DETERMINANTS OF REFERRAL CASES AND THEIR EFFECT ON HEALTHCARE DELIVERY; A CASE STUDY OF KENYATTA NATIONAL HOSPITAL ACCIDENT & EMERGENCY DEPARTMENT

BY

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X53/73035/2014

A Research Project Submitted to the School of Economics, the University of Nairobi in Partial Fulfillment of the Requirements for the Award of Masters of Science Degree in Health Economics and Policy

DECLARATION

Declaration by the student

I declare that this project is my original work and has not been presented to any institution for academic purposes by persons known to me. Other authors' work used in this proposal has been properly acknowledged and cited.

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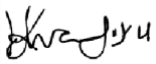

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Supervisors' approval

This project has been submitted with my approval as the university supervisor

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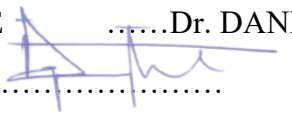

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DEDICATION

I dedicate this project to my family: my spouse Maxwell and our children; Favour and Liam George for their love, understanding, and support throughout this research work. I would also like to dedicate this project to the employees of Kenyatta National Hospital ─ Accident and Emergency department for their smart emergency interventions to patients seeking emergency health services in Kenyatta National Hospital.

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DEFINITION OF TERMS

Emergency referral:	The transfer of patients with conditions that threaten their life, limb, or eyesight (MOH, 2014).
Health:	A state of complete physical, social and, mental well being and not simply the nonexistence of infirmity or disease (WHO, 1948).
Patient:	The medical dictionary considers any ill individual or any person undertaking treatment for a disease a patient.
Referral system:	A structure that permits the needs of a client to be adequately addressed through the use of resources which are currently unavailable at the level at which they seek care (MOH, 2014).

ABBREVIATIONS

A&E	Accident and Emergency
CMA	Canadian Medical Association
ERC	Ethics Review Committee
GP	General Practitioner
HOD	Head of Department
KNH	Kenyatta National Hospital
MOH	Ministry of Health
SDGs	Sustainable Development Goals
SPSS	Statistical Package for Social Scientists
SWOT	Strength, Weakness, Opportunities, and Threats
UHC	Universal Health Coverage
UON	University of Nairobi
WHO	World Health Organization

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ABSTRACT

Referral systems in health care have been globally recognized as the pillars and influencers of the demand for health services and their consumption time (Amoah and Philips, 2017). Although studies have been conducted to enlighten on why despite the existence of referral guidelines, their adherence is minimal; no such study has been conducted at Kenyatta National Hospital despite it being at the peak of the Kenyan health referral chain. This study sought to address this gap at Kenyatta National Hospital, Accident and Emergency department and whether its referral cases could be handled by lower levels of care, in a bid to solve its overcrowding situation. The main objective of the study was to assess the determinants of referral cases in a national hospital ─ a case study of Kenyatta National Hospital and to make policy recommendations on Referral Strategy 2019-2023 based on findings. Data from a sample size of 311 randomly selected participants was analyzed after being collected using a structured questionnaire. After conducting necessary descriptive statistics, diagnostic tests and a probit regression using STATA; It was observed that 65.9% of the respondents received referral letters; with 39.3% of those being from public health facilities (level 1 to level 6), and 32.6% of them being patient self-request referrals. It is also important to note that 62.4% of respondents resided in Nairobi County, with the overwhelming majority of respondents using private transport means to KNH (80%), with only 17.4% using ambulance services to the facility. Nairobi County also has the largest referrals to KNH (62.4%). There are indeed several significant factors that determine referral cases to KNH; among them being the age ($p< 0.05$), residence of patients ($p< 0.05$), as well as their mode of transportation ($p< 0.05$) to the hospital. Gender, source of income and education level are observed to have an insignificant impact on the likelihood of receiving a referral letter to KNH. The presence of the National Hospital Insurance Fund (NHIF) is most likely the 'equalizer' so that economic factors have less influence on access to referral care at KNH. The study recommends greater investment by national and county governments in lower-level institutions, especially outside Nairobi County, to increase their quality of care and build trust in local facilities thus reduce the numerous incidences of self-referrals. A policy brief based on study findings has also been submitted to Kenyatta National Hospital to aid actualize the current referral strategy 2019-2023.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Referral systems in health care have been globally recognized as the pillars and influencers of the demand for health services and their consumption time (Amoah and Philips, 2017). Although studies have been conducted to enlighten why despite the existence of referral guidelines their adherence is minimal; no such study is conducted at Kenyatta National Hospital despite Kenyatta National Hospital being at the top of the health referral chain. Moreover, factors such as personnel, emergency transport services and communication have been cited as the main factors influencing referral patterns globally. Sound referrals provide the link between primary care and much sought after specialty care providing for a continuum of care for patients in need (Mehrotra, Forrest, and Lin, 2011).

The World Health Organization report (2008) has also emphasized the importance of primary health care since it plays a paramount role in reducing the cost of healthcare through the minimization of referrals. Countries like the Netherlands, Scandinavian and the United Kingdom have been acknowledged as the hospitals with a great investment in primary healthcare. General practitioners at the primary healthcare level have been documented as the gatekeepers of the healthcare referral system and thus play an important role in influencing referrals.

However, a study conducted by Sibbald, McDonald,and Roland (2007) revealed that there is a scarcity of research work done to establish if indeed there is a relationship between the number of services provided by a general practitioner (GP) and their consequent referral behaviour. Concurrently, Denmark, Krasnik et al, (1990) showed following the introduction of payment for services offered, the number of services performed at the primary level care by the GP increased, translating to a decrease in the number of referrals. We cannot therefore ignore the effect of GPs with a well-functioning primary care level system in enhancing sound referrals.

Global

A study conducted in the United States revealed that out of all outpatient visits in a hospital; more than half of these come for specialist visits. Additionally, the same study also reveals that in each year; greater than one-third of patients warrant specialist review (Machlin and Carper, 2007). This

study by assessing the referral cases to KNH provided adequate information that will be used to assess if out of all patients being referred to the facility more than half needed specialist care.

Norwegian healthcare provided referral letter guidelines which the GP need to adhere to while referring patients for specialist care. However, a recent Norwegian study by Martinussen (2013) revealed that there is no particular guideline on the content to be written below the identified guidelines hence there is lack of adequate clinical information on the referral letter. This lack of adequate information presents as a barrier to a high quality of care by the specialist, a conclusion echoed by Rokstad, Holmen et al, (2013) in a referral intervention study and consequently in another cluster randomized trial study Wåhlberg, Valle, et al, (2015) assessing the quality of referrals. Measuring information quality rather than structure has been identified as the superior indicator in assessing the significance of the referral letters (Bodek andGhori et al, 2006).

Consequently, a survey conducted by the Canadian Medical Association (2013) of more than 3000 Canadian GPs and specialist; 51% of the specialists identified the unclear reason for referrals as among the main problems in the referral cases. This variation further confounds to the inability of the specialist to evaluate and prioritize patients due to the gap in the reason for referrals. This has led to specialist relying on other ways of prioritizing patients rather than rely on the inconclusive reason for referral (Patel, D'souza et al, 2008). This study will aim at providing data to address this gap and inform policy on standardization of referral letters with a clear reason for referral as the indicator.

Regional

In sub-Saharan Africa, Ghana has been documented as the best health system with reference to the availability of personnel and health facilities (Gross, 2016). Consequently, Gyapong, Garshong, et al. (2007) affirmed the healthcare system in Ghana is Ghana is a pluralistic model of health care encompassing the conventional and non-conventional models of healthcare delivery. Despite these strong attributes of its health system, Ghana is challenged with a fragile referral system though a proper referral system necessitates that patients seek healthcare from lower levels of care before transfer to higher levels of care based on needs assessed (Ghana MOH, 2012).

Ghana has gone further to outline the systematic referral pathway of patients and has also highlighted the inappropriate usage of the referral system where lower-level facilities refer directly

to the highest level of care thus overcrowding and leading to a higher cost implication at the highest level of care as documented by Amoah and Philips (2017). Ghana depicts a similar situation at Kenyatta National Hospital, illuminating a regional gap in the health referral policy and thus necessitated the need to conduct this study aimed at assessing the referral patterns to KNH and whether they were in line with the outlined referral strategy.

