# UTILIZATION OF PARTOGRAPH AMONG NURSES AND MIDWIVES IN SELECTED FACILITIES, MAKUENI COUNTY, KENYA

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## DECLARATION AND CERTIFICATION

### DECLARATION BY THE STUDENT

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

Signature …… Date ……..…

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## DEDICATION

This study effort is dedicated to my wife, Veronica, my father, Francis, and my siblings, who have made this research possible and to whom I will be eternally grateful.

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## LIST OF ABBREVIATIONS AND ACRONYMS

| | | |
|---|---|---|
| ANC | - | Ante Natal Care |
| APGAR | - | Appearance, Pulse, Grimace, Activity and Respiration |
| B/P | - | Blood Pressure |
| CPD | - | Cephalopelvic disproportion |
| CS | - | Caesarean Section |
| DF | - | degrees of freedom |
| FHR | - | Fetal Heart Rate |
| FP | - | Family Planning |
| FSB | - | Fresh Still Birth |
| GoK | - | Government of Kenya |
| HIV | - | Human Immunodeficiency Virus |
| ICPD | - | International Conference on Population and Development |
| KDHS | - | Kenya Demographic and Health Survey |
| KSPA | - | Kenya Service Provision Assessment |
| LFT | - | Life Full Term |
| MCH | - | Maternal and Child Health |
| MDGs | - | Millennium Development Goals |
| MMR | - | Maternal Mortality Ratio |
| MoH | - | Ministry of Health |
| MSB | - | Macerated Still Birth |
| NGO | - | Non-Governmental Organizations |
| NRHS | - | National Reproductive Health Strategy |
| NRFS | - | Non-Reassuring Fetal Status |

| | | |
|---|---|---|
| OR | - | Odds Ratio |
| PET | - | Pre-Eclampsia |
| PV | - | Per-Vaginal |
| PNC | - | Post Natal Care |
| PSC | - | Previous Scar |
| PPH | - | Post-Partum Haemorrhage |
| SDGs | - | Sustainable Development Goals |
| SD | - | Standard Deviation |
| SE | - | Standard Error |
| Sig. | - | Significance level |
| SMI | - | Safe Motherhood Initiative |
| SPSS | - | Statistical Package for the Social Sciences |
| TBA | - | Traditional Birth Attendant |
| UNFPA | - | United Nations Population Fund |
| UNICEF | - | United Nations Children's Fund |
| WHO | - | World Health Organization |

## DEFINITION OF OPERATIONAL TERMS

**Maternal mortality** - it’s a woman's death during labor and/or within six weeks of the baby's birth.

**Maternal morbidity** - is any sign or symptom as a result of, or made worse by pregnancy or childbirth.

**Neonatal mortality**–is the death of a new born during birth and/or within twenty-eight days after birth

**Partogram** – is a graphical presentation of labor progress documented from the active phase of labor i.e., when cervical is 4 cm dilated. In this study the partogram used is the modified WHO partograph.

**Utilization of partograph** –Referred to the number of retrieved partographs that were fully filled (complete); also plotting or recording the partograph correctly and interpreting to make appropriate decisions and intervene where necessary

**Partograph Completeness** – These are partographs that had all the three parameters i.e., fetal condition, labor progress and maternal condition properly filled.

## ABSTRACT

The partograph, a graphic recording of progress of labor and salient conditions of the mother and fetus, has been used since 1970 to detect labor that is not progressing normally, to indicate when augmentation of labor is appropriate and to recognize cephalopelvic disproportion long before labor becomes obstructed. Early detection of abnormal progress of labor and the prevention of prolonged labor would significantly reduce the risk of postpartum hemorrhage and sepsis, and eliminate obstructed labor, uterine rupture and its sequelae. In comparison to high-income countries, maternal mortality is a severe health issue in low-income countries. This primarily affects low-income nations in Sub-Saharan Africa and Southeast Asia, where maternal mortality account for nearly all of the deaths. The use of partograph in labor management is recommended by the World Health Organization (WHO). This allows for quicker decision-making and life-saving measures. Factors that influence partograph use in Makueni County are unknown. The purpose of this study was to determine the level of partograph usage in the selected facilities in Makueni County. This was a descriptive cross-sectional study that used quantitative and qualitative methods. A data abstraction tool was utilized to obtain data from partographs retrospectively for the quantitative investigation. Individual interviews with 46 nurses and midwives working in the maternity wing were used to gather qualitative data. SPSS version 20.0 was used to analyze the data. To summarize the data and indicate the scope of partograph use, frequency tables were employed. The Chi-square test was used to determine the relationship between the independent and outcome variables. The significance level was set to 0.05. The Phi and Cramer's V tests were used to determine the strength of the relationship. The analysis of qualitative data was done in grouped themes. The interviews were verbatim transcribed and examined with content analysis. From the findings of the study both fetal and maternal outcomes were linked to partograph use. The study found that method of birth had a significant association with fetal monitoring (fetal heart rate (p=.000), liquor (p=.002), and moulding p=.021)), labor progress monitoring (descent (p=.001), contractions (p=.000) and cervical dilatation (p=.001)) and referral monitoring at $\alpha = 0.05$. The study also found significant association between fetal outcome and contraction (p=.014), gravidity (p=.000), parity (p=.000), fetal heart rate and moulding (p=.021) at $\alpha = 0.05$. Most midwives partially filled the partograph. The study further concluded that there exists a significant association between maternal, fetal outcomes and labor progress with partograph completeness in Makueni County. The study therefore recommends increased support supervision to ensure proper partograph use. The number of midwifery care-providers should also be increased to improve efficiency in maternal and child care. Regular and structured ongoing trainings on partograph use should be part of the policy framework to build capacity of the midwives and improve maternal and fetal outcomes.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the study

The partograph is a graphical record of the progress of labor and relevant details of the mother and the fetus. It has action and alert lines to stimulate commencement of additional interventions by a skilled birth attendant monitoring the progress of labor. The partograph (or partogram) is the most commonly used labour monitoring tool, widely supported by health professionals and recommended by the World Health Organization (WHO) for use in active labour (Bedwell et al., 2017).

The different variables of a partogram includes: fetal condition which can be assessed through fetal heart rate, status of the membranes, quality of liquor and the degree of molding on the fetal head. The progress of labor records the rate of dilation of the cervix, strength and pattern of uterine contractions and the descent of the presenting part while maternal records includes maternal pulse rate, temperature, blood pressure and urine of the mother (Chaturvedi et al., 2015)

The purpose of the partograph is to enable health professionals to monitor wellbeing and progress in labour and provide timely intervention when required. Despite its use for over 40 years, continuing deaths from obstructed labour have led to concern that the partograph is not reaching its potential in enabling detection of deviation from the norm and timely intervention (Bedwell et al., 2017)

Globally, a total of 13.6 million women have died due to maternal causes from 1990 to 2015. Of all the deaths, 99% were in developing countries with 546 per 100,000 live births, and sub-Saharan Africa only accounts 66% of deaths (Ayenew & Zewdu, 2020). Additionally, there is staggering evidence that peripartum fetal mortality and morbidity are directly related to the labor abnormalities like asphyxia, birth injuries,

low Apgar scores (Appearance, Pulse, Grimace, Activity, and Respiration), and intrapartum or postpartum deaths. About 97% of all reported neonatal deaths occur in less developed countries. Of these, majority are a direct consequence of labor complications (Ayenew & Zewdu, 2020). Maternal mortality in Kenya was 362 per 100,000 live births in 2014, down from 488 in 2008. (KDHS, 2014).

Complications of labor are a significant cause of morbidity, mortality and other long-term complications to the mother and baby, especially in low-income countries (Bedada et al., 2020). The majority of problems and deaths occur in level one or level two facilities, when women deliver alone or with the assistance of unskilled birth attendants under poor birth conditions. Similarly, most health facilities have substantial poor maternal and fetal outcomes due to a lack of effective protocols and recommendations on how to intervene in the event of problems during labor and deliveries.

The partograph which is a graphical tool showing events in labour is used to track and monitor labour progress. It has been shown to detect deviations early and interventions taken when used by knowledgeable and skilled birth attendant. However, it can be is a tedious process which consumes a lot of time hence its either not used or when it's used, it's done incorrectly, leading to incorrect interpretation (Dalal & Purandare, 2018).

Lack of proper training including in-service training, resource shortages, high workload in relation to the staff ratios, inadequate knowledge and negative attitude like the viewpoint that a partograph use is tedious and needless, among healthcare workers, have been reported as some of the issues that impede correct use of the partograph (Kaunda et al., 2021). Interpretation of all the germane information to

take the suitable action is not always easy. Studies conducted in Kenya have documented insufficient and incorrect partograph use (Zelellw & Tegegne, 2018).

While most impediments to partograph usage have been extensively documented, there is little information available in the research area about the level of knowledge, status of partograph use, and consequences. It is thought that a variety of factors, operating at several levels, influence the use of partograph and the intended outcomes. This study therefore seeks to assess partograph utilization at its influence on maternal and fetal outcomes in Makueni County.

## 1.2 Problem statement

The World Health Organization recommends the universal utilization of the partograph during labor for routine monitoring of labor, and helps the health care provider in identifying slow progress in labor, and to make better decisions for the diagnosis and management of prolonged and obstructed labor (Ayenew & Zewdu, 2020). For pregnant women, obstructed labor remains an important cause of not only maternal death but also short and long-term disability like obstetric fistula, uterine rupture, uterine prolapse, nerve damage, incontinence, puerperal sepsis, postpartum hemorrhage, and infertility from hysterectomy. This can be prevented by accessing skilled birth services such as plotting partograph during the progress of labor. (Ayenew & Zewdu, 2020) Complicated deliveries are deleterious and cause serious physical mental and mental harm to women and their families. Given that a lot of investment has been made to avert any fetal or maternal adverse outcomes, there is need to evaluate whether the interventions translate to positive outcomes. Kenya currently has an infant mortality rate of 39 deaths per 1,000 births, with a maternal mortality rate (MMR) of 362 deaths per 100,000 live births (KDHS, 2014), falling

short of the Sustainable Development Goals (SDGs) target of below 70 deaths per 100,000 live births and the elimination of needless deaths of newborns and children under the age of five by 2030. In Makueni County, though there is a decrease of MMR, infant deaths are still high. From January to June 2019, Makueni County reported eighty-nine (89) neonatal deaths and four (4) maternal deaths against 2200 live births. This is a worrying trend and correct use of partograph with timely interventions would prevent these deaths.

A review committee from Makueni County on maternal and neonatal deaths in the county reported that some partographs were either or not correctly filled or not at all used to monitor labor. This study therefore set out to verify the claim made by the review committee on the utilization of the partograph in Makueni County referral units.

### 1.3 Justification

In Kenya, 62 percent of births are attended by a skilled birth attendant (KDHS, 2014). In Kenya, three types of delays are typical. The first delay occurs when the issue is discovered and the choice to seek treatment is made. The second factor is the time it takes to get to a health center and receive treatment. The third reason is a delay in receiving proper medical care at the health facility. Because advanced devices to detect complications are not available in most Kenyan health institutions, an experienced birth attendant should use a partograph to discover issues, diagnose complications early, and perform the necessary measures.

The researcher also chose to study on the partograph because it is inexpensive tool which if used correctly can detect complications which may lead to death hence reducing neonatal and maternal mortality. Midwives were chosen in this study

because they work in maternity, and therefore use partograph while monitoring mothers until labor is complete

Makueni County was purposely chosen because from the records, there were more complications among women in labor related to inappropriate of partograph utilization. Interventions that can be used to prevent mortality rates from the major causes of death can be accessed even in poor resource setting like Makueni County. According to WHO, the use of a partogram can be highly effective in reducing complications from childbirth.(Chaturvedi et al., 2015)

The findings may also provide baseline information for further studies on the partograph and recommend to the appropriate authorities on measures likely to improve utilization of the partograph in order to reduce child mortality and improve maternal health as important Sustainable Development Goals (SDG) number 3.

### 1.4 Research questions

1. To what extent is the partograph used and completed in maternity units in Makueni County?
2. What is the relationship between partograph use and fetal and maternal outcomes?
3. What are the challenges faced by nurses and midwives in partograph use?

### 1.5 Research objectives

#### 1.5.1 Broad objective

The broad objective of this study was to analyze partograph utilization among nurses and midwives in Makueni county

### 1.5.2 Specific objectives

1. To establish the level of partograph utilization among nurses and midwives in Makueni County
2. To compare fetal and maternal outcomes to partograph completeness
3. To assess the challenges in partograph use as perceived by nurses and midwives

## 1.6 Study Hypothesis

There is no relationship between the use and completeness of the partograph and fetal- maternal outcomes.

## 1.7 Significance of the study

Obstetric care providers (nurses and midwives) will gain more understanding on the use of partograph; this may increase the observation and interpretation skills related to the progress of labor. These findings will help pinpoint the extent to which the partograph is used, determine whether it is used correctly, identify the relationship between correct use and outcomes, and identify areas where education or training needs to be strengthened. This study will also strengthen the existing policy on utilization of partograph. The findings will inform policy makers who make decisions about training programs on personnel needs that would allow them to reach the millions of women who are delivered with no attendant or with the assistance only of a relative or other untrained person. Findings will guide further research in the area of labor and birth in safe(r) motherhood, with the view of enhancing maternity care and bringing down maternal morbidity and mortality. Finally, the study will contribute to the body of knowledge in the area of reproductive health.

## 1.8 Limitations and Delimitations of the study

### 1.8.1 Limitations

For logistical reasons this was a retrospective partograph review study and the interviews focused only on the nurses and midwives working in the maternity unit, the findings might not be generalized to other health professionals who are involved in managing of mothers in labor.

### 1.8.2 Delimitations

Only two sub-county hospitals were chosen for this study, and midwives and nurses from other health institutions were not included. This did not affect the quality of the findings since most of the challenges faced cut across in the different levels and most deliveries are done in the two main sub-county hospitals which are the referral centers. For the incomplete documentation of the retrieved partographs, this was handled as non-response.

## 1.9 Theoretical Framework

The quality of maternal and newborn care in health facilities was assessed using the Donabedian's three-dimensional conceptual framework for assessing the quality of care which involves structure, process and outcome (Billah et al., 2019). According to the Donabedian model, the quality of health care can be assessed by three components that are relevant for organizations: structure (i.e., requirements of the organization), process (i.e., actions to be taken), and outcome (i.e., end results). *Structure* is defined as the setting in which health care is provided (e.g., facilities, equipment, numbers, and qualification of personnel); *process*, as what is actually done in giving and receiving care (e.g., patient and doctor activities, doctor-patient communication and

information); and *outcome,* as the consequence of the provided health care (e.g., health status, satisfaction, and costs). Quality of health care is based on different aspects of these three categories and their relationships. As Donabedian eloquently puts it: “A good structure increases the likelihood of good process, and good process increases the likelihood of good outcomes” .The interaction between the categories can be bidirectional, and it is not a simple separation between cause and effect (Tossaint-Schoenmakers et al., 2021)

The system referred in this study is the utilization of the partograph among nurses, a tool used for quality care to women in labour. The structure denotes the attributes of the setting in which the care may occur Donabedian (2003). The attributes of the process may be of any performance done in order to achieve the outcome such as training, attitude and knowledge of the user (A et al., 2017)

**Training:** According to the theory of Donabedian’s conceptual model, training measures a person’s strength of intention to measure the behaviour. The theory states that self-efficacy of perceived behavioural control is a person’s ability to carry out specific behavioural successfully which can be attained through training. A midwife who receives training both theory and practical experience during training is more likely to utilize the partograph than one who received theory (Melese et al., 2020)

**Attitude:** The theory states that attitude consists of a person’s beliefs about the consequences to perform the behaviour multiplied by his or her valuation of these consequences. For example, if the midwife has a negative attitude towards the use of the partograph, and perceives using it as time consuming, such negative attitude tends to influence other midwives not to utilize the partograph (Rani et al., 2015)

**Knowledge:** The theory looks at knowledge as one of the motivational factors that influence specific behaviour and as one of the best predictors of behaviour. For example, when a midwife knows how to use the partograph, he or she is more likely to use it than when she or he lacks the knowledge (Rani et al., 2015)

### 1.10 Conceptual framework

Continuity of care is required during pregnancy, birth, and the postpartum period to promote optimal outcomes for women and their newborns. Partograph use to manage labor is at the heart of the continuum of care. Knowledge, training, experience, and place of work are some of the basic elements that may influence partograph usage, as are immediate aspects such as attitude toward partograph use and availability of pre-printed graphs. Additionally, the years of service, health system factors like workload, training and supervision are critical.

