

**FACTORS INFLUENCING ADHERENCE TO
NATIONAL GUIDELINES ON EMERGENCY
OBSTETRIC CARE AND ASSOCIATED HEALTH
OUTCOMES AMONG PREGNANT WOMEN AND
NEWBORNS IN SAMBURU CENTRAL SUB-COUNTY,
KENYA**

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**Factors Influencing Adherence to National Guidelines on
Emergency Obstetric Care and Associated Health Outcomes among
Pregnant Women and Newborns in Samburu Central Sub-County,
Kenya**

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Science in International Health in the Jomo Kenyatta University of
Agriculture and Technology**

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DECLARATION

This is my original work and has not been presented for a degree in any other university.

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This thesis has been submitted for examination with our approval as University Supervisors.

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DEDICATION

This piece of work is dedicated with affection and love to my wife Lucy Makena Lodeke and my son Robert Samal, daughters Renet Namosing'o and Rufina Silale for their patience, understanding and support during the period of my study. And also to my late parents Mr. Paul Long'olea Samal and Mrs. Catherina Naroo Tyoko. May the Lord rest their souls in eternal peace

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ABBREVIATION AND ACRONYMS

BEmOC	Basic Emergency Obstetric Care
CBS	Central Bureau Of statistics
CEmOC	Comprehensive Emergency Obstetric Care
CFR	Crude Fatality Rate
EmOC	Emergency Obstetric Care
KDHS	Kenya Demographic Health Survey
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MNCH	Maternal, New-born and Child Health
NCAPD	National Coordinating Agency for Population and Development
PAHO	Pan American Health Organization
PH	Public Hospital
UN	United Nations
UNDP	United Nations Development and Population
UNICEF	United Nations Children's Fund
WHO	World Health Organization

DEFINITION OF TERMS

Basic EmOC facility: Is a health facility which provides the first six signal functions that are necessary to save the lives of women with obstetric complications. The services include: administration of parenteral antibiotics, parenteral oxytocic drugs, parenteral anticonvulsants, manual removal of placenta, removal of retained products of conception and assisted vaginal delivery.

Comprehensive EmOC Hospital: A hospital facility which provides the eight signal functions that are necessary to save the lives of women with obstetric complications. The services include: administration of parenteral antibiotics, parenteral oxytocic drugs, parenteral anticonvulsants, manual removal of placenta, and removal of retained products of conception, assisted vaginal delivery, surgery and blood transfusions.

Emergency Obstetric Care: Package of medical interventions identified by WHO, UNICEF and UNFPA required to treat the major direct obstetrical complications. These services are necessary to save the lives of women who experience obstetric complications. The services are: administration of parenteral antibiotics, parenteral oxytocic drugs, parenteral

anticonvulsants, manual removal of placenta, and removal of retained products of conception, assisted vaginal delivery, surgery and blood transfusions.

Maternal Death: Death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of its duration and site, from any cause related to or aggravated by the pregnancy or its mismanagement, but not from accidental causes.

Maternal Mortality Ratio: Number of maternal deaths per 100,000 live births, due to complications of, or medical conditions aggravated by pregnancy, childbirth, or postnatal period up to six weeks after delivery.

Obstructed Labour: Secondary arrest of descent of presenting part and cervical dilatation despite strong uterine contractions.

Primary Postpartum Haemorrhage: Severe vaginal bleeding of above 500mls within 1 hour of delivery.

Signal Functions: Key interventions that are used to treat the direct obstetric complications that cause the vast majority of maternal deaths round the globe.

Skilled Attendant:

A Skilled birth attendant is defined by the World Health Organization as a person ‘with midwifery skills (for example, doctors, midwives, nurses and medical/surgical assistants) who has been trained to proficiency in the skills necessary to manage normal deliveries and diagnose or refer obstetric complications’.

ABSTRACT

Globally, about 830 women die daily due to complications of pregnancy and child birth. Out of these, 550 deaths occurred in sub-Saharan Africa and 180 in Southern Asia, compared to 5 in developed countries. World Health Organization recommended that all pregnant women should have access to good quality Emergency obstetric care (EMOC). The objective of the study was to establish factors influencing adherence to national guidelines on emergency obstetric care and associated health outcomes among pregnant women and newborns in Samberg Central Sub- county. The study adopted a descriptive cross-sectional design involving six public health facilities offering maternity services were involved in this study. The study was conducted between June to November 2016. A census of 990 pregnant women who had utilized the selected health facilities were involved in the study. A checklist was also used to inspect the infrastructure in the maternity department. In addition, key-informant interviews were conducted among facility in-charges. Data was extracted into an SPSS database. Descriptive statistics and chi-square statistics were useful for analysis. Quantitative and Qualitative data were thematically coded and evaluated. The results indicated that 67.8% of the pregnant women who attended the facilities were married, 20.1% were single, and 1.6% and 8.5% were separated. On educational background 47.2% of all the pregnant women have never attended at any level of education, 24.3% primary school, 17.8% secondary school, 7% college level and 3.7% attended the university. Out of 6 health facilities five health facilities were Basic emergency obstetric cares (83.3%) offering the six signal functions while 16.7% offered comprehensive emergency obstetric care services. On EMOC training, Marital county referral hospital had 1(62.5%) trained on EMOC, SurgutMar marhealth Centre 3 (12.5%) Kisimahealth Centre (12.5%) Loosuk health Centre 1(4.7%), Porrohealth Centre1 (4.7%) and Lolmolog health Centre (4.7%). The main health outcomes encountered were obstructed labour 6(0.6%), antepartum haemorrhage (0.4%) and postpartum hemorrhage (0.4%). There was need to upgrade the at least two health facilities to provide comprehensive emergency obstetric care services. The national and county government should employ skilled health personnel and capacity building with training and knowledge and finally there was need for education of all pregnant mothers to attend antenatal clinic.

CHAPTER ONE

INTRODUCTION

1.1 Background

Along with infectious diseases, maternal and neonatal conditions account for a substantial part of the health gap between rich and poor countries; for example, more than 99 percent of maternal deaths occur in the developing world. Overall, the average lifetime risk of maternal death is 1 in 4,000 in high-income countries, 1 in 61 in middle-income countries and 1 in 17 in the lowest income countries (World Bank, 2006). Worldwide, 514,000 women die from pregnancy and childbirth each year, half of whom are from Africa (Pearson & Shoo, 2005).

The majority of the deaths are caused by direct obstetric complications including haemorrhage, sepsis, eclampsia, obstructed labour, and unsafe abortion practices. Studies show that most women who develop complications do not have any known risk factors, and there is no way of knowing whether any will develop (Maine, 1993).

Therefore, quality emergency obstetric care (EMOC) services need to be available to every pregnant woman over and above health worker responsiveness to life-threatening complications. The United Nations recommends that for every 500,000 inhabitants, there should be at least four facilities offering basic EMOC and one facility offering comprehensive EMOC, appropriately distributed. The United Nations further recommends that 15 percent of all births take place in EMOC facilities, 100 percent of all complications should be treated, the caesarean section

rate should be between 5 and 15 percent of all births, and the case fatality rate of obstetric complications should be less than 1 percent (UNICEF, WHO, & UNFPA, 1997).

The World Health Organization (WHO), United Nations Population Fund (UNFPA) and United Nations Children's Fund (UNICEF) recommend that all pregnant women should have access to good quality Emergency Obstetric Care (EMOC). This is due to the fact that most of maternal deaths cannot be predicted. For example, regardless of the best obstetric care due to an emergency, a pregnant woman can go into coma due to bleeding in third trimester of pregnancy (Purohit, Desai, Jodha, & Garg, 2012). In fact, ante partum haemorrhage is one of the leading causes of maternal and foetal mortality globally.

Therefore, Emergency Obstetric Care and services are necessary to save the lives of women who experience obstetric complications. They include; removal of retained products of conception, assisted vaginal delivery, administration of parenteral antibiotics, parenteral oxytocic drugs, parenteral anticonvulsants, manual removal of placenta, surgery and blood transfusion.

Within the emergency services, there are facilities that are useful in the provision of medical interventions (signal functions). The basic EMOC facilities used to treat obstetric complications comprise eight packages recommended by the World Health Organisation (WHO), the United Nations Children's Fund (UNICEF) and United Nations Population Fund (UNFPA). This are summarised in (Dogba & Fournier 2009) and include; administration of parenteral antibiotics, oxytocic drugs,

anticonvulsants as well as manual removal of placenta, removal of retained products of conception and assisted vaginal delivery.

Comprehensive EMOC facilities perform all the basic signal functions as well as perform surgery (caesarean sections) and provide blood transfusion. Currently almost all health centres in the country are not basic EMOC facilities and all patients who require comprehensive services are referred to the secondary facilities. A detailed description of the Emergency obstetric care is given in Table 1. EMOC is often discussed in terms of “basic” and “comprehensive” care available within a facility that provides care for women with obstetric complications.

Emergency Obstetric Care (EMOC) can be discussed in terms of basic and comprehensive care available within a facility that is provided to a woman with obstetric complications. Basic and comprehensive services are distinguished through the signal functions as shown in Table 1.1.

Table 1.1: Elements of care: Basic and Comprehensive Emergency Obstetric Care Description

Basic Emergency obstetric care	Comprehensive obstetric care
<p>1.Administration of parenteral oxytocic drugs</p> <p>2.Administration of parenteral antibiotics</p> <p>3.Administration of parenteral anticonvulsants</p> <p>4.Performance of manual removal of placenta</p> <p>5.Performance of manual removal of retained products (e.g., manual vacuum aspiration)</p> <p>7.Performance of assisted vaginal delivery</p>	<p>All (1–6) functions included in basic EMOC</p> <p>plus:</p> <p>8. Performance of surgery (e.g., caesarean section)</p> <p>9. Performance of blood transfusion</p>

Source: UNICEF, 1997

1.2 Statement of the Problem

Maternal mortality in Kenya has dropped from 485 deaths per 100,000 live births to 362 deaths per 100,000 live births. This suggests that Kenya's efforts towards reducing maternal mortality ratio, has a significant remarkable improvement but still remains high (Tamrat & Kachnowski, 2012). Whereas the government has been providing free maternity services in last three years, this has failed to deliver substantial reduction in the high maternal and perinatal mortality in the country. This means that government's efforts to attain MDGs target of reducing MMR by 75% by 2015 are not possible.

Although antenatal care, clean and safe delivery, access to essential obstetric care and other means to prevent and handle complications during pregnancy and childbirth are known and utilized in health facilities in the country, there are unmet needs at the point of service delivery. This is particularly so for major obstetric complications experienced by women in Samburu county.

