

**DETERMINANTS OF PUBLIC PRIMARY HEALTH FACILITIES
PREPAREDNESS FOR SERVICE DELIVERY IN NYANDARUA COUNTY,
KENYA**

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**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE CONFERMENT OF THE DEGREE OF
MASTER OF SCIENCE IN HEALTH SYSTEMS MANAGEMENT OF
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DECLARATION

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

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DEDICATION

This work is dedicated to my dear wife, Mary Muthoni, my beloved children; Grace, Cephas, Prudence and Florence who have held me firmly and consistently as the strongest anchor for keeping me focused and determined. I have never seen such a people. Without them I wouldn't have reached here.

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ABSTRACT

The Kenyan primary health care (PHC) system is currently going through a major transformation, especially in the effort of actualizing the universal health coverage which is part of the “Big Four” national government agenda at a time when WHO regrets that at least half of the world’s population, especially in the Sub-Saharan Africa cannot obtain primary health care services. Health service is one of the building blocks in any health system. A health system with a strong PHC model delivers better outcomes. The main objective of this study was to evaluate the determinants of public primary health facilities preparedness for health service delivery in Nyandarua County. Specifically, to determine the influence of basic amenities, infection control precautionary measures, basic equipment and essential medicines on public primary health care services delivery. Data was collected using structured questionnaires from May to December 2018. The study was descriptive cross sectional with a desired sample of 47 facility in charges drawn from 47 facilities in three sub counties (Kinangop, Olkalou and Ndaragwa) out of the all the five sub counties. The study used both descriptive and inferential statistics in data analysis where 23 (49%) of the respondents indicated that their facilities had basic amenities, 32 (69%) said their facilities had basic equipment, while 39 (85%) said that infection control measures were in place and 29 (64%) said that there were essential medicines. The study found that health facilities with adequate basic amenities ($p<0.05$, OR=0.312, 95% CI), basic equipment ($p<0.05$, OR=0.195, 95% CI) and essential medicines ($p<0.05$, OR=0.728, 95% CI) were more likely to be prepared with primary health service delivery and added significantly to the primary health service delivery preparedness. The study concluded that the level of health care provided in primary health facilities is dependent on the level of the availability of adequate basic amenities, basic equipment and essential medicines. This study recommends that the department of health in the county should ensure timely delivery and availability of basic amenities, basic equipment and essential medicines. The department of health should also work in close collaboration with the department of roads to ensure all the primary health facilities are accessible to people seeking health services by improving the road network. A further audit can be done to all the primary facilities in the County to establish similar gaps and work towards improving them.

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ABBREVIATIONS AND ACRONYMS

CDC	Centers for Diseases Control and Prevention
CDF	Constituency Development Fund
CGN	County Government of Nyandarua
CIDP	County Integrated Development Plan
DHIS	District Health Information System
EML	Essential Medicines List
FGD	Focused Group Discussion
GDP	Gross Domestic Product
GoK	Government of Kenya
HDI	Human Development Index
HIV	Human Immuno- Deficiency Virus
KEBS	Kenya Bureau of Standards
KEML	Kenya Essential Medicines List
KeMU	Kenya Methodist University
KNA	Kenya News Agency
KPMG	Klynveld Peat Marwick Goerdeler
KMPDB	Kenya Medical Practitioners and Dentists Board
MDG	Millennium Development Goals
MOH	Ministry of Health
NCA	Nyandarua County Assembly
NCPD	National Council for Population Development
NEML	National Essential Medicines List
NGO	Non-Governmental Organization
NHIF	National Hospital Insurance Fund

PHC	Primary Health Care
PPE	Personal Protection Equipment
SDP	Service Delivery Preparedness
SERC	Scientific and Ethical Review Committee
SPSS	Statistical Package for the Social Sciences
SSA	Sub Saharan Africa
THET	Tropical health and Education Trust
UHC	Universal Health Coverage
UNDP	United Nations Development Programme
US\$	United States (US) Dollar
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The Kenyan primary healthcare (PHC) system is currently going through a major transformation, first arising from the constitutionally mandated devolution of health services and secondly from the actualization plans for universal health coverage (UHC) which is part of the “big four agenda”. It is a must therefore that the counties have to implement relatively new and untested methods, ranging from policy and regulatory interventions. Health service delivery is one of the building blocks of any health system and is concerned with how inputs and services are organized and managed. Globally, some dimensions of health service availability or otherwise their readiness are available while others may still being the early stages (World Health Organization [WHO], 2017).

Health outcomes are unacceptably low especially in much of the developing world despite all the huge health investments and no country is exempt. It is completely unacceptable that at least half of the world’s population cannot obtain primary health services. The director General of WHO termed it “unnecessary” despite having registered an improvement in the increase of the number of people able to obtain some key health services in the 21st century because the progress has been very uneven. Wide gaps still exist in the availability of health services in the Sub-Saharan Africa and Southern Asia (World Bank [WB], 2017). In essence, PHC capacity is lacking in many Low- and middle-income countries (LMIC) and these gaps continue to be exacerbated (Bitton, et. al., 2016) but people-centered health services focus and is organized around the health needs and expectations of the people rather than on diseases (WHO, 2017).

Therefore, primary health facilities ought to be organized and prepared around people's needs in contributing to PHC and eventually to universal health coverage (UHC). PHC which can meet more than 80% of an individual's health needs over the course of life is usually the first point of contact a community has with a health care system. It has already been established that a strong PHC health system model delivers better outcomes than all other models. However, PHC performance has been unequal due to under investments, misconceptions and lack of political will. While only 36% of total health budget goes to infrastructure, medical equipment and vehicles across the globe for example, 35% of healthcare facilities do not have even water and soap for hands washing (WHO, 2018).

Majority (85.2%) of the public health facilities fulfill the criteria for basic equipment, but almost half (47.7%) of the facilities did not fulfill the criteria for infection prevention supplies. More than 90% of facilities did not fulfill the criteria for providing healthcare services for insurance beneficiaries and were not ready to provide general services according to the standard. About 38% of healthcare facilities did not have an improved water source, when 19% did not provide improved sanitation, and 35% did not have soap for hand washing as 42% of all health care facilities lacked an improved water source. That notwithstanding, regular monitoring of access to services and services delivery globally is often a weak component. Yet, health policy makers, planners and managers need proper evidence for basing decisions. Reviews of progress and performance at national and sub national levels should include updated and accurate information (O'Neill, Takane, Sheffel, Zahr & Boerma, 2013).

General Service readiness (GSR) for Kapasia and Sreepur Upazila was 62% of all the health facilities (Rashedullislam, Laskar & Macer, 2016) while the same GSR for Zambia was 64% (Ministry of Health & Social Welfare [MoH& S W], 2013). In 2012, Tanzania's was 42%; a little lower than Kenya's 57%. According to the Ministry of Health (2014), Kenya aims at increasing access of referral systems by increasing the use of primary health services. There can be too many unnecessary referrals, clients are likely to be put off from seeking health services or the quality of care may be compromised if the primary health facilities are not well prepared. Sabuni (2017) points that there have been wide ranging opinions in Kenya on whether counties have the capacity to deliver health services after devolution in 2013; alongside the difficulties in taking over health facilities constructed through CDF because of delays in official handing over.

Those who support devolution of health care to counties including the Governors have resisted the proposals that would kill devolution like the returning of the health docket to the national government as has been suggested at times in the national assembly under the assumption that the counties are not in a position to manage healthcare. Senators have been defending counties by arguing that residents in counties have better health services since devolution and that the benefits of a devolved system far outweigh those of centralization (Valerie, 2015).

Prior to devolution in 2013, the general service readiness index (GSRI) minus the diagnostic domain (which represents 4/5 of GSRI domains) for Nyandarua County was 64%. It was however difficult to determine counties' readiness to offer health services after devolution because the Kenyan Transition Authority's (TA) assessment on

preparedness was generic. Political pressures led to bulk transfer of health functions irrespective of counties' preparedness (Barker et al., 2014). A study on influence of devolved governance and performance of the health sector in Kenya, established that the health sector's contribution to the GDP reduced by 0.5 % by the end of 2013; the year when devolution of healthcare to counties happened (Muchomba, 2015). UHC is globally embraced as a significant prerequisite for economic development. However, the state of some health facilities contradicts their support to the global health agenda. Health service readiness assessments have the capacity to broaden our understanding of the ability to adjust to some strategic or even constitutional changes (Oyekale, 2017).

The Kenyan national government is in the process of implementing UHC as a key solution to the problems bedeviling the health system by piloting it first in four counties before a roll out in the entire country. UHC is anticipated to ensure that all citizens get access to preventive, promotive, curative, rehabilitative and palliative health services within a minimum financial burden which may not succeed without the county governments taking a leading role now that health is a devolved function. Counties therefore have a responsibility to make sure that all the necessary health workers are available in the health facilities, medicines and other medical commodities are available throughout in the health facilities and necessary basic equipment are available in the health facilities as well. Besides, the national government requires that all health services must be of the highest attainable quality (Ministry of Health [MOH], 2018).

1.2 Statement of the Problem

The primary health facilities in Nyandarua county government perform 86% of the workload in the county government health facilities (District Health Information system [DHIS], 2018) and have an immediate contact with the community. However, only 19% of the county government's primary health facilities are accredited for national insurance cover (National Hospital Insurance Fund [NHIF], 2017) which may depict the level of service delivery preparedness though Smits, Supachutikul, and Mate (2014) have doubted the credibility of accreditations globally. In its Hansard, Nyandarua county assembly indicated that there are several impediments in their county's health system (Nyandarua County Assembly [NCA], 2015). Patients too have severally protested health services citing lack of essential drugs as an example (Maina, 2018) but the county government has reiterated its commitment on quality, affordable and accessible health care (County Government of Nyandarua [CGN], 2018).

1.3 Purpose of the Study

This purpose of this study was to evaluate the determinants of public primary health facilities preparedness for service delivery in Nyandarua County, Kenya.

1.4 Study Objectives

- i. To determine the influence of basic amenities on public primary health facilities preparedness for service delivery in Nyandarua County.
- ii. To determine the effect of infection control measures on public primary health facilities preparedness for service delivery in Nyandarua County.
- iii. To determine the influence of basic equipment on public primary health facilities preparedness for service delivery in Nyandarua County.

- iv. To determine the contribution of essential medicines to public primary health facilities preparedness for service delivery in Nyandarua County.

1.5 Research Questions

- i. What is the influence of basic amenities on public primary health facilities preparedness for service delivery in Nyandarua County?
- ii. What is the effect of infection control measures on public primary health facilities preparedness for service delivery in Nyandarua County?
- iii. What is the influence of basic equipment on primary health facilities preparedness for service delivery in Nyandarua County?
- iv. What is the contribution of essential medicines to primary health facilities preparedness for service delivery in Nyandarua County?

1.6 Justification of the Study

Majority (95.8 %) of the Nyandarua county human population lives in the rural areas (CGN, 2018). Public primary health facilities have been reported to be pro-rural where health care access especially due to poverty is rampant (WHO, 2017). While no known studies similar to the proposed one have been done, Barker et al., (2014) have found out that post devolution assessments have not determined counties' readiness to offer health services after devolution in 2013 at a time when some see health devolution not only disruptive but also a process overwhelmed by unending challenges (KPMG, 2014).

Nyandarua county assembly (2015) notes that their health system has some touching and emerging issues attributable to the neglect the health facilities have suffered from the national and now the county government. They noted that even the pictures depicting the health facilities were pathetic, yet the GoK is in the process of initiating UHC which focuses on PHC; a domain of counties (Omboki, 2019). GoK aims to provide accessible and affordable health services by 2022 and the county governments are at the closest grass root inflection at a time when health services have been cited as the most troubling among the “big four” development agenda (GoK [Government of Kenya], 2018).The PHC facilities need an upgrading (CGN, 2017) and there’s therefore a need to evaluate their current status. This study has added new knowledge; especially in evaluating the new constitutional concept of health devolution and is a pointer to the UHC plan.

1.7 Limitations of the Study

The workload in health facilities along with staff shortages were thought to be possible barriers to the respondents’ participation in this study. Therefore, the respondents were interviewed in their convenient time. The anticipated rainy and cold weather during data collection too could have been a deterrent in accessing the health facilities but travel happened only when the weather was most convenient.

1.8 Delimitation of the Study

The scope of this study was the clinical officers and nurses in charges of the Nyandarua County government dispensaries and health centers sampled from Kinangop, Olkalou and Ndaragwa sub counties. Those on leave were not interviewed and the non-county government facilities were excluded from the study.

1.9 Significance of Study

This study is expected to inform the health facility managers on the gaps that might exist and any available opportunities to guide actions for outcomes. It may also strengthen strategic and operational planning of the Nyandarua County and national governments in health sector investments alongside providing a basis for more research.

1.10 Assumptions of the Study

There are assumptions that respondents gave accurate information and the sampled health facilities and respondents were representative of the target population. The gender of the respondents was not considered a significant factor that would influence the outcome of this study and therefore whichever gender was available during the interview was the one considered appropriate for response.

1.11 Operational Definition of Terms

Acceptability	Quality of being Tolerated.
Accessibility	Easy to Approach or Reach.
Accreditation	Certification by NHIF.
Affordability	Not Paying any Direct Cost for a Service.
Availability	Possibility of Getting; Presence of a Service.
Basic Amenities	Minimum Features of Health Services.
Basic Equipment	Minimum Tools in a Health Facility.
Big Four	The Kenyan National Government's Priorities for Development; Manufacturing, Farming, Housing and Healthcare.
Essential Medicines	Priority Drugs that Satisfy Minimum Needs.
In charge	A Clinical Officer or a Nurse.
Precautions for Infection	Minimum Measures for Prevention of Communicable Diseases.
Primary Health Facilities	Dispensaries and Health centers.
Primary Health Services	Outpatient Services; Reception, Consultation/
Service Preparedness	Readiness to Offer Minimum Primary Health Services.
Workload	General Outpatient Attendance/Visits/Access.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents the review of the existing literature relating to basic amenities, precautions for infection prevention, basic equipment, and essential medicines. It also presents the theoretical and conceptual frameworks.

2.2 Basic Amenities and Primary Health Services Preparedness

Amenities refer to the features of health services that do not directly relate to clinical effectiveness but may enhance the client's satisfaction and willingness to return to the facility for subsequent health care needs. They may affect the client's expectations and confidence. Amenities relate to the physical appearance of facilities, personnel, materials, comfort, cleanliness, privacy, music, educational or recreational videos, and reading materials. While some amenities like clean, accessible restrooms and privacy curtains in examination rooms are considered luxuries in most of the lesser developed countries' health care settings, they are nevertheless important for attracting and retaining clients and for ensuring continuity and coverage (Goldman & Romley, 2008).

