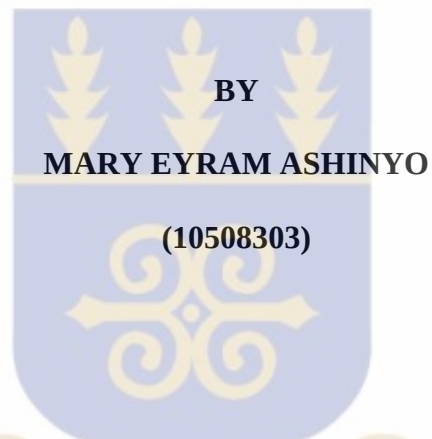


**SCHOOL OF PUBLIC HEALTH
DEPARTMENT OF HEALTH POLICY PLANNING
AND MANAGEMENT**

**SUB DISTRICT MATERNAL REFERRAL PRACTICES
IN HO MUNICIPALITY**



**A DISSERTATION SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH,
COLLEGE OF HEALTH SCIENCES, UNIVERSITY OF GHANA, LEGON IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF
MASTER OF PUBLIC HEALTH DEGREE**

JULY, 2015

DECLARATION

I, Mary Eyram Ashinyo hereby declare that apart from references to other people's works which have been duly acknowledged, this dissertation is a result of my own independent work. I further declare that this dissertation either in whole or in part, has not been submitted for the award of any other degree in this institution or another University



DR. REUBEN K. ESENA

ACADEMIC SUPERVISOR

.....

DATE

DEDICATION

This dissertation is dedicated to my mother, Rose Kporku who took care of my children while I concentrated on my studies in pursuit of my MPH program. I also dedicate this dissertation to my husband Dr. Anthony Ashinyo and my two God given children Kevin and Keisha.



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ABSTRACT

Background: The referral system is emphasized as a back-up function of particular importance in pregnancy and childbirth, as a range of potentially life-threatening complications require management and skills that are only available at higher levels of care (WHO, 1994). In Ho municipality, the proportion of maternal deaths arising from referrals from the periphery to the Volta Regional Hospital had increased from 63% in 2012 to 81% in 2013.

Objectives: The objectives of this study were to determine maternal referral rates of primary care providers, describe the referral processes of primary care providers, explore patient and health system factors in the referral practices and determine the knowledge of healthcare providers in the sub-district facilities in Ho Municipality on danger signs related to pregnancy complications.

Methodology: The study was conducted in 10 sub-district facilities in Ho Municipality from 1st March to 5th June 2015. A cross sectional exploratory and descriptive study with mixed methods was employed. Data were collected using a data extraction tool and in-depth interviews with interview guides. Data were extracted from 266 patient's medical records. Also, 12 midwives and 2 community health officers were interviewed. Data were analyzed using stata 12.0 version and Nvivo 10.

Results: Referral rate for sub-district facilities was 61.7%. Referral processes in Ho Municipality complies with the guidelines of the Ministry of Health's policy on referral though with some challenges. Presence of a danger sign was the significant patient factor influencing referral decision in the sub-district. There was good knowledge on danger signs related to pregnancy complications among all care providers. Poor transportation systems, staff attitude at receiving facilities and poor communication among health workers were challenges confronting the referral system.

Conclusion: The main challenges facing the referral system in Ho Municipality are health system factors particularly concerning human resources and logistics and pharmaceuticals. Streamlining health systems factors will therefore result in tremendous improvement in referral practices in Ho Municipality.

Key words: Client, danger sign, referral rate, primary care giver.

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LIST OF ACRONYMS

CHO	Community Health Officers
cEMONC	Comprehensive Emergency Obstetric and Neonatal Care.
GHS	Ghana Health Service
HMHD	Ho Municipal Health Directorate
HPC	Ho Polyclinic
MOH	Ministry of Health
MPH	Master of Public Health
VRH	Volta Regional Hospital
WHO	World Health Organization.

DEFINITION OF TERMS

Client	A pregnant woman, irrespective of gestational age and 42 days after termination of pregnancy, who is accessing health care.
Danger sign	A symptom or examination finding indicating that a pregnant woman's life is likely to be in jeopardy.
Primary care provider	Health care provider who renders services to clients at the sub district level.
Maternal mortality	Death of a woman whiles pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.
Referring facility	A health facility from which a client is being referred.
Maternal Referral rate	Number of maternal cases referred by the primary care giver per 100 obstetric patients seen.
Referral facility	A health facility to which a client is being referred.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Maternal mortality remains a public health concern. In 2013, 289,000 maternal deaths were recorded globally, with 179,000 (62%) occurring in Sub Saharan Africa. Ghana's maternal mortality ratio stands at 350 per 100,000 live births as of 2013, (WHO, 2014).

In Ghana, hypertensive state in pregnancy are the leading cause of mortality (26.4%) and, together with hemorrhage, genital tract sepsis and early pregnancy deaths, account for 62.2% of all-cause maternal deaths and 87.3% of direct deaths. Infection and sickle cell disease accounted for 13.7% of all-cause maternal deaths and 61.1% of indirect deaths (Lee et al., 2012).

Although there has been several advancement in therapeutic intervention in the last decade, maternal morbidity and mortality still remains a problem. Most of the maternal complications resulting in mortalities often present as emergencies either from aggravation of preexisting conditions during pregnancy, directly from the pregnancy or even after delivery which could have been prevented if detected early and mitigating measures put in place. Early detection of danger signs with prompt interventions or referral to a well-resourced health facility could minimize multiple organ failure and death in critically ill obstetric patients (Zeeman, 2006).

Through referrals, a lot of maternal morbidities and deaths could be averted particularly at the district level. An optimal referral system is therefore crucial in addressing maternal mortality issues in sub Saharan Africa to meet the Millennium Development Goals 4 and 5 (Zeeman, 2006).

Patient referral is a process in which health care providers at lower levels of the health system, who lack skills, facilities, or both to manage a given clinical condition, seek the assistance of providers who are better equipped and specially trained to guide them in managing or to take over responsibility temporarily or permanently for a particular episode of a clinical condition in a patient (Al-Mazrou, Al-Shehri, and Rao 1990).

Primary care is faced by a number of challenges as a result of which a client might need to be referred to a higher level of health care to access a particular service when indicated. These challenges include the evolutionary and undifferentiated nature of symptoms, very low prevalence of certain conditions, the high degree of overlap in symptoms for serious and common conditions, the difficulty of probability-based reasoning and the weak predictive value of diagnostic tests (Foot, Naylor, & Imison, 2010).

In many developing countries, these challenges are compounded by the fact that the diagnostic abilities of health centres is poor and this often warrants a referral (Ilboudo, Chou, & Huang, 2012). Building human capacity at the community level as well as health facility level to recognize and refer complicated cases to higher level facility when indicated is very important (Turab et al., 2013). Such referral systems must be effective, through understanding the processes and challenges of referral practices in health facilities so that there could be full participation of all stakeholders such as patients, their communities, families and health workers.

1.2 Problem Statement

A critical task of primary care providers is to be effective gate keepers to medical specialist so that the needed care is provided to clients whenever required. In developing countries, timely access to emergency obstetric care is not provided by most health systems. Poor referral practices therefore have great impact on the cost of health care both to patient and provider, the quality of care received by the client and access to health care (Murray & Pearson, 2006). A sustainable system that continually improves the safety of clients should be of the highest priority to health managers (Feitelberg, 2006). It is the mandate of the Volta Regional Hospital (VRH) to serve as a referral facility to provide specialized care however, inappropriate referrals are being received persistently from the periphery of the municipality. These patients often are referred late with no pre referral treatment (VRH, 2013).

It is therefore not surprising that in 2012, out of a total of eight (8) maternal deaths recorded in the Volta Regional Hospital (VRH) which is one of the two referral points for the sub district facilities in the municipality, five (5) were cases referred from the periphery of the municipality. Out of the total of sixteen (16) maternal deaths recorded in the same hospital in 2013, thirteen (13) were referred from the periphery of the municipality. The proportion of maternal deaths arising from referrals from the periphery to the VRH had increased from 63% in 2012 to 81% in 2013 (VRH, 2014). Policy makers have been concerned about the number of preventable deaths resulting from referral practices of health care providers in the country (MOH, 2012). It is therefore important to understand the provider's referral decision making process because a well-functioning referral system is the basis for an effective delivery of primary health care and primary care (Ilboudo et al., 2012). The views of patients and health care providers on referral practices are very divergent and this diversity may

impact referral rates of primary care providers. This difference could influence clients as to how they welcome referral suggestions from their primary care providers (Zuckerman et al., 2011).

This study therefore seeks to explore the referral practices of healthcare providers, analyze the challenges associated with their referral practices in order to inform policy makers on appropriate strategies for referral systems in Ho Municipality and the Volta Region at large.