A recent report by the World Health Organisation (WHO), indicate that maternal deaths in Kenya in 2013 were about 2% of the global ratings similar to that for China which is the most populous country in the world (WHO & Unicef, 2014). This means that maternal mortality in Kenya remains one of the highest in the region.

Considering that provision of timely and quality emergency obstetric care is critical to preventing maternal deaths, this study is important because no studies to the best of knowledge have highlighted the subject in this marginalized region of the country.

1.3 Justification of the study

The study attempted to determine the factors influencing adherence to National Guidelines on emergency obstetric care and associated health outcomes among pregnant mothers and the newborns in Samburu Central Sub-county health facilities. The health providers would be aware of the skills on how to handle women with emergency obstetric complications. Health professionals countrywide would be able aware of adherence to national guidelines on emergency obstetric care in health facilities. Both the county and national health facilities would benefit in strategizing and boosting ways of achieving the health Millennium Development Goals targets.

1.4 Purpose of the Study

The purpose of the study was to evaluate the facility level factors, health outcome, delivery and newborn outcome in adherence to national guidelines on emergency obstetric care in Samburu Central Sub-County.

1.5 Research Questions

1. What are the facility-level factors associated with adherence to national guidelines on emergency obstetric care?
2. What are the health outcomes associated with adherence to national guidelines on emergency obstetric care?
3. What are the delivery and new-born outcomes associated with adherence to national guidelines on emergency obstetric care?

1.6 General objectives

To determine factors associated with adherence to national guidelines on emergency obstetric care and the associated health outcomes among pregnant mothers and newborns in Samburu central sub-County.

1.7 Specific Objectives

1. To determine facility-level factors associated with adherence to national guidelines on emergency obstetric care.
2. To determine the health outcomes associated with adherence to national guidelines on emergency obstetric care.
3. To determine the distribution of deliveries in regards to month and new-born outcomes associated with adherence to national guidelines on emergency obstetric care.

CHAPTER TWO

LITERATURE REVIEW

2.1 Maternal Health and Obstetric Care

In September 2000, the Heads of States and Governments gathered in New York and adopted the United Nations (UN) Millennium Declaration). Among the key goals of this declaration was the reduction of maternal mortality by 75% by 2015. Some of the indicators toward achieving this goal are maternal mortality ratio (MMR) and the proportion of deliveries with a skilled health provider.

The Millennium Development Goal number 5 is to improve maternal health with a target of reducing MMR by 75% between 1990 and 2015. For this to be attained there is need for a 5.5% decline in MMR annually from 1990. However, globally the reported annual percentage decline in MMR between 1990 and 2008 was only 2.3%. Among countries with an MMR ≥ 100 in 1990, it is evident that 30 countries have made insufficient or no progress. This list includes 23 countries from sub-Saharan Africa (*WHO...Trends in Maternal mortality 1990-2008*). Sadly Kenya is among these countries with an MMR of 488 per 100,000 live births, with some regions reporting MMRs of over 1000 per 100 000 live births. (KDHS, 2008/09).

In general, the estimates developed in 2000, maternal deaths are almost equally divided between Africa and Asia, which together accounts for 95% of the total (WHO, 2007). Only 4 per cent of all maternal deaths occurred in Latin America and the Caribbean, and less than one per cent in the more developed regions of the world.

The MMR was estimated to be close to 500 per 100,000 live births globally in 2000 with the highest occurring in Sub-Saharan Africa (940) and South Asia (560). Other regions including Middle East, North Africa, Latin America and the Caribbean, East Asia, and the Pacific had lower MMR. According to Hogan et al. (2010) maternal deaths declined from 526,300 in 1980 (MMR=422) to 342,000 in 2008 (MMR=251) globally and only 23 countries seem to be making tangible progress towards achieving 75% reduction in MMR by 2015.

Unfortunately, in Sub-Saharan Africa, women face the risk of dying in many occasions due to lack of proper maternal care and it is estimated that 1 in 16 women die in Africa compared to 1 in 3800 women in developed countries. Moreover in each case another 15 to 30 suffer severe morbidities owing to pregnancy.

The leading causes of pregnancy related deaths are due to haemorrhage (25% of women), sepsis (15%), unsafe abortions (13%), hypertensive disorders of pregnancy(12%)due to, obstructed labour and other obstetric causes (e.g. ectopic pregnancy) (8% each). Most of these causes occur as pregnancy progresses, during labour and delivery or even, during the postpartum period. Evidence shows that approximately 15% of all pregnancies will develop sudden serious complications that could lead to death and require life-saving access to quality obstetric services

In terms of maternal care and services, many of the pregnancy related complications can be treated or prevented through use of modified clinical obstetric practices. The World Health Organization, UNFPA and UNICEF indicate that 80% of deaths resulting from pregnancy complications can be avoided using quality EMOC. It is

also argued that consistent availability of skilled birth attendant helps in prevention, early detection and management of obstetric complications.

As a matter of fact, the proportion of deliveries done by a skilled attendant are used as key indicators of progress towards achieving the MDG target of improving maternal health. These interventions have been shown to reduce maternal mortality to negligible levels in industrialized countries. In Sweden, the MMR is now estimated at 7.3/100,000 live births from 500,000 live births in the past two decades. Ironically, the average maternal deaths in Sweden between 1988 and 2007 were 64% higher than those reported by the World Health Organization.

This can also be seen in the study by Ahmed, Li, Liu and Tsui (2012) in which they estimated maternal deaths ratio averted by use of contraceptives in Sweden to be between 4 and 5. This suggests that there may be instances where documented maternal mortality statistics have been underestimated due to a lack of data or improper evaluations of maternal mortality.

In spite of the above highlights, it appears that little progress has been made by the country in meeting the MDG goal of reducing maternal mortality in the last 2 decades. Some of the barriers to delivering in health facilities in Kenya include fear of harsh treatment especially for HIV infected women and the distance from the health facilities.

At the global scale, every minute, at least one woman dies from complications related to pregnancy or childbirth translating to an equivalent of 529,000 women a year. The average global levels in 2013 were estimated at 292 982 maternal deaths

compared to 376 034 in 1990. It is suggested that this rates have consistently declined consistently in most of Asia in the last two decades but in contrast maternal deaths increased in most of the sub-Saharan Africa region in the 1990s out of which 0.4% of the global total maternal deaths were associated with HIV, while most of the deaths occurred intra-partum or postpartum.

Causes varied by region and between 1990 and 2013 (Kassebaum, 2014). In general, complications during pregnancy and childbirth are a leading cause of death and disability among women in developing countries. There are also cases of serious injuries and disability. Every year approximately nine million women suffer some type of injury from pregnancy or childbirth, while one million children are left motherless each year, leading to a lasting effect on their lives.

Up to 86% of the global maternal deaths occur in Asia and Africa where access to modern maternity care have been largely denied to women (WHO, 2007). In other words, a large number of maternal deaths could be prevented if women had access to quality family planning services, skilled care during pregnancy, childbirth and the first month after delivery, or post-abortion care services and where permissible, safe abortion services.

According to the World Health Organization (WHO), 300 million women across the developing countries experience short-term or long-term morbidities resulting from pregnancy and childbirth (Acharya et al., 2015). Varied complications are also associated with high numbers of maternal deaths globally. For instance, Postpartum haemorrhage accounts for 33% of pregnancy related deaths in Africa and Asia, while

pre-existing diabetic conditions accounts for four times risk of foetal deaths in pregnant women compared to those with no diabetes in England (Tennant et al., 2014) infection (15%).

Complications linked to unsafe abortion, low birth weight (increased risk of ischemic heart disease in mother later in life), eclampsia and obstructed labour also substantially contribute to maternal mortality and morbidity in many regions (Ghulmiyyah & Sibai, 2012; Smith et al., 2001). In general, maternal mortality is an important indicator and measure of women's health and also the performance of a health care system.

Detailed reviews of some of the interventions and strategies widely used to reduce pregnancy complications and maternal mortality in many countries can be found in (De Brouwere & Tonglet, 2013). Drug treatments and procedures and particularly preventive best practices, avoiding of iatrogenic procedures, and first-line management of complications are commonly used.

It is believed that with the establishment of, the Millennium Development Goals (MDGs) in 2000 world governments and development organizations would improve health, education and well-being of least developed countries. However, only less than 20 countries have managed to achieve the target of reduced maternal mortality by three quarter globally by 2015.

In achieving these, maternal mortality ratio (MMR) and proportion of births attended by skilled health personnel have been proposed as the two important indicators for measuring the success and progress of maternal mortality numbers. However there

have been challenges in estimating maternal mortality/deaths using these measures particularly in developing countries where there are poorly organized health information and registration system (AbouZahr & Wardlaw, 2001).

In view of the above, there has been a lot of information and research in maternal health around the globe, but there seems to be little evidence that the situation has changed much in sub-Saharan Africa and other developing countries in the last two decades. It is therefore, important to address this gap in order to improve the understanding of maternal health in Kenya.

This study therefore is an attempt to contribute to the reduction of maternal mortality through understanding the factors that influence adherence to national guidelines in emergency obstetric care and their outcome in Samburu Central Sub-County health facilities in Samburu County of Kenya. This is one of the counties which experiences high obstetric case fatality

Efforts towards reducing maternal deaths and the declines in maternal mortality witnessed in some countries could have been due to various reasons. Mostly, combinations of interventions and factors have played a role in curtailing maternal deaths. Key among these includes; the introduction of penicillin, blood transfusion on a large scale, and improved obstetric care in many regions. MMR has been reduced by 50% or higher in some developing countries such as Bangladesh, Egypt, Malaysia and Sri Lanka due to increased access to quality EMOC interventions (Filippi et al., 2006; Hounton et al., 2013; Koblinsky et al., 2008).

In contrast, the MMR levels in most other third world countries appear to have stagnated and with little or no progress. This particularly the case in Sub-Saharan region, where maternal mortality is highest (Montoya et al., 2014). For example, maternal mortality rates in Mozambique and United Republic of Tanzania have been increasing instead of declining, and Kenya is no exception (Gross et al., 2012).

Studies on adherence to national guidelines of obstetric care in developing countries indicate that the quality of obstetric care for women have generally been poor. In Malawi for example, inadequate skilled personnel, lack of equipment, no essential drugs and supplies have shown to be some of the main factors that have contributed to poor quality of care. Adherence to national guidelines is very relevant as it would help unveil deficient complications related to obstetric care.

2.2 Definition and Standards of Obstetric Care

The World Health Organization (WHO) (2003) define Essential Obstetric Care (EOC) as a set of eight basic care functions that should continuously be available and performed by physicians in treating obstetrical emergencies such as; surgery, anesthesia, blood transfusions, manual procedures, monitoring labour, management of pregnancy complications, neonatal care and clinical treatments. EOC is thus, the first referral level to reduce maternal mortality and morbidity.