Healthcare facilities rely on a steady, reliable and well-maintained electric power system. Even small electric failures or faults can be devastating. Having reliable power means having an electrical system designed to handle daily threats of the power system (Latzko, 2009) and should include identifying failure responses. There should be a power system that has means to connect portable equipment. These include a generator and installation of power systems that mitigate the impact of discrete equipment failures. There should also be comprehensive and appropriate plans for electric power. Health facility professionals also should consider that water is almost always likely to find the lowest

elevation and a sump pump is only as good as its power source and maintenance (Stymiest, 2016).

In Bangladesh, almost 80 percent of all health facilities, excluding community clinics (CCs), are connected to the national electricity grid, and 45 percent of these facilities have regular electricity. One fifth of CCs have an electrical connection with the national electric grid, while only 9 percent of CCs have regular electricity. One-third of facilities have computers with Internet access. On the day of the survey, more computers were functioning at district and upazila facilities (90 %) than at CCs (42 %) and 24 % union level facilities (National Institute of Population Research and Training [NIPORT], 2016).

Before 1990s, hospitals were thought to attract patients by attracting physicians but another style of competition has emerged where hospitals compete for patients on the basis of amenities. Almost a third of general practitioners would honor a patient's request to be treated at a hospital that provided a superior nonclinical experience but care that was clinically inferior to that of other nearby hospitals; a probable indication that good amenities motivate service providers also. On the same level, patients considered that the nonclinical experience is twice as important as the clinical reputation in making hospital choices (Goldman, Vaiana, & Romley, 2010). Facilities that received district and community support, supervision visits, and underwent renovations and improvements in Timor-Leste of south East Asia from 2014/15 improved their readiness for primary services by scoring from an average of 44% to 84% (Snow, 2018).

A Los Angeles study found that one standard deviation increase in a hospital's amenities increases its demand among patients by 38.4% while a standardized increase in clinical quality (as measured by lower pneumonia mortality) increased demand by only 12.7%. These findings indicated that hospitals may have an incentive to compete in amenities, with potentially important implications (Goldman & Romley, 2008). Kenya was one of the sub-Saharan African countries lagging behind in reaching the fourth and fifth MDGs attributable to lack of basic infrastructure especially in rural Kenya. Only 58 % of all hospitals in the country had an all-year supply of water, while only 20% had uninterrupted electricity supply. Some 40 % of health facilities in Eastern province did not have either an uninterrupted electricity supply or a generator with fuel. Despite the clear lack of essential services needed to provide very basic health services, there has been little research (Essendi et. al., 2015).

Speech privacy is the inability of an unintended listener to understand outside conversations in healthcare settings. Without it, patients are concerned that their conversations are being overheard by others. In most medical offices or hospital reception areas, speech privacy is virtually nonexistent. These spaces rarely have walls or partitions to block sound, so patients often overhear conversations between office personnel and other patients. Lack of speech privacy is by no means confined to reception areas and pharmacy lines – the problem is also present in exam rooms. Some constructions provide walls that are often thin and don't extend to the ceiling deck, so conversations between caregivers and patients can often be heard from room to room. Sound can even travel to nearby hallways or corridors where patient speech privacy is compromised. When patients can hear other patients checking in, ordering their prescription or discussing care options with their caregiver, it fosters a negative patient

experience where patients feel uncomfortable or embarrassed, and are potentially less likely to have frank conversations with caregivers (Hughes, 2016).

The Kenyan Ministry of Health referral system provides that patient cases that cannot be handled by lower level facilities are referred up the service delivery pyramid, making the availability of ambulance services critical. Besides the availability of functional ambulances, there is also the availability of other vehicles that can be deployed in place of ambulances. A Kenyan survey found that 72.1 per cent of the facilities had ambulances, the rate being higher in urban than rural health facilities in general, but also higher in public rural than public urban. The greater location of health facilities in urban areas leads to the higher availability of emergency transportation in urban-based facilities. However, nearly 50% of the facilities could not promptly respond to emergencies when they occurred mainly because fuel availability for emergency transport stood at an average of 66%; the rate being higher for all urban facilities compared to their rural counterparts. An interesting finding was that fuel availability was higher at public urban (84%) compared to public rural (54.3%) facilities where long distances must be covered to a filling station and even hard to reach areas, where infrastructure and road network was poor (Kenya institute for public policy research and analysis [KIPPRA], 2018).

Health related processes stand to be reshaped by the use of computers and the Internet. The increased use of electronic medical records (EMRs), medical devices that are wireless and mobile phone technology has turned health facility networks into components and determinants of patients' treatments and it is important. Medicine practice today requires maintaining uninterrupted internet wireless network. The health

professionals' information needs, information seeking and use are very important. Health workers, especially physicians seek health information for the need to answer questions to patient specific questions and to keep abreast of developments in healthcare. On characteristics of information resources preferred by primary care physicians, it was realized that above all, physicians seek information for patient care. In the past, books and journals were held in personal libraries and colleagues would make them their main sources of information (O'Connor, 2012).

Today, many new electronic information resources and systems are now available with the increase in health care research and the introduction of computers and the Internet. Availability of computers and the Internet has provided the most immediate access to the most recent and reliable results of health and clinical research. On the contrary, the Internet is still only available to a minority of health professionals, and often it is not available at the point of care in developing countries. Some studies have explored the use of the internet to obtain clinical information by medical practitioners in diverse health institutions across the globe. A 2004 study on resident physicians in Pennsylvania, United States, showed that 98% of the respondents used the internet and two-thirds used it for health-related purposes. However, internet access is still a challenge in Nigeria because majority of the people there cannot afford the high initial cost of computers and connection fees (Ajuwon, 2006).

2.3 Infection Prevention Control and Primary Health Services Preparedness

Standard precautions for infection prevention are the basic measures for infection control used as a minimum in the care of patients, environment and healthcare providers themselves. Hand hygiene is a major component. It's one of the most effective methods

to prevent transmission of pathogens in health care set ups. Generally, the use of personal protective equipment (PPEs) should be guided by risk assessment and the magnitude of contact anticipated with blood and body fluids, or pathogens. Together with practices carried out by health workers when giving care, all persons (including patients and visitors) should adhere to infection control practices in health care settings (WHO, 2006).

It should be considered that each person is potentially infected; or colonized with an organism that could be transmitted in the healthcare workplace and the CDC (Centers for disease control and prevention) notes that standard precautions require all HCW's (Health care workers). Patients and healthcare staffs are all at risk of getting an infection. An estimate of 10% of patients acquires a healthcare associated infection (HAI). The six elements of the "chain of infection" that must be available for a transmission to occur are the infectious agent, a reservoir, portal of exit, means of transmission, portal of entry and a susceptible host. There are some highly transmissible infections that require additional precautions but all HCWs have an obligation to implement the standard precautions. Managers of healthcare facilities are responsible for ensuring that the resources necessary for implementation of standard precautions are provided including an infection prevention and control service, an occupational health service, an infection prevention and control induction program for new staff, an ongoing infection prevention and control education program for staff, equipment (e.g. personal protective equipment, cleaning equipment), physical infrastructure (isolation rooms, hand wash sinks etc.) and development of an action plan to address any non-compliance with standard Precautions identified by regular audits(Centers for disease control and prevention [CDC], 2009).

Baylis and Morgan (2017) points out that the indications for gloves use are to protect hands from contamination with organic matter, micro-organisms and chemicals, reduce the risks of transmission of microorganisms to both patients and staff. The procurement team ought to understand the rationale for the selection of gloves in clinical settings. Siegel, Rhinehart, Jackson and Chiarello, as cited by Grissinger, (2013) notes that all health staff members should understand that any form of syringe or needle re-use is dangerous and should be avoided. The current CDC guidelines recommend that syringes and needles be used not more than once. Grissinger, (2013) also cited Pugliese, Gosnell, Bartley and Robinson who had concluded that nearly 1% of health workers sometimes or always reused a syringe for more than one patient after changing only the needle.

In healthcare, patient and personnel protection against infection is the rationale that determines the indications for hands disinfection, surface disinfection (elimination of microbial reservoirs within the patient's immediate environment), decontamination of medical devices and laundry, disinfection of critical waste and in exceptional cases also of excretions. The role of disinfection in infection prevention has been analyzed over the past 50 years both in the form of benefit and risk assessments as well as in an epidemiological aspect. Currently, the efficacy of disinfection measures, the user safety and environmental compatibility in line with the state of the art are considered. The user is able to determine and correctly put in use the disinfectant most suited to the intended purpose. Disinfection is affected with the aim of killing pathogens or putrefactive microbes by means of chemical and, or physical inactivation, so that under the given circumstances they cannot give rise to infection or putrefaction respectively (Kramer, 2007).

Decontamination should be the first step in handling used healthcare instruments and equipment in for example the three buckets system preferably by using 0.5% solution of chlorine from readily available liquid chlorine or its tablets. A fresh solution should be made every morning, or after 8 hours, or more often if the solution becomes visibly dirty. Thereafter, prior to disinfecting or sterilizing, all instruments and equipment must be cleaned to remove organic materials or chemical residues. If instruments and equipment are not cleaned thoroughly, organic matter could prevent the disinfectant or sterilizing agent from having contact with the instrument or piece of equipment and might also bind and inactivate the chemical activity of the disinfectant. All surfaces of instruments and equipment, including channels and bores, should be cleaned by using liquid soap or enzymatic detergents. Liquid soap suspends grease, oil, and other foreign matters in solution so that they can be removed easily by the cleaning process. An abrasive cleaner, such e.g. steel wool, for household cleaning, shouldn't be used because it can scratch the instruments, which creates potential harborage sites for microorganisms (CDC, 2009).

Disinfection removes microorganisms from instruments and equipment, but it is not a sterilizing process. Therefore, it should not be used as a convenient substitute for sterilization. Disinfection destroys organisms on delicate or heat sensitive instruments that cannot be sterilized or when single use items are not available. It is not favorable for instruments for use in critical sites, because it's required that these instruments must be sterile. Sterilization is complete destruction of all microbes (bacteria, viruses, fungi, and parasites), including bacterial endospores. It protects patients and is recommended for all instruments and other items that will come in contact with the blood stream or tissues under the skin, as well as on drapes and some surgical attire. Physical or chemical

methods of sterilization may be employed (Ministry of Public Health and Sanitation and Ministry of Medical Services [MoPHS& MOMS], 2010).

2.4 Basic Equipment and Primary Health Services Preparedness

Medical equipment has a critical role and impact on the quality of patient care. Much useful information about essential drugs has been available but less information is available about essential medical equipment. Selecting supplies is also an important aspect. Equipment are often given little attention. This results in procurement of inappropriate items. Procurement, effective storage, stock control, care and maintenance of basic equipment are also critical. For people to have confidence in health services and health workers, adequate supplies of equipment alongside drugs are very essential. There has been limited information available about the aspects of management of medical supplies and equipment (Kaur, Hall & Attawell, 2001).

A joint survey by KMPDB (Kenya Medical, Pharmacists and Dentists Board), WB (World bank), MOH (Ministry of health) and economic survey indicates that 25% of public health facilities lack the minimum basic equipment like a stethoscope, a weighing scale, a thermometer and a sphygmomanometer as compared to 20% that lack clean water. In comparison, 90% of private health institutions are connected to electricity against only 66% of the public (Mutisya, 2018).

Use of laboratory testing can readily be incorporated into routine clinical services. Effective application of basic laboratory tests at primary health care levels improves diagnosis and patient treatment significantly. Basic laboratory tests can promote better diagnosis and management of 60% of the most common diseases and conditions

presented in outpatients of primary health facilities. However, many of the primary health facilities lack essential diagnostic equipment for patients' examination. It's advocated by the World Health Organization (WHO) that basic laboratory services should support clinical and public health activities at PHC level and the government of Kenya has planned for appropriate diagnostic services at all levels of the health care system. Most health facilities are situated in the rural areas where majority of the population lives. Considerable constraints exist in establishing rural laboratory units and supporting their operations (Carter, Lema, Wangai, Munafu, Rees & Nyamongo, 2012).

In Nigeria, medical disposables such as hand gloves were reported to be available in 77.18 % of all the healthcare facilities. Functional stethoscopes were reported by 77.22% of the healthcare facilities, while only 68.10% had sphygmomanometers. Among the states in southern Nigeria, regression results showed that indices of medical equipment availability among other variables increased significantly ($p < 0.05$). Adult weighing scale was available in 94.5%, of the health facilities in Anambra state, although only 85.4% was functioning. The states with lowest functioning adult weighing scales were Taraba (51.8%), Kebbi (52.2%), Niger (58.7%) and Bauchi (59.4%). Availability of functioning infant weighing scale was reported by 69.1, 65.9 and 65.8% of the respondents from Bayelsa, Ekiti and Anambra states respectively. Thermometers were found in 91% of the healthcare facilities in Anambra state, while only 58.9% of those from Kebbi had it (Oyekale, 2017).

A hospital that keeps at all times the key medical equipment on hand is ready for any case that might pass through their doors. Medical treatment requires that in order to provide complete care, a health provider must be in possession of a complete and all the necessary equipment. For a health facility to comprehensively treat patients there is a standard set of medical equipment that all health facilities should always have on hand (AKW Medicare, 2011). Medical equipment was found to be strong predictors for effective health care delivery in selected state government hospitals in Oyo State in Nigeria. Effective health care delivery can significantly be predicted through adequacy of equipment. Availability does not always significantly predict effective health care. Therefore, it could be inferred that inadequate or non-availability of facilities, equipment and resources especially basic resources could be said to be responsible for substandard care (Raj, 2009).

Most of the medical equipment in the developing world is broken and 96 % of this equipment are estimated to be out of service. More than 50 % of the medical and laboratory equipment in resource-stricken settings are not in service. This has been having devastating health impacts. In Ethiopia for example, lack of proper management of medical equipment has constrained the capacity of health institutions to provide adequate health services where only about 61 % of medical equipment in public hospitals and other health facilities are functional at any one time. Medical equipment management defines the organization and coordination of activities that ensure the good management of equipment related to patient care in any health facility. Functionality of equipment is critical for quality services. Otherwise, certain services cannot be rendered at all or that the quality of the services delivered would be low. The expectation of

healthcare seekers is that the equipment used in the facilities are enough, clean and safe (Ademe, Tebeje & Molla, 2016).

