SCHOOL OF PUBLIC HEALTH

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HEALTH FACILITY DELIVERY AND ASSOCIATED FACTORS IN THE CHEREPONI DISTRICT OF NORTHERN GHANA

BY

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DECLARATION

I hereby declare that apart from specific references which have been duly acknowledged, this study is my own work put together. I also declare that this dissertation has not been presented elsewhere, either in part or in whole for another degree.

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(Supervisor)

DEDICATION

I wish to dedicate this work to my father Mr.Tawiah Adjei, my wife Mrs. Agnes Nketia and my daughters Diana Twumwaa, Florence Kyeraa, Comfort Kyeraa and Georgina Kyeremaa for their constant support in prayers, and in kind throughout my education.

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ABREVIATION

ANC:	Antenatal Care
aOR:	Adjusted Odds Ratio
cOR:	Crude Odds Ratio
TBA:	Traditional Birth Attendant
UNDP:	United Nations Development Programme
UNICEF:	United Nations International Children's Fund
WHO:	World Health Organization

ABSTRACT

Worldwide facility delivery remains a serious concern and challenge to all international, national and local stakeholders. It is important to reduce this burden of large number of women and neonates who die annually from preventable causes as a result of home delivery. Facility delivery is a critical strategy to improve maternal and newborn health in the world, but still a large number of home deliveries occur in the developing countries, mostly in the Sub Sahara African countries. A quantitative cross-sectional study was conducted among women who delivered from March, 2017 to March, 2018 in Chereponi district. Structured questionnaire was administered to the mothers and data collected on factors likely to influence place of delivery.

The study was conducted among women aged between 15 to 49 years who delivered within one year prior to the beginning of the study. Data on individual demographic characteristics, community level factors, institutional level factors and the level of facility delivery were collected from the respondents. Data were analyzed using STATA Version 15.0. Multivariate logistics regression was used to identify factors related to place of delivery, controlling for covariates that were statistically significant in the univariate regression model.

Among 440 women interviewed, 38.41% delivered at a health facility, while 61.59% deliveries took place at home. Several factors were identified to be significantly associated with place of delivery. These included: the women's level of education (aOR=0.49, 95% CI: 0.07-53.63, P=0.013), her ethnicity (aOR=2.48, 95% CI: 0.51-11.92, P=0.003), income level (aOR=2.79 95% CI: 1.49-5.24, P=0.001), number of antenatal visits (aOR=2.41, 95% CI: 0.68-8.54, P=0.019), her husband's level of education (P=0.001), distance to a health facility (aOR=0.51 95% CI: 0.31-0.85, P=0.003), health staff attitude (aOR=5.59, 95% CI: 2.11-14.82, P<0.001), and religion (P<0.001).

High illiteracy rate, low income level of women, distance and staff attitude were the key factors explaining why rural women deliver at home. Addressing universal formal education, geographic access to health facilities and staff attitude will increase number of facility deliveries.

CHAPTER ONE

1.0INTRODUCTION

1.1 Background Information

Globally lots of maternal health interventions are put in place to increase access to health care and facility delivery, but still many women deliver at home (World Health Organization, 2014). However, many women die during or immediately after delivery in which many of these deaths could have been prevented if those deliveries occurred in health facilities (Kyei-Nimakoh et al., 2016).

Maternal mortality remains the most important challenge to the health systems worldwide (Hogan et al., 2010). Global maternal mortality has sharply declined in the high income and middle income countries from 1990 to 2015, with the developing countries still accounting for 99% of the world's maternal mortalities and the greater proportion (66.3%) is distributed in the Sub-Sahara African countries (Alkema et al., 2016). On the other hand, with tremendous stride, Finland has been able to bring maternal mortality ratio to 3 per 100,000 live births, while Sierra Leone remains at 1360 per 100,000 live births (ibid). As cited by WHO (2017), women who stay far away from health facilities are less likely to deliver in health facilities than those near, similarly, there are increase in maternal mortality rates with increasing distance away from health facilities. Though in Ghana, facility delivery and maternal mortalities have improved for years, but relatively, there is not much difference from what exist in most developing countries in Sub-Sahara Africa (UNDP, 2015).

Focused antenatal care provides women and their families with right information on healthy pregnancy, management of complications, appropriate public health interventions, and to

prepare women for facility delivery that ensures safe child births, postnatal recovery and new born care that reduces maternal and newborn mortalities (Dickson etal., 2017). Similarly, focus antenatal care aims to achieve sustainable development goal 3.1, to improving facility delivery and reducing maternal mortalities globally to less than 70 per 100 000 live births by the year 2030

(Group, World Bank, 2015). Nonetheless, as facility delivery has greatly improved in the developed regions in the world (95%), developing regions are still far behind in achieving Millennium Development Goal 5 target of 90% and above (WHO et al., 2015).

In 2012 alone, 40million deliveries occurred outside health facilities in the developing countries, this accounts for the high maternal mortalities resulting from delivery related complications, and every day 800 women die from preventable causes related to pregnancy ("WhY Skilled Birth Attendants Matter," 2015).

As cited by UNICEF (2015), internationally, 2.9 million newborn babies die, and out of these deaths the greatest proportion occurs in Sub- Sahara African countries. Newborn mortality rate still remains high in Ghana with the national average of 320 per 100000 live births, and Northern region of Ghana accounted for the highest of 350 per 100,000 live births. It is also estimated that out of these deaths, 26 (75%) occur within the first week of birth, and 17 out of these deaths (50%) occurred within the first 24hours after delivery (UNICEF DATA, 2015). This report cited that, the funding factors are associated with low family planning acceptor rate (25%), high fertility rate (4.3%), high adolescent birth rate (60/100 women), low utilization of skilled delivery (68%) in which Northern region of Ghana skilled delivery is between 37.3% contrary to 89.7% in the Greater Accra region of Ghana.

Home based deliveries have less health interventions among women and their babies which put them at high risk of emergency obstetric complications and neonatal seizures and other complications (Der et al., 2013). However, high number of home deliveries account for the large number of maternal and newborn mortalities in the developing countries as a result of complications associated with delivery such as post-partum hemorrhage, puerperal sepsis, prolong labour, hypertensive disorder and anemia (Kirkwood et al., 2010).

In the rural communities of Lao People's Democratic Republic in the Southern Asia, only 15% of women deliver in health facility due to convenience in home delivery, cost of facility delivery, distance and traditional beliefs (Sychareun et al., 2012). Maternal mortalities adversely affect the nutritional status of the kids the women left behind, access to quality health care becomes a problem, older children drop out from school to take care of their younger siblings, which endorses early childhood labour and difficulties that encourage early migration for better opportunities elsewhere, early marriage and teenage pregnancy (Molla et al., 2015),

Following from this, the study seeks to examine how women in Chereponi district of the Northern region of Ghana are able to gain direct access and utilization of maternal health services with the framework of the free maternal health care services and facility delivery policy. The knowledge of contributory factors influencing facility delivery is important to design appropriate public health interventions that focus on promoting facility level deliveries in the Chereponi district.

1.2 Problem Statement

Facility deliveries are high in the developed countries but very low in the least developed countries [98.7% as against 31.3%] (WHO 2014). In Ghana facility delivery is relatively low as compared to the developed countries, 56.7%, (GHS, 2015). The Chereponi district in northern Ghana is among the districts with the lowest facility deliveries, with 37.9%, 28% and 37.6% in 2014, 2015 and 2016 respectively (Chereponi district annual report, 2016).

Earlier studies indicate that there are several factors leading to the choice of place of birth by women, and some of these are determined by: the women's educational attainment, parity, transportation system, family wealth, season and rapid unexpected labour (Kumbani, et al., 2013). High number of home deliveries are likely to increase maternal and newborn mortalities as a result of complications associated with delivery (Mensah et al., 2011). Maternal mortalities have serious adverse effect on the newborns, young children, aged and the families that are left behind (Kirigia et al, 2006). This study sought to identify factors contributing to low facility delivery in the Chereponi district of Northern Ghana.

1.3 Research Questions

The following research questions were formulated mainly for the purpose of this study and to aid the researcher to meet the objectives set out in this study. They were;

1) What are the individual level factors that influence place of delivery in the district?
2) What are the community level factors that influence place of delivery in the district?
3) What are the health facility level factors that influence place of delivery in the district?
4) What is the level of facility delivery in the district?

1.4 Study Objectives

1.4.1 General Objective

To identify factors influencing facility delivery in Chereponi district in the Northern region.

1.4.2 Specific objectives

1. To determine individual level factors that influence place of delivery in the district.
2. To identify community level factors that influence place of delivery in the district.
3. To identify health facility factors that influence place of delivery in the district.
4. To determine the level of facility delivery in the Chereponi district

1.5 Conceptual Framework

Several factors can interchange to increase or decrease the rate of facility delivery. Large number of studies have identified some demographic factors to be significantly contributing to the place of women's delivery. Some of these are age of a woman (Moindi, R. O., Ngari, M. M., Nyambati, V. C. S., & Mbakaya, C. (2015); Gabrysch, S., Cousens, S., Cox, J., & Campbell, O. M. R. (2011), Education (Mrisho et al., 2007; Moindi et al., 2015), place of residence (Abebe, F., Berhane, Y., & Girma, B. (2012); Kwungezi et al., 2015), and religion.

Many individual factors can interplay to increase or decrease the rate of facility delivery. Some of the factors identified by some studies to have significantly contributed to increase or decrease in facility delivery include parity (Sialubanje et al., 2015; Gabrysch et al., 2011), ethnicity ((Kitui, Lewis, & Davey, 2013), antenatal visit (Dickson, K. S., Kofuor, E., Darteh, M., &

Kyereme, A. K. (2017); Kawungezi et al., 2015; Abebe, F., Berhane, Y., & Girma, B. (2012), health information/education (Abebe, F., Berhane, Y., & Girma, B (2012), and income level (Shah et al., 2010; Sialubanje et al., 2015; Titaley et al., 2010).