To evaluate the efficiency of the EOC system deficiencies are highlighted by comparing care that was provided to a patient to care that was supposed to be given. However, there is no general agreement as to what constitutes high quality of care for obstetric care. Current definitions of quality of care agree that biomedical outcomes

address patient and provider satisfaction, social, medical and financial outcome as well as aspects of equity and performance according to the standards and guidelines.

2.3 Quality of Emergency Obstetric Care

The quality of emergency obstetric care has raised interest in many studies (Abegunde et al., 2015; Dogba & Fournier, 2009; Mehta et al., 2015). For example, (Mehta et al., 2015) found that pregnant women perceived triage care to be of superior quality and more accessible compared to out-patient prenatal care.

The study indicated that excess emergency utilization could be an indication of poor quality of care and service and suggested the need to address the problem through provision of required facilities. A study by (Dogba & Fournier, 2009) assessed the importance of human resources in the enhancement of quality of EMOC and reduction of maternal deaths. They revealed that most studies highlight professionalism of midwives ranked among the most successful human resources in maternal health care in and that this contributed immensely in the reduction of maternal mortality in developed countries.

In practice the quality of EMOC can be expressed in the following way: A process/situation that involves a state of readiness that enables an appropriate response to obstetric emergencies in a way that fulfills the needs and rights of your clients/patients. This by extension helps to achieve and maintain a state of preparedness in the facility so as to provide quality EMOC. Efficient EMOC system includes staffs that have adequate skills and a willingness to respond to clients

throughout on 24 hours a day basis as well as the availability and functional equipment and supplies and reliable infrastructure.

More specifically, staff requires respect, dignity, and freedom to express their opinion; facilitative supervision and reliable management in order to create a positive work environment; information, training, and development to maintain skill levels; and functional and sufficient facilities or resources such as supplies and equipment to provide correct and complete treatment.

2.4 Availability of Obstetric Care

The progress of the Millennium Development Goals for reducing maternal mortality was based on two indicators: maternal mortality ratio (MMR) and the proportion of births attended by skilled personnel (Paxton, Bailey, & Lobis, 2006) however, argued that the two indicators were insufficient for measuring the progress in the reduction of maternal mortality. For instance, Du et al. (2012) found that progress in measuring of maternal mortality derived from routine live births differed with those derived from survey data with the latter being lower compared to the routine live births in the rural areas but in contrast was the opposite in urban areas.

These however might be because; the monitoring of EMOC is low in rural areas with limited information on availability of EMOC services such as in the case of Tanzania (Bakari et al., 2015). EMOC services are considered to be an additional indicator which measure how the health care system responds to obstetric complications. The benefits of EMOC include adequate distribution of obstetric services and management of obstetric complications and in more general terms, safety of life.

According to UN recommendations, the use of EMOC is regarded as the provision of at least one comprehensive and four basic Emergency Obstetric Care facilities per 500,000 people. However, this is put into question since different UN reports and documents make contradictory recommendations, and the present procedures are less associated with maternal mortality.

Access to quality care during pregnancy and especially at delivery seems to be the crucial factor in explaining the disparity in maternal mortality and morbidity between the developing and the industrialized world. An estimated 90% of maternal deaths could be avoided if adequate care was provided (Wagle et al., 2004).

Culture of quality of care and improved accessibility to obstetric services, along with the number of health care facilities, equipment, staffing of these facilities contributed to a decline in maternal mortality in the USA and Europe, since the 1940s (De Brouwere et al., 1998). Until the 1990s, the international community realized that deliveries are far safer with professional assistance; when a complication appears, a pregnant woman should have access to an appropriately equipped health service (De Brouwere et al., 1998). But in practice, only limited support has been given for professional assistance (midwifery's) to all deliveries.

Some countries have invested in institutionalization and medicalization of childbirth and antenatal screening, whereas the minority is investing in the WHO-recommended essential obstetric care (Van Lerberghe et al., 2001) While maternal mortality has many causes, it is well known that most deaths can be prevented if adequate and timely emergency obstetric care is provided.

A study in the rural areas of Pakistan (Ali et al., 2006) showed that comprehensive EMOC, instead of basic EMOC, tends to be numerically adequate in relation to the population. It was also found that both basic and comprehensive obstetric care facilities fall short of UN minimum recommendations.

The number of facilities providing basic EMOC services was much too low to be called providing comprehensive coverage. According to (Campbell, Graham, & group, 2006), there is no doubt that hospitals can provide more effective packages of emergencies than health centres, partly because of the provision of surgery and blood transfusions.

A study by (Freedman, 2003) stated that antenatal care and nutrition programs will not substantially reduce maternal health. In her vision, all women must have access to EMOC in case they Experience complications. This means that Emergency Obstetric Care should be seen as a core element of essential health care services for women. In reality, several other factors contribute to a delay in seeking and having care for pregnant women.

These factors could be based on cultural, financial or social determinants. Accessibility of EMOC depends on whether countries have functioning, equitable health care systems (Freedman 2003).The international consensus is that scarce resources should not be spent on trying to predict which women will have life-threatening complications, but that maternal mortality programs should be based on the fact that every pregnant woman may be at risk.

So all women must have access to high quality delivery care with the following three key elements; a skilled attendant at delivery, access to emergency obstetric care in case of complication and a referral system to ensure that women with complications can reach a lifesaving EMOC in time. A comparative study in Bangladesh, Russia, South Africa and Uganda revealed that Health outcome in pregnancy and childbirth are not strictly related to the number of staff or proportion of skilled attendant but, relatively more influenced by the structure and operation of health centre (Parkhurst et al., 2005).

The availability of a minimum level of care for all pregnant woman, and higher level of care for some is an important one, as most users of maternal services are well and do not need specialized care (Ronsmans, 2000). According to (Campbell, 2000), most countries appear to have developed a least minimal infrastructure for providing antenatal care, but a far bigger challenge is posed by delivery care services. Barriers to the use of professional skilled care include user fees, poor confidence in the service provided and bad attitudes of health professional. These factors have contributed to a low visit of the health facility with EMOC services (Ansong – Tornui et al., 2007).

A project in nine conflict-affected countries was carried out between 2000 and 2005, where 12 emergency obstetric cares were implemented, to increase the availability of EMOC and to institutionalize EMOC. Some of the activities include the provision of physical facilities with equipment, enhancing staff capacities through training, 24-hour coverage seven days per week and improvement of communication and transportation (Meyers et al., 2006). This project produced an increased women's use

of EMOC services, accompanied with a sustained increase of the number of deliveries in EMOC facilities where complications were treated.

It also demonstrated that improving EMOC services was not only critical but also feasible for both local and international NGOs and the involvement of the community successfully resulted in purchasing an ambulance (Meyers & Friedlander, 2006). On the other hand, one of the constraints consisted of frequent staff turnover causing delay in training and providing the necessary care.

A study in Nicaragua revealed that health centres treated no women with obstetric complications but referred them to the nearest hospital. This referral pattern to comprehensive emergency obstetric care declined with 70% after the provision of the health centres with emergency drugs and qualified staff (Paxton et al., 2006). One of the barriers to obstetric care was obviously due to a decrease in the quality of obstetric care and lack of adherence to written obstetric care protocols. The lack of availability of obstetric care does result in a longer travel time for routine care (Goodrum, 2001).

In Pakistan, pregnant women strongly preferred to give birth at home. Large proportions of these home births take place without a skilled attendant. This increases the risk for these women if a complication occurs during or after delivery (Ali et al., 2006). This study also found that the rates of hospital birth were low and few women reached the health facilities Ali (2006) stated that the challenge is to ensure the availability 24 hours of basic and comprehensive EMOC services

geographically distributed to maximize access for the greatest number of women, especially in rural areas.

Cost can also be a considerable barrier to accessing obstetric and emergency care. In Port-au-Prince and the larger cities, high quality private medical and obstetric care is readily available for those with sufficient financial resources. In contrast, public facilities such as the national maternity and the main public hospital, which is also the teaching hospital for the national medical school, are characterized by a lack of supplies, and overworked and underpaid staff. Although care is officially provided free of charge, indirect costs can be considerable et al., 1998).

2.5 Quality of Obstetric Care

According to Gibson (1995), quality of care means the “excellence” in reference to improvement in health status. Retrospectively, Donabedian (2003) takes a general view and regards quality of care as the extent to which application of medical science and technology is expected to achieve the most favorable balance between risks and benefits. In contrast, Roemer and Montoya-Aguilar (1988) defines the quality of care as the degree to which resources on health care or services correspond to some given standards that are believed to lead to desired results.

In general, good quality of obstetric care involves both responding to emergencies and swiftly monitoring and responding to normal labour and delivery so that uncomplicated cases do not turn into complicated ones (AMDD, 2003). Assessment of quality of care should be based on the interrelationship between structure, process and outcome components of a health intervention; no single dimension alone is

sufficient to measure quality of care (Urassa et al., 2005). To guarantee good quality of essential obstetric care, the focus should be on life saving skills, interpersonal and counseling skills, commitment of non-physician health care providers, availability of essential drugs and supplies, and the management of obstetric care (Post, 1997).

2.6 Standards of Care

In monitoring and evaluation of quality of care, it is mandatory to establish standards of care and also criteria to assess the quality of care. The standards have been described as explicit statements that lay down the desired and/or achievable level of performance upon which the actual performance is compared. Criteria are variables selected as indicators to determine whether the established standards have been met.

Varied forms and standards of care in maternal health have been practiced in different settings. These includes family-centered care from homes, community workers mobile technology based care and care at health institutions. A good reference to standards of care has been illustrated in Johnson, Maas, & Swanson. This study evaluated and compared the actual performance of care to patients who experienced major obstetric complications against the established national treatment guidelines and protocols.

2.7 Emergency Obstetric Care in Kenya

In Kenya, the ratio of basic and comprehensive EMOC facilities to 500,000 people is 2.7 and 1.7, respectively (NCAPD, 2004). In terms of basic services, it would seem that Kenya is faring poorly, as it has a lower-than-recommended ratio for basic

EMOC services, but it seems to be doing much better in terms of comprehensive services, having more than the recommended number of facilities. However, it is important to be aware that the comprehensive service facilities may not be evenly distributed across all regions. Only 4 percent of births are delivered by caesarean section (CBS, 2004), and the case fatality rate of obstetric complications is very high. Complications related to pregnancy and childbirth are leading causes of morbidity and mortality in Kenya, translating to 414 maternal deaths per 100,000 live births. Although 88 percent of Kenyan women studied attended antenatal care, only 40 percent delivered in the health facilities, and only 42 percent of all deliveries have skilled attendants present at the time of delivery (CBS, 2004). In the Kenyan context, access to and use of quality EMOC are essential to the efforts aimed at reducing maternal morbidity and mortality (Mavalankar & Rosenfield, 2005).