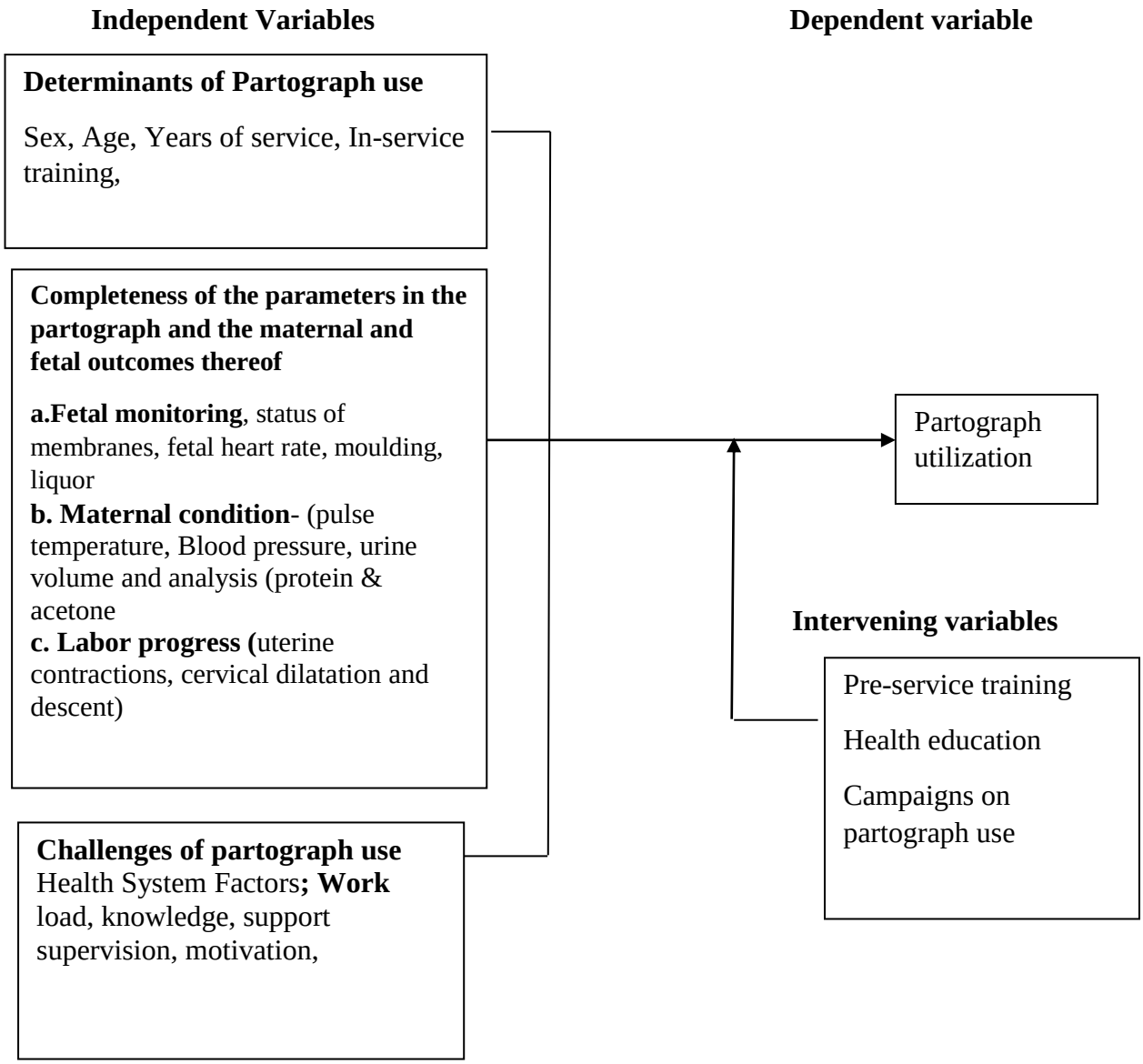


**Fig. 1.1: Conceptual Framework**

**Source: Literature Review**

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Partograph

The partograph is a tool that is used to track labor progress, as well as fetal and maternal health (Oladapo et al., 2018). It aids in the monitoring of labor by birth attendants. On a graph, fetal heart rate, cervical dilatation, uterine contractions, maternal pulse rate, and blood pressure are depicted. This data enables the skilled birth attendant to promptly point out any deviations from the normal and make appropriate decisions regarding the management of the mother. This may include referral (Shimoda et al., 2015). The partograph is an important part of current obstetric care. Instead of free written patient notes, the World Health Organization (WHO) suggests using partographs (Billah et al., 2019). When a partograph is used, difficulties like as obstructed labor can be detected early, before they become harmful to the mother and baby.

Obstructed labor caused by cephalo-pelvic disproportion is one of the primary causes of maternal mortality globally (United Nations, 2010). According to (Bedada et al., 2020) , 8% (42,000) of maternal deaths annually are as a result of obstructed labor. In the developed world, obstructed labor rarely causes maternal mortality because facilities for emergency obstetric care are available, for example caesarean sections. Whereas in the developing world, maternal deaths caused by obstructed labor are often not reported but instead the complications brought about by obstructed labor, like hemorrhage and sepsis, are reported instead, hence a wrong conclusion is made on the cause of maternal mortality (Markos & Bogale, 2016). Other maternal morbidities like obstetric fistula are also as a result of obstructed labor.

Some physical markers such as small shoe size or pelvis size were often used to determine at-risk women; however, the reliability and the accuracy of these metrics were questionable and mostly misled the birth attendants (Hofmeyr, 2004). Obstetric ultrasounds and X-ray pelvimetry have also been shown not to be conclusive in accurately predicting obstructed labor. The best predictor of obstructed labor has been shown to be labor itself (Wakgari et al., 2015). The best methods of predicting and preventing obstructed labor and complications which occur is by proper and accurate assessment and monitoring of labor progress by skilled attendants and timely decision making (Markos & Bogale, 2016).

**2.2 Level of Partograph Utilization**

Partograph use improves labor management and aids in decision-making regarding intervention to prevent complications during labor. The goal of using the partograph in labor is to reduce maternal and perinatal morbidity and mortality rates, improve the quality of care for pregnant women during labor, and improve midwives' observation and interpretation skills (Opoku & Nguah, 2015)

As part of the Safe Motherhood Initiative, the use of a partogram necessitates certain skills. The WHO partograph distinguishes between normal and abnormal labor progress and identifies women who are likely to require intervention. It is recommended that it be used in all labor wards. Findings from Nigerian midwives revealed that, despite midwives' good knowledge of the partogram, labor monitoring was underutilized in both centers (Monjok et al., 2014)

Correct use of partograph in developing countries is often determined by the training given to the birth attendants (Melese et al., 2020). Furthermore, even in the training of the nurses, midwives and doctors, the aspect of correct usage of the partograph is not

given the emphasis which is required (Bedada et al., 2020). A study done in Nigeria on partograph use found out that 94% of doctors were of the opinion that a partograph is useful in labor management, but only 25% used it routinely, and 35% of the respondents could correctly give the reasons for using the partograph (Oladapo et al., 2018). Research conducted in Kenya demonstrated that 50% of birth attendants had low knowledge on correct partograph use, and the information obtained from the partograph was not used in making clinical decisions regarding labor management. Moreover, 60% of the respondents were not able to apply the data obtained from the partograph properly to make decisions to positively impact fetal and maternal outcomes (Sama et al., 2017).

Training on partograph was shown to increase partograph use with a comparable improvement in record keeping and labor management. Through the safe motherhood training programme done in Western Kenya, there was a 74% increase in partograph use (Markos & Bogale, 2016). It has also been shown that ongoing education, continuous on job training through continuous medical education, support supervision, and quality assurance measures have a positive impact on partograph utilization and improvement in the quality of care given to laboring women (Oladapo et al., 2018)

### 2.3 Relationship Between Partograph Use and Fetal and Maternal Outcomes

The purpose of the partograph is to provide a pictorial overview of labor in order to alert care providers to deviations in labor progress, maternal and fetal well-being, and so on. When used properly, it aids in the careful monitoring of the woman in labor, avoids unnecessary interventions, and recognizes and responds to complications in a timely manner, all of which can help to prevent maternal and neonatal morbidity and

mortality(Lavender et al., 2013). It also acts as a "early warning system" and a simple method for preventing prolonged and obstructed labor, which are causes of many maternal deaths and disabilities such as infection, obstetric fistula, and nerve injuries, as well as stillbirths, neonatal death (Opoku & Nguah, 2015)

Patient referral system is a key component in the management of labour. When complications occur especially during labour, they should be treated as an emergency because in most cases the life of the unborn child and/or that of the mother are at risk. When these emergencies occur especially in the primary health care facilities were there equipment for emergency care like an operation theatre is lacking, timely referral is very important. The partograph serves as the only tool to help the birth attendant to detect potential complications early enough and make timely referral if that is a feasible option so that the patient can receive the required care (Fistula Care, Engender-Health, USAID, and Maternal Health Task Force, 2011). Factors that have been shown to cause low referral rates in such instances include poor transport system, cultural issues, cost, and failure to believe partograph data in making of decisions regarding labor management (Zelellw & Tegegne, 2018)

Late referrals have been shown to cause many pregnancy related disabilities including maternal and fetal deaths according to a study done in Nairobi Kenya (Underwood et al., 2012). Most primary care facilities are not willing to refer patients to the district level facilities due to the fear that they will be questioned for mismanaging the patients (Kaunda et al., 2021). Record management protocol also impedes the movement of the partograph from the lower-level facilities to the referral facilities making it difficult to track labor progress when a patient is referred. This is because

these records are required either during auditing or in case funding of these facilities is to be done (Melese et al., 2020).

### 2.4 Challenges Faced by Nurses and Midwives in the Use of Partograph

Several hurdles to using partograph have been identified in studies undertaken in various countries to examine the impact of using partograph. These obstacles include a lack of material and human resources, as well as a lack of information about how to utilize partographs and supportive supervision (Melese et al., 2020). Some of the barriers identified in a study carried out on nursing students in Nairobi, Kenya, included resource constraints, poor teaching methods where there is a disconnect between theory and practice in partograph training, retrospective partograph completion after most mothers have delivered, and a lack of follow up and coaching post-training (Lavender et al., 2018). In a study conducted in nine health facilities in Kenya, staff shortages and supply shortages of the tools and equipment required to take the measurements needed to complete the partograph, such as fetal-scopes, blood pressure machines, and doppler, were also identified as major barriers to proper partograph use (Dalal & Purandare, 2018)

Midwives in higher-resource settings in a Cochrane review stated that they did not like using the partograph and criticized it for disrupting their clinical practice and reducing the autonomy of the midwife to make decisions based on their findings and the paper form notes(Lavender et al., 2018).This attitude can be attributed to the fact that most of these midwives are highly trained and experienced in labor management and also these settings can perform advanced emergency obstetric procedures with ease. These settings also have all the obstetric specialists within reach if not available always.

## 2.5 Gap between knowledge and practice

An experimental investigation in Nigeria included pre- and post-intervention assessments following a training program on the introduction and usage of the WHO partograph, Obstructed and prolonged labor were proven to have a greater reduction in the incidence of labor lasting more than 12 hours, from 18.6% to 3.7 percent, and labor lasting more than 24 hours, from 6.6 percent to 0.4 percent, obstructed labor from 7.9% to 0.8 percent, and caesarean section from 6.6 percent to 4.5 percent. All laboring mothers which became obstructed during the partograph use were detected early at the stage of cephalo-pelvic disproportion were promptly referred. The ensuing delay before assenting to the referral led to the obstruction. Augmented labor increased from 9.9% to 13.2% (A et al., 2017).

This is in keeping with the finding that more laboring women were transferred in labor after introduction of partograph, due to early recognition of slow progress. It is therefore not surprising that complications such as uterine rupture, postpartum hemorrhage, genital sepsis, perinatal morbidity, neonatal asphyxia and maternal deaths were all significantly reduced after introduction of partograph. However, there was an increase in operative vaginal birth from 1.7% to 4.9%. This is also the result of earlier recognition and intervention in labor. If partograph were not used, these women might have ended up with prolonged second stage and probably obstructed labour (A et al., 2017).

## 2.6 Gaps Identified on Literature Review

Following a thorough review of the literature, it is clear that the majority of previous studies on partograph use, particularly focused on knowledge among nurses regarding the use of the partograph. There are, however, a few studies that focus on fetal and maternal

outcomes in relation to partograph use and health system factors and their influence on partograph utilization among nurses and midwives working in maternity units.

## 2.7 Conclusion

Researches have shown that labor monitoring with correct partograph use enhances fetal and maternal outcomes. The main reason for partograph use is to distinguish between the normal from abnormal labor progress. Use of Partograph is essential and helps in timely identification of women who would probably require some type of intervention before any complications occur, therefore improving the outcomes. Knowledge and skills are required for its successful use and these are gained through the formal pre-service education and in-service training. Resources are required properly implement all the parameters of the partograph fully. All these factors play a key role in monitoring of labor, and if not correctly implemented and in a timely manner, there will be late identification of problems and complications and the result is neonatal and maternal morbidity and mortality. In Kenya and by extension in Makueni County, few studies have been done on partograph and only one study has reported on the effect of partograph use. This merited the current study.

# CHAPTER THREE: MATERIALS AND METHODS

## 3.1 Research design

This was a descriptive cross- sectional study with both qualitative and quantitative inquiries. Research questions one and two were answered by the quantitative approach by reviewing partographs retrospectively, whereas question three was answered by the qualitative study. This design was chosen because it gives accurate measurements of population, characteristics and attributes. It is also relevant to provide facts and opinions of individuals. Descriptive cross-sectional design gives a representative subset of the entire population under study

## 3.2 Study Variables

### 3.2.1 Dependent Variable

The outcome variable was Partograph utilization. In this study, the researcher investigated how independent variables influenced the use of non-use of the partograph among nurses while managing women in labour.

### 3.3.2 Independent variables

These included: - Sociodemographic factors which included years of service as an obstetric care provider and training on partograph. Fetal factors comprised of; fetal heart rate, liquor, status of membranes and fetal head moulding. For the maternal condition the focus was on blood pressure, pulse and temperature. On labor progress, uterine contractions, cervical dilatation, descent of fetal head and whether alert line was crossed and action line if reached were considered in this study. Health system factors like, support supervision, motivation and workload.

### 3.3 Study site

The study sites for this study were Makueni County Referral Hospital and Makindu Sub-County Hospital, which are both located in Makueni County. This study area was purposively chosen by the researcher and from review of literature no study of this nature had been carried out in this area. An area of 8,034.7 $Km^2$ is covered by Makueni county. It is classified as arid and semi- arid area within the eastern region of Kenya. There are six administrative sub-counties that include: Mbooni, Makueni, Kaiti, Kilome, Kibwezi East, and Kibwezi West. In 2019 the total population was 987,653 consisting of 489,691 males and 497,942 females (KNBS, 2019). Makueni County has six sub county hospitals namely Makindu and Makueni (which are modeled as referral hospitals), Mbooni, Kilungu, Sultan Hamud, and Kibwezi west. The County also has 21 level three facilities (health centers) and 125 dispensaries. In total the County has 156 public health facilities.

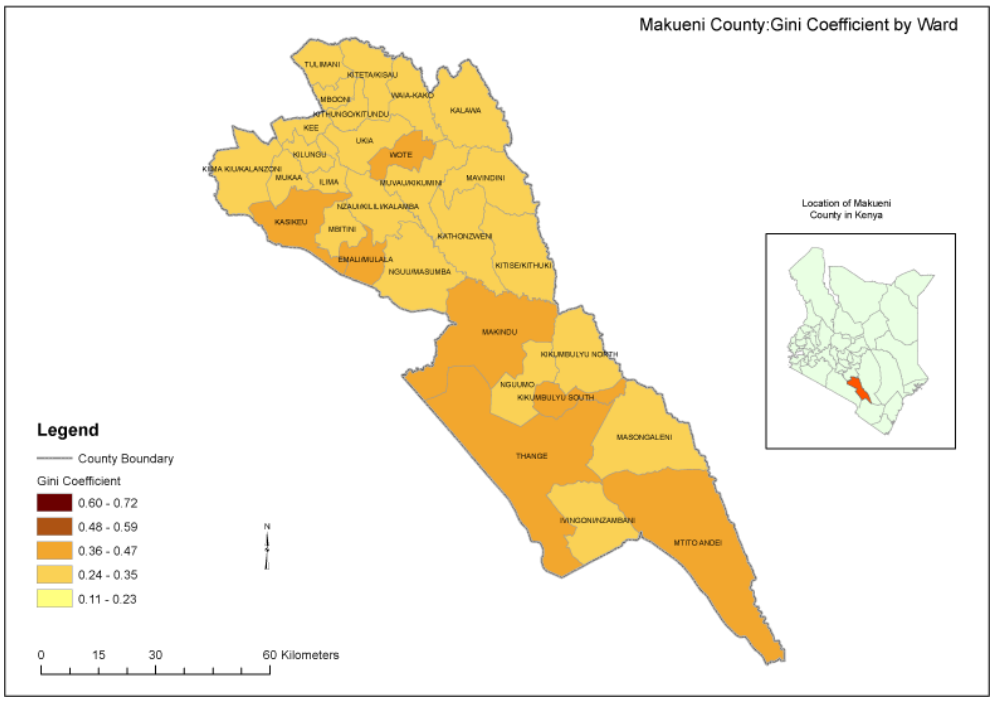


**Fig. 3.1 Map of Makueni County**

## 3.4 Study population

Partographs from 1st May 2019 to 30th may 2019 deliveries were retrieved retrospectively for the quantitative analysis. The population for the qualitative study included all nurses and midwives who offered obstetric care in the specified health facilities.