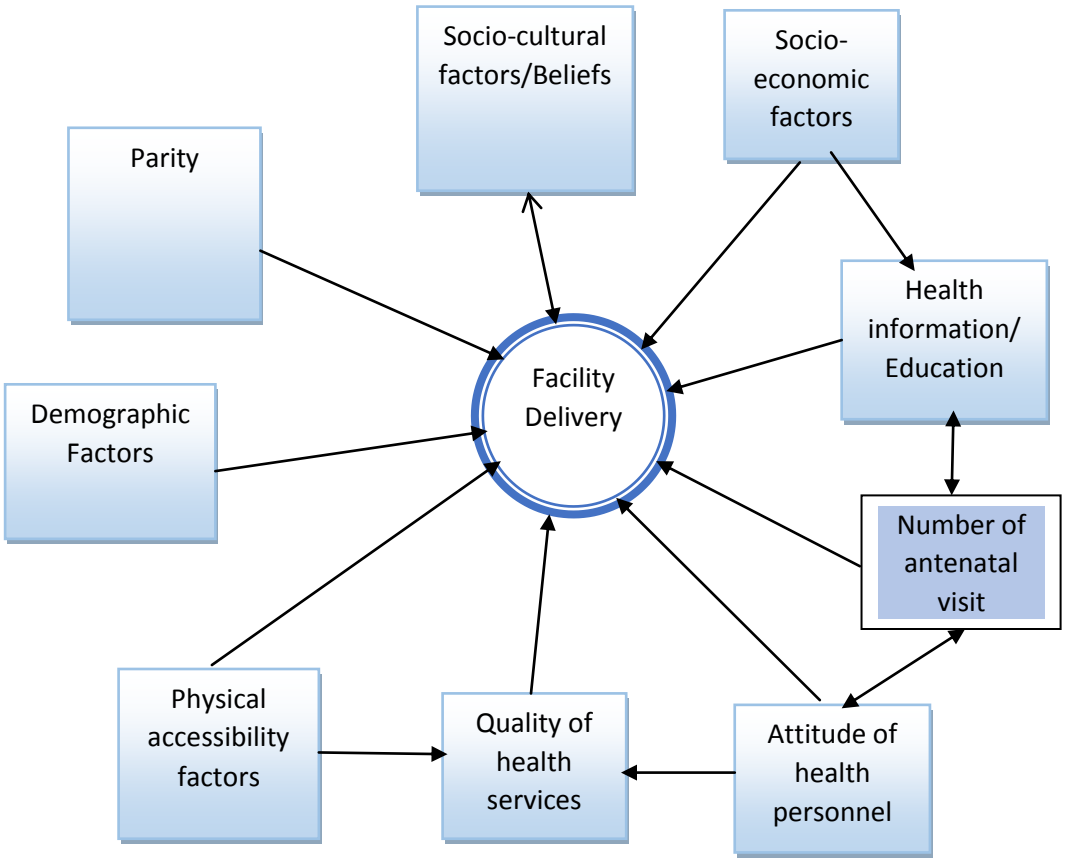
Some community factors can contribute to increasing or decreasing the rate of facility delivery. Some of the contributory factors associated with facility delivery from evidence of other studies were socio-cultural practices and beliefs (Simfukwe, M. E. (2011); Sychareun et al., 2012), family wealth (Enuame et al., 2016), husband's approval on place of delivery (Sialubanje et al., 2015), transport (Sialubanje et al., 2015; Sychareun et al., 2012) and distance to health facility (Moyer, 2014; Nesbitt et al., 2016; Moindi, et al., 2015; Sychareun etal., 2012).

The physical accessibility factors that can increase or decrease facility delivery include availability of transport system, the type of services and affordability of the services (Shah, et al., 2010; Titaley et al., 2010; Sialubanje et al., 2015),

Institutional factors in one way or the other can increase or decrease the rate of facility delivery. Some past studies identified that some of the institutional factors that significantly contribute to facility delivery were associated with quality of health services in a facility (Gabrysch, et al., 2012), attitude of health staff (Enuame et al., 2016; Sychareun et al., 2012) and cost of facility delivery (Mrisho et al., 2007; Sychareun et al., 2012)

Refining the little coverage of facility deliveries, hinge on large measures that efficiently applying the existing strategy that is known to work best. Therefore, there is the need for further research to formulate, adjust and assess workable resolutions predominantly at the local levels.

Figure 1.1: A Conceptual framework on factors associated with health facility delivery



1.6 Justification of the Study

Identifying the contributory factors influencing facility delivery, the data will be used to formulate appropriate policies and programmes that improve high level of facility deliveries in the district. However increasing the proportion of facility delivery will improve maternal and newborn health, thereby reducing maternal and newborn mortalities in the Chereponi district and beyond.

General information that will be gathered in the study may guide policy makers to provide effective and efficient guidelines to strengthening communities and health facilities in addressing health related issues that decrease the level of facility deliveries. The information will also help the district to identify the communities with low facility deliveries and the associated factor that influence place of delivery so that the district can effectively plan the appropriate interventions that aim at improving maternal and child health in the Chereponi district.

High number of home deliveries is likely to increase delivery related complications and maternal and newborn mortalities which will affect individuals at the local levels, district level, national and the international levels. Identifying the determinants of facility delivery will help in policy making and planning of appropriate health interventions that promote health. However, the district has insufficient information on determining factors of low facility deliveries and therefore, the study on factors of facility delivery will give enhanced view of the matter in the district.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Maternal Health Care Delivery across the Globe

Worldwide over 55 million women deliver at home annually with approximately 70% occurring in the Sub-Sahara African countries (Group, 2015). Universally about 303 000 women die annually during or immediately after delivery due to home deliveries and out of these deaths, 99% occur in the developing countries (World Health Organization, 2014) Comprehensive estimates indicate that, Sub-Sahara Africa and Southern Asian countries alone contribute to about 86% (260,580) of the world's total maternal mortalities (Group, World Bank, 2015). However, Nigeria and India alone contribute to about 34% (103 000) of the world's total maternal mortalities.

Evidence shows that out of every 100, 000 births 216 women perish globally, 546 occurs in Sub-Sahara African countries, while in the high income countries only 12 per 100 000 live births occur annually (Alkema et al., 2015). In Uganda, a cross-sectional study conducted using interviewer questionnaires and mixed methods of focus group discussion and in-depth interview revealed that maternal mortality ratio in that country was 435 per 100,000 live births with neonatal mortality rate of 29 per 1000 live births due to large number of home deliveries (Kawungezi et al., 2015). In Ghana institutional maternal mortality ratio still remains high (152, 153 and 143) per 100 000 live births in 2012, 2013 and 2014, while Northern region of Ghana recorded 212, 173.6 and 107.8 in that same period due to low facility deliveries (GHS, 2014). An indication shows that 'every 15 minutes a new-born baby dies in Ghana and newborn mortality contribute to 50% of all infant deaths' (UNICEF, 2015).

2.2 Facility Delivery

WHO report shows that, global skilled delivery was 65.7%, even though there were variations between regions, the more developed regions recorded 99.5%, less developed regions 61.9%, least developed regions 35.3% and Africa 46.5% (WHO, 2008). This is as a result of the availability of facilities for efficient and effective healthcare delivery within many developed countries as against the inadequate facilities found in many underdeveloped countries. Facility delivery has gradually improved in Ghana from 2010 (44.6%) to 2014 (56.7%), with regional differences in which Northern region of Ghana is among one of the lowest in the country 43.4%, 47.4% and 53.4% in 2012, 2013 and 2014 (GHS, 2015).

2.2 Coverage of Antenatal Care Services

Estimates specify that globally 60% of pregnant women attend four antenatal visits before delivery, while Americans achieved 90%, South East Asia attained 70% and Africa recorded 40% in 2014 (Dickson et al., 2017). Progressively, Ghana is recording high antenatal care coverages across all regions of at least one visit per woman's pregnancy (98.2%, 92.2% and 90.1%), in 2012, 2013 and 2014, but still facility deliveries are relatively far below national and international target of 90% and above (49.4%, 54% and 54.7%) in that same years (GHS, 2014). The same report cited that though, Northern region of Ghana achieved the highest antenatal care coverage of at least one visit 135%, 112% and 113.6% in that same years, but these achievements did not equally transform into the level of facility deliveries (44.5%, 43.4% and 46.8%).

2.3 Individual Factors of Facility Delivery

A study conducted in Southern Tanzania using in-depth interview, focus group discussion and participant observation study discovered that individual factors of facility delivery include, lack of decision making power among women within the households, lack of formal education, transport, poverty, and gender role (Mrisho et al., 2007). In Bahirdar -Ethiopia, a research study identified that absence of women's knowledge about obstetric care, delay in starting antenatal care, illiteracy and rural residence have been influenced by facility delivery (Abebe, Berhane, & Girma, 2012).

In rural coastal Kenya a prospective cross-sectional study conducted, proved that the major factors of low facility delivery were old age of women and their husbands, polygamous marriage, distance and high illiteracy among women and their husbands (Moindi et al., 2015). In rural Zambia, a focus group discussion and in-depth interviews conducted among stakeholders, opinion leaders, health staffs and women, uncovered that, the preference for TBA deliveries were due to lack of women's autonomy to decide place of child birth, poverty, distance, parity and transport system (Sialubanje et al., 2015). In 2014, a research conducted in Ghana, showed that women's education, parity, rural or urban residence, household wealth, distance to nearest health facility and the number of antenatal visits were the determining factors of facility delivery (Moyer, 2014).

2.4 Health Facility Level Factors Of Facility Delivery

A research conducted in rural Zambia, linking geographic information system, demographic health survey and national facility data showed that, lack of geographic emergency obstetric care in many health facilities compelled women to deliver at home (Gabrysch et al., 2011).

In Ghana, a research conducted in Dodowa, Kintampo and Navorongo exhibited that, the influence of health facility staff and possession of valid national health insurance card determines women's delivery at health facilities (Enuameh et al., 2016). Again, evidence from a mixed methods of focus group discussion, in-depth interviews and quantitative study in rural Tanzania presented that, home deliveries were as a result of cost of hospital bed and other delivery expenditures, cost of food when women are on admission, distance to health facility and the length of stay until all medical bills are paid before discharged (Mrisho et al., 2007). Kawungezi et al., (2015) report specified that, women in the rural Uganda are two times (46%) less likely to access antenatal care services and facility delivery than women in urban areas (92%) due to low level of education, poverty, perceived high cost of facility services, distance, and health facility privacy.

2.5 Community Level Factors of Facility Delivery

A cross-sectional survey conducted in Congwa district in Tanzania established that, the factors influencing facility delivery were traditional practices, convenience in delivering at natural habitat, satisfactory of traditional birth attendants and unsatisfactory of maternal health care services (Simfukwe, 2011). A prospective, descriptive study conducted in the department of obstetrics and gynecological unit in Karachi Civil hospital in Pakistan established that, the reasons for home deliveries among women admitted on serious delivery complications in the hospital were family tradition, poor socio-economic conditions among families, and traditional birth attendants recognition, and the most confrontational outcomes were post-partum hemorrhage and retained placental tissue (Shah et al., 2010). In rural Zambia a qualitative study on reasons for home delivery established that more women ignore facility delivery due to

absence of self-sufficiency to decide place of birth, dependency on husbands and family members to decide place of birth, socio-economic barriers of poverty, distance, food cost while women are in health facilities, perceive traditional birth attendants as respectful, trust-worthy, skillful, friendly, cared for and always available (Sialubanje et al., 2015).