In addition to demonstrating that many facilities offering obstetric services lack the equipment and basic supplies necessary to support the provision of quality antenatal care (ANC), delivery, and postnatal care (PNC) services, the 2004 KSPA further showed that the health providers' level of knowledge, competency, and skills are not up to date with the recommended practices. Although training of service providers is an important element in the provision of quality maternity care (NCAPD, 2005), less than 20 percent of health workers interviewed had received training in focused ANC or PNC in the last 3 years. Among caregivers providing delivery services, only 18 percent had received training in lifesaving skills, and only 37 percent had received training in the prevention of mother-to-child transmission of HIV during the last 3 years.

Empirical investigations of health worker training in Kenya have been limited to mappings of health service providers in terms of cadre and distribution (Ministry of Health, 2004) and assessments of the training needs for various skills (Department for International Development/JHpiego, 2005). However, there has not been a comprehensive study of the influence of training on the provision of quality EMOC.

2.8 Global Overview and Trends in Pregnancy Related Complications

A number of physiological changes may occur in the maternal organs during normal pregnancy, after which a person eventually goes back to normalcy after child birth. In contrast, pregnancy related complications may occur before, after or even at the time of delivery. For example, haemostatic status in pregnancy and related complications may be serious and critical both within obstetric ward, in trauma, anaesthesia or any other situation.

In the United States, pregnancy-related mortality ratio increased from 10.3 in 1991 to 12.9 in 1997 due to pregnancy complications and was found to be more pronounced in black women or older women, and resulting mostly from embolism and haemorrhage. In Sweden, high prevalence of maternal overweight and obesity in pregnant women was found to lead to significant complications such as pre-eclampsia and diabetic disorders (Johansson et al., 2014).

This was associated with increased risks of infant mortality resulting from increased mortality risk in term and preterm births. In the study, infant mortality rates were higher (5.8 per 1000 individuals) among women with obesity compared to women with normal weight (2.4 per 1000 individuals).

A study conducted in 19 countries in Africa indicates that the number of deaths related to pregnancy complications and HIV since 2003 was found to be about 27%. Regionally, only 4.5% of these deaths were found in East Africa compared to 26.1% of the deaths reported in southern Africa (Ronsmans et al., 2003).

Globally, almost 600,000 women die from pregnancy-related complications every year, while more than 60 million suffer from morbidity and long-term disabilities such as chronic pain, fistula, impaired mobility, and infertility while many more develop life-threatening complications (Christian, 2002). The problem is direr in developing countries, making pregnancy related complications and childbirth to be the leading causes of disability and death among women of reproductive age.

To address the situation, maternal health programs have mostly been used through antenatal screening to try to identify women at risk of complications (Gabbe et al., 2012; Hardt et al., 2013; Olds, Henderson, Tatelbaum, & Chamberlin, 1986) In recent times, the use of mobile health system through mobile telecommunication and multimedia and wireless technology has been used to improve maternal health care delivery systems.

Despite the benefits from these programs the efforts have had little success little in lowering maternal mortality rates. Some studies suggest that most women with pregnancy complications do not have any known risk factors (Scholl et al., 1994) although common risk factors are well documented (Gardosi et al., 2013). However, good health and provision of antenatal care alone are not sufficient to enable a clear

knowledge on whether a woman will develop complications and require emergency services. This one is not well focused in our public health facilities.

2.9 Conceptual Framework

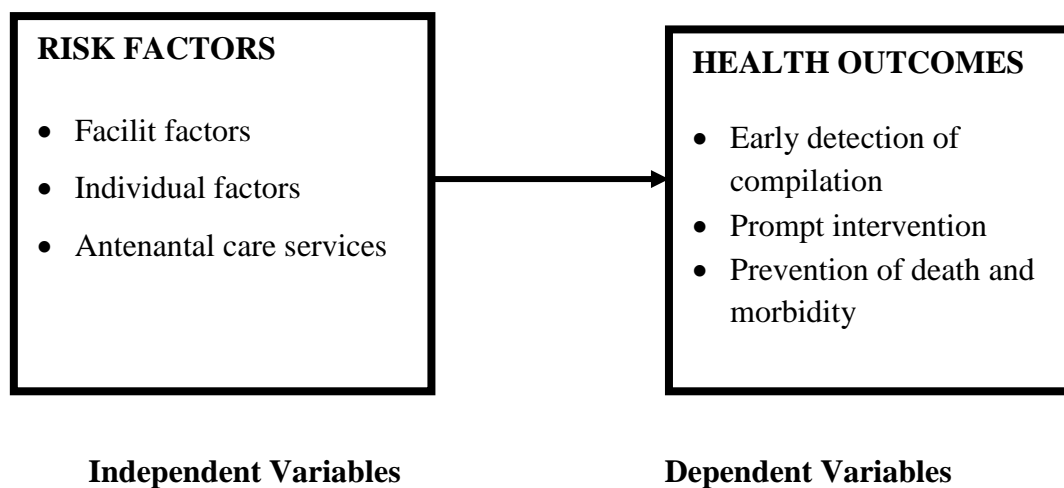


Figure 2.1: Conceptual framework for determining the factors influencing adhering to national guidelines on health emergency obstetric care and associated health outcomes among pregnant mothers and newborns.

CHAPTER THREE

MATERIAL AND METHODS

3.1 Description of the Study Area

The study was conducted in 6 health facilities in Samburu Central Sub-County namely: Maralal County Referral Hospital, Loosuk Health Centre, Kisima Health Centre, Porrer Health Centre, Loloolog Dispensary, Suguta Marmar Health Centre. Samburu central sub-County is in Samburu county with its main Headquarters in Maralal township. Approximately 370 kms from Nairobi and 140 kms from Nyahururu town. The sub county is bordering North sub-County in the north, Laikipia County in the south, Samburu East sub County in the east and Baringo county in the west.

3.2 Study design

The study adopted a descriptive cross-sectional design involving six public health facilities offering maternity services were involved in this study. The study was conducted between June to November 2016.

3.3 Study population

The staff in charges of the six facilities providing maternity services and the previous records of mothers who delivered at the health facilities for the six months..

3.4 Sampling method

This adopted purposive sampling technique. Involved the six health facilities offering maternity services in the Samburu Central Sub- County

3.5 Sample size and selection

This was a census for all 990 the mothers who utilized the health facilities with the sixmonths. All the files were studied and information extracted.

3.6 Inclusion and Exclusion Criteria

Inclusions:

1. All files in which mothers who had delivered in the health facilities
2. All deliveries for the last six months .

Exclusions

1. All pregnant who delivered at home and brought to the facility
2. Those who delivered more than six months

3.7 Data Collection Tools

Data collection instruments consisted of a key informant interview guide to interview the In-charge of each of the selected facilities. In addition, checklist for the infrastructure of health facility was also used. For the desk review, a data collection form was utilized to collect the maternal/newborns outcomes from the secondary data.

3.8 Validity of Instrumentation

Validity included: checks on the face, construct and content in order to ascertain whether the instruments could accurately represent the variables under study and satisfy the purpose and objectives of the study. The final instruments were designed in view of the outcomes of the validation process. Other senior health officers and also three experts from the faculty of health sciences were involved in checking of content, face validity and construct.

3.9 Reliability of Instrumentation

To test for reliability, the instruments were pilot –tested in two health facilities: one for BMOC and one for CMOC health facility within the sub-county so as to avoid contamination of the results. After piloting, the internal consistence procedure was used to determine the reliability of the instruments. This was determined from the scores obtained from a single test questionnaire administered to a sample of subjects.

3.10 Ethical Considerations

Clearance from the ethical committee at the University of Nairobi and the scientific health committee was sought (refer to Appendix II). Specifically, permission to conduct the research was sort from the county director of medical services in Samburu County and respective in-charges of health facilities in the sub-county .The data collected was coded and keyed in a database that was pass-word protected to ensure confidentiality. In addition no harm on the study subjects will be anticipated since this is largely, a retrospective study. Finally potential benefits were

dissemination of the information to health facilities and the ministry of health and this may help improve outcomes in the future.

3.11 Data Analysis

The researcher scored the key informant interview guide, checklist and the desk review so as to generate both the Quantitative and Qualitative data respectively. Data was analysed using the computer program, statistical package for social sciences (SPSS) Version 23.0 for windows. Descriptive statistics was used where means, percentages and frequencies were determined. Chi-square and Pearson's correlation(r) was used to establish relationships between the independent and dependent variables in the study. Pearson's correlation coefficient is used where both data is in interval scale (Black, 2002).The cause and effect relationship between factors affecting the values in question will not be assumed. Consequently, the correlation coefficient was used to indicate the strength and direction of the relationship between scores of variables.

To make reliable inferences from the data, the correlation was subject to test of significance at alpha (α) equal to or less than 0.05.

3.12 Limitations of the Research

These assessments specifically looked at the factors influencing adherence to national guidelines on Emergency Obstetric Care. However, there may not be enough information to properly analyze why pregnant women do or do not use EMOC services in the Study area. This means that there needs to be a follow up study in the

future which should look deeper into the socio-cultural and economic factors and knowledge and attitude that affect the utilization of EMOC services at the primary health care facilities.

Table 3.1: Variables and Methods of Data Analysis

Research Questions	Variable		Methods of data analysis
	Independent	Dependent	
1. What are the facility-level factors associated with adherence to national guidelines on emergency obstetric care?	Facility-level factors	Emergency obstetric care	Frequencies, means and percentages
2. What are the health outcomes associated with adherence to national guidelines on emergency obstetric care?	Health outcomes	Emergency obstetric care	Frequencies, means and percentages
3. What are the delivery and newborn outcomes associated with adherence to national guidelines on emergency obstetric care?	Delivery and newborn outcomes	Emergency obstetric care	Chi-square

CHAPTER FOUR

RESULTS

4.1 Demographic data of the pregnant women that utilized the facilities

4.1.1 Age distribution

The results indicated that 40.1% of the pregnant women that utilized the facilities were below 25 yrs, 52.4% were between 25-34 yrs, 7% were 35-44yrs and 0.5% were more than 45yrs (Table 4.1).