1.3 Conceptual Framework

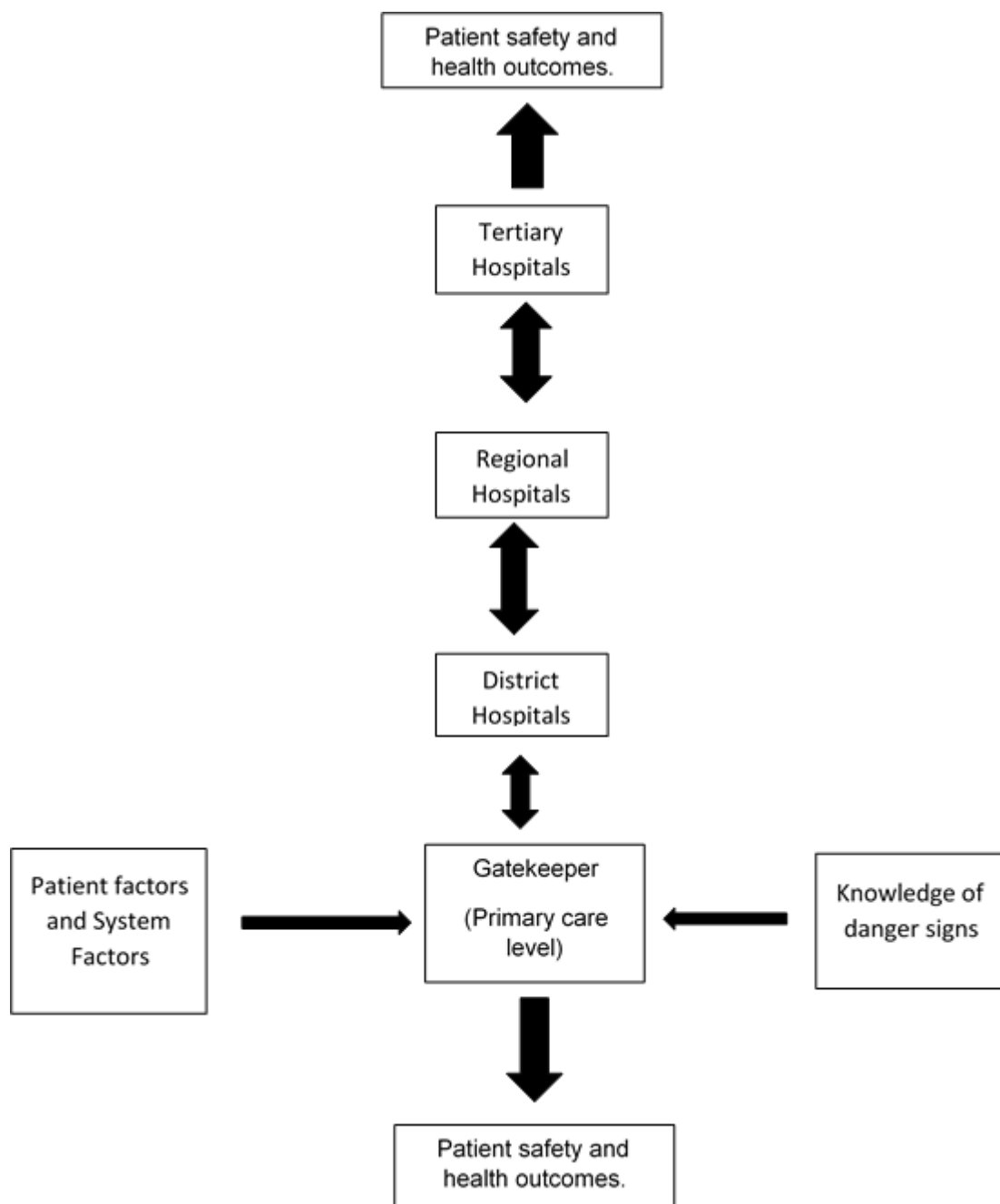


Figure 1. The referral system in Ho Municipality

Fig.1 shows the pathway of patient referral with the primary care provider acting as gatekeeper to the specialist. Patients could be referred back to lower levels to continue treatment with written instructions and supervision from the higher level. Patient

referral is therefore a two-way communication between care providers at lower and higher levels of health care delivery.

Higher levels of health care are better equipped and resourced to provide advanced forms of maternal care than lower levels. In Ho municipality, comprehensive emergency obstetric care is only provided at the municipal and regional levels. Sub municipal levels of health care provided only some aspects of basic obstetric emergency care. This conceptual framework (Fig. 1) also shows that a primary health care provider's decision to refer patients to the next level is influenced by patient factors, system factors, knowledge about danger signs and ability to identify these danger signs in pregnancy as well as challenges faced in the referral process. Referral decisions taken by the primary care provider about a woman who requires comprehensive emergency obstetric care therefore have great impact on patient safety issues and health outcomes.

1.4 Justification

Findings from this study will inform policy formulation and implementation on issues regarding patient referral in Ho Municipality. Programs of interventions may use the findings from this study to design appropriate strategies for improving referral systems. Also, findings from this study will add to the knowledge available on referral practices.

1.5 Objectives

1.5.1 General objective

The general objective of this study is to explore maternal referral practices of primary health care providers in sub district facilities in Ho municipality.

1.5.2 Specific objectives

The specific objectives of this study are to:

- Determine the referral rates of primary care providers in sub district facilities of the Ho municipality in 2014.
- Describe the processes involved in the referral system of sub district facilities of the Ho municipality.
- Determine the patient factors that influence a provider's decision to refer in the sub district facilities of the Ho municipality.
- Explore the health system factors influencing a provider's decision to refer in the sub district facilities of the Ho municipality.
- Determine the level of knowledge on danger signs related to pregnancy complications among health care providers in the sub district facilities of the Ho municipality.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

Maternal mortality is a health indicator that shows the greatest disparity between developed and developing countries (Geelhoed et al 2003, Khan et al 2006). About three-quarters of the current maternal deaths could be averted if full provision of the key maternal mortality interventions were to be achieved in developing countries (Wagstaff & Claeson, 2004).

Antenatal and essential obstetric care including skilled-birth attendance at deliveries have been identified as key interventions needed to reduce morbidity and mortality related to pregnancy and childbirth in developing countries (Buttice^{ns}, Marchal, & De Brouwere, 2004). Prevention and management of these complications require care by a skilled-birth attendant and timely access to comprehensive emergency obstetrical care (cEmONC). While most countries share a long-term aim of increased coverage of professional attendant at deliveries, this is unlikely to be immediately attainable for many (Buttice^{ns}, Marchal, & De Brouwere, 2004).

Estimates suggest that essential obstetric care for hemorrhage, sepsis, eclampsia, and obstructed labour alone would have the capacity to avert around half of these deaths (Jahn & Brouwere, 2000). The processes of access to such care are, therefore, a key dimension in saving mothers' lives. A well-functioning referral system is fundamental to primary health care (PHC) delivery. It is particularly important in pregnancy care and childbirth for providing access to emergency obstetric care and for backing up antenatal and delivery care in first line facilities (Jahn & Brouwere, 2000). Through referrals, primary care providers save lives and provide prompt responses to

emergency situations; they do this by helping people obtain access to higher levels of care, particularly at the district level.

An effective referral systems is therefore required to ensure that vulnerable groups such as pregnant women and children can readily be linked up with specialist care from the community when need arises.

2.2. Referral practices

Referral has been defined as a process in which the treating health worker at a lower level of the health service seeks the assistance of a trained person with better resources/facilities at higher level, to guide him or her in managing or take over management (Tawfik et al. 1997). Referral of patients is a two-way communication process between primary care physicians and specialists and it is a valuable intervention in the quest for improved access and quality of care across all levels of health care delivery to complement the primary health care (PHC) principle of treating patients as close to their homes as possible at the lowest level of care with the needed expertise (King, 1966).

Successful referral means that a patient who has been referred for whatever reason, reaches the referred health facility in an appropriate time period irrespective of the treatment outcome. The referral system is emphasized as a back-up function of particular importance in pregnancy and childbirth, as a range of potentially life-threatening complications require management and skills that are only available at higher levels of care (WHO, 1994).

Referral system is usually designed to optimize the use of three levels of health services and to avoid unnecessary congestion and waste of human and material resources in the specialized levels (Rasoulynejad, 2000). An ideal referral system will

require sufficient coordination and relationships between its different levels and elements. In such a system, reference to the higher level will only be possible through the lower level and referred cases can hence be tracked by receiving feedback from higher levels.

Referral systems function effectively when all service providers adhere to the referral levels and protocols, to refer appropriately, and to follow the agreed guidelines of care. According to the Ministry of Health's referral policy in Ghana, when a primary care provider needs to refer a client, a pre-referral treatment should be given when necessary (MOH,2014). The health care provider should then complete the referral form and make arrangement with the receiving facility. It is also the duty of the referring facility to arrange transportation of the client to the next level to receive prompt care to improve client and health care provider satisfaction.

On arrival at the referral health facility, the accompanying health worker hands over the client to the next or receiving care giver and this is evidenced by documentation. This formal system of client referral also stresses the need for a feedback system so that primary care providers are empowered as they learn from their previous practices and improve their future practice by means of quality assurance.

In today's healthcare environment the role of the patient have increased in healthcare delivery. Most patients can research about their symptoms and where they can get the best of care and so either self-refer or asked to be referred to the best of care. Self-referral may therefore suggest a justifiable lack of confidence in the quality of care available at the lower-level facilities. In remote settings where transportation is a challenge and health systems are weak, self-referral to hospital may be the most realistic option if maternal complications are suspected. Even though this can put

intense pressure on both human and logistic resources of the receiving health facilities.

2.3 Referral rates

It was discovered in Zimbabwe that 59% of women who had a previous history of pregnancy related complications were not referred by nurse midwives working at lower levels of health care. This was attributed to several factors including patient factors, health system factors and inability of primary care providers to identify danger signs. About 52% of women with elevated blood pressure of greater or equal to 140/90mmHg were also not referred. Referral rates often vary widely among providers. They may remain fixed over time and can be generalized across diagnostic categories (Franks, Zwanziger, Mooney, & Sorbero, 1999).

The frequency of referral, often expressed as referral rates, defined as the number of patients referred per 100 consultations, vary across the globe from 2.3% in Taiwan to 40% in the United States. It is true that over referral may increase cost of health care and even result in adverse health outcomes due to over stretching of resources at receiving facilities but it is also a myth that failure to refer is more harmful than excessive referrals (Ilboudo et al., 2012).

Low referral rates do not always signify a poorly functioning health system. For instance in the United Kingdom, patients are not often referred and low rates of 5 per 100 consultations have been recorded. When low referral rates are coupled with high levels of patient satisfaction or low levels of patient complaints, this is a sign of high level of skill at the primary level (Ghaffar, 2000). A low frequency of referral and untimely referrals associated with maternal deaths is therefore a public health concern in developing countries.

2.4 Factors influencing a health care provider's decision to refer a patient

Studies suggest that three groups of factors often influence referral practices of health care providers namely, patient factors, provider factors and disease characteristics. Patient factors mentioned include patient's attitude, age, sex, and socioeconomic status or health insurance status. Provider factors included relevant skills to manage a particular patient and work place setting whether private or public. Disease characteristics included the severity and number of danger signs a patient has (Kabakyenga et al, 2011).