2.6 Physical Accessibility Factors of Facility Delivery

In Ghana the available research findings show that distance and closeness of health facilities have influence on facility delivery (Nesbitt et al., 2016). Similarly a cross-sectional study conducted in Morogoro in Tanzania proved that 88% of women who delivered at home stayed far beyond 5kilometers from health facilities, while 92% of women who delivered at health facilities were relatively very close to health facilities (Melorose, Perroy, & Careas, 2015). West Java Province in Indonesia, women used traditional birth attendance due to poverty, distance and means of transport (Titaley et al., 2010).

2.7Identified Gaps and Rationale of This Research

The high antenatal care coverage and low facility delivery accompanied by high maternal and newborn mortalities in Ghana is difficult to comprehend. The only question that has not been answered by these studies is the role that demographic factors play in contributing to low facility delivery. Also results from the reviewed studies are inconclusive since majority of these studies in Ghana are concentrated in the southern part of the country, hence, the need for further investigation to unveil the precise determining factors as applicable in Northern Ghana, specifically Chereponi district, in order to design applicable approaches that encourage acceptable number of facility level deliveries. This will also depart from the qualitative

approach adopted by many of the studies reviewed and concentrate study on the use of structured questionnaires to collect primary data on factors of facility delivery at one point in time in Chereponi district.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Research Design and Approach

A community based cross-sectional study was conducted in the Chereponi district among women who had delivered within a period of one year prior to initiation of the study. The study covered all five sub-districts in the district. Participants were identified using the snow-ball approach and distributed among the sub-districts based on a weighted average proportional to the number of Women in the Fertile Age (WIFA). Data were collected using a structured questionnaire specifically designed for the study which captured individual level factors, community level factors as well as health system factors likely to influence place of delivery. Antenatal care books of the women were reviewed where available, to capture information on antenatal attendance.

Trained research assistants conducted face to face interviews with women who delivered within one year in their individual residential localities in the communities. Ethical approval were seek from the respondents before they were interviewed. Data collection was between 12th March 2018 and 19th, March, 2018.

3.2 Study Area

3.2.1 Location and Demographic Characteristics

The Chereponi district is located in the Eastern corridor of the Northern region of the Republic of Ghana. It is also one of the smallest districts in the Northern region. The district shares boundaries with four other neighboring districts. To the East is the Oti district of the Republic of

Togo, to the West is Gushegu district, to the North is the East Mamprusi district and to the South is the Saboba district.

The population in the district varies in terms of Ethnicity with Anofo (Chokosi) constituting the majority, followed by Konkomba (Likpakpan), Ewe, Basare, Hawsa, Fulani, Akan and Moshie. The total population of Chereponi district in the year 2018 is 67,116 (13,423 in urban and 53,693 in rural). The district has five sub-districts and 201 communities.

3.2.2 Health System

The district has one Government hospital, two health centres and seven operational CHPs compounds. The population of Women in Fertility Age in 2018 is 16,108. The annual expected pregnancy or delivery is projected to be 2,685 and children less than one year is 2,685. The district has one district director of health services, one Medical Doctor in the Chereponi hospital, four disease control officers, two nutrition officers, one health information officer and one health promotion officer. In the health facilities there are nine Midwives, twenty State Registered Nurses, forty-six Enrolled Nurses and twenty-five Community Health Nurses all uniformly distributed across the health facilities in the district.

3.2.3 Transportation System

The district does not have a permanent ambulance for referral of cases from one level to another. The district transport system is good only in Chereponi market days, but there are large number of motorbikes in the communities owned by individuals for their daily movements and for emergency situations. Many communities become difficult to reach while others are completely cut off during heavy rainfall season due to flood.

3.2.4 Climatic and Economic Features

The mean wet seasonal rainfall is between April and October. The mean dry season is between November and March. The main occupation of the people in the district is farming, animal rearing and petty trading.

Majority (86.4%) of the people in the district are farmers. The main food crops produced in the district are mainly cereals, legumes and tubers of yam. The only economic trees in the district is mostly shear-nut and dawadawa trees.

3.2.5 Education

The district has one government Senior high school, twenty junior high schools, sixty three primary schools, one Catholic vocational school and six day care centres. Majority (77%) of the people in the district did not receive any formal education.

3.3 Variables

3.3.1 Dependent Variable:

The main outcome variable was place of delivery.

3.3.2 Independent variables:

Table 3.1: Variables table

VARIABLES	OPERATIONAL DEFINITION	SCALE OF MEASUREMENT/ POSSIBLE VALUES
SOCIO DEMOGRAPHIC CHARACTERISTICS		
Age of participants	Refers to the age in years of the woman as reported during the interview.	Continuous
Occupation	Refers to the work of the woman as reported during the interview. Employed refers to women who are employed by government or any agency. Self-employed refers to women working for themselves. Unemployed refers to women not working. And others refers to women who are students etc.	Categorical Values: - Government worker - Self-employed - Unemployed - others
Educational status	Refers to the educational status mentioned by the participant during the interview.	Categorical Values: - No Formal education - Primary/JHS - Secondary - Tertiary
Marital status	Refers to the marital status reported by the participant during the interview.	Categorical Values: - Single - Married -cohabitation - Divorced/ separation/widow
Gravidity	Refers to the number of time the woman has been pregnant as mentioned by the participant	Numerical
Parity	Refers to the number of surviving children of participants	Numerical
Religion	Refers to the type of religion reported by the participant during the interview.	Categorical
Income level	Refers to the level of income reported by the participant during the interview.	Ordinal values: -Very low -Low -Moderate -High -Very high

VARIABLES	OPERATIONAL DEFINITION	MEASUREMENT/POSSIBLE VALUES
ANTENATAL AND DELIVERY		
Number of ANC visit	Refers to the number of times the woman visited the ANC clinic	Numerical values:
Place of delivery	Refers to the place of delivery as reported by the participant during the interview.	Categorical values: -Home -Health facility -TBA
PHYSICAL ACCESSIBILITY		
Distance from community to facility	Refers to the distance in kilometers from the woman's community to the health facility.	Continuous values:
Availability of transport	Refers to whether there were means of transport available for the woman to deliver at health facility.	Categorical: Yes / No
Season/period in the year	Refers to the season/time of year of delivery as reported by the participant.	Categorical values: -Rainy season -Flood -Dry season
Rural or urban setting	Refers to whether the residential location of the participant is rural or urban.	Categorical values: -Rural -Urban
Affordability	Refers to whether the cost affordability was a problem as reported by the participant.	Categorical values: Yes / No
Rapid labour	Refers to whether the participant's labour occurred rapid.	Categorical: Yes / No
COMMUNITY LEVEL FACTORS		
Culture /traditional norms	Refers to the traditional culture or norms that determine the woman's place of delivery.	Categorical values: Yes / No
Influence of TBA	Refers to whether the participant's place of delivery was influenced by TBA.	Categorical values: Yes / No
Desired for child	Refers to the seriousness of the woman desired for a child.	Categorical values: Yes / No
Previous delivery experience	Refers to the previous delivery encounter and experience as reported by the participant.	Categorical values:

VARIABLES	OPERATIONAL DEFINITION	MEASUREMENT/POSSIBLE VALUES
HEALTH FACILITY LEVEL FACTORS		
Availability of skilled personnel	Refers to the availability of skilled personnel who conduct facility delivery.	Categorical: Yes / No
Attitude of staff	Refers to the attitude of health staff perceived by the women when they go for health services.	Ordinal values: -Very good -Good -Poor -Very poor
Cost of health facility delivery	Refers to whether the cost of health facility delivery influenced the participant the choice of place delivery.	Ordinal values: -Very high -High -Moderate -Cheap
Privacy at health facility	Refers to whether there is privacy at the health facility as reported by the participant during the interview.	Categorical: Yes / No
Availability of logistics and supplies	Refers to whether logistics and supplies are available to conduct facility delivery	Categorical: Yes / No
Availability of male personnel in the facility	Refers to whether a male personnel conduct facility deliveries.	Categorical: Yes / No

3.4 Study Population

The study population was Women aged 15 to 49 years old from the study area who delivered within one year prior to the start of the study and were alive.

3.5.0 Sampling

3.5.1 Sample Size

The sample size was obtained by using Yamane's formula (1967), n= N/1+N (e^2). Thus, n is the sample size for the study, where N was the population size of the district and e^2 was the precision at 95% confidence level and p=0.5 is assumed in computing the minimum sampling size.

n= N/1+N ($0.5^{2)}$

N= 67, 116

e= 0.5

The sample was proportionately allocated depending on the population of women in their fertility age in each of the sub districts. Specific population of each of the five sub districts was used to compute the sample size needed from each sub district using the formula nk=n/Nk*N, where nk was the number of subjects that were required for interview in each sub district k, n was the number of women of fertility age in each of the sub districts, and Nk was the total number of women of fertility age in the district and N was the required sample size for the study.

Table 3.2: Study Site and Sample Population

Sub District	Sub District Population (WIFA)	Proportional Sample
Chereponi	5,192	146
Bumburiga	1,167	33
Garinkuka	3,235	90
Wenchiki	4,118	115
Wonjuga	2,396	68
Total	16,108	452

3.5.2 Sampling Method

The research was conducted in all the five sub-districts in the Chereponi district. Samples were proportionately allocated to the Sub-districts based on their estimated population of women in their fertility age. Simple random sampling and Linear Snowball sampling procedures were used to select communities in the sub districts and women in their residential locations in their respective communities for the study. In selecting the sub-district communities, names of the sub-district communities were written on pieces of paper and were put into a closed box and shook thoroughly, after which a neutral person was assigned to pick the communities one after the other, and the one picked first was labelled number one, the second community that was picked was also labelled number two in that order till all the communities required were picked and labelled for each of the sub-districts. The participants of the study were selected from community one, two, three to any number of the community in sequence till the maximum number of participants required was achieved in each sub-district.

In selecting the subjects for the study, participants were identified using the Linear Snow-ball approach and distributed among the sub-districts based on a weighted average proportional to the

number of women in the fertile age. This was non-probability sampling technique where existing study subjects recruited the subsequent subjects from among their acquaintances. The first subject was identified in the community and the second person was also identified through the referral from the first subject continuously till the maximum sample size required was achieved in each sub-district.