Merab (2018) points out the need for KEBS (Kenya bureau of standards) to recalibrate medical equipment for health facilities to ensure they are in line with international standards. Uncalibrated ones are a predictor of most misdiagnosis happening now and again in health facilities. Health seekers also want to be assured that there are various modern methods of sterilizing medical equipment. Where these are either absent or inadequate, they would prefer to go to other facilities, even if they will be required to pay. In the Delta State of Nigeria concerning the primary health care centers, the medical devices and equipment were deficient in various combinations from one center to another. Consequently, stakeholders were generally not satisfied with the quality of services. The community was unanimous that this was caused by insufficient allocation of resources to the health; particularly the primary health care subsector (Ged, 2016).

The World Health Organization (WHO) identified the shortage of functional medical equipment in low income countries as a critical barrier to meeting the global health goals like the health-related Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs). Equipment donations should meet guidelines to ensure they are more sustainable and contribute positively to service delivery. WHO estimates that between 50 and 80% of medical equipment is out of service in low income countries. Up to 80% of the medical equipment in some sub-Saharan African countries is donated equipment. A study of 20 developed and developing countries found that the appropriate selection of medical equipment could save up to 90% of the costs associated with the

operation and maintenance of the equipment over its lifespan (Tropical Health & Education Trust [THET], 2016).

2.5 Essential Medicines and Primary Health Services Preparedness

World Health Organization (2012) and World Bank (2010) acknowledged that 40 million deaths globally have been reported in one year alone in developing countries, yet most leading causes of death and disability can be prevented or treated with cost effective essential drugs. Spending on pharmaceuticals represents less than 20 % of the total public and private health spending in most developed countries but up to 66% in developing countries. Pharmaceuticals account for about 40 % of total health expenditure in China. Several of its universities conduct research and 33.2 % of essential drugs in the EML (essential medicines list) are traditional medicines. To keep prices low, procurement is through centralized bidding.

In Kenya, (Ministry of Health [MOH], 2016) the healthcare management and therapeutics are highly dynamic fields. Essential medicines are those that satisfy the priority health care needs of the population. They are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford. The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations; exactly which medicines are regarded as essential remains a national responsibility. The EML core list is the minimum for treating priority conditions based upon efficacy, safety and cost effectiveness but, it is noted that the complementary list of medicines covers priority diseases that require special facilities, equipment, and/or training (Kaiser (2016).

Health care in Brazil is currently characterized by a demographically accelerated demographic transition and expressed by a triple burden which revolves around the burden of infectious diseases which is not yet overcome, diseases associated with external causes, and the hegemony of chronic conditions. To solve this, the health network structured access to actions and services coordinated by primary health care where the pharmaceutical services play a critical role. This pharmaceutical service in primary health care aims at ensuring a continuous, comprehensive and a compatible healthcare with essential medicines as one of the critical elements. Eighty percent (80%) availability of essential drugs and basic technologies is one of the nine global goals for control of non-communicable diseases (CNCD) since the appropriate pharmacological treatment significantly reduces morbidity and mortality of these diseases (Baylis & Morgan, 2017).

Appropriate availability, sustainable funding and health care system improvement contribute to provision of universal health coverage (UHC). A Brazilian national study in 273 cities showed some statistically significant differences regarding the type of unit, infrastructure, and presence of a pharmacist between regions. Tracer medicines availability average was 52.9% in primary health care facilities with differences between regions and sampling strata. However, this index rose to 62.5% when phototherapeutic medicines were not included. There was a limited availability of medicines for treatment of chronic and epidemiological diseases, such as tuberculosis and congenital syphilis. Supply chain management is indicated as a cause for low availability of essential medicines purchased centrally by the Brazilian Ministry of Health (Nascimento et. al., 2017).

There is an argument that lack of access to essential drugs, irrational use of drugs and poor drug quality remain serious global public health problems. Roughly, 10% of the health budget goes into procuring medicines in India where 50–80% of the populations are not able to access all the medicines they need despite having lower prices of medicines. It's contradictory to note that India though is one of the global leaders in manufacturing generic medicines. Since public healthcare facilities usually provide medicines at low cost or free of cost, they are especially important for providing access to medicines for the underprivileged. Access to essential medicines is closely linked to health system performance and its utilization. The non-availability of essential medicines in health facilities is not the only issue. There are problems of affordability and accessibility despite spending a large proportion of resources on medicines (Oyekale, 2017).

Most of the studies suggest that unless procurement and delivery systems of essential medicines are strengthened, mere presence of a NEML (National essential medicines list) will largely be futile. In developing countries, where budgets for medicines are often tight, the supply cycle needs to be well-managed to prevent all types of wastage, including pilferage, misuse and expiry. This wastage reduces the quantity of medicines available to patients and therefore the quality of health care they receive. The expiry of medicines highlights a problem with the supply chain, which includes medicine selection, quantification, procurement, storage, distribution and use. Expiry of medicines in the supply chain is a serious threat to the already constrained access to medicines in developing countries(Maiti, Bhatia, Padhy, & Hota, 2015).

In Uganda, volumes of valuable medicines have expired at the National Medical Stores in district and hospital stores. Such a problem has also been reported in Botswana, India and the United Republic of Tanzania. Poor management of a change in treatment policy was implicated in the expiry of huge stocks. On probing for contributing factors in the supply chain, the main ones included neglect of stock monitoring, lack of knowledge of basic expiry prevention tools and nonparticipation of clinicians in medicine quantification in hospitals. Poor coordination appears to be responsible for some expiry incidents. Medicines with slow and unpredictable turnover are generally prone to expiry. Rigorous vigilance in inventory management and maintenance of minimum stock levels is the best approach to reduce expiry of medicines. Pharmaco-economists favour bulk purchasing for economies of scale. This can lead to overstocking and thus exacerbate expiry. It can however be mitigated by appropriate procurement phasing, lean supply and stock rotation. A lean supply policy would specifically prevent expiry of items with a short shelf life, though its effectiveness requires a robust logistics management information system (Nakyanzi, Kitutu, Oria & Kamba, 2010).

There is a report in Kirinyaga, Kenya, that one of the major constraints found to be associated with the essential drugs program was the delay in procurement or their distribution to the rural (PHC) health facilities (Agwanda, Kwamanga & Kiugu, 2016). Currently, as a trend in the whole country, the pharmacist at the county is usually responsible for pooling orders from individual health care facilities, putting them together, and then making orders to Kenya Medical Supplies Agency (KEMSA) which presently supplies over 4400 PHC facilities in the whole country. Commodities and supplies are distributed to the facilities using a combination of KEMSA vehicles and outsourced transporters. Reports continue indicating frequent stock-outs for key

commodities and supplies at primary facilities. The 2014 assessment of PHC facilities, for example, found that 48% and 27% of surveyed health centers and dispensaries respectively had 16 essential tracer drugs in stock at the time of the survey (WHO, 2017).

2.6 Theoretical Framework

This study uses the principles of the whole systems theory pointed out in 1997 by O'Grady, et al., as cited by Radichel (2018). It argues that the basic tenants of the whole system always define the parts. Each of the components of a system supports the whole system so that a problem in any one part of the system affects the whole system and outcomes always define the value of the process.

Moreover, Weiner (2009) argues that organizational preparedness for change is not only a multi-level construct, but also a multi-faceted one. It is not a homologous multi-level construct and readiness can be more or less present at the individual, group, unit, department, or organizational level and can be theorized, assessed, and studied at any of these levels.

2.7 Conceptual framework

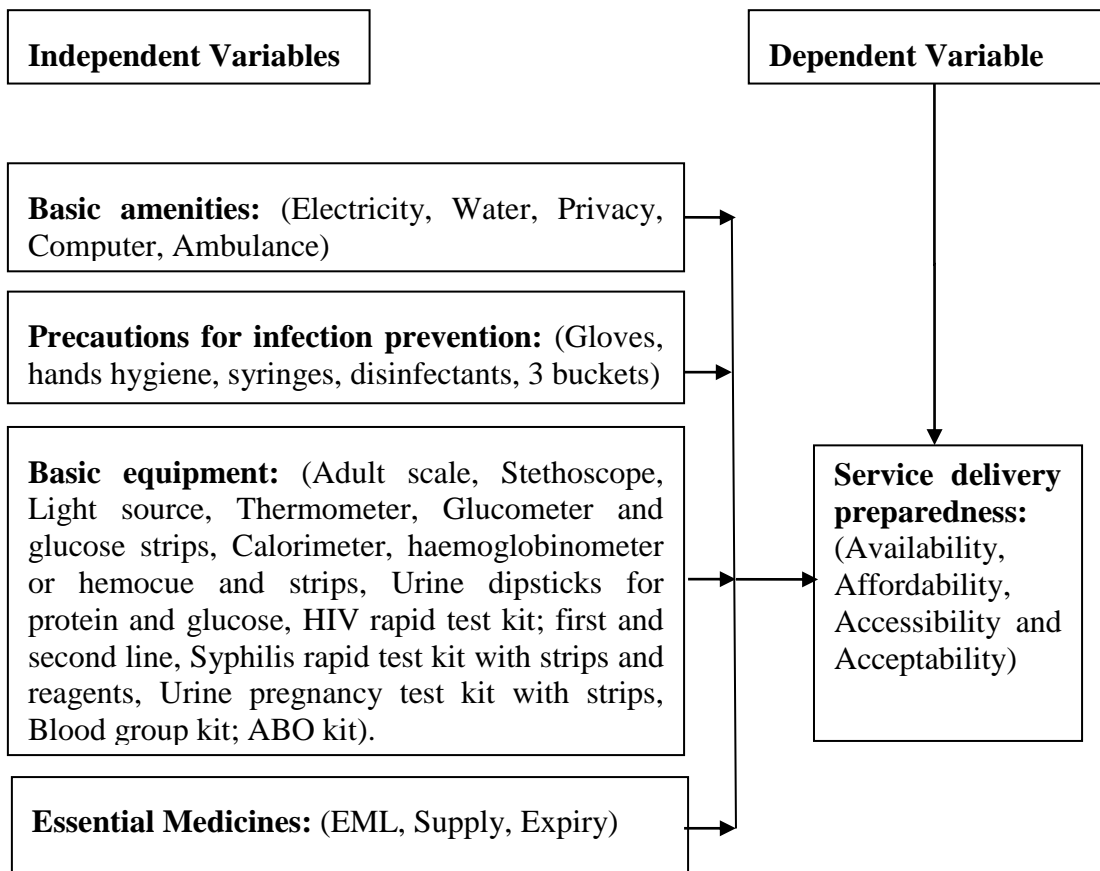


Figure 2.1: Conceptual Framework

The above figure 2.1 shows the relationship between the independent and dependent variables and the measurement parameters involved under each variable.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section outlines the research design, target population, sampling procedure, data collection instruments, methods of data collection, operational definition of variables and data analysis techniques.

3.2 Research Design

A descriptive cross-sectional study was used in this study in Nyandarua County which has five sub counties of which three were sampled for the study. Mugenda and Mugenda (2003), recommends this design because it allows information to be collected without changing the environment, is a suitable way to answer questions, describes a population at a given point in time, is less expensive to conduct and takes lesser time. However, Levin (2006) postulates that it is not the best design to infer causality and gives no indication about the sequence of events because of its nature of being carried out in one point in time.

3.3 Target Population

The target population in the study was 68 officers in charge of the dispensaries and health centers of the County Government of Nyandarua (Appendix VI) who were either clinical officers or nurses. They are usually the first to come into contact with patients and clients from the community when they come for services before referral. The Nyandarua County Government primary health facilities perform 86% (Appendix VIII) of all county government's health facilities workload. The clinical officers and nurses are aware of the outpatient department where the study is confined because that is where they work.

3.4 Sampling Procedure

The desired sample size was 47 clinical officers and nurses in charge of dispensaries and health centres from three sub counties (Olkalou, Ndaragwa and Kinangop- Table 3.1). Nyandarua County has two Sub counties in the South (Kinangop and Kipipiri), two in the north (Oljoro Orok and Ndaragwa) and Olkalau Sub county is centrally located. Through simple random, Kinangop was selected to represent the southern part, Ndaragwa the northern side and Olkalou was purposely selected as the single central region. The study conducted a census for all the 47 primary health facilities from the sampled Sub-counties.

Table 3.1: Sample Distribution

Sub-Counties	Dispensaries			Health Centers			Total Clinical Officers and Nurses
	Facilities	Clinical Officer	Nurses	Facilities	Clinical Officer	Nurses	
Ndaragwa	11	0	11	6	1	5	17
Olkalou	7	0	7	3	1	2	10
Kinangop	14	1	11	6	2	4	20
Total	31	1	30	15	4	11	47

The table above represents the figures of respondents from the three sub counties of Nyandarua County

3.5 Data Collection Instruments

A structured questionnaire was used to collect data through self administration among the 47 in charges or their representatives. Pretesting of the questionnaire was done from 11 health facility in charges through simple random sampling (Appendix XII) in Oljoro- orok and Kipipiri Sub counties which were not included in the final study.

Table 3.2: Pretesting Sample Distribution

Sub County	Number of Primary Health Facility In charges	Criteria (15%)	Pretest Sample (No)
All sub counties	68	10	10
Kipipiri	13	13/21 x 10	6
Oljoro-orok	8	8/21x 10	4
Total of Kipipiri & Oljoro-orok	21		10

The table above shows how the pretesting sample was calculated and the population of officers in charge of the primary health facilities within Kipipiri and Oljoro Orok Sub counties where pretesting was done in Nyandarua County.

3.5.1 Reliability and validity of the data tools

Reliability of the data tools was tested through Cronbach alpha test and the alpha (α) levels were 0.7 which was acceptable according to Mugenda and Mugenda (2003). Similar data collection tools were used across all respondents. The study ensured content validity by deriving relevant representative questions that were in line with the objectives. Data was collected only from the target population, cleaning of data, data coding, correct recording was done and high response rate was also encouraged.

3.6 Methods of Data Collection

All respondents in Kinangop, Olkolou and Ndaragwa sub counties answered questions in the structured questionnaires. Every respondent was asked to fill the structured questionnaire. Each primary health facility had one respondent. In case of absence of the in charge of every facility that was visited, the nurse or clinical officer in charge at the time of data collection was asked to fill the data tool. Where the respondent was not able to fill the questionnaire because of services' demands, the data tool was left to be filled and was collected later. Data collection was done between May and December 2018.