However, it has been noted that patient and organizational factors mainly informed a clinician's decision to refer a patient. For instance, patients who arrived in the evening had better histories taken and were referred on timely bases when indicated (Ebben et al., 2013). Organization arrangement was such that health care providers are normally overloaded with work during the day as compared to the night.

2.5. Patient factors influencing referral

Clinical characteristics of a patient's presenting conditions is the most important inputs into a clinician's decision to refer a patient (Delnoij, Van Merode, Paulus, & Groenewegen, 2000). A clinician's decision to refer a patient often starts with how a patient presents to him clinically. Signs and symptoms with or without investigations allows the primary care giver to make a diagnosis after which the primary care giver decides if patient's condition is within his scope of treatment or otherwise. A referral often follows if the patient's condition is not within the scope of the primary care giver (Gerrity, Earp, DeVellis, & Light, 1992).

The age and sex of a patient, comorbidities, insurance status and patient's preferences are associated with a care provider's decision to refer a patient. Insured patients,

critically ill patients, females and children were more likely to be referred than their other counterparts (Van Schaik, Flynn, van Wersch, Douglass, Cann, 2005).

Primary care providers often refer patients mainly because they are uncertain about the diagnosis of the patient's presenting symptoms, or because they receive pressure from their patients to refer them to a higher level (Wright & Wilkinson, 1996).

The age of patient being attended to by a clinician may influence his decision to refer or otherwise. In Niger, it is known that health workers easily referred children when indicated but were reluctant to refer the elderly since transporting the diseased back to the village was expensive (Bossyns et al., 2006). Contrary to this finding, Heisler, Melton, Weaver, & Gebhart (2010) found that patients who were referred were elderly with extremely low body mass index and had hypertensive diseases. Clients who were referred often had more comorbid conditions than their retained counterparts.

Whether a patient is insured or not could affect a clinician's decision to refer this patient. When a patient is insured, he is more likely to be referred when indicated than his uninsured counterpart. Clinicians may be assured of care for the insured client at a higher level of health care which may be more expensive than the primary level for the uninsured patient (Gerrity et al., 1992).

Clients who can afford health care services or have good socio economic status are more likely to be referred to practicing specialists or hospital compared to their counterparts of poorer socioeconomic status (Sørensen, Olsen, & Vedsted, 2009). In the context of this study therefore, clients who are insured may stand a greater chance of being referred than clients who are not insured and cannot afford the out of pocket payment at the referral facility.

In Niger, it was found that a provider's decision to refer a patient was influenced by the attitude of the patient. Patients felt that only critically ill persons warranted a referral to a higher health care facility. 'Referral means death and refusing a referral will equally bring death' (Bossyns & Van Lerberghe, 2004). Patients' refusal to comply with referrals may also influence a clinician's decision to refer him. The more resistant a patient was towards a referral, the less likely he was to be referred by his clinician to the next level (Holtrop, Malouin, Weismantel, & Wadland, 2008).

The views of patients and health care providers on the need for referral are very divergent and this diversity may impact referral rates of primary care providers. This diversity may also influence clients as to how they welcome referral suggestions from their primary care providers (Zuckerman et al., 2011).

2.6 System factors

Diagnostic processes at the primary care level is adversely influenced by system factors. Resilient actions of front line providers however mask these system barriers as they support the safe delivery of health care despite these challenges that the system cannot immediately adopt to. In a study conducted in rural Tanzania, it was found that 96.3% of respondents mainly referred their patients due to lack of equipment and expertise. Health care providers were quick to refer patients whenever they perceived they did not have the expertise to manage some disease conditions and this reduced mortality (Smith et al., 2013).

Although health care providers may be judged for not having interest in some fields of medical practice, health care providers naturally develop some passion for specific disciplines in practice. Clinician's personal interest in matters relating to a patient's medical condition also influences his decision to refer the patient or otherwise for

instance, clinicians who have a great interest in maternal health issues were more likely to refer an obstetric emergency than one who has no interest in maternal health issues (Pierre Ilboudo, Chou, & Huang, 2012).

Physician's therapeutic confidence and competence were found to have important influences on patient referral when patient and health system factors were controlled (Kravitz et al., 2006). Although some health care providers have been documented to retain clients despite the knowledge that they do not have the competencies to manage such cases, other health care providers are able to admit that some services are beyond their competences and quickly decide to and refer their clients. This practice has been found to reduce maternal deaths significantly to a great extent as clients are able to receive the needed care promptly and ensure the continuity of quality care.

Female health care providers who have worked for more years of practice were found to be more likely to refer their emergency patients than those who had practiced for fewer years and their counterpart male health care providers (Peter Franks, Williams, Zwanziger, Mooney, & Sorbero, 2000). Contrary to this, it was also found in New York that no significant relationship exists between the gender of a primary care health provider and his or her decision to refer a patient (Peter Franks et al., 2000).

A health care provider's knowledge about the patient referral process has been identified to play key role in the quality of services rendered to patients being referred. Lack of this knowledge can generate great tendency to be informal in the referral practice as well as how information is shared between referring and referral care providers. This tendency is an explicit marker of concern to policy makers that has to be addressed in order that continuity of care is provided to patients who are referred through improved collaboration among care givers in the referral process

(Smith, Greene, Haas, & Allareddy, 2006). This holds true in both developed and undeveloped countries.

Often conflicts arise between referring and referral facilities because of lack of a shared vision on referral practices and processes. Such common vision may be shared through advocacy but also through capacity building of health care providers at all levels. This will ensure the use and understanding of a common language by health care providers who drive the referral systems. In Uganda for instance, it was found that improving knowledge about referral processes and practices will encourage timely referral of complicated obstetric cases (Keri, Kaye, & Sibylle, 2010).

2.7 Challenges in referral practices

The formal system of client referral described earlier should have been very simple to implement in order to achieve and sustain optimum health outcomes however, certain challenges face health care providers as they try to link patients to higher health systems to ensure continuity of care. These challenges are often diverse and multi sectorial and need to be investigated using several perspectives to ensure a holistic approach to their management. An efficient ambulance network or transport system ensures prompt access to comprehensive emergency obstetric care and improves maternal health outcomes thereby reducing maternal mortality (Tayler-Smith et al., 2013).

Inadequate transportation and means of communicating with referral facilities have reduced access to life saving health services. This prevents prior arrangements to be made in the referral facility to receive the patient who needs emergency care. When care providers do not enforce the implementation of the referral policy and arrange transportation of referred clients, clients usually return home and sometimes never reach the next level of care. They often return to the primary care provider in terminal

states when not much could be done to save their lives. Also, when effective and efficient transport systems are established, universal coverage is aided as individuals will not have reduced access to health care just because they cannot afford the cost of transport when they are referred (Bailey et al., 2011).

Health system challenges have great impact on referral practices and often are a fuelling factor to referral malpractice. For instance, in Malawi, it was alarming to find that even when patients needed to be referred, health care providers were reluctant to refer these patients due to lack of transportation to the referral facility. In a poorly functional health system therefore, malpractice may be rather perceived as beneficial (Knight, Self, & Kennedy, 2013). Due to the transportation difficulties, it was perceived that retaining patients and offering sub optimum care was rather beneficial than referring them as specialized care lags behind disease progression. This practice is often associated with worse health outcomes.

It is known a well-documented fact that an increase in the third delay in reaching a health facility where the needed care can be provided contributes to worsening morbidity and mortality. In one study, increased journey distance to hospital appears to be associated with increased risk of mortality since the disease progresses as the patient awaits treatment (Nicholl, West, Goodacre, & Turner, 2007).

There are several perspectives to health outcomes, be it social, economic administrative or political context within which health policies are implemented. Despite the fact that maternal death is multifactorial in nature, identification of system factors or challenges often lead to a reduction in maternal mortality (Geelhoed, Visser, Asare, Schagen Van Leeuwen, & Van Roosmalen, 2003). This is because

often patient factors cannot be fully controlled by health systems and also because of the great confident clients often have in a well functional health system.

2.8 Recognition of danger signs in pregnancy

A good referral system is strengthened with early recognition of danger signs in pregnancy by the health care provider and the pregnant woman (Sarker et al., 2010). Health outcomes generally improve when health workers identify risk factors, communicate them to the general population and provide care and link clients with care to ensure continuity of care. Similarly for maternal health, awareness creation in the community, early detection of risk and early transfer of a client to the appropriate level of health care have been identified as key strategies to reduce maternal morbidity and mortality (Koum et al., 2002).

These three strategies ensure a holistic system in which pregnant women are empowered to make timely decisions concerning their health. This reduces the first delay of identifying the need to access health care, the second delay of deciding to access health care and the fourth delay of health care providers giving timely or immediate care to pregnant mothers and all kinds of clients on arrival to health facilities. In Nigeria, the commonest causes of maternal mortality identified are puerperal sepsis, abortion complications, pre-eclampsia/eclampsia, prolonged obstructed labour, hemorrhage accounting for 33%, 22.6%, 17.4%, 13.0% and 7.8%, respectively, and these often presented as unbooked emergencies with a tenfold increased risk of maternal mortality. This was attributed to the poor referral system at the periphery of referral facilities (Igberase & Ebeigbe, 2007).

If referral systems were effective, clients in any emergencies arriving at the sub district level would be promptly and appropriately linked to more competent health

workers who are also better equipped to receive the care they need which is not available at the sub district level.

Raising awareness on danger signs in pregnancy among pregnant women is important in improving maternal health outcomes (Hailu, Gebremariam, & Alemseged, 2011). In order to raise this awareness among pregnant women, health care providers themselves must be equipped with such knowledge. Knowledge of danger signs in pregnancy and birth preparedness are advised as two important interventions in enhancing access to emergency obstetric care in low income countries to reduce maternal mortality. This timely access to skilled health care however depend on a functional referral system to transfer obstetric emergencies from the communities to well-equipped health facilities (Kabakyenga et al 2011).

