

**HEALTH SYSTEM FACTORS AFFECTING COMMUNITY HEALTH UNITS'
PERFORMANCE IN DELIVERY OF CHILD IMMUNIZATION SERVICES IN
URBAN INFORMAL SETTLEMENTS IN NAIROBI COUNTY**

**LENAH CHEPKORIR
HSM-3-3001-2/2014**

**A THESIS SUBMITTED TO THE DEPARTMENT OF HEALTH SYSTEMS
MANAGEMENT IN PARTIAL FULFILMENT FOR REQUIREMENTS OF THE
CONFERMENT OF MASTER OF SCIENCE IN HEALTH SYSTEMS
MANAGEMENT OF KENYA METHODIST UNIVERSITY**

SEPTEMBER 2024

DECLARATION

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

Signed **Date**

Name: Lenah Chepkorir (HSM-3-3001-2/2014)

Recommendation by Supervisors

“We confirm that the work reported in this thesis was carried out by the candidate under our supervision.”

Signed..... **Date**

Prof. Wanja Mwaura Tenambergen, PhD.

Riara University, Kenya.

Signed..... **Date:**

Dr. Job Mapesa

Department of Public Health and Nutrition

Kenya Methodist University

COPYRIGHT © 2024

Lenah Chepkorir. “All rights reserved. No part of this thesis may be reproduced, stored in any retrieval system or transmitted in any form or by any means, electronically, mechanically, by photocopying or otherwise, without prior written permission of the author or Kenya Methodist University, on that behalf”.

DEDICATION

I dedicate this work to my husband Christopher Oyuech, mother Ruth Soi, sisters Jackline Cherotich and Mercy Cheronno for their support and love throughout this project. I love you.

ACKNOWLEDGEMENT

I offer my deepest gratitude to GOD for His enablement. Nothing could have been possible without His guidance and grace. Secondly, I am thankful to my supervisors, Prof. Wanja Mwaura-Tenambergen and Dr. Job Mapesa whose guidance and support from the initial to the final level enabled me to develop an understanding of this work. Thirdly, I am grateful to National Commission for Science and Technology; Nairobi Metropolitan Services Medical Officer of Health (MOH) and Kenya Methodist University (KeMU), Science and Ethics Review Committee for the permission/authorization to access my target study population and collect the necessary data during the project period. Fourthly, I am grateful to Kenya Methodist University Health System Management Department whose support and guidance and constant evaluation has made me achieve and earn my Master of Science in Health Systems Management. Lastly, I am indebted to my mother Ruth Soi, husband Christopher Oyuech and family for their unconditional love, support and always believing in me. Thank you for keeping me focused and motivated.

ABSTRACT

Health systems are complex, and in a complex real world setting a health system needs system's thinking approach to operate more successfully and effectively. Community Health Unit delivers a structured child immunization services at household and community level. Full Immunization Coverage in Nairobi slums is at 55%. Nairobi hosts one of the largest informal settlement in Africa where approximately 56% of urban population in Kenya lives. Therefore the study sought to establish Accountability; Human resource; Logistics & supplies; and Incentives factors influencing Community Health Units' performance in the delivery of child immunization services in Nairobi County urban Informal Settlement. This study was a cross-sectional descriptive research which adopted Interpretivist research philosophy. It used survey methodology to obtain data and used both systematic and simple random sampling to get a sample size of 354 respondents drawn from 4490 functional Community Health Units. The data collection instrument used was a structured questionnaire. Methods of data analysis used were descriptive statistic which included percentages, frequencies and cross-tabulation; and inferential statistics which involved logistic regression and logistic model was fitted to the data. The findings revealed that firstly, $\beta = -1.967$, Wald =42.893, df =1 which is associated with a p-value of 0.000 and Odds ratio=0.140 for the Accountability factors. Secondly, $\beta = -1.574$, Wald =16.000, df =1 which is associated with a p-value of 0.000 and Odds ratio =0.207 for the Human Resource factors. Thirdly, $\beta = -1.115$, Wald =12.866, df =1 which is associated with a p-value of 0.000 and Odds ratio =0.328 for the Logistics &supplies. Fourthly, $\beta = -1.336$, Wald =9.634, df =1 which is associated with a p-value of 0.002 and Odds ratio =0.113 for the Incentive factors. Lastly CHU showed 71.2% effectiveness in the delivery of child immunization services. It was concluded that Accountability, Human resource practices, Logistics & supplies; and Incentives factors significantly influenced the odds of Community Health Units' performance in the delivery of child immunization services in Nairobi County Informal Settlements. This study recommendations included: selection of more male Community Health Promoter; Communication channel to be strengthened; Support supervision to be enhanced; Friendly and relevant and not restrictive job aids to be provided; and Incentives to be provided for Community Health Promoter. Further research should be done to establish the ways to have more males as Community Health Promoter; to establish strategies to have effective toiler made community monitoring and evaluation and the best and affordable, suitable and sustainable incentives for Community Health Promoter.

TABLE OF CONTENT

DECLARATION.....	ii
COPYRIGHT © 2024.....	iii
DEDICATION.....	iv
ACKNOWLEDGEMENT.....	v
ABSTRACT.....	vi
TABLE OF CONTENT	vii
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
ABBREVIATIONS AND ACRONYMS.....	xi
CHAPTER ONE: INTRODUCTION.....	1
1.1. Background of the Study	1
1.2. Statement of the Problem	4
1.3. Purpose of the Study	5
1.4. Objectives	6
1.5. The Research Questions.....	6
1.6. Justification of the Study	7
1.7. Limitations of the Study.....	8
1.8. Delimitation/Scope of the Study	8
1.9. Significance of the Study.....	9
1.10. Assumptions of the Study.....	9
1.11. Operational Definition of Terms	9
CHAPTER TWO: LITERATURE REVIEW	11
2.1. Introduction.....	11
2.2. Dependent variable: CHU performance in the delivery of child immunization services	11
2.3. Independent Variable: Accountability system factors.....	12
2.4. Independent Variable: Human resource factors	15
2.5. Independent Variable: Logistics and supplies factors	18
2.6. Independent Variable: Incentive factors.....	20
2.7. Theoretical Framework	23
CHAPTER THREE: RESEARCH METHODOLOGY.....	26
3.1 Introduction	26
3.2. Research Philosophy	26

3.3.	Research design.....	26
3.4.	Target Population	27
3.5.	Sampling Procedure.....	28
3.6.	Instrumentation	29
3.7.	Methods of Data Collections.....	30
3.8.	Methods of Data Analysis	32
3.9.	Ethical Considerations.....	33
CHAPTER FOUR: RESULTS AND DISCUSSION.....		35
4.1.	Introduction	35
4.2.	Pilot Results.....	35
4.3.	Participants Response rate	36
4.4.	Demographic characteristics of the respondents	36
4.5.	Descriptive analysis of the study variables.....	42
4.6.	Bivariate logistic regression	57
CHAPTER FIVE: SUMMARY, CONCLUSION & RECOMMENDATIONS		63
5.1.	Introduction	63
5.2.	Summary	63
5.3.	Conclusions.....	65
5.4.	Recommendations.....	67
REFERENCES.....		69
Appendix I: Introduction Letter.....		78
Appendix II: Informed Consent Form		79
Appendix III. Data Collection Instruments		80
Appendix IV: Kenya Methodist University Ethical Approval		87
Appendix V. Research Permit NACOSTI.....		88
Appendix VI. Nairobi Metropolitan Services Research Authorization/Permit Letter ...		89
Appendix VII. Nairobi County Map		90

LIST OF TABLES

Table 3.1. Operational Definitions of Variables	31
Table 4.1. Cronbach's Alpha Reliability Statistics	35
Table 4.2. Response rate	36
Table 4.3. CHU Performance (Dependent Variable)	43
Table 4.4. Accountability factors	45
Table 4.5. Human resource management factors	49
Table 4.6. Logistics & supplies factors.....	52
Table 4.7. Incentives Factors	55
Table 4.8. Analysis of relationship between Sub-County of Operation and CHU performance	56
Table 4.9. Omnibus Tests of Model Coefficients.....	57
Table 4.10. Model Summary	57
Table 4.11. Hosmer and Lemeshow Test	58
Table 4.12. Relationship between Demographic characteristic and CHU performance	58
Table 4.13. Omnibus Tests of Model Coefficients.....	60
Table 4.14. Model Summary	60
Table 4.15. Hosmer and Lemeshow Test	61
Table 4.16. Relationship between Independent variables and Dependent variable	61

LIST OF FIGURES

Figure 2.1. <i>Conceptual Framework</i>	25
Figure 4.1. <i>Participants age</i>	37
Figure 4.2. <i>Participant's Sex</i>	38
Figure 4.3. <i>Participants' Marital status</i>	39
Figure 4.4. <i>Education level</i>	40
Figure 4.5. <i>Monthly income</i>	41
Figure 4.6. <i>Sub-county of Operation</i>	42

ABBREVIATIONS AND ACRONYMS

CCSC-	County Community Strategy Coordinator
SCCSC-	Sub-County Community Strategy Coordinator
CHA-	Community Health Assistants
CHC-	Community Health Committee
CHS-	Community Health Strategy
CHT-	Community Health Teams
CHU-	Community Health Units
CHP-	Community Health Volunteers
CHS	Community Health Services
CHWF-	Community Health Worker Force
CSC-	Community Strategy Coordinator
FIC -	Full Immunization Coverage
KeMU-	Kenya Methodist University
KEPH-	The Kenya Essential Package for Health
KHPF-	Kenya Health Policy Framework
KHSIP-	Kenya Health Strategic and Investment Plan
KMOH-	Kenya Ministry of Health
MOH-	Ministry Of Health

NMS- Nairobi Metropolitan Services

SCCSC- Sub-County Community Strategy Coordinator

UNICEF- United Nations Children’s Fund

USAID- United States Agency for International Development

WHO - World Health Organization

CHAPTER ONE: INTRODUCTION

1.1. Background of the Study

Health systems are complex and to achieve better and more equitable and responsive health outcomes this must be taken into consideration. This therefore calls for a shift in approach from linear to a dynamic and holistic approach that takes into consideration the multilayered and interrelated relationships that exist among the components and power of the actors and the stakeholders (Sheikh et al., 2011).

The Health System's main goal is to enhance health as well as health equity to ensure that there is proper financial, receptive and most efficient use of the existing resources (World Health Organization [WHO], 2015). Resilient systems are able to react to shock while maintaining its functions and also is able to react to a shock by learning and innovation (Michielsen et al., 2023).

Health system constitute of building blocks which are the health sub-systems and these must be looked holistically as a dynamic design of interactions and synergies (Michielsen et al., 2023). Service Delivery is one of the Health systems building blocks that is concerned with the "provision of effective, safe, and quality personal and non-personal health interventions to those in need, when and where needed (including infrastructure), with a minimal waste of resources" (WHO, 2015).

Kenya Essential Package for Health Services (KEPHS) are delivered through four-tiers of care which are:- the Community Health Units (CHU); primary healthcare; County health services; and National health Services. KEPHS key innovations is the recognition and introduction of

tier 1- CHU, which aims to enable the population at household levels to take responsibility of their own health. (Kenya Ministry of Health [KMOH], 2010). Community health system (CHS) undoubtedly is a key aspect in strategizing these effective approaches, executing and appraising primary healthcare services thus helping those with inadequate access to health services specifically the marginalized and very needy groups in the community (GaneshAID, 2023) CHU is a community structure in the formal Health system through which health service are provided to the community (KMOH, 2014).

Community Health Strategy (CHS) works, through CHU and it was introduced in 2006 to address primary health care needs and the government adopted it because it has potential benefits in improving health service coverage and quality leading to a more productive living (KMOH, 2010). CHS is one of the approaches the government has adopted in its quest to achieve Vision 2030, it has therefore been restated in the Kenya Health Policy Framework [KHPF] 2013-2030. Kenya Health Strategic and Investment Plan [KHSIP] 2014-2018). CHU has 3 types of Community Health Worker Force (CHWF) with different roles namely: Community Health Promoters (CHP), Community Health Committee (CHC) and Community Health Assistants (CHA) (KMOH, 2019).

The Community Health Worker Force (CHWF) performs a very important part in provision of Kenya Essential Package for Health and actual functioning of Primary Health Care (Kawakatsu et al., 2012) ; KMOH, (2014). CHU is not facility-based and on average, each community unit serve 5,000 people. (United States Agency for International Development [USAID], 2015). Community Health Assistants (CHA) is responsible for supervising about 25 Community health Volunteers (CHP) and every CHP is responsible for providing health interventions to

twenty household. Approximately there would be about 35 to 45 CHP in every community of 5000 people.

Immunization is one of the of the health functions of the CHU is delivery of Child health interventions which is an access point to delivery of other vital health services, (WHO, 2015). Full Immunization Coverage (FIC) is projected to prevent about two to three million deaths each year world over, thus is a very key component in health and is cost-effective approach to decrease infant mortality and morbidity related to juvenile communicable and immunizable illnesses (Legesse & Dechasa, 2015).

The role of CHP in delivery of Full of immunization coverage include and not limited to:- Health education on the importance of immunization to the community/Households; Identification of all the under-five year's children households; Home visits for follow up on the immunization status of Under-five; Case search for Immunization defaulter; Referral of Identified defaulter/ immunization need to the health facility for actual immunization; Providing feedback to the households on immunization concerns/information; and monthly report writing on successful referrals (WHO, 2015).

Muhammad et al. (2017) found out that the use of community strategy interventions through the Community Health Units to mobilize the community to take up immunization services is successful and increases immunization coverage. In agreement Wangalwa et al. (2012) states that Community health strategy enhances community's access to health care by delivering healthcare interventions to various cohorts at community as well as household level, capacity building of CHA and CHPs to deliver interventions at the community level firming up health

facility and community relationships and creating awareness of the community's rights to health services.

Approximately 54% of world's population lives in cities as of 2017, with small and medium size cities in Africa and Asia driving most of this trend. As urban areas or cities grow, informal settlements or slums develop in many cities and access to health services is generally lower for the socially marginalized and urban poor than for the urban rich (United Nations Children's Fund [UNICEF], 2018b). Lower immunization coverage is found in poorer urban dwellers, and concentration of a large number of unimmunized children population creates risks for outbreaks of vaccine preventable diseases (Crocker et al., 2017). In a study conducted in Kenya Urban slums it revealed that FIC Nairobi slums is at 55%, which is one of the lowest in the country (Soura et al., 2015; UNICEF, 2018a).

Therefore, the study seeks to establish the influence of Accountability System; Human resource management; Logistics & Supplies; Incentives factors on community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County.

1.2. Statement of the Problem

Community health Unit is a very important platform in the health system when it comes to the delivery of community-based health interventions particularly in settings where resources are scarce (Wangalwa et al., 2012). Studies have shown that as performance of CHU upsurges, the usage of health services like immunization can potentially be increased (Kiptoo et al., 2015). The actions of several health systems have largely been thought not to be enough and

inexperienced, not enough so far such that it not only fail to expect but to retort properly (WHO, 2015).

Full immunization coverage in Nairobi informal settlement is at 55%, which is one of the lowest in the country (Soura et al., 2015; UNICEF, 2018a). 56% of the population living in the urban areas in Kenya currently live in the informal settlements and Nairobi County hosts the largest informal settlements in Africa (Debabrata, 2018). Children living in the informal settlements have been found to be prone to the poorer health indicators than those in non-informal settlements' neighborhoods, this is attributed to the hazardous environment and socioeconomic challenges they live in (African Population and Health Research Center [APHRC], 2018).

According to a study conducted by Rajaonarifara et al. (2022) investing in resilient primary healthcare systems could enhance immunization coverage, decrease inequalities and ensure timeliness of immunization through upsurge in routine vaccinations. The Community Health Units service delivery studies done before are from the public health perspective, therefore due to complexity of the health system, system's thinking approach is required as this would offer a way forward for functioning more successfully and effectively in a complex, real-world settings.

1.3. Purpose of the Study

The purpose of the study is to establish Health system factors influencing community health units' performance in the delivery of child immunization service in urban informal settlements in Nairobi County.

1.4. Objectives

1.4.1. Broad Objective

To establish Health system factors influencing community health units' performance in the delivery of child immunization service in urban informal settlements in Nairobi County.

1.4.2. Specific Objective

- 1) To find out the accountability system factors on influencing community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County.
- 2) To establish human resource management factors influencing community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County.
- 3) To establish the logistics and supplies factors influencing community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County.
- 4) To establish the incentives factors influencing community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County.

1.5. The Research Questions

1. What are the Accountability system factors influencing the community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County?
2. What are the Human resource management factors influencing the community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County?

3. What are the Logistics & supplies factors influencing the community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County?
4. What are the Incentives factors influencing community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County?

1.6. Justification of the Study

Studies have shown that Community Health strategy is effective in delivering Child health interventions which include interventions to increase under-five years 'immunization both in the community and primary health care levels (Lewin et al., 2010). A similar study singled out Community strategy as very key in the implementation of the service at the community level where children and mothers are found. (Yihunie et al., 2015). In addition a study conducted in Kenya confirmed the importance of Community units as an effective service delivery point for immunization and maternal health service (KMOH, 2010).

Despite the introduction and intervention of the Community Strategy since 2006, there is still 45% of children in Nairobi informal settlement who are yet to receive FIC. Therefore system's thinking approach to understanding the health system factors influencing CHU performance would be an accelerative way for performing more productively and excellently in a multifaceted actual world settings (Michielsen et al., 2023).

System's thinking approach takes into consideration how variables in the study behave, interconnect and relate with each other (WHO, 2018). This study has not been undertaken before in Nairobi County informal settlements and therefore researcher seeks to understand how Accountability System; Human resource management; Logistics and Supplies; and

Incentives factors influence community health units' performance in the delivery of child immunization services in the urban informal settlement in Nairobi County.