### 3.4.1 Inclusion Criteria

Partographs for women who arrived at the labor ward, were admitted, and had their partographs begun. Partographs for various modes of birth, all partographs one month prior to data collection. All birth modes with partographs. Nurses and midwives who agreed to take part in the research and worked in the maternity wards of Makueni county referral hospital and Makindu sub county hospital.

### 3.4.2 Exclusion Criteria

All partographs not within the required time frame, Nurses and midwives not providing obstetric care and those who did not consent.

## 3.5 Sampling Techniques

### 3.5.1 Qualitative Study

An in-depth interview was done using the census sample method. In the maternity wards of both hospitals. All 46 nurses and midwife's working in the maternity units participated in the study.

### 3.5.2 Quantitative Study

The partographs that were included in the study were chosen using a simple random sampling procedure. All files from the previous month before data collection (May, 2019) were obtained from the registry to select the files to be included in the study.

Sequential numbers were assigned to each of the 420 partographs. This formed the sampling frame. A random number generator was used to select a sample of 221 (distributed proportionately; 121 in Makindu Sub County Hospital and 100 in Makueni County Referral Hospital) from the total partrographs of 420.

## 3.6 Sample Size Determination

### 3.6.1 Quantitative Study

Sample size was calculated using the formula:

$$n = \frac{t^2 \times p(1-p)}{d^2}$$

**Where:**

**n** = the required sample size for population above 10,000

t = 95 percent confidence level (1.96)

p = the approximate proportion of partographs used and completed, which is unknown in this investigation and will be assumed to be 50%

d = the precision or standard error is set at 5% (0.05)

$$n = \frac{1.96^2 x\ 0.5\ x\ 0.5}{0.05^2}$$

n = 384

The final sample estimate (nf) necessary if the target population is smaller than 10,000 is calculated as follows:

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

**Where**

nf = Sample size desired (when the population is less than 10,000)

n = is the number of people who should be included in the sample (when the population is more than 10,000)

N = is the population size estimate.

Target population, N, per month = 420 (average number of deliveries in the two facilities per month- that is Makindu hospital 220 and Makueni hospital 200 deliveries)

$$nf = \frac{384}{1 + \frac{384}{420}}$$

$$nf = 384 \div (1 + 0.91) = 384 \div 1.91 = 201$$

The study's n = 201 is projected to be missing 10%, so 10% of 201 was calculated and then added to the actual sample size to keep the study's power. This gave a total of 221.

### 3.6.2 Qualitative Study

All 46 nurses and midwives working in the maternity wards of the specified hospitals were included in the sample.

**Table 3.1: Distribution of the nurse's and midwives in the two Hospitals**

| **Name of Hospital** | **Number of staff (sample size)** |
|---|---|
| Makueni County Referral (MCRH) | 22 |
| Makindu Sub County (MSCH) | 24 |
| **Total** | **46** |

### 3.7 Instruments of data collection

For the quantitative study, a data abstraction tool was used to extract data from partographs. For the qualitative study, a semi structured question guide was used for individual interviews.

### 3.8 Pre-testing

Two months before the actual data collection, the data abstraction tool and interview guide were put through their tests. It took place at the Mbooni Sub-County Hospital. The hospital is similar to the primary research centers in terms of location. Five (5) informants and 23 partographs were used in the pilot study. Data collection devices were pretested for clarity and predictive validity

### 3.9 Findings of the pretesting

The data abstraction tool was considered to be simple to comprehend and clear, despite the fact that most of the questions in the interview guide were repeated. The studies also revealed several previously unknown areas that needed additional investigation. As a result, questions were created to delve deeper into the topics that had been highlighted. This helped to guarantee that the interview guide was accurate.

### 3.10 Reliability and Validity

In a quantitative study, dependability refers to the consistency and accuracy with which the results represent the total population, as well as the ease with which they can be duplicated using similar methodologies. Validity establishes the objectivity of the outcomes in quantitative research. The instrumentation utilized determines the trustworthiness of the results. (2009, Kvale & Brinkmann). In a qualitative investigation, reliability and validity are more concerned with precision than replicability. This entails finding illumination, comprehending, and examining the

research method and product for consistency. The goal of trustworthiness is to instill faith in the outcomes. As a result, credibility in qualitative research is based on the researcher's efforts. (Glense, 2006)

A variety of methods were used to realize reliability and validity. Triangulation methodologies, quantitative and qualitative approaches were used in the research. Different data gathering methods, such as reviews and interviews, were used, resulting in the data from each of these methods being supplemented and verified.

The validity of the interview guides and data abstraction tool was also evaluated beforehand. The two sites collected the same data, excluding the possibility of site variation. To reflect the data's complexity, the data analysis method was applied. The information gathered from partograph/labor chart checks was supplemented by comments from nurses and midwives. A feedback discussion was held to look into any contradictions or inconsistencies between the two sources.

## 3.11 Data collection procedures

### 3.11.1 Partograph reviews

On births made in the month leading up to the start of data collection, a retrospective partograph evaluation was performed. The number of births was checked using the labor ward birth book. To retrieve partographs, the researcher collaborated with data clerks. Regardless of technique of birth or time admission to the labor unit, all births were included. Data was abstracted from 221 labor charts and entered into the data abstraction tool. By inspecting the documentary evidence of the parameters as filled in or not filled in, the parameters in partograph use were analyzed (yes or no, complete or not complete). The extent to which these characteristics were filled in (enough or insufficient) was also evaluated.

During fetal monitoring, the Fetal Heart Rate, membrane status, liquor, and moulding were all assessed. The maternal state was determined using temperature, blood pressure, and pulse rate. The fetal head descent, cervical dilatation, and uterine contractions were used to measure labor progress. It was also determined whether the alert line had been crossed and whether the action line had been reached.

### 3.11.2 Semi- structured individual interviews

Prior to each interview, informed consent was sought. The purpose of the interviews was to gain a larger and more in-depth understanding of the phenomena under investigation. There were 46 interviews conducted. The guidance was open-ended and adaptable. Observing the attitudes and behaviors of respondents added to the data's richness.

## 3.12 Data analysis

SPSS version 20.0 was used to code, insert, and analyze the variables. Data cleansing, explanation, and quality control were all completed by the researcher. The extent to which the partograph was used was described using descriptive statistics and frequency tables. To investigate the relationship between the independent and dependent variables, the Chi-square test was used. The level of significance was established at 0.05 as the cutoff point. The strength of the relationship was determined using the Phi and Cramer's V tests.

The qualitative data was collected and processed at the same time. The interviews were transcribed verbatim and content analyzed. Using conventional content analysis, in which coding attributes were formed straight from the text and the researcher avoided using pre-conceived categories. (Shannon & Hsieh, 2005).

### 3.13 Ethical Considerations

Kenyatta University Research Ethics Committee was requested for ethical approval. The National Commission for Science, Technology, and Innovation (NACOSTI) also awarded a research permit. Approval from the county administration and the individual hospitals' Hospital Management Teams was also sought. Before the data collecting activity, each study participant signed an informed written consent form. During data collection, no personal information about research participants was recorded. By putting the questionnaires under lock and key and encrypting the data with passwords, the confidentiality of the information was ensured. The data was acquired solely for the purpose of this research.

# CHAPTER FOUR: RESULTS

## 4.1 Introduction

This chapter discusses the interpretation and presentation of the findings obtained from the field. The chapter presents the background information of the respondents and the findings of the analysis based on the objectives of the study. Descriptive and inferential statistics have been used to discuss the findings of the study.

## 4.2 Demographic data

The responders' profiles are shown in this section. This data is based on a variety of basic factors, such as job experience and training in the study's subject area. This information is crucial for gaining an overall overview of the study's population. The analysis of these variables offers the foundation for understanding the context in which other elements are placed. The data was collected from 221 partographs via questionnaires, while the interview schedule addressed 46 persons. The study has a 99.5 percent response rate, which is considered sufficient for evaluating and drawing results. Kothari et al., 2004.

Majority of respondents had worked as midwifery care providers for an average of 5.26 ± 4.74 years and in the hospital labor ward for an average of 2.23 ± 2.58. The study also found that the maximum working experience as midwifery care provider and the labor ward were 20 and 10 years respectively.

The researcher also looked into whether or not in-service training on how to use a partograph was available to the respondents, as well as how long it took. According to the survey, 67.4% of those interviewed had received no in-service training on how to use partograph, with only 10.9 percent receiving two weeks of training, 15.2% had

received training for one week while 6.5% had received training for 3 days (Table 4.2).

**Table 4.1: Demographic Characteristics**

| **Variable** | **n=46** | **Percent** |
|---|---|---|
| Sex | | |
| Male | 10 | 21.7 |
| Female | 36 | 78.3 |
| Age category | | |
| 20-24 | 5 | 10.9 |
| 25-29 | 10 | 21.7 |
| 30-34 | 10 | 21.7 |
| 35-39 | 12 | 26.1 |
| >40 | 9 | 19.6 |
| Service year | | |
| <5 years | 10 | 21.7 |
| 5-10 years | 30 | 65.3 |
| >10 years | 6 | 13 |
| Inservice training on partograph use | | |
| None | 31 | 67.4 |
| 1 week | 7 | 15.2 |
| 2 weeks | 5 | 10.9 |
| 3 days | 3 | 6.5 |

## 4.3 Review of partographs and completeness of the maternal, fetal and labor parameters

The study's first goal was to go over partographs and figure out which maternal, fetal, and labor characteristics were missing. In Makueni county referral hospital and Makindu sub county hospital, the study looked at the completeness of various parts of partographs. The partograph was examined for personal information, admission details, examination on admission, fetal monitoring, labor process and maternal monitoring. The results are provided in the subsections that follow.

### 4.3.1 Personal details

The researcher examined elements of partograph section on personal details which include; name of the patient, address, age, gravida and parity. The study found that recording of patients' name, address age and gravida was 99.5% while that of parity was 98.2%.

### 4.3.2 Admission details

The researcher examined if the partographs had the date and time of admission, the start of labor, the rupture of the membranes, and any abnormal symptoms noted. The results found 98.2% of partographs had admission date filled, 95.9% had admission time filled, 70.5% had date and time of onset labor completely filled, 72.7% had date and time membranes ruptured completely filled and 2.7% recorded completeness in abnormal symptoms recording (Table 4.3).

**Table 4.2: Admission details**

| | Indicated | N=220 | % |
|---|---|---|---|
| Date | Yes | 216 | 98.2 |
| | No | 4 | 1.8 |
| Time of admission | Yes | 211 | 95.9 |
| | No | 9 | 4.1 |
| Date and time of onset labour | Yes | 155 | 70.5 |
| | No | 65 | 29.5 |
| Date and time membranes ruptured | Yes | 160 | 72.7 |
| | No | 59 | 26.8 |
| | Not applicable | 1 | .5 |
| Abnormal symptoms | Yes | 6 | 2.7 |
| | No | 214 | 97.3 |

### 4.4.3 Examination on admission

The other part of partograph that was examined was recording of patients' examination on admission. The study found that 99% (N=216) of the partographs had recording regarding the first examination of the patients. Once the first examination has been conducted on the patients, the doctors determines if to admit the patient or refer the patient to another hospital.

Further, the study found that 7.7% (n = 17) of the patients were referred to other hospitals upon the first examination. The reasons for referral included meconium grade III (MG3), non-reassuring fetal status (NRFS), obstructed labor, previous scar (PSC), pre-eclampsia (PET), per vaginal (PV) bleeding, and poor progress of labor due to malposition and prolonged second stage. However, the study found that in

three (3) cases, the reason for referral was not indicated while in two (2) cases the referral letters were missing.

### 4.3.4 Fetal monitoring

Fetal monitoring is one of the main components of partograph in labor ward. The study examined completeness in the recording of fetal monitoring. The fetal heart rate, number of plotted fetal heart rate, liquor, moulding, and number of plotted molding are among the main elements captured in this part. The study found that 92.7% of partographs had fetal heart rate record, 7.3% had not been recorded.

**Table 4.3: Fetal monitoring**

| | Response | N=220 | % |
|---|---|---|---|
| Fetal heart rate | Yes | 204 | 92.7 |
| | No | 16 | 7.3 |

Regarding the number of recorded fetal heart rates, 189 cases were plotted out of 220 with a mean of 9.21 ± 6.31 cases. The number of plotted cases ranged from a minimum of 1 and maximum of 28 cases.

The study also examined the recording of fetal liquor in partographs examined. The study found 86.4% of partographs had fetal liquor recorded while 13.6% partographs had no liquor records. The study also examined the recording of moulding in the partograph in the attempt to assess the completeness of partographs among the targeted labor wards. The study found that only 80% of the partographs had moulding recording while 20% were found to have incomplete information on moulding (Table 4.6).

**Table 4.4: Plotting of liquor and Moulding in partographs**

| | | N=220 | % |
|---|---|---|---|
| Liquor | Yes | 190 | 86.4 |
| | No | 30 | 13.6 |
| Moulding | Yes | 176 | 80 |
| | No | 44 | 20 |

### 4.3.5 Labor process

Labor process record is another component of partograph that was found important for this study. This component comprises of cervical dilation, descent, contractions, whether the alert line was crossed, if yes, any action taken, as well as the number of times each of them was plotted.

The study found the completeness varied for different indicators; 95.0% completeness for cervical dilation, 94.5% for descent, 94.1% for contractions, 17.3% of partograph indicated that the alert line was crossed with no action taken at all. The study further noted that 2.3% of action line was reached and 0.9% action taken as a result (Table 4.7).

**Table 4.5: Labor process indicators completeness**

| | | N=220 | % |
|---|---|---|---|
| Cervical dilation | Yes | 209 | 95.0 |
| | No | 11 | 5 |
| Descent | Yes | 208 | 94.5 |
| | No | 12 | 5.5 |
| Contractions | Yes | 207 | 94.1 |
| | No | 13 | 5.9 |
| Was the alert line crossed | Yes | 38 | 17.3 |
| | No | 182 | 82.7 |
| If yes, any action taken | No | 11 | 29.0 |
| | Yes | 27 | 71.0 |
| Was the action line reached | Yes | 5 | 2.3 |
| | No | 215 | 97.7 |
| If yes, any action taken | Yes | 2 | 0.9 |
| | No | 220 | 99.1 |

The study also examined the number of times the plotting of cervical dilation, descent and contractions. The study found that cervical dilation, descent and contractions were distributed with a mean of 2.28±0.873, 2.25±0.837 and 5.53±5.280 respectively.

**Table 4.6: Frequency of cervical dilation, Descent and Contractions plotting**

| Descriptive Statistics | | | | | |
|---|---|---|---|---|---|
| | N | Minimum | Maximum | Mean | |
| Cervical dilation | 209 | 1 | 6 | 2.28± | 0.873 |
| Descent | 208 | 1 | 5 | 2.25± | 0.837 |
| Contractions | 208 | 1 | 24 | 5.53± | 5.280 |

### 4.3.6 Maternal monitoring

The researcher also looked into the partograph's completeness, maternal monitoring component's completeness. This component includes blood pressure, heart rate, respirations, urine output and temperature. The number of times blood pressure, heart rate, and temperature were displayed in the partographs under study fell into this category. The study found that blood pressure and pulse rate records for completeness was 95.0% (n=209) each, while temperature record for completeness was 79.1% (n=174) from the targeted institutions. The study further examined the number of recordings of each of the above elements of maternal monitoring component. The average number of times blood pressure was recorded was 2.34 ± 2.439. The study also noted that the average number of times pulse rate was recorded was 5.58 ± 5.325

**Table 4.7: Completeness of maternal monitoring**

| | | N=220 | % |
|---|---|---|---|
| Blood Pressure. | Yes | 209 | 95.0 |
| | No | 11 | 5 |
| Pulse | Yes | 209 | 95.0 |
| | No | 11 | 5 |
| Temperature | Yes | 174 | 79.1 |
| | No | 46 | 20.9 |

### 4.3.7 First vaginal examination and second stage of labor

First vaginal examination is one of the components of partograph. The study found all information of first vaginal examination was recorded. The study also examined stage of labor completeness. The elements evaluated in this case are the completeness of the

date and time cervix was fully dilated, as well as the completeness of the date and birth time records. The study found that records of date and time of full dilatation of cervix in partographs was 80.0% completed, 98.6% of partographs had birth date and 98.6% of birth time was completed in partographs examined in Makueni County (Table 4.11).