Majority of referral systems in Africa have been critiqued as focusing more on the supply side of health through the referral system while failing to address the demand for health from the perspective of the patient. This has been justified through studies conducted in Uganda by Nanyonjo, Bagorogoza, et al (2015) and Zimbabwe by Nanyonjo, Bagorogoza, et al. (1998) revealing that the referral procedure is hardly put to use or it is completely absent in the referral stratum. Several factors have been attributed to the disregard of the laid out referral strategies in African countries as expressed by Amoah and Philips (2017) and include but not limited to; inadequate health personnel, inadequate communication, inadequate emergency transport services. This research was timely as it thus sought to investigate if the highlighted factors in the neighboring countries to Kenya were similar to the factors that determine referrals to Kenyatta National Hospital.

Kenya

The Kenyan Constitution 2010 asserts that each citizen of Kenya has the right to health. The goal of the Kenyan health system is the provision of affordable, equitable and quality healthcare for all citizens. Accessibility to all of health care services remains a great challenge of the healthcare system and also affordability though recent times have witnessed the scale up on National Hospital Insurance Fund. Like other developing countries, Kenya has health facilities as well as health human resources concentrated in the urban and private sector while the greater population resides in the countryside.

Universal Health Coverage (UHC) is one of the milestones that the Kenyan government has taken as part of achieving sound health referral patterns. UHC emphasizes comprehensive access to equitable, quality and affordable health services. This means that when seeking healthcare services, the population should not be financially impoverished by the healthcare service they are seeking. It is also part of the developed 15 Sustainable Development Goals (SDGs) which Kenya is a

signatory in their achievement. The Kenyan health referral strategy needs to provide accessible, quality and affordable health services at each level of care to ensure that referrals to the next level of care are only for those services unavailable at that level of health care. UHC is therefore a concept that the Kenyan upcoming Referral Strategy 2019-2023 needs to emphasize on its components to achieve the UHC component in Kenya (Koon, 2017).

A referral letter is the main document that summarizes client condition, care initiated by the GP, and the reason for referral for specialist care. This serves as a communication tool and is very essential for baseline data and continuum of care. Despite it being a very important document, a study conducted by Garasen & Johnsen (2007) revealed that the content and quality of referrals vary depending on referring GP, despite there being documented referral guidelines (MOH, 2014). This illuminates a gap that this research study endeavours to answer through the assessment of referral cases in KNH, with referral letters being one of the key indicators.

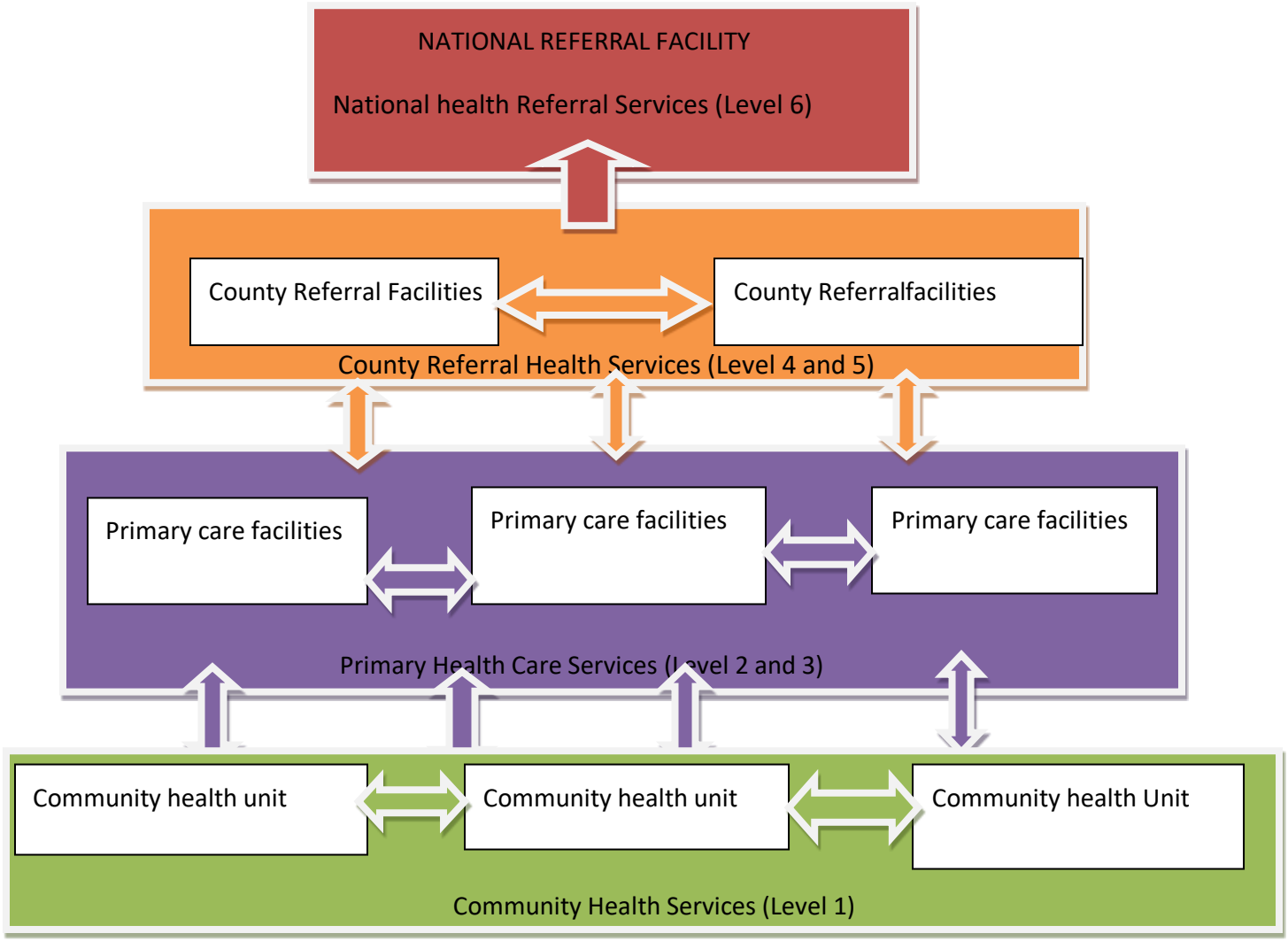
Kenya Health Sector Referral Strategy: 2014-2018

This served as the 1st guideline for health sector referrals, aimed at providing a guideline which healthcare facilities need to adhere to when referring patients. The Ministry of health intended to improve the referral services through directing the scale-up of a fully functional referral system across the 47 counties. The Principal Secretary Ministry of Health Prof. Fred H.K. Segor urged all stakeholders in health to ensure adherence to the referral guidelines to offer direction when giving effective management of referrals thus ensuring scale-up of care as well as meeting the health needs of the Kenyan citizens (MOH, 2014).

Kenya has a six-tier model of health delivery (Figure 1.1.1). This cascade commences at the community level; via primary careservices, incorporating the dispensaries (level 2) and health centres (level 3). The primary level is complemented by the county level comprising of county referralhealth services (level 4 & 5) who finally refer to the apex of the referral; the national referral health services (level 6). To achieve a health system that effectively and efficiently utilizes healthcare resources at each level, the referral policy emphasizes the need to link these levels of care. This reduces wastage, redundancy of services as well as maximizing health outcomes at each level of care. The Ministry of health asserts for continuity of care to occur, these effective linkages

must be adhered to and it is these linkages that constitute an all-inclusive referral system (MOH, 2014).

Figure 1: Health Referral Chain



Source: Kenya Health Referral Implementation Guidelines, (2014)

Why Kenyatta National Hospital?

Kenyatta National Hospital (KNH) fourth Strategic Plan2019-2023 defines KNH as a public hospital whose mandate is to provide specialized medical care, facilitate training and research, and participate in policy formulation. KNH is at the peak of the National referral system and is the hospital of choice in providing specialized medical care. This strengthens the importance of this research study since KNH being at the top of healthcare services, it should be receiving patients requiring specialized services and not services which can be provided at lower levels of health care. This study will determine the factors that contribute to referral cases in Kenyatta National Hospital and assess if indeed all patients referred to the facility require specialized healthcare services.