1.7. Limitations of the Study

There were some possible limitations in this study, the first was the sample size; grounding my research in a bigger sample would have produced a more precise outcome, however due to resource constraint and time sample size was smaller. The second limitation concerned the Data collected; the data collected could be biased and not accurate because the respondents would want to please or withhold important data from the researcher.

In order to overcome the mentioned limitations the researcher used the standard sample calculation method to get appropriate sample size; researcher took time to explain to the respondents the purpose of the research and the importance of honesty in responding to the questions; the researcher reassured the respondents of confidentiality and anonymity that would be accorded to responses of the questionnaire to avoid any victimization. Also the researcher would follow the due process in seeking permission from the relevant authorities before undertaking the study.

1.8. Delimitation/Scope of the Study

The study focused on four specific variables which are:- the Accountability system; Human resource management; Logistics and supplies; Incentives factors and how they influence community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County. The specific respondents in the CHU that were included in the study were Community Health Promoters attached to maternal and child health clinic specifically the immunization department of the health facilities.

1.9. Significance of the Study

The finding of this study will greatly contribute to the body of knowledge by bringing out the important and significant aspects of the relationship between: Accountability system; Human resource management; Logistics and supplies; Incentives factors and Community Health Units Performance in the delivery of child immunization services in Nairobi County Informal Settlements. This knowledge will help the key stakeholder in health sector and other like-minded actors in making evidence-based interventions that will eventually contribute to the overall health system strengthening.

1.10. Assumptions of the Study

The assumptions of this study were:- Respondents were honest and expected to give responses that are accurate responses to facilitate data analysis; the results would be generalizable to any other urban informal-settlement; the exclusion criteria of the sample was suitable thus ensuring that participants experience same phenomenon; and respondents honestly participate in the study.

1.11. Operational Definition of Terms

The following are meaning of the operational terms as used in the study:-

Job Aid: - The simple information used to support in treatment decision making by the CHWF

Community support: -This is the direct and indirect financial and non-financial help that the community structures give to enhance the work of Community Health Volunteers

Community health workforce: These are the key actors with different roles in the CHU namely: Community Health Volunteers (CHV), Community Health Committee (CHC),

Community Health Assistants (CHA), and Community Health Strategy Coordinator (CHSC).

This is the group that form the first point of contact in the community

Links: this is embedment of CHW in the health system

Effective services delivery: It is improved competences and adherence to standard procedure by the Community Health Units

Accountability; It is the CHU Communication structure; how they are embedment in community health system; the Support they receive; and how the Community and health facility monitor and evaluation their work.

Human resource management; It is how CHWF is selected and recruited, their years of experience in Community health work, their gender, how they understand their roles, how they are supervised and trained.

Logistics: It is the transportation or movement of CHWF from the community/ Households to health facility/ service delivery points,

Supplies: These are the commodity kits and job aids with simple information that reminds and helps CHWF in decision making.

Delivery of child immunization services: Health education on the importance of immunization to the community; Identification of all the under-five year's children households; Home visits for follow up on the immunization status; Case search for Immunization defaulter; Referral of target clients to the health facility; Providing feedback to the households on immunization issues; and Report writing.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

Existing work previously done by other scholars was critiqued in this chapter. It aimed at establishing what was already known in the body of knowledge and identify the existing gaps that the researcher addressed. The review was done systematically guided by the study's variables; Dependent variable was CHU performance in the delivery of child immunization and Independent variables were: - Accountability system factors; Human resource management factors; Logistics and Supplies factors; and Incentives factors.

2.2.Dependent variable: CHU performance in the delivery of child immunization services

2.2.1. Competences in assessment skills and referral skills

Assessment and referral skills are key in ensuring all children in need of immunization and are stuck in their households due to varied reason would benefit a great deal, according to (Bartos et al., 2019) CHWF attached to maternal and child health programme revealed their effectiveness in the referral of the pregnant and under- 6month children to the health facility with a standard referral form and all the referred clients were confirm to have accessed the services in the health facility. Chang et al. (2012) revealed that communication was improved between CHWF and health facility health workers by use of an m-health intervention in Uganda which lead to improved quality of care and agreement. (Teela et al., 2019) revealed that as CHWF and healthcare workers working in the maternal and child healthcare department coordination improved in Myanmar, the quality of care too improved.

2.2.2. Adherence to standard procedures

Studies revealed that adherence to policy and procedure does affect the performance of CHWF both negatively and positively. The study conducted by (Rowe et al., 2017b) on CHWF adherence to guidelines for treating ill children, it revealed that the more their adherence improved the performance improved as well. In addition another study showed that there was a need for proper standards and guidelines was emphasized by many respondents in another study done in Uganda to measure performance of CHWF in a task shifting among all healthcare workers in the health system. (Dambisya & Matinhure, 2012).

2.3. Independent Variable: Accountability system factors

2.3.1. Communication structure

According to Kok et al. (2015) their study found out that it was important to have good communication between the CHWF and other actors in the health system and community. They highlighted the dynamic position of CHWF which is in-between the community and the health system, this position requires a delicate balance because they are accountable to both parties. Therefore a clear communication process and system is key in minimizing any potential burden that could arise between community committees and the health system supervisors.

Similar study conducted by Chang et al. (2012) showed that there was improved quality of care which was linked to improvement in communication between Clinical healthcare and the CHWF and another study by Teela et al. (2019) revealed that as CHWF and healthcare workers working in the maternal and child healthcare department coordination improved in Myanmar, the quality of care too improved due to improved communication. In another in Mozambique CHWF reported an improvement in the accountability to the primary healthcare system and

the community and this was attributed to the improvement in the coordination and communication (Simon et al., 2019).

2.3.2. Referral and linkage to Health System

Linkages in the health system is key in influencing CHWF performance. Past studies and literature have shown evidence of relationships between CHWF and other healthcare workers influencing CHWF accessing among others job supplies, equipment, referrals; communication and coordination in the health system. In agreement, Teela et al. (2019) revealed that as CHWF and healthcare workers working in the maternal and child healthcare department coordination improved in Myanmar, the quality of care too improved. In another in Mozambique CHWF reported an improvement in the accountability to the primary healthcare system and the community and this was attributed to the improvement in the coordination (Simon et al., 2019).

Bartos et al. (2019) in their study in Bolivia revealed that conflicts between CHWF and healthcare workers brought about by CHWF not being valued in the system led to them perceiving themselves as inferior and inadequate which affected their performance negatively. CHWF attached to the health system and community in Zimbabwe received managerial support and felt motivated to execute their tasks though no change in performance were reported (Osawa et al., 2010). In another study done in Kenya CHWF attached to the health system and community reported to have gained respect and recognition and this has motivated their performance (Yasemin et al., 2012).

2.3.3. Community Support

Studies have shown that support from the community could have influence on CHWF. A study done in Ethiopia, by (Amare, 2011) revealed that community support given to CHWF increased their motivation and thus increased their performance, this support was given through various

local institutions who served as community anchors to raise their recognition and acceptance in the community. In a similar study in Ethiopia community participated in the construction of health post where CHWF could work from (Teklehaimanot et al., 2016).

A study conducted revealed increased CHWF performance following involvement of religious leaders and participation of community structures in the institutionalization of a project for routine surveillance of birth, death and childhood ailments, which eventually increased community uptake of the service (Edward et al., 2017).

According to Puchalski et al. (2012) involvement and support from the community negatively affected the work of the CHWF, guardians who were expected to monitor daily intake of tuberculosis medication by patient, instead only got involved when patients got sick. Another study by Simba and Kakoko (2012) revealed that lack of community support can completely demotivate CHWF affecting their performance negatively as it happened in a reproductive health program in Tanzania where village leader did not support the work of CHWF.

2.3.4. Community monitoring and evaluation

Studies have shown that community monitoring and evaluating of the CHWF has an influence on their performance. In Indonesia pregnant women were engaged in the assessment of CHWF and this emphasized accountability from them as well as empowering the expectant mothers to anticipate better healthcare services from the CHWF. Being aware of community evaluation CHWF established good relationships with the expectant mothers and this also improved their performance (Shankar et al., 2019). A study in Mozambique showed that participation of community structures in the institutionalization of a functional project for routine surveillance of birth, death and childhood illnesses helped to monitor the work of CHWF (Edward et al.,

2017). A study conducted by Kalyango et al. (2012) in Uganda revealed that community gave CHWF feedback for their performance and rewards too were offered for work well done, and this influenced their performance positively.

2.4. Independent Variable: Human resource factors

2.4.1. Selection and Recruitment process

Studies have shown influence of the selection and recruitment process on CHWF performance. A study done among CHWF in Ghana revealed that as a result of being carefully chosen by the community, CHWF felt a sense of duty and pride which in turn effected motivated their performance (Yasemin et al., 2012). A similar study carried out in India, CHWF did not feel sense of acceptance in the community because they were perceived as being answerable to the health facility and not community because their selection was exclusively done by the health facility staff and this affected their performance negatively (Adhish et al., 2019; Scott & Shanker, 2010 ; Yirga et al., 2010). However, a study in Kenya was conducted and the CHWF who had been selected by the community didn't demonstrated any difference in adhering to guidelines when likened to CHWF not to have been selected by the community (Rowe et al., 2017a).

2.4.2. Years of experience in Community health work

A study done in Kenya showed that the number of years one has worked as CHWF has effect on their performance as it is shown in their ability to appropriately use job aids, delivery of good quality of care and empowering of clients (Crispin et al., 2012). Contrasting this a study done in Uganda showed a CHWF who had worked for less than six years delivered their services with more patience towards clients unlike those that had served more years (Alamo et

al., 2012). While in a study done in Iran revealed no change in job performance based on years worked by CHWF (Kebriaei & Moteghedhi, 2009)

2.4.3. Clarity of roles

According to a study carried in India CHWF were found out to have a limited understanding and perception of their job responsibilities than the actual formal job description thus making them not to execute their mandate of child and maternal health responsibilities as required (Adhish et al., 2019). While in another study carried out in Ghana CHWF reported that due to lack of clear of understanding of their role they experienced work-related changes especially in the community affecting their work negatively (Yasemin et al., 2012). A study on CHWF done in Bolivia revealed mistrust from the community towards the CHWF because of lack of understanding their role this in turn split over to the community who could know understand the responsibility of CHWF in the community of the role (Bartos et al., 2019).

In Malawi due to lack of understanding of their role CHWF ended up taking role that were not theirs, they ended up doing basic treatment for adults yet CHWF were working in child healthcare services program (Adnan et al., 2012). More studies on CHWF showed that due to lack of clarity of their role they ended up rendering services that were not within their scope of responsibilities i.e. gave them anti-malaria treatment despite not having any clinical report of malaria (Chanda at al., 2011).

2.4.4. Supportive Supervision

A study was conducted in Uganda CHWF reported that they were more recognized and trusted following support supervision they received and this gave them a sense of belonging to the bigger team of Health system (Martinez et al., 2018). In another study done in South Africa CHWF revealed to having challenges-with the supervisors and 40% of CHWF felt their

supervisors lacked management skills while 30% of CHWF felt their supervisors were selfish and this affected their work output (Moetlo et al., 2011). Furthermore, a study done in Ghana CHWF reported that if they were supervised, they would feel motivated and would do well in their work. (Bazzano et al., 2016).

According to a study done in Madagascar on CHWF revealed that frequency of supervision affected their performance significantly, those who received higher frequency of supervision showed better performance (Smith et al., 2013). Yet a study conducted in Kenya showed no effect of the number of times of supervision on performance (Rowe et al., 2017a).

2.4.5. Training

According to Smith et al. (2013) performance is directly influenced by training, the CHWF who received training were able to carry on their roles better than those who did not receive i.e. they could do assessments, prescribe basic treatment and did in their study revealed that CHWF who received training performed better at work compared to CHWF who did not receive the training. While in another study conducted in India among CHWF working in maternal and child health program showed no difference in performance between those CHWF who received training and those who did not receive (Saravanan et al., 2011). Kebriaei and Moteghedhi (2009) study carried in Iran revealed that CHWF confidence and communication skills as well as their service delivery capacity improved after they received a pre-service training CHWF. Another study found out that despite receiving training they were demotivated in their work because they felt the quality and timing and the trainers poorly presented the content (Javanparast et al., 2012).

Studies conducted among CHWF in Kenya and Malawi revealed that trainings were a demotivating factor because of favoritism in selection of participants and thus some looked at it as an income-generating activity as opposed to the intended purpose of enlightenment. (Aagaard-Hansen et al., 2010; Kok & Muula, 2013). In support Gill et al. (2012) study conducted in Zambia, revealed that 40% of trained CHWF would not attend a training if there was no payment, compared to the non-trained CHWF who were available to attend the training with or without payment. However according to Rowe et al. (2017a) in another study conducted in Kenya it revealed that there were no relationship between trainings and CHWF improved use of job aid.

Lewis (2010) and Gill et al. (2012) in their studies showed that CHWF were satisfied in their job and felt motivated as a result of receiving continuous training. In support Smith et al. (2013) in their study in Madagascar found out that CHWF were able to assess, give basic treatment, and refer appropriately as per the guidelines after receiving refresher training. However according Rowe et al. (2017a) no relation existed between CHWF performance and them receiving refresher training.

2.5. Independent Variable: Logistics and supplies factors

2.5.1. Transport to health facility

According to Simba and Kakoko, (2012) unavailability of CHWF transportation to facilitate referrals of clients to health facility showed a negative influence on their performance. In support Arem et al. (2011) in their study in Uganda on HIV program CHW were not able to make the required number of home visit due to lack of transport and that affected the outcome of the program.

Moetlo et al. (2011) revealed in their study in South Africa that it was difficult to transport the beneficiaries that were unwell at home to the health facility due to lack facilitation of transport and vehicles are extremely expensive for CHWF to afford. According to Pongvongsa et al. (2011) study in Japan it was reported by CHWF that despite being facilitated with transport they still experienced difficulty traveling to the responsible health center as well as failure to report. Kalyango et al. (2012) and Kok and Muula (2013) in their studies reported that lack of transported influenced them hence affecting their performance negatively.

2.5.2. Job Aids

Job aids are simple tools used by CHWF to facilitate making efficient decisions (Gill et al., 2012; Mothabbir et al., 2011; Rowe et al., 2017a). A study conducted in Malawi showed that by CHWF using Short Message Service (SMS) to ask questions on dosage and side effects of drugs as well as healthcare questions, resulted in improved their performance and acceptance by the community (Lemay et al., 2012).

According to Hamer et al. (2012) a study carried out in Zambia, CHWF in Maternal and Child health program used simple treatment algorithm and clear treatment chart and as a result they managed to get clear guidance for their work which improved their performance. In support Gill et al. (2012) and Mothabbir et al. (2011) in their studies showed an improvement in the CHWF interventions. Rowe et al. (2017b) in their study found out that there was general improvement to guideline adherence which was attributed to the use of a treatment card by the CHWF.

In contrast, Javanparast et al. (2012) study conducted in Iran revealed that job aid was a demotivation to the CHWF because they felt that it was too prescriptive and did not allow for creative learning, these category of CHWF were young and had higher education. “There are too many step-by step guidelines and instructions that we have to follow, we are not given a chance to search, to think and to analyze things” Similarly Rowe et al. (2017a) found out that among some CHWF in the maternal and child health program in Kenya there was no influence of Job aid on their performance.

2.5.3. Commodity kit

Studies conducted by some scholars have shown that commodities such as drugs and education materials have influence on CHWF performance (Simba & Kioko, 2012; Takasugi & Lee, 2012; Kok & Muula, 2013b). In agreement (Furth & Crigler, 2012; Kalyango et al., 2012) revealed that CHWF were demotivated and were unable to carry out their tasks due to lack of commodities. However in their studies Osawa et al. (2010) and Rowe et al. (2017a) did not find any correlation between adequacy of health commodities and CHWF adherence to guidelines for particular task.

2.6. Independent Variable: Incentive factors

2.6.1. Financial Incentives

Studies have shown that financial incentives influence CHWF performance. In a study conducted in India CHWF stated that they preferred financial incentives to any other types of incentive as it motivated them in their performance (Adhish et al., 2019). Furth and Crigler, (2012) in their study in Zambia found out that CHWF performance was affected positively as

a result did better than those who did not receive any financial incentives. In support (Bartos et al., 2019; Rahman et al., 2008) found out that CHWF preferred financial incentive.

Alam et al. (2012) in their study in Bangladesh found out that CHWF were motivated to work because they were getting financial incentive through selling of commodities and providing healthcare service. In agreement another study conducted in Mali revealed that CHWF who received financial incentives through selling drugs were more active in their roles as CHWF (Winch et al., 2008). Furthermore a study done in Kenya on CHWF programme, CHWF reported that financial incentives motivated them to continue with their work.

According to a study conducted in India both positive and negative effects of financial incentives were found, CHWF who were found active were the ones who accompanied people to the health facility and assisted with interventions on biomedical earned money from it while those health interventions that did not earn them any financial incentive they ended up neglecting those duties (Adhish et al., 2019; Scott & Shanker, 2010). In support (Yasemin et al., 2012; Yirga et al., 2010) showed that CHWF were demotivated in their work due to unfulfilled promises concerning financial incentive. According to Callaghan-Koru et al. (2013) study in Malawi CHWF became inactive and not motivated because they never received any financial incentive for running the village clinic instead they had spent their own finances.

2.6.2. Social Reward

Studies have indicated influence of Social rewards on CHWF performance. A study carried out in rural settings of Uganda reported that for CHWF, work motivation was enhanced as a result of trust and respect from the community which they considered very significant (Alam

et al., 2012). Another study in Zimbabwe showed that CHWF were motivated to perform better the more the community appreciated and accepted them (Osawa et al., 2010).

