

No problem	0	5	0	0
TOTAL	**0**	**9**	**0**	**0**

Two table analysis
Respondents of one child

Exposure{Knowledge on health problems)	Home delivery{case}	Hospital delivery{control}
Exposed{not know}	0	0
Non exposed{ know}	17	17

Odds ratio $0 * 17/0 * 17 = 0/0 = 0$

Lack of knowledge on health effects among women who had bore one child did not contribute to home delivery of their child.
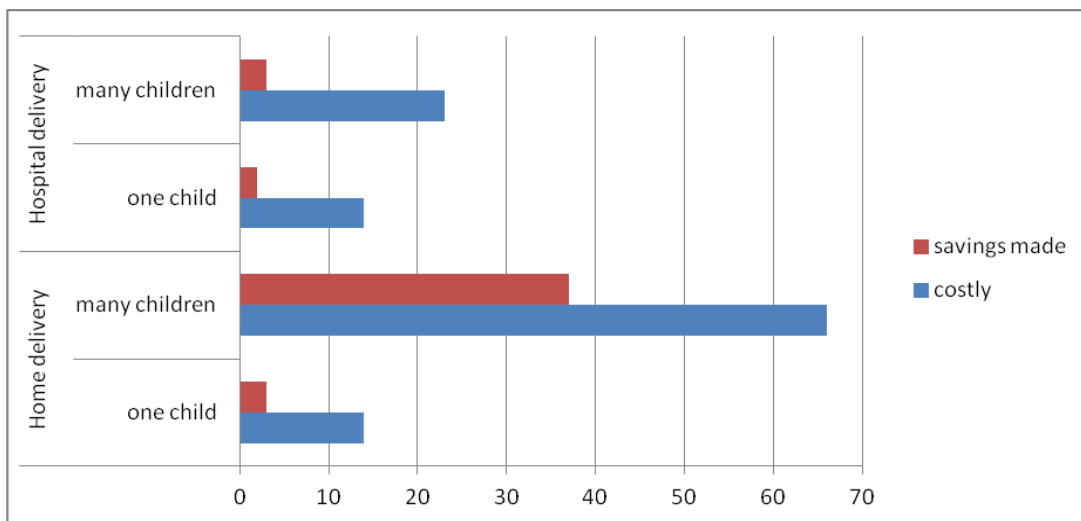
Respondents of more than one child

Exposure{Knowledge on health problems)	Home delivery{case}	Hospital delivery{control}
Exposed{ not know}	9	0
Non exposed{ know}	100	29

Odds ratio $9 * 29/0 * 100 = 261/0 = 261$

Lack of Knowledge on health problems associated with home delivery of women who had more than one child did influence home delivery. Due to lack of awareness on health effects women still continued giving birth at home with their subs equate children.

Economic problems with home delivery

Two table analysis
Respondents of one child

Exposure{Knowledge on economic problems)	Home delivery{case}	Hospital delivery{control}
Exposed{ not know}	3	2
Non exposed{ know}	14	14

Odds ratio $14 * 3/14 * 2 = 42/28 =$ 1.5

Lack of knowledge on economic effects was associated to home delivery thus contributed to home delivery among women who had one child and those who had more than one child as indicated in the ratio of 1.5 above and 4.2 below. Women who deliver at home were not able to acknowledge the economic effects which come along with home delivery so they continue giving birth at home.

Respondents of more than one child

Exposure{Knowledge on economic problems)	Home delivery{case}	Hospital delivery{control}
Exposed{not know}	37	3
Non exposed{ know}	66	23

Odds ratio $37 * 23/3 * 66 = 851/198 = 4.2$

Social problems in home delivery

		Stigma	Low self esteem	Separation	Total	Respect
Home delivery	One child	5	8	4	17	0
	More than one child	49	39	18	106	1
Hospital delivery	One child	12	4	0	16	0
	More than one child	13	7	7	27	0

Two table analysis
Respondents of one child

Exposure{Knowledge on social problems)	Home delivery{case}	Hospital delivery{control}
Exposed{ not know}	0	0
Non exposed{ know}	17	16

Odds ratio $0 * 16/0 * 17 = 0/0 = 0$
The lack knowledge on social effects did not influencing home deliveries to those women who had given birth to one child, hence was not contributing factor to home delivery for women who were to give birth to their first born.