3.6 Data Collection / Methods & Tools

An interviewer administered structured questionnaire was used to collect the data. Women aged 15-49 years who delivered within one year of the study were selected to participate in the study. Research assistants conducted face to face interviews with women who delivered within one year in their respective residential locations in the communities. The tool captured socio-demographics characteristics including age, marital status, ethnic group, religion, level of education, and employment status. Community level factors included culture, distance to facility, husband's level of education, husband's approval on place of delivery, influence of traditional birth attendance and previous delivery experience. Physical accessibility factors were perceived cost of facility delivery, availability of transport to health facility, affordability of facility delivery cost, season, and rapid labour. Health facility level factors included availability of skilled personnel, staff attitude towards clients, cost of facility delivery, and satisfaction with facility delivery. Six research assistants (teachers from Chereponi Senior High School) were duly trained in order to ensure that the questionnaires were properly understood and subsequently administered. The tool was not translated (written) into any local language, however enumerators being fluent in the two major languages in the district (Anofo and Likpapan) were made to pretest the tools by oral translation before the final data collection in the communities.

3.7 Quality Control

This included training of data collection and entry field workers on processes involved in the interview procedures. During data collection on the field, forty (10%) of the completed questionnaires containing raw data were selected by supervisors at random and checked to identify errors and/or omissions and corrective actions were made when necessary. These checks were repeated during data entry. Data were double entered into Epi Info and merged in order to detect errors. All the data had backed up with external storage device. The questionnaires were pre-tested in Natabu sub district in the Saboba district of the Northern region.

3.8 Data Processing and Analysis

3.8.1 Statistical Methods

On daily basis, the principal investigator collected and checked the completed forms and corrected errors that occurred during data collection. To ensure quality, the collected data were double entered into Epi Info version 3.5.4 for validation. Records that were discordant during the validation process were resolved by consulting the questionnaires. Data was exported to STATA version 15.0 for analysis. Data was first analyzed descriptively by running for frequencies and estimating proportions. Continuous variables such as; age were summarized into mean and range. Age was then re-categorized into age groups of 4 years interval according to the Demographic and Health Survey Categorization. Pearson chi square test was done to determine significance differences between facility delivery and categorical variables and present as contingency tables with p values and fishers exact tests done for variables with less than 5 frequencies. Variables with P-value <0.05 at bivariate level were considered statistically significant. Binary logistic regression was done to determine factors associated with low facility

delivery. The variables which were significant as well as those proven plausible in literature to be associated with facility delivery including religion, ethnicity and educational level were controlled for in a multiple logistic regression model to detect factors that will be statistically significant to cause low facility delivery. The results were presented in two by two tables which displayed the frequencies, percentages, crude and adjusted odds ratios (ORs) and 95% confidence intervals (CIs) and p-values.

3.9 Ethical Issues

Ethical approval for this study was obtained from the Ghana health service Ethical Review Committee. Permission was sought from the Northern Regional health directorate and the Chereponi district health directorate. Written informed consent was sought from individual women (women aged 18-49years who delivered within one year of the study) before administering the questionnaire. For women aged 15-17years informed consent were obtained from their mothers and assent obtained from themselves before participation in the study. Permission letters and consent forms were available in English and intensive explanations were given in the local language to ensure participants had comprehensive understanding of the study objectives, potential risks and benefits and assurance of confidentiality. Participants were also given the opportunity to decline to participate and the right to opt out at any point in the course of the interview. Participants' confidentiality and privacy were respected during questionnaire administration and interactions. To ensure proper confidentiality and privacy, names of participants were not used in the write-up since the questionnaires were coded. The findings from the study were reported such that the names of the respondents would not be used. All

information were treated as confidential. Data collected was only accessed directly by those who were involved in the research. All data were stored under lock and key.

3.10 Pretesting Of Questionnaire

A pre-test was done in the Saboba district to identify errors in the questionnaires. To ensure that the questions were clear, and respondents understood the questions as intended, the pre-testing was done outside the study area during training of field workers (National service personnel in the teaching field). Final data collection was done by these trained field workers.

CHAPTER FOUR

4.0 RESULTS

4.1 Demographic characteristics of study participants

A total of 440 women who gave birth between March, 2017 and March, 2018 were interviewed. The ages of the respondents ranged from 15 to 49 years. Rural communities in the Chereponi district were used for the health research. Out of the 440 women interviewed, 271 (61.59%) delivered at home while 169 (38.41%) delivered at a health facility. Women in the age group 40-49 years delivered more at home than any other age group interviewed (71.9%). Proportionally, women in the age group 15-20 years recorded more (50.9%) facility deliveries than any other age group in the district. There was no statistically significant difference in the number of home deliveries and facility deliveries (P=0.144). Almost all the women interviewed were married (99.09%) and majority (61.59%) delivered at home.

Most of the women interviewed (76.82%, 338/440) had no formal education, while 23.18% attended primary school and beyond. A total of 66.9% of the respondents who did not have formal education delivered at home. Majority of the women who had secondary level of education delivered at health facility (66.8%). The educational level of the women in determining place of delivery was statistically significant (P<0.001).

Anofo ethnic group was the majority among the respondents interviewed (55.23%), followed by Likpakpan (40%) and other ethnic groups formed (4.77%). Most of the respondents from Ewe ethnic group delivered at a health facility (70%). Majority of Likpakpan ethnic group delivered at home (74.4). The difference among the ethnic groups in terms of health facility delivery was statistically significant (P<0.001)

Religion as demographic factor, Moslems population was the highest (47.96%), followed by Christians (32.27%), while Traditionalists were the least (19.77%).

Traditionalists, Christians and Moslems all recorded higher proportion of home deliveries (75.9%, 66.2% and 52.6%) in that order. Religion as factor in determining place of delivery among the women interviewed was statistically significant (P<0.001).

A high proportion of women interviewed, belonged to low (49.6%) and very low (28.2%) income level status. Most of the women with moderate income level (54.4%) delivered at a health facility, whilst only a few who belonged to very low income status (31.5%) delivered at a health facility. The difference in terms of facility delivery and income levels among mothers was statistically significant (p=0.003).

Majority of husbands of the women interviewed, had no formal education (77%). The percentage of women who delivered at health facility was high (66.7%) among women whose husbands had secondary level of education. On the other hand the least facility delivery occurred among women whose husbands had no formal education (33.1%). The difference among the educational level of husbands of the women who delivered at a health facility and the women who delivered at home was statistically significant (P=0.001).

Table 4. 1: Demographic Characteristics of Study Participants in Chereponi District

	Place of Delivery		
	Home	Health Facility	
Variable	N=271	N=169	p value
Age			0.144
15-20	26 (49.1)	27 (50.9)	
21-29	137 (63.7)	78 (36.3)	
30-39	85 (60.7)	55 (39.3)	
40-49	23 (71.9)	9 (28.1)	
Marital Status			0.73*
Married	269 (61.7)	167 (38.3)	
Single	1 (33.3)	2 (66.7)	
Separated	1 (100)	0	
Highest Education			**0.001***
No Formal Education	226 (66.9)	112 (33.1)	
Primary	18 (56.3)	14 (57.9)	
Middle School/Junior High	16 (42.1)	22 (57.9)	
Secondary (SHS)	7 (33.3)	14 (66.8)	
Tertiary	3 (42.9)	4 (57.1)	
Ethnic Group			**<0.001***
Anofo	128 (52.7)	115 (47.3)	
Likpakpan	131 (74.4)	45 (25.6)	
Ewe	3 (30)	7 (70)	
Akan	3 (100)	0 (0)	
Fulani	4 (80)	1 (20)	
Gonja	2 (66.7)	1 (33.3)	
Religion			**<0.001***
Christian	94 (66.2)	48 (33.8)	
Moslemm,	111 (52.6)	100 (47.4)	
Traditionalist	66 (75.9)	21 (24.1)	
Income level			**0.003***
Very low	85 (68.6)	39 (31.5)	
Low	142 (64.6)	78 (35.4)	
Moderate	41 (45.6)	49 (54.4)	
High	3 (60)	2 (40)	
very high	**0 (0)**	1 (100)	
Husband Education level			**0.001***
No Formal Education	226 (66.9)	112 (33.1)	
Primary	18 (56.3)	14 (43.7)	
Middle School/Junior High	16 (42.1)	22 (57.9)	
Secondary (SHS)	7 (33.3)	14 (66.7)	
Tertiary	4 (36.4)	7 (63.6)	

*** - Fishers Exact Test** **Bolded means statistical significant**

Fig. 4.1 below shows distribution of place of delivery that occurred in Chereponi district. The women who delivered in Chereponi district between March 2017 and March 2018, out of a total of 440 women interviewed 169 (38.41%) delivered at a health facility, 22 (5%) deliveries took place at home of a trained traditional birth attendants in the communities whilst 249 (56.59%) deliveries were attended to by non-trained traditional birth attendants at the pregnant women's home.

Figure 4. 1: Health facility delivery and non-health facility delivery in Chereponi district