Yirga et al. (2010) showed that CHWF were seemed to have performed well because the community's compliance to health behaviour increased, while insufficient knowledge in CHWF was found to impede their acceptability in the community. Adhish et al. (2019) found out that in Bangladesh, CHWF stated that social reward motivated them and 44% reported that they would willingly to render their services even without financial incentive. In agreement (Rowe et al. 2017b) CHWF reported that due to community showing them respect they motivated were to adhere the more to child health guidelines.

However studies have also shown that distrust from the community negatively affects CHWF performance. In a study conducted in Bolivia it showed that CHWF were occasionally afraid to conduct home visits since the community deceitfully spread rumors about them that they ate food meant for the little children thus failing to feed those children (Bartos et al., 2019).

According to Smith et al. (2013) CHWF reported to have felt motivated and satisfied to be able to help and care for others. In another study CHWF working in child health in Zambia felt overwhelmingly satisfied when they helped their community. In support the study conducted in Uganda among CHWF giving palliative care revealed that they enjoyed helping the community because of the traditional values placed on helping people in need of care (Jack et al., 2012). Furth and Crigler (2012) stated that CHWF in Zambia got engaged more as they got opportunities for advancement in their careers. In another study the findings showed that lack

of CHWF promotion opportunities contributed to many of them dropping out (Rahman et al., 2010).

2.7. Theoretical Framework

2.7.1. General System's theory

The General System's theory is the idea that systems abridged to sequence of parts working separately, and that one must comprehend the interrelationship between the parts before comprehending the whole one (Bertalanffy, 1969). The fundamental ideologies of Systems Theory remain chiefly instinctive toward health professionals, the tasks necessitate that healthcare providers and managers reflect in what way individual complex system structure affects and gets affected by its surroundings.

Therefore, General System Theory ideologies applies in this study in that delivery of immunization services by CHU get to interact in a complex way with Accountability factors ; Human resource practice ; Logistics and supplies; and Incentives factors and influence the performance both positively and negatively in the in urban informal settlements in Nairobi County.

2.7.2. Job-demand resource model (JD –R Model)

The Job-Demand- Resources Model (JD-R Model) does show how job demands and Resources have unique and manipulative effects on job stress and motivation. On one hand Job demands concerns the physical, collective or sensitive characteristics of the job and the work setting. On the other hand Resource concerns organizational or social aspects that might help the health provider endeavour for objectives. Work Demand triggers a state of negative energy which drains an individual and decreases his/her well-being. Resources triggers a motivation which

leads the individual to grow and achieve his/her goals which elevates his/her occupational well-being (Bakker & Demerouti, 2014).

This theory informs the Human resource practice which was concerned with well they adhere to standard operating procedure and how resource motivate their work output. Incentive factors also was also addressed in this theory since it is resource that highly motivates and these two factors influence community health units' performance in the delivery of child immunization services.

2.7.3. Governance theory

Governance theory is about the practice of collective decision-making. Graham et al. (2003) study shows that governance is perceived as interface of traditions, processes and structures that decide how power and tasks are implemented. It also determines the decision taken, and how people and stakeholders have their say. Therefore, this theory addresses power, accountability and relationships. Logistics & supplies factors which include transportation means to facility, job aids and CHP commodity kits availability affect how child's immunization services are delivered by CHU and accessed by clients; Accountability factors such as communication structure, referral channels, community support, monitoring and evaluation affect how CHU delivery immunization service; and Incentive factors such as financial and non-financial CHU delivery of child immunization services.

Figure 2.1

Conceptual Framework

Independent Variable

Accountability Factors

Communication structure; Referral and linkage to Health System; Community support; Community Monitoring & Evaluation

Human resource factors

Selection & Recruitment; Experience; Clarity of work; Supervision; Training

Logistics and supplies factors

Transport; Job aid; CHP kits

Incentives factors

Financial, Non-financial

Dependent Variable

Community Health Units' Performance

Competence in assessment and referral skills;

Adherence to standard procedures)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter discussed the research design, target and population, sampling, preparation of research instrument / instrumentation, procedure for collecting and analyzing data. This was done guided by the study variables which were: - Dependent variable: - Community Health Units' performance in the delivery of child immunization services and independent variables: - Accountability system factors; Human resource management factors; Logistics and supplies factors; and Incentives factors.

3.2. Research Philosophy

This study used interpretivist research philosophy which guided how this study was conducted, this research philosophy is suitable for small sample size and this study had a sample size of 354 CHWF drawn from the target population. The study was concerned in finding out the depth of the existing and significant relationship between Accountability; Human resource management; Logistics and supplies; and Incentives related factors that influence community health units' performance in the delivery of child immunization services in urban informal settlements in Nairobi County. Therefore the design used was cross-sectional descriptive research, and sampling method used was stratified simple random. Data analysis was done using descriptive and inferential statistics. Credibility was ensured by carrying out reliability test and validity test.

3.3. Research design

Cross-sectional descriptive and analytical research design was used in this study, generally these research designs made inferences about possible relationships that exist between

dependent and the independent variables in the study. In this study the researcher measured four independent variables: - Accountability system factors; Human resource management factors; Logistics and Supplies factor; Incentives factors and dependent variable:- Community Health Units' performance in the delivery of child immunization services.

Deductive approach was used, in deriving the research questions based on the research variables: - Accountability system; Human resource management; Logistics and Supplies; Incentives factors and Community Health Units' performance in the delivery of child immunization services. The study used survey methodology to obtain data through questionnaires (Saunders et al., 2012). The use of survey permitted the researcher to study all the four independent variables and the dependent variable at once. Descriptive and analytical techniques were used to analyze data guided by the four variables being measured in this study (Saunders et al., 2012).

3.4. Target Population

The respondents was made up of Community Health Worker force in the Community Health Units in the informal settlements in Nairobi County. Nairobi County has 449 fully functional Community Health Units, (KMOH, 2020). The study was conducted in Nairobi County because despite the introduction of Community strategy the gap for Full immunization coverage in Nairobi informal settlements is one of the highest in the country as revealed by studies as being at over 45% (UNICEF, 2018a; Soura et al., 2015). Nairobi County has the largest urban informal settlements which is heterogeneous thus gave a true picture of a multifaceted settlement and furthermore no such study had been undertaken before. All Counties in Kenya operate similarly and are run and managed by the Kenya Ministry of health, therefore because they are similar, the researcher chose Nairobi County because it was easier

to access, considering the limitation of time and finances (Nairobi County Health Service [NCHS], 2016).

3.5. Sampling Procedure

The researcher used both systematic and simple random sampling (Mugenda & Mugenda, 2012). This technique involved direct selection of the units from the study frames that were listed progressively. All Community Health Units in the informal settlements in Nairobi were selected; further selection of all active CHU was done and all got an equal chance of selection for the study (KMOH, 2020). A starting point in sampling was aided by use of the table of random numbers (Kothari, 2004). Therefore the number of units were first sampled systematically then simple random sampling was done.

3.5.1. Sample size determination

The sampling frame was made up of 449 Functional Community Health Units within Nairobi informal settlements. Active CHUs have approximately 10-Community Health Promoters, hence the total sample frame was approximately **4490 CHP** $\{(10 \times 449)\}$ and they all got a chance to be selected to take part in the study. All these were further randomly sampled to get a sample size using formula for estimating sample size (Cochran, 1977).

3.5.2. Sample size calculation

The Cochran formula is

The Cochran correction formula when population is $< 50,000$ is:

$$n = \frac{n_0}{1 + (n_0 - 1/N)} \quad (\text{Ahamed \& Halim, 2017})$$

Where:

n_0 is the Cochran sample size recommendation of 385

N is the size of the population = 4490

Calculation

$$385 / \{1 + (385 - 1 / 4490)\} = 354$$

$$n_0 = 354.$$

3.5.3. Sample Design

The study was focused on random sampling techniques hence every subject in the study population got an equal chance to participate. **354** respondents were sampled. This was proportionally distributes across the strata (sub-counties).

3.6. Instrumentation

The research instrument used a structured questionnaire. This instrument was developed informed by the study problem and the objectives. The items in the instruments were about five main variable; Accountability system factors; Human resource management factors; Logistics and Supplies factors; Incentives factors; and Community Health Units' performance in the delivery of child immunization services. The study used structured closed-ended questionnaire, the purpose of close-ended question was to provide data that could be straightforwardly categorized because of its preciseness.

3.6.1. Validity test

Validity refers to how well an instrument measures what it is intended to measure (Dudovskiy, 2022). The pre-testing of the instrument was conducted in 4 Community Health Units in the informal settlements in Ruaraka sub-county which had similar characteristics as the sampled

units for the study (Mugenda & Mugenda, 2012). 30 respondents were selected to participate in the pretest but their responses were not be included in the final study sample (Mugenda & Mugenda, 2012). The instrument included items about: Accountability System factors; Human resource management factors; Logistics &Supplies factors; Incentives factors; and Community Health Units performance in the delivery of Child immunization services. The procedure aided the review of the items in the instrument and editing appropriately guided by the study objectives thus making the instrument fit to obtain complete and accurate data, thus making valid for the study.

3.6.2. Reliability test

“Reliability test refers to the consistency across the parts of a measuring instrument” (Hucks, 2007). Cronbach’s alpha reliability test was used to measure the internal consistency and reliability of all items in the data collection instrument (Mohamad et al., 2018).

3.7. Methods of Data Collections

Data was collected using a structured questionnaire. The study used interview approach to gather data from the respondents. A systematic collection of the data from the CHWF in every Community Unit was adopted and approximately 30 respondents were reached on a daily basis for 26-30 days to make the 354 sample size. Protocol for collecting data was observed ensuring that data instruments were used (Mugenda & Mugenda, 2012). The researcher addressed the following logistical:-

During pre-field the researcher ensured that terms of reference was made and availed. Permission to access research population was sought from all relevant Authorities and were granted.

During the **field work** researcher ensured that all tools needed were available in adequate number and the filled research instruments were reviewed in the field for completeness,

accuracy and right responses to the right questions. The completed data was entered and coded in the computer immediately they were received them from the field which eased the load.

Post-field work included coding, analysis and storage of research tools (Mugenda & Mugenda, 2012). Once the data was transferred from the questionnaire to the computer, the questionnaire was kept in safe place for future reference. The completed instruments was safely kept for a period of not less than five years before they can be destroyed for future reference and also it's the recommended time frame for storage and the statute of limitation demands so.

Table 3.1

Operational Definitions of Variables

Variable	Indicator	Measuring scale	Tool for collecting data	Data analysis
Demographic data	Sub- county of operation	Ordinal	A questionnaire	Frequencies
	Age	Ordinal	A questionnaire	Percentages
	Sex	Ordinal	A questionnaire	
	Marital Status	Ordinal	A questionnaire	
	Education level	Ordinal	A questionnaire	
	Monthly Income	Ordinal	A questionnaire	
Accountability System factors	Communication structure	Nominal	A questionnaire	Frequencies
	Referral and linkage to Health System	Nominal	A questionnaire	Logistic regression, Chi-square
	Community support	Nominal	A questionnaire	Percentages
	Monitoring & Evaluation	Nominal	A questionnaire	
Human resource management Factors	Selection & Recruitment	Nominal	A questionnaire	Frequencies
	Years of experience	Nominal	A questionnaire	

	Clarity of work	Nominal	A questionnaire	Logistic regression, chi-square
	Support Supervision	Nominal	A questionnaire	Percentages
	Training	Nominal	A questionnaire	
Logistics & supplies factors	Transport	Nominal	A questionnaire	Frequencies
	Job aid	Nominal	A questionnaire	Logistic regression, Chi-square
	CHV kits	Nominal	A questionnaire	Percentages
Incentives factors	Financial	Nominal	Questionnaire	Frequencies
	Non-financial	Nominal	Questionnaire	Logistic regression, Chi-square
				Percentages
Community Health Units performance	Effectiveness	Nominal	Questionnaire	Frequencies
	Ineffectiveness	Nominal	Questionnaire	Logistic regression, Chi-square
				Percentages

3.8. Methods of Data Analysis

Quantitative data analysis method was using SPSS version 27. Data analysis was done using descriptive statistic which captured cross tabulation, frequencies and percentages; and inferential statistics which captured logistic regression and chi-square, data was then presented through figures, tables and narration. This analysis was guided by the objectives of the study namely: Accountability system; Human resource management practices; Logistics and supplies; incentives and the dependent variable. The dependent variable was measured using two categories i.e. first category; effectiveness and second category; ineffectiveness. The

logistic regression generated beta coefficients, standard error, significance levels, a formula to predict logit transformation of the probability of presence of the characteristics of interest.

$$f(p) = 1 / (1 + e^{-p}) \text{-----} 1$$

Equation 1 simplifies as:

$$\text{logit } (p) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_nX_n \text{-----} 2$$

Where:

P = probability of presence of characteristic of interest

b_0 = representation of the reference group

b_1 = the regression co-efficient associated with the reference group

$X_1, \dots, X_n$ = explanatory variables.

3.9. Ethical Considerations

Researcher ensured that there was proper entry into the Nairobi County health department by getting permission from National Commission for Science and Technology; Nairobi Metropolitan Services Medical Officer of Health (MOH) to officially undertake study within his/her jurisdiction. A written letter from Kenya Methodist University (KeMU), Science and Ethics Review Committee of introducing and authenticating the researcher as a student in the university further facilitated the acceptance in the County.

Purpose of the study was fully explained to the participants and informed written consent was sought from all. The respondents were treated with respect and the data given by them was

handled with confidentiality; participants were given freedom to express their ideas or ask questions; and participants were given the freedom to participate or withdraw from the study if so wish. This contributed to the success of the study.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1. Introduction

This chapter shows the results of the analyzed, presented and interpreted data gathered from the field. The results aimed at showing the relationship and significant influence that the independent variables have with community health units' performance in the delivery of child immunization services in the urban informal settlements.

4.2. Pilot Results

A pretest was carried out on 30 respondents in 4 CHU in Ruaraka sub-county Nairobi County informal settlements to test the reliability and validity of the research instrument. Cronbach's alpha to assess the validity and reliability of the study instrument, the researcher performed a pre-test on 30 respondents from Ruaraka Sub-county in Nairobi County. Cronbach's alpha reliability test was done to measure the questionnaire internal consistency.

Table 4.1:
Cronbach's Alpha Reliability Statistics

	Cronbah' s Alpha	Number of Items	Conclusion
Accountability	.789	31	Scale reliable
Human resource management	.814	48	Scale reliable
Logistics and Supplies	.859	19	Scale reliable
Incentives	.799	21	Scale reliable
CHU immunization service delivery	.647	6	Scale reliable

Cronbach's Alpha for the 5 variables was 0.647 and above, this showed that the questionnaire had the required internal consistency. A reliability test of more than 0.5 is considered to be acceptable.

4.3. Participants Response rate

354 CHP from all CHUs in the informal settlements of Nairobi County were sampled. 354 questionnaires were issued out and all were completed resulting in 100% response. A response above 50% is acceptable therefore this rate was acceptable and this means the findings can be generalized (Mugenda & Mugenda, 2012).

Table 4.2

Response rate

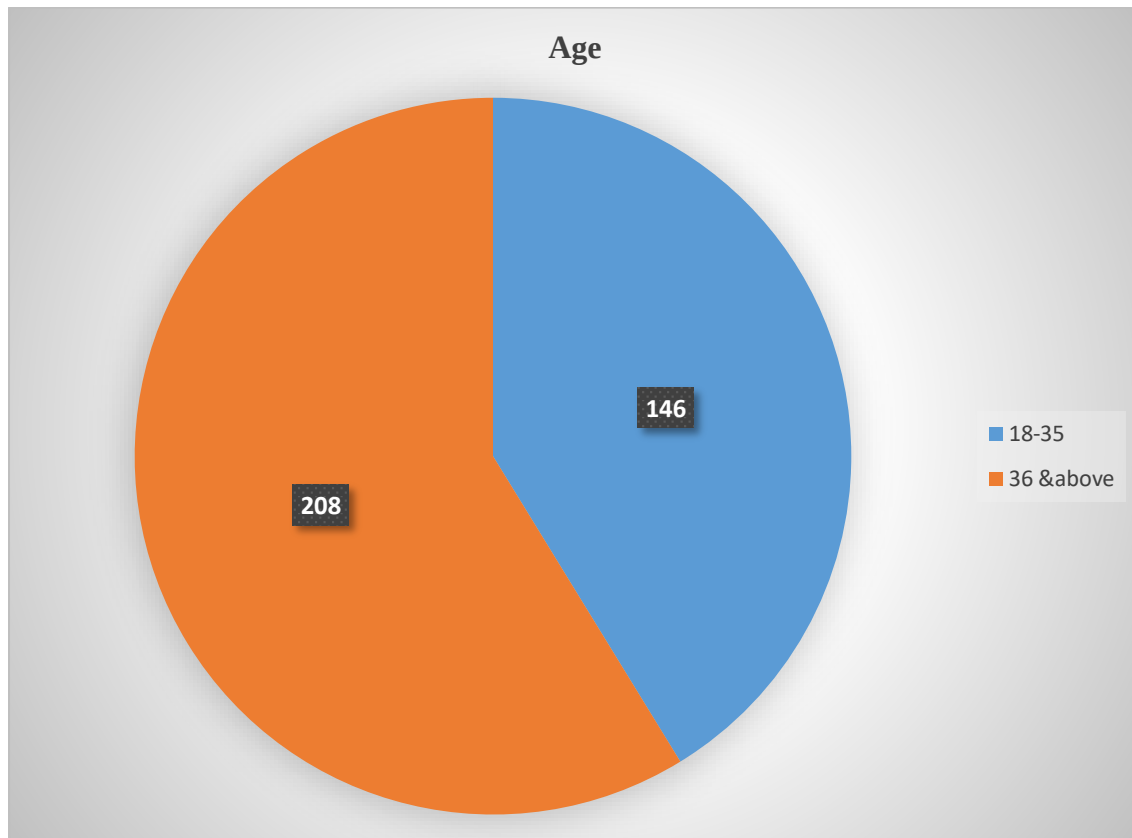
Response	Frequency (n)	Percentage (%)
Completed questionnaires	354	100

4.4. Demographic characteristics of the respondents

The demographic characteristics of the participant were established these included:-, Age, Sex, Marital Status, Education level, Monthly Income of more than Ksh. 10,000 and Sub-county of operation. This demographic information highlighted characteristics which were deemed necessary to determine that the respondents were a representative sample.