Table 4.1: Age distribution of pregnant women that attended the health facilities

AGE(YRS)	FREQUENCY	PROPORTION (%)
>25	397	40.1
25-34	519	52.4
35-44	69	7
45-55	5	0.5

4.1.2 Marital status of pregnant women that attended the health facilities

The results indicated that (691) 67.8% of the pregnant women who attended the facilities were married, 20.1%(1990 were single ,(16) 1.6% and (84) 8.5% were separated (.Table 4.2)

Table 4.2: Marital status of pregnant women that attended the health facilities

Marital status	Married	Single	Divorced	Separated
Frequency	691	199	16	84
Proportion	67.8%	20.1%	1.6%	8.5%

4.1.3 Educational background of pregnant women that attended the health facilities

The study indicated that 47.2% of all the pregnant women who visited the health facility have never attended at any level of education, 24.3% primary school ,17.8% secondary school, 7% college level and 3.7% attended the university.

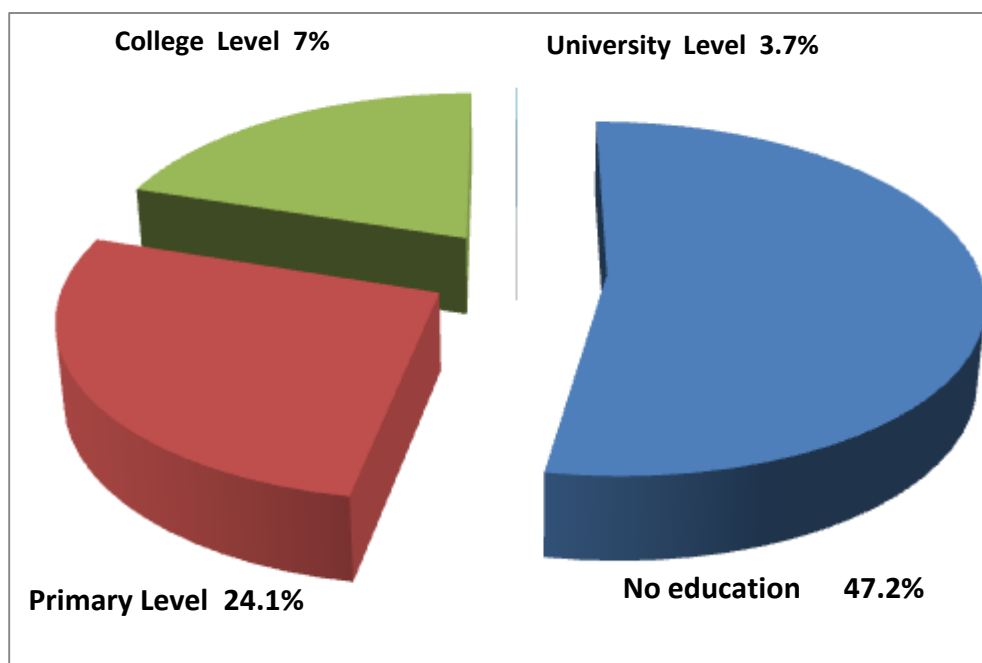


Figure 4.1: Educational background of pregnant women that attended the health facilities

4.1.4. Occupation of pregnant women that attended the health facilities

The study found that out of 990 of pregnant women 56.7 % (571) were not employed, 37.1 % (367) self-employed and 5.3% (52) were employed (Figure 4.2).

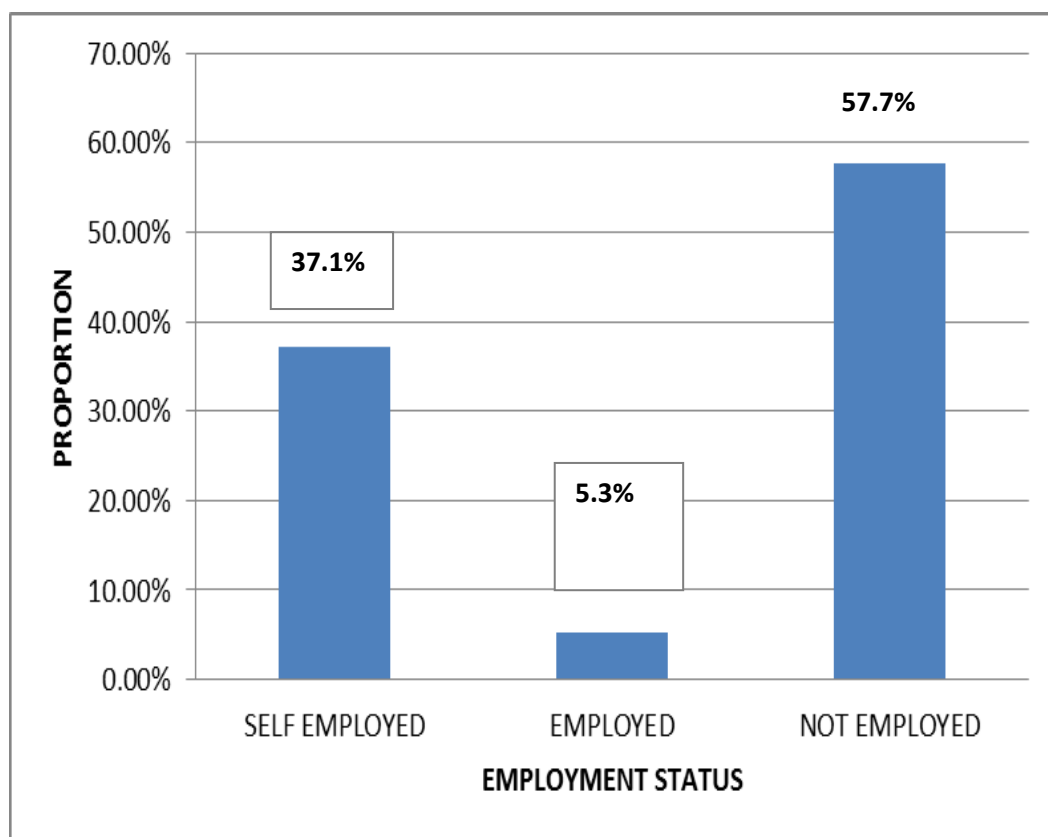


Figure 4.2: Occupation of pregnant women that attended the health facilities

4.2 Facility level factors Associated with Adherence to National Guidelines on Emergency Obstetric care

Results indicated that out of 6 health facilities five health facilities were Basic emergency obstetric care (83.3%) offering the six signal functions: Administration of parenteral antibiotics, administration of parenteral oxytocic drugs, administration of parenteral anticonvulsants for preeclampsia and eclampsia, performance of manual removal of placenta, performance of manual removal of retained, products (e.g., manual vacuum aspiration) and performance of assisted vaginal delivery while one facility provided the six signal functions and blood transfusion and surgery comprehensive emergency obstetric care services (16.7%)(Table 4.3).

Table 4.3: Type of health facility in Samburu Central Sub County

HEALTH FACILITY TYPE	FREQUENCY (F)	PROPORTION (%)
Basic Emergency Obstetric care 1. Loosuk Health Centre 2. Kisima Health Centre 3. Porrer Health Centre 4. Lolmolog Health Centre 5. Suguta Marmar Health Centre	5	83.3
Comprehensive Emergency Obstetric Care 1. Maralal County Referral Hospital	1	16.7

4.3 Human/Personnel Resources Factors

4.3.1 Nursing staff staffing in Maternity Unit per health facility

From the results, Maralal county referral hospital had many Nursing staff compared to other health facility. In addition it was the main facility where there are many midwives and personnel trained on EMOC. (Table 4.4).

Table 4.4: Nursing staff staffing in Maternity Unit per health facility

FACILITY	FREQUENCY	PROPORTION (%)
Maralal County Referral Hospital	15	46.9
Loosuk Health Centre	4	12.5
KisimaModel Health Centre	6	18.8
Suguta Marmar Health Centre	5	15.6
Porror Health Centre	1	3.1
Lolmolog Health Centre	1	3.1

4.3.2 Nursing staff per shift at the maternity unit at the facilities

The study found that Maralal county referral hospital had more staff;3(30%) per every shift , Kisima health centre 2(20%),Loosuk health centre had 1(10%),Suguta Marmar 2(20%),Porror 1(10%) and Loolmolog had 1(10%)(Table 4.5).

Table 4.5: Nursing staff per shift at the maternity unit at the facilities

FACILITY	FREQUENCY	PROPORTION (%)
Maralal County Referral Hospital	3	30
Loosuk Health Centre	1	10
Kisimal Model Health Centre	2	20
Suguta Marmar Health Centre	2	20
Porror Health Centre	1	10
Lolmolog Health Centre	1	10

4.3.3 Number of nursing staff trained in midwifery at the facilities

The results obtained showed that (9) 56.3% of the nursing staffs were trained midwives at Maralal county referral hospital, Loosuks and Kisima health centre were (2) 12.5% respectively while Loolmolog,,Porrer and Suguta Marmar health centre were (1) 6.3% respectively.(Figure 4.6).