These five-year strategic plans provide focus and direction in the operations of the hospital. The current 2019-2023 plan has been developed using the Balanced Scorecard approach which is aimed at communicating to both its internal and external stakeholders on strategic direction the hospital is taking. It also serves as a linking approach to results while allocating budgets, timeframes and responsibilities to identified initiatives.

Of key importance to this research study was the Strength, Weakness, Opportunities, and Threats (SWOT) analysis conducted where the implementation of the National Referral policy was highlighted as one of the opportunities of the hospital. The strategic impact intended is reduced congestion at the facility, improved clinical outcomes of patients and increased specialized care which is the mandate of the hospital. This thus enriches the importance of this research as data generated will be useful in enhancing the implementation of the referral policy at KNH.

1.2 Problem Statement

Kenyatta National Hospital, being at the apex of the health referral chain is mandated to provide specialized and emergency healthcare services to patients referred ideally from the county referral hospitals. However, the Accident &Emergency department receives a myriad of patients both hospital referrals and self-referrals from other lower levels of care. This translates to overcrowding in the emergency department; hindering service delivery to emergency and specialized patients and culminating to increased turn- around the time of patients in the department, a problem that has been identified by the hospital in its strategic plan 2019-2023. Moreover, the scarce human

resource is overstretched leading to inefficient use of healthcare resources and increased healthcare burden.

Access and equity to healthcare play a paramount role in determining self-referrals to a level six hospital as documented by Kloos (1990) in a study conducted in Ethiopia. Lyun (1983); Okafor 1983) conducted a similar study in Nigeria. Both studies emphasize the concept of a **steep distance-decay function model**. It is further expounded to mean that all other factors held constant; when individuals have a clinical need, they will not seek healthcare further away from the referral facility that is near to them. Prohibitively as evidenced by the same authors, a significant proportion of the population will tend to mushroom near the referral hospital and thus make it their hospital of choice for even lower level illnesses. This illuminated the need for this study as Kenyatta National Hospital is located in Nairobi, making it accessible to the majority of residents who might thereby bypass other levels of care.

The study aimed at providing data that would statistically further affirm the significance of the steep distance-decay function model at Kenyatta National Hospital. By investigating the referral cases at Kenyatta National Hospital, Accident and Emergency department and whether these cases could be handled by lower levels of care; data collected would help solve the overcrowding situation at the emergency department.

1.3 Research Objectives

1.3.1 Main Objective

The main objective was to identify the determinants of referral cases and their effect on healthcare delivery at Kenyatta National Hospital; Accident & Emergency department.

1.3.2 Specific Objectives

1. To identify factors that determine referral cases in Kenyatta National Hospital, Accident & Emergency department.

2. To evaluate the effects of the above factors on healthcare delivery at Kenyatta National Hospital Accident & Emergency department.

3. To make policy recommendation on current Referral Policy 2019-2023.

1.4 Research Questions

1. What factors contribute to referral cases in Kenyatta National Hospital?
2. Do the identified factors have any effect on healthcare delivery at Kenyatta National Hospital?

1.5 Significance of the Study

An econometric study conducted within African countries Kenya included revealed that of the total public health expenditure, between 45% and 69% is consumed by the tertiary levels of care (Adams, Evans & Murray, 2003). However, despite this heavy burden on the tertiary levels of care, the number of patients seen at these facilities keeps on escalating despite there being other lower levels of care where some of the patients can be attended to. This study will aim at providing statistical evidence on the referral cases in KNH, Accident and Emergency, and patient acuity level being one of the indicators to assess if indeed all patients referred require emergency services.

The utility of this study: it would provide information to the KNH policymakers on the nature of patients received in the institution; it would also aid in lobbying for more funds based on the economic burden of the referral cases to the facility.

Moreover, despite the rich data in referrals both internationally and locally, no researcher had conducted a study in Kenya to determine the referral cases in a national hospital in Kenya to assess the patient demographic characteristics, patient acuity levels, referring facility level of care and county of referral facility, and also whether patients referred to Kenyatta National Hospital come with referral letters. This study would benefit Kenyatta National Hospital as it would provide information that can be used for planning purposes in its decongestion agenda as it is one of its action plans in the recent KNH Strategic plan 2019-2023. Consequently, this study would serve as a reference point in the monitoring and evaluation platform in assessing the trend of referral cases at Kenyatta National Hospital in future.

Finally, this study is significant to health policymakers as it would illustrate the gaps that need to be bridged in the primary and secondary level of care. Policies aimed at meeting identified needs in various health facilities would be designed translating to a more efficient and effective referral

system. Consequently, this study would inform health economist on resource allocation for health based on needs identified through an assessment of referrals to Kenyatta National Hospital.

1.6 Scope of the Study

The study was conducted at Kenyatta National Hospital, Accident and Emergency department. KNH is located at upper hill; hospital road off Ngong road, approximately 3.5 kilometers from the central business district in Nairobi, the capital city of Kenya. This serves as the reception of patients referred from other facilities with exception of pediatric medical patients and maternal emergencies. The referral coordination office is also located in this department.

This study was conducted between August 2021 and October 2021 after being granted ethical approval from KNH-UON ERC for the period 30th January 2020- 29th January 2021, and also after getting a research grant award from Kenyatta National Hospital Research Department for the period 15th June 2020- 14th June 14th June 2021.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter incorporates both theoretical review and empirical review of referrals to a level six hospital giving a broader perspective of referral cases and providing a deeper understanding of this concept. This chapter helps in building a foundation of this research and help in selecting a framework summarizing the review of literature on referral patterns.

2.2 Theoretical Literature Review

2.2.1 Andersen Health Behaviour Model

This model was first developed in the 1960s and has since gone through phases of development aimed at improving it. This model intends to assess the factors that either facilitate an individual to seek healthcare services or impede an individual from utilizing health services. The goal of this theory is to design a patient behavioral model aimed at measuring access to medical care. This model outlines the access and utilization of health services by an individual as a function of three characteristics:

Predisposing factors; entails the socio-cultural distinctiveness of a patient that are inherent way before an individual becomes ill. These factors can further be categorized as; social structure including education, occupation, culture, social interactions, ethnicity and social networks. Health belief is another predisposing factor which entails knowledge, values and attitudes that individuals have towards the healthcare system. Demographics including age and gender are other predisposing factors that influence healthcare utilization by individuals (Andersen, 1995).

Enabling factors; these are the logistics that come with the need to obtain health services. The family that an individual belongs to either enables or curtails health service utilization as this family contributes to the income of the person, access to health insurance, accessibility of health services and their quality of social relationships. Additionally, the community will influence the availability of healthcare services, health personnel, and the waiting time for access to these health services. Possible additional enabling factors are the psychological characteristics of a patient as it will influence the ability of this individual to find the necessity of seeking and utilizing available healthcare services (Andersen, 1995).

Need factors; "Perceived need" for healthcare services will influence the health-seeking behaviour of an individual and will also influence the adherence of an individual to medical regimes provided. This is more subjective to the patient as it will determine how a patient perceives the severity of their illness thus influencing their healthcare utilization. "Evaluated need" will entail the amount and sort of treatment that the healthcare provider will provide once the patient has presented to a healthcare provider. This represents the professional judgment of the healthcare provider as pertains to the health status of individuals and if they indeed need medical care (Andersen, 1995).

2.2.2 The theory of Lay Referrals

This theory has been heavily emphasized in the Strengthening of Referral System through Social Capital Study conducted by Amoah and Philips (2017) in Ghana. This theory reveals that the social relationships that a patient has influences the choices made by a patient to come into the health system, decisions made throughout their experience in the health system and the decisions made after their experience in the health system (Nettelton, 2013). This is based on the strong sociocultural connotations that illness and health have on an individual.

Studies conducted in Africa (Sakeah, McCloskey, &Bernstein et al., 2014) reveal the majority of health care seekers are actually 'self-referrals'. Aikins (2005) asserts that since human beings are social beings, the influence of their families, peers, workmates and social media will motivate them to disregard existing referral guideline and seek care at the highest level. Cognitive elements such as trust have been shown to have a great influence on health practices that majority of patients depict when seeking health services despite there being published referral policies (Aryeetey, Aikins, Gyeke-Dako, & Adongo, 2015). Studies conducted in other Sub-Saharan countries by Bakare, M.O. (2013) as well as low- and middle- income countries (Sheikh, Ali, Hussain, Shehzadi, & Afzal, 2009) show similar patterns. This research hence presents an opportunity for a critique of this theory concerning referral cases at Kenyatta national Hospital, Accident and Emergency department.