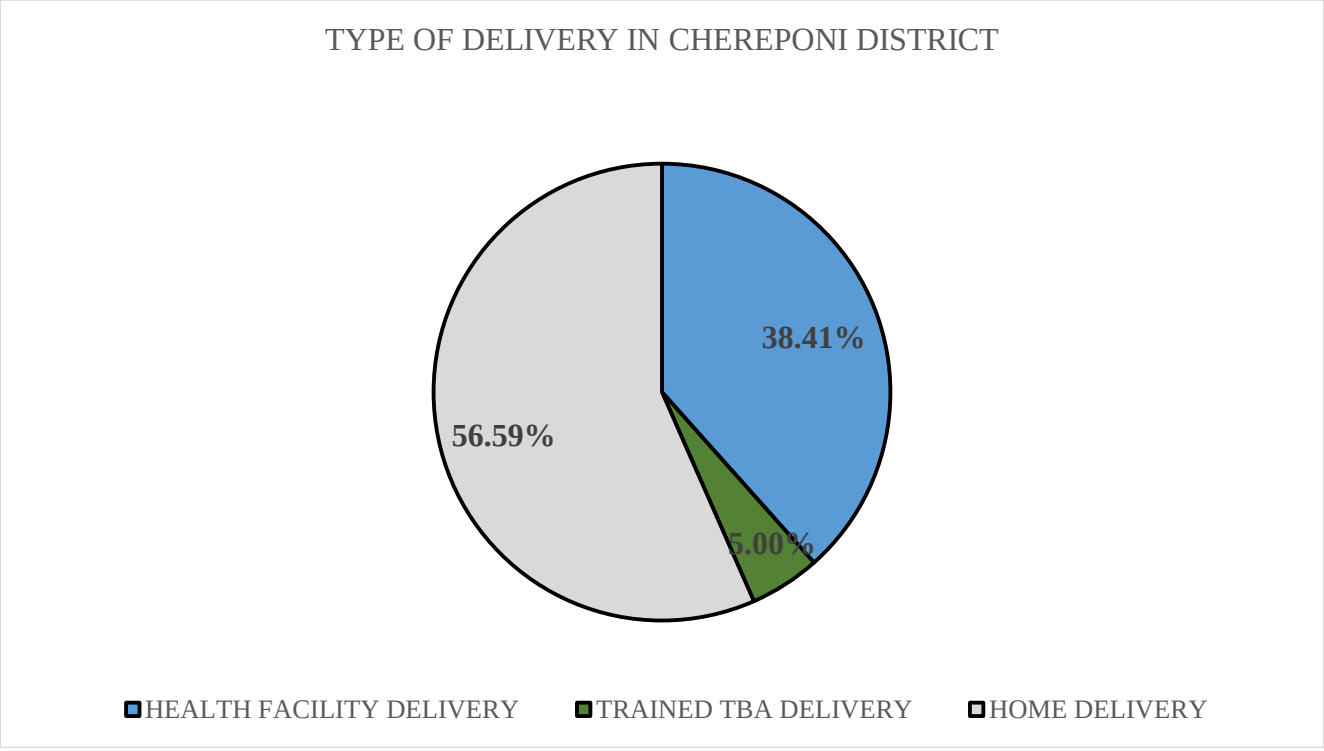


Fig. 4.2 shows the parity in relation to facility delivery. Out of 440 women sampled for the survey, proportionally the women who belonged to parity one, 47% delivered at a health facility, while among women with parity two, only 43% delivered at health facility, those women who had parity three, 44% of them delivered at a health facility, while those women who had seven deliveries and above, 34% delivered at a health facility.

Figure 4.2: Parity and proportion of facility delivery in Chereponi district

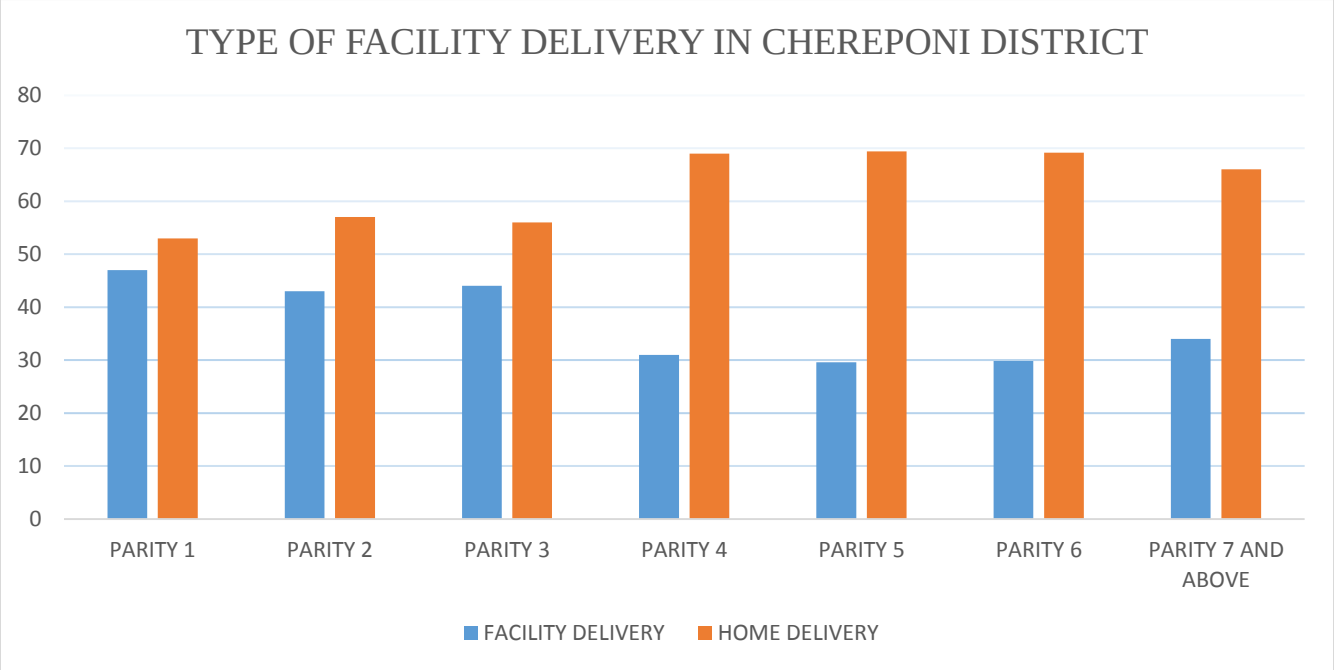


Fig. 4.3 compares distance from communities of respondents to the nearest health facility and facility delivery. Women who lived within a distance 1-2 kilometers to the nearest health facility 57% delivered at health facility. Among the women who lived 3-5 kilometers to the nearest health facility, 39% delivered at health facility. Among women who lived 16-20 kilometers, 24.5% delivered at a health facility while among women who lived between 21-30 kilometers away from the nearest health facility, 77% delivered at health facilities.

Figure 4.3: Distance and facility delivery among respondents in Chereponi district

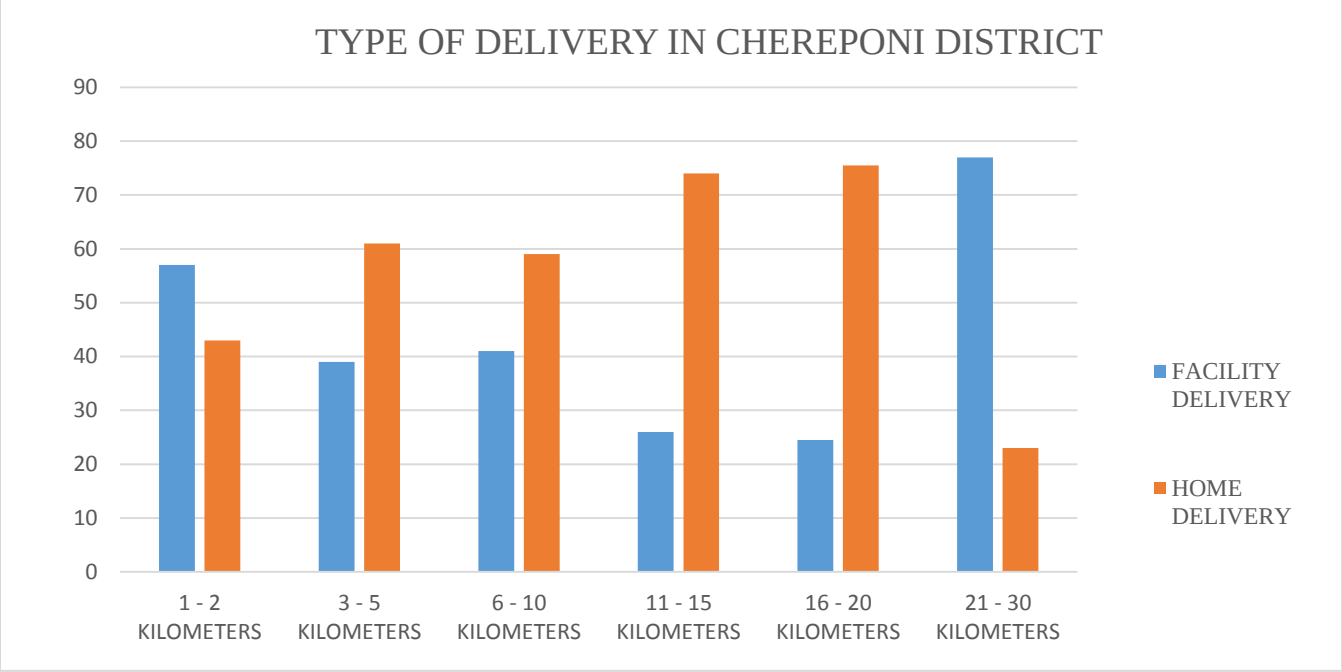


Fig. 4.4 shows the relationship between number of antenatal visits and facility delivery. Out of the total number of women interviewed, 4% attended antenatal clinic only once during their recent pregnancy before delivery, and among these women 33.3% delivered at a health facility. A total number of women who attended antenatal clinic twice, 26% delivered at a health facility, while a total number of women who attended antenatal clinic five times and above, 49% delivered at a health facility.

Figure 4.4: Number of antenatal visits and facility delivery among respondents in Chereponi district

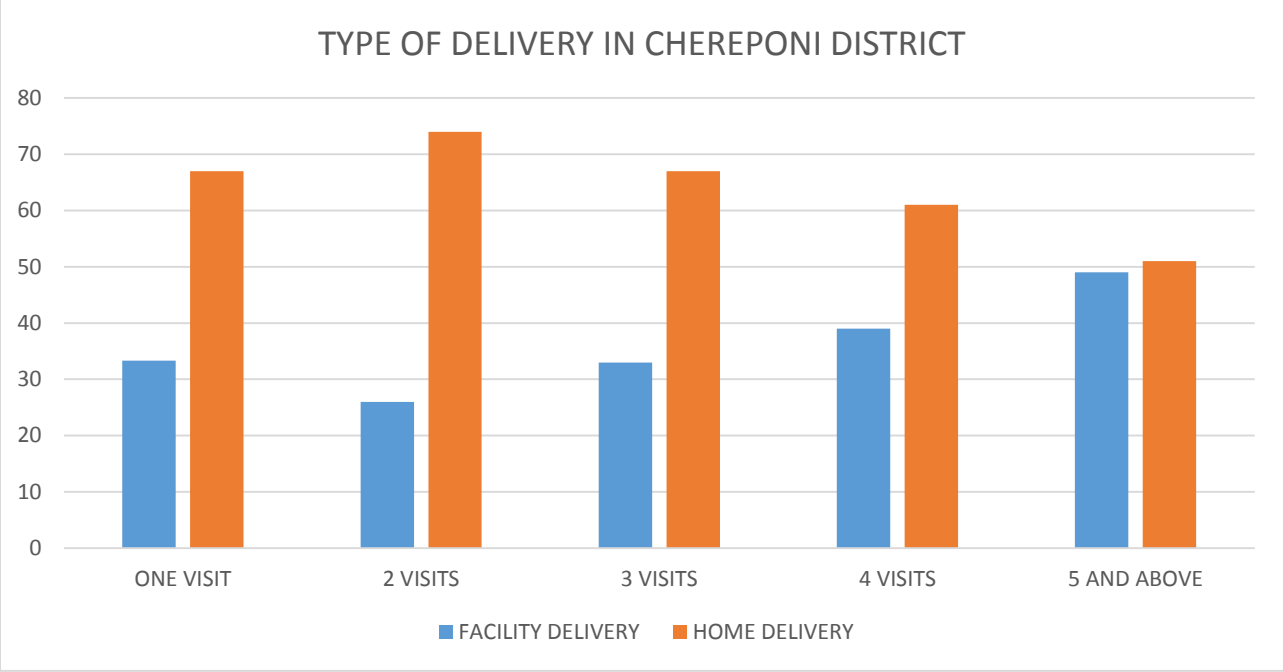


Fig. 4.5 shows occupation and facility delivery among respondents. Most (86.4%) of the women interviewed were farmers. Out this proportion 34% of these women delivered at a health facility. A few (5.5%) of the respondents were traders, and out of this proportion 87.5% delivered at a health facility. Public servants formed 0.9% and 50% of them delivered at a health facility. Seamstress who were only 3%, and 71% of these women delivered at a health facility, while the women who were housewives (1.6%), 43% delivered at a health facility.