3.6.1 Ethical Consideration

Approval to collect data was granted by Scientific Ethic Review Committee (SERC) of Kenya Methodist University, National Commission For Science, Technology and Innovation- NACOSTI, Ministry of Education, Director of health in Nyandarua County Government(Appendices XIII-XVI) and the health facility in charges (respondents) consented by signing the consent forms (Appendix I). It was explained to them that the data collection was voluntary. Respondents were required not to write their names for confidentiality and questionnaires were coded for anonymity.

3.7 Operational Definition of Variables

The primary health facilities were the dispensaries and health centers. Primary health services imply the outpatient services from reception, consultation, Laboratory and pharmacy service areas only. The independent variables were measured through basic amenities, precautions for infection prevention, basic equipment and essential medicines. Primary health service (Service delivery preparedness), which was the dependent variable, was determined by availability, affordability, accessibility and acceptability.

Basic amenities availability were determined by electricity, water, privacy, computer and emergency transportation; precautions for infection prevention by gloves, hands hygiene, syringes, disinfectants and 3 buckets system; basic equipment by adult scale, thermometer, stethoscope, blood pressure apparatus, light source, glucometer, HIV rapid test kit, syphilis rapid test kit, urine dipsticks, colorimeter, urine pregnancy test kit, urine dipsticks for protein and glucose and blood group kit, while essential medicines by essential medicines list (EML), supply and expiry.

3.8 Methods of Data Analysis

Data was cleaned, coded and entered in SPSS version 25 for analysis. For descriptive statistics, computation was done on a dichotomous approach and data presented in percentages for dependent and independent variables. The study opted for binary logistic regression model and Chi-square statistic in determination of the relationship between independent and dependent variables. The formula for logistic regression model is as follows:

$$f(z) = 1 / (1 + e^{-Z})$$

Where Z is a linear combination of the covariates expressed as:

$$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$$

X_1, X_2, X_3 and X_4 = Independent variables

β_0 = is the intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = are the estimates of increase in the log odds of the dependent variable

(Primary health service delivery preparedness).

In binary logistic ordinal ratio (OR), when $OR=1$ means that there is no effect or difference between the two binary variables on the dependent variables, $OR<1$ means a possible but decreased effect of the effect (intervening) variable but increased effect of the control variable while $OR>1$ means the contrary.

In both Chi- square and logistic ordinal model, every p-value greater than 0.005 means acceptance of the null hypothesis which means that there is no effect of the independent variable on the dependent variable. It means that the independent variable is insignificant. Significant means that the independent variable has an effect, an association or relationship on the dependent variable and the p- value is ≤ 0.05 . If a beta coefficient was positive, then a relationship of the independent variable with the dependent variable was positive and the contrary was true. Tables and figures were used to present the findings in August, 2019.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results and discussions. It comprises descriptive and inferential analysis results. Chi- square measures of association and binary logistic regression were used to arrive at the inferential analysis results. Chi- square measure of association and binary logistic regression were used to the association and prediction of independent variables on dependent variables respectively.

4.2 Response Rate

The study included 47 health facility in charges out of which data from 46 Clinical officers and, or nurse in charges from 46 health centers and dispensaries were successful completed. This was 98% response rate which was adequate on account of the threshold of 50% suggested by Mugenda and Mugenda (2003) and is therefore better enough to provide validity of generalizations on the entire population.

4.3 Demographic Data

This section presents the demographic data on the respondents. These include respondents' gender, age brackets and the type of the health facilities they worked. These finding were crucial in putting into context the results of the study in terms of the health workers' demographic characteristics; especially worth noting that health workforce is one of the key pillars of a health system.

4.3.1 Gender of the Respondents

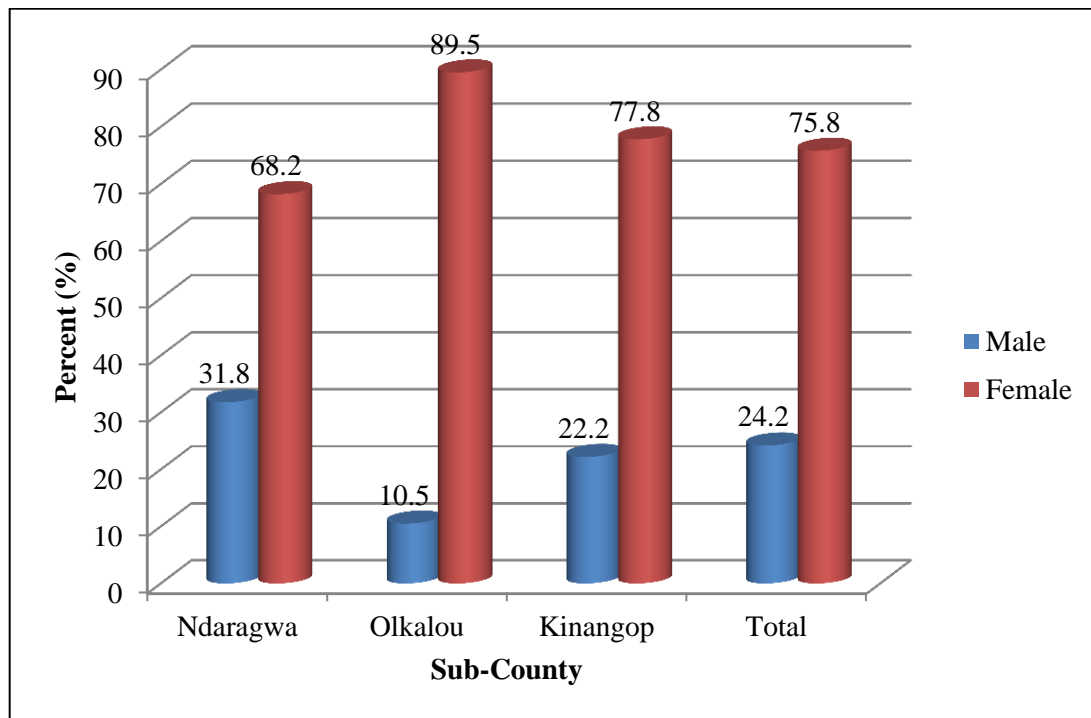


Figure 4. 1: Gender of the Respondents

Figure 4.1 above shows that majority 34 (76%) of the respondents were females while males were 12 (24%). The results indicate that across all sub-counties, female respondents were more as compared to male respondents. The study findings established that majority of the nurses in the study area were female. It is worth noting that there is a very wide gap of inequality between male and female in terms of gender because of the overpopulation of females in the nursing profession.

4.3.2 Age Bracket of the Respondents

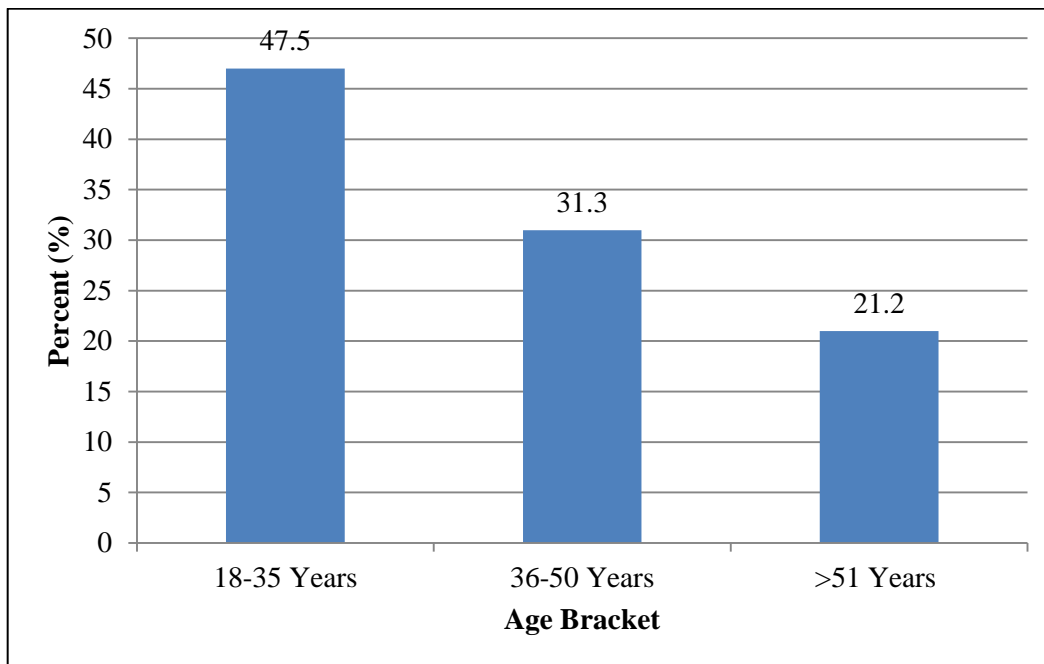


Figure 4.2: Age Bracket of the Respondents

The figure 4.2 above shows that the majority who were 22 (48%) of the respondents were youths (18-35 years), 14 (31%) were between 36-50 years while the rest who were 10 (21%) were 51 years and above. The findings show that the majority of the health workers in dispensaries and health centers were youths and the middle aged were almost a third. This finding gives hope for the filling of employment gaps arising from retirement. This is important for succession management because of the youths being the majority and fewer officers being close to the exit due to retirement age.

4.3.3 Health Facilities of the Respondents

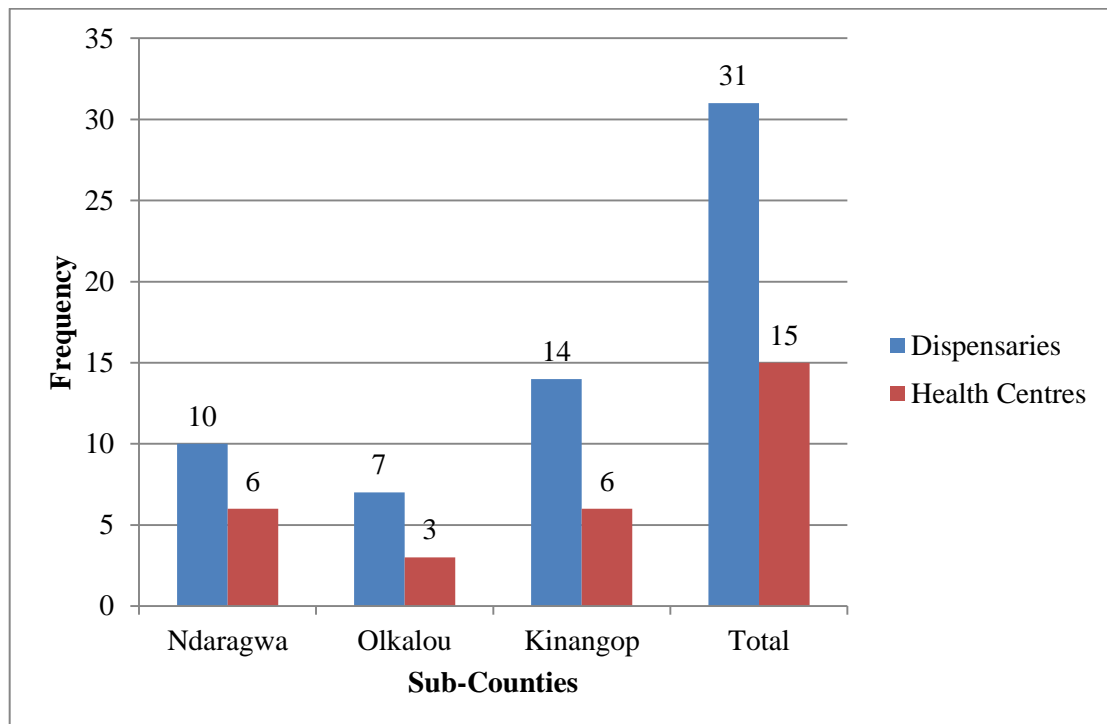


Figure 4.3: Health Facilities

The figure 4.3 above shows that the majority (67%) of primary health facilities were dispensaries which mean that several facilities require further development in view of upgrading them so as to increase their scope and availability of service.

4.4 Descriptive Analysis

This section presents the descriptive analysis for all the independent variables and the dependent variable. In this section, percentages were employed to analyze the responses.

4.4.1 Basic Amenities

The first objective of the study was to determine the influence of basic amenities on public primary health facilities service delivery preparedness in Nyandarua. The results are presented in table 4.3 below.

Table 4.3: Descriptive Results for Basic Amenities

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	N %	N %	N %	N %	N %
Health facility connected and supplied with the electric power from the national grid	9 (20)	0(0)	1 (2)	3 (7)	33 (72)
Health facility has an alternative readily available electric power supply back up in case of a breakdown or disruption of the main electric power source	34 (74)	8 (17)	1 (2)	1 (2)	2 (4)
Health facility has a protected or safe water source within its premises supplying water throughout the year without disruptions	7 (15)	11 (24)	1 (2)	8 (17)	19 (41)
A room available for patient consultation with auditory and visual privacy	1 (2)	4 (9)	3 (7)	12 (26)	26 (57)
Health facility has a functional computer with ready access to internet/ email.	24 (52)	9 (20)	6 (13)	4 (9)	3 (7)
Health facility has an ambulance accessible within a reasonable distance and response time for emergency evacuation or referral	15 (33)	4 (9)	4 (9)	17 (38)	5 (11)

The table above shows the descriptive results for basic amenities in the primary health facilities of Nyandarua County.

The results show that 36 (78%) of the respondents agreed and strongly agreed that the health facilities were connected and supplied with the electric power from the national grid. However, more than three quarter 43 (94%) strongly disagreed that the health facilities had an alternative readily available electric power supply back up in case of a breakdown or disruption of the main electric power source which is more than double in

the finding of Essendi et. al. (2015) that some 40 % of health facilities in Eastern province did not have either an uninterrupted electricity supply or a generator with fuel.

However, the connection of electricity to the national grid in Nyandarua public primary health facilities was better; more than four times the Bangladesh community clinics (CCs) which were at 20% according to National Institute of Population Research and Training [NIPORT] (2016). The findings of primary health facilities in Nyandarua County Government on connectivity to the electricity in the national grid disagrees with the report of Mutisya (2018) that places public health institutions electricity connection at 66%.

Some 59% (27) respondents agreed and strongly agreed that the health facilities had a protected or safe water source within its premises supplying water throughout the year without disruptions. This finding shows that 19 (41%) of the facilities does not have such kind of water. This is slightly better than the findings by O'Neill, Takane, Sheffel, Zahr and Boerma (2013) who found out that about 38% of healthcare facilities did not have an improved water source. The level (59%) of the protected or safe water in Nyandarua primary health facilities confirms the findings of Essendiet. al. (2015) that only 58 % of all hospitals in the country had an all-year supply of water. However, 38 (83%) agreed and strongly agreed that their health facilities had a room available for patient consultation with auditory and visual privacy. This is contrary to Hughes (2016) finding that in most medical offices or hospital reception areas, speech privacy is virtually nonexistent.