**Table 4.8: Second stage of labor records completeness**

| Aspect | Recorded | **n=220** | **%** |
|---|---|---|---|
| Date and time of full dilatation of cervix | Yes | 176 | 80.0 |
| | No | 44 | 20 |
| Birth date | Yes | 217 | 98.6 |
| | No | 3 | 1.4 |
| Birth time | Yes | 217 | 98.6 |
| | No | 3 | 1.4 |

The study also sought to analyse the method of birth recorded in partographs under the second stage of labor. The study found that majority of women gave birth through SVD methods (65.9%). However, cases of C/S accounted for 32.3% of method of birth by women in Makueni County. These two methods account for the largest proportion of the births in the County as shown in the figure 4.2.

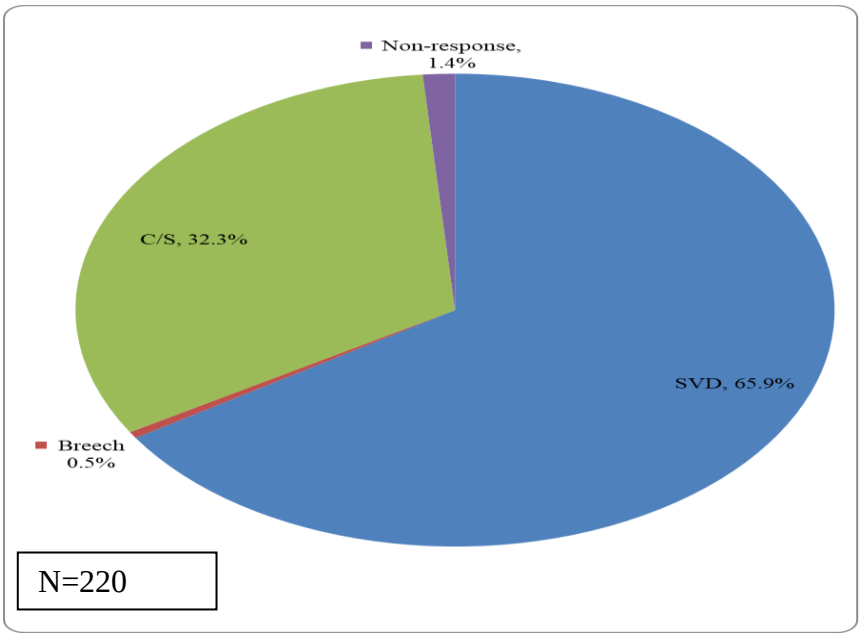


**Fig. 4.1: Method of birth recorded in partographs**

At 1 minute and 5 minutes, the researchers looked at the recording of Apgar scores "Appearance, Pulse, Grimace, Activity, and Respiration." The study discovered that in both situations, 98.6% of the partographs had Apgar data at 1 minute and 5 minutes, respectively.

**Table 4.9: Apgar score recording**

| | | n=220 | % |
|---|---|---|---|
| Apgar at 1 minutes | Yes | 217 | 98.6 |
| | No | 3 | 1.4 |
| Apgar at 5 minutes | Yes | 217 | 98.6 |
| | No | 3 | 1.4 |

The study also assessed the recording of partograph on the status of new born under the second stage of labor component. The study found that among the recorded status of new born 80.0% of new born was life full term, 1.8% were premature 0.9% was

fresh still birth  and 0.5% recorded as macerated. It was noted that 16.8% partographs were not clear

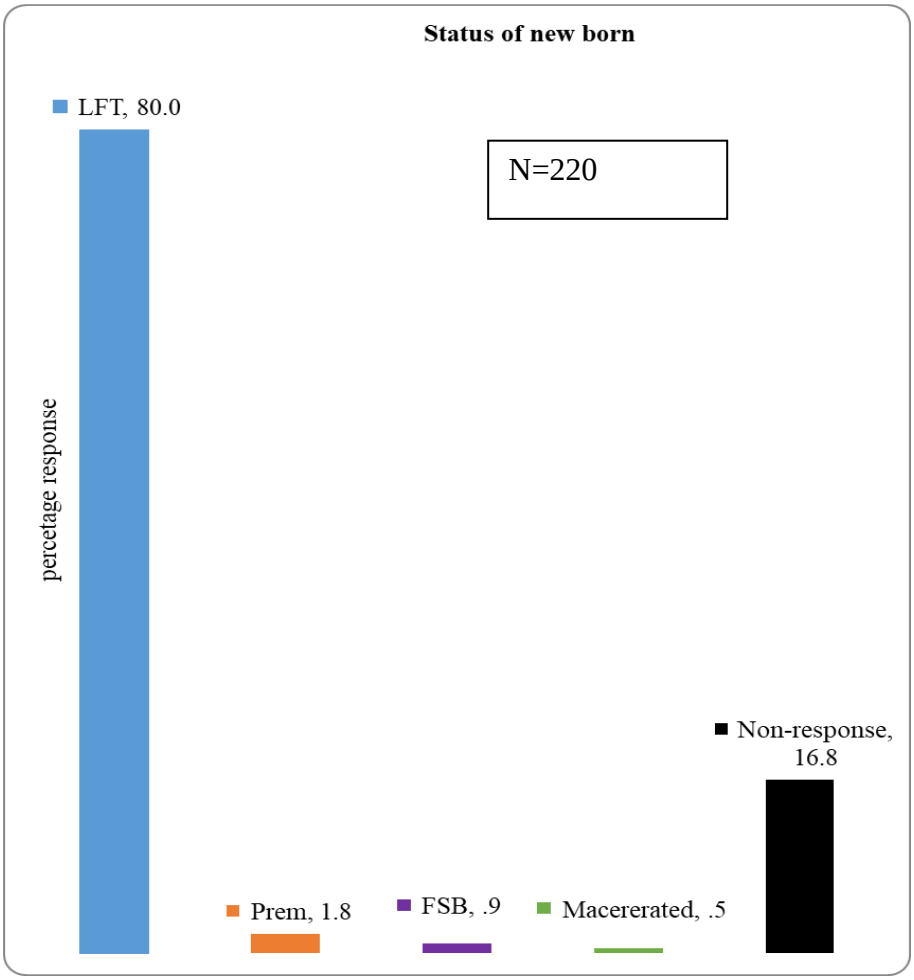


**Fig. 4.2: Status of new born**

The study further evaluated the information regarding recording of specific details of new born such as sex, abnormalities, weight, length, head circumference, baby to nursery and delivered by (circle if signed or not). As stated in Table 4.13 below, new-born sex was documented in 99.5 percent of partographs, anomalies in 50.5 percent, weight in 99.1 percent, length in 54.1 percent, head circumference in 54.5 percent, baby to nursery in 7.7% of partographs, and birth by signature in 98.6 percent of partographs.

**Table 4.10: New born characteristics records completeness**

| | | N=220 | % |
|---|---|---|---|
| Sex | Yes | 219 | 99.5 |
| | No | 1 | .5 |
| Abnormalities | Yes | 111 | 50.5 |
| | No | 109 | 49.5 |
| Weight | Yes | 218 | 99.1 |
| | No | 2 | .9 |
| Length | Yes | 119 | 54.1 |
| | No | 111 | 45.9 |
| Head circumference | Yes | 120 | 54.5 |
| | No | 100 | 45.5 |
| Baby to Nursery | Yes | 17 | 7.7 |
| | No | 202 | 92.3 |
| Delivered by (Circle if signed or not) | Yes | 217 | 98.6 |
| | No | 3 | 1.4 |

### 4.3.8 Third stage of labor

The study also looked at the third stage of partographs for completeness. The study looked at the completeness of records for the time of placenta birth, route of birth, blood loss, placenta, and membranes in this section of partograph. The study found

that 93.2% of the partographs had information on time of birth of placenta completed, 99.5% had mode of birth record completed, 93.6% had records on blood loss completed, 96.4% had placenta recorded completed and another 93.6% membranes record completed as shown in (Table 4.14).

**Table 4.11: Third stage of labour records completeness**

| | | N=220 | % |
|---|---|---|---|
| Time of birth of placenta | Yes | 205 | 93.2 |
| | No | 15 | 6.9 |
| Mode of birth | Yes | 219 | 99.5 |
| | No | 1 | .5 |
| Blood loss | Yes | 206 | 93.6 |
| | No | 14 | 6.4 |
| Placenta | Completed | 212 | 96.4 |
| | Not indicated | 8 | 3.6 |
| Membranes | Completed | 206 | 93.6 |
| | Not indicated | 14 | 6.4 |

### 4.3.9 Completeness of records

The second last component of the partograph was perineum records. The study found that 78% of the partographs had the records on perineum, 1% had no record and 21% had not been indicated.

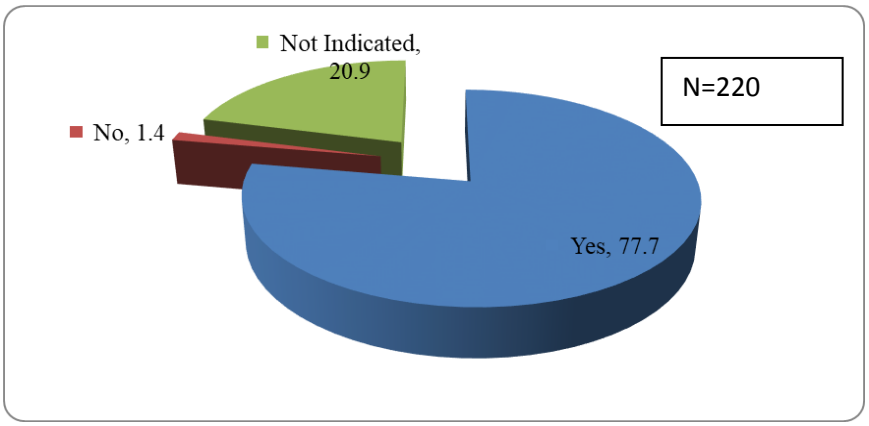


**Fig. 4. 3: Completeness of perineum records**

### 4.3.10. Postnatal check

Finally, the study examined the recording of postnatal check details in partographs. The study found that 97% of partographs had records on postnatal check records as shown in the figure below.

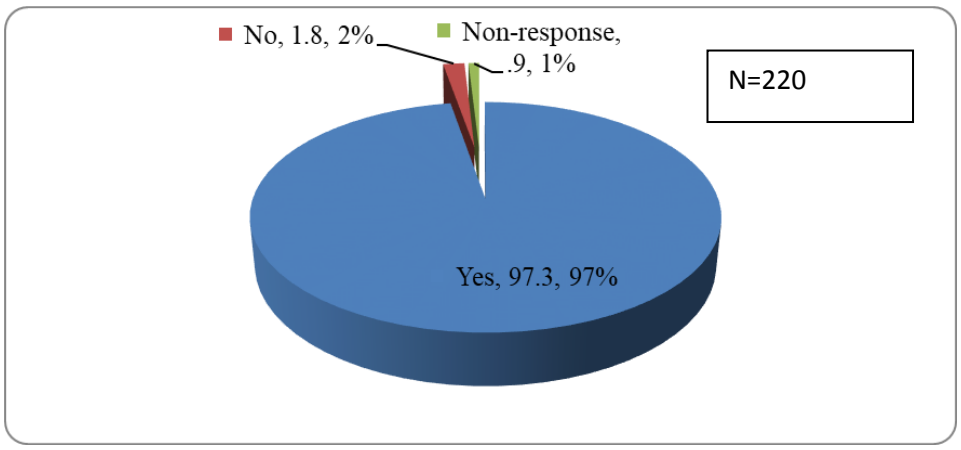


**Fig. 4. 4: Completeness of postnatal records**

## 4.4. Relationship between mother and fetus outcomes and the graph's completeness

This section summarizes the research regarding the link between partograph use and maternal and fetal outcomes. The partograph was used as a predictor variable, and

the birth method was used as a maternal outcome, while the newborn's status at birth was used as a fetal outcome.

The explanatory factors for each of the three components are depicted in the partograph; maternal monitoring (blood pressure, pulse, temperature); fetal monitoring (FHR, moulding, liquor) and labor progress (descent, contractions, cervical dilation, crossing of alert line and reaching of action line). The mode of birth (SVD, breech, vacuum extraction, and C/S) has an impact on the maternal outcome. There was no maternal fatality among the partographs tested.

### 4.4.1 Association between use of partograph and maternal outcome

**Table 4.12: Association between use of partograph and maternal outcome**

| | **P-Value** | **df** | **$\chi^2$** |
|---|---|---|---|
| **Association Between Cervical Dilatation and Maternal Outcome Chi-Square Tests** | | | |
| Pearson Chi-Square | 13.363[a] | 2 | .001 |
| Phi | .251 | | .001 |
| Cramer's V | .251 | | .001 |
| **Association Between Descent and Maternal Outcome** | | | |
| Pearson Chi-Square | 13.568[a] | 2 | .001 |
| Phi | .254 | | .001 |
| Cramer's V | .254 | | .001 |
| Association between contractions and maternal outcome Chi-Square Tests | | | |
| Pearson Chi-Square | 15.906[a] | 2 | .000 |
| Phi | .275 | | .000 |
| Cramer's V | .275 | | .000 |
| **Strength of association between Referral and maternal outcome** | | | |
| Pearson Chi-Square | 12.032[a] | 2 | .002 |
| Phi | .235 | | .002 |
| Cramer's V | .235 | | .002 |

The researcher used a chi-square test of association to see if there was a link between partograph use and birth modalities (SVD, C/S, Breech, and Vacuum Extraction). The study revealed a link between manner of birth and fetal monitoring (fetal heart rate, fluid, and moulding), as well as labor progress monitoring (descent, contractions and cervical dilatation) and referral monitoring at $\alpha = 0.05$. The association between method of birth and fetal monitoring, labor progress monitoring and referral was found to be significantly high as indicated by Phi and Cramer's Values {fetal monitoring (fetal heart rate = 0.347, liquor = 0.244, and moulding = 0.242)}, labor progress monitoring (descent = 0.254, contractions = 0.275 and cervical dilatation = 0.251) and referral = 0.235). These figures suggest that fetal monitoring (fetal heart rate, liquor, and moulding) as well as labor progress monitoring (descent, contractions, and cervical dilatation) may be useful in determining the best birth strategy.

However, monitoring of gravidity (p=.356), parity (p=.356), maternal monitoring (blood pressure (p=.083), pulse rate (p=.083) and temperature (p=.069)) reaching of action line (p=.341) and crossing of action line (p=.168) did not have significant association with birth method at $\alpha = 0.05$. The study further noted a moderate association between method of birth and use of partograph factors such as gravida, parity, maternal monitoring (blood pressure, pulse rate and temperature) reaching of action line and crossing of action line; these were deduced from Phi and Cramer's values which ranged from 0.098 to 0.152 with gravida recording Phi and Cramer's value of 0.098, parity = 0.098, maternal monitoring (blood pressure = 0.152, pulse rate = 0.152 and temperature = 0.158) reaching of action line = 0.102 and crossing of

action line = 0.132. The association between method of birth and maternal monitoring tended to be slight high though not significant.