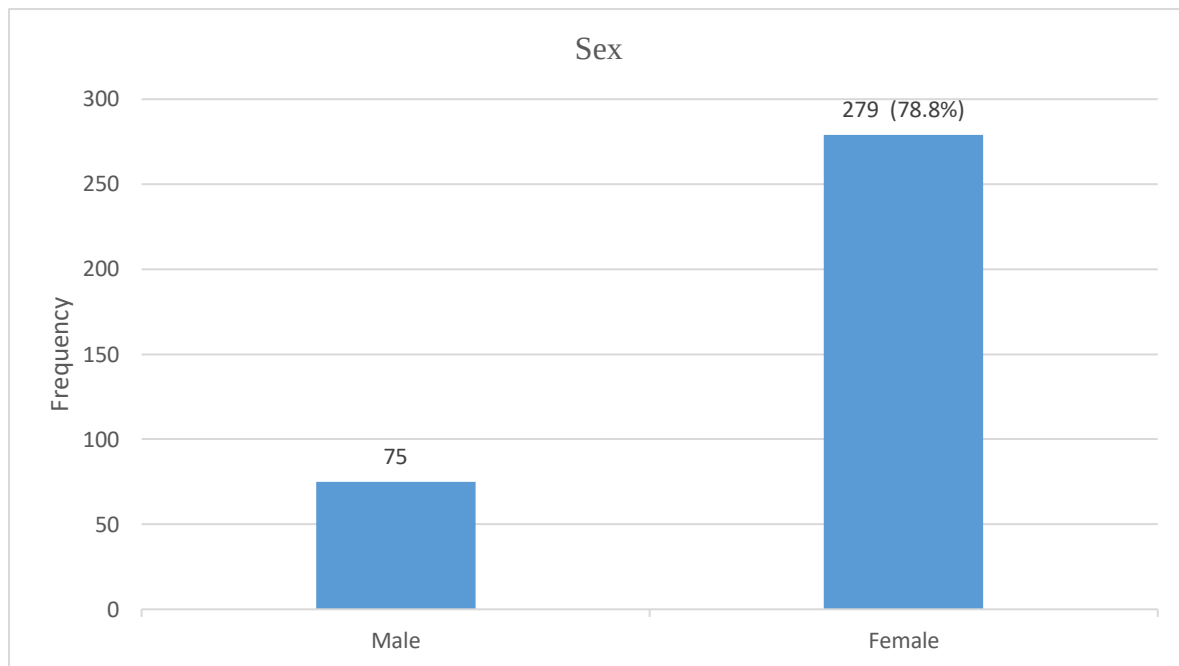
Figure 4.1

Participants age



Majority 208 (58.8%) of the respondents were 36 & above years of age while minority 146 (41.2%) were 18-35 years.

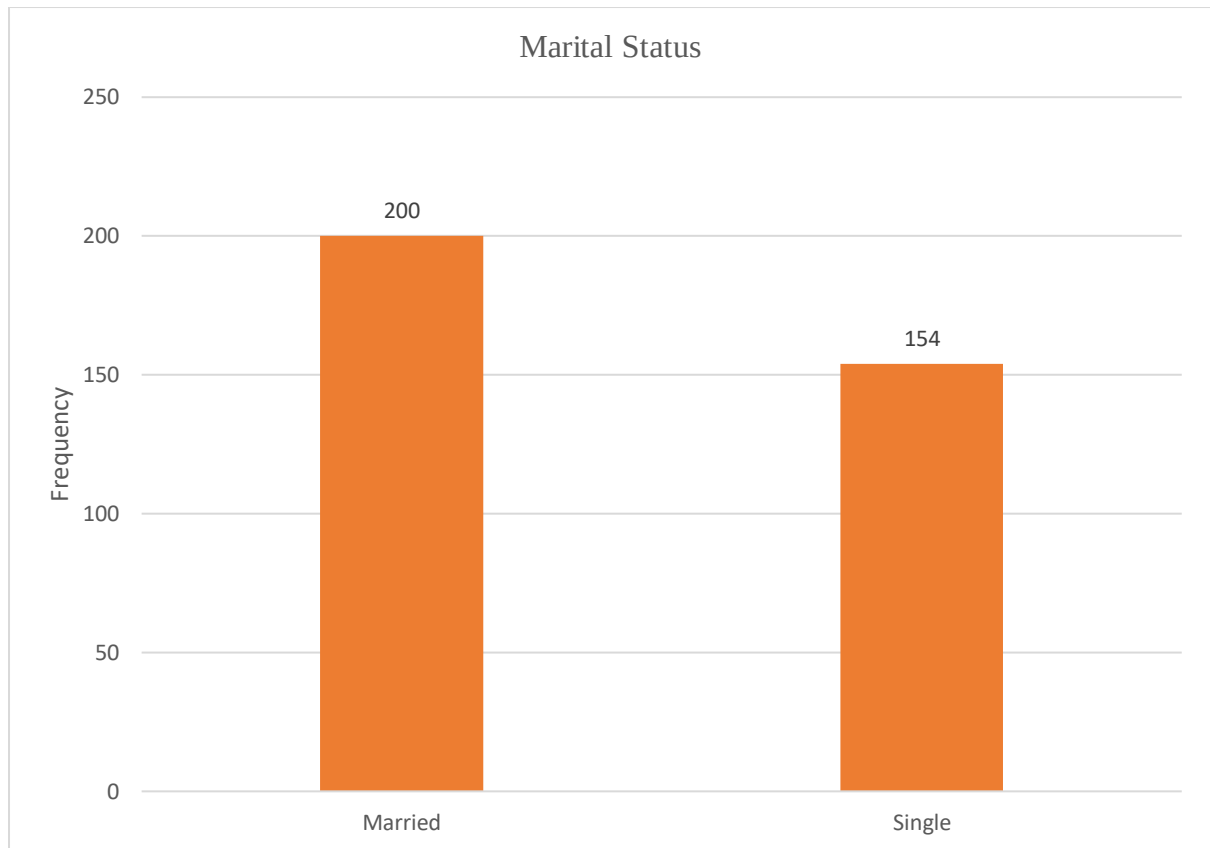
Figure 4.2
Participant's Sex



Majority of the respondents 279 (78.8%) were female, while minority 75 (21.2%) male respondents.

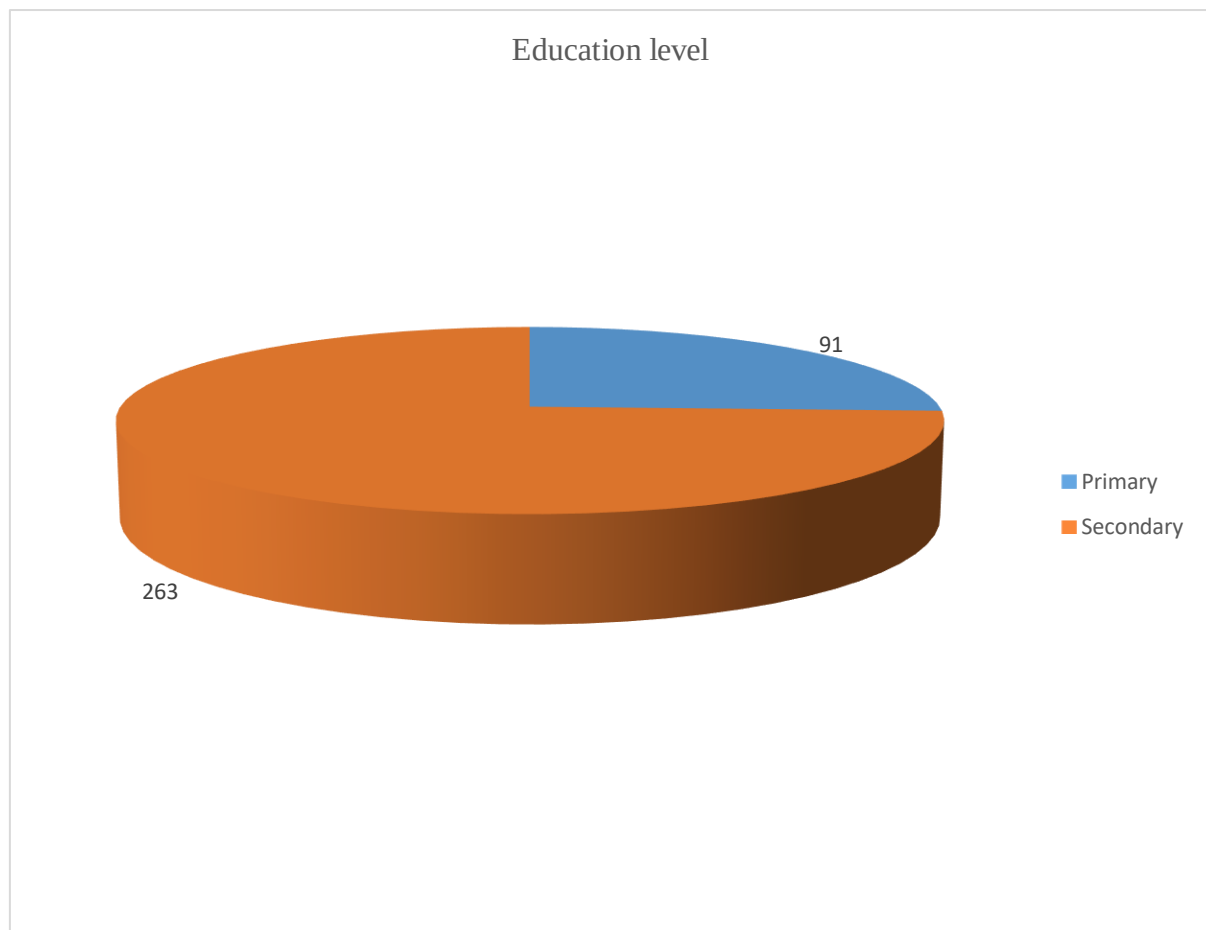
Figure 4.3

Participants' Marital status



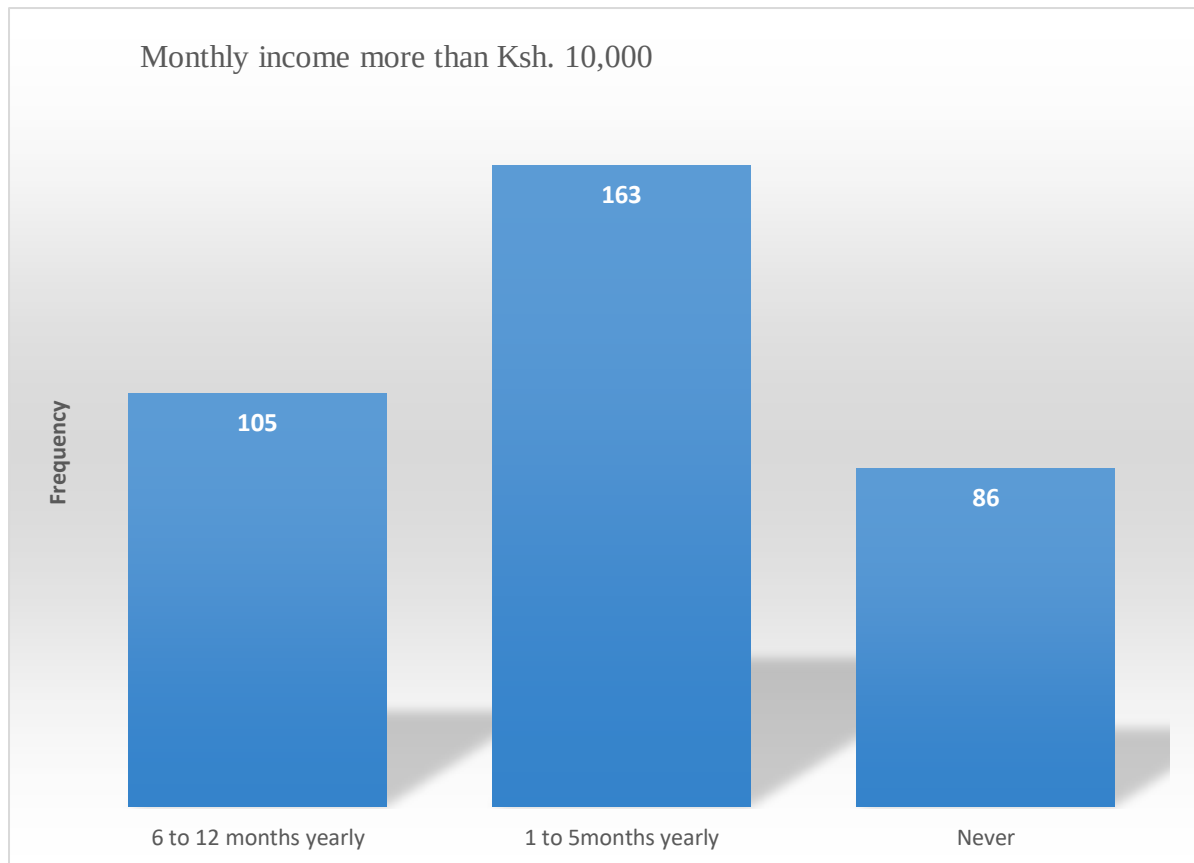
Majority of respondents were married at 200 (56.5%) while a minority 154 (43.5%) were single

Figure 4.4
Education level



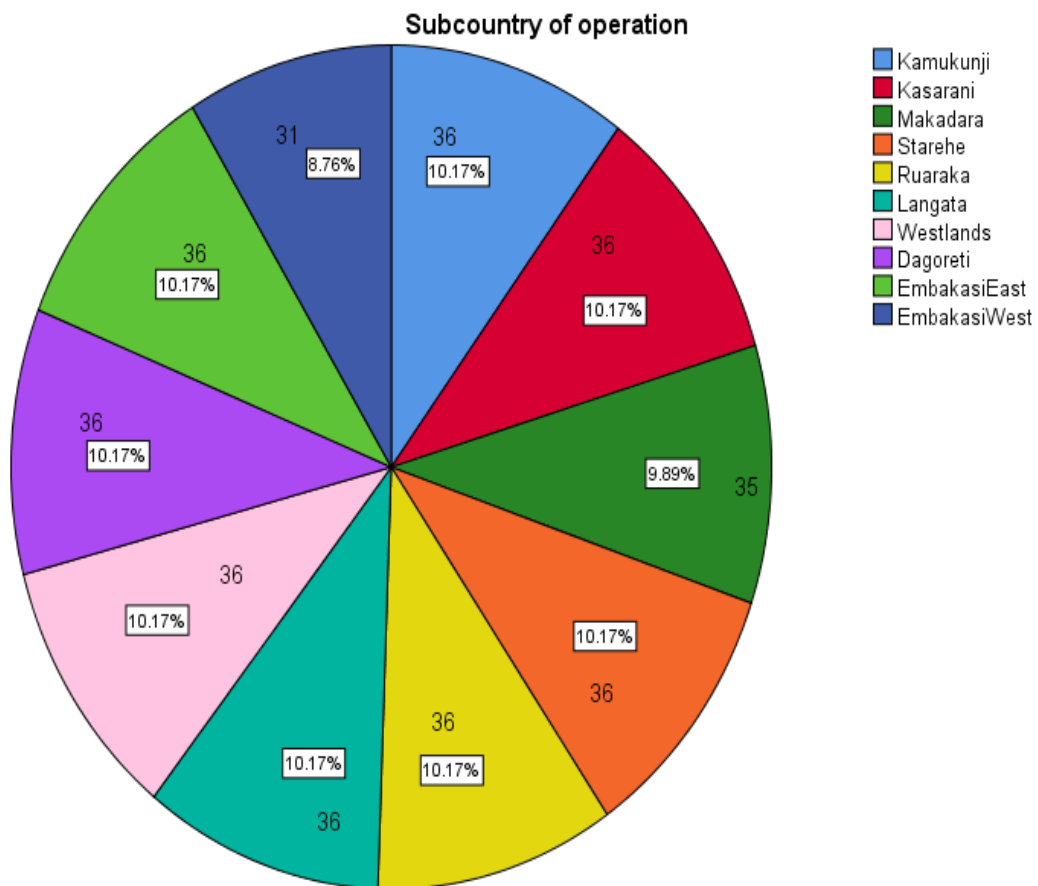
Most of the respondents had attained secondary education 263 (74.3%) while minority 91 (25.7%) had primary level of education only.

Figure 4.5
Monthly income



Majority of the respondents 163(46%) earned a monthly income of more than Ksh. 10,000 6-12 times in a year; 105(29.9%) earned a monthly income of more than Ksh.10,000 1-5 times in a year, while minority 86 (24.3%) never earned income more than Ksh 10,000.

Figure 4.6
Sub-county of Operation



Majority (36) 10.17% of respondents were from each of the 8 sub-counties while Makadara had 35 (9.89%) and Embakasi West had (31) (8.76%) participants.

4.5. Descriptive analysis of the study variables

This part presents perceptions the respondents held in respect to:- accountability system; Human resource management practices; Logistics and supplies; Incentives; and CHU performance. The views of the respondents were on 5 Likert scale where 5= strongly disagree, 4=disagree, 3=Neutral, 2= Agree, 1= strongly agree. The Likert scale was transformed into nominal scale with two categories where 1=Agree, 2=Disagree. The views were combined and each study variable computed using SPSS Version 27. Results captured in the following tables.