In reducing maternal mortality, health care providers must advice women of reproductive age and their relatives on the recognition of danger signs of unpredictable obstetric complications and their management. The health care provider's knowledge about these danger signs determines the quality of information passed to the client and the quality of knowledge impacted on the client (Sarker et al., 2010). A health care provider's preparedness for birth and its complications included many elements, one of which is the health care provider's knowledge about danger signs of pregnancy. Health care providers knowledge of danger signs therefore has great impact on the patients' knowledge of danger signs shown in a number of studies conducted (Moran et al., 2006).

A great opportunity is created for the accurate dissemination of health information on danger signs by the high antenatal care attendance in Ghana. However, the story of Ho Municipality may not be different from rural Tanzania where it was found that

poor performance of some health care providers was due to their poor knowledge on how to identify danger signs. Pregnant women in that community could therefore not identify danger signs and report to hospital on timely basis. This resulted in increased complications and increased mortality (Pembe et al., 2010).

Knowledge of danger signs by pregnant women is crucial to good health outcomes but this is not the case in all situations. For instance in Jordan, it was found that 84.8% of the women did not know a minimum of four danger signs in pregnancy (Okour, Alkhateeb, & Amarin, 2012). This was attributed to the fact that these women were not provided with accurate and adequate information on danger signs in pregnancy through health education in antenatal clinics. These women were therefore unable to recognize these danger signs in pregnancy and report to a health facility on timely basis. They mostly reported to the health facility in critical stages and ultimately contribute to maternal mortality.

In Nigeria, less than a third of pregnant women knew about three or more critical danger signs in pregnancy. Contrary to studies conducted in Tanzania and Jordan however, this was not associated with poor health education at antenatal clinics (Doctor, Findley, Cometto, & Afenyadu, 2013). In Ghana, 22% of women attending antenatal care had good knowledge about two danger signs namely severe abdominal pains and bleeding per vagina. The type of health worker, depending on the training received, was significantly associated with counselling practices (Duysburgh et al., 2013). The importance of health care provider's knowledge about danger signs though cannot be overemphasized, can be context specific.

CHAPTER THREE

3.0 METHODS

3.1 Study Design

This study was an explorative and descriptive mixed method cross sectional study. Data for the year 2014 were collected on explanatory and outcome variables at the same time from the 1st of March to 5th of June, 2015.

3.2 Study Area

The study was conducted in Ho municipality with a maternal mortality rate of 290/100000 live births and 80% of all deliveries are attended to by a skilled health personnel.

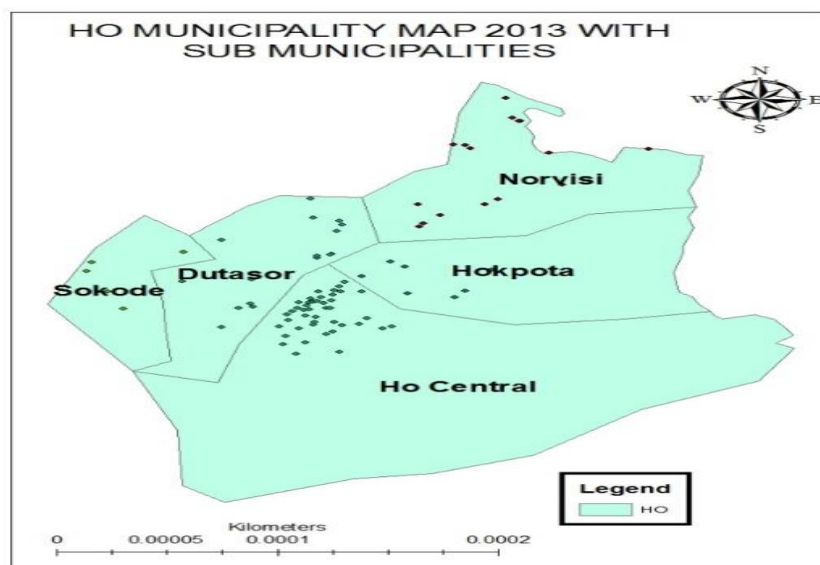


Figure 2: Map of Ho Municipality Showing sub-districts. Source: 2014 annual report, Ho municipal health directorate.

3.2.1. Population

Ho Municipality has a total population of 193,808 people who are predominantly employed in agriculture, formal sector employment, trading and farming. It is

bounded to the North by Hohoe and South Dayi districts, to the South by Adaklu Anyigbe and North Tongue, to the West by Asuogyamang and to the East by Togo (GHS, 2014).

3.2.2. Administration

Ho Municipality is one of the 25 administrative districts located in the central part of the region and also the most populated district of the Volta Region, with five sub districts namely Sokode, Dutasor, Norvisi, Hokpota and Ho Central which is the biggest and most populated. Ho Municipality accommodates the regional capital, regional hospital, the municipal hospital and covers 1506 km² of land.

Ho Municipal has a doctor to patient ratio of 1:10,000 and a nurse to patient ratio of 1:6000 (HMHD, 2013), maternal mortality rate of 290 per 100000 and a skilled delivery rate of 80%. There are four levels of public health care delivery in Ho municipality deed as follows:

Level One

The CHPS compounds provide services at the community level and are operated by community health officers. Patients who require a more advanced form of treatment are then referred to the next level.

Level Two

This level is the sub district level made up of 10 health facilities. They are operated by Physician assistants, midwives and nurses. Patients are referred from this level to either the municipal or regional hospitals when they need further services that cannot be rendered.

Level Three

The only Municipal hospital is resourced with medical officers, nurses, midwives and no specialist.

Level Four

The municipality accommodates the Volta Regional Hospital which is the highest referral point in the region and is resourced with obstetricians.

3.3 Variables**3.3.1. Outcome variable****Table 1: Outcome variable**

Outcome variable	Definition
Referral practices	Whether a client is ‘referred’ or ‘not referred’. This will be expressed as a referral rate, defined as number of clients referred out of every 100 maternal clients attended to by the primary care provider.

3.3.2. Explanatory variables include patient factors and themes

Table 2: Patient factors which influence a clinician's decision to refer a patient

Patient factors	Definition
Age	Age at last birth date at the time of client's last attendance at health centre.
Insurance status	Positive if client accessed health services at last attendance with a functional insurance card, whether private or public.
Patient's request	Whether referral was initiated by provider or requested by Patient.
Danger sign	Presence of one or more of any of the leading causes of maternal death or danger signs namely: • hypertension pregnancy, • hemorrhage, • genital sepsis, • sickle cell disease or • an elective condition

Table 3: Health system factors influencing referral practices

Factors	Definitions
Distance	Health care provider's perceived proximity of referral facility from his or her health center
Transport	Availability of a designated means of transport for referred obstetric patients.
Sex of care provider	Male or female care providers
Provider's knowledge of danger signs	Good knowledge means ability to identify at least four danger signs of the leading causes of maternal mortality namely BP>140/90mmHg, • Bleeding per vagina, • Frontal headache • Fever, • Swollen feet • Lower abdominal pain.

3.4 Study population

The study units were primary health care providers and medical records of maternal health patients who accessed health services from January 2014 to December 2014 at the sub district facilities in Ho municipality.

3.4.1 Inclusion criteria

Primary care providers who directly referred maternal patients at the sub district level in Ho municipality as well as medical records of pregnant clients who received antenatal care services within the period of January to December 2014. These patients include pregnant mothers irrespective of gestational age up to 42 days after delivery.

3.4.2 Exclusion criteria

Primary health care providers who were indirectly involved in the referral practices at the sub district level at Ho municipality. For example those who provide diagnostic services, for instance, the laboratory staff, support services, traditional birth attendants and medical records of pregnant women irrespective of gestational age up to 42 days after delivery who received antenatal services before 1st January 2014 and after 31st December 2014 were excluded.

3.5 Sample size

In this study, the sample size was calculated using the hypothesis testing approach for two sample comparison of proportions. For a referral rate of 50% or 0.5, sample size of 377 was required to achieve a power of 80% at 5% margin of error and 95% confidence level. A sample size of 400 was then anticipated in order to account for non-response. However 266 medical records were obtained with the data extraction tool giving a response rate of 71%. Fourteen (14) health care providers made up of 2 community health officers and 12 midwives took part in the in-depth interviews.

3.6 Sampling method

In the *qualitative methods*, purposive sampling was used and all primary care providers at post at the time of the study were enrolled. In-depth interviews were conducted with all primary care providers at post in each sub district facility during the data collection period until a saturation point was reached. In the *quantitative method*, 400 patient cards of clients who accessed health services from the health centres from January 2014 to December 2014 were retrieved as follows; forty (40) patient records were sampled from each of all ten (10) sub district facilities in Ho municipality. In each facility, the identity number of all cards used by pregnant clients in accessing health care within the period were serially coded. Forty random numbers

ranging between one and the highest serial code were generated on the computer using a random number generator and the cards with corresponding random numbers were picked. If a particular card was not found, the next card in the list was picked. If a particular health centre did not have more than 40 records, all the medical records were retrieved.

3.7 Data Collection Techniques/Methods & Tools and Data Control

Three research assistants were trained by the principal investigator. Informed consent was obtained from research participants before data was collected.

3.8 Qualitative methods

Using an interview guide (Appendix 1), in-depth interviews were conducted with primary health care providers who are directly involved in the referral practices to collect data on referral processes, provider's knowledge on danger signs and system factors influencing referral practices. Interviews were conducted in English for one hour each and were audio-recorded.

3.9 Quantitative methods

A data extraction tool (Appendix 2), was used to extract data on referral rates and patients factors influencing the referral practices of primary care givers from patients' medical records.

3.10 Data Processing and Analysis/ statistical methods

The data collected at the end of the study were cleaned to remove inconsistencies.

Double data entry was done to remove any inconsistencies to improve data quality before a final dataset were generated.

3.10.1 Quantitative methods

Data extraction forms were serially coded before data entry was done. All data entered were pass-word protected and were accessible to only the principal investigator. The data analysis was done from 7th May to 8th June 2015 using stata version 12.0. The referral rate were determined for each health center and the results presented in tables. The referral rate, for the municipality was then determined from the individual health center referral rates. Patient factors were compared in proportions of responses in the outcome. Raw frequencies as well as relative frequencies were determined. The chi square test was used to determine the relevant statistic and its corresponding probability value to test for statistical significance of the relationship between each explanatory variable and referral practices.