### 4.4.2 Association between use of partograph and fetal outcome

**Table 4.13: Association between use of partograph and fetal outcome**

| | **Value** | **df** | **$\chi^2$** |
|---|---|---|---|
| **Association Between Contraction and Foetal Outcome Chi-Square** | | | |
| Pearson Chi-Square | 10.605[a] | 3 | .014 |
| Phi | .243 | | .014 |
| Cramer's V | .243 | | .014 |
| **Association Between Gravida and Foetal Outcome Chi-Square Tests** | | | |
| Pearson Chi-Square | 44.996[a] | 3 | .000 |
| Phi | .496 | | .000 |
| Cramer's V | .496 | | .000 |
| **Association between parity and foetal outcome Chi-Square Tests** | | | |
| Pearson Chi-Square | 44.996[a] | 3 | .000 |
| Phi | .496 | | .000 |
| Cramer's V | .496 | | .000 |
| **Association between foetal heart rate and foetal outcome Chi-Square** | | | |
| Pearson Chi-Square | 46.340[a] | 3 | .000 |
| Phi | .505 | | .000 |
| Cramer's V | .505 | | .000 |
| **Association Between Moulding and Fetal Outcome Chi-Square Tests** | | | |
| Pearson Chi-Square | 9.724[a] | 3 | .021 |
| Phi | .232 | | .021 |
| Cramer's V | .232 | | .021 |

The usage of partograph has an effect on the new borns status, according to the study. The fetus could be life full term, preterm, fresh still birth, or macerated when he or she is born. At a significance level of 0.05, there was a link between fetal outcome and contraction, gravidity, parity, fetal heart rate, and moulding. The researchers discovered a greater link between fetal outcome and gravida, parity, and fetal heart rate, with a p-value of 0.01, meaning 99 percent certainty. The researchers also discovered a substantial link between fetal outcome and contraction, gravida, parity, fetal heart rate, and liquor color, as shown by Phi and Cramer's values of 0.243, 0.495, 0.496, 0.505, and 0.232, respectively.

The researchers discovered no link between fetal fate and liquor, descent, cervical dilatation, crossing of the alert line, or reaching the action line. As a result, the relationship between fetal outcome and liquor, descent, cervical dilatation, passing the alert line, and reaching the action line was determined to be weak, as indicated by Phi and Cramer's values of 0.139, 0.031, 0.094, and 0.032, respectively

The finding indicated a strong association between birth method, fetal outcome and the contraction (p=.014), fetal heart rate (p=.000) and moulding (p=.021). This implies that monitoring of contraction, fetal heart rate and moulding could help anticipate the method of birth and the status of new born.

### 4.4.3 Probability of fetal death and use of partograph

By comparing outcome of the fetus (alive or dead) to independent variables, the risk of a fetus dying if the explanatory factors (parameters on the partograph) were not observed was estimated. The chances of delivering a dead infant were reduced by 66.7 percent when FHR and liquor were tracked, and by 33.3 percent when moulding

was observed. Checking for state of liquor after a membrane rupture reduced the chance of fetal death by 100 percent.

When cervical dilatation monitoring was performed, the risk of fetal death was reduced by 100%. Monitoring of descent and contractions was also found to lower the risk of fetal death by 100%. The study also found that where the alert line was not crossed as well as the cases where action line was not reached, no fetal death occurred. This implies that the probability that no fetal death will occur if the alert line is not crossed or action line reached is 1.

### 4.5 Usefulness of the partograph

One of the study's goals was to see how useful partograph was among Makueni County's midwifery care providers. Partograph was found to be useful in monitoring fetal-maternal and labor progress (89.0 percent, n = 41) and avoiding difficulties in labor among women in the labor ward, according to the study. This implies that partograph is a very crucial tool among midwifery care provider whose application should be well taught and embraced by all midwifery care providers.

Under this objective, the research also sought to find out which components of partograph were more important to the midwifery care providers as well as the reason they considered the components important. *'we use a partograph to monitor the progress of labor' (nurse from makindu level 4 hospital). In addition, 'I use a partograph to detect any complications among mothers in labor' (nurse from Makueni level 5 hospital).* A nurse from Makindu indicated *'we use a partograph as a routine in monitoring progress of labor' (FGD nurse from makindu level 4 hospital).* The study found that slightly more than a half of midwifery care providers (51.6%) considered all components of the partograph to be important because they point to the

labor outcome. However, 28.1% said that fetal and maternal monitoring components were more important as they helped detect any complication while 12.5% reported that fetal monitoring, maternal monitoring especially virginal examination were important as they helped to monitor progress of labor and state of fetus. *"I mostly plot the cervical dilatation, fetal heart rate, descent of the fetal head and the number of contractions on the partograph''( nurse from Makueni level 5 hospital).*

**Table 4.14: Important components of Partograph**

| | n | % |
|---|---|---|
| All components are important they point to the labor outcome | 33 | 51.6 |
| Fetal and Maternal monitoring as they help detect any complication | 18 | 28.1 |
| Fetal Monitoring, maternal monitoring esp. Virginal examination | 8 | 12.5 |
| All points to the well-being of mother and fetus | 3 | 4.7 |
| It helps to monitor progress of labor and state of fetus | 2 | 3.1 |
| Total | 64 | 100.0 |

The study further examined the stage of labor when the partograph was filled. Majority of the midwifery care providers indicated that the filled partograph soon after the observation was made, (78.0%). However, 22.0% filled the partograph after birth a situation which could possibly lead to omissions in the partograph.

Filling of partograph is very important, however, the use of partograph is of greater importance. The study sought to examine the frequency of partograph use among the midwifery care providers. Majority (64%) indicated that they used partograph most of time while 36% used partograph all the time. *''partographs are often used to monitor*

*the progress of women in labor on a regular basis'' (informant from makindu level 4 hospital), ''it is a requirement of the hospital for every mother in active labor be monitored using a partograph'' (key informant from Makueni level 5 hospital).*

### 4.6. Reason for not using partograph

Another goal of the study was to look into why midwifery care providers did not use the partograph. The findings revealed that midwifery care providers do not use the partograph for a variety of reasons. The most common reason for not using a partograph (56.4 percent) was a lack of knowledge and abilities, followed by a demanding workload (21.8 percent). As shown in Table 4.15, lack of support supervision (19.2%) and poor staff motivation (2.6%) were also cited as reasons for not employing the partograph.

**Table 4. 15: Reason for gaps in Partograph**

| Reason | N | % |
|---|---|---|
| Lack of knowledge and skills on partograph use | 44 | 56.4 |
| High workload | 17 | 21.8 |
| Lack of support supervision | 15 | 19.2 |
| Low motivation | 2 | 2.6 |
| Total | 78 | 100.0 |

In order to offer a reliable solution to use of partograph, the study also examined obstacles faced in using the partograph in the hospital. Lack of complete adherence to partograph was hampered by high workload (52.8%) Lack of supportive supervisor (30.6%), lack of training (9.7%) and lack of staff motivation (6.9%) were cited as reasons for not using the partograph (Table 4.17).

Interviews revealed that *''during peak season, there were more deliveries than the nurses can handle which led to inadequate utilization of the partograph'' (nurse in Makindu). ''this being a referral hospital, maternity ward is always full and the number of nurses in the unit is constant despite the increased workload which prevents utilization of the partograph'' (nurse in Makueni level 5 hospital*). *''adequate staffing of nurses in labor ward can ensure successful utilization of partograph in management of women in labor'' (nurses in Makueni level 5 hospital).*

**Table 4.16 Obstacles faced in using the partograph in the hospital**

| | **N** | **%** |
|---|---|---|
| High workload | 38 | 52.8 |
| Lack of training | 7 | 9.7 |
| Lack of supportive supervisor | 22 | 30.6 |
| Lack of staff motivation | 5 | 6.9 |
| Total | 72 | 100.0 |

The interviews revealed that supervision among nurses could make nurses to utilize the partograph, *'nurses working in maternity need to be supervised and monitored frequently in order to be reminded to make utilization of partograph as a routine' (midwife from Makindu level 4 hospital).* Another respondent said *''majority of the nurses do not bother to complete most parameters of the partograph after the mother delivers'' (nurse from Makueni level 5 hospital).* Another nurse revealed that, *''nurses do not complete the partograph because some of the information is transferred to other documents such as the cardex which makes nurses not to replicate the same information'' (midwife from Makueni level 5 hospital).*

On further probing why the partographs were not complete, members reported that; *''majority of the nurses do not bother to complete most parameters of the partograph after the mother delivers because it took time to transfer the information'' (nurse from makindu level 4 hospital).* Other nurses revealed that, *''nurses do not complete the partograph because some of the information is transferred to other documents such as the cardex which makes nurses not to replicate the same information'' (midwife from Makueni level 5 hospital).*

During the discussion nurses and midwifes revealed that utilization of the partograph was time consuming, there was lack of training on partograph use and lack of partograph papers was reported, *''partograph consumes a lot of time in documentation while monitoring women in labor'' (nurse from Makueni level 5 hospital).* Others revealed that lack of training contributed to lack of utilization of the partograph, *'we never receive trainings on partograph use therefore we don't have the latest updates on partograph utilization'' (nurse from Makindu level 4 hospital). Interviews revealed inadequate training among the majority of nurses, 'I have worked in maternity for more than 2 years but I have never been trained on partograph use' (nurse from makindu level 4 hospital). Similar sentiments were shared by a midwife ''I am trained as a midwife but I have never received any training on partograph since devolution started'' (nurse from Makueni level 5 hospital). In addition, 'there was lack of supervision from the unit in charge because some nurses needed supervision in order to utilize the partograph' (key informant from Makindu level 4 hospital).*

Finally, under the reasons for not using partograph section, the study examined midwifery preparedness in completion of partograph. Majority felt that they were very equipped though not hundred per cent (73.9%, n = 34) while 26.1% (n = 12) felt that they were hundred per cent equipped to complete partograph.

# CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Discussion

This chapter discusses the interpretation and presentation of the findings obtained from the field. The chapter presents the background information of the respondents and the findings of the analysis based on the objectives of the study. Descriptive and inferential statistics have been used to discuss the findings of the study.

### 5.1.1 Demographic data

The research found that majority of respondents had worked as midwifery care providers for an average of 5.26 ± 4.737 years and in the hospital labour ward for an average of 2.23 ± 2.577 years with maximum working experience as midwifery care provider and the labour ward were 20 and 10 years respectively. The majority of the respondents (72.1%) never had undergone any in-service training about the usage of partograph during their time at work. This calls for prioritization of staff training on partograph use to improve labour outcomes. These findings are compare to those of an Ethiopian investigation (Zelellw & Tegegne, 2018) which showed majority (83.6%) of the respondents had not received any training on partograph use.

### 5.1.2 Review of partographs and completeness of the maternal, fetal and labor parameters

According to the findings of this study, the completion rate on labor process, maternal monitoring, stage of labor, perineum, and postnatal check was satisfactorily completed in the majority of partographs. These findings exceed those of a Ghanaian study (Opoku & Nguah, 2015), which found that measures related to labor progress

(contractions, cervical dilatation, and descent) were recorded to standard in 55-60% of instances. In Shimoda et al., 2015) it was found out that only 25.6% were recorded to standard while in an Ethiopian study, cervical dilatation, uterine contractions and descent were recorded to standard in 32%, 21% and 6.9% respectively (Kiondo et al., 2021). Because data relevant to labor progress were not recorded as expected in at least 40% of cases in this study, abnormal/slow progress could not be determined. These findings demonstrate a lack of awareness of the partograph's purpose. The fetal heart rate was correctly documented in nearly half of the instances, out of the characteristics related to fetal welfare (heart rate, moulding, and kind of liquor).

In nearly a third of the cases, the other characteristics were documented to standard. Fetal heart rates were not completely recorded in 73 (30.5%) partograph forms, while documentation was unsatisfactory in 59 (24.7%) and standard in 107 (44.8%) partograph forms, according to an Ethiopian study. (Daniel & Desalegn, 2015). The findings also found that the moulding for the vast majority (94.1 percent) of partograph forms was not recorded, with 11 (4.6 percent) partographs being marked as substandard and three (1.3 percent) being documented as standard.

Completion of the partograph was also assessed by looking at the files retrogressively on the completion of the partographs during monitoring labor.

General utilization of the partographs in labor ward among nurses from selected hospitals revealed that majority of the files were not fully completed (started to be filled but not completed) while monitoring women in labor. Several similar studies confirmed the low utilization of the partograph in Africa (Kiondo et al., 2021). This finding is lower than studies conducted in Nigeria (98.8%) but higher than the findings from other studies like; Addis Ababa, Ethiopia (57.4%). The possible reason

for this variation could be due to the availability of well-designed and coordinated programs like; the strength of mentorship, supportive supervision (Bedada et al., 2020). Moreover, inadequate utilization of the partograph could be part of the reasons for high maternal mortality in developing countries (Gupta et al., 2020). In the current study therefore, this necessitates the need for regular on job training among midwives on partograph use for safety of women in labor.

### 5.1.3 Relationship between feto-maternal outcomes and partograph completeness

The researcher discovered a stronger link between fetal outcome and gravida, parity, and FHR (p=0.01). There was also a strong link between fetal fate and contraction, gravida, parity, and fetal heart rate, according to the study. When FHR and liquor were tracked, the chances of having a dead newborn were reduced by 66.7 percent, and when moulding was observed, the chances of having a dead fetus were lowered by 33.3%. Checking for membrane rupture also cut the chances of a fetus dying in half. This explains why feto-maternal outcomes are always favorable when a partograph is utilized correctly. This is in contrast to Opoku and Nguah's Ethiopian study (2015), which found a weak link between the use of partograph and the risk of fetal death. When the FHR was properly monitored, the risk of fetal death was lowered by 59.5 percent.

Cervical dilatation monitoring lowered the risk of fetal death by 100 percent. Monitoring of descent and concentrations was also found to lower the risk of fetal death by 100%. The study also found that where the alert line was not crossed as well as the cases where action line was not reached, no fetal death occurred. This explains

why it is important to emphasize on timely intervention in case any deviations are noted while monitoring labor.

The findings of the qualitative study were comparable to those of peers around the world. For example, it was discovered that the vast majority of respondents (72.1 percent) had received no in-service training on the use of partograph during their time at work. This study supports the findings of (Lavender et al., 2018), who discovered that the majority of respondents (83.6 percent) had not received training.

### 5.1.4 The partograph's usefulness, as perceived by health workers

The study also sought to find out which components of partograph were more important to the midwifery care providers as well as the reason they considered the components important. It was noted that most of midwifery care providers considered all components to be important since they point to the labor outcome followed by those who reported that fetal and maternal monitoring components were more important as they helped detect any complication and lastly vaginal examination was important as it helped to monitor progress of labor and state of fetus. This finding necessitates and points out at the need for continuous in-service training of caregivers on partograph use and that all parameters in the partograph are important.

It was also noted that partograph was completed soon after the observation was made with a small fraction of partograph filled after birth a situation which could possibly lead to omissions in the partograph. This is probably because of limited time and shortage of midwives on duty. This may challenge them to balance between monitoring and conducting a birth and filling a partograph (Souza et al., 2015). It also was further noted that frequency of partograph use among the midwifery care

providers was slightly high with a commendable fraction indicating that they used partograph all the time(Dalal & Purandare, 2018). These findings are similar to those of Anokye et al., (2019) in Ghana, who found that 80% of the partographs were completed.

### 5.1.5 Reasons for using or not using the partograph

Another goal of the study was to look into why midwifery care providers did not use partograph. The study discovered that midwifery care providers did not use the partograph for a number of reasons, including a lack of knowledge and abilities in partograph use. a lack of supervision, a heavy workload, a lack of instruction on the use of a partograph, and a lack of conviction were identified as reasons for not using the partograph in research conducted in Tanzania by (Shimoda et al., 2015). (Kaunda et al., 2021). In order to offer a reliable solution to the use of partograph, the study also examined obstacles faced in using the partograph in the hospital. Lack of knowledge and abilities on partograph use (56.4%), lack of supporting supervisor (30.6%), lack of training (9.7%), and lack of employee motivation all inhibited complete adherence to partograph (6.9 percent).

In the present study, overall general knowledge among midwives on partograph use was below average. This differs with the findings by (Onunwa et al., 2021) where 53.1% of the respondents had good general knowledge on partograph use. Moreover, majority of the nurses were generally knowledgeable on components of the partograph which has also been shared by Rani *et al.*, (2015) on the components of the partograph. However, knowledge among the respondents on the components of the partograph did not translate to proper utilization of the partograph. In the current study, this is an indication that utilization of the partograph is not only influenced by

Finally, under the reasons for not using partograph section, the study examined midwifery preparedness in completion of partograph. Majority felt that they were very equipped though not hundred per cent (73.9%) while only 26.1% felt that they were hundred percent equipped to complete partograph; this might be due to lack of in-service training. These results are similar to those of an Ethiopian study (Ollerhead & Osrin, 2014), which found that despite most respondents (52.3 percent) having a basic understanding of partographs, they were rarely used to monitor labor. Other studies also confirm the low utilization of partograph in many African countries like Ethiopia by (Billah et al., 2019). Inadequate awareness and use of partograph can explain why maternal mortality is so high in Kenya and other underdeveloped countries (Mukisa et al., 2019). In order to protect women in labor and improve feto-maternal outcomes, obstetric care professionals must receive ongoing training on the use of partographs.

### 5.2. Conclusion

In Makueni County, obstetric care providers use the partograph seldom. This is due to a lack of expertise, a heavy workload, and a lack of suitable supervision and training. As a result, poor birth outcomes have resulted.