2.3 Empirical Literature Review

The economic impact of hospital referral system

Hospital economic costing study conducted in Africa by Adam, Evans, and Murray (2003) revealed that more than half of public health expenditure (50 to 60 percent) is allocated to all types of public

hospitals in the region. Of concern is that tertiary and secondary hospitals uptake the largest total public health expenditure (60 to 80 percent). Moreover, the same study conducted in transversely five countries (Zambia, Belize, Zimbabwe Indonesia, and Kenya) revealed that the tertiary level of care consumes between 45 and 69 percent of total public expenditure. This affirms further that the tertiary levels of care in addition to being the greatest consumers of the health care expenditure; they have the greatest burden of patients (Adam, Evans, and Murray, 2003).

Additionally, the same econometric study revealed that Disability Adjusted Life Years (DALYs) is an economic cost-effectiveness measure that can be measured to portray the economic impact of referral hospitals and importance of a good referral system. It has been argued that referral facilities uptake a large percentage of the public health expenditure as illustrated in the former paragraph. The calculation of various diseases specific DALYs can serve as a measure of prioritizing disease-specific referrals and subsequent specialist interventions in referral facilities (Adam, Evans, and Murray, 2003). This further highlights a research opportunity to calculate the DALYs of referral casesat a level six-hospital, as well as the study ofeconomic significance.

Referral discipline

A study conducted in London by Walford and Grant (1998) describe referral disciple as one of the ways of improving the effective functioning of a referral system. One highlighted strategy is separating the referral patients from non-referral patients since it is hardly possible to eliminate them from referral hospitals. Referred patients are fast-tracked within the system and the nonreferred patients have explained the importance of seeking healthcare at the highest level of referral with a referral note. Consequently, there is a need to divert these patients to a nearby primary healthcare facility where they can be attended to. Referral disciple in an initiative KNH endeavours to embrace as evidenced by an internal memo by the director of clinical services referencing reverse referral of non-critical patients to decongest A&E (Appendix 11).

Moreover, a study conducted in Niger documented the concept of false negatively referred patients and false positively referred patients. False negatives are where patients that warranted referrals to a higher level of care were not referred or were referred but failed to adhere to the referral and thus succumbed to their conditions. These patients may fail to be registered in the current health structure as the majority of them die in their homesteads. Consequently, the concept of false

positives is where many patients are referred to a higher level of care though not warranting the care leading to overcrowding and congestion of higher levels of care facilities where they provide primary care utilizing scarce resources meant for specialized care services. Tertiary hospitals are thus encouraged to monitor and evaluate referral cases to capture especially the false-positive referrals (Bossyns et al, 2006).

A retrospective cohort analysis conducted in the United States and the United Kingdom asserts that one out of three non-elderly patients reviewed in the primary setting is referred for specialist care. When compared to the elderly population; each person on average experiences two referrals for specialist review (Forrest, Majeed, et al. 2002). This further illuminates the need for this research as it aims at coming up with statistical information that shows the age category of patients that is mostly referred for specialized healthcare services at Kenyatta National Hospital, Accident & Emergency department.

Consequently, a study conducted in Ghana documented 45 percentof the referrals came from teaching hospitals or government hospitals with 26% referral cases coming from the clinics. Out of all referrals, 5 – 34 percent missed important patient demographic characteristics like the reason for referral, age, and the working diagnosis of the referring facility.Moreover,only 39-58 percent of the referrals documented the treatment the patient had received for the condition being referred. Consequently, the patient's medical history was only documented in 39-58 percent of the referrals. The diagnostic tests done on the patient and the surgical history of the patient before the referral was only recorded in 2-5 percent of the referrals as documented by Gyenda et al., (2013).

Feedback to referring facilities from receiving facilities has been documented as the missing link in streamlining referral patterns to tertiary hospitals. A study conducted to evaluate colorectal surgery referrals through which feedback was given to referring clinicians; there was 25% increase in improved referral competencies as a result of feedback received from referring facilities (Jiwa, Walters & Mathers, 2004). Moreover, constructive feedback has been documented as a strategy to curb the increasing number of avoidable referrals. Consequently, a study conducted by Elwyn, Owen & Roberts, et al., (2007) revealed that when feedback was given to clinician referring patients for gastroscopy, unnecessary referrals reduced by 31%.

A study conducted in Ghana to assess the quality of referrals revealed that majority of patients present in tertiary hospitals late due to long waiting times between referring and receiving hospitals, lack of access to good diagnostic services as well as direct and indirect healthcare costs which are unaffordable to the patient. A simple yet cost-effective intervention like the use of a standardized referral letter has been documented as an intervention that can bridge this gap but one that requires political will and significant investment Gyedu et al., (2015).

Referral letters use is a successful process improvement for high-income countries though the same cannot be recognized in the low medium countries (Ramanayake, 2013). It is as a result of comprehending the benefits of a standardized referral process that Ghana engaged a well-thoughtout referral form; its absorption by the private facilities was not significant. Similar care is depicted in the Kenyan Health Sector whereby despite the existence of a standard referral letter, it is rarely adhered to during the referral process of a patient hence the discrepancies in the referral process.

2.4 Summary of Literature Review and Research Gaps

A wealth of literature has been documented on referral patterns globally, regionally, and locally and of importance to note is that adherence to laid down guidelines has translated to better health outcomes of patients and economic efficiency in healthcare. Feedback to referring hospitals has also been documented as a strategy that has improved the referral patterns and has discouraged against unnecessary referrals.

The concept of lay-referrals and the steep decay function has also greatly enriched this research paper in understanding the concept of direct referrals to KNH and how referral discipline can curtail this tendency of direct referrals to KNH from lower levels of care. However, despite this rich information, no research has been conducted at Kenyatta National Hospital on referral cases adherence to the referral guideline. Moreover, KNH has no policy on feedback mechanism to hospitals on referrals received in the institution. This study sought to advice on policy recommendation; to include a feedback mechanism for referrals.

In conclusion, this research paper sought to bridge the identified gaps and provide new information that would be of help to Kenyatta National Hospital, patients seeking healthcare services in the facility and influence the current 2019-2023 Referral Guideline.