Respondents of more than one child

| Exposure{Knowledge on social problems)	Home delivery{case}	Hospital delivery{control}
Exposed{ not know}	1	0
Non exposed{ know}	106	27

Odds ratio $1 * 27/0 * 106 = 27/0 = 27$

Women of many children who delivered at home did so due to lack of knowledge on social problems associated with home delivery. Women continued to deliver at home as they had limited knowledge on social implications associated with home delivery.
Attitude of respondent on maternal services
How nurses/doctors handle pregnant women in the hospital?
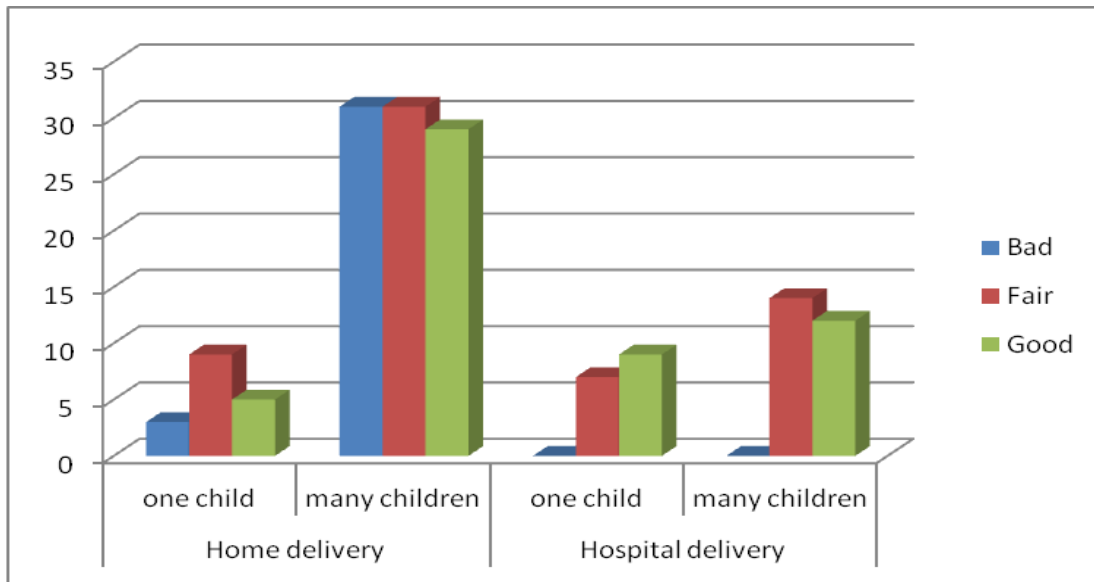
Two table analysis
Respondents of one child

Exposure{attitude to nurses}	Home delivery{case}	Hospital delivery{control}
Exposed{ bad}	3	0
Non exposed{good/fair}	14	16

Odds ratio $3*16/0*14 = 48/0 = 48$

    Attitude towards nurses is a risk factor contributing to home delivery among women who had one child as the ratio is above digit 1, attitude to nurses was associated to home delivery.

Respondents of more than one child

Exposure{attitude on nurses}	Home delivery{case}	Hospital delivery{control}
Exposed{ bad}	31	0
Non exposed{good/fair}	60	26

Odds ratio $31*26/0*26 = 806/0 = 806$

Women who had more than one child indicated as per the ratio that attitude towards nurses influenced majority of those women to give birth at home other than hospital.

Health services in the hospitals

		Good	Bad	Fair
Home delivery	One child	8	3	4
	More than one child	29	19	42
Hospital delivery	One child	14	0	2
	More than one child	19	0	7

Two table analysis
Respondents of one child

Exposure{attitude to health services}	Home delivery{case}	Hospital delivery{control}
Exposed{ bad}	3	0
Non exposed{good/fair}	12	16