According to the findings, there is a substantial link between partograph completion and maternal, fetal, and labor progress in Makueni County. Most midwifery care providers, on the other hand, only partially filled out partographs. This was attributed to a high workload and a lack of understanding of how to fill partographs, resulting in no timely action during the labor process, since the majority of respondents stated that they filled partographs after the birth.

This implies in cases where maternal, fetal outcomes and labor progress is positive, there is high likelihood of having a properly filled partograph.

The study also concludes that partographs were useful mainly in monitoring the labor progress as well as helping in detecting any complication of labor process. The study further found that partographs were mainly not filled due to high workload

## 5.3. Recommendation

### 5.3.1 Recommendations from the Study

The report suggests that partographs be filed on time by increasing mobilization and having supervisors verify them on a regular basis. To improve hospital efficiency, county governments should consider increasing the number of midwifery care providers.

Because one of the most common obstacles to completing partographs is a lack of expertise, hospitals should invest in training programs to help midwifery care providers learn how to complete partographs during the labor phase. The policy makers should develop a periodic in-service training for personnel. There needs also to be a protocol developed guiding the actions and interventions to be taken in case of deviations in the partograph. These should be displayed on the wards so that midwives and nurses can apply them promptly. Education models that develop the needed skill level in the use of partograph should be developed.

### 5.3.2 Recommendations for further research

The study suggests evaluating the effects of using the modified World Health Organization (WHO) partograph on maternal health quality in Kenya's other health facilities.

The study also suggests that more research be conducted to analyze partograph documentation using a direct observation approach to data collection in order to eliminate report bias and ensure that full partograph forms are filled correctly on the spot.

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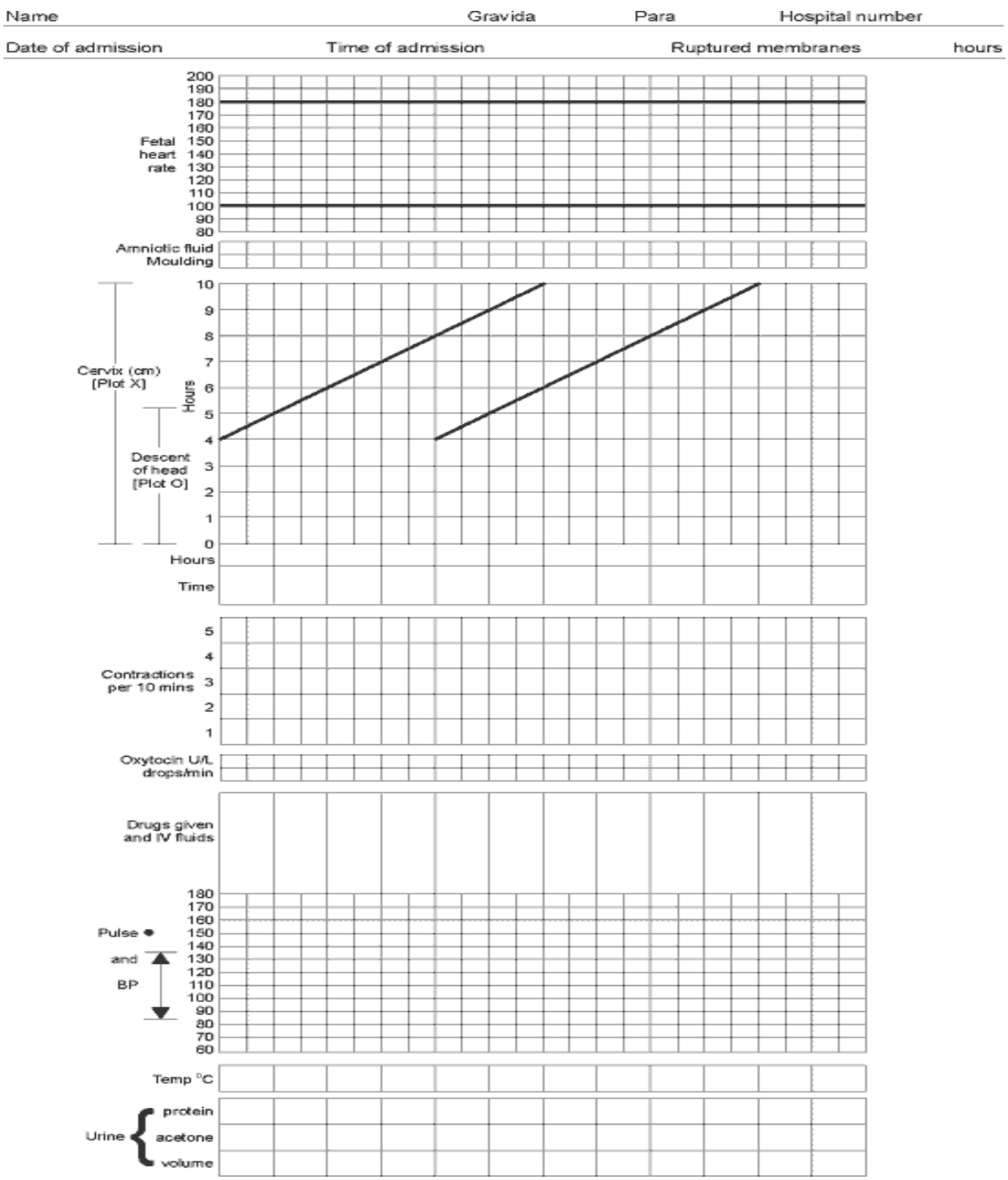
# APPENDICES

## Appendix I: Modified WHO Partograph



**Appendix II: Informed Consent Form**

Urbanus M. Muthusi, MPH/RH. BSc.N. Dept. of Population & Reproductive Health, Kenyatta University.

**Purpose**

I'm researching the use of partographs during labor and birth. The study's goal is to find out how much the partograph is used as a labor management tool.

**Procedure**

You are invited to participate in an interview to learn more about the factors that influence the use of partograph. This is expected to last at least 30 minutes. Your personal information will be kept private. The information will be accessible only to the researcher and his superiors. There will be no names mentioned. Participation is entirely voluntary, and you have the option to decline or opt out any time.

**Benefits of participating in the study**

Your participation in the study will provide you with no direct benefit, but the findings will help in the development or modification of strategies to address the problem. Planning in-service trainings and/or allocating resources to increase partograph utilization are two examples.

**Contacts**

If you have any queries or require additional information about the study, please contact: +254 726 707 786 or email mokuaglagys@ku.ac.ke, MACHARIA.STEPHEN@ku.ac.ke, Ethical Review Secretariat on chairmankuerc@ku.ac.ke, Ercku2008@gmail.com.

**Participant Declaration**

The preceding information has been read and comprehended by me. I hereby declare that my participation in this study is entirely voluntary.

Participant signature _____Date_____

**Statement of the investigator**

I, the undersigned, have explained the procedure to be followed in the study, as well as the risks and benefits involved, to the participant in a language they understand

Name of interviewer.....

..... .....

Interviewer signature Date

**Appendix III: Data Abstraction Tool: Retrospective Partograph Review**

**PERSONAL DETAILS**

Have the following been recorded (circle, where applicable, give details.)

Name yes no

Address yes no

Age yes no

Gravida yes no

Parity yes no

Comment _____

**ADMISSION DETAILS:**

Is there anything in the following admission details that has been noted?

Date yes no

Time of admission yes no

Date and time of onset of labor yes no

Date and time membranes ruptured yes no N/A_____

Abnormal symptoms yes no what was it

Comment_____

**EXAMINATION ON ADMISSION**

Is there any documentation of the first examination? (Circle yes or no)

Yes no

Comment _____

Referred yes no

Reason_____

From where_____

**FOETAL MONITORING**

Were the following aspects observed? (Circle yes or no, if yes write how many times plotted)

Foetal heart rate yes no _____

Liquor yes no _____

Moulding yes no _____

**LABOUR PROGRESS**

Were the following indicators of labor progress recorded? (Circle yes or no, if yes write how many times plotted)

Cervical dilatation yes no _____

Descent yes no _____

Contractions yes no _____

Was the alert line crossed yes no _____

If yes any action taken yes no _____

Was the action line reached yes no _____

If yes, any action taken yes no _____

General comment _____

**MATERNAL MONITORING**

Were the following indicators of labor progress recorded? (Circle yes or no, and if yes write how many times recorded)

B.p yes no

Pulse yes no

Temperature yes no

General comment _____

**FIRST VAGINAL EXAMINATION**

Was there any information available regarding the examination? (Circle yes for filled or no for not filled)

Yes no

Comment _____

**SECOND STAGE OF LABOR**

Were the labor indicators' second stage recorded? (Circle yes or no and provide information where applicable)

Full dilatation of cervix

Date and time of yes no _____

Birth date yes no _____

Birth time yes no _____

Method of birth (**circle mode**) SVD, breech, V/E, forceps, C/S or not indicated

Apgar score at 1 min yes no

At 5 min yes no

Status of newborn (**circle**); LFT, prem, FSB, macerated, NND, or not indicated

Sex yes no

Abnormalities yes no

Weight yes no

Length yes no

Head circumference yes no

Baby to nursery yes no if yes, reason_____

Delivered by (**circle** if signed or not) yes no

Comment_____

**THIRD STAGE OF LABOUR**

Were the specific variables in this section filled or not? (circle)

Time of birth of placenta yes no

Mode of birth yes no

Blood loss yes no

Placenta completed not completed not indicated

Membranes completed not completed not indicated

Comment _____

**PERINEUM**

Is the perineum information documented? (Circle)

Yes no not indicated

**POSTNATAL CHECK**

Was there any information on the postnatal period? (Circle)

Yes no

Any post-natal comments _____

**EVALUATION**

**1. Grading of labour chart**

**Complete:** if the labor chart contained information on all sections of the partograph, including all three components (fetal monitoring, labor progress, and maternal monitoring)

**Incomplete**: if no information could be found in the other components or sections of the labor chart

**Blank:** if neither the partograph nor the labor chart contained any information.

**2. The partographs' grading.**

**OK:** If the three parts of the partograph were completely filled out

**Adequately filled in:** if information was available for the three components but some parameters were not documented

**Inadequately filled in:** If only two of the components had data.

**Grossly inadequate:** If only one component or no information on the three components

**Note:**

1. Components represent the three parts of the partograph (fetal, maternal and labor progress).
2. Parameters indicate what is contained in the components (fetal-FHR, liquor, and moulding)

**Appendix IV: Guide to Interviewing**

**Individual Interviews: A General Guide**

Demographic data

How long have you worked?

a. As midwifery care provider

b. In labor ward

c. Have you undergone any partograph training since starting work on this ward? If so, how many, when, and how do you define it (I day, I week, etc.)?

To determine the partograph's utility

- What is the significance of the partograph according to you?
- Which section of the partograph do you believe is the most important, and why?
- When should you fill out the partograph?
    a. When the shift is over?
    b. Following the birth?
    c. In the immediate aftermath of the observations?

How frequently do you use the partograph?

To find out why the partograph isn't being used

Probe

Why are there gaps on partographs?

Probe

- What challenges have you encountered while using the partograph in this hospital?

• Do you think you are able to complete it and act appropriately?

**Appendix V: Interviews Summary Guide**

**Questions to help in summarizing the interview**

Institution's name:

Interview Location:

Interview time and date:

Interview duration:

Interviewer's name

Was the interview location appropriate?

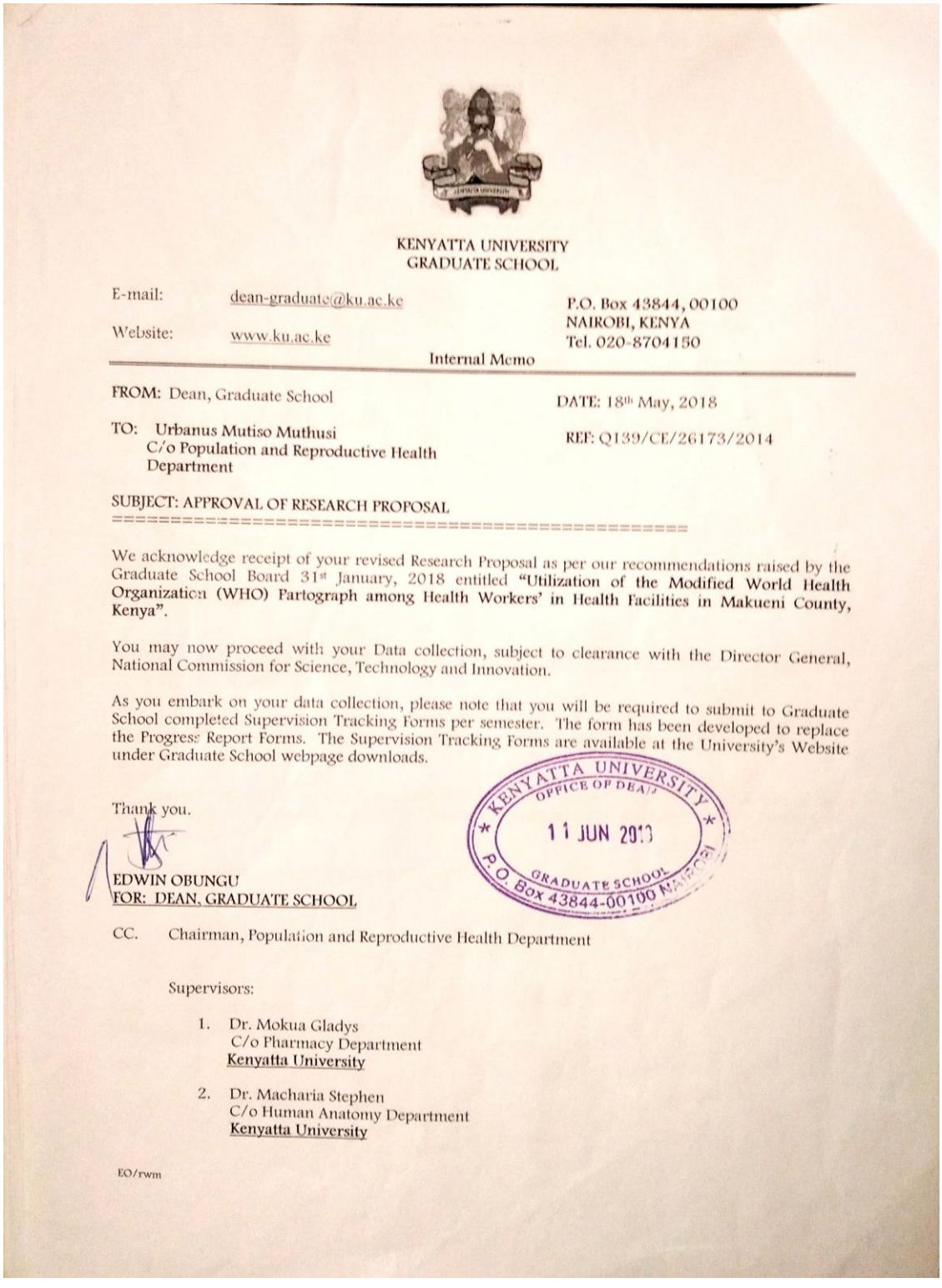
Is there something you think should be changed before another interview?

Have you run into any issues? Are there any potential sources of distraction?

Is there anything you need to change to better the next interview?

Main points that were brought up?

## Appendix VI: Approval of Research Proposal from Kenyatta University



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

FROM: Dean, Graduate School

DATE: 18th May, 2018

TO: Urbanus Mutiso Muthusi
C/o Population and Reproductive Health
Department

REF: Q139/CE/26173/2014

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

We acknowledge receipt of your revised Research Proposal as per our recommendations raised by the Graduate School Board 31st January, 2018 entitled **"Utilization of the Modified World Health Organization (WHO) Partograph among Health Workers' in Health Facilities in Makueni County, Kenya".**

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

KENYATTA UNIVERSITY
OFFICE OF DEAN
11 JUN 2018
GRADUATE SCHOOL
P.O. Box 43844-00100 NAIROBI

Thank you.