Figure 4.5: Occupation and facility delivery of the respondents in Chereponi district.

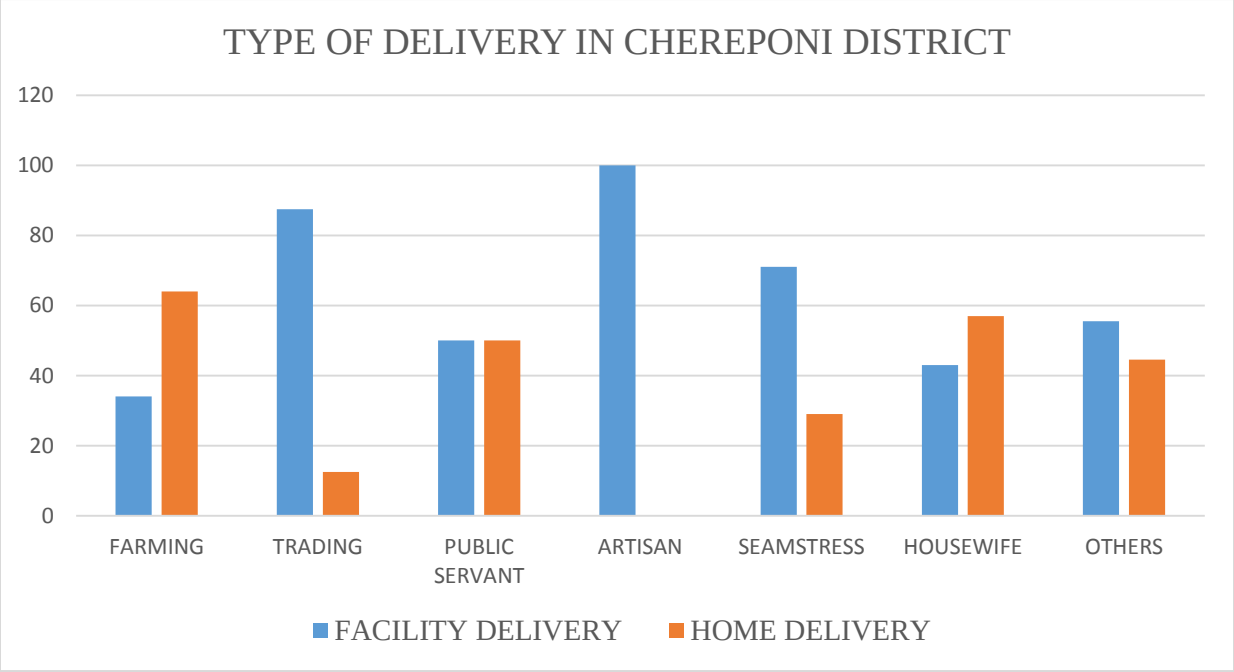


Table 4.2 shows individual factors associated with place of delivery in the Chereponi district. In univariate analysis, educational level, (P=0.001), ethnic group (P=0.003), income level (P=0.001), parity (P=0.007) and number of antenatal visit (P=0.004) were significantly associated with place of delivery. Almost all the individual factors that were significantly associated with place of delivery at the univariate analysis were statistically associated with place of delivery at the multivariate level, educational level (P=0.013), ethnic group (P=0.003), income level (P=0.001), and number of antenatal visit (P=0.019), except parity (P=0.264) which was not significantly associated with place of delivery. At the univariate level, age (P=0.134), marital status (P=0.951) and religion were not significantly associated with place of delivery.

Mothers with secondary level of education 61% more likely to deliver at health facility in the multivariate analysis compared to women with no formal education (aOR: 0.61, 95% CI: 0.08-4.48).

Respondents who were women from Ewe ethnic group were two times more likely to deliver at a health facility compared to women who belonged to Anofo ethnic group in both the multivariate and multivariate logistic regression analysis (aOR: 2.48, 95% CI: 0.51-11.92, P=0.003).

At both the univariate and multivariate levels of analysis the odds of a woman with high level of income status delivering at a health facility was about two times the odds of a woman with very low income level status delivering at health facility (aOR=2.25, 95% CI: 0.28-17.89, P=0.001).

Women who had five and above antenatal visits during pregnancy were 141% more likely to deliver at a health facility compared to women with only one antenatal visit (aOR=1.41, 95% CI: 0.68-8.54, P=0.019).

Table 4. 2: Individual Factors Associated with Place of Delivery in Chereponi District

	Unadjusted			Adjusted		
Variable	**OR**	**95% CI**	**p value**	**OR**	**95% CI**	**p value**
Age			0.134			0.711
15-20 (Ref)	1.0					
21-29	0.55	0.29-1.01		0.511	0.25-1.05	
30-39	0.62	0.33-1.18		0.61	0.27-1.37	
40-49	0.38	0.15-0.96		0.36	0.12-1.10	
Marital Status						
Married (Ref)	1.0		0.951			0.692
Single	3.22	0.29-35.8		1.34	0.08-22.6	
Education level			**0.001**			**0.013**
No Formal Education (Ref)	1.0					
Primary	2.86	1.46-5.57		2.13	1.0-4.52	
Middle School/Junior High	2.04	0.95-4.36		1.56	0.67-3.62	
Secondary (SHS)	1.27	0.21-7.69		0.49	0.07-3.63	
Ethnic Group			**0.003**			**0.003**
Anofo (Ref)	1.0					
Likpakpan	0.38	0.25-0.58		0.46	0.25-0.85	
Ewe	2.59	0.66-10.28		2.48	0.51-11.92	
Fulani	0.28	0.03-2.53		0.39	0.04-3.74	
Religion			0.418			0.231
Christian (Ref)	1.0					
Moslem	1.76	1.14-2.74		0.92	0.48-1.76	
Traditionalist	0.62	0.34-1.14		0.64	0.33-1.24	
Income level			**0.001**			**0.001**
Very low (Ref)	1.0					
Low	1.19	0.75-1.91		1.21	0.72-2.04	
Moderate	2.6	1.48-4.57		2.79	1.49-5.24	
High	1.45	0.23-9.05		2.25	0.28-17.89	
Parity			**0.007**			0.264
1 (Ref)	1.0					
2	0.85	0.44-1.63		0.95	0.44-2.05	
3	0.88	0.47-1.65		1.005	0.48-2.1	
4	0.51	0.26-1.01		0.66	0.29-1.46	
5+	0.52	0.30-0.91		0.83	0.4-1.71	
Number of ANC Visits			**0.004**			**0.019**
1 (Ref)	1.0					
2	0.7	0.22-2.26		1.06	0.27-4.22	
3	0.94	0.33-2.73		1.49	0.41-5.44	
4	1.29	0.46-3.68		2.05	0.56-7.27	
5+	1.79	0.64-5.02		2.41	0.68-8.54	

Bold means statistically significant **OR- Odd Ratio** **Ref-Reference**

Table 4.3 shows community factors associated with place of delivery in Chereponi district. Univariate analysis show that the level of educational (P=0.001), husband's approval (P=0.006), decision of place of delivery (P=0.031), reasons why women deliver at home (P=0.009) and challenge to accessing health facility (P=0.001) were significantly associated with place of delivery. In the multiple logistic regression analysis, challenge to accessing health facility was the only community factor that was significantly associated with place of delivery (P=0.003).

In the univariate analysis, age (P=0.134), marital status (0.692), norm on place of delivery (P=0.45) and consulting oracle on place of delivery were not significantly associated with place of delivery.

Women who had challenge with distance to a health facility were 49% less likely to deliver at a health facility compared with women with whom distance was not a problem to be delivering at a health facility at multivariate level analysis (aOR=0.51, 95% CI: 0.31-0.85, P<0.003). Similarly, at multivariate level analysis, it was shown that, distance was significantly associated with facility delivery (aOR=0.51, 95% CI: 0.31-0.85, P=0.003).

Table 4.3 Community Factors Associated with Place of Delivery in Chereponi District

	Unadjusted			Adjusted		
	OR	95%CI	p value	OR	95% CI	p value
Age			0.134			0.462
15-20 (Ref)	1.0					
21-29	0.62	0.29-1.0		0.62	0.30-1.27	
30-39	0.78	0.33-1.18		0.78	0.35-1.76	
40-49	0.40	0.15-0.96		0.40	0.13-1.25	
Marital Status			0.951			0.801
Married (Ref)	1.0					
Single	3.22	0.29-35.8		1.92	0.11-34.65	
Educational level			**0.001**			0.057
No Formal Education (Ref)	1.0					
Primary	2.86	1.46-5.57		2.20	1.03-4.67	
Middle School/Junior High	2.04	0.95-4.36		1.47	0.62-3.45	
Secondary (SHS)	1.26	0.21-7.69		0.61	0.08-4.48	
Husband Approval			**0.006**			0.098
Husband doesn't approve (Ref)	1.0					
Husband Approves	0.48	0.28-0.81		0.42	0.21-0.83	
Decision of place of delivery			**0.031**			0.779
Pregnant women (Ref)	1.0					
Husband	1.27	0.77-2.1		1.10	0.61-1.96	
in-laws	1.41	0.79-2.51		0.65	0.31-1.35	
Family heads	2.21	1.03-4.75		1.36	0.57-3.23	
The gods	4.18	0.37-47.79		2.63	0.21-33.19	
Reasons women deliver home			**0.009**			0.055
Poverty (Ref)	1.0					
Distance to health facility	0.67	0.31-1.43		0.88	0.38-2.03	
Rapid Labour	1.19	0.77-1.84		1.37	0.82-2.26	
Traditional Birth Attendants	0.91	0.26-3.16		0.93	0.23-3.71	
Transport	2.11	0.94-4.73		1.64	0.64-4.19	
Convenience	12.78	1.53-106.4		10.85	1.15-102.16	
Norm on place of delivery			0.45			0.553
No Norm (Ref)	1.0					
Existence of norm	1.62	0.46-5.69		1.40	0.34-5.71	
Consult oracle on place of delivery			0.729			0.414
Not consult oracle (Ref)	1.0					
Consult oracle	0.87	0.41-1.87		0.71	0.30-1.71	
challenge to skilled delivery			**<0.001**			**0.003**
Distance not a challenge(Ref)	1.0					
Distance a challenge	0.4	0.26-0.61		0.51	0.31-0.85	

Bolded means statistically significant OR- Odd Ratio Ref-Reference

Table 4.4 shows health facility factors associated with place of delivery in the Chereponi district. In the univariate analysis health facility staff attitude (P<0.001), type of clients reception at a facility (P<0.001) and satisfaction with facility delivery (P<0.001) were significantly associated with facility delivery.