4.5.1. Community Health Units performance (Dependent Variable)

This variable was tested using two measures:- effectiveness; and ineffectiveness. This implied that when there was effectiveness CHU delivery of child immunization services would be improved. The variable had 6 perception items measured with 5 Likert scale. Therefore the lowest probable view was 6 and highest probable score was 30. Responses with opinion tally between 6 -12 were perceived as effectiveness, while those with perceptions above 12 were perceived as ineffectiveness.

Table 4.3

CHU Performance (Dependent Variable)

Variable	n	%
Performance		
Effective	252	71.2
Ineffective	102	28.8

According to table 4.3, highest 252 (71.2%) number of the CHP were effectiveness in the delivery of child immunization services. This implied that CHP followed the laid down standard procedures and competently assessed, refer and follow-up children for immunization services appropriately. These findings concurred with studies conducted by (Rowe et al., 2017b) and (Dambisya & Matinhure, 2012) which stated that for improved performance there is need for proper standards and guidelines; and adherence to these standards and guidelines showed improvement in the CHWF performance. In addition, (Bartos et al., 2019) in their study revealed that CHWF showed their effectiveness in the referral of the pregnant and under-6month children to the health facility with a standard referral form and all the referred clients were confirm to have accessed the services in the health facility.

4.5.2. Accountability factors (Independent variable)

This variable sort to establish whether CHU had a clear accountability systems in place. Accountability factors were measured using, communication channel, referral system, community support, community monitoring and evaluation. To ease computation and interpretation of perceptions scores on accountability factors, the 5 Likert scales data was recoded such that each indicator were in two sets of nominal scale.

Communication channel was assessed by 2 opinion score using 5 Likert scaled data. Hence the lowest probable perceptions tally was 2 and the highest probable perceptions tally was 10. Responses with opinion tally between 2- 4 were classified as “communication channel clear”. Those with a perception score of above 4 were thought as communication not clear. Referral channel was assessed by 2 opinion score using 5 Likert scaled data, therefore the lowest probable perceptions tally was 2 and the highest probable perceptions tally was 10. Responses with opinion tally between 2- 4 were classified as “referral system clear”. Those with a perception score of above 4 were thought as referral system not clear. Community support was assessed by 5 opinion score using 5 Likert scaled data. Hence the lowest probable perceptions tally was 5 and the highest probable perceptions tally was 25, Responses with opinion tally between 5- 10 were classified as “Community actively participate in CHP activities”. Those with a perception score of above 10 were held as community not actively participated in CHP activities. Community monitoring and evaluation was assessed by 5 opinion score using 5 Likert scaled data, consequently the lowest probable perceptions tally was 5 and the highest probable perceptions tally was 25, responses with opinion tally between 5- 10 were classified as “Community actively monitors and evaluates CHP activities”. Those with a perception score of above 10 were held as community does not actively monitor and evaluate CHP activities.

Table 4.4
Accountability factors

Variable	n	%
Communication		
Communication channel is clear	214	60.5
Communication channel not clear	140	39.5
Referral & linkage		
Referral system in place and clear	302	85.3
Referral system not in place not clear	52	14.7
Community support		
Community actively participates in CHP activities	296	83.6
Community not actively participates in CHP activities	58	16.4
Monitoring and evaluation		
Community actively monitors and evaluate the CHP	109	30.9
Community not active in monitoring and evaluating the CHP	245	69.2

In table 4.4. Majority 214 (60.5%) of CHP agreed that communication structure was clear and made delivery of child immunization services in the community easier. 140 (39.5%) thought that communication channel was not clear. This implied that a significant number of CHP struggled with proper communication within and without the CHU. In agreement (Kok et al., 2015) revealed the significance of having proper communication between the CHWF and other actors in the health system and community, *“Therefore a clear communication process and system is key in minimizing any potential burden that could arise between community committees and the health system supervisors”*. The study also found out that communication and Linkage/referral channel were clear and had made coordination and access to job aid and child healthcare services proficient. It also agreed with the study by (Chang et al., 2012) which

revealed there was improved quality of care which was linked to improvement in communication between Clinical healthcare and the CHWF.

Majority 302 (85.6%) of CHP agreed that referral system was clear. 52 (14.7%) were of the opinion that “referral channel was not clear”. This implied that relatively referral system was generally clear and therefore tracking of referred children from the community to health-care services and back is much better. In agreement (Teela et al., 2019) revealed that as CHWF and healthcare workers working in the maternal and child healthcare department coordination improved in Myanmar, the quality of care too improved.

Most 296 (83.8%) of CHP agreed that community gave them support. 58 (16.2%) perceived lack of support from the community. This infers that community should be encouraged to embrace CHP work in order to have 100 % full coverage of immunization of children in the community. In support another study done in Kenya CHWF attached to the health system and community reported to have gained respect and recognition and this has motivated their performance (Yasemin et al., 2012). Study by Amare, (2011) revealed that community support given to CHWF increased their motivation and thus increased their performance, this support was given through various local institutions who served as community anchors to raise their recognition and acceptance in the community.

Majority 245 (69.2% of CHP disagreed with the perception that community actively participated in the monitoring and evaluation of CHP activities. 109(30.8%) agreed that there was community actively participated in the monitoring and evaluation of CHP activities. This implied that there is low understanding of monitoring and evaluation and its role in the community, hence community should be educated and shown the easiest methods used at the

community level. In support a study by (Shankar et al., 2019) community evaluation CHWF established good relationships with the expectant mothers and this also improved their performance. In addition study by Kalyango et al. (2012) in Uganda revealed that community gave CHWF feedback for their performance and this influenced their performance positively.

4.5.3. Human resource management factors (Independent Variable)

This variable sought to establish Human resource management practices used. Human resource management factors were measured using, selection & recruitment, years of experience, clarity of roles, supportive supervision, and training. To ease computation and interpretation of perceptions scores on human resource factors, the 5 Likert scales data was recoded such that each indicator were in two sets of nominal scale.

Selection& recruitment was assessed by 3 opinion score using 5 Likert scaled data, hence the lowest probable perceptions tally was 3 and the highest probable perceptions tally was 15, responses with perceptions tally between 3- 6 were classified as “selected by the community”. Those with a perception score of above 6 were thought as “not selected by community”. Work experience assessed by 3 opinion score using 5 Likert scaled data, therefore the lowest probable perceptions tally was 3 and the highest probable perceptions tally was 15, responses with perceptions tally between 3-6 were classified as “worked for more than 3 years as CHP”. Those with a perception score of above 6 were thought as worked for less than 3 years.

Clarity of roles was assessed by 8 opinion score using 5 Likert scaled data, hence the lowest probable perceptions tally was 8 and the highest probable perceptions tally was 40, responses with perceptions tally between 8- 16 were classified as “There is an understanding of roles and

targets”. Those with a perception score of above 16 were held as having “no understanding of roles and targets”.

Supportive supervision was assessed by 5 opinion score using 5 Likert scaled data. Consequently the lowest probable perceptions tally was 5 and the highest probable perceptions tally was 25, responses with perceptions tally between 5- 10 were classified as “supportive supervision timely received”. Those with a perception score of above 10 were held as supportive supervision not timely given.

Training was assessed by 1 opinion score using 5 Likert scaled data. Consequently the lowest probable perceptions tally was 1 and the highest probable perceptions score was 5, responses with perceptions tally between 1 and 5 were classified as “received training on immunization”. Those with a perception score of above 2 were held as “not received training on immunization” Findings are presented in table 4.5

Table 4.5*Human resource management factors*

Variables	n	%
Selection and recruitment		
Selected by the community	288	81.4
Not selected by the community	66	18.6
Years of experience		
Gained more skills and confidence	109	30.8
No skills nor confidence gained	245	69.2
Clarity of roles		
There is understanding of roles and targets	268	75.7
No understanding of roles and targets	86	24.3
Support supervision		
Support supervision timely received by CHP	228	64.4
Support supervision not timely received by CHP	126	35.6
Training		
Received training on Under-five children's Immunization	311	87.9
Not received training on Under-five children's Immunization	43	12.1

In Table 4.5. Majority 288 (81.4%) CHP selected by the community, worked and lived in the same community, 66 (16.6%). This implied that majority of the CHP understood the community challenges around immunization better since they belonged in the same locality they worked in. In agreement a study showed that when CHP were selected, lived and worked within the same community this made them keep confidentiality and gained trust & support from the community which positively enhanced their motivation, this finding concurred with study carried out among CHWF in Ghana showed that as a result of community selecting them,

the CHWF had sense of responsibility and pride which in turn motivated their performance (Yasemin et al., 2012).

Majority 109 (30.8%) of CHP agreed that work experience had helped them gained more skills and confidence. however 245 (69.2%) of CHP felt experience they had gained did not make any difference in their work. This implied that experience had no effect on skill and nor confidence needed to serve as CHP. In contrast this study showed that gained work experience showed to have helped CHP adhere more to standard and procedure, and gain more confidence, it concurs with the a study which revealed that years one has worked as CHWF has effect on their performance as it is shown in their ability to appropriately use job aids, deliver good quality of care and empower clients (Crispin et al., 2012).

Majority 268 (75.7%) CHP agreed that they understood their roles and targets while 86 (24.3%) had no understanding of their roles and targets. This inferred that clarity of roles should be made at the point selection, to ensure improved delivery of children immunization services. this finding concurred with the study that was carried out in Ghana CHWF which reported that due to lack of clear of understanding of their role they experienced work-related changes especially in the community affecting their work negatively (Yasemin et al., 2012); also in another study conducted in Malawi it showed that due to lack of understanding of their role CHWF ended up taking role that were not theirs, they ended up doing basic treatment for adults yet CHWF were working in child healthcare services program (Adnan et al., 2012).

Most of 228 (64.4%) of CHP agreed that Support supervision was received timely while 126 (35.6%) did not receive timely supportive supervision. This implied that a structured way of giving supportive supervision should be put in place in order for every CHP to benefit from it,

since this helped in minimization of errors and enhanced skills imparted. CHP agreed that support supervision had helped them to minimize errors in their work in support. Regular and timely support supervision helps to minimize errors in their work and most CHP were motivated to seek more knowledge and skill, this finding agreed with the study done in Ghana CHWF reported that if they were supervised they would feel motivated and would do well in their work. (Bazzano et al., 2016). Furthermore a study done in Madagascar on CHWF found out that frequency of supervision affected their performance significantly, those who received higher frequency of supervision showed better performance (Smith et al., 2013).

Majority 311 (87.9%) CHP had been trained on under-five years' immunization, while 43 (12.1). This implied that the CHU were doing well in terms of equipping the CHP with knowledge on immunization. The findings agreed with the study that shows that majority of CHP had received training on Immunization and hence were able to render their services with confidence, knowledge and skill, According to Smith et al. (2013) training has direct effect of performance, the CHWF who received training were able to carry on their roles better than those who did not receive.

4.5.5. Logistics and supplies factors (Independent variable)

This variable sought to establish how easy and accessible logistics and supplies were at CHU. Logistics and supplies factors were measured using, Transportation, Job aid and commodity kit. To ease computation and interpretation of perceptions scores on logistics and supplies factors, the 5 Likert scales data was recoded such that each indicator were in two sets of nominal scale.

Transportation means was assessed by 4 opinion score using 5 Likert scaled data, hence the lowest probable perceptions tally was 4 and the highest probable perceptions score was 20, responses with perceptions tally between 4- 20 were classified as “transportation means accessible”. Those with a perception score of above 6 were thought as “transportation means not accessible”. Job aid was assessed by 3 opinion score using 5 Likert scaled data, therefore the lowest probable perceptions tally was 3 and the highest probable perceptions tally was 15, responses with perceptions tally between 3-6 were classified as “job aid used as a reminder to quicken decision making”. Those with a perception score of above 6 were thought as not “used job aid as a reminder to quicken decision making”. Commodity kit was assessed by 7 opinion score using 5 Likert scaled data. Consequently the lowest possible perceptions score was 7 and the highest probable perceptions tally was 35, responses with perceptions tally between 7 and 14 were classified as “commodity kit available for use”. Those with a perception score of above 14 were held as “commodity kit not available for use” Findings presented in table 4.6.

Table 4.6

Logistics & supplies factors

Variables		n	%
Transportation	Transportation means is accessible	287	81.1
	Transportation means is not accessible	67	18.9
Job aid	Uses Job Aid as reminder and to quicken decision making process	141	39.8
	Not use Job Aid as reminder and to quicken decision making process	213	60.2
CHP Commodity kit	Commodity kit available for use	112	31.6
	Commodity kit not available for use	242	68.4

As per table 4.6. Majority 287 (81.1%) agreed that means of transport was accessible from community to the health facility while 67 (18.9) did not agree that the means of transport was accessible. This implied that the community was well able to reach the facility for immunization services without much challenges. In support Arem et al. (2011) in their study in Uganda on HIV program CHW were not able to make the required number of home visit due to lack of transport and that affected the outcome of the program. (Moetlo et al., 2011) revealed in their study in South Africa that it was difficult to transport the beneficiaries that were unwell at home to the health facility due to lack facilitation of transport and vehicles are extremely expensive for CHWF to afford.

Most 213 (60.2%) respondents agreed that job aid was an important reminder and quickened their decision making process, however 141 (39.8%) felt that the job aids were restrictive and did not allow creativity in their work. This implied that job aid should be provided for all and helped to appreciate its importance in work process. This study agreed with the study according to Hamer et al. (2012) which showed in Zambia CHWF in Maternal and Child health program used simple treatment algorithm and clear treatment chart and as a result they managed to get clear guidance for their work which improved their performance.

Majority 242 (68.4%) CHP disagreed that there was commodity kits available for use, and 112 (31.6%) agreed that there was commodity kits available for use. This inferred that commodity kit largely lacked and this affect the delivery of their work negatively, this finding agreed with Gill et al. (2012) and Mothabbir et al. (2011) studies which showed an improvement in the CHWF interventions due to availability of Job aids. In contrast, Javanparast et al. (2012) study conducted in Iran revealed that job aid was a demotivation to the CHWF because they felt that it was too prescriptive and did not allow for creative learning, these category of CHWF were

young and had higher education. In agreement (Furth & Crigler, 2012; Kalyango et al., 2012) revealed that CHWF were demotivated and were unable to carry out their tasks due to lack of commodities. However in the study Osawa et al. (2010) did not find any correlation between adequacy of health commodities and CHWF adherence to guidelines for particular task.

4.5.6. Incentive factors

This variable sought to establish the attractive incentives in the CHU. Incentive factors were measured using, financial incentives and non-financial incentives. To ease computation and interpretation of perceptions scores on logistics and supplies factors, the 5 Likert scales data was recoded such that each indicator were in two sets of nominal scale.

Financial incentive was assessed by 2 opinion score using 5 Likert scaled data, therefore the lowest probable perceptions tally was 2 and the highest probable perceptions tally was 10, responses with perceptions tally between 2 and 4 were classified as “received financial incentive”. Those with a perception score of above 4 were thought as not received financial incentive. Non-financial incentive was assessed by 19 opinion score using 5 Likert scaled data. Consequently the lowest probable perceptions tally was 19 and the highest probable perceptions score was 95, responses with perceptions tally between 19 and 38 were classified as “non-financial incentive received”. Those with a perception score of above 38 were held as “non-financial incentive received.” Findings presented on table 4.7.

Table 4.7
Incentives Factors

Incentives factors	Indicators	n	%
Financial incentive	Received financial incentive	88	24.9
	Not received financial incentive	266	75.1
Non-financial Incentive	Non-financial incentive received by CHP	78	22.
	No non-financial incentive	276	78

According to Table 4.7. Majority 266 (75.1%) CHP disagreed that they received financial incentive, and the minority 88 (24.9%) agreed they received financial incentive. This implied that largely CHP were not receiving any financial incentive.

Majority 276 (78%) of CHP agreed that they did not receive any non-financial incentive while 78(22%) agreed they were receiving a non-financial incentive. This implied that Non- financial incentive were not given to CHP despite not receiving any financial availability of it would motivate CHP and therefore not consider dropping-out. In a study conducted in India CHWF stated that they preferred financial incentives to any other types of incentive as it motivated them in their performance were demotivated in their work due to unfulfilled promises concerning financial incentive. (Yasemin et al.2012 & Yirga et al., 2010).

Non-financial incentive are highly appreciated by the CHP and almost at the same level as financial incentive, recognition by health facility and recognition and respect by community appeared to be embraced more by the CHP further more lack of them could be reasons to drop-out; A study carried out reported that CHP's work motivation was enhanced due to trust and respect from the community which they considered very significant (Alam et al., 2012). Furth

& Crigler (2012) stated that CHWF in Zambia got engaged more as they got opportunities for advancement in their careers. In another study the findings showed that lack of CHWF promotion opportunities contributed to many of them dropping out (Rahman et al., 2010).

4.5.5. Cross tabulation of Sub-county of operation and Community Health Units performance (CHU)

This analysis sought to establish the existing relationship between sub-county of operation and CHU performance in the delivery of child immunization services.

Table 4.8

Analysis of relationship between Sub-County of Operation and CHU performance

		CHU performance					
		Effective			Ineffective		
		n	f	%	f	%	P-value
Sub-county of Operation	Kamukunji	36	28	77.8%	8	22.2%	11.628
	Kasarani	36	33	91.7%	3	8.3%	
	Makadara	35	22	62.9%	13	37.1%	
	Starehe	36	26	72.2%	10	27.8%	
	Ruaraka	36	22	61.1%	14	38.9%	
	Lanagata	36	25	69.4%	11	30.6%	
	Westlands	36	25	69.4%	11	30.6%	
	Dagoreti	36	25	69.4%	11	30.6%	
	Embakasi East	36	24	66.7%	12	33.3%	
	Embakasi West	31	22	71.0%	9	29.0%	

According to table 4.8. Majority >61% of CHP in all Sub-county were effectiveness in the delivery of child immunization services while minority < 38.9% of CHP were ineffectiveness in the delivery of child immunization services. However county of operation had no significant effect (p-value=11.628) on CHU performance in the delivery of under.