3.10.2 Qualitative analysis

Recorded interviews were played repeatedly to identify themes. The data was then transcribed, coded and a codebook generated. The data was entered into NVIVO version 9. After this, data was then organized according to themes and described. The relationship between themes and the concept was used to interpret the findings.

3.11 Ethical Consideration/Issues

Ethical approval was obtained from the Ghana Health Service Ethical Review Committee and additional administrative permission was obtained from the Volta Regional Director of Health Services, the Ho Municipal Director of Ghana Health Service and the heads of participating facilities.

3.11.1 Consenting process

Informed consent was obtained from the participating health staff after the method of data collection had been carefully explained to them. Participants were informed that this was a research and that ethical approval had been obtained from the Ghana Health Services Ethical Review Committee with additional administrative permission from the Regional and Municipal directors of health services.

3.11.2 Confidentiality and data usage

Participants were assured of confidentiality and were also assured that the data collected shall be used only for the intended purpose of this study. They were told that data shall be confidential and password protected with no names recorded. They were also informed about the duration of the interview, which was one hour. Participants were informed that the interview was to be audiotaped and the recorded audio tapes kept for one year after the results of the study had been published before they would be destroyed.

3.11.3 Voluntary withdrawal

Participants were informed that they had the right to exit the study whenever they wished at any stage of the study and they shall have no lost medical benefits as a result of exiting.

3.11.4 Risk and benefits to participants

Participants were informed that although their participation will contribute to knowledge to improve the referral system, there was no incentives or immediate benefit for them in the research and there were no potential risk to their participation in this study.

3.11.5 Funding

Participants were told that this study was funded by the principal investigator and the principal investigator had no conflict of interest in this study.

3.12 Pre-test or Pilot Study

Ho West district shared similar health indicators, topography and health indicators as Ho Municipality. Ten (10) of the questionnaire (Appendix 1) were therefore pre tested in Ho West district. The results obtained from the pre-test were then used to make the necessary changes required on the survey forms.

3.13 Limitations

One of the challenges faced in this study was financing of the project which would otherwise have extended the scope and coverage of this study. Some of the data extracted were not used because the data were incomplete. Data analysis were therefore limited only to complete medical information recorded in the facility's medical records. This affected the sample size. Some health centres had not rendered services to the minimum number of maternal cases needed which was 40. These reasons accounted for the response rate of 71%.

CHAPTER FOUR

4.0 RESULTS

4.1. Demographic characteristics of patients and providers

Fourteen (14) health care providers made up of 2 community health officers and 12 midwives took part in the in-depth interviews all of whom were females (100% of respondents). This number is the total number of frontline primary care providers directly involved in the referral practice who were at post during the survey period in all the sub district facilities. Out of these, 6 were aged between 55-60 making a proportion of 42.8 % all of whom had practiced for at least 15 years, while the remaining 8, a proportion of 57.1% were aged between 30-35 years all of whom had practiced for at least 6 months.

A total of 266 records of pregnant women within the ages 16 and 49 years with a mean and standard deviation of 27.1(6.9years) were included in the study. Most (71%) were in the age bracket 20-35 years while about 13.5% were under 20years. Majority (92.5%) of the women were insured with about 34.6% of them presenting with danger signs. Table 4 shows details of the characteristics of pregnant women receiving maternal health services at the sub-district level of the Ho Municipality of the Volta Region of Ghana, 2014.

Table 4: Demographic characteristic of pregnant women receiving maternal health services at the sub-district level of the Ho municipality, 2014. (n=266)

Variables	Frequency	Percentage (%)
Patient's Age		
<20	36	13.5%
20-35	189	71.1%
>35	41	15.4%
Total	266	100.00%
Danger sign		
Danger sign	174	65.4%
No danger sign	92	34.6%
Total	266	100.00%
Insurance status		
Uninsured	20	7.5%
Insured	246	92.5%
Total	266	100.00%
Patient's Request		
No request	264	99.2%
Request	2	0.8%
Total	266	100.00%
Referrals		
Not Referred	102	38.4%
Referred	164	61.6%
Total	266	100.00%

4.2. Referral rate

Out of the 266 pregnant women whose medical records were reviewed during the study period, 164 were referred giving an overall referral rate of 61.6%. However there are individual variations in the referral rates among the health facilities in the sub-district.

Table 5: Referral rates of sub-district facilities in the Ho Municipality, 2014

Health centre	Total clients	Number referred	Referral rate. (%)
Akrofu	16	7	43.8
Quasi govt.	21	14	66.7
HPC	40	14	35.0
Takla	7	7	100.0
Klefe	36	36	100.0
Mech	23	23	100.0
Shia	40	7	17.5
Nyive	34	7	20.6
Taviefe	9	9	100.0
Matse	40	40	100.0
Sub-District	266	164	61.7

Majority of the referrals were done for women in the age bracket 20-35 years. However 14% of the referrals involved women under 20 years. This represent 63.9% of all the pregnant women under 20 year old. Most (91%) of the pregnant women referred access services with valid insurance cards. About 44.5% of the pregnant women representing 79.3% of all those with at least one danger sign were also referred. However about 1.2% of the women were referred based on request.

Table 6: Referral status against demographic characteristics of clients receiving maternal health services in the sub-districts of Ho Municipality, (n=266)

Variables	Referral status		Total
	Referred-n (%)	Not referred-n (%)	
Insurance status			
Insured	150 (91.5)	96 (94.1)	246 (92.5)
Non insured	14 (8.5)	6 (5.9)	20 (7.5)
Total	164 (100.0)	102(100)	266 (100)
Danger sign			
Danger sign	73(44.5)	19(18.6)	92(34.6)
No danger sign	91(55.5)	83(81.4)	174(65.4)
Total	164 (100.0)	102 (100.0)	266 (100.0)
Patient's request			
Request	2 (1.2)	0 (0.0)	2 (0.8)
No Request	162 (98.8)	102 (100.0)	264 (99.2)
Patient's Age			
<20	23(14.0)	13(12.7)	36(13.5)
20-35	116(70.7)	73(71.6)	189(71.1)
>35	25(15.3)	16(15.7)	41(15.4)
Total	164(100.0)	102(100.0)	266(100.0)

4.3. Referral process

The basic process for making a referral is the same across all sites: recognition of danger signs, stabilization of patient including giving pre referral treatment, initiating referral, arrange transportation to next appropriate level of care, and completion of referral. Although a national referral protocol published by the MOH does exist, very few sites adhere to these guidelines. For example, the national protocol encourages health workers to accompany referred patients, but only 7 of 14 respondents reported frequently accompanying the client to the district hospital. Of the remaining seven, two accompanied patients in critical cases only and five rarely accompanied the client. Most of the primary care providers (71%) explained they could not accompany clients because of the low workforce capacity of their sites, even though many understood the importance of accompanying patients to the district hospitals.

For the health workers who often gave pre referral treatment, the most common factor preventing them from doing this occasionally is the unavailability of the logistics needed to provide such pre referral treatment. As mentioned by one midwife:

“As for me I usually give them the care needed before treatment unless we don’t have it in our facility because I know they may not get to the next level early and the disease severity will be increasing.”

Other primary care providers however do not give the pre referral treatment even when they know that it is indicated. In their opinion, though this is a bad practice, it is in the best interest of the patient. A midwife explains:

“These days, I usually don’t give the pre referral treatment. When I gave it in the past, the patients considered the pre referral treatment as the final treatment and therefore did not comply with the referral I issued them. They later come back after a day or

two in terrible and critical stages when you cannot do much for them. Two of the deaths that happened in the regional hospital this is what happened. It was too late to help them. So when I refuse them the pre referral treatment, they go to the next referral facility.”

4.4. Patient Factors Associated With Maternal Referral

During the in depth interviews, most of the health care providers interviewed described the presence of danger signs, patient’s age, and patients request for referral as factors that influenced referral practices of the primary care giver.

However from a bivariate analysis of extracted data on these factors, insurance status, patient’s age, and patients request for referral did not show any significant influence on referral. A statistically significant association was found between presence of a danger sign and referral as shown in the table below with p-value <0.001.

Table 7: Bivariate analysis of patient factors associated with maternal referral in the sub-district level of the Ho Municipality, 2014 (n=266)

Patient factors	Number referred	Number not referred	Chi²	p-value
Age			0.09	0.96
<20	23 (14%)	13 (12.7%)		
20-35	116 (70.7%)	73 (71.3%)		
>35	25 (15.3%)	16 (15.7%)		
Danger sign			18.6	0.00
Danger sign	73 (44.5%)	19 (18.6%)		
No danger sign	91 (55.5%)	83 (81.4%)		
Insurance status			0.64	0.42
Insured	150 (91.5%)	96 (94.1%)		
Not insured	14 (8.5%)	6 (5.9%)		
Patient's request			1.3	0.26
On patient's request	2 (1.25%)	0 (0.0%)		
Not on patient's request	162 (98.8%)	102 (100%)		

4.5. System Factors

4.5.1. Transport systems

The Municipal and Regional hospitals which are the points of referral for these sub district facilities are both found in the Ho central sub district. The sub district facilities outside Ho central are each at least 5 km away. Most of the roads leading to the district hospital are untarred, often in poor condition, unfavorable during rainy seasons and not safe at night for security reasons.

One CHO explained *“that drivers commuting from remote parts of the district often hesitate to transport patients at night for fear of encountering thieves. In some of these communities, no vehicle is available after 22:00GMT.”*

Most of the referring facilities do not have reliable means of transport to convey cases referred to the next facility. The National Ambulance service that is available for the municipality is stationed at the municipal capital Ho. Access to this is usually not readily available as it serves other adjoining district also. The facilities have to either use commercial vehicles or motorbikes or arrange for a vehicle to transport the clients to the District Hospital.

One midwife puts it this way:

“Sometimes we hire commercial vehicles and sometimes too we use the motorbike. If there is no commercial vehicle at the station, then we beg someone to use his motorbike or private car to convey them to the nearest health center or hospital”

Almost all the primary care providers said that the main factor determining whether they arrange transport or not is their perception of the presence of an emergency or otherwise.