CHAPTER THREE: RESEARCH METHODOLOGY

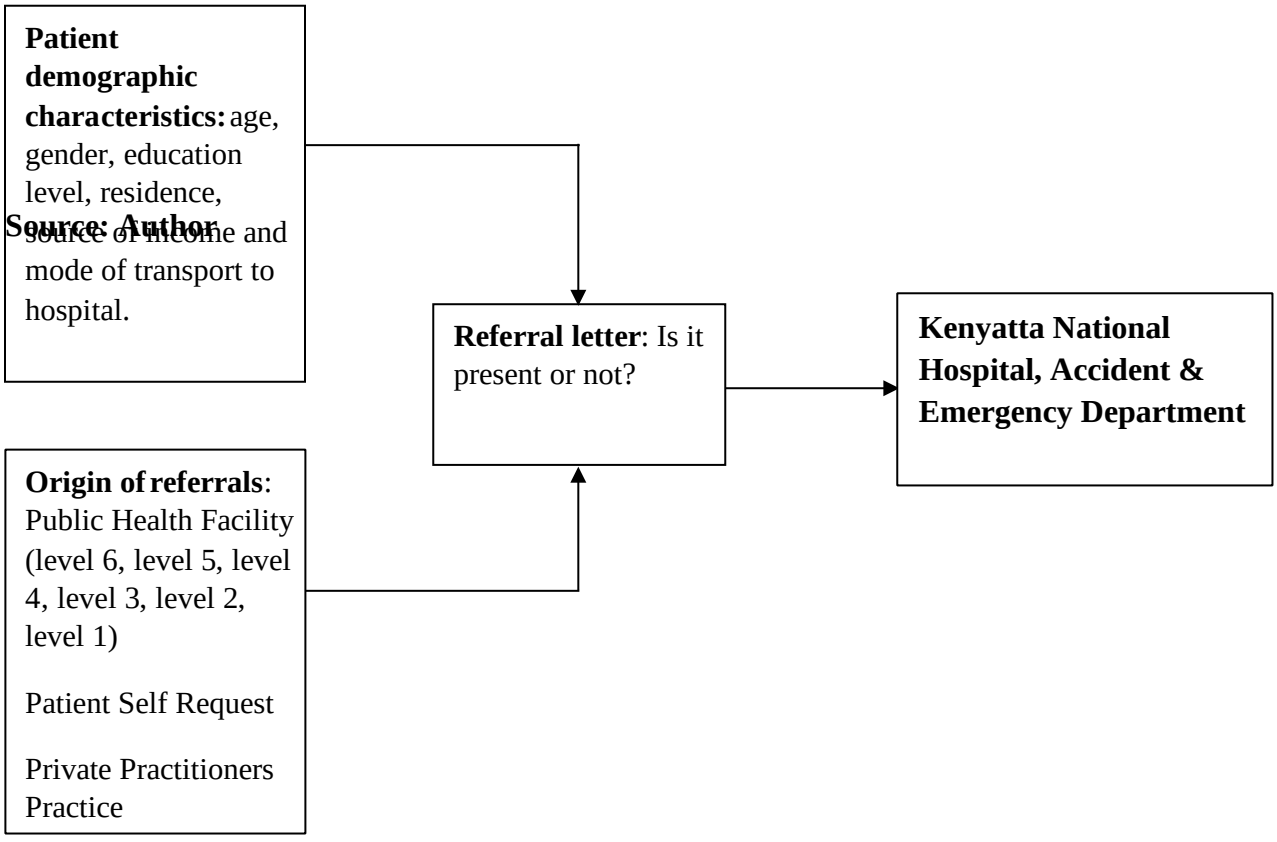
3.1 Introduction

This chapter presents; conceptual framework and economic model of this study. It expounds on the research design as well as the operationalization of the research variables.

3.2 Conceptual Framework

This is the diagrammatic portrayal of the association between the dependent and independent variables. In this research, the dependent variable was there referral letter to Kenyatta National Hospital, Accident and Emergency department. Independent variables are unique inputs that need to be in place to influence the dependent variable and included: patient demographics such as age, gender and place of residence; the level of care of referring facility; and reason for referral.

Figure 2: Conceptual Framework



Source: Author

Source: Author

3.3: Economic Modeling

3.3.1 Model Specification

The probit regression model was the model of choice to predict the referral patterns to Kenyatta National Hospital. This model states that predictions will lie within an interval of (0,1) where an assumption shall be made that the error term takes a standard normal distribution hence the probability of an individual being referred to Kenyatta National Hospital is either 1 or 0. Since the variable y* cannot be observed, hence cannot estimate variance, a linear relationship can be expressed between the explanatory variable ($\mathbf{X_i}$) and the unobservable variable y* represented as:

$$\mathbf{y^* = X_i\beta + \mu} \quad \textbf{.....(1)}$$

Where:

y*is the latent variable (Referral cases)

$\mathbf{X_i}$is the independent variables comprising of patient demographic characteristics, referral reason, the origin of referral and referral letters.

β is the coefficient of each independent variable **μ**

is the random error term.

The link between the latent variable **y***can be linked to the observed binary variable y and expressed in the vector form below:

$$\mathbf{Y_i} = \begin{cases} \mathbf{1 \ \ if \ \ y^* > k} \\ \\ \mathbf{0 \ if \ \ y^* \leq k} \end{cases} \quad \textbf{.....(2)}$$

Where,

$\mathbf{Y_i}$= 1 if an individual is referred from a county referral hospital, given that $\mathbf{Y_i > 0}$

$\mathbf{Y_i}$=0 if an individual is not referred from a county referral hospital, given that $\mathbf{Y_i \leq 0}$

Greene, (2002), states that the binary probit model can be further defined by transforming Xβ into a probability function represented as:

Prob (Y_i =1) = F ($X_i\beta$)…… (3)

Where; **β** represents the parameters to be

maximized.

Incorporating the maximum likelihood method, the probability of referral to Kenyatta National Hospital from a county referral hospital was specified as:

RL= β 0 + β 1 GND + β 2 AG + β 3 ED + β 4 SIN + β 5 ACS+ β 6 RSD + β 7 RF SOURCE + e

Where:

RL= Presence of Referral Letter

GND= Gender

AG= Age Group

ED= Education level

SIN= Source of income

ACS= Mode of Transportation/Hospital Access

RSD= County of residence of the participant

RF SOURCE= Source of Referral Letter

3.3.2 Description of Variables

Table 1: Description of model variables

Variables	Description
Dependent variable	
Referral Letter	Whether a participant has received a referral letter to KNH (1= Yes, 0= Otherwise)
Explanatory Variables	
Age in years	0= 0-14, 1= 15-24, 2= 25-54, 3= 55-64, 4= >65
Gender	1= Male, 0= Female
Education	1= No Education, 2= Primary Education, 3= Secondary Education, 4= Tertiary Education
Residence	1= Nairobi County, 0= Otherwise
Source of income	1= Employed, 2= No Employment, 3= Self Employment
Mode of Transportation/ Hospital Access	1= Ambulance Services, 2= Private Transport Means, 3= Walking
Source of Referral Letter	0= Private Practitioners Practice, 1= Public Health Facility from level 1 to 5, 2= Patient Self Request Referrals

Source: Author

3.4 Diagnostic Tests

This being a cross-sectional study using probit model that assumes the data follows a normal distribution, has a mean of 0 and a variance of 1; unobserved error term may be responsible for the deviation in the normal distribution of data hence the need to determine this variation. The deviation can either be unvarying or varying given any value of the descriptive variable.

Homoscedasticity is achieved when there is constant variance assumption that is not influenced by the predictor variables and is expressed as an equation below:

$Var\ (\mu_t)\ \delta^2$

Where:

μ error term t

variables of the

sample δ^2 variance

Ideally, this is the normal distribution expected in a model; however, when deviations occur from this assumption it can be termed as heteroscedasticity or multicollinearity.

3.4.1 Heteroskedasticity

This is the opposite of homoscedasticity and it occurs when there is a non-constant variance of the error variance. The error variance is described as the variation of the observed value from the authentic true value (unobserved). This leads to bias in the interpretation of coefficients hence the need for intervention.

The **Breusch-Pagan/ Cook-Weisberge Test** will be run using STATA to detect Heteroskedasticity in a probit regression:

This is a chi-square test used to test the null hypothesis of homoskedasticity. If;

P<0.05: reject the null hypothesis and accept Heteroskedasticity.

P >0.05: accept the null hypothesis and reject Heteroskedasticity.

3.4.2 Multicollinearity

When two or more independent variables achieve a linear relationship with each other, they are said to correlate and can be termed as exhibiting perfect Collinearity. The solution is either to eliminate or to drop the variable that causes this linear relationship to ensure that the co-efficient of the remaining variable is a unique estimation and not a blend of another variable (Berry and Feldman, 1985).

However, there are times that severe multicollinearity occurs making dropping or deleting one of the variables impossible thus translating to an inflated standard error of the coefficients. This in turn makes the regression coefficients unreliable. When this happens, two measures need to be conducted to correct multicollinearity (Menard, 1995):

Tolerance (T): it serves as a pointer of the similarity endurance a regression can accommodate. It is computed as:

$$\mathbf{T= 1-R^2}$$

Variance Inflated Factor (VIF): of the inflated standard error, how significant is it to Collinearity? It is computed as:

$$\mathbf{VIF= 1/T}$$

We either conclude that**;** there is multicollinearity when T=0 and VIF is a very big number, OR that variables in a model are **uncorrelated** when **T & VIF =1.**

3.5 Area of Study

The study was conducted at Kenyatta National Hospital, Accident and Emergency Department which is one of the outpatient departments at KNH that handles casualties, referrals, and adult medical and surgical emergency patients, and pediatric surgical emergencies.

3.5.1 Justification of Study Area

Kenyatta National Hospital is the largest Teaching and Referral Hospital in East and Central Africa and the only level six hospital in Nairobi County situated in the capital city of the country. Accident and Emergency has a referral coordination office where ideally all facilities referring patients to

the hospital are supposed to communicate with KNH and are advised appropriately on whether to refer or not to refer and available options. The instruction on acceptance or reversal of referral is done by the team leader nurse in collaboration with the team leader doctor. Accident and Emergency department serves as the entry point of patients to KNH and will aid achieve the objectives if this study. This study upon completion sought to document its study findings and recommendations as well as give policy directions on the current second referral strategy 20192023.