4.6. Bivariate logistic regression

4.6.1. Relationship between demographic characteristics and CHU performance

Logical regression analysis was done to determine the association between demographic characteristics and CHUs performance in the delivery of child immunization services in Nairobi county informal settlements.

Table 4.9

Omnibus Tests of Model Coefficients

	Chi-square	df	P-value.
Step	24.455	6.0	0.0000
Block	24.455	6.0	0.0000
Model	24.455	6.0	0.0000

Table 4.9. Demonstrates the impact of the projection ability of the model when all the independent variables are considered as one block. The p-value =0.000 was smaller than 0.05 which indicates that the model has significant projection ability.

Table 4.10

Model Summary

	Cox & Snell R Square	Nagelkerke R Square
-2 Log likelihood		
400.680a	0.067	0.095

Table 4.10, indicates that the model projects 95% variation in the effectiveness of CHU delivery of child immunization services. This inferred there was a possibility for additional studies on factors affecting performance in the CHU performance in the delivery of child

immunization services in Nairobi county informal settlements since there was 5% of variation which remains unsolved in this study.

Table 4.11

Hosmer and Lemeshow Test

Chi-square	df	p-value
8.226	8	0.812

Table 4.11. This test measured whether the model was fit for the prediction. The chi-square result is 8.226 and P-value is 0.812. This implied that the model was fit and had significant predictive capacity hence appropriate for this study.

Table 4.12

Relationship between Demographic characteristic and CHU performance

Variable	B	S.E.	Wald	df	p-value	Odds Ratio
Age						
36years and above(RC)						1
18years to 35years	0.424	0.248	2.916	1	0.088	1.529
Gender						
Female (RC)						1
Male	-0.152	0.303	0.251	1	0.616	0.859
Education						
secondary (RC)						1
Primary	-1.01	0.328	9.504	1	0.002	0.364
Marital Status						
Single (RC)						1
Married	-0.411	0.247	2.762	1	0.097	0.662
Monthly income of						
>Ksh.10,00						
Never (RC)						1
6-12months yearly	0.405	0.354	1.309	1	0.252	1.499
1-5months yearly	0.726	0.325	4.975	1	0.025	2.068

In Table 4.12. The results indicated that Education was a significant predictor ($p\text{-value}=0.002$) of CHU performance in delivery of child immunization services in Nairobi County informal settlements. CHP with primary education level were 0.364 times less likely to effectively deliver child immunization services. When compared to their counterparts with secondary education level, the results were significant at 5% level.

The findings further showed that income was a significant predictor ($p\text{-value}=0.026$) of CHU performance in delivery of child immunization services in Nairobi County informal settlements. CHP who could get monthly income of more than Ksh.10, 000 1-5 times a year were 2.068 times more likely to effectively deliver child immunization services when compared to their counterparts who never got any monthly income of more than Ksh.10, 000 and the results were significant at 5%. While CHP who could get monthly income of more than Ksh.10, 000 6-12 times a year were 1.499 times more likely to effectively deliver child immunization services when compared to their counterparts who never got any monthly income of more than Ksh.10, 000 and the results were significant at 5%. Contrary to the expectation Age and sex and Marital Status had no significant influence on CHU's performance in delivery of child immunization services in Nairobi County informal settlements.

4.6.1. Relationship between Independent variables and Dependent variable

The logical regression analysis was done to determine the relationship between: Accountability system; Human resource management practices; Logistics and supplies; Incentives and CHUs performance in the delivery of child immunization services.

Table 4.13*Omnibus Tests of Model Coefficients*

	Chi-square	df	p-value
Step	126.81	4.0	0.0000
Block	126.81	4.0	0.0000
Model	126.81	4.0	0.0000

Table 4.13 demonstrated the impact of the projection ability of the model when all the independent variables were considered as one block. The p-value =0.000 was smaller than 0.05 which indicated that the model had significant projection ability.

Table 4.14*Model Summary*

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
298.326a	0.301	0.431

Table 4.14, indicated that the model projects 43% variation in the effectiveness of CHU to deliver child immunization services. This inferred that there was a possibility for additional studies on factors affecting performance in the CHU performance in the delivery of child immunization services in Nairobi county informal settlements since there is 57% of variation which remains unsolved in this study.

Table 4.15*Hosmer and Lemeshow Test*

Chi-square	df	p-value
12.556	6	0.071

Table 4.15. This measured whether the model was fit for the prediction. The chi-square result is 12.556 and P-value is 0.071. This implied that the model was fit and had significant predictive capacity hence appropriate for this study.

Table 4.16*Relationship between Independent variables and Dependent variable*

Variable	B	S.E.	Wald	df	p-value	Odds Ratio
Accountability factors						
Accountability system is unclear(RC)						1.000
Accountability system is clear	1.967	0.300	42.893	1	0	0.140
Human resource factors						
Human resource practices not used(RC)						1.000
Human resource practices used	1.574	0.394	16	1	0	0.207
Logistics and supplies						
Logistics and supplies are not easy to use and not accessible(RC)						1.000
Logistics and supplies are easy to use and accessible	1.115	0.311	12.866	1	0	0.328
Incentives						
Incentive are not attractive						1.000
Incentive are attractive	1.336	0.431	9.634	1	0.002	0.263

As shown in table 4.16, Accountability system was a significant (p-value=0.000) predictor of CHU performance in the delivery of child immunization services in Nairobi County informal. Clear accountability system was predicted to 0.140 times less likely to affect effective delivery of child immunization services than when accountability system was not clear. The results were significant at 5% level.

In addition the findings showed that Human resource management was a significant (p-value=0.000) predictor of CHU performance in the delivery of child immunization services in Nairobi County informal settlement, when Human resource management standard practices were used it was predicted 0.207 times less likely to affect effective delivery of child immunization services than when standards and human resource practices were not used. The results were significant at 5% level.

Furthermore the findings showed that Logistics and supplies was a significant (p-value=0.000) predictor of CHU performance in the delivery of child immunization services in Nairobi County informal settlements, when logistics and supplies were easy to use and accessible it was predicted 0.328 times less likely to affect effective delivery of child immunization services than when logistics and supplies were not easy to use and not accessible. The results were significant at 5% level.

Finally, the results showed that Incentive factors were significant predictors (p-value=0.000) of CHU performance in the delivery of child immunization services in Nairobi County informal settlement, when one received incentive it was predicted 0.263 times less likely to affect effective delivery of child immunization services than when one did not receive incentive. The results were significant at 5% level.

In conclusion CHU performance in delivery of child immunization services was influenced positively when accountability system was clear; human resource management standards practices were used; logistics and supplies were easy to use and accessible; and when one received incentive in the Community Health Units in Nairobi County informal settlements.

CHAPTER FIVE: SUMMARY, CONCLUSION & RECOMMENDATIONS

5.1. Introduction

In this section the summary, the conclusions and the recommendations of the study was covered. Summary the findings of the study. Conclusions entailed the outcomes built on the set objectives:-Accountability system; Human resource management; Logistics and Supplies; Incentives factors and Community Health Units' performance in the delivery of child immunization. Finally it captured the recommendations derived from the findings of the study.

5.2. Summary

The purpose of this study was to establish the health system factors influencing Community Health Units' performance in the delivery of child immunization service in urban informal settlement in Nairobi County. The road objective was Community Health Units' performance while specific objectives were:- Accountability system; Human resource management; Logistics and Supplies; Incentives factors.

Chapter one of this study explored purpose and objectives. Health systems are complex, and in a complex real world setting a health system needs system's thinking approach interventions in order to operate more successfully and effectively. Children living in the informal settlements have been found to be prone to the poorer health indicators (APHRC, 2018), hence the usage of health CHU can potentially bring improvements on the health indicators (Kiptoo et al., 2015).

Consequently the study sought to establish Health system factors influencing community health units' performance in the delivery of child immunization service in urban informal

settlements in Nairobi County. The specific objectives were: Accountability system; Human resource management; Logistics and supplies; and Incentives factors influencing community health units' performance in the delivery of child immunization services in the urban informal settlements in Nairobi County.

In the second chapter, existing work previously done by other scholars was reviewed with the aim of establishing what was already known in the body of knowledge and identified the existing gaps that the researcher addressed. The review was done systematically guided by the study's specific objectives which were:- Accountability System; Human resource management; Logistics and Supplies; and Incentives factors influencing community health units' performance in the delivery of child immunization services in the urban informal settlements in Nairobi County.

The third chapters discussed research design, target and population, sampling, preparation of research instrument / instrumentation, procedure for collecting and analyzing data. The study was a cross-sectional descriptive research which adopted Positivists research philosophy. It used survey methodology to obtain data and used both systematic and simple random sampling to get a sample size. Data collection was done using a structured closed-ended questionnaire. Using Statistical Package for Social Research, data was analyzed using Descriptive Statistics i.e. cross tabulation, percentages and frequencies and Inferential Statistics i.e. binary logistic regression and chi-square then presented using tables, graphs, pie charts and narrations.

Chapter four discussed the results and discussions, this included the pretest results, and study data results. The results findings were presented through figures, tables and discussion. The results were presented based on the set objectives which were:- Accountability system factors;

Human resource management factors; Logistics and supplies factors; and Incentives factors influencing community health units' performance in the delivery of child immunization services in the urban informal settlements in Nairobi County.

5.3. Conclusions

Demographic characteristics data was to determine the influence demographic characteristics had on CHU performance in the delivery of child immunization services in Nairobi County informal. The study found out Age, gender, marital status and sub-county of operation did not have significant effect on CHU performance in delivery of child immunization services. However those with secondary education were 0.364 times less likely to affect deliver child immunization services when compared to their counterparts with primary school. In addition those who has a source of income of more than Ksh. 10000 6-12 times a year were 1.499 times more likely to perform better than those who did not have any source of income of more than Ksh. 10000.

The first specific objective was to establish the influence of accountability system factors on CHU performance in the delivery of child immunization services in Nairobi County informal settlement. Accountability system was a significant ($p\text{-value}=0.000$) predictor of CHU performance in the delivery of child immunization services in Nairobi County informal settlement. The study found out that when accountability system was in place it was predicted 0.140 times less likely to affect the delivery of child immunization services than when accountability system was not clear. This therefore showed that clear communication channel, functional and clear referral system, active community monitoring and evaluation processes and community support enhanced performance of CHU in the delivery of child immunization service.

The second specific objective was to establish the influence of Human resource management factors on CHU performance in the delivery of child immunization services in Nairobi County informal settlement. Human resource management factors were significant ($p\text{-value}=0.000$) predictor of CHU performance in the delivery of child immunization services in Nairobi County informal settlement. It was found out that when Human resource management standard practices were used it was predicted 0.207 times less likely to affect delivery of child immunization services than when standards and human resource practices were not used. Therefore this meant that there should be clarity of work/tasks, more support supervision sessions, more refresher trainings and community participation in the recruitment of CHP. However length of time one has worked did not show any effect on performance.

The third specific objective was to establish the influence of logistics and supplies factors on CHU performance in the delivery of child immunization services in Nairobi County informal settlement. Logistics and supplies factors were significant ($p\text{-value}=0.000$) predictor of CHU performance in the delivery of child immunization services in Nairobi County informal settlement. Study found out that when logistics and supplies were easy to use and accessible i.e. transportation, friendly and non-restrictive job aids and availability of CHP kits it was predicted 0.328 times less likely to affect the delivery of child immunization services than when logistics and supplies are not easy to use and not accessible.

The fourth specific objective was to determine the influence of incentives factors on CHU performance in the delivery of child immunization services in Nairobi County informal settlement. Incentive factors were significant ($p\text{-value}=0.000$) predictor of CHU performance in the delivery of child immunization services in Nairobi County informal settlement. CHP

performed better when they received incentives whether financial or non –financial incentive, though they gravitated more towards being given financial incentives.

5.4. Recommendations

5.4.1. Recommendations on research finding

1. Nairobi county MOH department should strengthened the communication channel in the CHU so as to improve the accountability system levels among CHWF.
2. Nairobi county MOH department should enhance Support Supervision as it revealed to help in minimizing work/task related errors and boosts confidence in CHP work delivery.
3. Nairobi county MOH department should provide friendly and non-restrictive job aids to the CHU to enhance their decision making process. This should be provided by MOH for standardization.
4. Incentives should be provided for CHP by the Nairobi health MOH, incentives could include but not limited to:- constant reaffirmation of the CHP to the community so that they can gain and maintain respect and trust by the community they serve; organize for more on-job trainings to enhance their confidence and minimize errors while serving clients; seek opportunities for CHP to undergo personal career development.

5.4.2. Recommendations for further research

1. Further research should be done to establish the ways to have more males as CHP, since studies reveal that in majority of households men are the key decision makers, hence would be greatly influenced by male CHP.
2. In addition further research should be done to establish strategies to have effective toiler made community monitoring and evaluation

3. Finally further research should be done to find out the best and affordable, suitable and sustainable incentives

REFERENCES

- Aagaard-Hansen, J., Nyamongo, I., & Olang'o, C. (2010). Staff attrition among community health workers in home-based care programmes for people living with HIV and AIDS in western Kenya, *Health Policy*, 97(2-3), 232-237. <https://doi.org/10.1016/j.healthpol.2010.05.004>
- Adhish, V., Srivastava, D. K., Prakash, S., Nair, K. S., Gupta, S., & Nandan, D. (2019). A study of interface of ASHA with the community and the service providers in Eastern Uttar Pradesh. *Indian Journal of Public Health*, 53(1), 133-136. <https://pubmed.ncbi.nlm.nih.gov/20108875/>
- Adnan, A., Asha, G., Callaghan-Koru, J., Gilroy, K., Hyder A., Kate, E ...& Jennifer, A. (2012). Health workers' and managers' perceptions of the integrated community case management program for childhood illness in Malawi: the importance of expanding access to child health services. *The American Journal of Tropical Medicine and Hygiene*, 87(5), 61-68. <https://doi.org/10.4269/ajtmh.2012.11-0665>
- African Population and Health Research Center (2018). *Improving Healthcare Delivery in Informal Settlements*. APHRC Press. <https://aphrc.org/project/improving-healthcare-delivery-in-informal-settlements/>
- Ahamed, H., & Halim, H. (2017). Determining sample size for research activities. *Selangor Business Review*, 2(1), 20-34. <https://sbr.journals.unisel.edu.my/ojs/index.php/sbr/article/view/12>
- Alam, K., Tasneem, S., & Oliveras, E. (2012). Performance of female volunteer community health workers in Dhaka urban slums. *Social Science and Medicine*, 75(3), 511-515. <https://doi: 10.1016/j.socscimed.2012.03.039>
- Alamo, S, Wabwire-Mangen, F, Kenneth, E. (2012). Task-shifting to community health workers: evaluation of the performance of a peer-led model in an antiretroviral program in Uganda, AIDS Patient Care and STDs. *AIDS Patient Care STDs*, 26(2), 101-107. <https://doi: 10.1089/apc.2011.0279>
- Amare Y. (2011). *Non-financial incentives for voluntary community health workers: a qualitative study*. JSI Research & Training Institute, Inc., Addis Ababa, Ethiopia.
- Arem, H., Nakyanjo, N., Kagaayi, J., & et al. (2011). Peer health workers and AIDS care in Rakai, Uganda: a mixed methods operations research evaluation of a cluster-randomized trial. *AIDS Patient Care STDs*, 15 (8), 719-24. <https://doi: 10.1089/apc.2010.0349>
- Bakker, A. B., Demerouti, E. (2014). Burnout and Work Engagement: The JD-R Approach. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(2), 389-411. <https://www.annualreviews.org/content/journals/10.1146/annurev-orgpsych-031413-091235>

- Bartos, A., Tenorio, A., Saunero, R., Siñani, J., & Lafuente, L. (2019). *Extending the duration of exclusive breastfeeding in El Alto, Bolivia through a community-based approach and the provision of health services*. Child Health and Nutrition Research Initiative (CHNRI).
<https://www.scirp.org/reference/referencespapers?referenceid=3814421>.
- Bazzano, A.N., Felker-Kantor, E., Kaji, A., & Saldanha, L. (2016). Parent and caregiver perspectives on home-based newborn care in low-income settings: *protocol for a systematic review of qualitative studies*, 6(8), 1-12. <https://doi.org/10.1136/bmjopen-2016-012137>.
- Bertalanffy, L.V. (1969). *General system theory; foundations, development, applications*. Braziller.
https://monoskop.org/images/7/77/Von_Bertalanffy_Ludwig_General_System_Theory_1968.pdf
- Jack, B. A., Kirton, J. A., Birakurataki, J., & Merriman, A. (2012). The personal value of being a palliative care Community Volunteer Worker in Uganda: A qualitative study. *Palliative Medicine*, 26(2), 753-759. doi: 10.1177/0269216311413628.
- Callaghan-Koru, J. A., Gilroy, K., Hyder, A. A., George, A., Nsona, H., Mtimuni, A., Zakeyo, B., Mayani, J., Cardemil, C. V., & Bryce, J. (2013). Health systems supports for community case management of childhood illness: lessons from an assessment of early implementation in Malawi. *BMC Health Serv Res*, 13(1), 55-62.
<https://doi.org/10.1186/1472-6963-13-55>.
- Chanda, P., Chalwe, V., Hamainza, B., Moonga, H. B., & Gnoni F. (2011). Community case management of malaria using ACT and RDT in two districts in Zambia: achieving high adherence to test results using community health workers. *Malaria Journal*, 10(2), 158-169. <https://doi.org/10.1186/1475-2875-10-158>.
- Chang, L.W., Kagaayi, J., Arem, H., Nakigozi, G., Ssempijja, V., Serwadda, D., Thomas, C. Q., Gray, R. H., Bollinger, R. C., & Reynolds, S. J. (2012). Impact of a Mhealth Intervention for Peer Health Workers on AIDS Care in Rural Uganda: A Mixed Methods Evaluation of a Cluster-Randomized Trial. *AIDS and Behavior*, 15(8), 1776-1784. doi: 10.1007/s10461-011-9995-x.
- Cochran, W. G. (1977.). *Sampling Techniques*. (3rd ed). John Wiley and Sons, Inc.
https://fsapps.nwcg.gov/gtac/CourseDownloads/IP/Cambodia/FlashDrive/Supporting_Documentation/Cochran_1977_Sampling%20Techniques.pdf
- Crispin, N., Wamae, A., Ndirangu, M. (2012). Effects of selected socio-demographic characteristics of community Health workers on the performance of home visits during pregnancy: a cross sectional study in Busis District, Kenya. *Global Journal of Health Science*, 4(5), 78-90. doi: 10.5539/gjhs.v4n5p78.