“If it is an emergency, we arrange for a taxi to send the woman and we even go with them to the next health facility but if it is not an emergency, then they are left to go on their own.

“The use of taxis, Lorries and pick-up trucks and private vehicles for transporting patients to the Municipal or Regional hospital makes it difficult to ensure appropriate care while transporting the patients. There are challenges of monitoring vital signs and provision of oxygen and in some instances cardiopulmonary resuscitation to

stabilize the patient when needed. In the taxi you know it cannot be done since those facilities are not available”.

Patients are challenges with having to pay for transport when referred. This is how a midwife explained:

“There were instances where a pregnant woman who was spotting per vaginum was referred to receive care at the next level but she could not go because the driver of the vehicle she wanted to use charged her about 50 Ghana cedis (\$15 equivalent) which she did not have and so had to resort to herbal medication. By the time she raised the funds to go the condition became serious and she aborted the baby”

4.5.2. Communication System

There are no standard systems for communication in the sub-district of the Ho Municipality. Most of the primary care providers make prior arrangements with receiving facilities by placing phone call or sending text messages to their colleagues in the District Hospital using their own phones and airtime.

Many providers noted the difficulty in calling ahead to alert receiving units, because of the poor telephone network connectivity in their communities, inadequate networking with phone numbers, and lack of phones and airtime. Some midwives explained:

“Sometimes we wish to call but we do not even have the contact details of our colleagues in other health facilities.”

“Our colleagues in the bigger health facilities make the work difficult for us. When you call them, they are not receptive at all and so you will prefer to refer the client

without telling them ahead of time because they will receive her anyway. They will either tell you there is no doctor or they don't have a bed but we know they are lying."

"This place there's no network to make a call. It's terrible sometimes and the patient can't wait till our calls go through so we refer them without calling the receiving facility."

"The facility has not been equipped with phones and airtime to make such calls. When it is very critical, we use our own phones but sometimes we also get broke."

4.5.3. Poor documentation, supervision and monitoring of referral cases.

Another referral challenge is the inadequate documentation of referrals. Five sites regularly used recommended GHS referral forms, one documented referrals in clients' antenatal record cards, while the others used prescription forms and other paper forms. The information documented on these sheets was often inadequate. Indications for referral were recorded only in hospital records but included limited depth and context. There were also no well-defined feedback systems established for quality improvement purposes. Some facilities said they received feedback but others did not.

"Recently we attended a meeting with one of the referral facilities and we discussed our difficulties with them so they started sending us feedback on our referred patients."

"Well, unless the patient returns to tell us how she was treated, we don't hear anything from the referral facility".

4.5.4. Human Resource Issues

In this study, health providers' sex, competencies and interest in maternal health issues were not identified as factors influencing referral practices.

The in-depth interviews revealed that staff attitude at receiving facilities was a major challenge to the patients and even to the referring primary care givers. This was said to be one of the reasons why clients' attitude was not favorable to referrals.

“Our pregnant women prefer this facility to the bigger ones. If we had delivery services here, we would not even refer them because they mostly return with bitter experiences.”

“The health workers in the bigger hospitals look down on us. Even when we go with the referred patient in our uniforms they don't give any preferential treatment.”

Other challenges mentioned include community values about referrals as well as inadequate logistics and pharmaceuticals as shown in the following table.

Table 8: Representative quotes of care providers on various themes

Challenges	Quotes
Transportation difficulties	<i>"In emergency situations, there are no ambulance to transport the client. Even when we find a taxi, the patient usually has no money to pay. It's very challenging for us here."</i>
	"my patients complain terribly about money to transport themselves to the next facility so sometimes I am just tempted to treat them here"
	"Sometimes we have to spend our own money to pay their transport because they are critically ill and yet they cannot pay by themselves."
Staff attitude at receiving facility	"Mostly our patients complain of their previous bad experience at the bigger hospitals so when you refer them, they are not happy to go".
	"Even we the health workers in nurses' uniform, they do not treat as well when we accompany referred patients to them. It is very surprising."
	"Our colleagues who work in the receiving facilities look down on us. Sometimes they even send back the patients because they claim patient did not come with a referral note."

Table 9: Representative quotes of care providers on various themes continues

Challenge	Quotes
Community Value and patient's attitude towards referral.	<i>"In this facility we do not conduct delivery so we refer all our patients to the municipal or regional hospital when they are near term but some of them come from communities where they prefer delivery by TBA so we continue to educate them"</i> <i>"For some of the patients, a referral means very serious illness that may cause death so they are initially very resistant to referrals."</i>
Poor networking Among health care providers	<i>"We do not have the contact numbers of our colleagues so it is difficult to communicate with them about referred patients."</i> <i>" Apart from the phone numbers I thinks our work will be easier if some phones are provided with airtime. This way it is even easier to track referred patients."</i>
inadequate logistics and medication.	<i>" Sometimes we need to give pre referral treatment but we don't have the medications and we know the patient will arrive in the next facility in a poor state but there is not much we can do about it."</i>

4.5.5. Primary care provider's knowledge about danger signs in pregnancy

Most of the primary care providers interviewed had good knowledge about danger signs. They were all able to mention at least 4 of the danger signs of the leading causes of maternal death. They were also aware of the urgency with which they should refer clients with such danger signs. Two of the health workers explained;

“As for me, immediately I see any of these danger signs, I refer immediately. I don't wait for pre referral treatment if it's not available because I know the client can die easily on my hands.”

“ The danger signs include severe frontal headache, bleeding from the vagina, high blood pressure more than 140/90mmHg, swollen feet, fever, or lower abdominal pain. And we also educate the patients about these signs at our antenatal clinic”

Although the good knowledge of danger signs is widely distributed among the primary care providers, there seems not to be enough transfer of such knowledge to the clients. For the very few who mentioned that they educated their client on such danger signs, they mentioned that sometimes patient did not report to them immediately the danger signs were noted. This is what one health worker said.

“Sometimes too, the patients comes too late and we can't do much for them. We educate them on danger signs but I admit there is more to do.”

CHAPTER FIVE

5.0 DISCUSSIONS

Referral practices and maternal health.

The primary care providers are well informed about the consequences of not giving pre referral treatment. Most of them therefore give prereferral treatment whenever indicated and when the logistics are available. A poor referral system could result in a situation where the malpractice is perceived as the best decision for the patient. For instance, in the absence of an ambulance or transport system, primary care givers could refuse to give pre referral treatment with the notion that the patient would perceive the pre referral treatment as tentative treatment and not adhere to the referral. It is clear that the primary care providers would have complied with the policy of making prior arrangements with the receiving facility if not for the absence of phones and airtime.

The referral systems function effectively when all service providers adhere to the referral process to refer appropriately, and to follow the agreed guidelines of care to ensure timely referral to health facilities. The current study showed that most of the care providers understood and complied with all the processes of referral and provided adequate and quality care at the referral facility before referral was done to reduce the effect of the delay in initiating treatment at the referral site caused by the long time that the referral process may take. This finding is consistent with a study conducted by Smith, Greene, Haas, & Allareddy (2006) where knowledge about referral processes and practices were found to encourage timely referral of complicated obstetric cases. It is also consistent with studies conducted in Tanzania by Keri, Kaye, & Sibylle (2010) where knowledge about referral processes improved the chances of survival for clients.

The high level of knowledge of the referral process and practice among the care providers could be explained by the regular educational workshops organized on referrals in the Municipality and also the fear of being blamed for poor outcome of the referral.

5.1 Referral Rates

The overall referral rate of 61.6% observed in this study was high compared to other studies, where the referral rate ranged from 4.3 to 6.6 per 100. The wide variation seen between the various health facilities in the sub-district is also consistent with several studies that also shows rates that vary widely between primary care providers (Ghaffar, 2000).

The high referral rate could be explained by the fact that 4 facilities that did not render delivery services and therefore referred all their clients once they are approaching term, with 100% referral rates. Most sub-district facilities in the Ho municipality lack the requisite human, infrastructural, logistics and other resources such as drugs necessary to deal with issues of pregnant women. There was also high awareness created among care providers in the sub-district on timely recognition of dangers signs in pregnancy and referral to district hospital that are equipped to manage them.

It is likely that the fear of been blamed by patients' relatives and queried by higher authorities in the event of poor or adverse outcomes at healthcare facility could be a trigger for the high rate of the referral in the sub-district. Despite this trend, it is worth noting that the teenage pregnancies that were not referred could be attributed to challenges confronting the primary care providers. High referral rates also mean there

might be increased cost of health care and adverse health outcomes in receiving facilities as found in a similar study by Ilboudo et al, (2012).

5.2 Patients Factors

Presence of danger sign was found to have a significant association with maternal referral in this study and is consistent with findings of others studies where clinical characteristics of a patient's presenting conditions is the most important inputs into the decision to refer a patient (Delnoij et al, 2000). The importance of the presence of co-morbidity as a factor in determining the chances of referral means that the care provider must be able to identify the danger signs associated with pregnancy complications. Failure of which may result in the non-referral of women with identified risks or complications. In this study, most of the participants identified the danger signs associated with pregnancy complications. This may be due to experience acquired over long years of practice and several trainings received over the years on safe motherhood practices. However the few who could not identify the danger signs may be as a result of insufficient skills needed to conduct a good physical examination due to inadequate knowledge and experience. More training and extensive practice are needed to help achieve better diagnostic capability.

In this study, patients' request for referral, age of the patient and the insurance status of a client did not influence their referral. This is in contrast to findings from other studies where there was a significant association between patients' age, request for referral and patients' insurance status. (Van Schaik, Flynn, van Wersch, Douglass, Cann, 2005). This is explained by the fact that the free maternal care policy is being implemented fully in these facilities. It is however worth noting that although the services are free, other cost such as transportation cost to the patient when referred to

receive such service is an important factor. Even though socioeconomic status was not within the scope of this study, it could be an important factor in determining whether a patient is referred or not in the sub district.