3.6 Target Population

The target population was patients seeking healthcare services at Accident & Emergency department serving as the pool from which the sample population will be generated.

Inclusion criteria

- All patients with surgical conditions were included in the study; adults above 18 years who had a next of kin will sign a consent form, children less than 18 years gave their assent.
- All adults with medical conditions were included in the study.
- Pregnant women less than 20 weeks gestation were included in the study.
- Women with other obstetric and gynecological emergencies were included in the study.

Exclusion criteria

- Children less than 13 years with medical conditions were excluded from the study as they were seen at the pediatric emergency department.
- Pregnant woman more than 20 weeks gestation was excluded from the study as they were referred to labor ward.
- Alone critically ill patients who had no next of kin to consent to the study were excluded from the study.

3.7 Data Source and Type

Cross-sectional data was collected at a specific period. Structured questionnaires were used to collect primary data from the target population of participants seeking health care services at Kenyatta National Hospital, Accident & Emergency Department. Secondary data was presented in

the empirical literature review of this study and served as the basis of discussion of the study findings of this study.

3.8 Study Design, Sample Size, and Sampling Procedures

This was a descriptive cross-sectional study aimed at identifying factors that contribute to referral cases in Kenyatta National Hospital, Accident and Emergency Department. This study mainly used primary data collected from participants seeking healthcare at the Accident and Emergency department.

The estimated sample size for the study was based on sample size estimation procedures for the descriptive survey. A previous study has shown that the prevalence of hospital referrals to Kenyatta National Hospital is at 72.3% (Mahinda, 2013). Therefore, a pre-study estimate of the prevalence of hospital referrals to Kenyatta national Hospital of 72.3% at a confidence level of 95% and an absolute precision error of 5% was used in sample size calculation. The sample was computed as follows:

$$\mathbf{N=Z^2\ P\ (1-p)/d^2}$$

Where;

N=desired sample size

P= pre-study estimate from the previous literature review which showed approximately 72.3% of referrals to Kenyatta national Hospital were hospital referrals.

Z= standard normal deviate corresponding to a 95% confidence level.

d= absolute precision/ margin of error

Substituting for the above formula gives

$N=1.96^2$, $0.723(1-0.723)0.05^2=1.96^2 *0.723*0.277/ 0.05^2$

$N_o =$**304.4**

Therefore, this study required **305** participants to detect a 72.3% of hospital referrals to Kenyatta National Hospital at 95% confidence level and 5% margin error.

Sampling process

Sampling was done via systematic random sampling. This is where the n^{th}participant is randomly selected and included in the study. On average, a total of 120 patients are seen at Accident &Emergency department in 24 hours (Accident and Emergency Health Information). This means at an interval of 3 derived from (305/120) every 3^{rd}, 6^{th}, 9^{th}, 12^{th}, 15^{th}.....patient will be systematically randomly selected to achieve a sample size of 305 participants.

Recruitment and consenting procedures

Recruitment of the 305 participants was conducted by the researcher and the research assistants at Accident & Emergency department throughout the 7 days of the week to translate to approximately 45 participants per day to achieve a sample size of 305 participants**.**

Consenting of the study participants was done within the Accident & Emergency department monitoring area A and B, after triaging at the emergency observation. Consenting was facilitated by the researcher and research assistants trained and piloted on administration of the consent form used in the study.

Once identified, the principal investigator or research assistant briefed the patients on the purpose and method of the study and attain verbal consent. Thereafter, consent was given in written form, on a pre-designed consent form. The consent form provided described the purpose of the study, the study procedure to be followed, and the potential benefits and risks of participating in the study. Any pertinent questions regarding the study from the parent/guardian was answered at this point. This process was free from coercion and will be explicitly voluntary. Those who accepted to take part in the study were asked to sign the consent form, which was counter-signed by the investigator. Records were kept regarding reasons for non-participation of eligible participants. The investigator or research assistant then countersigned the consent form. A copy of the signed consent form was given to the participant.

3.9 Data Collection Instruments

Ngechu (2004) asserts that the attributes of research such as the research topic, research objectives, research problem and expected results influence the choice of researchers' study instrument. This study employed the use of a survey questionnaire as the data collection instrument. The questionnaire had both open-ended and close-ended questions where the open-ended questions

provided more structured responses to the research questions. The questionnaire was tested prior to the study on randomly selected participants to assess the validity, reliability and appropriateness of questionnaire questions in achieving the objectives of the research.

3.10 Data Collection Procedure

Data was collected at the Accident and Emergency; Resuscitation Rooms A and B, Monitoring area A and Monitoring area B which is the area of emergency, very urgent, urgent and routine patients respectively as that's how patients are triaged and reviewed in Accident & Emergency. Respondents were patients able to individually consent, or next of kin able to consent on behalf of the patient and parents able to give assent on behalf of their minors.

3.11 Data Analysis

Intention to treat analysis was used. Data was cleaned, coded, and analyzed by the use of STATA.

Objective one: To identify factors that determine referral cases in Kenyatta National Hospital, Accident and Emergency Department. Independent factors variables (X) such as socio-demographic factors, gender, age, source of income, and mode of transport, presence of referral letter, referring facility as indicated on referral letter, and reason for referral as indicated on referral letter were analyzed. Descriptive analysis: mean, median, percentiles and frequencies of each independent variable were calculated and results presented using tables, charts, pies, and frequency distribution to show the distribution of these factors among the referral cases.

Objective two: To evaluate the effects of the above factors on healthcare delivery at Kenyatta National Hospital, Accident and Emergency Department.

Regression using Probit model was done whereby a p value of 0.05 will assessed the statistical significance of the variables This model allowed us to jointly estimate several response variables at a time and apply adjustments to co-variances. The p values of each independent variable indicate if the variable is significant if the p value is <0.05 hence will have a positive effect (if the coefficient is positive) or a negative effect (if the co-efficient is negative) on healthcare delivery at KNH, A&E department. All statistical tests were done at 95% confidence level and 5% level of significance ($p<0.5$). Presentation was in form of tables.

3.12 Ethical Consideration and Limitations

Ethical approval was sought and granted by the Kenyatta National Hospital-University of Nairobi Ethics Review Committee (ERC). Written informed consent was administered to the participants in the study. This study was not directly beneficial to the participants. However, since one of the specific aims of this research was to make policy recommendations on the current 2019-2023 Referral Strategy; this would aid in streamlining lower levels of healthcare and thus avoid unnecessary referrals to Kenyatta National Hospital.

The likely limitation was the study population; other departments like the Pediatric Emergency Unit that deals with pediatric medical emergencies; as well as maternity unit that deals with expectant mothers in labor were excluded from the study. Consequently, critically ill patients who were alone patients were not captured by this study due to unavailability of a next of kin to provide consent which was an ethical requirement for the study.

CHAPTER FOUR

4.0 Results and Interpretations

This chapter will present the findings of empirical analysis of the association between the dependent and independent variables in our regression model, to identify the determinants of referral cases in the Kenyatta National Hospital, Accident & Emergency Department.

4.1 Descriptive Statistics

Table 1 below shows descriptive statistics of the y and x variables. The standard deviation shows the dispersion of the values from the mean, while the difference between the maximum and minimum values gives the range of the variables. The total observations considered were 311.