EDWIN OBUNGU
FOR: DEAN, GRADUATE SCHOOL

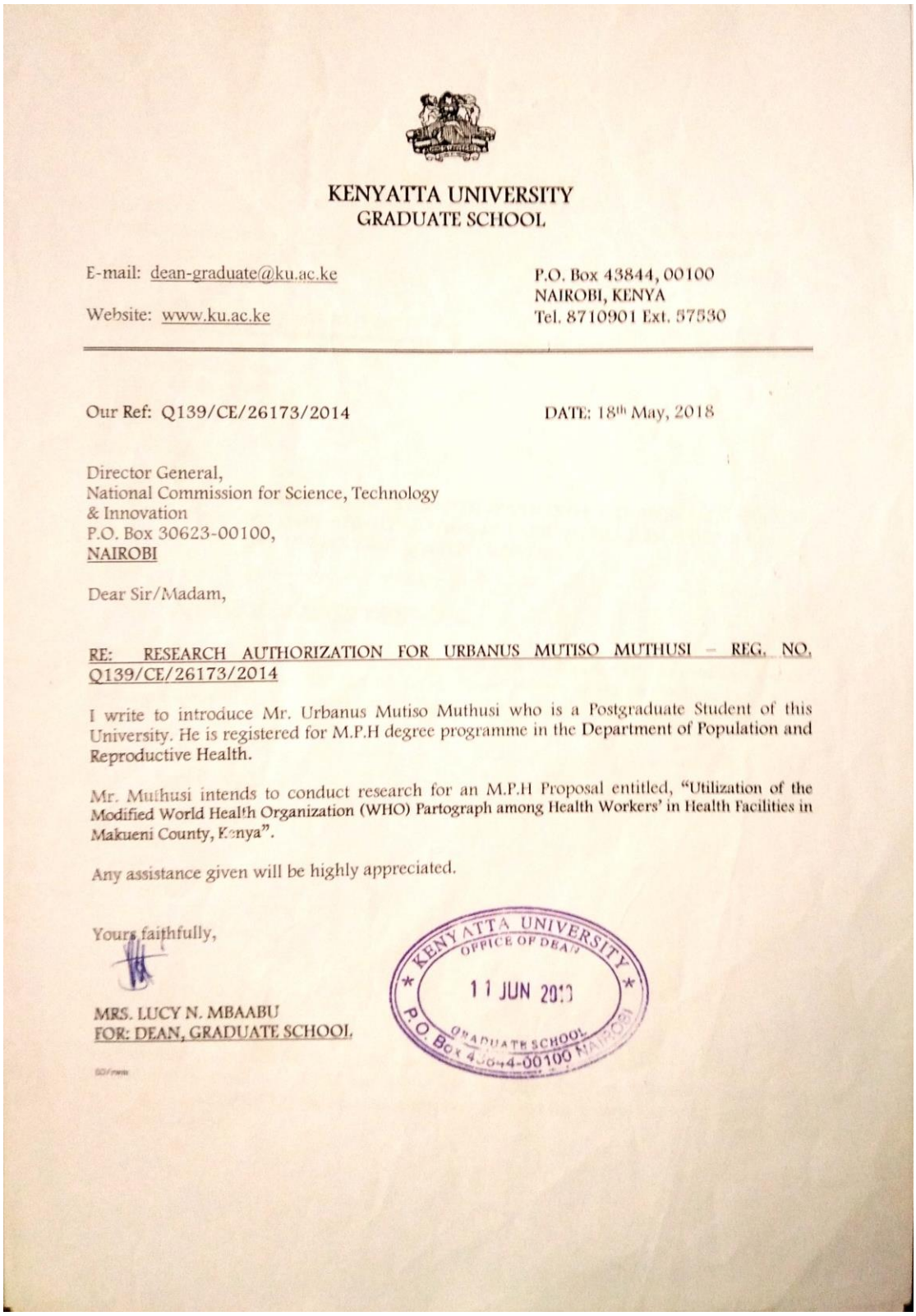
CC. Chairman, Population and Reproductive Health Department

Supervisors:

1. Dr. Mokua Gladys
   C/o Pharmacy Department
   Kenyatta University
2. Dr. Macharia Stephen
   C/o Human Anatomy Department
   Kenyatta University

EO/rwm

## Appendix VII: Research Authorization from Kenyatta University



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: Q139/CE/26173/2014

DATE: 18th May, 2018

Director General,
National Commission for Science, Technology
& Innovation
P.O. Box 30623-00100,
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR URBANUS MUTISO MUTHUSI – REG. NO. Q139/CE/26173/2014

I write to introduce Mr. Urbanus Mutiso Muthusi who is a Postgraduate Student of this University. He is registered for M.P.H degree programme in the Department of Population and Reproductive Health.

Mr. Muthusi intends to conduct research for an M.P.H Proposal entitled, "Utilization of the Modified World Health Organization (WHO) Partograph among Health Workers' in Health Facilities in Makueni County, Kenya".

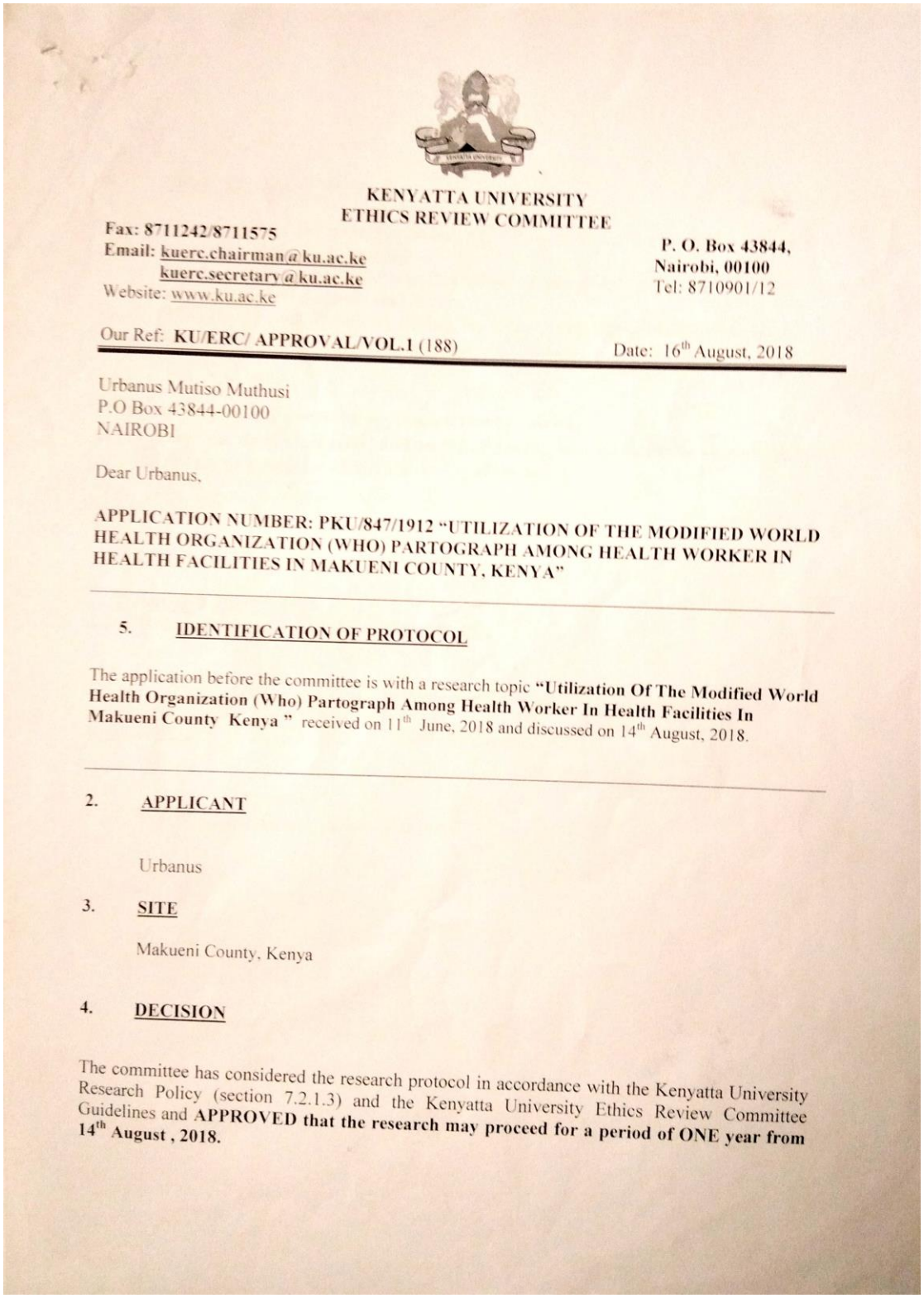
Any assistance given will be highly appreciated.

Yours faithfully,

MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL

KENYATTA UNIVERSITY
OFFICE OF DEAN
11 JUN 2018
GRADUATE SCHOOL
P.O. Box 43844-00100 NAIROBI

## Appendix VIII: Ethical Approval From Kenyatta University



KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: kuerc.chairman@ku.ac.ke
kuerc.secretary@ku.ac.ke
Website: www.ku.ac.ke

P. O. Box 43844,
Nairobi, 00100
Tel: 8710901/12

Our Ref: KU/ERC/ APPROVAL/VOL.1 (188) Date: 16th August, 2018

Urbanus Mutiso Muthusi
P.O Box 43844-00100
NAIROBI

Dear Urbanus,

APPLICATION NUMBER: PKU/847/1912 "UTILIZATION OF THE MODIFIED WORLD HEALTH ORGANIZATION (WHO) PARTOGRAPH AMONG HEALTH WORKER IN HEALTH FACILITIES IN MAKUENI COUNTY, KENYA"

5. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic **"Utilization Of The Modified World Health Organization (Who) Partograph Among Health Worker In Health Facilities In Makueni County Kenya "** received on 11th June, 2018 and discussed on 14th August, 2018.

2. APPLICANT

Urbanus

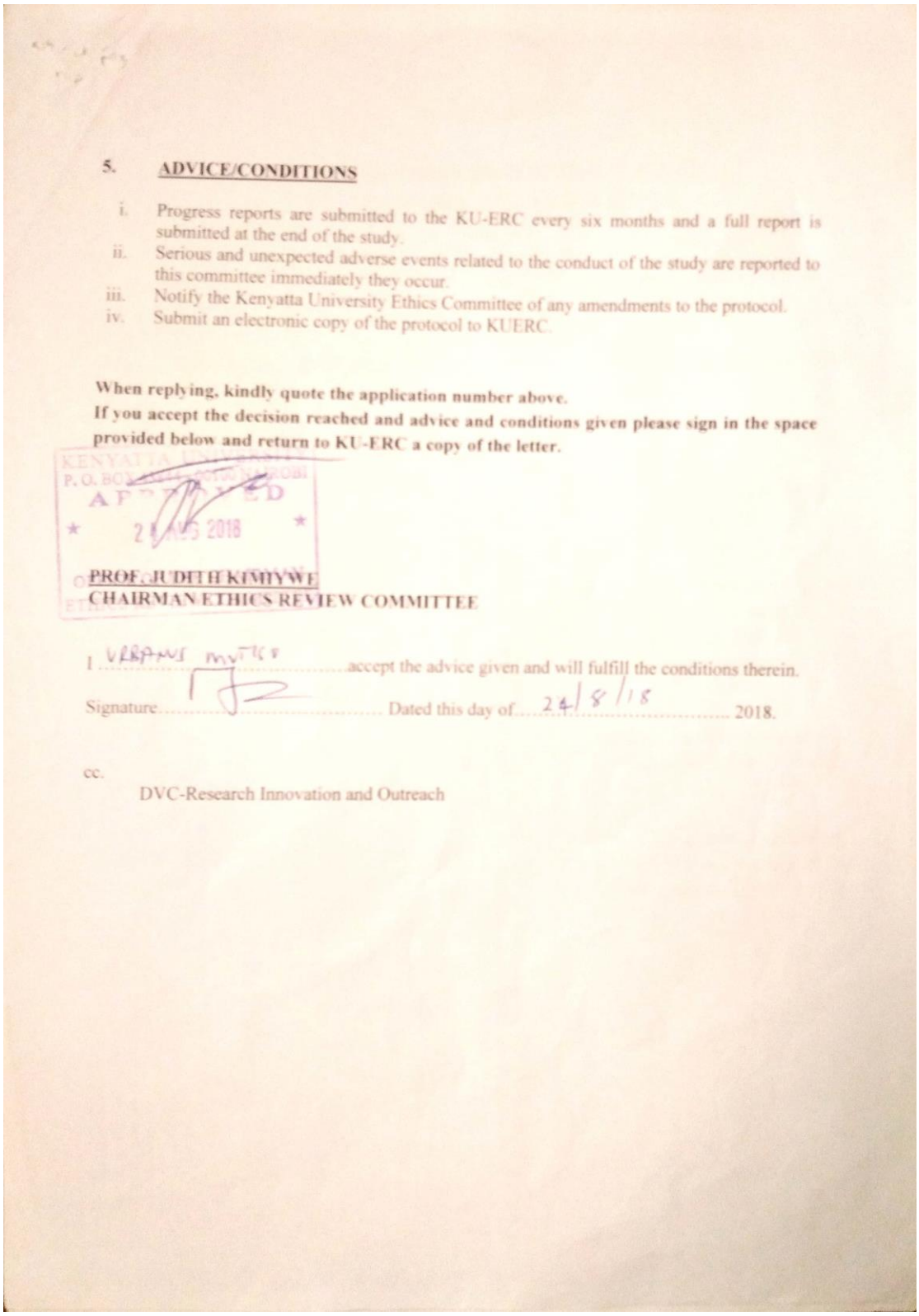
3. SITE

Makueni County, Kenya

4. DECISION

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines and **APPROVED that the research may proceed for a period of ONE year from 14th August , 2018.**

## Appendix IX: Ethical Approval From Kenyatta University



5. **ADVICE/CONDITIONS**

i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
ii. Serious and unexpected adverse events related to the conduct of the study are reported to this committee immediately they occur.
iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
iv. Submit an electronic copy of the protocol to KUERC.

**When replying, kindly quote the application number above.**
**If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.**

KENYATTA UNIVERSITY
P. O. BOX 43844 - 00100 NAIROBI
APPROVED
★ 24 AUG 2018 ★

**PROF. JUDITH KIMIYWE**
**CHAIRMAN ETHICS REVIEW COMMITTEE**

I VERANUS MUTISO ..... accept the advice given and will fulfill the conditions therein.

Signature ..... Dated this day of 24/8/18 ..... 2018.

cc.
DVC-Research Innovation and Outreach

## Appendix X: Research Approval From NACOSTI

THIS IS TO CERTIFY THAT:
*MR. URBANUS MUTISO MUTHUSI*
of KENYATTA UNIVERSITY, 127-90138
MAKINDU,has been permitted to
conduct research in *Makueni County*

on the topic: *UTILIZATION OF THE MODIFIED WORLD HEALTH ORGANIZATION (WHO) PARTOGRAPH AMONG HEALTH WORKERS' IN HEALTH FACILITIES IN MAKUENI COUNTY, KENYA*

for the period ending:
*13th September,2019*

Permit No : NACOSTI/P/18/59529/25104
Date Of Issue : 15th September,2018
Fee Recieved :Ksh 1000

.....
*Applicant's Signature*

.....
*Director General*
*National Commission for Science, Technology & Innovation*

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and Innovation
P.O. Box 30623 - 00100, Nairobi, Kenya
TEL: 020 400 7000, 0713 788787, 0735 404245
Email: dg@nacosti.go.ke, registry@nacosti.go.ke
Website: www.nacosti.go.ke