Findings from this study is also consistent with studies conducted by Bossyns& Van lerberghe (2004) where it was found that patients perceived referrals as highly emotionally charged events. This may be attributed to inadequate sensitization of community members about the importance of referrals. These perceptions about referrals was seen to influence health providers' decisions as found also in studies conducted by Holtrop, Malouin, Weismantel& Wad land in 2008.

5.3 System Factors and Challenges

5.3.1 Transportation

The findings of this study is consistent with several studies that reported high transportation costs, lack of transport and poor road conditions as key barriers to referral system (Ahluwalia et al, 2003; Bari et al, 2006; Bossyns& Van Lerberghe, 2004; Font et al, 2002). Improved road infrastructure, readily available transport vehicles and funds for fuel and maintenance costs are necessary to bridge the time between complication onset (decision to seek a higher level of care) and utilization of care at the next level of the referral chain. Even though the Ghana National Ambulance system was introduced in 2004 to help provide this service, the total number of ambulances available are not adequate to meet the increasing demand. Reliable transport system required to facilitate early referral of complicated obstetrics cases is often lacking. While much of the international experience on referrals mentions the need for a functioning transportation scheme, there are very few examples of successful approaches. In general, transportation systems have the best

chance of success where the community is involved in the creation and management of the system.

Rural communities in other parts of the world with little access to ambulance services have developed innovative methods to address the transportation challenge, including community financing schemes in the form of emergency fuel funds. (Font et al.2002). In the past, arrangements existed between some Ghana Health Service (GHS) facilities and local transport unions to allow pregnant women to be transported to their facilities without charge and they are presented with coupons which they redeem monthly. This arrangement only worked in urban centers but failed in many rural areas due to lack of vehicles and accessible roads. Communities therefore needed to work locally to secure resources that are compatible with their environment that can be used to transport cases to referral sites.

5.3.2 Communication

Communication between health care providers in the sub-district level and those of the district and Regional hospitals during the referral process was found to be inadequate in this study. There is lack of formalized systems of communication and standard for follow-up and feedback to ensure effective coordination of care and management in the sub-districts of the Ho municipality. This prevents prior arrangements to be made in the referral facility to receive the patient who needs emergency care, a finding consistent with that of Bailey et al (2011).

This breakdown in communication can lead to poor continuity of care, delayed diagnoses, polypharmacy, increased litigation risk, and unnecessary testing, and can therefore decrease the quality of care. A poor referral communication therefore is an important quality and safety issue. Several studies have underscored the critical need

for communication for maternal health with use of low cost systems such as regular meetings and use of phone applications such as whatsApp.

5.3.3. Poor supervision and monitoring

The poor supervision noted by the health workers could also fuel other challenges mentioned. Adequate supervision could have identified staff attitudes that need to be changed as well as proper documentation of referral issues in the sub district.

5.3.4. Human resource issues

Findings in this study did not agree with those in which health care providers' sex, competencies and special interest were found to influence referral decisions for instance study conducted by Kravitz et al in 2006 and another study by Peter Franks, Williams, Zwanziger, Mooney & Sorbero in 2000 where females were found to refer patients more than males. This study is however consistent with a study conducted in New York by Franks et al in 2000 where no association was found with sex and competencies. These differences could be explained by the fact that all primary care providers interviewed were females who also had never worked with male midwives.

Staff attitude at receiving facilities was found to have a negative influence on patients' acceptance of referrals. This could be explained by inadequate commitment to the course of improved referral systems and the provision of prompt care to referred clients to ensure continuity of care and better health outcomes for women. The similar attitude shown to colleague health workers may be explained by the lack of a shared vision between referring and referral facilities. This lack of shared vision is of concern because referral systems are made effective and functional only when all stakeholders are brought on board to perform their respective roles. This finding is

consistent with other studies that emphasize the need for a shared vision among stakeholders in the referral system (M. Smith, Greene, Haas, & Allareddy, 2006).

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The conclusions are summarized as follows:

1. The referral rate of sub districts in Ho Municipality is high, that is 61.7%.
2. The process of referral practices in these facilities complies with the MOH referral guidelines.
3. The most significant patient factor influencing referral decisions is the presence or absence of danger signs in the patient. The referral of pregnant mothers is done by the primary care giver usually on purely medical or obstetric grounds.
4. Challenges confronting the referral practices of primary care providers at the sub district level are health system factors which are amendable.
5. There are weaknesses in the referral systems in the municipality and the community members are not engaged enough so as to make very important stakeholders in strengthening the referral systems in the municipality.

6.2. Recommendations:

- The Municipal Health Directorate should collaborate with the ambulance service to provide readily available and accessible transport to the sub district facilities.
- The directorate should also organize a common forum for all stakeholders involved in the referral process to discuss the state of referrals in the

municipality. This may improve staff attitude at the receiving facilities towards primary care providers and referred clients in the municipality.

- Primary care providers should be networked with health care providers in receiving facilities. This will enhance exchange of information about referred patients and also empower the primary care providers so as to improve their credibility in the communities. Subsequently this will impact the acceptability of information provided to the community members to comply with medical advice and accept referrals more easily.
- Community participation should be encouraged by midwives and community health officers during outreach programs as a means of empowering community members to welcome referral decisions freely.
- The Municipal health Directorate should establish an integrated health information system of sending feedback to referring sub district facilities to learn from their previous practice and subsequently improve future practices.
- There is the need for further studies in the municipality by researchers to determine the challenges to maternal referral practices from the patient's and the receiving facility's perspective should be done. This will ensure a holistic approach to strengthening the referral system. This is because health outputs may not be meaningful if referral systems are improved at health facility level without sufficient positive change in community behavior to reduce the first and second delays which are the delay in recognizing the need to access health care and the delay in deciding to access such care respectively.

References

- Bailey, P. E., Keyes, E. B., Parker, C., Abdullah, M., Kebede, H., & Freedman, L. (2011). Using a GIS to model interventions to strengthen the emergency referral system for maternal and newborn health in Ethiopia. *International Journal of Gynecology and Obstetrics*, 115, 300–309. doi:10.1016/j.ijgo.2011.09.004
- Bossyns, P., Abache, R., Abdoulaye, M. S., Miyé, H., Depoorter, A.-M., & Van Lerberghe, W. (2006). Monitoring the referral system through benchmarking in rural Niger: an evaluation of the functional relation between health centres and the district hospital. *BMC Health Services Research*, 6, 51. doi:10.1186/1472-6963-6-51
- Bossyns, P., & Van Lerberghe, W. (2004). The weakest link: competence and prestige as constraints to referral by isolated nurses in rural Niger. *Human Resources for Health*, 2, 1. doi:10.1186/1478-4491-2-1
- Bradley, E. H., Cramer, L. D., Bogardus, S. T., Kasl, S. V, Johnson-Hurzeler, R., & Horwitz, S. M. (2002). Physicians' ratings of their knowledge, attitudes, and end-of-life-care practices. *Academic Medicine: Journal of the Association of American Medical Colleges*, 77, 305–311. doi:10.1097/00001888-200204000-00009
- Delnoij, D., Van Merode, G., Paulus, A., & Groenewegen, P. (2000). Does general practitioner gatekeeping curb health care expenditure? *Journal of Health Services Research & Policy*, 5, 22–26.
- Doctor, H. V, Findley, S. E., Cometto, G., & Afenyadu, G. Y. (2013). Awareness of critical danger signs of pregnancy and delivery, preparations for delivery, and utilization of skilled birth attendants in Nigeria. *Journal of Health Care for the Poor and Underserved*, 24, 152–70. doi:10.1353/hpu.2013.0032
- Duysburgh, E., Ye, M., Williams, A., Massawe, S., Sié, A., Williams, J., ... Temmerman, M. (2013). Counselling on and women's awareness of pregnancy danger signs in selected rural health facilities in Burkina Faso, Ghana and Tanzania. *Tropical Medicine and International Health*, 18, 1498–1509. doi:10.1111/tmi.12214
- Ebben, R. H. A., Vloet, L. C. M., Verhofstad, M. H. J., Meijer, S., Mintjes-de Groot, J. A. J., & van Achterberg, T. (2013). Adherence to guidelines and protocols in the prehospital and emergency care setting: a systematic review. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 21, 9. doi:10.1186/1757-7241-21-9
- Feitelberg, S. P. (2006). Patient safety executive walkarounds. *The Permanente Journal*, 10, 29–36.

- Franks, P., Williams, G. C., Zwanziger, J., Mooney, C., & Sorbero, M. (2000). Why do physicians vary so widely in their referral rates? *Journal of General Internal Medicine*, 15, 163–168. doi:10.1046/j.1525-1497.2000.04079.x
- Franks, P., Zwanziger, J., Mooney, C., & Sorbero, M. (1999). Variations in primary care physician referral rates. *Health Services Research*, 34, 323–329.
- Geelhoed, D. W., Visser, L. E., Asare, K., Schagen Van Leeuwen, J. H., & Van Roosmalen, J. (2003). Trends in maternal mortality: A 13-year hospital-based study in rural Ghana. *European Journal of Obstetrics Gynecology and Reproductive Biology*, 107 (2), 135–139.
- Gerrity, M. S., Earp, J. A. L., DeVellis, R. F., & Light, D. W. (1992). Uncertainty and Professional Work: Perceptions of Physicians in Clinical Practice. *American Journal of Sociology*. doi:10.1086/229860
- Hailu, M., Gebremariam, A., & Alemseged, F. (2011). Knowledge about obstetric danger signs among pregnant women in Aleta Wondo District, Sidama Zone, Southern Ethiopia. *Ethiopian Journal of Health Sciences*. doi:10.4314/ejhs.v20i1.69428
- Heisler, C. A., Melton, L. J., Weaver, A. L., & Gebhart, J. B. (2010). Complication rates between local and referral patients undergoing vaginal hysterectomy at an academic medical center. *Mayo Clinic Proceedings. Mayo Clinic*, 85, 145–149. doi:10.4065/mcp.2009.0299
- Holtrop, J. S., Malouin, R., Weismantel, D., & Wadland, W. C. (2008). Clinician perceptions of factors influencing referrals to a smoking cessation program. *BMC Family Practice*, 9, 18. doi:10.1186/1471-2296-9-18
- Igberase, G. O., & Ebeigbe, P. N. (2007). Maternal mortality in a rural referral hospital in the Niger Delta, Nigeria. *Journal of Obstetrics and Gynaecology*, 27, 275–278. doi:10.1080/01443610701213687
- Ilboudo, T. P., Chou, Y.-J., & Huang, N. (2012, January). Assessment of providers' referral decisions in rural Burkina Faso: a retrospective analysis of medical records. *BMC Health Services Research*. doi:10.1186/1472-6963-12-54
- Jahn, A., & Brouwere, V. De. (2000). Referral in pregnancy and childbirth: concepts and strategies. ... *Motherhood Strategies: A Review of ...*, 1–17. Retrieved from http://www.givewell.givewell.net/files/DWDA_2009/Interventions/MaternalMortality/SafeMotherhoodStrategies.pdf#page=233
- Kabakyenga, J. K., Östergren, P.-O., Turyakira, E., & Pettersson, K. O. (2011). Knowledge of obstetric danger signs and birth preparedness practices among women in rural Uganda. *Reproductive Health*. doi:10.1186/1742-4755-8-33
- Keri, L., Kaye, D., & Sibylle, K. (2010). Referral practices and perceived barriers to timely obstetric care among Ugandan traditional birth attendants (TBA). *African Health Sciences*, 10, 75–81.