Odds ratio $3*16/0*12 = 48/0 = 48$

Attitude towards health services offered in the hospital was contributing to home delivery among women who had one child as presented in the ratio of above digit 1.
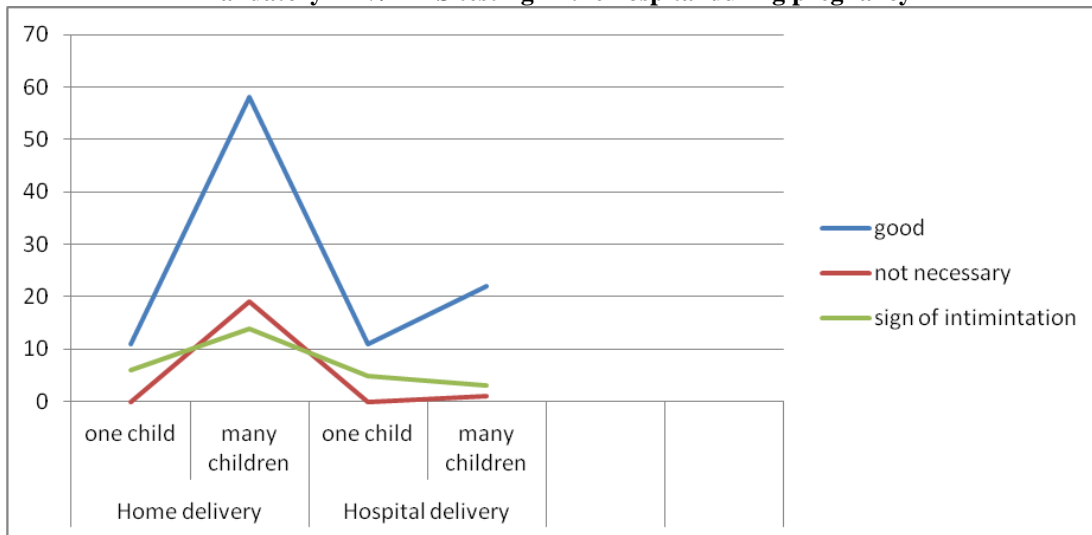
Respondents of more than one child

Exposure {attitude on nurses}	Home delivery {case}	Hospital delivery {control}
Exposed{ bad}	19	0
Non exposed{good/fair}	71	26

Odds ratio $19 * 26/0 * 71 = 494/0 = 494$

Women who had more than one child, attitude towards health services influenced majority of those women to give birth at home other than hospital.

Mandatory HIV/AIDS testing in the hospital during pregnancy

Two table analysis
Respondents of one child

Exposure{attitude to HIV testing}	Home delivery{case}	Hospital delivery{control}
Exposed{ bad}	6	5
Non exposed{good/}	11	11

Odds ratio $6 * 11/5 * 11 = 66/55 = 1.2$

Mandatory HIV testing contributed to home delivery among women who had one child as presented in the ratio of 1:2.

Respondents of more than one child

Exposure{attitude to HIV testing}	Home delivery{case}	Hospital delivery{control}
Exposed{ bad}	33	4
Non exposed{good/}	58	22

Odds ratio $33 * 22/4 * 58 = 726/232 = 3.1$

Among Women who had more than one child, attitude towards mandatory HIV testing influenced majority of those women to give birth at home other than hospital.

Sex of the nurse preferred   during delivery
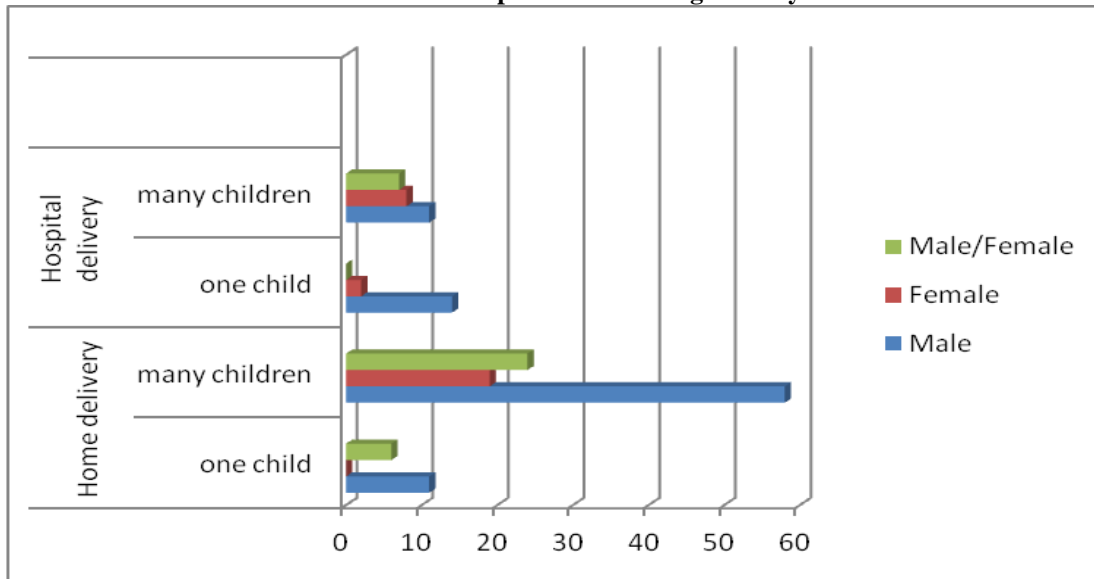
Two table analysis
Respondents of one child