- Crocker T., Mindra, G., & Mounier-Jack S. (2017). Immunization, urbanization and slums – a systematic review of factors and interventions. *BMC Public Health*, 17(3), 556-563 <https://doi.org/10.1186/s12889-017-4473-7>.
- Dambisya, Y.M., & Matinhure, S. (2012). Policy and programmatic implications of task shifting in Uganda. *BMC Health Serv Res*, 12(1), 61-72. <https://doi.org/10.1186/1472-6963-12-61>.
- Debabrata, T. (2018). *Nairobi's slum residents pay a high price for low quality services*. <https://theconversation.com/nairobis-slum-residents-pay-a-high-price-for-low-quality-services-104063>
- Dudovskiy, J. (2022). *The Ultimate Guide to Writing a Dissertation in Business Studies: A Step-by-Step Assistance (6th ed.)*. Research Methodology. <http://research-methodology.net/about-us/ebook/>
- Edward, A., Ernst, P., Taylor, C., Becker, S., Mazive, E., & Perry, H. (2017). Examining the evidence of under-five mortality reduction in a community-based programme in Gaza, Mozambique. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 101(1), 814-822. <https://doi: 10.1016/j.trstmh.2007.02.025>.
- Furth, R., & Crigler, L. (2012). *Improving CHW program functionality, performance, and engagement: operations research results from Zambia*. Zambia: University Research Co., LLC (URC) and Initiatives Inc. https://chwcentral.org/wp-content/uploads/2013/09/Zambia_Operations-research-on-improving-CHW-programs_June-12_0.pdf
- GaneshAID Intelligence Team (2023). *Challenges and Barriers of Community Health Systems in Africa*. Hanoi, Vietnam: GaneshAID. <https://new.ganeshaid.com/en/challenges-and-barriers-of-community-health-systems-in-africa/>
- Gill, C. J., Guerina, N. G., Mulenga, C., Knapp, A. B., Mazala, G., & Hamer, D. H. (2012). Training Zambian traditional birth attendants to reduce neonatal mortality in the Lufwanyama Neonatal Survival Project (LUNESP). *International Journal of Gynecology and Obstetrics*, 118(1), 77-82. <https://doi: 10.1016/j.ijgo.2012.02.012>.
- Graham, J., Amos, B., & Plumptre, T. (2003). *Governance Principles for Protected Areas in the 21st Century* [A Discussion Paper]. Ottawa: Institute of Governance/Parks Canada/Canadian International Development Agency. https://www.files.ethz.ch/isn/122197/pa_governance2.pdf
- Hamer, D. H., Brooks, E. T., Semrau, K., Pilingana, P., MacLeod, W. B., & Siazeele, K. (2012). Quality and safety of integrated community case management of malaria using rapid diagnostic tests and pneumonia by community health workers. *Pathogens and Global Health*, 106(1), 32-39. <https://doi: 10.1179/1364859411Y.0000000042>.

- Hucks, W.S. (2007). *Reading Statistics and Research (6th Ed)*. Allyn & Bacon. http://students.aiu.edu/submissions/profiles/resources/onlineBook/J5E3k4_Reading_Statistics_and_Research-_6th.pdf.
- Javanparast, S., Baum, F., Labonte, R., Sanders, D., Rajabi, Z., & Heidari G. (2012). The experience of community health workers training in Iran: a qualitative study. *BMC Health Services Research*, 12(2),291-302. <https://doi.org/10.1186/1472-6963-12-291>.
- Kalyango, J. N., Rutebemberwa, E., Alfven, T., Karamagi, C., Peterson, S., & Ssali, S. (2012) Performance of community health workers under integrated community case management of childhood illnesses in eastern Uganda. *Malaria Journal*, 11(2), 282-294. <https://doi.org/10.1186/1475-2875-11-282>.
- Kawakatsu, Y., Sugishita, T., Kioko, J., & Ishimura, A. (2012). Factors influencing the performance of community health workers in Kisumu West, Kenya. *Primary Health Care Research & Development*, 13(4), 294-300. [https://doi: 10.1017/S1463423612000138](https://doi.org/10.1017/S1463423612000138).
- Kebriaei, A., & Moteghedhi, M. S. (2009). Job satisfaction among community health workers in Zahedan District Islamic Republic of Iran. *East Mediterranean Health Journal*, 15(5), 1156-1163. <https://apps.who.int/iris/handle/10665/117745>.
- Kenya Ministry of Health (2010). *Evaluation report of the community health strategy implementation in Kenya*. Division of Community Health Services. http://guidelines.health.go.ke:8000/media/Evaluation_Report_of_the_Community_Health_Strategy_Implementation_in_Kenya.pdf
- Kenya Ministry of Health (2019). *Community health volunteers (chps) basic modules handbook*. Division of Community Health Service. http://guidelines.health.go.ke:8000/media/Evaluation_Report_of_the_Community_Health_Strategy_Implementation_in_Kenya.pdf
- Kenya Ministry of Health (2014). *Strategy for Community Health 2014-2019. Transforming health: Accelerating the attainment of health goals*. Ministry of Health Community Health Unit. http://guidelines.health.go.ke:8000/media/STRATEGY_FOR_COMMUNITY_HEALTH_2014-2019.pdf
- Kiptoo, E., Esilaba M., Kobia M., & Ngunjiri, R. (2015). Factors Influencing Low Immunization Coverage Among Children Between 12 - 23 Months in East Pokot, Baringo Country, Kenya. *International Journal of Vaccine & Vaccination*, 12(1), 12. [https://doi: 10.15406/ijvv.2015.01.00012](https://doi.org/10.15406/ijvv.2015.01.00012)
- Osawa, E., Kodama, T., & Kundishora, E. (2010). Motivation and sustainability of care facilitators engaged in a community home-based HIV/AIDS program in Masvingo Province, Zimbabwe. *Psychological and Socio-medical Aspects of AIDS/HIV*, 22(7), 895-902. <https://doi.org/10.1080/09540120903499196>

- Kok, M. C., & Muula, S. (2013). Motivation and job satisfaction of Health Surveillance Assistants in Mwanza, Malawi: an explorative study. *Malawi Medical Journal*, 25(1), 5-11. <https://pubmed.ncbi.nlm.nih.gov/23717748/>
- Kok, M. C., Dieleman, M., Taeg, M., Kane, S. S., Kane, S.S., Ormel, H., Tijm, M. M., & Konong, K.A. (2015). Which intervention design factors influence performance of community health workers in low- and middle-income countries? A systematic review. *Health Policy Plan*, 30(9), 1207-1227. <https://doi.org/10.1093/heapol/czu126>.
- Kothari, C. (2004). *Research Methodology: Methods and Techniques (2nd ed)*. New Age International Publisher. ht
- Legesse, E., & Dechasa W. (2015). An assessment of child immunization coverage and its determinants in Sinana District, Southeast Ethiopia. *MBC Pediatrics*. Legesse E., & Dechasa W. (2015). An assessment of child immunization coverage and its determinants in Sinana District, Southeast Ethiopia. *MBC Pediatrics*, 15(2015), 31-42. <https://doi.org/10.1186/s12887-015-0345-4>
- Lemay, N. V., Sullivan, T., Jumbe, B., & Perry, C. P. (2012). Reaching remote health workers in Malawi: baseline assessment of a pilot mHealth intervention. *Journal of health communication*, 17 (Suppl 1), 105–117. <https://doi.org/10.1080/10810730.2011.649106>
- Lewin, S., Munabi-Babigumira., Gleton C., Daniels, K., Bosch-Capblanch, X., van B.E., Odgaard-Jensen, W. J., Johansen, M., Aja, G. N., Zwarenstein, M., Scheel I. B., (2010). Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database of Systematic Reviews (online)*, 17(3), 4015. [https://doi: 10.1002/14651858.CD004015.pub3](https://doi.org/10.1002/14651858.CD004015.pub3)
- Lewis J. (2010). *Busia Child Survival Project. Final Evaluation Report*. African Medical and Research Foundation (AMREF). https://pdf.usaid.gov/pdf_docs/Pdacr845.pdf
- Maina, L.C., Karanja, S., & Kombich, J. (2013). Immunization coverage and its determinants among children aged 12 - 23 months in a peri-urban area of Kenya. *The Pan African Medical Journal*, 14(3), 1-9. <https://doi.org/10.11604/pamj.2013.14.3.2181>
- Martinez, R., Vivancos, R., Visschers, B., Namatovu, L., Nyangoma, E., & Walley, J. (2008). Training needs, practices and barriers in the work of community reproductive health workers in Masindi district, Uganda. *Tropical doctor*, 38(2), 93–95. <https://doi.org/10.1258/td.2007.070116>
- Michielsen, J., Simon, S., Verdonck, K., Accoe, K., Tonga, C., Polman, K., Tawaytibhongs, O., Cornu, T., Dens, S., Sy, H., Nieto-Sanchez, C., & Van Belle, S. (2023). Making 'resilience' useful again: recognising health system resilience as an effective boundary object. *BMJ global health*, 8(5), e012064. <https://doi.org/10.1136/bmjgh-2023-012064>

- Moetlo, G. J., Pengpid, S., & Peltzer, K. (2011). An evaluation of the implementation of integrated community home-based care services in vhembe district, South Africa. *Indian journal of palliative care*, 17(2), 137–142. <https://doi.org/10.4103/0973-1075.84535>
- Mohamad, A.B., Diana, E. O., & Akmal, N. B. (2018). MoA review on sample size determination for Cronbach's alpha test: a simple guide for researchers. *Malays Journal of Medical Science*, 25(6), 85–99. <https://doi: 10.21315/mjms2018.25.6.9>
- Mothabbir, G., Myatt, M., Puett, C., & Sadler, K. (2011). Community case management of severe acute malnutrition in southern Bangladesh, 2011 Boston Tufts University Sahay S, Mehendale S. Engaging community to support HIV prevention research. *Eastern Journal of Medicine*, 16 (1)168-77. <https://doi.org/10.1093/heapol/czu126>
- Mugenda, O. M., Mugenda, A. G., (2012). *Research Methods: Quantitative and qualitative approaches* (3rd ed). African Centre for Technology Studies. <https://www.scirp.org/reference/referencespapers?referenceid=2998951>
- Muhammad, A.H., Sajid, S., Cousens, S., Anwar, S., Haque, N.U., Ahmed. I., Ali, N., Tahir, R., & Bhutta, Z. (2017). Community engagement and integrated health and polio immunization campaigns in conflict-affected areas of Pakistan: a cluster randomized controlled trial. *Lancet Global Health*, 5(6), 593-603. [https://doi10.1016/S2214-109 X \(17\)30184-5](https://doi10.1016/S2214-109 X (17)30184-5).
- Nairobi County Health Service (2016). *Health Sector Working Group Report*. Nairobi City County. <https://www.treasury.go.ke/wp-content/uploads/2021/05/Health-Sector-Report.pdf>
- Pongvongsa, T., Nonaka, D., Kobayashi, J., Mizoue, T., Phongmany, P., & Moji, K.. (2011). Determinants of monthly reporting by village health volunteers in a poor rural district of Lao PDR. *The Southeast Asian Journal of Tropical Medicine and Public Health*, 42(5), 1269–1281. <https://pubmed.ncbi.nlm.nih.gov/22299454/>
- Puchalski, L. M., Lettow, M. V., Barnsley, J., Chan, A. K., & Joshua, M. (2012). Evaluation of lay health workers' needs to effectively support anti-tuberculosis treatment adherence in Malawi. *International Journal of Tuberculosis and Lung Disease*, 16(11) 1492-1497. <https://doi: 10.5588/ijtld.12.0206>.
- Rahman, S.M., Ali, N.A., Jennings, L., Seraji, M. H. R., Shah, I. M. R., Al-Mahmud, A. B., Bari, S., Hossain, D., Das, M. K., Baqui, A. H., Arifeen, S. E., & Winch, P. J. . (2010). Factors affecting recruitment and retention of community health workers in a newborn care intervention in Bangladesh. *Human Resources for Health*, 8(12). <https://doi.org/10.1186/1478-4491-8-12>.
- Rajaonarifara, E., Bonds, M. H., Miller, A.C., Ihantamalala, F. A., Cordier, L., Razafinjato, B., Rafenoarimalala, F. H., Finnegan, K. E., Rakotonanahary, R. J. L., Cowley, G. Ratsimbazafy, B., Razafimamonjy, F., Randriamanambintsoa, M., Raza-

- Fanomezanjanahar, E. M., Randrianambinina, A., Metcalf, C.J., Roche, B., & Garchitorena, A. (2022) Impact of health system strengthening on delivery strategies to improve child immunization coverage and inequalities in rural Madagascar. *BMJ Global Health*, 7(1), 6824. <https://doi.org/10.1136/bmjgh-2021-006824>
- Kenya Ministry of Health. (2020). *Kenya Master Health Facility List*. <https://kmhfr.health.go.ke/>
- Rowe, S. Y., Kelly, J. M., Olewe, M. A., Kleinbaum, D. G., McGowan, J.E. Jr., McFarland, D. A., & Deming, M.S. (2017a). Effect of multiple interventions on community health workers' adherence to clinical guidelines in Siaya district, Kenya. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 101(1), 188-20. <https://doi: 10.1016/j.trstmh.2006.02.023>.
- Rowe, S. Y., Olewe, M. A., Kleinbaum, D. G., McGowan, J. E., McFarland, D. A., Rochat, R., & Deming, M. S. (2017b). Longitudinal analysis of community health workers' adherence to treatment guidelines, Siaya, Kenya, 1997-2002. *Tropical Medicine and International Health*, 12(1) 651-63. <https://doi: 10.1111/j.1365-3156.2007.01824.x>.
- Saravanan, S., Turell, G., Johnson, H., Fraser, J., & Patterson, C. (2011). Traditional birth attendant training and local birthing practices in India. *Evaluation Program for Planning*, 34(3), 254-65. <https://doi: 10.1016/j.evalprogplan.2011.02.012>.
- Saunders, M., Philip, L., & Thornhill, A. (2012). “*Research Methods for Business Students*” (6th ed). Pearson Education Limited. https://www.researchgate.net/publication/330760964_
- Scott, K. & Shanker, S. (2010). Tying their hands? Institutional obstacles to the success of the ASHA community health worker programme in rural north India. *AIDS Care*, 22(2), 1606-1612. <https://doi: 10.1080/09540121.2010.507751>.
- Shankar, V., Asrilla, Z., Kadha, J. K., Sebayang, S., & Apriatni, M. (2019). Programmatic effects of a large-scale multiple-micronutrient supplementation trial in Indonesia: using community facilitators as intermediaries for behavior change. *Food and Nutrition Bulletin*, 30 (2) 207-214. <https://doi:10.1177/15648265090302S204>
- Sheikh, K., Gilson, L., Agyepong, I. A., Hanson, K., Ssengooba, F., Bennett, S., (2011.). Building the field of health policy and systems research: framing the questions. *PLoS Medicine*, 8(8), 1001073. <https://doi.org/10.1371/journal.pmed.1001073>
- Simba, D. O., & Kakoko, D. C. (2012). Volunteerism among out-of-school adolescent reproductive health peer educators: is it a sustainable strategy in resource constrained countries? *African Journal of Reproductive Health*, 13(3), 99-110. <https://pubmed.ncbi.nlm.nih.gov/20690265/>.
- Simon, S., Chu, K., Frieden, M. (2019). An integrated approach of community health worker support for HIV/AIDS and TB care in Angonia district, Mozambique. *BMC*