The results further show that about half of the facilities had an ambulance accessible within a reasonable distance and response time for emergency evacuation or referral because 22 (49%) agreed and strongly agreed while almost the same number 23 (51%) disagreed and strongly disagreed about it yet according to the Kenyan Ministry of Health, referral system provides that patient cases that cannot be handled by lower level facilities are referred up the service delivery pyramid, making the availability of ambulance services critical. Emergency referral is one of the “Linda mama” program service entitlements and the level of availability of the ambulance in the primary facilities of Nyandarua puts in question the success of the initiative. The findings in this study disagree with a survey by KIPPRA (2018) that found that 72.1 per cent of the facilities had ambulances though about 50% of these facilities could not promptly respond to emergencies when they occurred mainly because fuel availability for emergency transport stood at an average of 66%.

Some 39 (85%) of the health facilities do not have a functional computer with ready access to internet or email because majority of respondents disagreed and strongly disagreed about its existence which deviates from O'Connor (2012) who postulated that medicine practice today requires maintaining uninterrupted internet wireless networking. In the overall, the results show that some basic amenities were adequate while other were inadequate among the primary health facilities in Nyandarua County.

This shows that some health facilities in Nyandarua County are missing essential basic amenities critical to the health service delivery and reaffirms the Hansard report of the Nyandarua county assembly (2015) that their health system has some touching and emerging issues attributable to the neglect the health facilities have suffered from the

national and now the county government. Omboki (2019) noted that even the pictures depicting the health facilities were pathetic, yet the GoK is in the process of initiating UHC which focuses on PHC; a domain of counties.

The overall availability of basic amenities in Nyandarua county government primary health facilities score is less than half (49%). These findings support those of Goldman and Romley (2008) who found that some amenities like clean, accessible restrooms and privacy curtains in examination rooms are considered luxuries in most of the lesser developed countries' health care settings, though they are nevertheless important for attracting, retaining clients and for ensuring continuity and coverage.

4.4.2 Infection Control Measures

The second objective of the study was to determine the effect of infection control measures on public primary health facilities service delivery preparedness in Nyandarua County. This section presents the descriptive results to show the extent of infection control measures as presented in Table 4.4 below.

Table 4.4: Descriptive Results for Infection Control Measures

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	N %	N %	N %	N %	N %
Health facility has PPE supplied throughout the year	1 (2)	2 (4)	1 (2)	8 (17)	34 (74)
Available soap and running water in the clinical area supplied throughout the year	1 (2)	4 (9)	1 (2)	13 (29)	26 (58)
Conspicuously and strategically placed signs near sinks and hand sanitizers with the “5 moments of hands washing” or other reminders in the clinical/ outpatient room	8 (17)	9 (20)	6 (13)	11 (24)	12 (26)
Health facility have alcohol-based hand rub placed strategically in the clinical area/ room	1 (2)	1 (2)	0 (0)	18 (39)	26 (57)
Health facility have no any other syringes in the clinical and/ or injection room/ area for use apart from auto-disable syringes with a re-use prevention feature	2 (4)	0 (0)	0 (0)	8 (17)	36 (78)
Health facility has an environmental disinfectant (e.g. Chlorine, alcohol) for use?	2 (4)	0 (0)	3 (7)	9 (20)	32 (70)
Health facility has a three buckets system for use placed in the clinical area	0 (0)	5 (11)	2 (4)	14 (30)	25 (54)

The table above shows the descriptive results for infection prevention control measures in the primary health facilities of Nyandarua County.

When the respondents were asked whether primary health facilities had unused, clean, adequate and ready for use disposable latex gloves or their equivalent for personal hands protection (PPE) supplied throughout the year, 42 (91%) of them agreed and strongly agreed that the gloves were available throughout the. Most (87%) of the respondents agreed and strongly agreed that their health facilities had soap and running water in the clinical area supplied throughout. This contradicts the view of WHO (2018) that 35% of healthcare facilities do not have even water and soap for hands washing.

The study further sought to find out whether there were conspicuously and strategically placed signs near sinks and hand sanitizers with the “5 moments of hands washing” or other reminders in the clinical or the outpatient room. The results showed that 23 (50%) agreed and strongly agreed which indicates that these signs are conspicuously and strategically missing in several health facilities. However, some 96% of respondents agreed and strongly agreed that their health facilities had alcohol-based hand rub placed strategically in the clinical area/ room. A similar number, 44 (96%) agreed and strongly agreed that their health facilities have no any other syringes in the clinical and/or injection room/ area for use apart from auto-disable syringes with a re-use prevention feature.

This favour the Siegel, Rhinehart, Jackson and Chiarello, as cited by Grissinger, (2013) that all health staff members should understand that any form of syringe or needle re-use is dangerous and should be avoided. However, the 2 (4%) who strongly disagreed that the health facilities have no any other syringes in the clinical and/ or injection room/ area for use apart from auto-disable syringes with a re-use prevention feature surpasses the Grissinger (2013) findings which also cited Pugliese, Gosnell, Bartley and Robinson who had concluded that nearly 1% of health workers sometimes or always reused a syringe for more than one patient after changing only the needle.

Some 41 (90%) of the health facilities agreed and strongly agreed that their health facilities had an environmental disinfectant (e.g. Chlorine, alcohol) for use and almost similar number 39 (85%) agreed and strongly agreed that they had a three buckets system for use placed in the clinical area. These findings confirmed that majority (85%) of the primary health facilities in Nyandarua County had infection control precautionary measures in place. This negates the findings by O’Neill, Takane, Sheffel, Zahr & Boerma (2013) that almost half (47.7%) of the health facilities in the Sub-Sahara did not fulfill the criteria for infection prevention supplies. This abide by WHO (2006) recommendation that together with practices carried out by health workers when giving care, all persons (including patients and visitors) should adhere to infection control practices in health-care settings.

4.4.3 Basic Equipment

The study further sought to find out the influence of basic equipment on public primary health facilities service delivery preparedness in Nyandarua County as shown in Table 4.5 below

Table 4.5: Descriptive Results for Basic Equipment

	Strongly Disagree	Disagr ee	Neutra l	Agree	Strongly Agree
	N %	N %	N %	N %	N %
Adult scale	4 (9)	4 (9)	1 (2)	9 (20)	28 (70)
Stethoscope	2 (4)	0 (0)	0 (0)	10 (22)	34 (74)
Light source	18 (39)	8 (17)	2 (4)	5 (11)	13 (28)
Thermometer	1 (2)	0 (0)	0 (0)	11 (24)	34 (74)
Glucometer & glucose strip	9 (20)	4 (9)	1 (2)	13 (28)	19 (41)
Haemoglobinometer or Hemocue and strips	18 (39)	5 (11)	2 (4)	7 (15)	14 (30)
Urine dipsticks for protein and glucose	14 (30)	6 (13)	0 (0)	6 (13)	20 (44)
HIV rapid test kit; first and second line	2 (4)	1 (2)	0 (0)	9 (20)	34 (74)
Syphilis rapid test kit with strips and reagents	11 (24)	7 (15)	0 (0)	9 (20)	19 (41)
Urine pregnancy test kit with strips	14 (30)	3 (7)	0 (0)	10 (22)	19 (41)
Blood group kit; ABO kit	17 (37)	4 (9)	1 (2)	6 (13)	18 (39)

The table above shows the descriptive results for basic equipment in the primary health facilities of Nyandarua County.

Only about 37 (80%) agreed there was an adult scale, 44 (96%) for stethoscope, 18 (39%) for light source and 45 (98%) for the thermometer. This surpasses Nigeria where the functional stethoscopes were reported at 77.22% of the health care facilities. This Nigerian study found out that adult weighing scale and thermometers were available in 94.5% and 91.0% respectively of the health facilities in Anambra state according to Oyekale (2017) and compares with Nyandarua (2017) which was 80%. It was realized that it was more than (78%) of the above equipment which are usually found in the consultation area that were available.

All this basic equipment were available in majority of the primary health facilities having the light source scoring the least. At the same time, all the laboratory basic equipment which are usually used for the antenatal clinic (ANC) profiling for pregnant women in the “Linda mama” programme service entitlement. Glucometer & glucose strips scored 32 (70%), Haemoglobinometer or Hemocue and strips 21 (46%), Urine dipsticks for protein and glucose 26 (57%), HIV rapid test kit; first and second line 43 (94%), Syphilis rapid test kit with strips and reagents 28 (61%), Urine pregnancy test kit with strips 29 (63%) and Blood group kit; ABO kit 24 (52%).

The finding in this section demonstrates that majority (63%) of the primary health facilities in Nyandarua County had basic equipment for service delivery and this could be an indicator for the performance of “Linda mama” program for pregnant women. The finding is inconsistent with Carter, Lema, Wangai, Munafu, Rees and Nyamongo (2012) that most health facilities are situated in the rural areas and that these health facilities have considerable constraints in establishing laboratory units and supporting their operations.

Both groups of the basic equipment (that is equipment used in the reception/ consultation and those used in the laboratory for antenatal care profiling for pregnant women) in this objective scored more than 2/3 (69%) notwithstanding that Ademe, Tebeje and Molla (2016) argued that the expectation of healthcare seekers is that the equipment used in the facilities are enough, clean and safe. The county's level (69%) of basic equipment is lower than the findings by Sabit, Abazinab, Woldie and Alaro (2016) that majority (85.2%) of the public health facilities in Africa fulfilled the criteria for basic equipment despite Kaur, Hall and Attawell (2001) who note that medical equipment have a critical role and impact on the quality of patient care though it is also insinuated that medical equipment are often given little attention.

However, the level of basic equipment in Nyandarua contradicts what was found out by a joint survey by KMPDB (Kenya medical, pharmacists and dentists board), WB (World Bank), MOH (Ministry of health) and economic survey as indicated by Mutisya (2018) that 75% of public health facilities have minimum basic equipment.

4.4.4 Essential Medicines

This study also sought to evaluate the contribution of essential medicines on public primary health facilities service delivery preparedness in Nyandarua County as shown in Table 4.6 (a) below which presents the results for management issues on essential drugs.

Table 4.6: (a) Descriptive Results for Essential Medicines

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	N%	N%	N%	N%	N%
Health facility/ Pharmacy department have the current essential medicines list (EML)-soft or hard copy	10 (22)	5 (11)	3 (7)	10 (22)	17 (38)
Health facility has enough supply of all RELEVANT/ PRIORITY essential medicines throughout the year	9 (20)	14 (31)	5 (11)	7 (15)	10 (22)
The health facility doesn't get supply of medicines it hasn't ordered; it doesn't get a supply of medicines in excess of what it has ordered	7 (15)	9 (20)	4 (9)	15 (33)	11 (24)
Supplies of medicines don't take unreasonable longer lead time (Lead time is the time between ordering and delivery).	7 (15)	14 (30)	4 (9)	16 (35)	5 (11)
The facility doesn't get a supply of any drugs whose shelf life is likely to expire before issuance to patients.	3 (7)	6 (13)	5 (11)	19 (41)	13 (28)
The facility had never had cases of medicines expiring in the store?	5 (11)	9 (20)	5 (0.9)	17 (38)	9 (20)

The table above shows the descriptive results for essential medicines management issues in the primary health facilities of Nyandarua County.

The results showed that less than two thirds 27 (60%) agreed and strongly agreed that their health facilities had the current essential medicines list (EML) in either soft or hard

copy. About half 26 (57%) agreed and strongly agreed that the health facilities do not get supply of medicines it hasn't ordered and it doesn't get a supply of medicines in excess of what it has ordered while slightly over a third disagreed and strongly disagreed which may mean that some facilities may be getting a "push" supply as opposed to the pull supplies. The study further sought to establish whether supplies of medicines don't take unreasonable longer lead time (Lead time is the time between ordering and delivery). Almost equal number of respondents agreed and strongly agreed 21 (46%) while others 25 (54%) disagreed and strongly disagreed implying that some health facilities experienced longer lead time.

Majority 32 (70%) agreed and strongly agreed that their health facility doesn't get a supply of any drugs whose shelf life is likely to expire before issuance to patients but some 14 (30%) disagreed and strongly disagreed about it. More than half (58%) agreed and strongly agreed that the facilities had never had cases of medicines expiring in the store but almost a third disagreed and strongly disagreed which agrees with Maiti, Bhatia, Padhy, and Hota (2015) who noted that lack of access to essential drugs, irrational use of drugs and poor drug quality remain serious global public health problems.

Further, they have noted that the expiry of medicines highlights a problem with the supply chain, which includes medicine selection, quantification, procurement, storage, distribution and use. Expiry of medicines in the supply chain is a serious threat to the already constrained access to medicines in developing countries. The overall above managerial issues on essential medicines were 55%.

The availability of essential medicines was as presented in Table 4.6 (b) below.

Table 4.6: (b) Descriptive Results for Essential Medicines

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	N %	N %	N %	N %	N %
Amoxicillin tablets/ capsules	5 (11)	3(7)	0(0)	11(24)	27 (59)
Ampicillin powder for injections	21 (47)	11 (24)	0(0)	3(7)	10 (22)
Aspirin (capsules/ tablets)	5 (11)	6 (13)	0(0)	13 (28)	22(48)
Beclometasone inhalers	16 (35)	10(21)	1 (2)	10 (22)	6 (20)
Beta blockers (e.g. bisoprolol, metoprolol, carvedilol, atenolol)	9 (20)	4 (9)	2 (4)	11 (24)	19 (42)
Carbamazepine tablets	5 (11)	6 (13)	2 (4)	13(28)	20 (44)
Ceftriaxone injections	9 (20)	9 (20)	0 (0)	10 (22)	18 (39)
Diazepam injections	12 (26)	6 (13)	0 (0)	13 (28)	15 (33)
Enalapril tablets or alternative ACE inhibitors (e.g. lisinopril)	4 (9)	2 (4)	1 (2)	14 (30)	25 (54)
Ramipril, perindopril)	24 (55)	9 (20)	1 (2)	6 (14)	4 (9)
Fluoxetine tablets					
Gentamicin injections	3 (7)	1 (2)	0 (0)	13 (29)	28 (62)
Glibenclamide tablets	2 (4)	3 (7)	0 (0)	13 (29)	28 (70)
Haloperidol (oral/ injectables)	23 (51)	4 (9)	0 (0)	6 (13)	12 (27)
Magnesium sulfate injectables	12 (27)	5 (11)	0 (0)	11 (24)	17 (38)
Metformin tablets	1 (2)	2 (4)	0 (0)	13 (29)	29(64)
Omeprazole tablets or alternatives (e.g. pantoprazole, rabeprazole)	2 (2 4)	1 (2)	0 (0)	19 (41)	24 (52)
Oral rehydration solution/ powder	3 (6.7)	4 (9)	0(0)	11 (24)	27 (60)
Oxytocin injections	3 (7)	1 (2)	0 (0)	10 (22)	32 (70)
Salbutamol inhalers	5 (11)	7 (16)	2 (4)	10 (22)	21 (47)
fluvastatin) Thiazides (e.g. hydrochlorothiazide)	8 (18)	4 (9)	0(0)	9 (20)	23 (52)
Zinc sulphates (tablets or syrups)	1 (2)	3 (7)	0 (0)	11 (24)	30(67)

The table above shows the descriptive results for the availability of essential medicines in the primary health facilities of Nyandarua County.