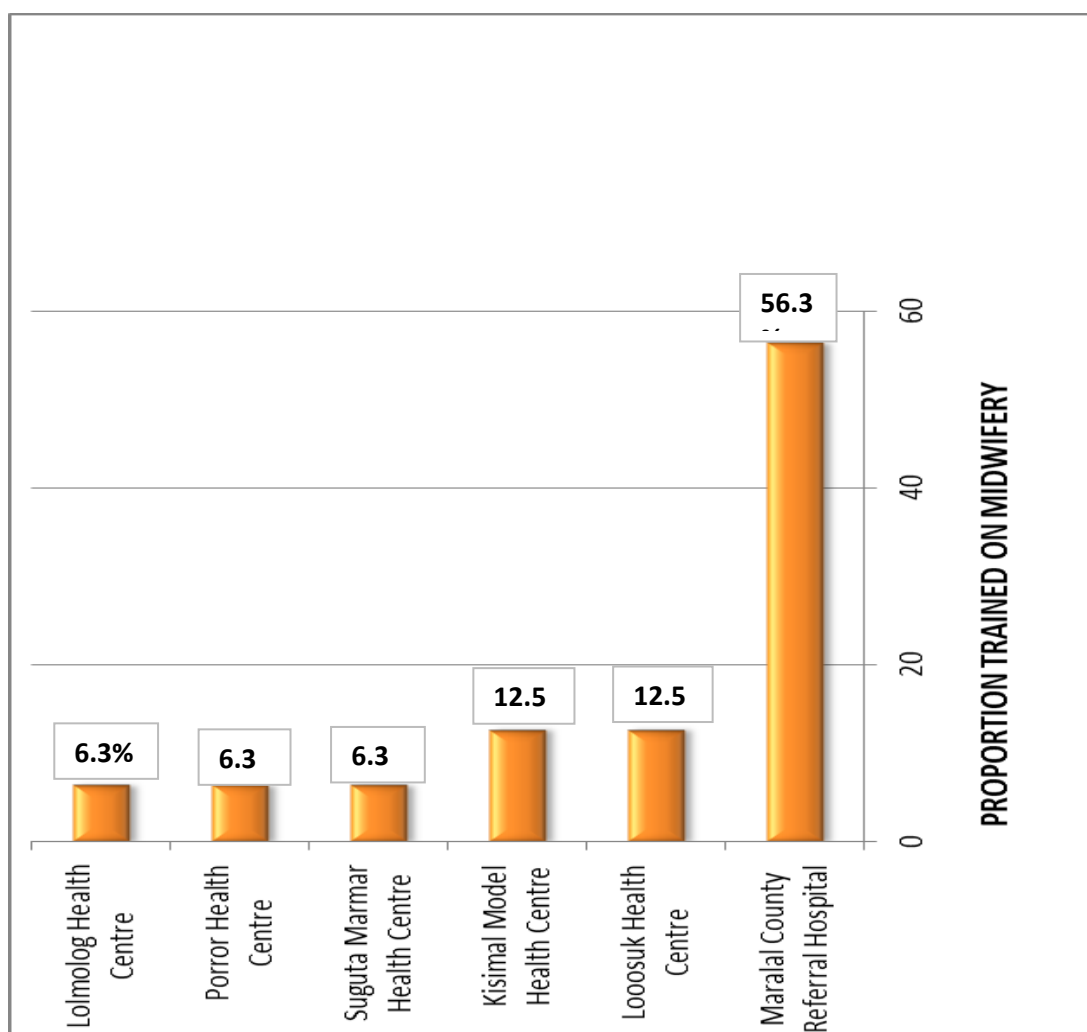


Figure 4.3: Number of nursing staff trained in midwifery at the facilities

4.3.4 Number of nursing staffs trained on EMOC at the facilities

The study showed that Maralal county referral hospital had 15(62.5%) trained on EMOC, Suguta Marmar health Centre 3 (12.5%) Kisima health Centre 3 (12.5%) Loosuk health Centre 1(4.7%), Porrohealth Centre1(4.7%) and Lolmolog health centre 1(4.7%)(Table 4.6).

Table 4.6: Number of nursing staffs trained on EMOC at the facilities

FACILITY	FREQUENCY	PROPORTION(%)
Maralal County Referral Hospital	15	62.5
Loosuk Health Centre	1	4.7
Kisimal Model Health Centre	3	12.5
Suguta Marmar Health Centre	3	12.5
Porror Health Centre	1	4.7
Lolmolog Health Centre	1	4.7

4.4 Implementation of free maternity services by National/County Government

(Key Informant Interview)

There was support from the national and county government. This was via; Maternity, fee waiver for all mother in all facilities, constant supply and availability of medicines ,supply of maternity equipment(incubators, delivery coaches, sanitary towels) and 24 Hours Free Ambulance Services.

4.5 Challenges faced in providing emergency care Services in Health Facility (Key informant Interviews)

The main challenges faced by the health workers in provision of services in their facilities were: Shortage of staff, long distance for mothers who live far from the facility attributed by poor means of communication and delays for referral to the main hospital

4.6 Key areas for further improvement of EMOC services (Key informant Interviews)

The results from the key informant commented and gave advice on issues on how to improve EMOC services. This included: Regular training and updating staff on new protocols in emergency obstetric care, provision of maternity equipment. Regular/consistent supply of drugs and up-grading another facility to provide comprehensive emergency obstetric care services.

4.7 Opinion on further improvement in improving adherence to the national guidelines on Obstetric emergency services (Key informant interviews)

Opinions from the key informant pointed out that further improvement of the emergency obstetric care services within the sub-County are needed by regular training and updating staff on new protocols in emergency obstetric care, provision of maternity equipment, regular/consistent supply of drugs and upgrading another facility to provide comprehensive emergency obstetric care services.

4.8 Organizational Structure of the Maternity unit(Checklist)

The checklist/observation revealed that Maralal county referral hospital had more and spacious room, delivery coaches and adequate number of beds in the post natal wards (Table 4.8)

Table 4.7: Organization of the maternity units in the health facilities

Facility	No. of rooms	No of delivery coaches	No of post natal wards
Maralal county referral hospital	5	3	2
Loosuk Health Centre	2	1	1
Kisima Model health Centre	2	1	1
Suguta Marmar Health Centre	2	1	1
Poror Dispensary	1	1	1
Lolmolog Dispensary	1	1	1

4.9 Availability of Emergency Obstetric care in the Health Facility: Basic

Emergency Obstetric care Kit (Key informant Interviews)

All the six health facilities had enough medications for the six signals of basic emergency obstetric care (intravenous fluids, Oxytocin, Injectable Sedatives/ Anticonvulsants and Inject able Antibiotics).

4.9.1 Maternity Supplies/Equipment’s availability in the Maternity Labour room supplies/Equipment (Key informant Interviews)

The checklist used to check the labour rooms indicated that rooms were equipped with equipment; incubators, oxygen cylinders, resuscitation tray, ambubags and medicines. (Figure 4.4).

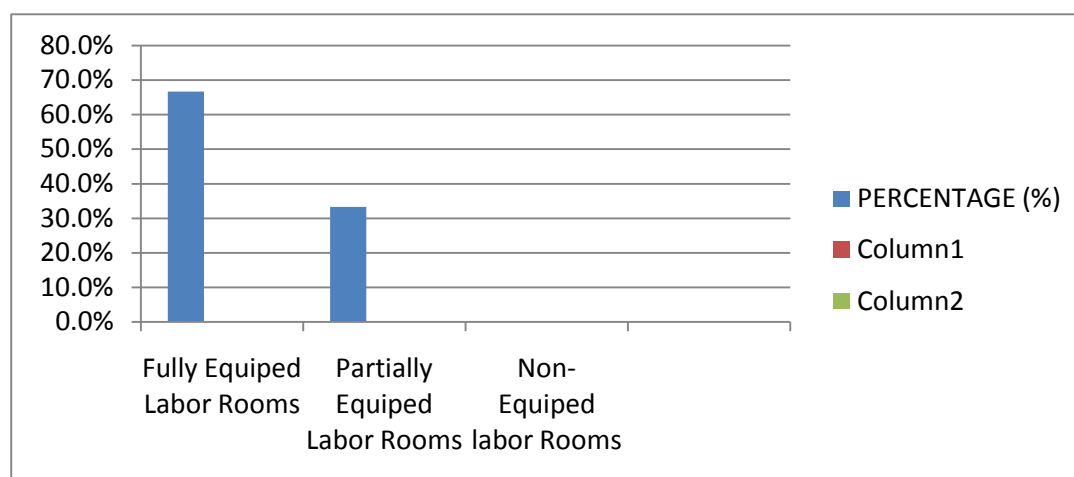


Figure 4.4: Maternity Supplies/ Equipment availability in the Maternity Labour Rooms

4.9.2. Availability of Neonatal Resuscitation Kit in the health facilities (Key informant Interviews)

The checklist revealed that Maralal county referral hospital, Kisima, Poror had all the fully equipped neonatal resuscitation kit. Vitamin K injection was missing at Lolmolog Dispensary, Suguta Marmar Health Centre and Loosuk Health Centre (Table 4.8.)

Table 4.8: Availability of Neonatal Resuscitation Kit

Facility	Suction machines	Cord clumps	Ambubags	Resuscitation coach	Vit K injection
Maralal county referral hospital	yes	yes	yes	yes	yes
Loosuk Health Centre	yes	yes	yes	yes	no
Kisima Model health Centre	yes	yes	yes	yes	yes
Suguta Marmar Health Centre	yes	yes	yes	yes	no
Poror Dispensary	yes	yes	yes	yes	yes
Lolmolog Dispensary	yes	yes	yes	yes	No

4.9.3 Health outcomes Associated with Adherence to National Guidelines on Emergency Obstetric care (checklist)

The study revealed that out of 990 pregnant mothers who delivered in the six health facilities the main health outcomes encountered were obstructed labour 6(0.6%), antepartum haemorrhage 4(0.4%) and postpartum hemorrhage 4(0.4%) (Table 4.9).

Table 4.9: Health outcomes

OUTCOME	FREQUENCY	PERCENTAGE (%)
1. Ant Partum Haemorrhage	4	0.4
2. Post-Partum Hemorrhage	4	0.4
3. Eclampsia	1	0.1
4. Abortion	0	0
5. Puerperal sepsis	0	0
6. Obstructed Labour	6	0.6

4.9.4 Delivery and New born outcomes Associated with Adherence to National Guidelines on Emergency Obstetric Care

More deliveries were observed in the month of September and October and least deliveries were in the month of July and August (Table 4.10).

Table 4.10: Distribution of deliveries with regard to month

MONTH DELIVERY	NO. OF DELIVERIES	PROPORTION OF DELIVERY
June	155	15.7
July	153	15.5
August	153	15.5
September	203	20.5
October	169	17.0
November	157	15.8

4.9.5 Neonatal outcomes

The study revealed that there was an average of 165 deliveries per months ,normal newborns with an average of 161 per month an average of 1 still birt, asphyxia neonatorum and prematurity(underweight) respectively (4.11).

Table 4.11: Neonatal outcomes

Month of delivery	No. of deliveries	Normal babies	Still births Frequency (%)	Asphyxia neonatorum Frequency (%)	Premature Frequency (%)
June	155	153(98.7)	0(0.0)	1(0.65)	1(0.65)
July	153	150(98.0)	2(1.3)	0(0.0)	19(0.7)
August	153	152(99.3)	0(0.0)	1(0.7)	0(0.0)
September	203	196(96.5)	3(1.5)	2(1)	2(1)
October	169	164(97.0)	1(0.6)	2(1.2)	2(1.2)
November	157	154(98.1)	1(0.5)	1(0.5)	2(0.9)
Mean	165	162	1	1	1

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Demographical characteristics of the pregnant women

Majority of the pregnant women that utilized the facilities were below 25 years and this showed that early marriages is an indicator of such an extreme age among the pregnant women that utilized the facilities. On the marital status among the pregnant women was that more than 65% were married. The illiteracy level of those mothers that utilized the facilities is high at more than 45% compared to those who have attended other levels of education. In addition more than 50% of the pregnant women were not employed.