- International Health and Human Rights*, 9 (13), 1-11. <https://doi: 10.1186/1472-698X-9-13>.
- Smith, S., Agarwal, A., Crigler, L., Gallo, M., Finlay, A., Homsy, C., & Wuliji, T. (2013). *Community Health Volunteer Program Functionality and Performance in Madagascar: A Synthesis of Qualitative and Quantitative Assessments*. Madagascar: University Research Co. LLC (URC). <https://stacks.cdc.gov/view/cdc/58003>
- Soura, A. B., Mberu, B., Elungata, P., Lankoande, B., Millogo, R., Beguy, D., & Compaore, Y. (2015). Understanding inequities in child vaccination rates among the urban poor: Evidence from Nairobi and Ouagadougou health and demographic surveillance systems. *Urban Health*, 92(1), 39-54. <https://doi: 10.1007/s11524-014-9908-1>.
- Takasugi, T., & Lee, A. C. (2012). Why do community health workers volunteer? A qualitative study in Kenya. *Public Health*, 126(10), 839- 845. <https://doi:10.1016/j.puhe.2012.06.005>.
- Teela, K. C., Mullany, L. C., Lee, C. I. (2019). Community-based delivery of maternal care in conflict-affected areas of eastern Burma: perspectives from lay maternal health workers. *Social Science and Medicine*, 68(7), 1332-1340. <https://doi: 10.1016/j.socscimed.2009.01.033>.
- Teklehaimanot, Kitaw, Y., Yohannes, A. G., Girma, S., Seyoum, S., Desta, S., & Ye-Ebiyo, Y. (2016). Study of the working conditions of health extension workers in Ethiopia. *The Ethiopian Journal of Health Development*, 21(3), 183-259. <https://www.ejhd.org/index.php/ejhd/article/view/536>.
- United Nations Children's Fund (2018a). *Universal Health Care in Kenya and Defeating Poverty through Immunization*. UNICEF. <https://www.unicef.org/kenya/press-releases/universal-health-care-kenya-and-defeating-poverty-through-immunization>
- United Nations Children's Fund (2018b). *Urban Immunization Toolkit*. United Nations Children's Fund (UNICEF). https://www.linkedimmunisation.org/wp-content/uploads/2020/05/Urban-immunization-toolkit_final-1563547313.pdf
- United Nations Children's Fund (2019). Immunization: *In 2018, 116 million children were immunized against diphtheria, tetanus and pertussis (DTP) yet millions of children are still not reached by potentially life-saving vaccines*. UNICEF press release. <https://www.unicef.org/press-releases/global-childhood-immunization-levels-stalled-2023-leaving-many-without-life-saving>
- United States Agency for International Development (2015). *Essential package of health services country snapshot: KENYA*. United States Agency for International Development (USAID). https://pdf.usaid.gov/pdf_docs/PA00MTR2.pdf
- Wangalwa, G., Wamalwa B., Machira Y., et al. (2012). Effectiveness of Kenya's Community Health Strategy in delivering community-based maternal and newborn health care in

- Busia County, Kenya: non-randomized pre-test post-test study. *The Pan African Journal*, 13(1), 12. <https://pubmed.ncbi.nlm.nih.gov/23467438/>.
- Winch, P. J., Gilroy, K. E., Doumbia, S., Patterson, A. E., Daou, Z., Diawara, A., & Black, R. E. (2008). Operational issues and trends associated with the pilot introduction of zinc for childhood diarrhoea in Bougouni district, Mali. *Journal of Health, Population and Nutrition*, 26 (2) 151-163. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2740667/>
- World Health Organization (2018). *Immunization Coverage Fact Sheet*. Geneva: World Health Organization. <https://www.who.int/westernpacific/news-room/events/world-immunization-week/2018/immunization-coverage>
- World Health Organization (2020). *Health Report*. WHO. https://cdn.who.int/media/docs/default-source/gho-documents/world-health-statistic-reports/2020/en_whs_2020_toc.pdf?sfvrsn=50d6d7c6_3#:~:text=As%20part%20of%20WHO's%20Transformation,still%20lagging%20in%20other%20areas.
- World Health Organization (2017). *Systems thinking for health systems strengthening*. WHO press. https://iris.who.int/bitstream/handle/10665/44204/9789241563895_eng.pdf
- World Health Organization (2014) *Implementation research toolkit*. World Health Organization. https://iris.who.int/bitstream/handle/10665/110523/9789241506960_Workbook_eng.pdf
- World Health Organization (2015). *Strategies to increase the demand for childhood vaccination in low- and middle-income countries: a systematic review and meta-analysis*. World Health Organization, 93(5), 339-346C. <https://doi.org/10.2471/BLT.14.146951>
- Yasemin, D., Strachan, D., Cairncross, S., Korkor, A. S., & Hill, Z. (2012). Motivations and challenges of community-based surveillance volunteers in the northern region of Ghana. Motivations and challenge. *Journal of Community Health*, 37(6), 1192-1108. <https://doi.org/10.1007/s10900-012-9569-5>.
- Yihunie, L., Alemayhu, B., & Sibhatu, B. (2015). Factors influencing full immunization coverage among 12–23 months of age children in Ethiopia: evidence from the national demographic and health survey in 2011. *BMC Public Health*, 15(1), 728-734. <https://doi.org/10.1186/s12889-015-2078-6>.
- Yirga, D., Deribe, K., Woldemichael, K., Wondafrash, M., & Kassahun, W. (2010). Factors associated with compliance with community directed treatment with ivermectin for onchocerciasis control in Southwestern Ethiopia. *Parasites and Vectors*, 3(1), 48-58. <https://doi.org/10.1186/1756-3305-3-48>.

Appendices

Appendix I: Introduction Letter



KENYA METHODIST UNIVERSITY

P. O. Box 267 Meru - 60200, Kenya
Tel: 254-064-30301/31229/30367/31171

Fax: 254-64-30162
Email: deanrd@kemu.ac.ke

DIRECTORATE OF POSTGRADUATE STUDIES

November 1, 2021

Commission Secretary,
National Commission for Science, Technology and Innovations,
P.O. Box 30623-00100,
NAIROBI.

Dear sir/ Madam,

LENAH CHEPKORIR (HSM-3-3001-2/2014)

This is to confirm that the above named is a bona fide student of Kenya Methodist University, Department of Health Systems Management undertaking a Degree of Master of Health Systems Management. She is conducting research on **'Health system-related factors influencing community health units' performance in the delivery of child immunization service in urban informal settlements in Nairobi County**

We confirm that her research proposal has been defended and approved by the University.

In this regard, we are requesting your office to issue a permit to enable her collect data for her research.

Any assistance accorded to her will be appreciated.

Thank you.



Dr. Peter M. Muri, Ph.D.
Director Postgraduate Studies

Cc: Dean SMHS
COD, HSM
Postgraduate Co-ordinator
Supervisors

Appendix II: Informed Consent Form

GENERAL INFORMED CONSENT FORM.

1.1. Purpose

The purpose of this study is to find out the Health system-related factors influencing community health units' performance in the delivery of child immunization service in urban informal settlements in Nairobi County

1.2. Procedure

I understand that I am one of the community health workers selected from my Community Unit in Nairobi County to respond to the Questions outline in the questionnaire given. I therefore agree to fill in the questionnaire provided to me honestly.

1.3. Duration

I understand that I am required to sit in a quiet and comfortable place and fill in the questionnaire for 30-45 minutes, and that I shall participate in this study only once.

1.4. Confidentiality

The aim of the study has been fully explained to me and I am aware that the responses I give will be treated with respect and only handled by authorized persons only; the questionnaire will not have my the name nor identification number, rather it shall have independently generated number as code number for the purpose of ensuring anonymity; completed questionnaire will be safely kept for a period of not less than five years. I am free to express my ideas or ask questions.

1.5. Risks

There is no any risk that I am aware of or anticipating while I participate in this research study.

1.6. Benefits

The results of the study will help me know where to strengthen in my health service provision to the community. I also understand that my participation in this study will see the researcher also achieve a master's degree.

1.7. Withdrawal

I understand that my participation in this study is voluntary and I can withdraw from the study if I so wish at any point of the study without being victimize

1.8. Concerns

I am aware that the researcher- Lenah Chepkorir, KeMU Student of Phone No. 0726400581 shall be available throughout and participate fully in the study and shall address all questions arising in the course of the study

1.9. Consent

I have received a copy of this consent form and have read it / it has read to me and I have understood the material in this document. I therefore knowingly agree to participate in this study.

Name..... STUDY ONYANCHI Signature..... [Signature]

Appendix III. Data Collection Instruments

Individual Questionnaire

I am a student in Kenya Methodist University and I am doing a study on establishing factors influencing Community Health Units performance in delivery of child immunization services among under-five years' children in urban informal settlements in Nairobi County. This study seeks to understand the environment in which CUs operate in, as well as the strengths, challenges, opportunities and threats that exist. The information gathered will be used for mitigation as well as strengthening process. Confidentiality of the information gathered will be highly observed. This will take approximately 30 minutes.

Section A: Demographic Data

1. How old are you in years?
☐ 18-25 ☐ 18-25 ☐ 26-35 ☐ 36-55 ☐ 56 and above
2. Sex of the respondent?
☐ Male ☐ Female
3. What is your marital status?
☐ Married ☐ Single ☐ Widow ☐ Separated
4. What is your education level?
☐ Primary completed ☐ Primary in-complete ☐ Post-primary vocational training
☐ Secondary complete ☐ Secondary Incomplete ☐ Post-Secondary vocational training
5. My approximate income (in a month) is more than 10,000 Kenyan Shillings
☐ Always. ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
6. In which sub-county is your Community Health Unit?
Kamukunji; Makadara; Starehe; Embakasi East; Embakasi West; Langata; Westlands;
Kasarani; Dagoreti; Ruaraka

Section B: Objectives

Accountability Factors

Communication structure

On a scale of 1 to 5 how do you agree with the following statements? 1=Strongly Agree.
2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Communication structure	1	2	3	4	5
7. Communication channel in CHUs is very clear					

8. Clear communication channels makes coordination of my clients easier					
---	--	--	--	--	--

Referral and linkages to the health system

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Embedment of CHWs in community and the health system	1	2	3	4	5
9. There is a clear referrals system in place for client from the community to health facility and vice versa					
10. I can track clients easily because of the clear referral/linkage system					

Community support

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Community support	1	2	3	4	5
11. . The Community recognizes my work as CHP					
12. The community gets in involved in the CHWF work by					
a. Mobilization of the community for actions around health					
b. Providing meeting places					
c. Providing service delivery points in the community					
d. Providing mean of transport to transfer patients in need to the health centre					

Community monitoring and evaluation

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Community monitoring and evaluation	1	2	3	4	5
13. . In my opinion the following forums have been effective in giving the community health education, updates and feedback on Immunization status of the under-five years' children in the community					
a. Chiefs' Baraza:					
b. Household visit:					

c. Community dialogues:						
d. Organized health education forums:						
14. . The number of community feedback sessions on immunization status of under-five years children in a month is satisfactory						

Human Resource factors

Selection and Recruitment process

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Selection and Recruitment process	1	2	3	4	5
15. . I was selected by the community a CHWF					
16. . In my opinion it is important that I live in the community I serve because:-					
a. It's easier to keep confidentiality					
b. Community gives me more respect and support					

Years of experience

Have you worked for more than 3 years as CHV?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

	1	2	3	4	5
17. . The more years of experience affects how I work as a CHWF in the following ways					
a. Makes me adhere with standards and procedure more					
b. Make me more confident					
c. It makes no difference					

Clarity of roles

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Clarity of roles	1	2	3	4	5
18. The roles and targets that I am required to meet specifically in Under five years Children's Immunization is clear to me					
19. . These are my important task in Under-five years Children's Immunization as a CHWF					
a. Health education on the importance of immunization to the community					
b. Identification of all the under-five year's children households					
c. Home visits for follow up on the immunization status					
d. Case search for Immunization defaulter					
e. Referral of target clients to the health facility					
f. Providing feedback to the households on immunization issues					
g. Report writing					

Supervision

On a scale of 1 to 5 how do you agree with the following statements? 1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Supervision	1	2	3	4	5
20. . In my opinion support supervision:-					
a. Makes me value my work more					
b. Helps me minimize on errors that I would have made					
c. Makes me seek more information and gain more skills					

21. Supportive supervision is very important

☐ 1=Strongly Agree. ☐ 2=Agree ☐ 3= Undecided ☐ 4=Disagree ☐ 5=Strongly Disagree

22. . I receive timely feedback and adequate support from my supervisors

☐ 1=Strongly Agree. ☐ 2=Agree ☐ 3= Undecided ☐ 4=Disagree ☐ 5=Strongly Disagree

Training

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Training	1	2	3	4	
23. . I have been trained on under-five years Children's immunization					

Logistics and Supplies Factors

Transportation

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Transportation	1	2	3	4	
24. Transportation from the community to the health facility is very important for my work					
25. Lack of transportation in place affects my job in that:-					
a. I am not able to make the required number of home visit					
b. I am not able to refer clients to health centres					
c. I am not able to submit my report on time					

Job aid

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Job aid	1	2	3	4	
26. . In my opinion Job aid are important because					
a. Acts as a reminder of what to do					
b. Quickens decision in making a process					
c. It doesn't allow creativity as it restricts one from bringing in new ideas					

Commodity kit

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Commodity kit	1	2	3	4	
27. . There is a system in place commodity kit					
28. . Lack of commodity kit would affect my work negatively					

29. . The most important items in my Commodity kit are					
a. Drugs					
b. Gloves					
c. Disinfectants					
d. Cotton wool					
e. Mackintosh					

Incentive Factors

Financial Incentives

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Financial Incentives	1	2	3	4	5
30. . I receive financial incentive for my work as CHP					
31. In my opinion the financial incentive is adequate for the work that I do as a CHP					

Non-financial incentive

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

Non-financial incentive	1	2	3	4	5
32. . Non-financial incentive is important to me as a CHP					
33. Iam currently receiving the following non-financial incentive					
a. Personal and career development opportunities					
b. Respect and trust from the community					
c. Recognition by the health facility					
d. Tokens					
34. . The following forms of incentives would motivate me my work as a CHP					
a. Financial allowance					
b. Personal and career development opportunities					

c. Respect and trust from the community						
d. Recognition by the health facility						
e. Training						
f. Tokens						
35. The following reasons can easily make me drop out or stop being active as a CHW						
a. Discouragement by family members						
b. Inadequate appreciation by the community						
c. Inadequate support and supervision						
d. Financial constraints						
e. Inadequate training						

Community Health Units Performance in delivery of child immunization

On a scale of 1 to 5 how do you agree with the following statements?

1=Strongly Agree. 2=Agree 3= Undecided 4=Disagree 5=Strongly Disagree

	1	2	3	4	5
36. Iam Satisfied with my work as a Community Health Volunteer					
37. Iam able to identify children who have defaulted immunization and give appropriate health education with confident (able to point out in the immunization card a defaulter, able to mention immunization schedule as per KEPI)					
38. I assess and refer appropriately more than one children in need (defaulter) of immunization services monthly (has copies of referral notes/register)					
39. I use these job aids to do my job (has and able to demonstrate it usage)					
a) Registers					
b) Procedure manual/guideline					
c) Algorithm/flowcharts					

Appendix IV: Kenya Methodist University Ethical Approval



KENYA METHODIST UNIVERSITY
P. O. BOX 267 MERU - 60200, KENYA FAX: 254-64-30162
TEL: 254-064-30301/31229/30367/31171 EMAIL: serc@kemu.ac.ke

November 1, 2021

KeMU/SERC/HSM /53/2021

Lenah Chepkorir
Kenya Methodist University

Dear Lenah,

SUBJECT: HEALTH SYSTEM-RELATED FACTORS INFLUENCING COMMUNITY HEALTH UNITS PERFORMANCE IN THE DELIVERY OF CHILD IMMUNIZATION SERVICE IN URBAN INFORMAL SETTLEMENTS IN NAIROBI COUNTY.

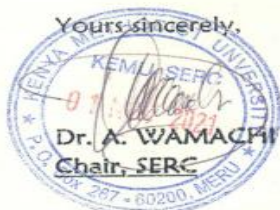
This is to inform you that Kenya Methodist University Scientific Ethics and Review Committee has reviewed and approved your above research proposal. Your application approval number is KeMU/SERC/HSM/53/2021. The approval period is 1st November 2021 – 1st November 2022

This approval is subject to compliance with the following requirements

- I. Only approved documents including (informed consents, study instruments, MTA) will be used.
- II. All changes including (amendments, deviations, and violations) are submitted for review and approval by Kenya Methodist University Scientific Ethics and Review committee.
- III. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KeMU SERC within 72 hours of notification.
- IV. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to KeMU SERC within 72 hours.
- V. Clearance for export of biological specimens must be obtained from relevant institutions.
- VI. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
- VII. Submission of an executive summary report within 90 days upon completion of the study to KeMU SERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,



Appendix V. Research Permit NACOSTI

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
RefNo: 852615	Date of Issue: 14/March/2022
RESEARCH LICENSE	
	
This is to Certify that Ms., Lenah Chepkorir of Kenya Methodist University, has been licensed to conduct research in Nairobi on the topic: HEALTH SYSTEM-RELATED FACTORS INFLUENCING COMMUNITY HEALTH UNITS' PERFORMANCE IN THE DELIVERY OF CHILD IMMUNIZATION SERVICE IN URBAN INFORMAL SETTLEMENTS IN NAIROBI COUNTY for the period ending : 14/March/2023.	
License No: NACOSTI/P/22/16184	
852615 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Verification QR Code	
	
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	

Appendix VI. Nairobi Metropolitan Services Research Authorization/Permit Letter

REPUBLIC OF KENYA
**EXECUTIVE OFFICE OF THE PRESIDENT
NAIROBI METROPOLITAN SERVICES**

Telegraphic Address
Telephone +3313002/4
When replying please quote

Kenyatta International Convention Centre
P. O. Box 49130-00100
NAIROBI

REF: EOP/NMS/HS/120 **DATE: 4th April, 2022**

LENAH CHEPKORIR
KENYA METHODIST UNIVERSITY
NAIROBI

Dear Ms. Lenah,

RE: RESEARCH AUTHORIZATION

This is to inform you that the Nairobi Metropolitan Services - Health Directorate's Research Ethics Committee (REC) reviewed the documents on the study titled "Health System- related factors influencing community health units' performance in the delivery of child health immunization services in urban informal settlements in Nairobi County."

I am pleased to inform you that you have been authorized to carry out the study in Nairobi County. The researcher will be required to adhere to the ethical code of conduct for health research in accordance to the Science Technology and Innovation Act, 2013 and the approval procedure and protocol for research for Nairobi.

On completion of the study, you will submit one hard copy and one copy in PDF of the research findings to the REC. In addition, you will disseminate recommendations of the research at a virtual meeting organized by the REC. By copy of this letter, all the Sub County Medical Officers of Health are to accord you the necessary assistance to carry out this research study.

Yours sincerely,



**DR. OUMA OLUGA - OGW
DIRECTOR HEALTH SERVICES**

Cc: All Sub County Medical Officers of Health

Appendix VII. Nairobi County Map