Exposure{preferred nurse}	Home delivery{case}	Hospital delivery{control}
Exposed{ male}	11	14
Non exposed{female/}	0	2

Odds ratio $11 * 2/14 * 0 = 22/0 = 22$

 Male nurse attending mothers on labor influenced women positively to attend delivery services in hospitals among those with one child.

Respondents of more than one child

Exposure{preferred nurse	Home delivery{case}	Hospital delivery{control}
Exposed{ male}	58	11
Non exposed{female/}	19	8

Odds ratio $58 * 8/11 * 19 = 464/209 = 2.2$

 Among Women who had more than one child, attitude towards male nurse influenced majority of those women to give birth at home other than hospital.

Feeling on home delivery

		Bad	Good	Not acceptable
Home delivery	One child	9	6	2
	More than one child	48	22	21
Hospital delivery	One child	13	0	3
	More than one child	19	0	7

Two table analysis
Respondents of one child

Exposure{opinion on home delivery}	Home delivery{case}	Hospital delivery{control}
Exposed{ good}	6	0

Non exposed{bad}	11	16

Odds ratio $6*16/0*11 = 96/0 = 96$

General attitude on home delivery influences women of one child negatively as they had a feeling that it is good.

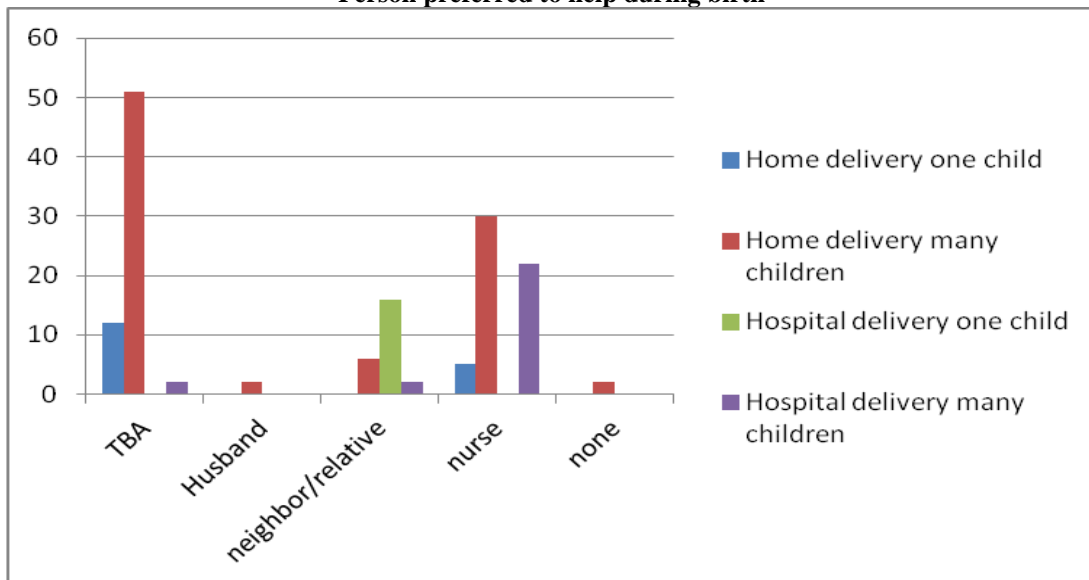### Respondents of more than one child

Exposure {opinion on home delivery}	Home delivery {case}	Hospital delivery {control}
Exposed{ good}	22	16
Non exposed{bad/}	69	26

Odds ratio $22*26/16*69 = 572/1104 = 0.5$

Attitude towards home delivery as factor does not influence home delivery among women of more than one child.