REPUBLIC OF KENYA

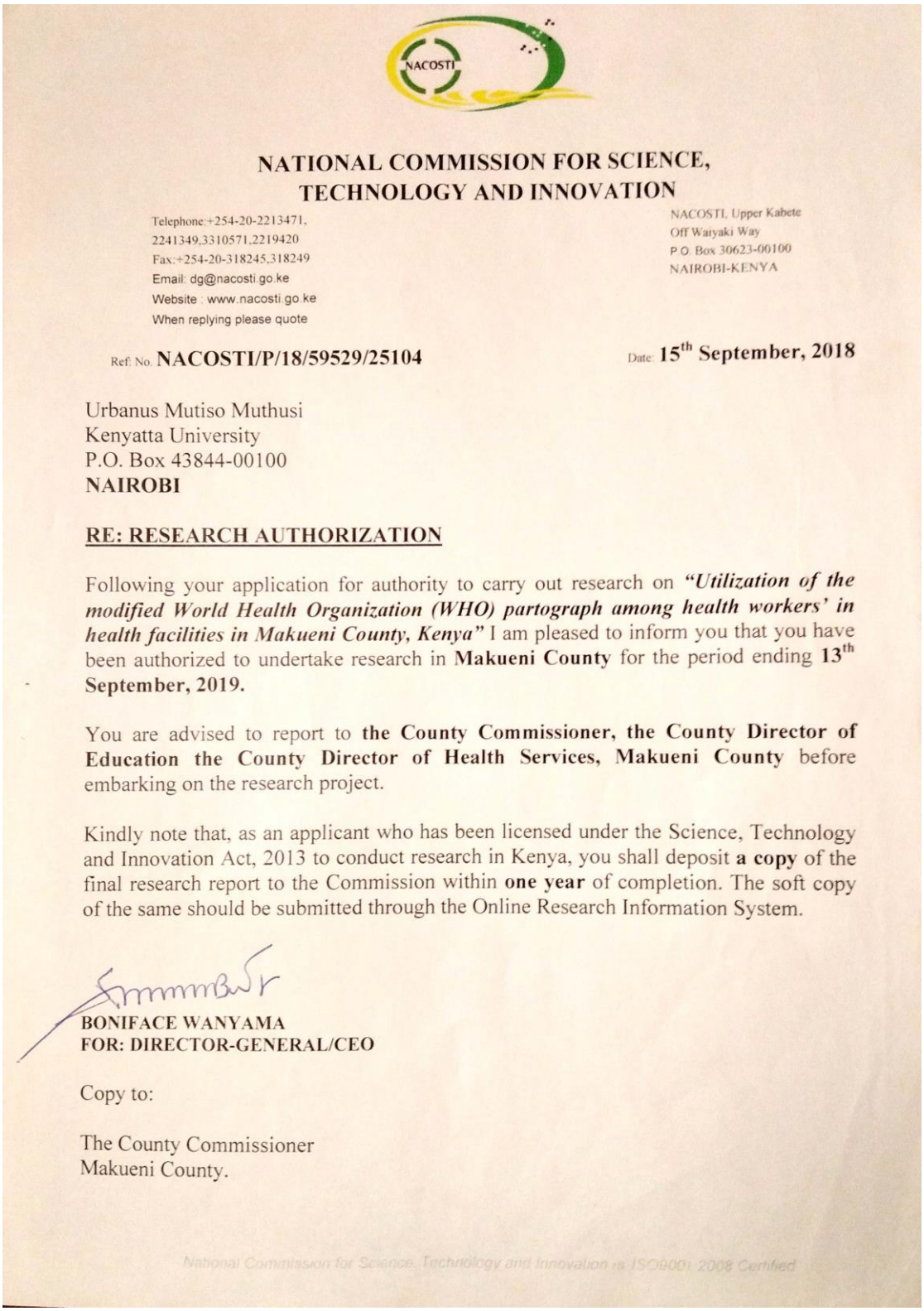
National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 20606

CONDITIONS: see back page

## Appendix XI: Research Authorization From NACOSTI



NACOSTI

**NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION**

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/59529/25104**

Date: **15th September, 2018**

Urbanus Mutiso Muthusi
Kenyatta University
P.O. Box 43844-00100
**NAIROBI**

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on ***"Utilization of the modified World Health Organization (WHO) partograph among health workers' in health facilities in Makueni County, Kenya"*** I am pleased to inform you that you have been authorized to undertake research in **Makueni County** for the period ending **13th September, 2019.**

You are advised to report to **the County Commissioner, the County Director of Education the County Director of Health Services, Makueni County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**BONIFACE WANYAMA**
**FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Makueni County.

National Commission for Science, Technology and Innovation is ISO9001: 2008 Certified

## Appendix XII: Request For Research Permit From Makueni County

URBANUS MUTISO MUTHUSI
ID/NO 22719291
P.O. BOX 127 - 90138, MAKINDU
1-9-2018

25/9/18
Noted
To reply appropriately

THE DIRECTOR MEDICAL SERVICES
MAKUENI COUNTY
P. O BOX 78-90300, MAKUENI

Dear Sir,

RE: **REQUEST FOR RESEARCH PERMIT**

I am a Master's Student in Kenyatta University pursuing a Master's degree in Public Health-Reproductive Health (MPH/RH). Currently I am at the project level and I'm conducting a Research entitled "**Utilization of the Modified World Health Organization (WHO) Partograph among Health Workers' in Health Facilities in Makueni County"**

Am requesting for permission to collect data in a period of two months from Makueni County Referral Hospital and Makindu Sub-County Hospital. The data collection process will involve interviewing Nurses in Maternity Units and reviewing Partographs retrospectively from the Records Department.

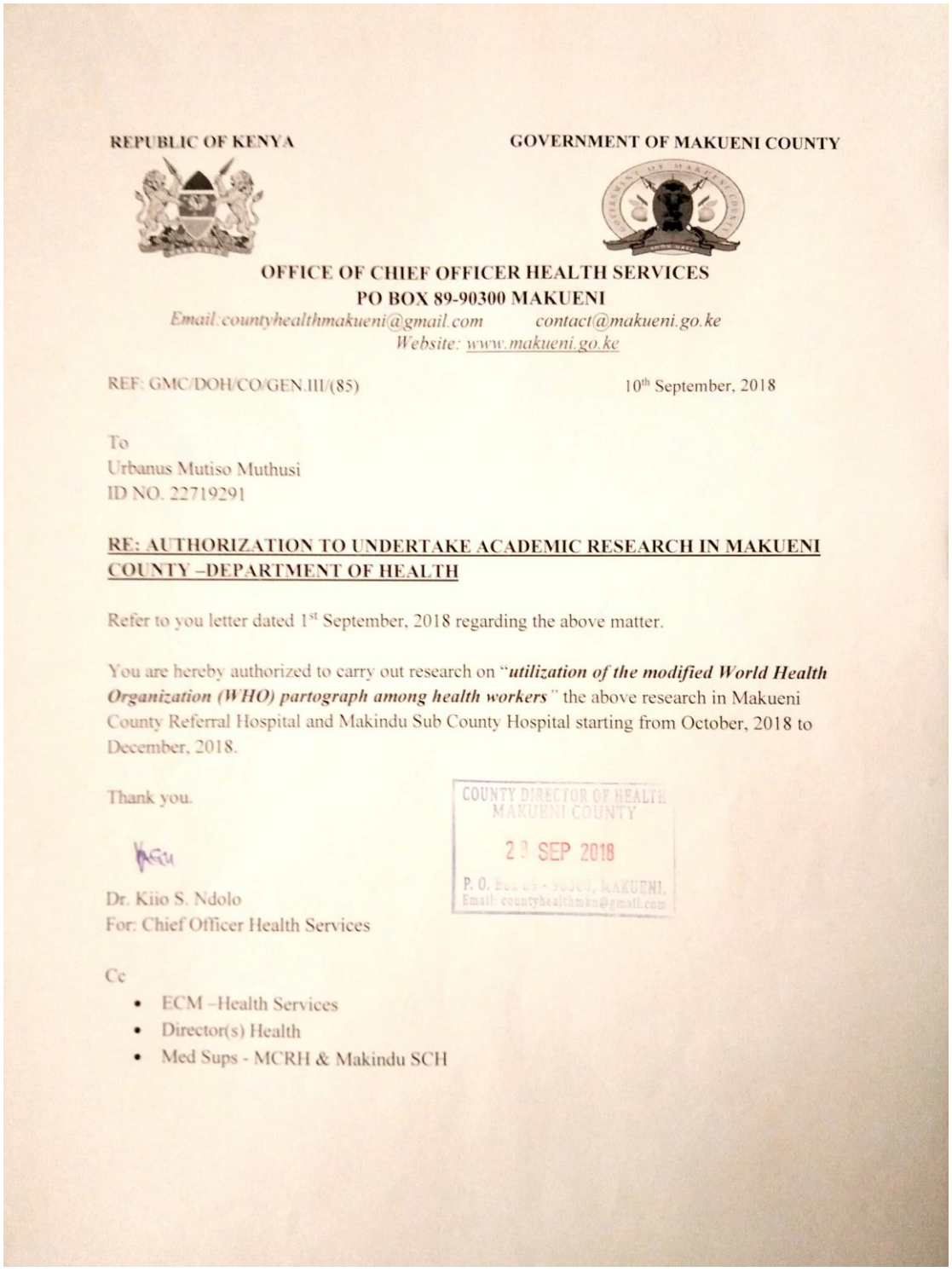
See attached approvals from the University and National Commission for Science, Technology & Innovation

Thanking you in advance.

Yours faithfully

Urbanus Mutiso Muthusi
Mob. No' 0726 707 786 / 0734 890 357

## Appendix XIII: Authorization To Undertake Research In Makueni County



REPUBLIC OF KENYA

GOVERNMENT OF MAKUENI COUNTY

**OFFICE OF CHIEF OFFICER HEALTH SERVICES**
**PO BOX 89-90300 MAKUENI**
*Email: countyhealthmakueni@gmail.com contact@makueni.go.ke*
*Website: www.makueni.go.ke*

REF: GMC/DOH/CO/GEN.III/(85) 10th September, 2018

To
Urbanus Mutiso Muthusi
ID NO. 22719291

**RE: AUTHORIZATION TO UNDERTAKE ACADEMIC RESEARCH IN MAKUENI COUNTY –DEPARTMENT OF HEALTH**

Refer to you letter dated 1st September, 2018 regarding the above matter.

You are hereby authorized to carry out research on "***utilization of the modified World Health Organization (WHO) partograph among health workers***" the above research in Makueni County Referral Hospital and Makindu Sub County Hospital starting from October, 2018 to December, 2018.

Thank you.

COUNTY DIRECTOR OF HEALTH
MAKUENI COUNTY
2 9 SEP 2018
P. O. Box 89 - 90300, MAKUENI.
Email: countyhealthmkn@gmail.com

Dr. Kiio S. Ndolo
For: Chief Officer Health Services

Cc
- ECM –Health Services
- Director(s) Health
- Med Sups - MCRH & Makindu SCH

## Appendix XIV: Authorization To Conduct Research In Makueni County Referral Hospital

REPUBLIC OF KENYA

GOVERNMENT OF MAKUENI COUNTY

OFFICE OF CHIEF OFFICER HEALTH SERVICES
PO BOX 89-90300 MAKUENI
*Email:countyhealthmakueni@gmail.com contact@makueni.go.ke*
*Website: www.makueni.go.ke*

REF: GMC/DOH/CO/GEN.III/(85) 10th September, 2018

To
Urbanus Mutiso Muthusi
ID NO. 22719291

**RE: AUTHORIZATION TO UNDERTAKE ACADEMIC RESEARCH IN MAKUENI COUNTY –DEPARTMENT OF HEALTH**

Refer to you letter dated 1st September, 2018 regarding the above matter.

You are hereby authorized to carry out research on ***"utilization of the modified World Health Organization (WHO) partograph among health workers"*** the above research in Makueni County Referral Hospital and Makindu Sub County Hospital starting from October, 2018 to December, 2018.

Thank you.

COUNTY DIRECTOR OF HEALTH
MAKUENI COUNTY
29 SEP 2018
P. O. Box 89 - 90300, MAKUENI.
Email: countyhealthmakueni@gmail.com

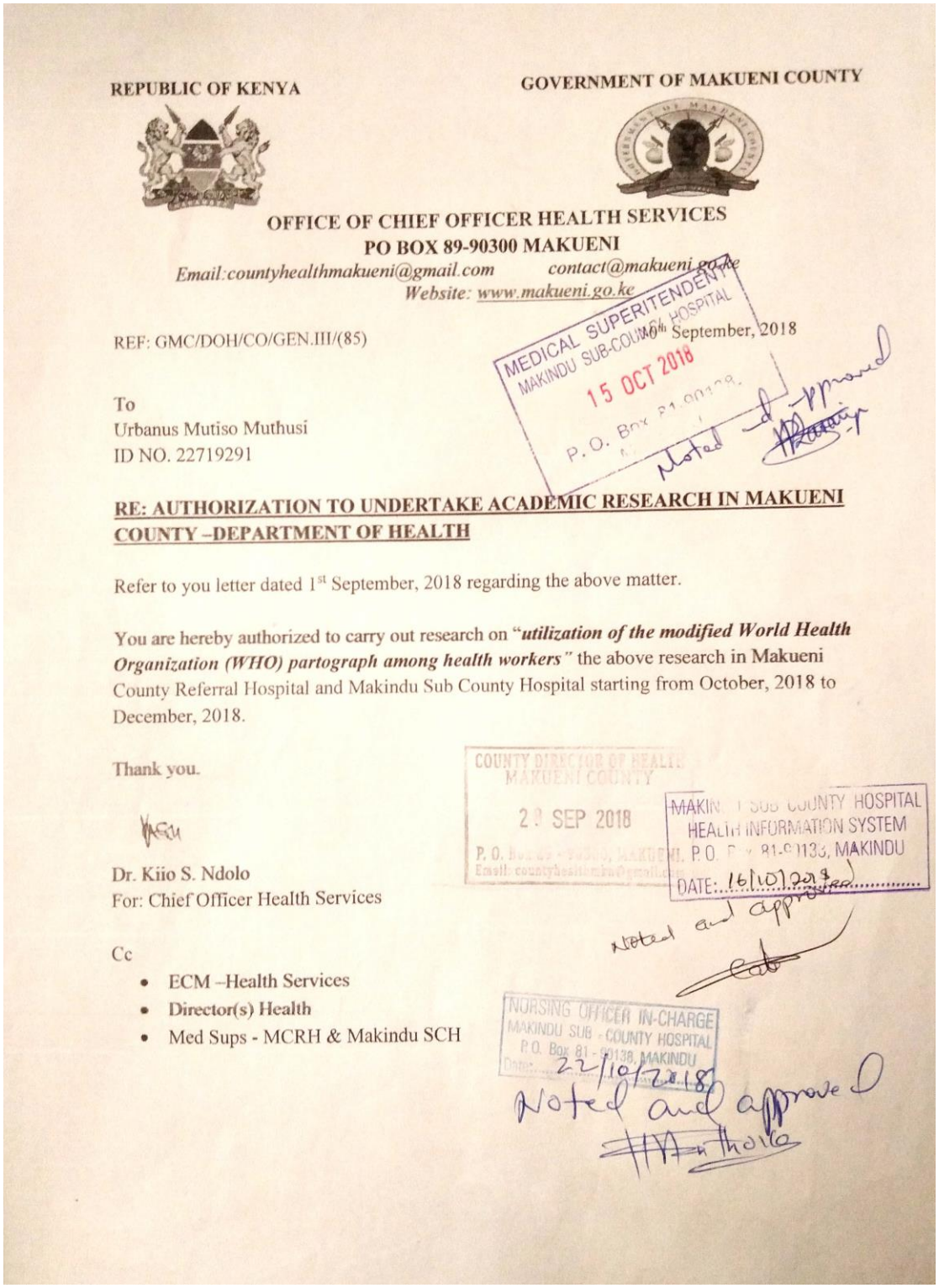
Dr. Kiio S. Ndolo
For: Chief Officer Health Services

Cc
- ECM –Health Services
- Director(s) Health
- Med Sups - MCRH & Makindu SCH

28/9/2018
Noted.
Nursing officer IIc to facilitate/assist.
Dr Gitungo.

28/9/2018
Allow him to carry the research
Dr Mutiso

## Appendix XV: Authorization To Conduct Research In Makindu Level 4 Hospital



REPUBLIC OF KENYA

GOVERNMENT OF MAKUENI COUNTY

OFFICE OF CHIEF OFFICER HEALTH SERVICES
PO BOX 89-90300 MAKUENI
*Email:countyhealthmakueni@gmail.com* *contact@makueni.go.ke*
*Website: www.makueni.go.ke*

MEDICAL SUPERITENDENT
MAKINDU SUB-COUNTY HOSPITAL
15 OCT 2018
P. O. Box 81-90138,
Noted

REF: GMC/DOH/CO/GEN.III/(85) 10th September, 2018

To
Urbanus Mutiso Muthusi
ID NO. 22719291

**RE: AUTHORIZATION TO UNDERTAKE ACADEMIC RESEARCH IN MAKUENI COUNTY –DEPARTMENT OF HEALTH**

Refer to you letter dated 1st September, 2018 regarding the above matter.

You are hereby authorized to carry out research on "***utilization of the modified World Health Organization (WHO) partograph among health workers***" the above research in Makueni County Referral Hospital and Makindu Sub County Hospital starting from October, 2018 to December, 2018.

Thank you.

COUNTY DIRECTOR OF HEALTH
MAKUENI COUNTY
2 9 SEP 2018
P. O. Box 78300, MAKUENI
Email: countyhealthmkn@gmail.com

MAKINDU SUB COUNTY HOSPITAL
HEALTH INFORMATION SYSTEM
P. O. Box 81-90138, MAKINDU
DATE: 16/10/2018

Noted and approved

Dr. Kiio S. Ndolo
For: Chief Officer Health Services

Cc
- ECM –Health Services
- Director(s) Health
- Med Sups - MCRH & Makindu SCH

NURSING OFFICER IN-CHARGE
MAKINDU SUB - COUNTY HOSPITAL
P.O. Box 81 - 90138, MAKINDU
Date: 22/10/2018

Noted and approved