5.2 Facility level factors

Out of 6 health facilities included in the study, five health facilities were Basic emergency obstetric care offering the six signal functions: Administration of parenteral antibiotics, administration of parenteral oxytocic drugs, administration of parenteral anticonvulsants for preeclampsia and eclampsia, performance of manual removal of placenta, performance of manual removal of retained, products (e.g., manual vacuum aspiration) and performance of assisted vaginal delivery while one(Maralal County Referral Hospital) facility provided the six signal functions and blood transfusion and surgery comprehensive emergency obstetric care services .

On human resource factor Maralal county referral hospital had a high number of maternity Nursing staff compared to other health facilities. In addition it was the

main facility where there are many midwives and personnel trained on EMOC and more than two staffs per shift.

There was support from the national and county government. This was via; Maternity, fee waiver for all mother in all facilities, constant supply and availability of medicines ,supply of maternity equipment(incubators, delivery coaches, sanitary towels) and 24 Hours Free Ambulance Services.

The main challenges faced by the health workers in provision of services in their facilities were: Shortage of staff, long distance for mothers who live far from the facility attributed by poor means of communication and delays for referral to the main hospital.

The study pointed out areas of further improvement of EMOC services, including: Regular training and updating staff on new protocols in emergency obstetric care, provision of maternity equipment. And regular and consistent supply of drugs and up-grading another facility to provide comprehensive emergency obstetric care services.

Maralal county referral hospital had more and spacious room, delivery coaches and adequate number of beds in the post natal wards compared to the other basic comprehensive All the six health facilities had enough medications for the six signals of basic emergency obstetric care (intravenous fluids, oxytocin, injectable sedatives/anticonvulsants and injectable antibiotics. In addition all the facilities rooms were equipped with equipment; incubators, oxygen cylinders, resuscitation tray, ambubags and medicines. Maralal county referral hospital, Kisima and Pororr

health centres had fully equipped neonatal resuscitation kit. Vitamin K injection compared to Lolmolog, SugutaMarmar and Loosuk Health Centres.

5.3 Delivery, neonatal and health outcomes influencing adherence to National Guidelines in obstetric care

A total of 990 deliveries were conducted study ,an average of 165 deliveries per months, normal newborns with an average of 161 per month an average of 1 still birth, asphyxia neonatorum and prematurity (underweight) respectively. More deliveries were observed in the month of September and October and least deliveries were in the month of July and August.

The study revealed that out of 990 pregnant mothers who delivered in the six health facilities the main health outcomes encountered were obstructed labour, antepartum and postpartum hemorrhage.

5.4 Conclusions

- Of the six health healthy facilities, one health facility provided comprehensive emergency obstetric care services and five health facilities had basic emergency obstetric cares service. The comprehensive emergency facility had a high number of midwives and personnel trained on EMOC. The national and the county governments had supported the provision of free maternity services. In addition, all health facilities were well equipped..
- The main health outcomes encountered were obstructed labour, antepartum and postpartum hemorrhage.

- More deliveries were observed in the month of September and October.
- The neonatal complications encountered at the facilities were asphyxia neonatorum and prematurity of all total deliveries.

5.5 Recommendations

- The national and county government should employ more staff and collaborate with other stakeholders and encourage ensuring that the health facilities have enough trained staff to provide services to the respective locations or areas of their operations.
- The government through the free maternity countrywide should support in supply of maternity equipment to every facility with maternity services.
- In addition, the national and the county governments should consider maternal health financing for preventive and promotive public health by budgetary allocation during every financial year.
- Upgrading of the basic emergency obstetric care facilities to comprehensive emergency obstetric care should be priority to decongest the main primary facility that is; Maralal county referral hospital and also eliminate the third delay in seeking emergency obstetric care services.
- The sub county ward administrators together with the political fraternity should be in the fore front of encouraging the community to utilize the existing facilities within their locality to encourage pregnant mothers to come to and deliver in the health facility.

- Health education to all pregnant mothers should be advocated to utilize the antenatal services that are given free in all health facilities. In addition communities should be mobilized to use the free waiver maternity services in the health facilities.
- Inclusions of male partner in the whole process of antenatal and during delivery. This will enhance health seeking behavior and promote attendance and achievement in utilization of services.

5.6 Area for further research

1. Correlations between antenatal visits and skilled attendant deliveries
2. Introduction of e-mobile to improve skilled attendant deliveries
3. Impact of beyond zero tolerance in reducing maternal mortality.

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APPENDICES

Appendix 1: Questionnaire

Date.....Serial.....number.....Facilityname.....

Type of facility :(Tick appropriately) A. BEmOC B. CEmOC

PART ONE

Facility level factors associated with adherence to national guidelines on emergency obstetric care

Table 4: Human/personnel resource factors

No of health workers in the facility	
No of deliveries conducted per day	
No of health workers per shift	
No. of staffs trained on EMOC	
No of staff trained as midwives	

Does the national/county government give support in delivering free maternity services? (Circle the appropriate response)

Yes Explain briefly

.....
.....

No Explain briefly

.....
.....

3. What challenges do you face in providing emergency obstetric care services in the facility?

.....
.....

4. What improvement in your opinion do you advocate to improve adherence to the national guidelines obstetric emergency services?

.....
.....

PART TWO

Health facility level factors check list

Section A

Table 5: Organizational Structure of the maternity

The number of rooms in maternity	
No of delivery coaches	
No of beds in post natal ward	

Section B

Availability of emergency obstetric care in the facility

Table 6: Basic emergency obstetric care kit

Provision of basic emergency obstetric care Yes No

	Yes	No
Injectable antibiotics		
Injectable oxytoxics		
Injectable sedatives/anticonvulsants		
Intravenous fluids		

Table7: Comprehensive emergency obstetric care

Providing Comprehensive emergency obstetric care

	Yes	No
<p>All of the six basic emergency functions:</p> <ul style="list-style-type: none"> • Administration of parenteral antibiotics • Administration of parenteral oxytocic drugs • Administration of parenteral anticonvulsants for preeclampsia and eclampsia • Performance of manual removal of placenta • Performance of manual removal of retained products (e.g., manual vacuum aspiration) • Performance of assisted vaginal delivery and 		
Caesarean section		
Blood transfusion		

Maternity supplies/equipment availability in the maternity

Table 8: Labour room supplies/equipment

	Yes	No	Comment
1.IV infusion set			
2.IV fluid			
3.Vacuum extractor			
4.Latex glove			
5.Partograph			
6.Manual vacuum aspirator			
7.Forceps			
8.Suture/syringes			
9.Suture/syringes			
10.Sterilizer			
11.Scissors			
12.Curette			
13.Vaginal speculum			
14.Sphygmomanometer			
15.Ambulances			

Table 9: Availability of neonatal resuscitation kit

Equipment	Yes	No
Suction machine		
Cord clumps		
Ambubags		
Resuscitation coach		
Vitamin K injection		

PART THREE

Table 10: Obstetric emergency encountered in the health facilities for the last 6 months

Condition	Number	Comment on management
1. Antepartum haemorrhage		
2. Postpartum haemorrhage		
3. Eclmpsia		
4. Abortion		
5. Puerperal sepsis		
6. Obstructed labour		

Table 11: Outcome of deliveries for the last 6 months

Month	Number of deliveries	New born outcomes	Comment

Thanks for your time and your cooperation

Appendix 11: Letter of Permission to conduct Research

SILAS LODEKE
P.O. BOX 12-20600
MARALAL

The Samburu central Sub-County Medical officer of health of Health

Samburu County

P.O BOX 12-2600

MARALAL.

Dear Sir,

**RE: PERMISSION TO CONDUCT RESEARCH IN THE SUB- COUNTY
HEALTH FACILITIES**

I am humbly requesting your permission to enable me conduct a research study in the health facilities in Samburu Central Sub-County. I am a postgraduate student undertaking Master of Science degree in International Health at the Jomo Kenyatta University of Agriculture and Technology.

My study focuses on factors associated with adherence to national guidelines on emergency obstetric care and associated outcome in Samburu central sub-county.

This study will enable me to establish and better understand the provision of quality Emergency obstetric care services in the county and provide appropriate recommendations and solutions on how to improve and develop a better health care system that can potentially reduce maternal mortality in the County.

Yours faithfully,

Silas Lodeke

Appendix III: Consent Form

Code

My names are Silas Lodeke, a postgraduate student at Jomo Kenyatta University of Agriculture and Technology. I am pursuing a Master of Science degree in International health.

The questions below seek to find out the factors influencing adherence to national guidelines on emergency obstetric care and health outcomes among pregnant mother and new-borns in health facilities of Samburu central sub county.

You have been chosen to provide information in regard to the topic and you are requested to answer all the questions as honestly as possible.

I want to assure you that your answers will remain confidential and will be used only for the purpose of this research and cannot be connected with you in any way in future.

You are one of a large cross section of health worker I will be interviewing around the sub county and your answers are necessary and you are a representative of other health staff.

You will be interviewed and you will be requested to answer the questions the best your knowledge. You will also be requested to assist the interviewer in going around the facility and fill the checklist and do observation in the facility.

This is a voluntary process and no fee or token will be provided to any staff interviewed

After completion of the study, analysis will be done and gaps will be identified and the outcome of the study will be expected to lead to solutions and recommendations that can improve delivery of services in the sub- county health sector.

Health workers will be interviewed in confidence/private and the all responses given will be held anonymously and used for research purpose only. No intimidation will be used and participation in the survey is purely voluntary.

I have read and understood the consent and the main objective of the research. I have voluntarily accepted to participate in the interview.

Signature..... Date.....