Women of on child are likely to be influenced to deliver their children at home as they felt that it was okay while those with many children it was not a factor.

Practices of respondent on maternal delivery
Person preferred to help during birth

Two table analysis
Respondents of one child

	Home delivery{case}	Hospital delivery{control}
Others(exposed)	12	16
Nurse(non exposed)	5	0
Total	17	17

Odds ratio $12*0/16*5 = 0/80 = 0$

Being assisted by other people other than a nurse was not associated to women of one child delivering at home therefore it was not a contributing factor to home delivery. Since it was the first delivery any person can just assist.

Respondents of many children

	Home delivery{case}	Hospital delivery{control}
Others (exposed)	61	4
Nurse (non exposed)	30	22
Total	91	26

Odds ratio $61*22/4*30 = 1342/120 = 11.2$

Being assisted by other people other than a nurse had an association to women of more than one child delivering at home. Due to negative attitude to nurses in the previous deliveries, they prefer being assisted by others outside the hospital.

Reasons for preferring the person above

		Easily available	Assist in complication	Friendly/comfort /massaging	Cheap
Home delivery	One child	2	11	2	2
	More than one child	26	48	10	7
Hospital delivery	One child	0	14	2	0
	More than one child	2	19	1	4

Respondents of one child

	Home delivery{case}	Hospital delivery{control}
Other reasons(exposed)	6	2
Assist in case of complication (non exposed)	11	14
Total	17	16

Odds ratio $6 * 14/2 * 11 = 84/22 = 3.8$

The other reasons of preferring other people other than a nurse to assist during delivery influences women to deliver at home other than hospital, they included , offering cheap services, being friendly and were accessible. The anticipation of having serious complication during home delivery do not motivate women to go to hospital as a measure of safe delivery to both categories of women, having the first child or subs equate children as indicated below with odds ratio of 2.4.
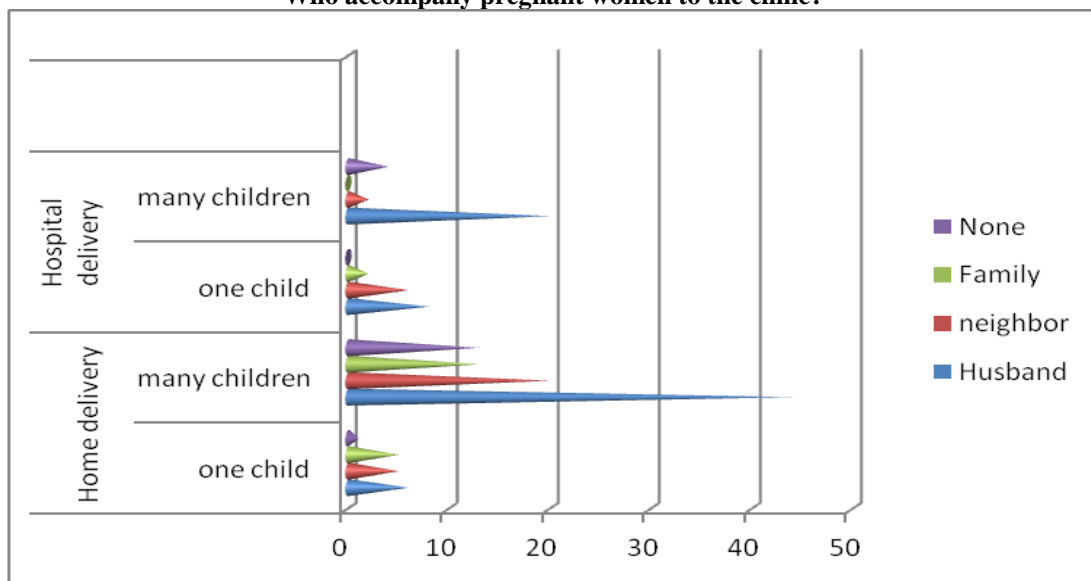
Respondents of many children

	Home delivery{case}	Hospital delivery{control}
Other reasons(exposed)	43	7
Assist in complication(non exposed)	48	19
Total	91	26

Odds ratio $43 * 20/6 * 48 = 817/336 = 2.4$

Who accompany pregnant women to the clinic?