Mothers who considered facility delivery services to be poor were 89% less likely to deliver at a health facility compared with women who rate facility delivery as very good (aOR=0.89, 95% CI: 0.03-0.28, P<0.001).

Mothers who were satisfied with facility delivery services were two times more likely to deliver at a health facility compared with mothers who are not satisfied with facility delivery services (aOR 2.98 95% CI 0.71-12.57, P=0.006).

It was only 35% of women with poor family wealth who were likely to deliver at a health facility compared with women with problem with means of transport to a health facility (aOR 1.65 95% CI 0.88-3.05, P=0.021).

Table 4.4 Health Facility Factors Associated with Facility Delivery in Chereponi District

	Unadjusted			Adjusted		
	OR	95% CI	p value	OR	95% CI	p value
Age			0.134			0.19
15-20 (Ref)	1.0					
21-29	0.62	0.29-1.0		0.49	0.22-1.15	
30-39	0.78	0.33-1.18		0.57	0.24-1.36	
40-49	0.40	0.15-0.96		0.42	0.12-1.49	
Marital Status			0.951			0.551
Married (Ref)						
Single	3.22	0.29-35.8		9.1	0.05-16.2	
Reason to Choose Health Facility			**0.001**			**<0.001**
Cost of Delivery (Ref)	1.0					
Cost of Stay in health facility	0.99	0.61-1.64		0.99	0.52-1.89	
Lack of Privacy	2.95	1.30-6.67		2.89	0.98-8.58	
Length of stay in health facility	1.52	0.51-4.54		2.75	0.63-11.97	
Staff attitude	3.49	1.83-6.65		5.59	2.11-14.82	
No Insurance	1.08	0.44-2.66		2.27	0.57-9.12	
Quality of Facility delivery			**<0.001**			**<0.001**
Very Good (Ref)	1.0					
Good	0.48	0.30-0.76		0.61	0.34-1.08	
Poor	0.09	0.04-0.23		0.89	0.03-0.28	
Lack of Skilled Personnel	0.01	0.002-0.104		0.01	0.001-0.09	
Type of facility reception			**<0.001**			0.303
Friendly (Ref)	1.0					
Cared for	0.46	0.29-0.75		0.41	0.22-0.75	
Respectful	0.2	0.08-0.49		0.42	0.13-1.32	
Always available	0.17	0.05-0.52		0.72	0.16-3.14	
Shout at women	0.4	0.18-0.89		0.44	0.14-1.39	
Poor attitude	0.59	0.29-1.2		1.01	0.36-2.84	
Not respectful	0.09	0.02-0.39		0.11	0.11-0.97	
Satisfaction with facility delivery			**<0.001**			**0.006**
Not Satisfied (Ref)	1.0					
Satisfied	3.3	2.09-5.13		2.98	0.71-12.57	
perception of facility delivery			0.111			0.182
Expensive (Ref)	1.0					
Staff not friendly	0.96	0.56-1.64		0.74	0.35-1.57	
No midwife	1.49	0.78-2.28		1.91	0.74-4.93	
No drug	1.79	1.01-3.15		1.8	0.82-3.97	
Presence of male staff	1.14	0.59-2.2		1.69	0.63-4.57	
Why no facility delivery			0.218			**0.021**
Means of transport (Ref)	1.0					
Family wealth	1.27	0.81-1.99		1.65	0.88-3.05	
Insurance Card	1.54	0.63-3.72		1.1	0.32-3.66	
Cost of Service	1.33	0.78-2.29		3.1	1.41-6.78	

Bold means Statistical Significant **OR - Odd Ratio** **Ref-Reference**

CHAPTER FIVE

5.0 DISCUSSIONS

This study was a cross-sectional one conducted in some selected communities in Chereponi district in Ghana among women who had delivered within a period between March, 2017 and March, 2018. The purpose of the study was to determine factors influencing health facility delivery in the district.

Among the 440 women interviewed, 38.41% delivered at a health facility. Out of the women who delivered at home, 22 (5.0%) were deliveries conducted by trained traditional birth attendants, while 249 (56.59%) were home deliveries conducted by the relatives of the women in their communities. This results confirm Chereponi district annual report, (2016) which indicated that health facility deliveries were low in 2014, 2015 and 2016 with 28%, 37.9% and 37.6% respectively taking place at health facilities. This level of facility delivery recorded in the current study was far below the national and international recommended facility delivery of 90% and above. Ghana health service report (2015) also indicated that the Northern region of Ghana was one of the regions with the lowest coverage of facility deliveries in the country with coverages of 43.4%, 47.4% and 53.4% in 2012, 2013 and 2014 respectively. These low performance of facility delivery requires deliberate efforts by Ghana health service to put in more interventions to improve facility delivery in the Northern region of Ghana.

The demographic characteristics that were found to be significantly associated with health facility delivery were the women's level of education, ethnic group, religion, income level and husbands' education. It was identified that, majority (76.82%) of the women interviewed did not receive any formal education, and out of these women who had no formal education only 33.1% delivered at a health facility. Among the women interviewed, those who had secondary education

had the highest level of health facility deliveries (66.8%), followed by women with middle or junior high level of education (57.9%), primary education 57.9%, tertiary education 57.1% and the least was among women with no formal education (33.1%). Women with middle or junior high education were 2.04 times more likely to deliver at health facilities compared with women with no formal education. It can be additionally inferred that, the education of a woman determines the knowledge a woman has on facility delivery and the best option to take on place of delivery. Women who have higher level of formal education have better job opportunities and good income that enables them to afford cost of delivery related expenditures and therefore, have the chance of making good decisions concerning their own health more than women with little or no formal education. The relatively high proportions of facility delivery among women who had formal education shows that education is one of the major factors that determine women's place of delivery. As cited by Kumbani et al (2013), women's choice of place of delivery is determined by factors like education, parity, transportation systems, family wealth, season and rapid delivery. The ethnic group assessment per the women sampled revealed that, women accessing health facility for child birth, among Ewe group was 70% (7/10). Though the Anofo group formed majority of the women interviewed 55% (243/440), among the Anofo ethnic group 47.3% delivered at a health facility. However, among Likpakpan ethnic group, only 25.6% (45/176) delivered at a health facility, and none of the Akans interviewed delivered at a health facility. The preference of facility delivery has significant association between ethnic groups delivering at health facilities. Ewe women were 2.59 times more likely to deliver at a health facility than the Anofo women. It was found that Fulani women were 72% less likely to deliver at a health facility compared with Anofo women. On the other hand, Likpakpan ethnic group, were 63% less likely to deliver at a health facility compared to Anofo women. The ethnic groups of women

determined the socio-cultural practices, beliefs and the way they embrace health interventions which may one way or the other have influence on the choice of place of delivery. A study conducted in Karachi hospital in Pakistan revealed that the reasons for high home deliveries were due to family traditions, poor socio-economic conditions and presence of traditional birth attendants (Shah et al., 2010).

Religious affiliation in relation to facility delivery also showed that Moslems recorded relatively high number of facility deliveries (47.4%), followed by Christians (33.8%) and the least was among Traditionalists (24.1%). Religion was found to have significant influence on place of delivery in the district. Relatively Moslem women were 76% more likely to deliver at a health facility as compared to Christians, while the Traditionalists were 38% less likely to deliver at a health facility compared to Christians. The type of religion women were born into will negatively or positively affect the beliefs, practices and behaviors which will have influence on health seeking priorities including the choice of place of delivery.

Income level was found to be significantly associated with facility delivery. It was found that women with moderate income level status were 2.6 times more likely to deliver at a health facility compared to women with very low income level status delivering at a health facility, while women with low income status were 19% more likely to deliver at a health facility compared to women with very low income status. Women with good income level are likely to have the capacity to afford every delivery related costs and therefore, have better opportunity to make good decision about their personal health and decide preferred place of delivery compared to women with very poor income status. Thus, as the income level increases the likelihood of the women visiting health facilities will be higher as compared to when the income level decreases. A research conducted by Sialubanje et al (2015) confirmed that women's place of delivery is

influenced by poverty, distance to health facility and availability of means of transport to a health facility.

Similarly, the level of education among husbands of respondents was equally significant in determining place of delivery. Among women whose husbands had secondary level of education 66% delivered at health facility, followed by women whose husbands had tertiary education, and the least was among women whose husbands did not have any formal education (31.2%). A research study conducted in rural coastal Kenya found that low facility delivery rate was as a result of high illiteracy rates among women and their husbands and the long distance from the communities to health facilities (Moindi et al., 2015).

This study saw a significant association between parity and facility delivery (P=0.007). Among women of parity one 47% delivered at a health facility. The next highest observed was among women of parity three 44% delivered at a health facility and the least facility delivery was among women with parity five 29.5%. It was identified that women with parity four and above were 48% less likely to deliver at a health facility compared with women with parity one. Thus, as the parity of women increases the number of facility delivery decreases. This may be as a result of delivery experience gained by the women as they continue to give more births. Similar findings on research conducted in Ghana, established that parity, women's level of education, rural or urban residence, household wealth, number of antenatal visits were determinants of facility delivery (Moyer, 2014, Sialubanje et al., 2015).

The number of times a woman visited the antenatal clinic before delivery was found to be related to the place of delivery. Those women who attended ANC five times or more were 1.79 times more likely to deliver at a health facility compared with women who had only one visit. A study conducted by Moyer (2014) found that the number of ANC visits by women was significantly

associated with place of delivery. The more the women attended ANC the more they received health education on reproductive health and the right place to choose for child birth.

The community factors that were significantly associated with health facility delivery were husbands' approval on place of delivery, in the community who decide for a woman on place of delivery, the reasons why women deliver at home and the challenge to access health facility delivery.