- Knight, H. E., Self, A., & Kennedy, S. H. (2013). Why Are Women Dying When They Reach Hospital on Time? A Systematic Review of the “Third Delay.” *PLoS ONE*, 8. doi:10.1371/journal.pone.0063846
- Koum, K., Tiv, S., Sann, C. S., Matsui, M., Obara, H., Kudo, Y., & Fujita, N. (2002). Maternal death cases in the top referral hospital in Cambodia. *Journal of Obstetrics and Gynaecology Research*, 28, 13–18. doi:10.1046/j.1341-8076.2002.00004.x
- Kravitz, R. L., Franks, P., Feldman, M., Meredith, L. S., Hinton, L., Franz, C., ... Epstein, R. M. (2006). What drives referral from primary care physicians to mental health specialists? A randomized trial using actors portraying depressive symptoms. *Journal of General Internal Medicine*, 21, 584–589. doi:10.1111/j.1525-1497.2006.00411.x
- Lee, Q. Y., Odoi, A. T., Opare-Addo, H., & Dassah, E. T. (2012). Maternal mortality in Ghana: A hospital-based review. *Acta Obstetrica et Gynecologica Scandinavica*, 91, 87–92. doi:10.1111/j.1600-0412.2011.01249.x
- Moran, A. C., Sangli, G., Dineen, R., Rawlins, B., Yameogo, M., & Baya, B. (2006). Birth-preparedness for maternal health: findings from Koupela District, Burkina Faso. *J Health Popul Nutr*, 24, 489–497.
- Murray, S. F., & Pearson, S. C. (2006). Maternity referral systems in developing countries: current knowledge and future research needs. *Social Science & Medicine (1982)*, 62, 2205–15. doi:10.1016/j.socscimed.2005.10.025
- Nicholl, J., West, J., Goodacre, S., & Turner, J. (2007). The relationship between distance to hospital and patient mortality in emergencies: an observational study. *Emergency Medicine Journal : EMJ*, 24, 665–668. doi:10.1136/emj.2007.047654
- Okour, A., Alkhateeb, M., & Amarin, Z. (2012). Awareness of danger signs and symptoms of pregnancy complication among women in Jordan. *International Journal of Gynecology and Obstetrics*, 118, 11–14. doi:10.1016/j.ijgo.2012.01.020
- Pembe, A. B., Carlstedt, A., Urassa, D. P., Lindmark, G., Nyström, L., & Darj, E. (2010). Quality of antenatal care in rural Tanzania: counselling on pregnancy danger signs. *BMC Pregnancy and Childbirth*, 10, 35. doi:10.1186/1471-2393-10-35
- Pierre Ilboudo, T., Chou, Y. J., & Huang, N. (2012). Compliance with referral for curative care in rural Burkina Faso. *Health Policy and Planning*. doi:10.1093/heapol/czr041
- Sarker, M., Schmid, G., Larsson, E., Kirenga, S., De Allegri, M., Neuhaan, F., ... Müller, O. (2010). Quality of antenatal care in rural southern Tanzania: a reality check. *BMC Research Notes*, 3, 209. doi:10.1186/1756-0500-3-209

- Smith, M., Greene, B. R., Haas, M., & Allareddy, V. (2006). Intra-professional and inter-professional referral patterns of chiropractors. *Chiropractic & Osteopathy*, 14, 12. doi:10.1186/1746-1340-14-12
- Smith, M. W., Davis Giardina, T., Murphy, D. R., Laxmisan, A., Singh, H., M.W., S., ... H., S. (2013). Resilient actions in the diagnostic process and system performance. *BMJ Quality & Safety*, 22, 1006–1013. doi:10.1136/bmjqs-2012-001661
- Sørensen, T. H., Olsen, K. R., & Vedsted, P. (2009). Association between general practice referral rates and patients' socioeconomic status and access to specialised health care. A population-based nationwide study. *Health Policy*, 92, 180–186. doi:10.1016/j.healthpol.2009.03.011
- Tayler-Smith, K., Zachariah, R., Manzi, M., Van den Boogaard, W., Nyandwi, G., Reid, T., ... Harries, A. D. (2013). An ambulance referral network improves access to emergency obstetric and neonatal care in a district of rural Burundi with high maternal mortality. *Tropical Medicine and International Health*, 18, 993–1001. doi:10.1111/tmi.12121
- Turab, A., Ariff, S., Habib, M. A., Ahmed, I., Hussain, M., Rashid, A., ... Bhutta, Z. A. (2013). Improved accessibility of emergency obstetrics and newborn care (EmONC) services for maternal and newborn health: a community based project. *BMC Pregnancy and Childbirth*, 13, 136. doi:10.1186/1471-2393-13-136
- Volta Regional Hospital. (2015). Annual report for 2014: Regional Health Directorate performance review for 2014.
- World Health Organization, United Nations Children's fund. Trends in Maternal Mortality: 1990 to 2013. (2014).
- Wright, J., & Wilkinson, J. (1996). General practitioners' attitudes to variations in referral rates and how these could be managed. *Family Practice*, 13, 259–263. doi:10.1093/fampra/13.3.259
- Zeeman, G. G. (2006). Obstetric critical care: a blueprint for improved outcomes. *Critical Care Medicine*, 34, S208–S214. doi:10.1097/01.CCM.0000231884.99763.69
- Zuckerman, K. E., Nelson, K., Bryant, T. K., Hobrecker, K., Perrin, J. M., & Donelan, K. (2011). Specialty referral communication and completion in the community health center setting. *Academic Pediatrics*, 11, 288–296. doi:10.1016/j.acap.2011.03.002

APPENDIX 1: Interview guide for study on sub district maternal referral practices in Ho Municipality.**Interview ID****Date.....**

1. Kindly describe your experience with the referral practices in your facility and the municipality.

2. What are the system factors or challenges faced by health care providers in the referral of obstetric patients in your facility or the municipality?

Transport

Distance from referral facility

Communication problems

Staff Attitude.

Sex of care giver

Others

3. What are the danger signs in a pregnant woman that will inform you to refer an obstetric patient?

BP>140/90mmHg

Bleeding from vagina

Headache

Fever

Swollen feet

Others

4. In your view, what are some of the solutions to these problems?

Name of the interviewer: _____

Date of the interview: _____

Place of the interview: _____

Signature of the interviewer: _____

APPENDIX 2: Data extraction tool for sub district maternal referral practices in Ho Municipality.**Form number:****Date:****Extraction and validated by:****Name of health center:**

Folder number	Code	Age of patient	Danger sign	Patient's request	Insurance status	Referral or not referral

Name of research assistant: _____

Date of extraction: _____

Place of extraction: _____

Signature of principal investigator: _____

APPENDIX 3: Information sheet and consent form for health workers in the study of sub district maternal referral practices in Ho Municipality.

Dear Health worker,

Introduction:

This is a research being conducted by a student of the School of Public Health, University of Ghana to explore the factors and challenges affecting referral practices in Ho municipality to make recommendations for improving the current referral practices.

Ethical Clearance

Ethical approval has been obtained from the Ghana Health Services Ethical Review Committee. Additional administrative permission has been sought from the Regional and Municipal directors of health services and the head of your institution to conduct this study.

Confidentiality and data Usage

All data collected shall be confidential and shall be used only for the intended purpose of this study. The data shall password protected with no names recorded. This interview shall last for one hour and the interview shall be audiotaped and the recorded audio tapes will be kept for one year after the results of the study have been published before they are destroyed by burning in an incinerator.

Voluntary withdrawal

Participants have the right to be allowed to exit the study whenever they wish at any stage of the study and they shall have no lost medical benefits as a result of exiting.

Potential risk and benefits to participants:

Although participation will contribute to knowledge to improve the referral system, there will be no incentives or immediate benefit for participants in the research and there are no potential risk to participants in this study.

Funding:

This study is funded by the principal investigator and the principal investigator has no conflict of interest in this study.

Further information:

For further clarification, kindly contact the Ghana Health Services Ethical Review Committee contact person- the administrative secretary, **Hannah Frimpong on 0243235225/0507041223, or the principal investigator Mary Eyram Ashinyo on 0208182647**

Thank you for your cooperation.

Signed

(Principal investigator)

Dear Principal investigator,

I have read the foregoing information. I have had the opportunity to ask questions about it and all questions I have asked have been answered to my satisfaction. I consent voluntarily to participate as a subject in this study and understand that I have the right to withdraw from the study at any time without in any way it affecting my further medical care. I also understand that there are no potential risk or benefits for me in this study that all information shall be recorded and kept confidential with only the principal investigator and the tape destroyed a year after results of this study have been published by burning in an incinerator.

Signed

Signed

(Research participant)

(Principal investigator)

Mary Eyram Ashinyo

Date.....

Time.....