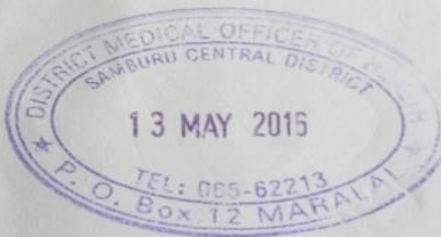
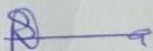
In case of any queries and clarification do not hesitate to contact the following:

1. Kenyatta National Hospital-University of Nairobi ERC Secretary

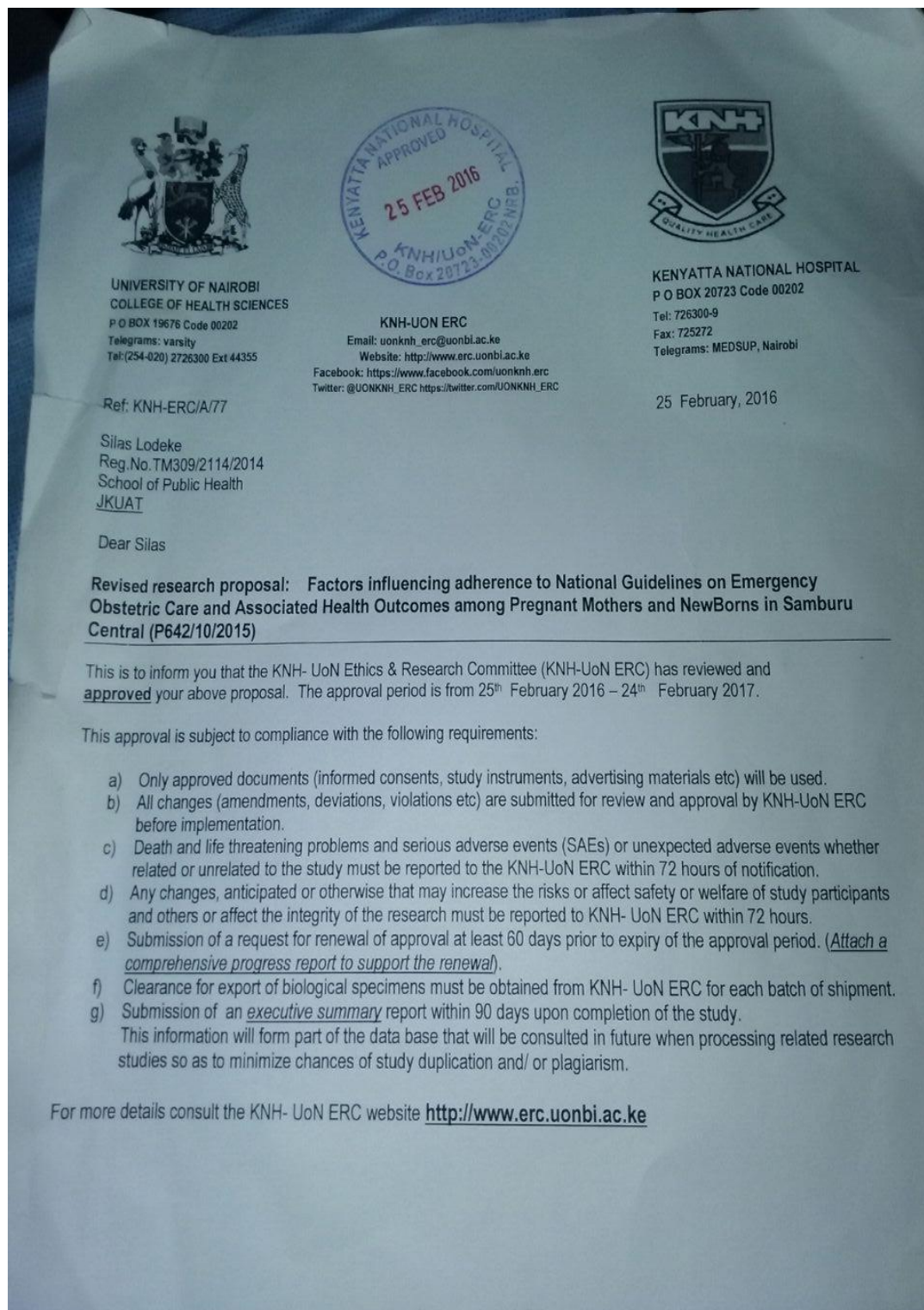
Telephone: 2726300 Ext 44102 Email:uonknh erc@uonbi.ac.ke

1. Professor Simon Karanja (supervisor)-0726424669
2. Professor Henry Ouma(supervisor)-0733726967


Appendix IV: Letter of Authorization


Samburu County Headquarters P.O Box 3-20600, Maralal		Medical Officer of Health Samburu County Government County Referral Hospital P. O Box 12-20600 Maralal, Kenya
SAMBURU COUNTY GOVERNMENT DEPARTMENT OF HEALTH SERVICES		
		2 nd May, 2016
<p>Silas Lodeke Reg. No. TM309/2114/2014 School of Public Health JKUAT</p>		
<p>Dear Silas Lodeke</p>		
<p><u>RE: APPLICATION FOR RESEARCH AUTHORIZATION</u></p>		
<p>This is in reference to your application for authority to carry out research on influencing adherence to National Guidelines on Emergency Obstetric and associated outcomes on pregnant mothers and newborns in Samburu Central County</p>		
<p>We are pleased to inform you that your request to undertake in the Sub-County is granted and on the completion of the research you are expected to submit one hard softcopy the research report of thesis to this office.</p>		
<p>Yours faithfully</p>		
<p> Dr. Robert Nato</p>		
<p>Medical Officer of Health <u>SAMBURU CENTRAL SUB-COUNTY</u></p>		


Appendix V: Ethical Clearance Certificate



The image shows a printed document titled "Ethical Clearance Certificate" from the Kenyatta National Hospital (KNH) - University of Nairobi (UoN) Ethics & Research Committee (ERC). The document is dated 25 February 2016. It features the logos of the University of Nairobi, the Kenyatta National Hospital, and a circular stamp from the KNH-UoN ERC with the date "25 FEB 2016". The certificate is addressed to Silas Lodeke, a student at the School of Public Health, JKUAT. The research proposal is titled "Factors influencing adherence to National Guidelines on Emergency Obstetric Care and Associated Health Outcomes among Pregnant Mothers and NewBorns in Samburu Central (P642/10/2015)". The committee has reviewed and approved the proposal, with an approval period from 25th February 2016 to 24th February 2017. The approval is subject to compliance with several requirements, including the use of approved documents, reporting of adverse events, and submission of progress reports. The document also provides contact information for the KNH-UoN ERC and a website link for more details.

 UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
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 KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
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Fax: 725272
Telegrams: MEDSUP, Nairobi

 KENYATTA NATIONAL HOSPITAL APPROVED
25 FEB 2016
KNH/UoN ERC
P.O. Box 20723-Nairobi

KNH-UoN ERC
Email: uonknh_erc@uonbi.ac.ke
Website: <http://www.erc.uonbi.ac.ke>
Facebook: <https://www.facebook.com/uonknh.erc>
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

Ref: KNH-ERC/A/77

25 February, 2016

Silas Lodeke
Reg.No. TM309/2114/2014
School of Public Health
JKUAT

Dear Silas

Revised research proposal: Factors influencing adherence to National Guidelines on Emergency Obstetric Care and Associated Health Outcomes among Pregnant Mothers and NewBorns in Samburu Central (P642/10/2015)

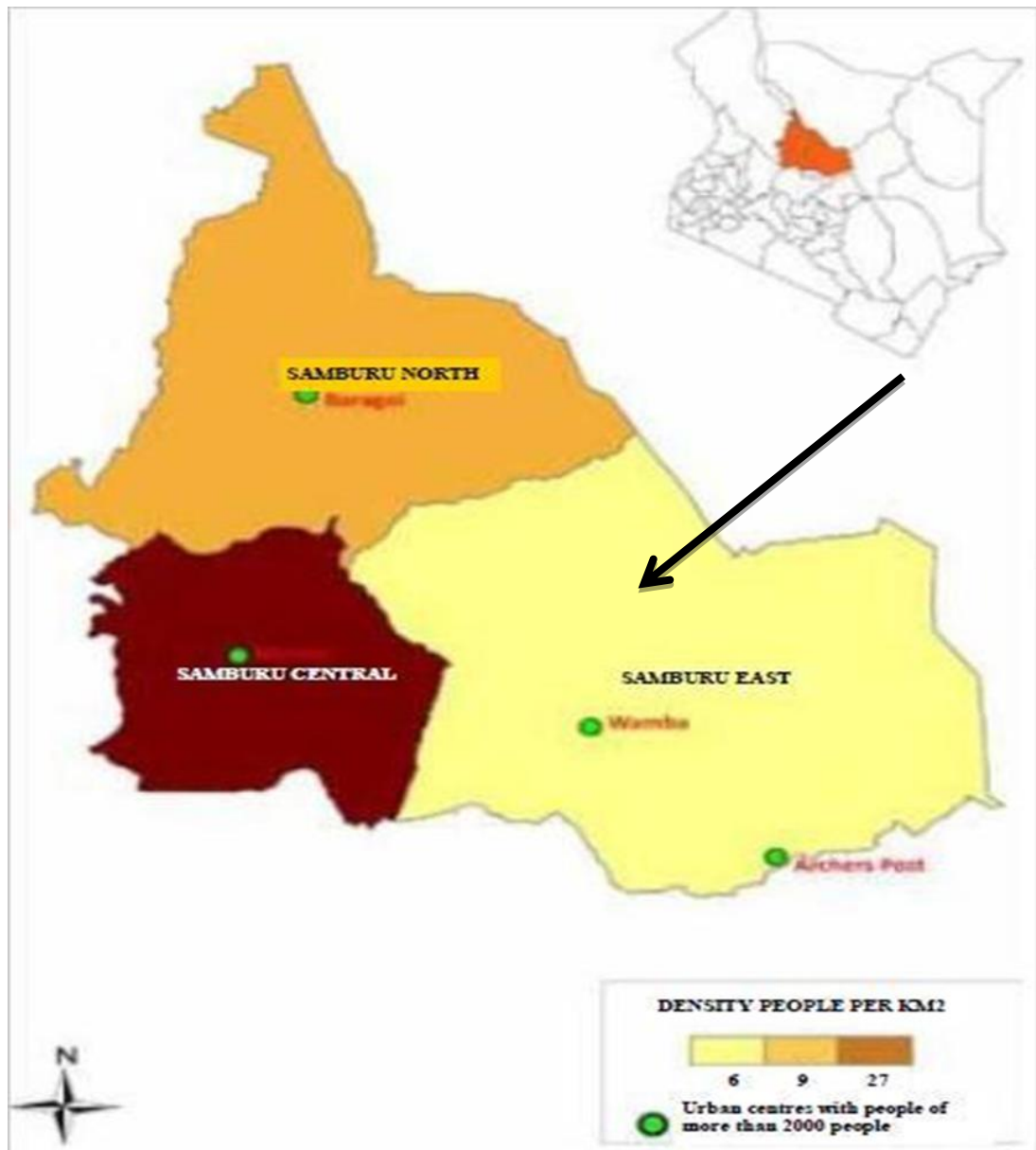
This is to inform you that the KNH- UoN Ethics & Research Committee (KNH-UoN ERC) has reviewed and **approved** your above proposal. The approval period is from 25th February 2016 – 24th February 2017.

This approval is subject to compliance with the following requirements:

- Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
- Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
- Submission of an *executive summary* report within 90 days upon completion of the study.
This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

Appendix VI: Map of Samburu County



Map of Samburu county of Kenya (left) with the central sub-county indicated by the chocolate colour. On the right is the map of Kenya and Samburu County inset in red. source: Google maps