Considering the agree and strongly agree answers on the available essential medicines, availability of Amlodipine tablets or alternative calcium channel blockers was 26 (57%), Amoxicillin (syrups/suspensions or dispersible tablets) 43 (94%), Amoxicillin tablets/capsules 38 (83%), Ampicillin powder for injections 13 (29%), Aspirin (capsules/tablets) 38 (76%), Beclometasone inhalers 19 (41%) and Beta blockers (e.g. bisoprolol, metoprolol, carvedilol, atenolol) 30 (67%).

Carbamazepine tablets scored 33 (72%), Ceftriaxone injections 28 (70%), Diazepam injections 28 (70%), Enalapril tablets or alternative ACE inhibitors (e.g. lisinopril, Ramipril, perindopril) 39 (85%), Fluoxetine tablets 10 (23%), Gentamicin injections 41 (92%), Glibenclamide tablets 41 (89%), Haloperidol (oral/ injectables) 18 (40%), Magnesium sulfate injectables 28 (62%), Metformin tablets 42 (93%), Omeprazole tablets or alternatives (e.g. pantoprazole, rabeprazole) 42 (94%), Oral rehydration solution/ powder 39 (85%), Oxytocin injections 42 (92%), Salbutamol inhalers 31 (69%), Simvastatin tablets or other statin (e.g. atorvastatin, pravastatin, fluvastatin) 10 (22%), Thiazides (e.g. hydrochlorothiazide) 32 (73%) and Zinc sulphates (tablets or syrups) 42 (91%).

In the overall, the availability of essential medicines in the health facilities was 67% but the average score for the essential medicine's objective including the managerial issues of essential medicines was 64%. That notwithstanding only 38% of the health workers agreed and strongly agreed that health the facilities have enough supply of all relevant or priority essential medicines throughout the year which means that about two thirds (62%) of them attest that the supply of essential medicines is not steady and constant.

Nascimento et. al.(2017) points out that the appropriate pharmacological treatment significantly reduces morbidity and mortality arising from non-communicable diseases (CNCD) but this study has found out that the average score (55 plus 67%) on essential medicines is lower than 80% which is the recommended level for the global goals on availability of essential drugs and basic technologies for the control these diseases.

This attests to Maina's (2018) sentiments that patients in the past have severally protested health services citing lack of essential drugs as an example at a time when the World Health Organization (2012) and World Bank (2010) acknowledges that 40 million deaths globally have been reported in 1 year alone in developing countries, yet most the leading causes of death and disability can be prevented or treated with cost effective essential drugs.

Some of the least available essential medicines were available in less than 30% of the health facilities which ascertains a report by WHO (2017) that indicated that frequent stock-outs for key commodities and supplies at primary facilities continue to be experienced with its 2014 assessment of PHC facilities which found that in Kenya 48% and 27% of surveyed health centers and dispensaries respectively had 16 essential tracer drugs in stock at the time of the survey.

The availability of Simvastatin tablets was 21%, Fluoxetine tablets 23%, Ampicillin powder for injections 29%, Beclometasone inhalers 42% and Haloperidol (40%) were the medicines that were available in less than half (50%) of the health facilities yet Nakyanzi, Kitutu, Oria and Kamba, (2010) emphasizes that access to essential medicines is closely linked to health system performance and its utilization.

4.4.5 Primary Health Service Delivery Preparedness

This section analyses the health service delivery preparedness among the public primary health facilities in Nyandarua County on affordability, accessibility and acceptability as shown in table 4.7 below.

Table 4.7: Descriptive Results for Health Service Preparedness

	Strongly Disagree N %	Disagree N %	Neutral N %	Agree N %	Strongly Agree N %
All primary health outpatient services are available to patients at any given time.	15 (33)	15 (33)	2 (4)	5 (11)	8 (18)
At no any time is the patient required to buy for himself or herself required and unavailable commodities like drugs outside the health facility	16 (36)	21 (47)	4 (9)	2 (4)	2 (4)
Facility is accessible within its catchment through a vehicle by road in all seasons throughout the year	15 (33)	17 (38)	5 (11)	3 (7)	5 (11)
There's no any service offered in this facility that could be morally, socially, culturally, ethically or spiritually unacceptable by some community members	5 (11)	14 (31)	3 (7)	11 (24)	12 (27)

The table above shows the descriptive results for the service delivery preparedness in the primary health facilities of Nyandarua County.

The study revealed that 32 (70%) of respondents disagreed, strongly disagreed and were neutral that all primary health services were available to the clients which means that only less than a third (30%) agreed and strongly agreed that all primary health services sought by the populations are available in the health facilities. This notwithstanding the WHO (2017) finding that health service delivery is one of the building blocks of any health system and is concerned with how inputs and services are organized and managed but agrees with their findings that globally some dimensions of health service availability or otherwise their readiness are available while others may still be in the early stages.

Some 41 (90%) of the health workers agreed, strongly agreed and were neutral that at no time were the customers required to buy outside the health facility a required but unavailable health commodity like medicines which means that only 10% said that all commodities for a primary health service were available. The study also sought to find out from the respondents whether their health facilities were accessible within their catchments through a vehicle by road in all seasons throughout the year. Majority who were 37 (82%) of the health facilities were inaccessible through a vehicle by road in all seasons throughout the year.

On whether there was any primary health service offered in the health facilities that could be morally, socially, culturally, ethically or spiritually unacceptable by some community members, it was established that 22 (50%) of the respondents agreed and strongly agreed that the primary health services were acceptable by the catchment population. Some 42% disagreed and strongly disagreed that the services were acceptable to the community served by the health facilities.

Most of these cited resistance from the controversial religious groups who did not believe in getting contemporary health care but believed in divine healing without the health care system interventions. though the existence of this groups might not be as many as the percentage of those who disagreed and strongly disagreed (47%), it only means that these groups are spread across the whole county of Nyandarua such that their effect and cognizance is felt in every corner which necessitates the view of WHO (2017) that people-centered health services should focus and be organized around the health needs and expectations of the people rather than on diseases.

In the overall, the primary health service preparedness scored 27% on the average yet the WHO (2017) mentions the health service delivery as one of the main building blocks of any health system and confirms the argument that some dimensions of health service are available while others may still be in the early stages. It also confirms the view of the World Bank (2017) that health outcomes are unacceptably low especially in much of the developing world despite all the huge health investments and wide gaps still exist in the availability of health services in the Sub-Saharan Africa and Southern Asia. It also validates the view of Bitton, et. al. (2016) PHC capacity is lacking in many Low- and middle-income countries (LMIC) and these gaps continue to be exacerbated.

The low (27%) primary service delivery preparedness found out in this study, could be a confirmation why the NHIF (2017) had accredited only 19% of the Nyandarua County Government's primary health facilities. If this is something to go by, then it may be noted that since, the level of service delivery preparedness has then increased by 8% for about the last two years.

The Primary health facilities are however key in a health system because of the WHO (2018) that a strong PHC health system model delivers better outcomes than all other models though PHC performance has been unequal due to under investments, misconceptions and lack of political will, while only 36% of total health budget goes to infrastructure, medical equipment and vehicles across the globe.

4.5 Inferential Statistics

This section presents the results on the inferential statistics conducted to test the association between the dependent and the independent variables. The study used chi-square measure of association and binary logistic regression analysis to test the association of basic amenities, infection prevention control measures, basic equipment and essential medicines on primary health service delivery preparedness.

4.5.1 Chi-Square Measures of Association

Chi-square was conducted to measure the association between independent variables and dependent variables. The results of chi-square analysis are presented in Table 4.8 below.

Table 4.8: Chi-Square Measures of Association

Variable	N	Chi-Square (χ^2)	df	P-value
Basic Amenities	46	4.804	1	0.028
Infection Prevention and Control	46	1.204	1	0.272
Basic Equipment	46	10.369	1	0.001
Essential Medicines	46	10.090	1	0.002

Dependent Variable: Service Delivery Preparedness

The table above shows the Chi- square measures of association between the independent and the dependent variables in the primary health facilities of Nyandarua County.

It was revealed that there's a significance ($p < 0.005$) between basic amenities and primary health service delivery preparedness. These findings support those of Goldman and Romley (2008) who found that some amenities are important for attracting and retaining clients and for ensuring continuity and coverage. The low (49%) availability of basic amenities point to Essendi et. al. (2015) who found out that Kenya was one of the sub-Saharan African countries lagging behind in reaching the fourth and fifth MDGs attributable to lack of basic infrastructure especially in rural Kenya.

Infection control prevention measures were insignificant ($p > 0.005$) to the primary health services preparedness contrary to common expectations. However, basic equipment had a significant effect ($p < 0.005$) on the primary health service preparedness. The findings mean that having basic equipment increases the level of health service preparedness in primary health facilities. The finding concurs with those of Raj, (2009) who inferred that inadequate or non-availability of facilities, equipment and resources especially basic resources could be said to be responsible for substandard care.

The study further established that essential medicines had a significance ($p < 0.005$) association on service preparedness. The finding established that increasing essential medicines availability increases health facilities level of service delivery preparedness. The study finding agreed with those of Maiti, Bhatia, Padhy & Hota (2015) who noted that lack of access to essential drugs, irrational use of drugs and poor drug quality remain serious global public health problems. The study finding also agreed with Nakyanzi, Kitutu, Oria and Kamba, (2010) who found that access to essential medicines is closely linked to health system performance and its utilization.

4.5.2 Univariate Binary Logistic Regression

This section presents the results for univariate binary logistics that test the effect of each independent variable on the dependent variable. The study used binary logistic model because the variables were categorical hence this regression analysis was considered appropriate results are indicated in Table 4.9 below.

Table 4.9: Univariate Binary Logistics Regression Results

Variable	B	S.E	Odds Ratio	P Value
Basic Amenities				
Inadequate Basic Amenities (ref)			1.000	
Adequate Basic Amenities	1.578	0.754	0.206	0.036
Infection Prevention and Control Measures				
Inadequate Infection Prevention and Control Measures (ref)			1.000	
Adequate Infection Prevention and Control Measures	0.916	0.853	0.400	0.283
Basic Equipment				
Unavailable Basic Equipment (ref)			1.000	
Available Basic Equipment	2.162	1.100	8.684	0.049
Essential Medicines				
Essential Medicines Not available (ref)			1.000	
Essential Medicines Available	0.129	1.208	2.336	0.015
Significance P < 0.05			Sample size= 46	

The table above shows the logistic regression univariate relationships between the independent and the dependent variables in the primary health facilities of Nyandarua County.

Health facilities with basic amenities were 0.206 times more prepared in primary health service delivery than those without. The results further show that there was a significant association between having basic amenities and primary health service delivery preparedness in public primary health facilities ($p < 0.05$) hence supporting the findings

by Goldman and Romley (2008) who found that some amenities are important for attracting and retaining clients and for ensuring continuity and coverage.

The study also sought to establish the effect of infection prevention control measures on level of primary health service delivery preparedness among the public primary health facilities in Nyandarua County. It showed that primary health facilities with adequate infection prevention control measures were 0.400 (Odds Ratio=0.400) more prepared in-service delivery compared to those with inadequate health facilities. However, the results showed that the effect of infection prevention control measures on primary health service delivery preparedness was insignificant ($p>0.05$).

The third objective of the study was to determine the influence of basic equipment on primary health service delivery preparedness. The Health facilities with basic equipment were 8.684 times more prepared in primary health service delivery than those without adequate basic equipment. The results further show that basic equipment had a positive and a significant effect ($p<0.05$) on primary health service delivery preparedness. The finding is consistent with those of Kaur, Hall and Attawell (2001) who found that medical equipment have a critical role and impact on the quality of patient care who also insinuated that medical equipment are often given little attention.

The study further conducted univariate binary logistic regression to test the influence of essential medicines on primary health service delivery preparedness. It was noted that primary health facilities with essential medicines were 2.336 more likely to be prepared for delivery of primary health service as compared to those with inadequate essential medicines. The findings show that essential medicine influenced the level of service

delivery preparedness among the primary health facilities in Nyandarua County. These finding supports those of Maiti, Bhatia, Padhy, and Hota (2015) who noted that lack of access to essential drugs, irrational use of drugs and poor drug quality remain serious global public health problems.

4.4.3 Multivariate Analysis Logistic Regression

This section presents the findings of multivariate binary logistic regression analysis for the joint relationships of basic amenities, infection prevention control measures and basic equipment and essential medicines on primary health service delivery preparedness as shown in Table 4.10 below.

Table 4.10: Multivariate Logistics Regression Analysis

Variable	B	S. E	Odds Ratio	P Value
Basic Amenities				
Inadequate Basic Amenities (ref)			1.000	
Adequate Basic Amenities	1.164	0.832	0.312	0.002
Infection Prevention Control Measures				
Inadequate Infection Prevention Control Measures (ref)			1.000	
Adequate Infection Prevention Control Measures	0.337	0.943	1.401	0.105
Basic Equipment				
Unavailable Basic Equipment (ref)			1.000	
Available Basic Equipment	1.637	1.166	0.195	0.001
Essential Medicines				
Essential Medicines Not available (ref)			1.000	
Essential Medicines Available	0.317	1.375	0.728	0.010
Significance p <0.05			Sample size= 46	

The table above shows the logistic regression multivariate relationships between the independent and the dependent variables in the primary health facilities of Nyandarua County.

Health facilities with adequate basic amenities were 0.312 times more prepared in-service delivery than those with inadequate basic amenities. The results also show that basic amenities had positive and significant effect on ($p < 0.005$) service delivery preparedness. The study agrees with Latzo (2009) who argued that basic amenities such as electricity are important in ensuring the high level of service delivery preparedness among health facilities.