Two table analysis
Respondents of one child

	Home delivery{case}	Hospital delivery{control}
Notaccampanied (exposed)	1	0
Accompanied(non exposed)	16	16

Odds ratio $1 * 16/0 * 16 = 16/0 = 16$

The non accompaniment to the hospital greatly was associated to women delivering at home, especially the first child bearers. The women giving birth the first time were likely to give birth at home if they do not get accompanied to the clinic by either a neighbor or family member.

Respondents of more than one child.

	Home delivery {case}	Hospital delivery {control}
Not accompanied (exposed)	13	4
Accompanied (non exposed)	77	22

$13 * 22/4 * 77 = 286/308 = 0.9$

With the women who have given birth more than once, non accompaniment to the clinic is not associated to giving birth at home; therefore it was not a contributing factor to home delivery.

What Makes Pregnant Women not to go to Hospital for Delivery?

	Home delivery		Hospital delivery	
	One child	More than one child	One child	More than one child
It is far	8	35	1	2
Expensive	5	12	1	4
Lack of transport	7	47	14	20
Lack of security at home	0	1	0	0
No need	2	14	0	0

Two table analysis
Respondents of one child

	Home delivery{case}	Hospital delivery{control}
All other reasons (exposed)	16	20
No reason (non exposed)	0	2

Odds ratio $16 * 2/20 * 0 = 32/0 = 32$

All the measured factors, distance to hospital, high cost (fare, meals), lack of means of transport (majorly boda bodas) and limited security at home contribute to home delivery among women expecting the first child as per the ratio of 32.
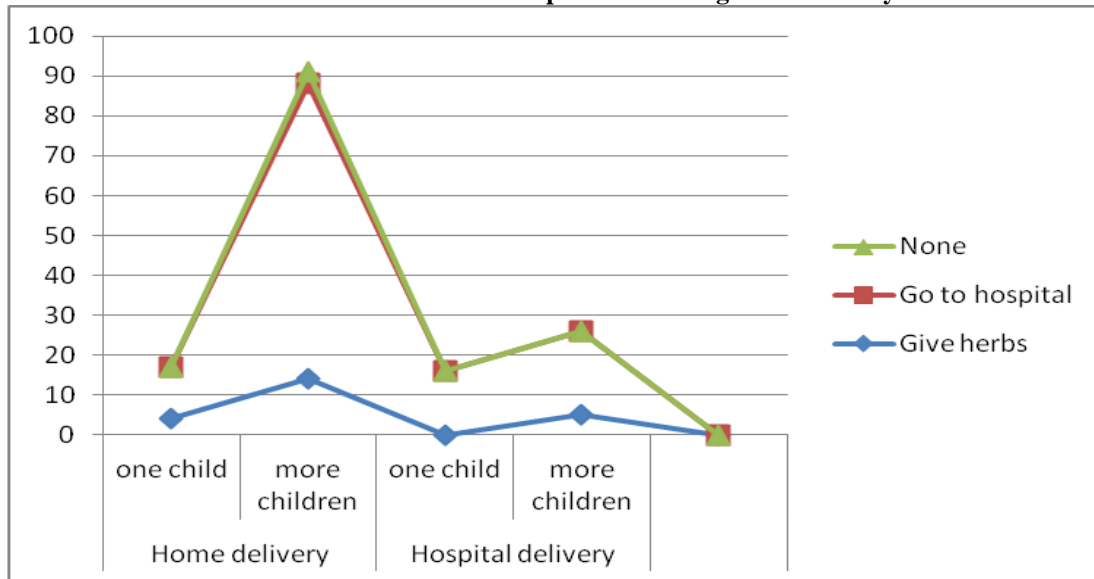Respondents of more than one child

	Home delivery{case}	Hospital delivery{control}
All other reasons (exposed)	26	94
No reason (non xposed)	0	14

Odds ratio $26 * 14/94 * 0 = 364/0 = 364$

There was high association of the factors measured to home delivery among women who have had several deliveries than women who have had one delivery due to tendency that they have had other deliveries and it is more of natural process and hence no need.

Action taken in case of a complication during home delivery

Two table analysis
Respondents of one child

	Home delivery{case}	Hospital delivery{control}
Other remedies (exposed)	0	4
Hospital treatment (non exposed)	16	13
Total	16	17

Odds ratio $0 * 13/4 * 16 = 0/64 = 0$

Giving other remedies during a complication like taking herbs is not an influencing factor to giving birth at home among women who expect their first child.