Table 2: Descriptive Statistics

Variable	Observations	Mean	Std. Deviation	Min	Max
Referral Letter	311	0.659	0.475	0	1
Gender	311	0.534	0.500	0	1
Age Group					
15-24	311	0.219	0.414	0	1
25-54	311	0.556	0.498	0	1
55-64	311	0.074	0.262	0	1
>65	311	0.103	0.304	0	1
Education Level					
Primary	309	0.304	0.461	0	1
Secondary	309	0.411	0.493	0	1
Tertiary	309	0.191	0.394	0	1
Source of Income					
No Employment	309	0.524	0.500	0	1

Self-Employment	309	0.243	0.429	0	1
Transportation Mode					
Private Transport Means	310	0.800	0.401	0	1
Walking	310	0.026	0.159	0	1
Residence	311	0.624	0.485	0	1
Referral Source					
Public Health Facility	298	0.393	0.489	0	1
Patient Self Request Referrals	298	0.326	0.469	0	1

Source: Author's estimates from primary data

It can be observed that 65.9% of the respondents received referral letters, with 39.3% of those being from public health facilities (level 1 to level 6), and 32.6% of them being from patient selfrequest referrals. It is also important to note that 62.4% of respondents reside in Nairobi County, but the overwhelming majority of respondents use private transport means to KNH (80%), with only 2.6% walking to the facility. This could imply the inaccessibility of ambulance services. Most of the respondents are female (53.4%) and are between 25-54 years of age (55.6%). They are also mostly unemployed (52.4%) and having completed their education at the secondary level (41.1%). Gender and non-employment show the greatest variability from the mean values with a standard deviation of 0.5, while the least is for walking as a transportation mode, at only 0.159. As can be observed, all variables are binary with a minimum value of 0 and a maximum value of 1.

4.2 Diagnostic Tests

4.2.1 Heteroscedasticity

The Breusch-Pagan test is conducted to check for heteroscedasticity and results are as shown below:

Table 3: Heteroscedasticity results

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity
Ho: Constant variance
Variables: Fitted values of Referral Letter
chi2(1) = 48.48
Prob > chi2 = 0.0000

Source: Author's estimates from primary data

The results confirm the presence of heteroscedasticity since the p-value of 0.0000 is less than the 5% level of significance, hence reject the null hypothesis and conclude non-constant variance. This will be corrected later using robust probit regression, as robust regression is designed to not overly be affected by violations of assumptions and outliers.

4.2.2 Multicollinearity

Examination of Variance Inflation Factors (VIF) in the model is conducted to ascertain the presence of multicollinearity between independent variables. For VIF values greater than 10, multicollinearity is present, and absent otherwise. VIF= 1/ (1^{-R^2}) and 1/VIF= tolerance.

Table 4: Multicollinearity results

	VIF	1/VIF	Variable	
		0.905	Gender	1.1
Age Group				
	15-24	5.82	0.172	
	25-54	7.98	0.125	

55-64	2.88	0.347
>65	3.2	0.312
Education Level		
Primary Level	3.64	0.274
Secondary Level	4.68	0.214
Tertiary Level	3.5	0.286
Source of Income		
No Employment	2.02	0.494
Self-Employment	1.75	0.57
Transportation Mode		
Private Transport Means	1.26	0.795
Walking	1.22	0.82
Residence	1.23	0.814
Referral Source		
Public Health Facility	1.57	0.638
Patient Self Request Referrals	1.55	0.646
Mean VIF	2.89	

Source: Author's estimates from primary data

We do not observe any presence of multicollinearity since all the VIF values are less than 10.

4.3 Regression

After the diagnostic tests, a robust probit regression was carried out on the model and the observed average marginal effects are presented below:

Table 5: Average Marginal Effects

	(1)
	Referral Letter

		dy/dx Deltamethod	Std. Error
Gender		0.037	(0.0535)
Age Group			
	15-24	-0.2737***	(0.101)
	25-54	-0.2496***	(0.0927)
	55-64	-0.1663	(0.1283)
	>65	-0.1905*	(0.1122)
Education Level			
	Primary	0.0368	(0.1053)
	Secondary	0.0317	(0.111)
	Tertiary	0.1115	(0.1184)
Source of Income			
	No Employment	-0.054	(0.0724)
	Self-Employment	0.0427	(0.0756)
Transportation Mode			
	Private Transport Means	-0.1415**	(0.0659)
	Walking	0.0381	(0.1452)
Residence		-0.2313***	(0.0536)
Observations		306	
Pseudo R-Squared		0.0919	
Prob > chi2		0.0017	

Note: Star (*) to indicate level of significance, where: $^{*}p< 0.10$, $^{**}p< .05$, $^{***}p< .01$

Source: Author's estimates from primary data

It can be observed that age is a significant influence on whether or not a patient receives a referral letter to Kenyatta National Hospital, with individuals aged 15-24 being on average 27.37% less

likely to be referred than those aged 0-14, while those aged 25-54 being on average 24.96% less likely to be referred than those aged 0-14, and those above 65 years of age being on average 19.05% less likely to be referred than those aged 0-14. Similar results were found by an analysis conducted in the United States and the United Kingdom where the elderly were observed to experience fewer referrals for a specialist review in comparison to other persons of different age groups (Forrest, Majeed, et al. 2002). This is expected since younger children typically require greater surgical care than their older counterparts or adults, due to greater vulnerability, though the older an adult gets the narrower this gap becomes.

The mode of transportation to KNH is also seen to significantly impact referral cases, with patients using private transport means being 14.15% less likely to have referral letters to KNH on average, than those using ambulance services. This implies that the cost and ease/speed of access to KNH could be inhibitors or enablers of referral cases. A study conducted in Uganda by

Nanyonjo, Bagorogoza, et al (2015) also found that, among other costs, transport costs are one of the access barriers and hence recommend their removal or reduction.

Residence in Nairobi County also significantly influences receipt of a referral letter, such that non-residents are 23.13% more likely on average to be referred to KNH than residents. This is most probably because healthcare facilities in Nairobi are generally better equipped and resourced to handle complex cases than those in neighbouring counties, mostly Kiambu, Kajiado and Machakos. This affirms studies conducted in Africa (Sakeah, McCloskey, &Bernstein et al.,

2014) reveal the majority of health care seekers are actually 'self-referrals'. Aikins (2005) asserts that since human beings are social beings, the influence of their families, peers, workmates and social media will motivate them to disregard existing referral guideline and seek care at the highest level. Cognitive elements such as trust have been shown to have a great influence on health practices that majority of patients depict when seeking health services despite there being published referral policies (Aryeetey, Aikins, Gyeke-Dako, & Adongo, 2015). Studies conducted in other Sub-Saharan countries by Bakare, M.O. (2013) as well as low- and middle- income countries (Sheikh, Ali, Hussain, Shehzadi, & Afzal, 2009) show similar patterns.

However as indicated by Kloos (1990) in a study conducted in Ethiopia, rural health services tend to be underutilized, as many patients prefer the tertiary level hospitals due to a trust deficit.

Consequently, the study results affirm that access and equity to healthcare play a paramount role in determining self-referrals to a level six hospital as documented by Kloos (1990) in a study conducted in Ethiopia. Lyun (1983); Okafor 1983) conducted a similar study in Nigeria. Both studies emphasize the concept of a **steep distance-decay function model**. It is further expounded to mean that all other factors held constant; when individuals have a clinical need, they will not seek healthcare further away from the referral facility that is near to them. Prohibitively as evidenced by the same authors, a significant proportion of the population will tend to mushroom near the referral hospital and thus make it their hospital of choice for even lower level illnesses. Interestingly, we observe that gender, source of income and education level have an insignificant impact on the likelihood of receiving a referral letter to KNH. The presence of the National Hospital Insurance Fund (NHIF) is most likely the 'equalizer' so that economic factors have less influence on access to referral care at KNH.

CHAPTER FIVE

5.0 Research Summary

The main objective of this study was to assess the determinants of referral cases in a national hospital, with Kenyatta National Hospital as a case study. To do so, the study began by assessing the nature and coverage of the Kenyan healthcare system, as well as the existing literature and theory on referral systems in different parts of Africa and the world. It then created an outcome variable based on the cross-sectional primary data collected, as well as the corresponding explanatory variables. The study proceeded to statistically analyze the data using *Stata/SE 14.1* software and make inferences based on the results, to establish the relationship between the presence of a referral letter and the identified possible explanatory variables. The paper now moves on to discuss possible improvements that can be made to the Kenyan Referral Strategy 2019-2023 based on findings.

5.1 Conclusion and Policy Recommendations

Based on findings, we can conclude that there are indeed several significant factors that determine referral cases at KNH, among them being the age and residence of patients, as well as their mode of transportation to the hospital.