Primary health facilities with adequate infection prevention control measures were 1.401 more prepared in primary health service delivery preparedness as compared to those with inadequate infection prevention and control measures. However, the results showed that the effect of infection prevention control measures on primary health service delivery preparedness was insignificant ($p > 0.005$) though Baylis and Morgan (2017) and Grissinger (2013) found that it is necessary for health providers to have adequate infection control precautionary measures.

Further, primary health facilities with basic equipment had odds ratio of 0.195 which implied that primary health facilities with adequate basic equipment were 0.195 times more prepared in primary health service delivery than those without adequate basic equipment. The results further show that basic equipment had a positive and a significant effect on ($p < 0.005$) service delivery preparedness. The finding concurs with those of Raj (2009) who inferred that inadequate or non-availability of facilities, equipment and resources especially basic resources could be said to be responsible for substandard care.

Finally, the study results also show that essential medicines had odds ratio of 0.728 which show that primary health facilities with adequate essential medicines were

0.728 more prepared for primary health service delivery as compared to those with inadequate essential medicines. It was realized that influence of essential medicines on primary health service delivery preparedness in primary health facilities in Nyandarua County was significant. The study finding agreed with those of Maiti, Bhatia, Padhy, and Hota (2015) who noted that lack of access to essential drugs, irrational use of drugs and poor drug quality remain serious global public health problems. It also agreed with Nakyanzi, Kitutu, Oria and Kamba (2010) who found that access to essential medicines is closely linked to health system performance and its utilization.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter covers the summary, conclusion and recommendations arrived at from the study. They were all presented based on the specific objectives of the study.

5.2 Summary of Findings

The main objective of this study was to evaluate the determinants of public primary health facilities service delivery preparedness in Nyandarua County with specific objectives to determine the influence of basic amenities, infection control measures, basic equipment and essential medicines on primary health service preparedness. Data was collected between May and December 2018 using structured questionnaires from 46 primary health facility in charges who were either Clinical officers or nurses from the dispensaries and health centers.

The study used descriptive and inferential analysis to test the association and the relationships of basic amenities, infection control measures, basic equipment and essential medicines on primary health service preparedness. Unless the primary health facilities are well prepared for service delivery, there can be too many unnecessary referrals, clients are likely to be put off from seeking health services or the quality of care may be compromised which may distract the intended Universal Health Care (UHC) principles and according to the Ministry of Health (2014), Kenya aims at increasing access of referral systems by increasing the use of primary health services.

5.2.1 Basic Amenities and Primary Health Service Delivery Preparedness

The first objective of the study was to determine the influence of basic amenities on public primary health facilities service delivery preparedness in Nyandarua County. The descriptive findings showed that not all the primary health facilities in Nyandarua County had basic amenities to support the primary health service delivery. The descriptive analysis determined that the county government of Nyandarua primary health facilities scored less than half on the availability of basic amenities. The study established a weak and positive association between basic amenities and service delivery preparedness. The findings show that increasing basic amenities would result to increase in level of primary health service delivery preparedness among the health facilities in Nyandarua County.

5.2.2 Infection Prevention Control Measures and Primary Health Service Delivery Preparedness

The second objective of the study was to determine the effect of infection control measures on public primary health facilities health service delivery preparedness in Nyandarua County.

The findings confirmed that majority of the infection control precautionary measures in the primary health facilities in Nyandarua County were in place. However, both univariate and multivariate binary logistic regression analysis had an insignificant association on primary health service delivery preparedness. The chi square findings also showed the same thing.

5.2.3 Basic Equipment and Primary Health Service Delivery Preparedness

The study further sought to find out the influence of basic equipment on primary health facilities service delivery preparedness in Nyandarua County. The study findings established that basic equipment was available in more than two thirds of the Nyandarua county public primary health facilities. The finding further show that availability of the basic equipment differed from one health facilities to another.

The study found that basic equipment and primary health service delivery preparedness had a strong, positive and significant correlation. The findings also showed that having basic equipment increased the level of primary health service delivery preparedness among the primary health facilities. Therefore, increasing the basic equipment would result to increase in level of primary health service delivery preparedness among the health facilities.

5.2.4 Essential Medicines and Primary Health Service Delivery Preparedness

The study also sought to evaluate the contribution of essential medicines on primary health facilities primary health service delivery preparedness in Nyandarua County. Two thirds of the essential medicines were available in the public primary health facilities of Nyandarua County. The results further revealed that essential medicines and primary health service delivery preparedness had a weak and positive association.

Essential medicines had a positive and significant contribution on the level of primary health service delivery preparedness among the public primary health facilities in Nyandarua County. The findings established that having essential medicines would result

in an increase in the level of primary health service delivery preparedness among the primary health facilities in Nyandarua County.

5.3 Conclusion

Basic amenities were found to be significant which means that they influenced public primary health facilities preparedness for service delivery in Nyandarua County. This meant that by increasing the availability of the basic amenities, the public primary health service delivery preparedness would be increased though the level of availability for basic amenities had gone down since devolution perhaps because of the many new health facilities that have come up after devolution and which are still under development. Some of these new facilities lack connection of electricity to the national grid while more of them lack a power back up or a continuous supply of safe water and an ambulance that is readily accessible within a reasonable distance and response time. Basic amenities may determine preference of a health facility to the potential customers and thereby improve health status of the community because it will reinforce the health seeking behaviour.

Though infection prevention control measures in place has gone up significantly after devolution, it was found to be insignificant in having an effect on the level of public health service delivery preparedness. This means that infection prevention control measures didn't promote the level of public health service delivery preparedness perhaps because care givers over- emphasize infection prevention control measures while under-emphasizing the service delivery preparedness. Therefore, while the infection prevention control measures increase, the public primary health service delivery preparedness decreases. Therefore putting more infection control prevention measures in place cannot increase public primary health service delivery preparedness. However, it can be

assumed that if public primary health service delivery would go up, infection prevention control measures in place would get an effect on service delivery. This shows that infection prevention control measures in place are too high such that they are not proportionate to the preparedness of the primary health service. Some of the gaps existing in infection prevention control measures like the gloves are thought to mean that the supply is not steadily continuous but not total lack of the same. The high level of infection prevention control measures in place and the low service delivery preparedness could be an indicator that the health workers are keener on self-protection from the health acquired infections (HAIs) as compared to service delivery which on the other hand is a direct deliverable for potential customers.

Basic equipment had an influence on primary health service delivery preparedness and therefore significant which is an indicator that improving the level of availability of basic equipment would promote primary health services delivery. Basic equipment availability has gone down since devolution and this could be the reason they are proportionately and positively associated with the low service delivery preparedness. Some of the missing basic equipment like a stethoscope indicates that taking of vital signs during consultation may incapacitate proper judgment for treatment of patients; the reason basic equipments has gone down as the level of service delivery preparedness is also low which is a prove of the whole systems theoretical framework of this study that the basic tenants of the whole system always define the parts and each of the components of a system supports the whole system so that a problem in any one part of the system affects the whole system.

Essential medicines were significant and therefore had a positive contribution towards the primary health service delivery preparedness such that increasing the level of essential medicines availability would increase the level of primary health service delivery preparedness for the public primary health facilities within Nyandarua County. The level of availability of essential medicines has increased since devolution perhaps because it is a direct deliverable for the customers who also happen to be the electorates of the county government where their needs are felt more quickly. It could have improved also because the Counties, unlike before devolution now procure their own medicines. Again, unlike before, the pull, rather than the push method of drugs' procurement has a greater chance of being applied.

Therefore, basic amenities, basic equipment and essential medicines contribute significantly to primary health service delivery preparedness in Nyandarua County unlike the infection prevention control measures which confirms the second theoretical framework that organizational preparedness for change is not only a multi-level construct, but also a multi-faceted one and that it is not a homologous multi-level construct but readiness can be more or less present at the individual, group, unit or a department. Primary health facilities with adequate basic amenities, basic equipment and essential medicines were more prepared to deliver primary health services than those which had inadequate availability.

It has appeared that there are other numerous factors beyond the scope of this study that influence the preparedness of a primary health service delivery. It was also concluded that health service delivery preparedness is still not up to date. This may seriously injure

not only the highly anticipated Universal Health care (UHC) that is to be rolled out soon countrywide but also the vision 2030 and the global health development goals.

5.4 Recommendations from the Study

Arising from the findings, this study has the following recommendations:

- i. Considering the findings that not all the primary health facilities in the Nyandarua County government had basic amenities, basic equipment, infection prevention precautionary measures and essential medicines, this study recommends to the department of health services in the County Government of Nyandarua to consider conducting an audit of all the primary health facilities to take account of more gaps that exist and put in place the appropriate measures to fill them because there were other areas of this study that were limited by the scope of this study.
- ii. The Department of Health in the County government of Nyandarua should work together with the roads' department and other stakeholders to ensure that all the primary health facilities are accessible by road in all seasons to people seeking health services.
- iii. Meanwhile, since accessibility in all seasons by road is low, the department should explore on the possibility of enhancing mobile clinics like beyond zero programme to make services accessible to all.
- iv. The study further recommends to the Department of Health in the County Government of Nyandarua to consider conducting a prior demand analysis for basic requirements and supplies to make prompt plans for the timely and continuous availability of items like essential medicines, laboratory equipment etc. and services throughout the year without interruptions.

- v. Finally, the department of health can explore other additional factors that enhance primary health service preparedness and improve on them for maximum service delivery benefits to the citizens.

5.5 Suggested Areas of Further Study

This section presents more areas suggested for further study as revealed by this study.

Infection Prevention and Control Measures had insignificant effect on health service preparedness among the primary health facilities in Nyandarua County government which conflicts to the studies conducted in different contexts; hence this area need further study to clarify why the infection prevention and control measures has little and dwindling effect on level of health service delivery preparedness.

The study focused on primary health facilities, further studies could be done focusing on hospitals from level 3 to level 5 to establish whether these factors affect level of health service delivery preparedness in those hospitals. The current study was done in one county government in Kenya and since there are 47 counties further studies can be done in the remaining counties to make more generalized conclusions. This study was done in county government primary health facilities and further studies could be done on private and faith based health facilities.

It appeared that more variables than what was the scope of this study influence primary health service preparedness and therefore more of these factors need to be explored. There is need for research for the “Lind mama” which is a free maternity programme for pregnant women considering the low (49%) availability of ambulances and the level

(69%) of laboratory basic equipment used for antenatal clinic (ANC) profiling as service entitlements in Nyandarua County and beyond.

There is need for a study to determine factors influencing the acceptability of primary health services to shed more light why only about half (49%) of respondents think that the primary health services offered in Nyandarua County Government primary health facilities are acceptable.

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APPENDICES

Appendix I: Informed Consent Form

Kenya Methodist University

P. O Box 267-60200

MERU, Kenya

SUBJECT: INFORMED CONSENT

Dear Respondent,

My name is **Haron Mukora Njoroge** and I am a Master of Science (MSc) student from Kenya Methodist University. I am conducting a study entitled: **Determinants of Public Primary Health Facilities Preparedness for Service Delivery in Nyandarua County, Kenya.**

The findings will be utilized to strengthen the health systems in Kenya and other Low-income countries in Africa. As a result, countries, communities and individuals will benefit from improved quality of healthcare services. This research proposal is critical to strengthening health systems as it will generate new knowledge in this area that will inform decision makers to make decisions that are research based.

Procedure to be followed

Participation in this study will require that I ask you some questions and also access all the hospital's department to address the six pillars of the health system. I will record the information from you in a questionnaire check list.

You have the right to refuse participation in this study. You will not be penalized nor victimized for not joining the study and your decision will not be used against you nor affect you at your place of employment.

Please remember that participation in the study is voluntary. You may ask questions related to the study at any time. You may refuse to respond to any questions and you

may stop an interview at any time. You may also stop being in the study at any time without any consequences to the services you are rendering.

Discomforts and risks

Some of the questions you will be asked are on intimate subject and may be embarrassing or make you uncomfortable. If this happens; you may refuse to answer if you choose. You may also stop the interview at any time. The interview may take about 40 minutes to complete.

Benefits

If you participate in this study you will help us to strengthen the health systems in Kenya and other Low-in- come countries in Africa. As a result, countries, communities and individuals will benefit from improved quality of healthcare services. This field attachment is critical to strengthening the health systems as it will generate new knowledge in this area that will inform decision makers to make decisions that are research based.

Rewards

There is no reward for anyone who chooses to participate in the study.

Confidentiality

The interviews will be conducted in a private setting within the hospital. Your name will not be recorded on the questionnaire and the questionnaires will be kept in a safe place at the University.

Contact Information

If you have any questions you may contact the following supervisors:

Musa Oluoch, Eunice Muthoni and Dr. Wanja; Head of the Department of Health Systems Management, Kenya Methodist University- Nairobi campus.

Participant’s Statement

The above statement regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will not be victimized at my place of work whether I decide to leave the study or not and my decision will not affect the way I am treated at my work place.

Name of Participant.....Date.....Signature.....

Investigator’s Statement

I, the undersigned, have explained to the volunteer in a language s/he understands the procedures to be followed in the study and the risks and the benefits involved.

Name of Interviewer: **Haron Mukora Njoroge**

Interviewer’s Signature..... Date.....

Appendix II: Structured Questionnaire

SOCIAL DEMOGRAPHIC INFORMATION FOR RESPONDENT:

1. Gender: Male Female
 Others (Specify):
2. What is your age (in years)? 18- 35 36- 50 51 and above

HEALTH FACILITY INFORMATION:

1. Name of health facility.....
2. Type of health facility? Dispensary Health centre
3. Sub County? 1. Kinangop 2. Olkalou 3. Ndaragwa

<i>Kindly answer the following questions. Tick in the correct box. Either; 5: Strongly agree, 4: Agree, 3: Neutral, 2: Disagree or 1: Strongly disagree.</i>						
A. Basic Amenities		5	4	3	2	1
1	Health facility <u>connected</u> and <u>supplied</u> with the electric power from the national grid.					
2	Health facility has an alternative readily available electric power supply back up in case of a breakdown or disruption of the main electric power source.					
3	Health facility has a protected or safe water source within its premises supplying water throughout the year without disruptions.					
4	A room available for patient consultation with auditory and visual privacy.					
5	Health facility has a functional computer with ready access to internet/ email.					
6	Health facility has an ambulance accessible within a reasonable distance and response time for emergency evacuation or referral					
B. Infection prevention precautionary measures		5	4	3	2	1
7	Health facility have unused, clean, adequate and ready for use disposable latex gloves or their equivalent for personal hands protection (PPE) supplied throughout the year.					
8	Health facility has soap and running water in the clinical are supplied throughout the year.					
9	There are conspicuously and strategically placed signs near sinks and hand sanitizers with the “5 moments of hands washing” or other reminders in the clinical/ outpatient room.					
10	Health facility have alcohol based hand rub placed strategically in the clinical area/ room.					