Respondents of more than one child

	Home delivery{case}	Hospital delivery{control}
Other remedies (exposed)	5	17
Hospital treatment (non exposed)	21	74

Odds ratio $5 * 74/17 * 21 = 370/357 = 1.0$

There was no relationship between taking herbs after a complication and giving birth at home among women who have had several deliveries.

Demographic factors	Women who had more than one child	Women who had one child
Age (36-49 years)	Yes	No
Illiteracy	Yes	Yes
Occupation(no stable source of income)	No	Yes
Having delivered more than one child	Yes	No

V.   CONCLUSION /RECOMMENDATION

In conclusion, the research findings showed the following factors were associated to home delivery in both women who expected their first delivery and those who expected subs equate delivery, the factors indicated as "yes" were associated to home delivery, and those indicated "no" least contributed to women delivering at home.

Lack of knowledge on effects of home delivery and its future impacts contributed to mothers especially those who have given birth more than once to deliver at home. Unaware of health problems and social problems associated with home delivery least contributed to home delivery in the women who expect the first child.

The attitudes of women both who had first delivery and those with more than one delivery towards health services and health workers contributed to women delivering at home.

Practices involved during delivery in both women of several births and first birth influenced women to deliver at home, though the issue of accompaniment and the person preferred to assist during delivery in women who expect the second birth least influenced them to deliver at home.

Women who were expecting their first child attended hospital for delivery due to unanticipated out come. Older women give birth at home than younger women due to repeated exposure of deliveries and avoid being intimintated by nurses. The attitudes towards gender of health workers and their behaviors, health services, mandatory HIV/AIDS testing and home delivery contribute to many women delivering at home. Lack of accompaniment to hospital demoralizes women as they need support from known family members. Far part maternity hospitals, poor infrastructure, high expenditure, insecurity to other children and property at home influences women to deliver at home. The researcher recommends more research to be done on health conditions incurred during home delivery and conditions of maternity hospitals.

REFERENCES

[1] Bewott Korros, 14/3/2014: A price too high to bear"- www. Standard media.

[2] Bosire Boniface, March 12th 2012, SABAHI.

[3] Br.med Bill, 2003, pregnancy, reducing maternal death and disability.

[4] Credit, 2010, Baby photo via shutter stock.

[5] Daily Nation, April 1, 2011, page 17

[6] Global long grasser, May 15th 2013, Maternity referral system in developing countries.

[7] Nusrat et al July 2010, Journal of Pakistan medical association.

[8] K D. H S, (2003, 2004), Kenya Demographic and Health Survey, pp 131.

[9] K S P A, (2011), The Kenya service provision assessment survey 2010, page 111, 13

[10] Kenyan Constitution, (2011). The constitution of Kenya 2010, page 31.

[11] Laura (2012) Barriers to access maternity care in Kenya, social perspective.

[12] Daily news papers 25th/11/2011Metro and Sunday newspaper,

[13] Min. of P H S, (2004), National Guidelines for Quality Obstetric and Perinatal.

[14] Ministry of Health, (2007), Reversing the trends, the second National Health Sector Strategic plan of Kenya 2007/08, page 1.

[15] Ministry of Health, (2013), National health information system 2012.

[16] Ministry of Medical servises, (2012), standard and guide lines for reducing morbidity and mortality from unsafe abortion in Kenya, page 10.

[17] Mophs (2008), child survival and development strategy 2008-2015.Pp 5.

[18] Mophs (2013), National Guidelines for Quality Obstetric and Perinatal Care.

[19] Phylama et al,17/5/2012.Home birth verses hospital birth

[20] Rachuonyo Duncan, April 2012 article 10, Thick Africa Press.

[21] Reject issue 87, July 2013 pages 1-7.

[22] Saffron, 2011, BMC Public health

[23] UNPF , 2014, United Nations Population Fund,

[24] WHO Geneva, 2014, Trends in maternal mortality

[25] WHO, 1990-2013Trends in maternal mortality

[26] WHO, 2014, Fact Sheet

[27] Wiki loves Africa Article, 2001 095, Maternal Health.

[28] Www. childhealth.2013

[29] wwwbiomed.com/1471/2014

[30] wwwsciencedaily.com, 2014

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