This study therefore recommends that the national and county governments should consider improving the quality of care provided at lower level institutions to reduce self-referrals, while generally investing more in healthcare institutions outside Nairobi County. Considering that the option of private transportation is a significant inhibitor to access to referral care, county governments in partnership with the national government should work to ensure that individuals can receive high-quality healthcare as close to their homes as possible. This will also help to build trust in local facilities, and reduce the numerous incidences of self-referrals to KNH.

Consequently; of key importance to this research study was the Strength, Weakness, Opportunities, and Threats (SWOT) analysis conducted by KNH where the implementation of the National Referral policy was highlighted as one of the opportunities of the hospital. The strategic impact intended is reduced congestion at the facility, improved clinical outcomes of patients and increased specialized care which is the mandate of the hospital. A policy brief was

presented to the management of KNH based on the findings of this study to help actualize this opportunity.

5.2 Limitations of the Study

The study was unable to observe the regression results for the x-variable 'Source of the Referral Letter' due to consistent omission by STATA as it predicts success perfectly. This is most probably because of the design of the questionnaire which was such that a Yes answer to the presence of referral letter question automatically led to an answer on the source of the referral letter so that they are perfectly collinear.

5.3 Areas for Further Research

Future studies should find ways of collecting data on the source of referrals/level of care of referring facilities and the patient acuity levels/reasons of referral, which are important, without directly linking them to the presence, or lack of, or a referral letter to avoid the problem of perfect Collinearity. They should also embrace Behavioural and Experimental Economics approaches in conducting similar studies, as they are more reliable and precise in explaining human behavior through the use of scientific experiments and the inclusion of knowledge from other academic disciplines.

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APPENDICES

APPENDIX 1: KNH-UON/ERC/FORM/ICO1

PARTICIPANT INFORMATION AND CONSENT FORMFOR ENROLLMENT IN THE STUDY

(To be administered in English or any other appropriate language e.g Kiswahili translation)

Title of the Study: To identify factors determining referral cases and their effect on healthcare delivery A case Study of Kenyatta National Hospital, Accident and Emergency Department.

Principal Investigator/and institution of affiliation: Miss Jacqueline Kagure Wanjiru, Master of Science Health Economics and Policy student at University of Nairobi School of Economics, Registration number X53/73035/2014.

Introduction:

The purpose of this consent form is to give you the information you will need to help you decide whether or not to be a participant in the study. Feel free to ask any questions about the research, what happens if you participate in the study, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered to your satisfaction, you may decide to be in the study or not. This process is called 'informed consent'. Once you understand and agree to be in the study, we will request you to sign this form. You should understand the general principles which apply to all participants in a medical research: (1) Your decision to participate is entirely voluntary, (2) You may withdraw from the study at any time without necessarily giving a reason for your withdrawal, (3) Refusal to participate in the research will not affect the services you are entitled to in this health facility or other facilities. You will be given a copy of this form for your records.

May we continue? YES/NO

This study has approval by the Kenyatta National Hospital-University of Nairobi Ethics and Research Committee protocol No _____

What is the study about?

This research aims at assessing the referral cases at Kenyatta National Hospital, Accident & Emergency department. The purpose of the interview will be to determine the factors that contribute to referral cases in Kenyatta National Hospital. Participants in this research will be asked questions about: their demographic characteristics, level of care of their referring facility and why they have been referred to Kenyatta National Hospital Accident & Emergency department. Participants will not undergo any tests in this research. There will be approximately **305** participants in this study, systematic randomly chosen. We are asking for your consent to consider participating in this study.

What will happen if you decide to be in this research study?

If you agree to participate in this study, the following will happen:

You will be interviewed by a trained interviewer in a private area where you feel comfortable answering questions. The interview will last approximately 10 minutes. The interview will cover topics such as your gender, age, level of education, source of income, county of residence, referral facility that has sent you to Kenyatta National hospital, and the reason for referral.

Are there any risks, harms, discomforts associated with the study?

Medical research has the potential to introduce psychological, social, emotional and physical risk. Effort should always be put in place to minimize the risks. One potential risk of being in the study is loss of privacy. We will keep everything you tell us as confidential as possible. We will use a patient number to identify you in a password-protected computer database and we will keep all of our paper records in a locked file cabinet. However, no system of protecting your confidentiality can be absolutely secure, so it is still possible that someone could find out you were in this study and could find out information about you.

Also, answering questions in this interview may be uncomfortable for you. If there are any questions you do not want to answer, you can skip them. You have the right to refuse the interview or any questions asked during the interview. There will be no embracing questions or examinations during the interview. No injury, illness or complication related to this study is anticipated, however incase of such an occurrence, contact the study staff at the number provided at the end of this document.

Are there any benefits being in the study?

There will be no monetary benefit of being involved in this study. However, the information you provide will help us better understand your healthcare needs and also contribute to science in bid to make Kenyatta National Hospital, Accident & Emergency a specialized patient centered health care facility.

Will being in this study cost you anything?

It will not cost you any monetary value to participate in this study. It will just indirectly cost you 10 minutes of your time incurred during the interview process.

Will you get refund for any money spent as part of the study?

You will not spend any money as part of the study hence there will be NO refunds.

What if you have questions in future?

If you have further questions or concerns about participating in this study, please call or send a text message to the study staff at the number provided at the bottom of this page.

For more information about your rights as a research participant you may contact the Secretary/ Chairperson, Kenyatta National Hospital-University of Nairobi Ethics and Research Committee Telephone No. 2726300 Ext 44102 email uonknh_erc@uonbi.ac.ke.

What are your other choices?

Your decision to participate in this research is voluntary. You are free to decline participation in the study and you can withdraw from the study at any time without injustice or loss of any benefits.

CONSENT/ ASSENT FORM

Participant's statement

I have read this consent/assent form or had the information read to me. I have had the chance to discuss this research study with a study counselor. I have had my questions answered in a language that I understand. The risks and benefits have been explained to me. I understand that my participation in this study is voluntary and that I may choose to withdraw any time. I freely agree to participate in this research study.

I understand that all efforts will be made to keep information regarding my personal identity confidential.

By signing this consent/assent form, I have not given up any of the legal rights that I have as a participant in a research study

I agree to participate in this research study: Yes ( ) No ( )

Participant name:_____

Participant signature/thumb stamp _____ Date _____

When participant is not able to provide informed consent, assent shall be provided below for participants less than 18 years:

Participant name:_____

Next of Kin name: Signature_____Date

_____ _____

Relationship of representative to participant

Researcher's statement

I, the undersigned, have fully explained the relevant details of this research study to the participant above and believe that the participant has understood and has willingly and freely given his/her consent/assent.

Researcher's Name: _____ Date_____
Signature_____ Role in the study:
_____

For more information contact **Jacqueline Kagure Wanjiru**at **Kenyatta National Hospital,Accident & Emergency Department**from **7:30am**to **4:30pm Monday to Friday.**

Witness if necessary (both acceptable to both researcher and participant)

Signature/thumb stamp_____ Date_____

APPENDIX II: STUDY QUESTIONNAIRE

Objective one:

Demographic characteristics

1. Gender of the participant
   - Male ( )
   - Female ( )
2. What is the absolute age of the participant?

   ……
3. Highest level of education obtained by the participant?
   - No education ( )
   - Primary level ( )
   - Secondary level ( )
   - Tertiary level ( )
4. Place of residence of the participant
   - Nairobi County ( ) if No
   - Specify……
     ……
5. Source of income of the participant
   - Employed ( )
   - Self employment ( )
   - No employment ( )
6. Mode of transport to hospital by the participant
   - Walking ( )
   - Private transport means ( )
   - Ambulance services ( )

Objective two:

1. Does the participant have a referral letter?
    - Yes ( )
    - No ( )
2. Is the reason for referral indicated on the referral letter?
    - No ( )
    - Yes ( )……

    If Yes; what is the reason for referral as indicated on the referral letter? :
    - Emergency services ( )
    - Specialized services ( )
    - Radiological services ( )
    - Laboratory services ( )

Level of care of referring facility

1.What is the level of care of the referring facility as per the referral structure?

- County referral facilities: Level 5 ( )
  Level 4 ( )
- Primary health facilities: Level 3 ( )
  Level 2 ( )
- Community health facility: Level 1 ( )
- Others: Patient self request referrals ( )
  Private practitioners practice ( )

2. Please indicate the County of the referring facility……
……

THANK YOU FOR YOUR PARTICIPATION