11	Health facility has no any other syringes in the clinical and/ or injection room/ area for use apart from auto-disable syringes with a re-use prevention feature.					
12	Health facility has an environmental disinfectant (e.g. Chlorine, alcohol) for use?					
13	Health facility has a three buckets system for use placed in the clinical area.					
C. Basic equipment:		5	4	3	2	1
<i>The items below are available and functioning in the consultation/ clinical area. NB: Defective items are also to be referred as unavailable and not functional.</i>						
14	Adult scale					
15	Stethoscope					
16	Light source					
17	Thermometer					
<i>The items below are available and functioning in the Laboratory room/ area.</i>		5	4	3	2	1
<i>NB: Defective/ missing items, missing/ defective/ expired strips or where both cases per item exist, the items are to be referred as unavailable and not functional.</i>						
18	Glucometer & glucose strips					
19	Haemoglobinometer or Hemocue and strips					
20	Urine dipsticks for protein and glucose					
21	HIV rapid test kit; first and second line					
22	Syphilis rapid test kit with strips and reagents					
23	Urine pregnancy test kit with strips					
24	Blood group kit; ABO kit					
D. Essential Medicines		5	4	3	2	1
25	Health facility/ Pharmacy department have the current essential medicines <i>list</i> (EML)-soft or hard copy.					
26	Health facility has enough supply of all RELEVANT/ PRIORITY essential medicines throughout the year.					
27	The health facility doesn't get supply of medicines it hasn't ordered; it doesn't get a supply of medicines in excess of what it has ordered.					
28	Supplies of medicines don't take unreasonable longer lead time (Lead time is the time between ordering and delivery).					
29	The facility doesn't get a supply of any drugs whose shelf life is likely to expire before issuance to patients.					
30	The facility had never had cases of medicines expiring in the store?					
<i>The following medicines are available in the dispensing area/ pharmacy?</i>						
31	Amlodipine tablets or alternative calcium channel blockers					
32	Amoxicillin (syrups/suspensions or dispersible tablets)					
33	Amoxicillin tablets/ capsules					
34	Ampicillin powder for injections					
35	Aspirin (capsules/tablets)					
36	Beclometasone inhalers					

37	Beta blockers (e.g. bisoprolol, metoprolol, carvedilol, atenolol)					
38	Carbamazepine tablets					
39	Ceftriaxone injections					
40	Diazepam injections					
41	Enalapril tablets or alternative ACE inhibitors (e.g. lisinopril, Ramipril, perindopril)					
42	Fluoxetine tablets					
43	Gentamicin injections					
44	Glibenclamide tablets					
45	Haloperidol (oral/ injectables)					
46	Magnesium sulfate injectables					
47	Metformin tablets					
48	Omeprazole tablets or alternatives (e.g. pantoprazole, rabeprazole)					
49	Oral rehydration solution/ powder					
50	Oxytocin injections					
51	Salbutamol inhalers					
52	Simvastatin tablets or other statin (e.g. atorvastatin, pravastatin, fluvastatin)					
53	Thiazides (e.g. hydrochlorothiazide)					
54	Zinc sulphates (tablets or syrups)					
E. Primary health service delivery preparedness		5	4	3	2	1
55	All primary <i>health outpatient services</i> * are available to patients at any given time. (<i>First see meaning of primary health service below</i>).					
56	At no any time is the patient required to <i>buy for himself or herself</i> required and unavailable commodities like drugs outside the health facility.					
57	Facility is accessible within its catchment through a <i>vehicle</i> by road in all seasons throughout the year.					
58	There's no any service offered in this facility that could be morally, socially, culturally, ethically or spiritually unacceptable by <i>some</i> community members					

***Primary health service:** Outpatient services; reception, consultation/ clinical, Laboratory and pharmacy areas/ services.

THANK YOU.

Appendix III: Map of Kenya Showing Nyandarua County



NB: Nyandarua County is the shaded part in the central point of the map of Kenya

Source: en.wikipedia.org

Appendix IV: Map of Nyandarua County



NB: Map of Nyandarua showing the sub Counties

Source: maphill.com

Appendix V: Number of Health Facilities

Category	Hospital	Primary H/F	Total	%
County Govt.	2	70	72	60
Others	1	48	49	40
Total	3	118	121	100

Source: DHIS 2. (2018).

The table above shows the existing operational number of health facilities in Nyandarua County. Others represent faith based and private health facilities.

Appendix VI: Primary Health Facilities in Sub Counties

Sub county	All facilities		N.H.I.F Accredited		Non-Accredited	
	No.	% of all	No.	% of all	No.	% of all
Ndaragwa	16	23.5	2	2.9	14	20.3
Oljoro orok	8	11.7	2	2.9	6	8.7
Olkalou	11	16.2	2	2.9	9	13
Kipipiri	13	19.1	4	5.9	9	13
Kinangop	20	29.4	3	4.4	18	26.2
Total	68	100	13	19.1	56	81.2

Source: DHIS 2 (2018)

The table above shows how Nyandarua county government primary health facilities are distributed within all sub counties and the level of N.H.I.F. accreditation. Two beyond zero mobile clinics are not included.

Appendix VII: Accredited Primary Health Facilities

	CODE	HEALTH FACILITY	SUB COUNTY
1	22291971	BAARI	NDARAGWA
2	22291175	BAMBOO	KINANGOP
3	22291984	GETA BUSH	KIPIPIRI
4	22291294	HENI	KINANGOP
5	22291293	KARANGATHA	KINANGOP
6	00181171	MANUNGA	KIPIPIRI
7	22291177	MIRANGINE	OL KOLOU
8	22291174	NDARAGWA	NDARAGWA
9	22291295	NDEMI	KIPIPIRI
10	22292019	NGANO	OL JORO OROK
11	22292019	NGORIKA	OL KOLOU
12	22292031	SILIBWET	OL JORO OROK
13	0018408	WANJOHI	KIPIPIRI

Source: <http://www.nhif.or.ke/healthinsurance/outpatientservices>

The table above shows the names of the accredited Nyandarua county government primary health facilities by N.H.I.F. for the national cover.

Appendix VIII: 2017 Workload of primary Health facilities and County Hospitals

Health facility (H/F)	Age>5yrs (Male)	Age>5yrs (Female)	Age<5yrs (Male)	Age<5yrs (Female)	Total	%
Primary H/F	129,012	208,579	45,353	46,411	429,355	85.52
Hospitals	21,565	28,123	11,089	11,893	72,670	14.48
Total	150,577	236,702	56,442	58,304	502,025	100

Source: DHIS 2. (2018).

The table below shows the county government health facilities workload based on the outpatient register (filter). It compares primary health facilities with county hospitals.

H/F means Health facility and Govt. means government.

Appendix IX: 2017 Workload of County Facilities and others

Health facility (H/F)	Age>5yrs (Male)	Age>5yrs (Female)	Age<5yrs (Male)	Age<5yrs (Female)	Total	%
County Govt.	150,577	236,702	56,442	58,304	502,025	69.74
H/F						
Others (All)	63,449	111,125	21,062	22,212	217,848	30.26
Total	214,026	347,827	77,504	80,516	719,873	100

Source: DHIS 2. (2018).

The table above compares county government health facilities workload based on the outpatient register (filter) against other health facilities. Others represent Faith based and private health facilities. H/F means health facility.

Appendix X: Evidence based 5 Core Components to Improve Hand Hygiene in Health Facilities

CORE COMPONENT	
1	System Change - Hand washing/Alcohol-based hand-rubs at point of care
2	Training and Education of Staff
3	Observation and Feedback to Staff
4	Reminders in the Workplace
5	Establishment of a Safety Climate - Individual active participation and institutional support

Source: www.moh.org.ke

The table above shows the core components to improve hand hygiene in health facilities

Appendix XI: Recommended Moments for Hands Hygiene in Health Facilities

No.	MOMENT
1	Before patient contact
2	Before clean procedures
3	After body fluid exposure risk
4	After touching patient
5	After touching patient surroundings

Source: www.moh.org.ke

The table above shows the recommended moments for hands hygiene in health facilities

Appendix XII: Random Sampled Health Facility in Charges for Pretesting

KIPIPIRI Sub COUNTY		OL JORO OROK COUNTY	
1	Geta bush health centre*	14	Chamuka Dispensary*
2	Geta forest dispensary	15	Kasuku Health Centre*
3	Kiambogo dispensary	16	Ngano Health centre*
4	Mikeu dispensary*	17	Gatimu Health Centre
5	Mumui dispensary	18	Silibwet Health Centre
6	Old Mawingu health centre	19	Olborosat Dispensary*
7	Turasha dispensary	20	Huhoini Dispensary
8	Lereshwa dispensary*	21	Maina Mwangi Dispensary*
9	Manunga health centre		
10	Gatondo dispensary*		
11	Kiburuti dispensary*		
12	Ndemi health centre		
13	Wanjohi health centre*		

**Sampled Health facilities*

Appendix XIII: NACOSTI Authorization



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/18/87020/22756**

Date: **25th May, 2018**

Haron Mukora Njoroge
Kenya Methodist University
P.O. Box 267- 60200
MERU.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***“Determinants of primary health service delivery preparedness in Nyandarua County Government Primary Health Facilities,”*** I am pleased to inform you that you have been authorized to undertake research in **Nyandarua County** for the period ending **25th May, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Nyandarua 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.

**GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Nyandarua County.

The County Director of Education
Nyandarua County.

Appendix XIV: Ministry of Education Authorization

**MINISTRY OF EDUCATION
STATE DEPARTMENT OF EDUCATION**

Email: cdenyandcounty@yahoo.com

Cellphone: 0722887223
When replying please quote



COUNTY DIRECTOR OF EDUCATION,
NYANDARUA COUNTY,
P.O. BOX 197, -20303
OL KALOU.

REPUBLIC OF KENYA

OUR REF;CDE/NYA/GEN/ 19/VOL 1/ 96

20th June 2018

Haron Mukora Njoroge
Kenya Methodist University
P.O. Box 267 -01000
MERU

RE: RESEARCH AUTHORIZATION

Following your request to carry out research on **“Determinants of primary health service delivery preparedness in Nyandarua County Government Primary Health facilities.”** I am pleased to inform you that you are hereby granted permission to carry out your research for the period ending **25th May, 2019.**

After completion of your project, you will be required to remit a copy of your finding to this office.

We wish you all the best.

A handwritten signature in black ink, appearing to read 'Hellen Nyang'au'.

HELLEN NYANG'AU (Mrs)
COUNTY DIRECTOR OF EDUCATION
NYANDARUA COUNTY

COUNTY DIRECTOR OF EDUCATION
NYANDARUA
P.O. Box 197 - 20303,
OL-KALOU

Appendix XV: Department of Health authorization

REPUBLIC OF KENYA

**COUNTY GOVERNMENT OF NYANDARUA
OFFICE OF THE DIRECTOR -HEALTH SERVICES**

Telephone. 0729289853
Email. healthcoordinator@nyandarua.go.ke

P.O. Box 221-20303
Ol' Kalou

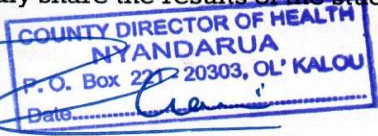
REF: NYA/CHC/120/VOL.I **26th June 2018**

**Haron Mukora Njoroge
Kenya Methodist University
P O Box 267-60200
MERU**

RE: RESEARCH AUTHORIZATION

Refer to research authorization letter Ref:NACOSTI/P/18/87020/22765 dated 25th May 2018 on a study entitled ***"Determinants of primary health service delivery preparedness in Nyandarua County Government Primary Health Facilities,"*** the Department of Health Nyandarua County has no objection for you to embark on the research.

Kindly share the results of the study with the Department of Health Nyandarua County.


COUNTY DIRECTOR OF HEALTH
NYANDARUA
P. O. Box 221 20303, OL' KALOU
Date.....

DR. Z. KARIUKI GICHUKI
COUNTY DIRECTOR OF HEALTH
NYANDARUA

Cc

H.E. The Deputy Governor
&County Executive Committee Member for Health
Nyandarua County

Chief Officer-Health Services
Nyandarua County

Appendix XVI: SERC (KeMU) approval



KENYA METHODIST UNIVERSITY

P. O. BOX 267, MERU - 60200, KENYA
TEL: 254-064-30301/31229/30367/31171

FAX: 254-64-30162
EMAIL: info@kemu.ac.ke

2ND MAY 2018

Haron Mukora Njoroge
HSM-3-5503-1/2016

Dear Haron,

RE: ETHICAL CLEARANCE OF A MASTERS' RESEARCH THESIS

Your request for ethical clearance for your Masters' Research Thesis titled "**Determinants of Primary Health Service Delivery Preparedness for Nyandarua County Government Primary Health Facilities**" has been provisionally granted to you in accordance with the content of your project proposal subject to tabling it in the full Board of Scientific and Ethics Review Committee (SERC) for ratification.

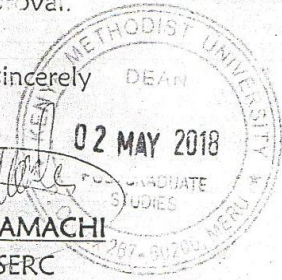
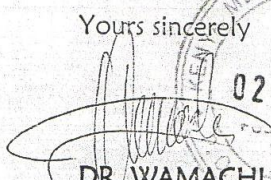
As Principal Investigator, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the project.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the SERC for re-review and approval **prior** to the activation of the changes. The Proposal number assigned to the project should be cited in any correspondence.
3. Adverse events should be reported to the SERC. New information that becomes available which could change the risk: benefit ratio must be submitted promptly for SERC review. The SERC and outside agencies must review the information to determine if the protocol should be modified, discontinued, or continued as originally approved.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by subjects and/or witnesses should be retained on file. The SERC may conduct audits of all study records, and consent documentation may be part of such audits.

5. SERC regulations require review of an approved study not less than once per 12-month period. Therefore, a continuing review application must be submitted to the SERC in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion will result in termination of the study, at which point new participants may not be enrolled and currently enrolled participants must be taken off the study.

Please note that any substantial changes on the scope of your research will require an approval.

Yours sincerely



DR. WAMACHI
Chair, SERC

cc: Director, RI & PGS

Appendix XVII: Raw Data File

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	
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AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG
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