The study found that in the communities where husbands decide for their wives on place of delivery women were 52% less likely to deliver at a health facility as compared to the communities where women have free will to decide on place of delivery. The situation where husband insist that he does not have money and therefore, his wife should deliver at home, the woman may not have any option than to deliver home which can negatively affect the health of the woman and her baby. Similar study in rural Zambia established that home deliveries were high when women depended on their husbands and his family members to decide on the place of delivery (Sialubanje et al., 2015). The findings revealed that one of the community factors why women deliver at home was due to convenience of the home. Women who found the home a convenient place for delivery were 12.78 times more likely to deliver at home compared to women who did not find convenience at home. A study conducted in Tanzania established that women prefer home delivery due to convenience in delivering at natural habitat, traditional practices and satisfaction with Traditional birth attendance (Simfukwe, 2011).

Distance from community to health facility was significantly associated with facility delivery ($P<0.001$). The women who were living far away from the facilities 60% were less likely to deliver at a health facility compared with those living close to the health facilities. The distance from the community could be poor road network leading to inaccessibility, difficulty in getting

means of transport or community totally cutoff during rainy season are the factors that can reduce the rate of facility delivery in a given geographical area at a given point in time. A study conducted in Ghana by Nesbitt et al. (2016) found that closeness of a health facility has influence on facility delivery. Another report on a study conducted in rural Uganda revealed that women in rural communities were two times (46%) less likely to access antenatal care and facility delivery compared with women in the urban areas due to low level of formal education, poverty, perceived high cost of facility delivery, distance to the nearest health facility and privacy during facility delivery (Kwungezi et al., 2015). Similarly a cross-sectional study conducted in Morogoro in Tanzania found that 88% of the women who delivered at home stayed beyond five kilometers from the nearest health facility and 92% of women who delivered at a health facility were relatively much closed to the health facilities (Melorose, Perroy. & Cares, 2015). In Java Province in Indonesia women use traditional birth attendance due to poverty, distance and means of transport (Titaley et al., 2010).

The health facility factors that were significantly associated with facility delivery were staff attitude, type of reception by facility staff and satisfaction with services during facility delivery. In a similar study conducted by Enuame et al. (2016), in Dodowa, Kintampo and Navorogo on factors influencing facility delivery, the attitude of health staff was found to be a determinant of the women's choice of place of delivery. In the current study, women who saw facility delivery to be good and providing quality service more delivered at a health facility compared with those who think otherwise. The attitude of health staff in relation to service delivery was significantly associated with facility delivery ($P<0.001$). It was identified that women who saw health staff to have poor attitude 41% were less likely to deliver at a health facility compared with women who perceived health staff to be friendly, and women who were satisfied with facility delivery were

3.3 times more likely to deliver at a health facility compared to women who were not satisfied with facility delivery.

CHAPTER SIX

6.0CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The level of facility delivery was found to be low (38.4%), and far below the national and international recommended target of 90% or more. Several factors were identified to be significantly associated with place of delivery. These included: the women's level of education, her ethnicity, income level, parity, number of antenatal visits, her husband's level of education, distance to a health facility, health staff attitude, and religion.

6.2 Recommendations

Based on the key findings of the study, the following recommendations were made to improve the level of facility delivery in the district, and also to improve upon clinical/public health practice, research and inform future policy decisions.

Clinical/public health practice

1. Ghana health service should strengthen the partnership between traditional birth attendants, stakeholders of health, community opinion leaders and the skilled providers in the district to increase the level of facility delivery.
2. Ghana health service must intensify reproductive health education in the district to improve the level of facility delivery.
3. The Chereponi district health administration must put sound measures in place to improve the quality of staff attitude, health delivery services and good facility reception in all health facilities to increase level of facility delivery in the district.

Policy

4. District assembly and Ghana government must intensify the enrollment of girl child education to improve women empowerment on decision making, employment, income level and social status which will result in increased level of facility delivery.
5. Chereponi district assembly and Ghana government must provide adequate health facilities in the communities to bring health delivery services close to the deprived populations.
6. Chereponi district assembly and Ghana government should construct roads of difficult to reach communities to easily link those communities to their nearest health facilities for health delivery services.

Research

7. Further studies should be conducted by Ghana health service to ascertain the factors that influence staff behavior and attitude that discourages women to deliver at health facilities, even though they are supposed to have attained the requisite training from recognized institutions.

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APPENDIX

APPENDIX I

FACTORS INFLUENCING FACILITY DELIVERY IN CHEREPONI DISTRICT

SECTION A: DEMOGRAPHIC/INDIVIDUAL FACTORS

D1	What is your highest level of education?	1. No school ( ) 2. Primary ( ) 3. Middle/JHS ( ) 4. Secondary/SHS ( ) 5.Tertiary ( ) 6. Others ……
D2	What is your marital status	1. Married ( ) 2. Single ( ) 3. Separated ( ) 4. Divorced ( ) 5. Widow ( )
D3	What is your husband's highest level of education?	2. No school ( ) 2. Primary ( ) 3. Middle/JHS ( ) 4. Secondary/SHS ( ) 5. Tertiary ( ) 6. Others ……
D4	How old are you?	1. 15-20 ( ) 2. 21-29 ( ) 3. 30-39 ( ) 4. 40-49 ( )
D5	Which ethnic group do you belong to?	1. Anofo ( ) 2. Likwakwa ( ) 3. Ewe ( ) 4. Akan ( ) 1. Dagomba ( ) 5. Fulani ( ) 6. Gonja ( ) 7. Others ……..
D6	Which religion do you worship?	1. Christian ( ) 2. Moslem ( ) 3. Traditionalist ( ) 4. Others specify……
D7	What is your major occupation?	1. Farming ( ) 2. Trading ( ) 3. Public servant ( ) 4. Artisan ( ) 5. Seamstress ( ) 6. House wife ( ) 7. Others ……
D8	What is your husband's major occupation?	1. Farming ( ) 2. Trading ( ) 3. Public servant ( ) 4. Artisan ( ) 2. Tailor ( ) 6. House wife ( ) 7. Others ……
D9	Parity- how many deliveries have you had in life?	1. 0ne ( ) 2. Two ( ) 3. Three ( ) 4. Four ( ) 5. Five ( ) 6. Six ( ) 7. Seven ( ) 8. Others……..
D10	Please how is your income level?	1. Very low ( ) 2. Low ( ) 3. Moderate ( ) 4. High ( ) 5. Very high ( )

SECTION B: COMMUNITY FACTORS OF FACILITY DELIVERY

	QUESTION	RESPONSE
S1	Do you have to seek approval from your husband about place of delivery?	1. Yes 2. No
S2	In your family structure who decides a woman's place of delivery when she is pregnant?	1. The pregnant woman ( ) 3. The in-laws ( ) 2. The husband ( ) 4. Family heads ( ) 5. The gods
S3	If you choose to deliver in a health facility what will be your husband's response?	1. He will agree ( ) 3. Culture does not allow 2. He will not agree ( ) 4. There will be suspicion( )
S4	Why do some women choose to deliver at home?	1. Poverty ( ) 4. Presence of TBA ( ) 2. Distance to health facility ( ) 5. Transport ( ) 3. Rapid labour ( ) 6. Convenience ( ). 7. Season()
S5	Do you have any traditional norm that prevent you from deciding where to give birth?	1. YES ( ) 2. NO ( )
S6	If yes, what are the traditional norms that prevent you to decide place of delivery?	1. Culture ( ) 3. Lack of women autonomy ( ) 2. Religion ( ) 4. Husband has to decide ( )
S7	In this community do your in-laws decide for you the place of delivery?	1. Yes ( ) 2. No ( )
S8	In your community here do you have to consult your oracles for place of delivery?	1. Yes ( ) 2. No ( )
S9	Does distance from your community to the health facility a problem to a facility delivery?	1. Yes ( ) 2. No ( )

SECTION C: INSTITUTIONAL/ HEALTH FACILITY FACTORS

	QUESTION	**RESPONSE**
F1	What are some of the problems in health facilities that prevent women to deliver at a health facility in your community here?	1. Cost of delivery ( ) 2. Length of stay ( ) 3. Cost of stay in facility ( ) 4. Poor Staff attitude ( ) 5 Lack of Privacy ( )6.Lack of insurance card
F2	How do you perceive facility delivery services in the health facilities?	1. Very good ( ) 2.Good ( ) 3. Poor ( ) 4. Lack of skilled personnel ( ) 5 Never delivered in health facility before ( )
F3	How do you assess the relationship betweenhealth facility staff and pregnant women who deliver in the health facilities?	1. They are friendly ( ) 2. Shout at women ( ) 3 They are cared for ( ) 4. Poor attitude ( ) 5-They are respectful ( ) 6. Not respectful ( )
F4	Do your community members like how health services are rendered to them?	1. Yes ( ) 3. Somehow ( ) 2. No ( ) 4. Not at all ( )
F5	In your community, what do people normally talk about health facility delivery services?	1. Expensive ( ) 2. No midwife ( ) 3. No drugs 4- Staff not friendly ( ) 5. Not expensive
F6	Why is it that some women deliver in health facilities but other do not?	1. Means of transport ( ) 3. H. Insurance card (2. Poverty ( ) 4. Cost of services ( )

SECTION D: COVERAGE OF FACILITY DELIVERY

	QUESTION	RESPONSE
C1	When did you deliver of your recent baby? (Check child CWC card)	1. January–March, 2017( ) 4. October–December, 2017 ( ) 2. April-June, 2017 ( ) 5. January-March, 2018 ( ) 3. July – September, 2018
C2	Where did you deliver of your recent baby? (Check for evidence)	1. At Health facility ( ) 3. At TBA ( ) 2. At home ( )
C3	What is the distance from this community to the health facility?	1. 1 - 2Km ( ) 3. 6 -10Km ( ) 5. 16 -20Km ( ) 2. 3 - 5Km ( ) 4. 11-15Km ( ) 6. 21- 30Km ( )
C4	When you were pregnant, how many times did you attend Antenatal clinic before delivery? (Check for ANC card)	1. Only one ( ) 5. Five times or more ( ) 2. Two times ( ) 6. None of the above 3. Three times ( ) 4. Four times ( )

APPENDIX II

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

Research & Development Division
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MyRef. GHS/RDD/ERC/Admin/App 1912
Your Ref. No.

23rd January, 2018

Ansah Clifford
University of Ghana
School of Public Health
Legon, Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC: 098/12/17**
Project Title	Factors Influencing Facility Delivery in Chereponi District in the Northern Region of Ghana
Approval Date	1st January, 2018
Expiry Date	31st December, 2018
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra