DETERMINANTS OF HEALTH FACILITY CONSULTATION FOR ACUTE RESPIRATORY INFECTION AMONG CHILDREN UNDER FIVE YEARS IN GITHUNGURI SUB – COUNTY, KIAMBU COUNTY, KENYA

BY

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Q57/CTY/PT/20593/12

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH (EPIDEMIOLOGY AND DISEASE CONTROL) IN THE SCHOOL OF PUBLIC HEALTH OF KENYATTA UNIVERSITY

AUGUST, 2016
Declaration

Student declaration

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

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Dedication

I dedicate this work to my family for their support, encouragement and prayers, which gave me the motivation to work harder during the entire period of the study.
Acknowledgement

I acknowledge my dedicated supervisors, Dr. John Paul Oyore and Dr. Florence NafulaOkwar for their invaluable expertise in making this thesis a reality. I will be grateful forever for their guidance throughout this study. I also wish to thank lecturers in the Department of Community Health, Kenyatta University for their contribution in expanding my knowledge base particularly in public health.

I also extend my gratitude to all community health extension workers and community health workers in Githunguri Sub-County, for their support during data collection process. Many thanks to my sister Ruth Ndungu for the assistance she accorded me during data collection.

I appreciate my loving parents for their financial, moral and spiritual support during the research process. Further, I am indebted to my siblings for their immense contribution in motivating me in my academic work. Last but not least, I am grateful to all my friends and well-wishers, who in one way or the other encouraged and gave me material and moral support in accomplishing this task.

To you all, I say thank you!
Tables of Contents

Declaration.................................................................................................................. ii

Dedication ................................................................................................................... iii

Acknowledgement..................................................................................................... iv

Tables of Contents ................................................................................................... v

List of Tables ............................................................................................................. x

List of Figures .......................................................................................................... xi

Abbreviations............................................................................................................ xii

Operational definition of terminologies ................................................................. xiv

Abstract..................................................................................................................... xvii

CHAPTER ONE: INTRODUCTION ............................................................................. 1

1.1 Background to the study .................................................................................... 1

1.2 Statement of the Problem .................................................................................. 3

1.3 Justification of the study ................................................................................... 5

1.4 Research questions ............................................................................................ 5

1.5 Hypothesis .......................................................................................................... 6

1.5.1 Null and alternative hypotheses .................................................................. 6

1.6 Objectives .......................................................................................................... 7

1.6.1 Broad objective ............................................................................................ 7

1.6.2 Specific objectives ....................................................................................... 7

1.7 Significance of the study ................................................................................... 8

1.8 Delimitation and limitation of the study ............................................................ 8
1.8.1 Delimitation ........................................................................................................... 8
1.8.2 Limitation .............................................................................................................. 8
1.9 Conceptual framework ................................................................................................ 9

CHAPTER TWO: LITERATURE REVIEW ................................................................. 11
2.1 Introduction .............................................................................................................. 11
2.2 Prevalence of acute respiratory infection and health care seeking ...................... 11
2.3 Socio-demographic factors influencing care seeking ............................................. 14
2.4 Socio-cultural and household factors influencing care seeking ............................. 15
2.5 Family practices influencing care seeking .............................................................. 17
2.6 Caregivers’ knowledge and perceptions influencing care seeking ...................... 18
2.7 Health facility factors influencing care seeking ..................................................... 19
2.8 Summary of literature review ................................................................................. 22

CHAPTER THREE: MATERIALS AND METHODS .............................................. 25
3.1 Introduction .............................................................................................................. 25
3.2 Research design ..................................................................................................... 25
3.3 Measurement of study variables .......................................................................... 25
  3.3.1 Dependent variable ............................................................................................ 25
  3.3.2 Independent variables ....................................................................................... 26
3.4 Location of the study ............................................................................................. 26
3.5 Study population ................................................................................................... 27
  3.5.1 Target population ............................................................................................. 27
3.5.2 Sample population ........................................ 27

3.6 Inclusion and exclusion criteria ................................ 27

3.6.1 Inclusion criteria ........................................ 27

3.6.2 Exclusion criteria ......................................... 27

3.7 Sample size and sampling techniques ......................... 28

3.7.1 Sample size .............................................. 28

3.7.2 Sampling techniques ...................................... 28

3.8 Construction of research instruments .......................... 31

3.8.1 Quantitative data ......................................... 31

3.8.2 Qualitative data .......................................... 32

3.9 Pre-testing ..................................................... 32

3.10 Validity and reliability ....................................... 33

3.10.1 Validity .................................................... 33

3.10.2 Reliability ................................................ 33

3.11 Data collection techniques ................................... 34

3.11.1 Quantitative data ........................................ 34

3.11.2 Qualitative data ........................................... 34

3.12 Data analysis .................................................. 35

3.13 Ethical and logistical considerations .......................... 37

CHAPTER FOUR: RESULTS ........................................ 39

4.0 Introduction ..................................................... 39
4.1 Socio-demographic characteristics of participants ............................................. 39

4.2 Prevalence of ARI ................................................................................................. 40

4.3 Timing of health facility consultation for ARI .................................................. 41

4.4 Socio-demographic and household determinants of health facility consultation. 43

4.4.1 Socio-demographic factors as determinants of health facility consultation ................................................................. 43

4.4.2 Household factors as determinants of health facility consultation.............. 45

4.5 Knowledge of pneumonia as a determinant of health facility consultation ...... 47

4.6 Facility factors as determinants of health facility consultation ..................... 50

4.7 Multivariate analysis .......................................................................................... 54

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS.......................... 56

5.1 Discussion ........................................................................................................... 56

5.1.1 Prevalence of ARI .......................................................................................... 56

5.1.2 Timing of health facility consultation for ARI ............................................. 57

5.1.3 Socio-demographic and household factors as determinants of health facility consultation ................................................................. 58

5.1.4 Knowledge of pneumonia as a determinant of health facility consultation .................................................................................. 61

5.1.5 Health facility determinants of timing of health facility consultation... 63

5.2 Conclusions ....................................................................................................... 65

5.3 Recommendations ......................................................................................... 66
5.3.1 Recommendations for policy makers ........................................ 66

5.3.2 Recommendations for practice ................................................... 66

5.4 Further research .............................................................................. 67

REFERENCES ....................................................................................... 68

APPENDICES .......................................................................................... 75

Appendix I: Kenyatta University Ethical Clearance ............................. 75

Appendix II: NACOSTI Permit ............................................................... 76

Appendix III: Kiambu County Commissioner Research Authorization .... 77

Appendix IV: Kiambu County Coordinator of Health Research Authorization 78

Appendix V: Structured Questionnaire ................................................ 79

Appendix VI: Key Informant Interview Guide ...................................... 84

Appendix VII: Focused Group Discussion Guide .................................. 85

Appendix VIII: Map of the Study Area ................................................ 86
List of Tables

Table 3.1: Sample size determination per strata ......................................................... 30
Table 4.1: Socio-demographic characteristics ................................................................. 40
Table 4.2: Socio-demographic determinants of health facility consultation ................. 44
Table 4.3: Household factors as determinants of health facility consultation ............... 46
Table 4.4: Knowledge of pneumonia as a determinant of health facility consultation 50
Table 4.5: Health facility factors as determinants of health facility consultation ....... 53
Table 4.6: Independent determinants of health facility consultation ............................. 55
List of Figures

Figure 1.1: Conceptual frame work................................................................. 10

Figure 4.1: Timing of health facility consultation......................................... 41
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>ALRI</td>
<td>Acute Lower Respiratory Infection</td>
</tr>
<tr>
<td>ARI</td>
<td>Acute Respiratory Infection</td>
</tr>
<tr>
<td>AURI</td>
<td>Acute Upper Respiratory Infection</td>
</tr>
<tr>
<td>CBI</td>
<td>Community Based Intervention</td>
</tr>
<tr>
<td>CHW</td>
<td>Community Health Worker</td>
</tr>
<tr>
<td>CU</td>
<td>Community Unit</td>
</tr>
<tr>
<td>CUFY</td>
<td>Children Under Five Years</td>
</tr>
<tr>
<td>FGD</td>
<td>Focused Group Discussion</td>
</tr>
<tr>
<td>HCW</td>
<td>Health Care Worker</td>
</tr>
<tr>
<td>GAPPD</td>
<td>Global Action Plan for Pneumonia and Diarrhoea</td>
</tr>
<tr>
<td>GHO</td>
<td>Global Health Observatory</td>
</tr>
<tr>
<td>iCCM</td>
<td>Integrated Community Case Management</td>
</tr>
<tr>
<td>ICCMp</td>
<td>Integrated Community Case Management for Pneumonia</td>
</tr>
<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
</tr>
<tr>
<td>IHME</td>
<td>Institute for Health Metrics and Evaluation</td>
</tr>
<tr>
<td>IMR</td>
<td>Infant Mortality Rate</td>
</tr>
<tr>
<td>KDH</td>
<td>Kiambu District Hospital</td>
</tr>
<tr>
<td>KDHS</td>
<td>Kenya Demographic Health Survey</td>
</tr>
<tr>
<td>KII</td>
<td>Key Informant Interview</td>
</tr>
<tr>
<td>KNBS</td>
<td>Kenya National Bureau of Statistics</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MICS</td>
<td>Multiple Indicator Cluster Survey</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>NACOSTI</td>
<td>National Council for Science, Technology and Innovation</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nation International Children Emergency Fund</td>
</tr>
<tr>
<td>U5MR</td>
<td>Under-five Mortality Rate</td>
</tr>
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<td>WHO</td>
<td>World Health Organization</td>
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Operational definition of terminologies

Acute respiratory infection (ARI) – Defined as a respiratory infection occurring for < 2 weeks and is characterized by a symptom of cough accompanied by difficult breathing and/or short, rapid breathing that is chest-related. It will be considered as a proxy for pneumonia in this study.

Caretaker - Someone who is responsible for the care of someone who is unable to take care of him/herself fully may be due to age or sickness. In this study, this term will be used to refer to home caretaker (parents, guardians or relatives).

Community health worker– A lay member of the community where he/sheworks, is answerable to the community for his/her activities, is supported by the health system to perform some health intervention activities, but have lower level training than professional health workers.

Cost of health care - This was termed to be high or low based on the household daily income. Majority of the community members earned an average of 150 – 200 Kenya shillings per day.

1. High cost – Having used more than 200 Kenya shillings for health care at the health facility.

2. Low cost - Having used less than 200 Kenya shillings for health care at the health facility.

CUFY – This will stand for children less than five years or children less than 59 months.

Health care worker– Person who is professionally trained to provide preventive, curative, promotional or rehabilitative health care services in a systematic way to individuals, families or communities. These include nurses, doctors and clinical officers.
Health care seeking

1. **Appropriate care seeking** - This is where health care is sought from qualified medical professionals in government health facilities and private hospitals or clinics.

2. **Inappropriate care seeking** - This includes care seeking from other types of care such as purchasing medicines from a pharmacy, home remedies, religious or faith healing and traditional healers.

**Health facility** – Any location where health care is provided. These facilities include private clinics, dispensaries, health centers and hospitals.

**Integrated community case management** - A health service delivery approach in which trained medical personnel, often community health workers, provide basic diagnostic and treatment services for a subset of common childhood illnesses at the community level. These health workers are trained to determine whether vague symptoms, such as fever, are due to pneumonia, diarrheal diseases, or malaria, and then treat the ailment accordingly.

**Level of knowledge** – This was described at two levels, at an individual question and at an overall score level as outlined below:

1. **Good knowledge** – refers to getting ≥ 50% of the total marks in each question.

2. **Poor knowledge** – refers to getting < 50% of the total marks in each question.

3. **Overall score level of knowledge:** This was generated by adding together all the correct responses for the questions asked. A score of 0-6 was termed as poor knowledge, a score of 7-12 as fair knowledge and a score of 12-17 as good knowledge.
Rapid/fast breathing or high respiratory rate – Respiratory rate above IMCI recommended cut-offs for age: 2-12 months > 50 breaths per minute, and 13-59 months > 40 breaths per minute

Timing of health facility consultation – This was defined as the amount of time taken by the caretaker to seek health facility care after recognition of signs and symptoms

1. Delayed health facility consultation – Health facility consultation after more than 24 hours of signs and symptom recognition

2. Prompt health facility consultation – Health facility consultation within the 24 hours of signs and symptoms recognition
Abstract

There were an estimated 5.9 million deaths among children under five years in 2015, with infectious diseases accounting for almost half (51.8%) of these deaths. Pneumonia was the leading cause of infectious deaths, with 60% cases concentrated in 10 countries in Sub-Saharan Africa and South Asia. In 2014, pneumonia was the leading cause of death among children under five years in Kenya. Kenya is one of the countries that have not yet adopted community management of pneumonia as recommended by UNICEF/WHO in 2013. As such, management of pneumonia cases remains health facility based. Much delay however, has been observed by caregivers in seeking care at the health facilities. This study sought to establish the determinants of health facility consultation among caretakers of children under five years of age with ARI. This was an analytical cross-sectional study carried out in Githunguri Sub-County from November to December 2014. A total of 323 mothers of children under five were included in the study. Simple random sampling was used to select the study participants. The dependent variable was “timing of health facility consultation for ARI”. Structured questionnaires were used to collect data on socio-demographic and household factors, pneumonia knowledge and facility factors. Focused Group Discussions and Key Informant Interview guide were used to collect qualitative data. Informed consent was sought from the study participants. Data was analyzed using Statistical package for social sciences (SPSS) software version 20. Univariate, bivariate and multivariate analysis was done to show frequency distributions and associations between variables. The prevalence of ARI in Githunguri Sub-County among children under five years was 240 (74.3%). More than half 149 (62.1%) delayed consulting a health facility for ARI. Caretakers delayed seeking care for their female child than their male child (p = 0.036). There was more delayed facility consultation for ARI when fathers made on care seeking compared to mothers (p = 0.016). Poor knowledge of pneumonia symptoms was associated with delayed health facility consultation (p = 0.007). Facility factors that influenced health facility consultation were, high cost of care in the previous facility visit (p = 0.011) and long waiting time before assistance at the health facility (p = 0.023). On logistic regression, the strongest determinant of “health facility consultation for ARI” was having waited for >1 hour before service provision (delayed assistance) at the health facility (OR = 0.25; C.I (0.12-0.56); p = 0.001). In conclusion, delayed health facility consultation is rampant in this community, mainly due to perceived long waiting time before service provision at the health facility. The study therefore, recommends need to devise strategies to improve efficiency of services at all tiers of health care by the Ministry of Health. In addition, there is need for health education on recognition of pneumonia symptoms and on prompt appropriate care seeking to caretakers by the County health officers.
CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Acute respiratory infection (ARI) is grouped into acute upper respiratory infection (AURI) and acute lower respiratory infection (ALRI) like pneumonia and bronchitis. ALRI, especially pneumonia, is responsible for a high number of morbidity and among children under five years of age (CUFY). For purpose of this study ARI will be used as a proxy for pneumonia. Pneumonia is an acute lung infection, where they become inflamed and congested, reducing oxygen exchange and often leading to cough and breathlessness. Globally, 5.9 million CUFY died in 2015, which translates to nearly 16,000 deaths every day (WHO, 2015). About 3.3 million (51.8%) of these deaths were due to infectious diseases, with pneumonia accounting for 14.9% of these deaths (Liu et al., 2015).

Regional differences have been observed in causes of CUFY morbidity for pneumonia. South East Asia accounted for the highest incidence rate of clinical pneumonia (0.36 episodes per child-year), followed by Africa region with 0.33 episodes per child-year and the Eastern Mediterranean with 0.28 episodes per child-year. The other three regions, Western Pacific, the Americas and European region respectively accounted for 0.26, 0.22 and 0.06 episodes per child-year of clinical pneumonia (Rudan, Boschi-Pinto, Biloglav, Mulholland, & Campbell, 2008). According to a report by Black et al., (2010), most global deaths due to pneumonia were concentrated in Sub-Saharan Africa and South Asia, especially in India, Nigeria, Pakistan, Democratic Republic of the Congo, Ethiopia, Indonesia,
China, Tanzania, Afghanistan, and Kenya. These 10 countries are responsible for 60% of pneumonia deaths among children under-five years.

According to the 2013 Economic Survey, pneumonia was the leading killer disease in Kenya among CUFY. Among strategies adopted to reduce pneumonia mortality, WHO through Global Alliance of Vaccine and Immunization recommended introduction of pneumococcal vaccine in developing countries. While this had impact on morbidity and mortality, reduction of mortality among CUFY due to pneumonia has been slow (58%) compared to the other diseases like measles (which had an 83% drop) and diarrhea (with a 68% decline) (IHME, 2014).

Moreover, according to the Global Action Plan for Prevention and Control of Pneumonia and Diarrhea; (GAPPD, 2014) progress report on pneumonia intervention coverage, Kenya had achieved a 66% coverage score against the recommended coverage score of 86%. Pre-hospital care plays a vital role in pneumonia survival. Community based interventions (CBI) on children presenting with ARI averts pneumonia deaths. This strategy was adopted by most developing countries especially those from Sub-Saharan Africa, but its implementation in these countries remains low (GHO, 2015).

According to WHO and UNICEF joint statement on integrated Community Case Management (iCCM), survival of pneumonia depends on three essential steps. These steps entail timely recognition of signs and symptoms, prompt and appropriate care seeking and timely provision of a full course of antibiotic treatment. Caretakers play an important role, especially in recognition of symptoms and appropriate care
seeking. None the less, only 1 of every 5 caretakers in developing country is aware of the two foremost pneumonia symptoms which are, fast breathing and difficult breathing (Young, Wolfheim, Marsh, & Hammamy, 2012).

Appropriate care seeking for childhood pneumonia has been low. Globally, only 58% of those children who had pneumonia/ARI symptoms were taken to a health care provider in 2014. This was much lower in developing countries, where only 47% sought appropriate care (GHO, 2015). However, according to KDHS(2014)66% children under five years, who had ARI symptoms, were taken to an appropriate health care provider. As such, to avert pneumonia deaths, care seeking must not only be appropriate but also prompt. Timely care seeking from an appropriate provider helps in reducing disease morbidity and the risk of mortality. Health care seeking may be influenced by various factors ranging from individual factors, social factors and service based factors. This study aimed at identifying factors that determined health facility consultation for ARI.

1.2 Statement of the Problem

Appropriate and prompt health care seeking is essential in management of ARI. Delays in treatment of this condition may lead to its complication and eventually death. In Kenya, under-five mortality rate (U5MR) and infant mortality rate (IMR) stands at 52 deaths per 1,000 and 39 deaths per 1,000 respectively (KDHS, 2014). This posed a great threat in achieving the Millennium Development Goals (MDG) target of 33 deaths per 1,000 and 26 deaths per 1,000 for U5MR and IMR respectively by 2015. Most developing countries (Kenya included) had not achieved these targets by 2015. In order to achieve the Sustainable Development Goal number three (SDG 3)
target on reduction of U5MR to at least as low as 25 deaths per 1000 live births by 2030, major causes (infectious diseases; 51.8%) of this mortalities must be addressed. Pneumonia was the leading cause of these deaths amounting to a total of 17%. Anecdotal reports from Kiambu County have shown an increased trend in pneumonia morbidity. In 2015, 14.2% CUFY were reported to have had pneumonia compared to 1.2% in 2014, in Kiambu County. Similarly, in Githunguri (one of the Sub – County in Kiambu County), in 2015, 5.9% CUFY had pneumonia compared to 3.9% in 2014 (Kiambu County Health Records, 2015).

Reported data from Githunguri Sub – County have shown that caretakerstake time before seeking care. Majority of the caregivers seek health facility care as the last resort (Githunguri Sub – County Health Records, 2015). Caretakers engage in a myriad of interventions after recognition of symptoms. These range from use of home remedies to purchase of over – the – counter drugs, and only opt to visit the health facility when the condition worsens. This delays appropriate care provision and result in increased disease morbidity and increased risk of mortality.

Moreover, despite the large (20,200) population of CUFY in Githunguri Sub – County, there is no nearby level – 4 care hospital. As such, most parents seek care at Kiambu District Hospital (KDH). Moreover, due to lack of an admission facility for pediatric cases in Githunguri Sub - County, children with severe cases of the disease are referred to KDH for further management. Anecdotal reports from KDH have shown an increase in pneumonia deaths. In 2014, 204 out of 1,083 (18.8%) CUFY admitted with pneumonia died, compared to 159 out of 1,967 (8.08%) in 2012. This trend shows an increase in pneumonia mortality which is higher than the National mortality
of 17% (KDHS, 2014). Most of these deaths at KDH were due to Community Acquired Pneumonia (CAP), most being referrals from lower level facilities in Githunguri Sub - County.

1.3 Justification of the study

Pneumonia is a severe form of ARI. It is both treatable and curable, yet, for so long it has been the leading cause of mortality among CUFY. With effective antibiotics treatment for pneumonia, timely recognition of signs and symptoms and prompt care seeking at the health facility, deaths due to pneumonia could be averted. Close to one million of lives could be saved if both pneumonia prevention and treatment interventions were promptly delivered (GHO, 2015).

In Kenya, management of pneumonia remains health facility based to date. Facility management approach has its inherent shortcomings and assumptions. It assumes that caretakers should be able to recognize signs and symptoms of pneumonia. Secondly, they should go out to a facility that offers care. Both assumptions have not been assessed comprehensively. Moreover, use of alternative remedies remains a common practice in most communities. These range from traditional and spiritual healers to purchase of over - the - counter drugs, all of which contribute to delayed care seeking at the health facilities.

1.4 Research questions

1. What is the prevalence of ARI among CUFY in the Githunguri Sub-County?
2. What is the timing of “health facility consultation for ARI” among CUFY?
3. What socio-demographic and household factors determine “health facility consultation for ARI” among CUFY?
4. Does level of pneumonia knowledge among caretakers of CUFY influence “health facility consultation for ARI” in Githunguri Sub - County?

5. What facility factors influence “health facility consultation for ARI” among CUFY?

1.5 Hypothesis

1.5.1 Null and alternative hypotheses

The study was guided by the following hypotheses:

1. Ho: “Timing of health facility consultation for ARI” is not determined by socio-demographic factors; child’s age, child’s sex, caretaker’s age, marital status, religion, education level, source of household income.

   Ha: “Timing of health facility consultation for ARI” is determined by socio-demographic factors; child’s age, child’s sex, caretaker’s age, marital status, religion, education level, source of household income

2. Ho: “Timing of health facility consultation for ARI” is not determined by household factors; key decision maker, family practices, caretaker’s perceptions, person responsible for paying household expenses.

   Ha: “Timing of health facility consultation for ARI” is determined by household factors; key decision maker, family practices, preferred source of care, caretaker’s perceptions, person responsible for paying household expenses.

3. Ho: “Timing of health facility consultation for ARI” is not determined by caretaker’s level of knowledge on pneumonia; causation, risk factors, signs and symptoms, prevention.
Ha: “Timing of health facility consultation for ARI” is determined by caretaker’s level of knowledge on pneumonia; causation, risk factors, signs and symptoms, prevention.

4. Ho: “Timing of health facility consultation for ARI” is not determined by health facility factors; distance to the health facility, previous costs at the facility, time taken before service provision at the previous facility consultation, previous experience.

Ha: “Timing of health facility consultation for ARI” is influenced by health facility factors; distance to the health facility, previous costs at the facility, time taken before service provision at the previous facility consultation, previous experience.

1.6 Objectives

1.6.1 Broad objective

To establish the determinants of “health facility consultation for ARI” among children under five years of age in Githunguri Sub–County

1.6.2 Specific objectives

i. To determine the prevalence of ARI among CUFY in Githunguri Sub-County.

ii. To determine the timing of “health facility consultation for ARI” among CUFY in Githunguri Sub-County.

iii. To establish the socio-demographic and household factors those determine “health facility consultation for ARI” among CUFY.

iv. To determine how caretakers’ level of pneumonia knowledge influence “health facility consultation for ARI” among CUFY.
v. To determine facility factors that influence “health facility consultation for ARI” among CUFY.

1.7 Significance of the study

Findings from this study will inform the Ministry of Health (MOH) at the national level, and the County Government through the County Health Officers on key interventions needed to improve prompt health facility seeking behavior, and therefore reduce the risk of increased pneumonia morbidity and mortality. The study findings will also assist in understanding the level of knowledge caretakers have on pneumonia. This will inform County Health Officers in developing health education programs based on the gaps identified.

1.8 Delimitation and limitation of the study

1.8.1 Delimitation

There had not been a similar study in the Githunguri Sub – County to identify the determinants of health facility consultation for ARI among CUFY. This kind of study assisted in identification of factors that were associated with delay or prompt health facility consultation for ARI. In addition, this study also helped in determination of ARI prevalence in the area and the timing of health facility consultation for the same.

1.8.2 Limitation

The study was carried out in short period of time and observations made as they naturally occurred in a population. This means caretakers whose children did not experience the desired symptoms at the time of the study did not get a chance to participate in the study. In addition, the study depended on the caretaker to report how long it took to seek care of the child after recognition of symptoms. This posed a
threat of recall bias. Moreover, it was assumed that the caretaker was able to recognize the symptoms of ARI which was not the case for all the study participants.

1.9 Conceptual framework

The conceptual framework was adopted from the Health Belief Model (Rosenstock et al., 1994). Several factors influence decision on health care seeking at the health facility. From this model, it has been hypothesized that, socio-demographic characteristics, household factors, caretaker’s pneumonia knowledge and health facility factors influence timing of health facility consultation. These factors are also shown to be interrelated. Socio-demographic factors like education level, age, source of income, religion and marital status are assumed to influence family practices, perceptions and decision making on health care seeking. Education level and age of the caretaker is hypothesized to be associated with caretaker’s knowledge of pneumonia. Caretaker’s religion is presumed to be associated with caretaker’s perception of the disease and family practices when one gets sick. Source of income and marital status is also hypothesized to influence decision for seeking health care, family practices and responsibility on catering for health care expenses. Family perceptions, practices and decision making on care seeking may be influenced by caretaker’s knowledge of pneumonia. A diagrammatic presentation of how these factors are interrelated is shown in Figure 1.1.
Source: Modified from Health Belief Model by Rosenstock, Strecher, & Becker (1988)

Figure 1.1: Conceptual frame work
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature on factors that had been shown to influence health care seeking for ARI among CUFY. A review on previous studies carried out to determine prevalence of ARI was undertaken. A review on health care seeking and factors influencing health care seeking was also discussed in this chapter. The main emphasis was on factors like: socio-demographic factors, socio-cultural and household factors, family practices, caretaker knowledge and perceptions on pneumonia, and health facility factors.

2.2 Prevalence of acute respiratory infection and health care seeking

Prevalence is defined as the frequency of existing cases of a disease in a population at a given point in time. Prevalence is used to estimate the probability of the population being ill at a given period of time. Various studies have been carried out to establish the prevalence and care seeking for ARI. Few studies however, investigate length of time caregivers take after recognition of signs and symptoms, to seek health facility services. The following paragraphs will present a review of literature for these studies.

In a study carried out in Albania, Europe, with the aim to assess mothers’ care seeking practices during childhood illnesses revealed that, 11.2% of the children had ARI symptoms 2 weeks prior the study. Most (64%) of the children were taken to a health facility for treatment. However, out of those who sought health care advise, 59.6% delayed seeking care for > than 2 days. Reason for this delay was due to use of unconventional medicines (Doracaj, Grabocka, Hallkaj, & Vyshka, 2015).
In Pakistan a study conducted to assess interventions taken when a child develops pneumonia revealed that, mothers delayed seeking care after recognition of signs and symptoms. Most (50.9%) mothers delayed up to 2 days before seeking health facility services, 33.9% of this delayed for up to 3 days and 13.7% of mothers delayed for even five days. Most of these delays were due to use of home remedies for pneumonia in their children (Memon, Shaikh, Pandhiani, & Usman, 2013).

In another study carried out in Sierra Leone, to determine health care seeking for common childhood illnesses, 16.9% had presumed pneumonia (ARI) 2 weeks prior the study. Majority (90%) sought care for presumed pneumonia outside home. Among these 75% were taken to a public health facility and the remaining were taken to other health facilities. However, 36.5% of those children who had presumed pneumonia did not receive the recommended treatment (Diaz et al., 2013).

In a similar study carried out in Nigeria, to assess caregivers’ health seeking behaviors and treatment options for childhood illnesses, out of 197 households, 32 (16.2%) children had ARI 2 weeks prior the study. Among these, most 14 (43.8%) visited a health center as the first choice of care, followed by 7 (22%) who sought care in patent medical stores (Bagbi, Obieche, & Enato, 2014).

In another study carried out in Southern Ethiopia, to assess status of healthcare seeking behavior of caregivers for childhood illnesses and associated factors revealed that, 66.5% of the children had symptoms of ARI two weeks prior the study. Most (55.8%) of the care takers took three days to seek care for their children at the health facility (Demissie et al., 2014). A similar study carried out in Ethiopia to investigate factors related to the help-seeking behavior of mothers for children with ARI,
revealed that, 773 (7%) out of 11,030 children had ARI symptoms 2 weeks before the study. Of these, 209 (27.2%) sought care at the health facility (Astale & Chenault, 2015).

Further, in a study carried out in Uganda to determine cause of death and care seeking for fatal pneumonia, most of those children who died from pneumonia were taken to the health facility after 2 days of symptoms recognition. Out of 44 children who died due to suspected pneumonia, 31 (70%) had been treated with drugs at home. Of these, 12 (27%) had reportedly been given antibiotics and 23 (52%) an antimalarial drug. Twenty five percent had received both antibiotics and antimalarial. This study revealed that delayed care seeking for suspected pneumonia ensued to increased mortality (Källander et al., 2008).

In Kenya, according to Multiple Indicator Cluster Survey (MICS) reports for Nyanza (2011) and Marsabit (2008) in both study areas, 9% of children who were under five years were reported to have had ARI symptoms during the two weeks preceding the survey. In Marsabit, 45% of those children who had ARI were taken to an appropriate health service provider. Out of these, 30% were taken to a government facility or service was provided by a government health worker (KNBS, 2009). On the other hand, in Nyanza, 51% of those who had ARI two weeks preceding the study were taken to an appropriate provider mostly from government dispensaries and health centers (KNBS, 2013).

According to Kenya Demographic Health Survey (KDHS) the prevalence of ARI among children under five years in 2014 was 65.9 % with central province having
70.3% prevalence. With regards to health care seeking, 66% of these children were taken to a health care provider. There is no study yet in Kenya that has been carried out to investigate the length of time taken by caretakers to consult health facility services after recognition of ARI symptoms.

It is evident from these studies that caregivers/mothers sought appropriate care for ARI. However, in most of these studies, mothers sought health care 2 days after recognition of symptoms. This shows a pattern of delayed health care consultation which can be detrimental to the child health.

2.3 Socio-demographic factors influencing care seeking

Various studies have shown associations between socio-demographic factors and care seeking. Findings from a study conducted in Pakistan to establish health care seeking patterns for childhood illnesses revealed that, mother’s educational status was strongly associated with type of provider sought for childhood illness ($p = 0.001$). In addition, family income and socio-economic status of the household were also associated with health care seeking (Rehman, Shaikh, & Ronis, 2014). Another study carried out in Pakistan showed that caretakers with high education status, those living in joint families and those with high parity were significantly associated with identification of pneumonia symptoms and prompt care seeking ($P = 0.04, P = 0.05$ and $P = 0.02$ respectively) (Memon et al., 2013). Similarly, in another study carried out in Sub–Saharan Africa, it revealed that caregivers’ with high education level and those from high wealth quintiles were more likely to seek appropriate care for their children (Noordam, Carvajal-Velez, Sharkey, Young, & Cals, 2015).
Similarly, in another study carried out in Ethiopia to establish healthcare-seeking behavior for ARI, it revealed that children from the two highest economic quintiles were 35 to 39% more likely to seek care immediately as compared with households in lower economic quintiles. In addition, household heads with informal education were 1.6 times more likely to take their children to a health facility compared with household heads with no education households. This study also found that households headed by orthodox Christians were 3.7 times more likely to seek modern care compared with Muslim-headed households (Mebratie et al., 2014).

In Kenya, a study conducted to determine healthcare-seeking behavior for childhood illnesses revealed that, children from households with higher socioeconomic status were more likely to be taken to a health facility or to be taken to a hospital than those from low socio-economic status (Burton et al., 2011). Moreover, in another study carried out in Nandi County, it was shown that, mothers with higher levels of education were more likely to seek immediate health facility care compared to those with lower levels of education (Keter, Mbakaya, Gikunju, & Mutai, 2015).

2.4 Socio-cultural and household factors influencing care seeking

Socio-cultural factors have been shown to play an important role in care seeking. Culturally, most household heads are men. This makes them the key decision makers concerning issues in the household by default. The following paragraphs present a review on decision making in regards to care seeking for childhood illnesses. In a study conducted in Yemen to find out factors that affect health seeking for common childhood illnesses showed that both parents made the decision to seek medical care
for 35% of the children. Mothers solely made decision on care seeking for only 29% of the children (Webair & Bin-Gouth, 2013).

Similarly, a systematic review carried out by Colvin et al., (2013), to provide understanding of care seeking for childhood illness in Sub-Saharan Africa revealed that, in more than 75% of the studies, women were the primary caregivers in many cultural setting. However, in nearly all the studies, men were the key decision makers especially on health care seeking outside home. When fathers were not available, women sought permission from the in-laws or other members of the extended family.

On the contrary, in a qualitative study carried out in Niger to identify local barriers on care seeking and treatment for pneumonia, it revealed that mothers were the key decision makers on care seeking and also the primary care givers. Nevertheless, mothers had to consult with the child’s father first, for financial support and permission to seek care outside home. As a result, mothers made herbal medicines or bought medicines from the informal vendors (shops, bicycle chemists or traders) before seeking hospital care. Further, fathers were more supportive in seeking hospital care for the child, especially when the care was free (Bedford, 2012).

Another multicenter study carried out to establish the local barriers and solutions to improve care-seeking for childhood pneumonia in Kenya, Nigeria and Niger found socio-cultural factors to influence hospital care seeking (2014). In Niger, respondents reiterated that, even though women were restricted to move from their home area, this did not hinder them from seeking care in the health facility, since male household heads regularly allowed them to. Nonetheless, it was noted that fathers at times
exhibited minute responsibility for their child’s health because socially and culturally, mother were the primary caregiver. In Kenya, gender-related barriers were identified to influence care seeking behaviors. Mothers felt there was need for them to be empowered both socially and economically to enable them make solid and immediate decisions on care seeking (Bedford & Sharkey, 2014).

2.5 Family practices influencing care seeking

Varied interventions take place at home when an illness emerges. These interventions are of paramount importance in determination of the disease outcome. In a study carried out in Pakistan, 94.4% of mothers used two or more home remedies before seeking care for pneumonia. Honey (82.4%), green tea (44.7%) and vicks (menthol) massage (43.2%) were the commonest home remedies used. The study found out that 50.9% sought hospital care after 2 days, 33.9% delayed up to 3 days and 13.7% delayed up to 5 days before seeking hospital care for pneumonia in children, as they waited to see if the home remedies would work (Memon et al., 2013).

In another study carried out in South West Nigeria to establish pre-hospital care seeking behavior for childhood ARI, it revealed that out of 226 mothers who were interviewed, 75% of them had given their children medication at home. 16.5% of the children received drugs within 24 hour of symptom recognition. Majority (70.6%) reiterated that they regularly sought health care at the local drug shops or chemist, while 46.6% of mothers opted to use home treatment first, while 14.4% waited for symptoms to subside (Ukwaja, Talabi, & Aina, 2012).
From a study conducted in Uganda to find out causes of delayed care seeking for fatal pneumonia, it showed that majority of mothers waited for at least 2 days after recognition of ARI symptoms, to seek care at the hospital. Mothers opted to buy antibiotics from drug shops or use already available home stock or sourced from the neighbors whose children had cough, fever and or difficult or rapid breathing (Källander et al., 2008).

2.6 Caregivers’ knowledge and perceptions influencing care seeking

Caregivers’ knowledge and perceptions on signs, symptoms, risk factors and prevention is deemed crucial in appropriate care seeking for ARI. Despite pneumonia being the leading cause of under-fives deaths globally, lots of disparities have been shown from previous studies on caregiver knowledge and perception of pneumonia. Cold is continually mentioned as the cause of pneumonia and keeping off from cold as a way of preventing pneumonia. This affects timing of the health facility consultation, as caregivers keep their children warm, when they develop cough and only visit the health facility if the condition worsens.

An Indonesian study seeking to examine caregivers’ perceptions and knowledge on pneumonia showed that, mothers were able to recognize difficult and rapid breathing as signs of pneumonia. However, mothers sought prompt care if these symptoms were accompanied with high body temperature (fever). In addition, appropriate and effective medical care for difficult or rapid breathing in infants was more likely to be delayed, than in older children. This was due to a community perception that infants should not be given medicines; instead their mothers should get treated and deliver the medication to their children through breast milk. This, therefore, increased the
chances of the mother to seek unconventional treatment before seeking hospital care(Kresno, Harrison, Sutrisna, &Reingold, 2010).

A similar study carried out in Nigeria to establish level of mother’s knowledge on childhood pneumonia showed that about 50% were able to correctly identify fast or difficult breathing as a symptom of pneumonia. However, 75% listed cold as a cause of childhood pneumonia. Furthermore, 75.8% and 49.5% of the mothers respectively said reducing exposure to cold and wearing warm clothes were the two commonest way of preventing pneumonia(Ekure et al., 2013).

A similar study carried out in Baringo District, Kenya revealed that, 18% mothers described pneumonia sufficiently well, 10% described it as difficulty in breathing, 5% as increased respiratory rate and 3% cough. Mothers sought immediate care more when they were able to recognize difficulty in breathing, than a mere cough. With regards to pneumonia causation, 87.5% mentioned cold weather as the main cause and therefore reported that the most effective way to prevent pneumonia was to evade cold condition(Simiyu, Wafula, &Nduati, 2003).

2.7 Health facility factors influencing care seeking

Cost of care, facility delays in care provision, and distance to the health facility have been shown to influence care seeking. A study done in Australia revealed that, distance from the care provider, availability and accessibility of the care provider, and past experience with a given provider influenced timing of care seeking. In this study, households delayed in seeking appropriate care due to the following factors. This was
due to financial constraints, long distances from a health provider, and delays in care provision at the health facility (Najnin, Bennett, & Luby, 2011).

A similar study carried out in Nicaragua, Central America, revealed that >58% of mothers were satisfied with medical care services provided. However, facility costs (46.6%), distance (25.8%), long waiting time while at the health facilities (44.1%) and past experiences (25.4%) were sources of dissatisfaction with medical services. These factors were therefore statistically associated with timing of health care seeking (p = 0.003) (Sakisaka, Jimba, & Hanada, 2010).

Similarly, a study carried out in Philippines to establish factors influencing healthcare utilization showed that, caregivers visited health care facilities when the cost of care was low (47.5%), when they had available and accessible transportation (29.6%) and when they perceived good quality of care (16.5%). High cost of care led to delays or failure to seek health care completely (Kim, Capeding, & Kilgore, 2014).

Further, a qualitative study done at Southeast Asia that aimed to understand factors that shaped households health care seeking for fatal illnesses revealed that, high cost of care, long distances and delays in service provision were associated with delayed health care seeking. Almost 50% of the care givers reported that they preferred using alternative medicines than formal health care due to costs incurred in the formal health care facilities. This study also revealed that those caregivers' who experienced health service provision delays were majorly due to health care workers absenteeism on arrival at the health facility, or due to low capacity of health care workers to attend to emergency cases. In addition, caregivers reported that distance to the nearest health
care facility contributed to delay hospital seeking. The revealed that caregivers delayed in seeking care due to long working distance to the health facility while carrying their child (Alvesson, Lindelow, Khanthaphat, &Laflamme, 2012).

From a qualitative study undertaken in Niger to identify local barriers on care seeking and treatment for diarrhea, malaria and pneumonia, it showed that financial constraint was one of the major barriers to health care access. Most mothers reported that, though hospital care was free, additional costs were incurred at purchase of the medications and paying for transportation. Most depended on the child’s father to finance this, while a few reported to have spent their own money. This study also revealed that, long distances and poor transport system, contributed to further delays as mothers waited till day break to access a health facility. Moreover, lack of necessary equipments for diagnosis and poor infrastructure were also mentioned as barriers of immediate hospital seeking (Bedford, 2012).

A South African study seeking to assess differences in health care seeking behavior between rural and urban communities revealed that, transport and or distance barriers to health care facilities, financial constraints, and poor service provision were common barriers. Service related problems included, lack of available medication, few staff, lack of facilities (including equipment) and long waiting time. These factors contributed to delayed care seeking (Van der Hoeven, Kruger, &Greeff, 2012).

In yet another South African study seeking to examine factors influencing healthcare-seeking for childhood illnesses among under resourced communities revealed that, poor service provision by health workers, accessibility and availability of services
influenced healthcare-seeking decisions among caregiver’s of children under-five years. Despite South African public-health services being free, findings from this study showed that poor families faced other financial constraints (like transportation to the health facilities) which impacted on timing of health care access (Sharkey, Chopra, Jackson, Winch, &Minkovitz, 2011).

An earlier study aimed to understand factors influencing delays in appropriate care seeking for pneumonia in Kenya, showed financial constraints and geographical barriers to contribute to health care delays. Though health care for children under five years is free in all government health facilities in Kenya, high cost of care was incurred as caregivers had to buy medications elsewhere (Irimu, Nduati, Wafula, &Lenja, 2008). Moreover, a qualitative study done in Homa Bay County had sought to identify local barriers on care seeking and treatment for diarrhea, malaria and pneumonia. Findings from this study revealed that lack of finances hindered immediate care seeking. Moreover, poor access and long distance to the nearest health facility were associated with delayed care seeking. Long queues or delays at the health facility, lack of consistent available medications and poor communication by health care workers influenced care seeking (Bedford & Sharkey, 2014).

### 2.8 Summary of literature review

A literature review was undertaken to identify prevalence of ARI, timing of health facility consultation and factors associated with care seeking for ARI. Prevalence of ARI was low in most of the studies. This can be attributed to the large sample size in these studies. In these studies, signs and symptoms of ARI were used to represent pneumonia at the community level. Therefore an ARI or presumed pneumonia
symptom was used synonymously. Moreover, these studies focused on the three common childhood illnesses at a go (Diarrhea, malaria and pneumonia). As such symptom overlap was evident. For instance, a study carried out in Sierra Leone revealed that 94% and 84% of children with presumed pneumonia and diarrhea had fever respectively. Twenty three percent (23%) who had diarrhea were diagnosed with presumed pneumonia (Diaz et al., 2013).

No study has been carried out in Kenya to estimate the length of time taken by caretakers/mothers to consult health facility care for ARI among CUFY after recognition of symptoms. Nevertheless, in other countries, mothers/caretakers delayed seeking health facility care for ARI. Most took > 2 days to seek care. The common reason for this delay in most of these studies was use of home remedies and over the counter drugs. Majority of the study participants were mothers in most of the reviewed studies. This could be attributed to the belief that mothers are the primary caregivers for the sick in the family/community. This however, created a gap on how to handle children with other guardians other than their mothers. Among socio-demographic characteristics, education level, religion and marital status were shown to be associated with timing of health care seeking in most of the reviewed studies.

From the reviewed literature, fathers were shown to be the household heads and key decision makers in most cultural setting. However, mothers were primary caregivers and therefore posed to make decision regarding health facility care for CUFY. Mothers only consulted the child’s father for financial provision to seek health care for the child. This was shown to cause delay in care seeking as the mothers had to
wait for the child’s father to provide and cater for any forecasted health facility expenses.

In most of the reviewed studies mothers/caretakers had a knowledge gap on causes, risk factors, signs and symptoms and prevention of pneumonia. Mothers were able to identify cough and or difficult/fast breathing as a symptom of pneumonia. Nonetheless, majority attributed it to cold and believed that keeping the child warm would prevent pneumonia. Mothers/caretakers sought care more promptly when they had good knowledge on pneumonia.

Facility factors like cost of care (facility costs), distance to the health facility and facility delays (long waiting time before being assisted by a health care worker at the health facility) were shown to be associated with timing of health facility seeking. Though health facility services for CUFY is free in most countries as revealed in most of the reviewed studies, caretakers cited need to have money at hand before visiting a health facility. This was necessary as most of the facilities lacked the prescribed medications and mothers had to buy these medications in a chemist or a private pharmacy.
CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter specifies the materials and methods used in describing the determinants of “health facility consultation for ARI” among CUFY in Githunguri Sub-County. It gives a description of the study design, study area, sampling techniques and research instruments, data collection techniques and analysis used as well as the ethical considerations for the study.

3.2 Research design

An analytical cross-sectional study design was used to describe and identify the determinants of “health facility consultation for ARI” among CUFY. This kind of study is used to investigate an association between a presumed factor and a disease outcome. This study design was chosen because it enables one to observe, describe and document aspects of a situation as it naturally occurs in a given population, and then conduct investigations to determine how different factors interact to produce a given outcome. This was possible as both qualitative and quantitative data on the study variables was collected and analyzed to test how these variables are associated.

3.3 Measurement of study variables

3.3.1 Dependent variable

The dependent variable for this study was “timing of health facility consultation for ARI.” The timing of the health consultation was either delayed or prompt. Health facility consultation was said to be delayed, if the caretaker took more than 24 hours to seek care in a health facility after recognition of signs and symptoms. The opposite was termed as prompt health facility consultation.
3.3.2 Independent variables

The independent variables for this study included socio-demographic factors, household factors, knowledge on pneumonia and health facility factors. These are as listed below:

i. Socio-demographic characteristics which included; caretaker’s age, marital status, source of income, education level, religion, child’s age and sex.

ii. Household factors which included; family practices and perceptions, family gender roles and key decision maker on care seeking.

iii. Caretakers’ knowledge of pneumonia which included; knowledge on causation, signs and symptoms, risk factors and prevention.

iv. Health facility factors which included; distance to the nearest health facility, previous costs of care the health facility, facility delays in the previous facility consultation and past experience.

3.4 Location of the study

The study was carried out in Githunguri Sub-County located in Kiambu County. Githunguri is 1 of the 12 Sub – Counties in Kiambu County. The Sub-County covers approximately 173.50 km². In 2014, the Sub – County had a total population of 160,315 persons while the total number of CUFY was approximately 20,200 (GithunguriSub-County records, 2014).

Data was collected in the 3 divisions of Githunguri Sub - County namely; Githunguri, Ikinu and Komothai. These divisions had 4, 5 and 2 functional community units (CUs) respectively at the time of the study. The names were, Githunguri 1, Githunguri 2, Kimathi, Nyaga,Githiga, Matuguta, Gathangari, Kiababu, Ikinu, Kibichoii and Mbari - ya – Igi.
3.5 Study population

3.5.1 Target population

All children under five years of age were the target population for this study. However, since these children could not respond on their own; all caretakers of these children were also targeted. This formed a caretaker-child pair as the target population.

3.5.2 Sample population

The sample population for this study comprised of caretakers of CUFY living in Githunguri Sub–County.

3.6 Inclusion and exclusion criteria

3.6.1 Inclusion criteria

1. All consenting caretakers of CUFY from Githunguri Sub–County whose children had symptoms of ARI two weeks prior the study period
2. Caretakers of CUFY who live in Githunguri Sub-County

3.6.2 Exclusion criteria

1. Caretakers whose CUFY had a pre-existing diagnosed chronic condition were excluded. To identify this, caretakers were asked if the child was being treated for another medical condition that required them to attend clinic days. If they answered yes, this called for exclusion to the study.
3.7 Sample size and sampling techniques

3.7.1 Sample size

The sample size was calculated using a formula as determined by Fisher et al., (1998). This formula is normally used to calculate sample size for studies with a population of more than 10,000.

The calculation is as shown below:

\[ N = \frac{(z^2pqD)}{d^2}, \text{ where;} \]

- **N** - Desired sample size (for a population more than 10,000)
- **Z**\(^2\) - Standard normal deviation which is 1.96 at 95% level of confidence
- **P** - Proportion of population with the desired characteristic estimated at 0.70 based on prevalence of ARI in Central Province (KDHS, 2014).
- **Q** - The proportion of population without the desired characteristic. It was calculated as: \((1-p) = 1.00 - 0.70 = 0.30\)
- **D** - The design effect in this study it was (1) as the study was carried out in Githunguri Sub-County only.
- **d**\(^2\) - Level of significance at 95% confidence interval which is 0.05

\[ N = \frac{1.96^2 \times 0.70 \times 0.30 \times 1}{0.05^2} \]

\[ N = 322.6 \]

The desired sample size was 323.

3.7.2 Sampling techniques

Multistage sampling approach was adopted for this study. First Githunguri Sub-County was purposively chosen because of the reported rise in pneumonia morbidity and mortality, despite efforts to improve case management at the health facilities. In
2014, 204 out of 1,083 (18.8%) CUFY admitted with pneumonia, died compared to 159 out of 1,967 (8.08%) in 2012. Secondly, two levels of stratification were used. First, three strata by division were used. Then each division was stratified by community units. Finally, simple random sampling was done per community unit, using a sampling frame of CUFY generated by community health workers (CHWs). 5 CHWs were engaged as research assistants, 2 for CUs in Githunguri Division, the other 2 for CUs in Ikinu Division and 1 for CUs in Komothai division.

Each CHW developed a list of households which had a CUFY in every CU they were responsible for. From this list a central location was identified for each CU. Simple random sampling was used to select the starting point. The interviewer used a coin to determine which household to begin with. If the coin landed on face, the household on the left side was used as the starting point while the opposite meant one should begin with the household on the right side of the road. Then the interviewer proceeded to the next household on the list until the desired sample size was achieved for every CU.

Caretakers whose children had a symptom of cough and or difficulty or fast breathing two weeks prior the study was included for the study. If a listed household lacked a child who met this criterion, this child was excluded for the study. Households which had 2 or more CUFY who met the inclusion criteria for the study, only one of them was included. To ensure equal chance of selection, each child was assigned a number (1, 2 or 3 and so on), then these numbers were written on pieces of paper and folded. The caretaker was then asked to pick one piece of paper. The number picked represented the child to be included for the study.
Calculation of the desired sample size per division and respective CUs was done as shown below.

**Sample size per division** = (Population of CUFY in that division divided by Total population of CUFY in the sub county) X Calculated sample size for the study

Githunguri division = \((\frac{8080}{20200}) \times 323\) = 129

Ikinu division = \((\frac{7474}{20200}) \times 323\) = 123

Komothai division = \((\frac{4646}{20200}) \times 323\) = 74

**Sample size per community unit** = Calculated sample size per division divided by the number of CUs.

In Githunguri division (129/4) each CU had a sample size of 32 participants apart from Githunguri 1 that had 33 participants. In Ikinu division (120/5) each CU had a sample size of 24 participants. Finally in Komothai division (74/2) each CU had a sample size of 37 participants. A tabular presentation on sample size determination in the two strata is shown in Table 3.1

### Table 3.1: Sample size determination per strata

<table>
<thead>
<tr>
<th>Division</th>
<th>Population of CUFY</th>
<th>Proportion</th>
<th>Sample size per division</th>
<th>Community units</th>
<th>Sample size per CU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Githunguri</td>
<td>8080</td>
<td>0.40</td>
<td>129</td>
<td>Githunguri 1</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Githunguri 2</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kimathi</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nyaga</td>
<td>32</td>
</tr>
<tr>
<td>Ikinu</td>
<td>7474</td>
<td>0.37</td>
<td>120</td>
<td>Gathangari</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Matuguta</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ikinu</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kiababu</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Githiga</td>
<td>24</td>
</tr>
<tr>
<td>Komothai</td>
<td>4646</td>
<td>0.23</td>
<td>74</td>
<td>Kibicho1</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mbari-ya-igi</td>
<td>37</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20200</strong></td>
<td><strong>1.00</strong></td>
<td><strong>323</strong></td>
<td></td>
<td><strong>323</strong></td>
</tr>
</tbody>
</table>
3.8 Construction of research instruments

3.8.1 Quantitative data

A structured questionnaire (Appendix V) was used to collect quantitative data for this study. The questionnaire was sub-divided into 6 sections. The first section had questions on the socio-demographic characteristics like, age (computed in completed months) and sex of the child, caretaker’s age (computed in completed years), marital status, education level, religion and source of income. The source of income was grouped as either salaried (those with a monthly salaried income) or unsalaried (those who depended on one of the following as a source of income; casual labor, crop farming, animal husbandry and business).

The second section comprised questions that were used to establish prevalence of ARI. The third section consisted questions on the timing of health facility consultation. The question asked included evidence of seeking care at a health facility and the duration it took to seek care after recognition of symptoms of ARI. The fourth section consisted questions on household factors like family perceptions, practices and the key decision makers on care seeking.

The fifth section of the questionnaire contained questions on knowledge of pneumonia. These included questions on pneumonia causation, risk factors, signs and symptoms and prevention. The last section comprised of questions regarding health facility factors. This included questions like the distance to the nearest facility, about costs incurred and time taken before being assisted in the previous visit and any other past experiences at the health facility.
3.8.2 Qualitative data

Qualitative data was collected using Key Informant Interview (KII) guide (Appendix VI) and Focused Group Discussion (FGD) guide (Appendix VII). Data generated from these interviews was used to augment the quantitative data. The KII guide included questions on health facility factors such as availability of trained staff, availability of equipment and medications, incurred costs at the facility and timing of health consultation by caretakers. The FGD guide comprised questions regarding caretakers’ knowledge of pneumonia, decision makers for health facility care seeking and its effects on timing of health facility consultation, family or community practices and perceptions towards ARI.

3.9 Pre-testing

The data collection tool was pre-tested with caretakers of CUFY in Kiambu Sub-County, which has similar characteristics as those of Githunguri Sub-County. Caretakers were asked to make suggestions on the instructions given, clarity of questions and appropriateness. This exercise involved 32 participants (10% of the study sample size). The feedback given by the caretakers and the field work experience from the pre-test, assisted in modification of the questionnaires for the final study. More questions were added where more information was needed. Vague questions were rephrased to more understandable ones. This process ensured that the research instruments were reliable and measured what they were intended to measure.
3.10  **Validity and reliability**

3.10.1  **Validity**

Validity is the degree to which results obtained from data analysis actually represent the phenomenon under study. This means that, the data obtained in a study should accurately represent the variables of the study. Internal validity for this study was achieved by use of a standard research instrument (structured questionnaire). The questionnaires were pre-tested to ensure that the questions were clear and in line with the study variables. Moreover, research assistants were trained on data collection to ensure that correct questions regarding the study variable were asked. External validity was achieved by ensuring the sample population was randomly selected and it bears the same salient characteristics as the target population. Through this, generalization of results from this study was ensured.

3.10.2  **Reliability**

Reliability is the measure of the degree to which a research instrument yields consistent results or data after repeated trials. In order to achieve reliability of the study, the research instruments were pretested and structured in a way that, when used by the same or a different investigator the results would be the consistent. Secondly, in order to reduce interview bias, research assistants were identified and underwent an intensive training on the use of the study instrument prior to the research. Finally, the principal investigator checked on all the filled questionnaires upon receiving them from the research assistants to ensure that they were all filled and where anomalies were detected a call back was performed.
3.11 Data collection techniques

3.11.1 Quantitative data

Interviewer – administered structured questionnaires (Appendix V) were used to collect quantitative data from caretakers of CUFY in the 11 functional CUs of Githunguri Sub – County. A total of 323 caretakers of CUFY were interviewed. 5 CHWs were engaged as research assistants, 2 for CUs in Githunguri Division, the other 2 for CUs in Ikinu Division and 1 for CUs in Komothai division. The interviews were conducted in households with caretakers who had a child less than five years old who met the set criterion for inclusion (this is described under sampling techniques section). The CHWs were trained by the researcher on data collection skills and on ethics. The responses gathered from the interview were then recorded in the questionnaires for coding and analysis.

3.11.2 Qualitative data

Qualitative data was generated through interviews with the key informants and FGD with caretakers of CUFY. This qualitative data was used to augment the quantitative data obtained during interviews with caretakers. Eleven (11) health care workers (HCWs) were purposefully selected to act as the key informant for this study. This included 5 clinical officers and 6 nurses, each a representative of the 11 functional CUs. These were selected as they directly interacted with the caretakers in the consultation rooms at the hospital. A Key Informant Interview (KII) guide (Appendix VI) was used to collect qualitative data from these HCWs working in different levels of the health facility.
Three (3) FGDs were conducted with caretakers of CUFY, each a representative of the 3 divisions of Githunguri Sub – County. Caretakers who had not participated for the study earlier on were selected to participate in the FGDs. Each FGD comprised of 10 caretakers. Members were converged in a central place in each division for the discussion. A FGD guide (Appendix VII) was used during these discussions. The principal investigator acted as the session’s moderator and the one of the research assistant acted as a secretary and noted down the various views and responses during FGDs. An observer was used to control the group dynamics and ensure that everyone contributed to the discussion without others dominating.

3.12 Data analysis

Data cleaning was done concurrently with data collection. At the end of each field day, quantitative data was checked for completeness, coded and then entered into the “Statistical package for social sciences (SPSS) software version 20” for analysis. Determination of a “knowledge index” was carried out before analysis of data. Each question on knowledge was weighted based on number of responses. Possible responses for these questions were listed and the caretaker asked to give a yes or no answer when the options were read out by the interviewer. For every correct answer a score of 1 was awarded and a zero (0) score was awarded for every wrong answer. Caretaker’s knowledge of pneumonia was measured for every question asked, after which an overall knowledge index was generated.

Four questions were used to determine pneumonia knowledge. Those questions with >2 correct responses (like on risk factors, signs and symptoms and prevention), participants that got more than half the responses correct, were termed as having good
knowledge, while the opposite implied poor knowledge. Finally, all the correct responses were added together and a likert scale (0-17) generated to describe the overall level of knowledge. A score of 0-6 was termed as poor knowledge, a score of 7-12 as fair knowledge and a score of 12-17 as good knowledge.

Descriptive and univariate analysis was carried out and data was presented as frequencies, proportions and means. Univariate analysis was carried out to show frequency and proportions on socio-demographic characteristics, ARI prevalence and timing of health facility consultation. Bivariate analysis was done. Chi-square test was used to provide comparisons between dependent and independent variables and statistical significance was established at p< 0.05. The following variables were tested each at a time;

1. Timing of health facility consultation versus socio-demographic characteristics; child’s age, child’s sex, caretaker’s age, marital status, religion, education level, source of household income.

2. Timing of health facility consultation versus household factors; key decision maker, family practices, family preferences, caretaker’s perceptions, person responsible for paying household expenses.

3. Timing of health facility consultation versus caretaker’s level of knowledge on pneumonia; causation, risk factors, signs and symptoms, prevention, overall score of pneumonia knowledge.

4. Timing of health facility consultation versus health facility factors; distance to the health facility, previous costs at the facility, time taken before service provision at the previous facility consultation, previous experience.
Multivariate analysis was carried out. Binary logistic regression model was used to determine independent determinants of health facility consultation. Variables that were statistically associated with “timing of health facility consultation”, on bivariate analysis, were included in this model. Graphs and tables were used to present the analyzed data where appropriate.

Qualitative data yielded from FGDs and in-depth interviews were organized and analyzed using content analysis based on the key themes generated from the study objectives. Some of these data was analyzed verbatim (data presented in the form the respondent presented it). The generated information after analysis was used to reinforce the quantitative data collected.

3.13 Ethical and logistical considerations

Ethical approval to carry out the research was granted by the Kenyatta University Ethical Research Committee Reference number: KU/R/COMM/51/362 (Appendix I). A research permit was obtained from the National Council for Science, Technology and Innovation (Appendix II). Further, research approval was obtained from Kiambu County Commissioner (Appendix III) and County Director of Health Research (Appendix IV). Written informed consent was sought from the study participants. Those who agreed to participate were asked to sign or thumb-print the informed consent form provided (Appendix V). Group consent was obtained for FGD. Confidentiality and privacy was maintained during data collection and handling. Interviews were undertaken with individual study participants in their homes or household. Names or any other form of identification were not used on the
questionnaire or qualitative data collected. All data collected was stored, analyzed and reported in formats that did not allow identification of the individual participant.
CHAPTER FOUR: RESULTS

4.0 Introduction

This chapter presents both qualitative and quantitative results. A total of 323 CUFY were included in this study. Caretakers of these children were interviewed to gather relevant information for this study. Data was collected in the 11 functional CUs of Githunguri Sub - County from November to December 2014. To determine the key determinants of “health facility consultation for ARI”, binary logistic regression was carried out on those variables that were statistically significant after Chi – square test (p < 0.05).

4.1 Socio-demographic characteristics of participants

To gather information on the bio data, caretakers were asked questions that would assist in identifying them and their children. Out of the 323 study participants who were interviewed (80, 24.8%) had their children aged between 13 to 24 months with a mean age of 29.2 months. Male children were (170, 52.6%), while (153, 47.4%) were females (Table 4.1). All of the study participants were mothers of these children. Of 323 mothers (160, 49.5%) were aged between 20 to 29 years, with a mean age of 29.4 years. Most of the study participants were married (230, 71.2%). Up to (177, 54.8%) study participants had achieved secondary level of education. More than half of the participants (215, 66.6%) were Protestants. Regarding their source of income, (291, 90%) of the study participants had non-salaried employment (casual laborers, crop farming and animal husbandry) while only (32, 10%) had salaried employment. Further details of socio-demographic characteristics are presented in Table 4.1.
Table 4.1: Socio-demographic characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Categories</th>
<th>n (323)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s age (in completed months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-12</td>
<td>64</td>
<td>19.8</td>
</tr>
<tr>
<td></td>
<td>13-24</td>
<td>80</td>
<td>24.8</td>
</tr>
<tr>
<td></td>
<td>25-36</td>
<td>79</td>
<td>24.5</td>
</tr>
<tr>
<td></td>
<td>37-48</td>
<td>50</td>
<td>15.5</td>
</tr>
<tr>
<td></td>
<td>49-59</td>
<td>50</td>
<td>15.5</td>
</tr>
<tr>
<td>Child’s sex</td>
<td>Male</td>
<td>175</td>
<td>54.2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>148</td>
<td>45.8</td>
</tr>
<tr>
<td>Mother’s age (in completed years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;19</td>
<td>9</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>20-29</td>
<td>160</td>
<td>49.5</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>118</td>
<td>36.5</td>
</tr>
<tr>
<td></td>
<td>&gt;40</td>
<td>36</td>
<td>11.1</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single/never married</td>
<td>78</td>
<td>24.1</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>230</td>
<td>71.2</td>
</tr>
<tr>
<td></td>
<td>Divorced/separated</td>
<td>11</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>Widowed</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>Education level</td>
<td>No formal education</td>
<td>33</td>
<td>10.2</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>92</td>
<td>28.5</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>177</td>
<td>54.8</td>
</tr>
<tr>
<td></td>
<td>College/University</td>
<td>21</td>
<td>6.5</td>
</tr>
<tr>
<td>Religion</td>
<td>Protestant</td>
<td>215</td>
<td>66.6</td>
</tr>
<tr>
<td></td>
<td>Roman Catholic</td>
<td>79</td>
<td>24.5</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>29</td>
<td>9.0</td>
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<tr>
<td>Source of income</td>
<td>No salaried</td>
<td>291</td>
<td>90.0</td>
</tr>
<tr>
<td></td>
<td>Salaried employment</td>
<td>32</td>
<td>10.0</td>
</tr>
</tbody>
</table>

### 4.2 Prevalence of ARI

To determine prevalence of ARI, participants were asked if their child who was under five years of age had experienced cough and or difficulty or fast breathing (symptoms of an ARI, considered a proxy for pneumonia) 2 weeks preceding the study. Out of 323 caretakers who were interviewed, (240, 74.3%) reported that their child experienced such symptoms. The rest (83, 25.7%) said they presented with symptoms of nasal congestion, chest congestion and a running nose. The prevalence of ARI in this study was 74.3%. 
4.3 Timing of health facility consultation for ARI

Mothers who had indicated their child had ARI symptoms were asked if they sought treatment in a health facility. Those who reported to have sought care at a health facility were then asked to state how long it took them to seek care for their child, after recognition of symptoms. Health facility consultation within 24 hours of signs and symptoms recognition was termed as prompt consultation while health facility consultation after more than 24 hours of signs and symptoms recognition was termed as delayed consultation. Timing of health facility consultation was measured among those children who had ARI. Of the 240 children with ARI, (149, 62.1%) delayed visiting a health facility, while (91, 37.9%) visited a health facility promptly. Among those who had delayed visiting a health facility, (80, 53.7%) took 1 day, (47, 31.5%) took 2 days and (22, 14.8%) took ≥ 3 days to seek appropriate care. Further details on timing health facility consultation are presented in Figure 4.1.

Figure 4.1: Timing of health facility consultation
During the interviews with the key informants, it was noted that mothers delayed in seeking health care for their children. One of the key informants reported, “*Mothers know that they should come to the health facility immediately when they recognize their child is not feeling well. However, most of them seek health facility care after three or four days of symptoms recognition*."

Moreover, during in-depth interview with the HCWs, it was noted that most mothers use alternative treatments before seeking care at the health facility. One of the HCW reported the following, “*Mothers always delay seeking care for their children even if they know that health facility care is the best. Most of them use home remedies and only come to us when the illness complicates*.”. Another key informant reported as follows, “*Mothers know that children should be brought to the health care facility immediately when sick. Most of them however, opt to buy cold cap and piriton at the shop for cough and only come to us (health facility) when the condition worsens*”. 

Similarly, during FGDs with the mothers, most reported that they used home remedies before seeking health facility care. This is what FGDs with the mothers revealed. “*I usually give (child name) cold cap or ‘njambatiikere’ (sweetex) or piriton, when he coughs before I take him to the hospital*” a focus group discussant. Another focus group discussant said, “*I sometime use petroleum jelly and salt to rub the chest of (child name) to reduce difficulty in breathing. If this fails to work I then go to the health facility*”. 
4.4 Socio-demographic and household determinants of health facility consultation

4.4.1 Socio-demographic factors as determinants of health facility consultation

Chi-square test was used to test association between socio-demographic factors and timing of health facility consultation. Every variable was compared with timing of health facility consultation individually. Among socio-demographic factors, child’s sex was shown to be associated with “timing of health facility consultation for ARI” ($\chi^2 = 4.396$, df = 1, $P = 0.036$). Mothers delayed more (83, 68.6%) for their female child than their male child (66, 55.5%). Since the calculated $p$ value was less than 0.05, the null hypothesis that “timing of health facility consultation for ARI” is not determined by child’s sex was rejected, and the alternative hypothesis that “timing of health facility consultation for ARI” is determined child’s sex was accepted.

The other socio-demographic factors were not shown to be associated with timing of health facility consultation. Caretaker’s age, religion, marital status, education level, source of income and child’s age ($\chi^2 = 1.805$, df = 3, $P = 0.614$), ($\chi^2 = 0.154$, df = 2, $P = 0.926$), ($\chi^2 = 1.226$, df = 3, $P = 0.747$), ($\chi^2 = 2.496$, df = 3, $P = 0.476$), ($\chi^2 = 2.680$, df = 3, $P = 0.444$) and ($\chi^2 = 5.115$, df = 4, $P = 0.276$) did not influence “timing of health facility consultation for ARI” respectively. Since the calculated $p$ value for each of these factors was greater than 0.05, we failed to reject the null hypothesis that “timing of health facility consultation for ARI” is not determined by caretaker’s age, religion, marital status, education level, source of income, child’s age, and failed to accept the alternative hypothesis that “timing of health facility consultation for ARI” is determined child’s sex.
for ARI” is determined caretaker’s age, religion, marital status, education level, source of income, child’s age. This data is presented in Table 4.2.

**Table 4.2: Socio-demographic determinants of health facility consultation**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Timing of health facility consultation (n=240)</th>
<th>Chi-square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Delayed</td>
<td>Prompt</td>
</tr>
<tr>
<td>Child’s age (in months)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-12</td>
<td>26</td>
<td>63.4</td>
</tr>
<tr>
<td>13-24</td>
<td>43</td>
<td>71.7</td>
</tr>
<tr>
<td>25-36</td>
<td>36</td>
<td>59.0</td>
</tr>
<tr>
<td>37-48</td>
<td>24</td>
<td>63.2</td>
</tr>
<tr>
<td>49-59</td>
<td>20</td>
<td>50.0</td>
</tr>
<tr>
<td>Child’s gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>66</td>
<td>55.5</td>
</tr>
<tr>
<td>Female</td>
<td>83</td>
<td>68.6</td>
</tr>
<tr>
<td>Mother’s age (in years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;19</td>
<td>4</td>
<td>66.7</td>
</tr>
<tr>
<td>20-29</td>
<td>71</td>
<td>59.2</td>
</tr>
<tr>
<td>30-39</td>
<td>53</td>
<td>62.4</td>
</tr>
<tr>
<td>&gt;40</td>
<td>21</td>
<td>72.4</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>34</td>
<td>58.6</td>
</tr>
<tr>
<td>Married</td>
<td>108</td>
<td>63.5</td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>4</td>
<td>50.0</td>
</tr>
<tr>
<td>Widowed</td>
<td>3</td>
<td>75.0</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protestant</td>
<td>95</td>
<td>62.5</td>
</tr>
<tr>
<td>Roman Catholic</td>
<td>43</td>
<td>62.3</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>57.9</td>
</tr>
<tr>
<td>Source of income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non salaried</td>
<td>137</td>
<td>63.7</td>
</tr>
<tr>
<td>Salaried</td>
<td>12</td>
<td>48.0</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal</td>
<td>16</td>
<td>66.7</td>
</tr>
<tr>
<td>Primary</td>
<td>45</td>
<td>66.2</td>
</tr>
<tr>
<td>Secondary</td>
<td>77</td>
<td>57.9</td>
</tr>
<tr>
<td>College/University</td>
<td>11</td>
<td>73.3</td>
</tr>
</tbody>
</table>

*Significant at p < 0.05

Though religion did not influence “timing health facility consultation for ARI”, during FGDs with the caretakers, it was noted that some religious denominations had beliefs that influenced health care seeking. Members from “Israeli religion” believed in the power of spiritual healing and so opted not to seek health facility care.
4.4.2 Household factors as determinants of health facility consultation

To determine what household factors influenced timing of health care seeking, caretakers were asked questions on decision making, household preferences, practices and perceptions. When asked who made decision on health care seeking for CUFY in the family, (151, 62.9%) of the study participants (mothers) reported that they were the key decision makers. When asked who catered for health care expenses, (160, 66.7%) said that the child father was responsible for meeting all health care expenses for the child.

During FGDs with the mothers, a similar picture was observed. Most mothers reiterated that they made the decision to seek care but they had to wait for their husbands to provide. “I am always with the (child name) so I am able to see when he gets sick. But, I have to inform his father before I seek care for financial provision” a focus group discussant. Another focused group discussant reported as follows, “After noticing (child name) was sick I waited for three days before going to a health facility, because, I depend on his father for finances”.

Among household factors, the key decision makers for the household on care seeking was shown to be associated with “timing of health facility consultation for ARI” ($\chi^2 = 5.803$, df = 1, P = 0.016). There was 71.9% probability of delay when fathers made decision to seek care and 56.3% delay when mothers decided on care seeking. Given that the calculated p value was less than 0.05, the null hypothesis that, “timing of health facility consultation for ARI” is not influenced by the key decision maker was rejected, and the alternative hypothesis that “timing of health facility consultation for
ARI” is influenced by the key decision maker was accepted. The data is presented in Table 4.3

Table 4.3: Household factors as determinants of health facility consultation

<table>
<thead>
<tr>
<th>Household factors</th>
<th>Categories</th>
<th>Timing of health facility consultation (n=240)</th>
<th>Chi-square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Delayed</td>
<td>Prompt</td>
</tr>
<tr>
<td>Key decision maker</td>
<td>Mother</td>
<td>85</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>Father</td>
<td>64</td>
<td>25</td>
</tr>
<tr>
<td>Payment of expense</td>
<td>Father</td>
<td>99</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>Mother</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Preferred source of health care</td>
<td>Health facility</td>
<td>145</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Traditional medicines</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Household practice</td>
<td>Taken to health facility</td>
<td>137</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>Other (Give hot drinks/cover the child)</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Caretaker Perceptions</td>
<td>Serious disease</td>
<td>140</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Not serious</td>
<td>9</td>
<td>8</td>
</tr>
</tbody>
</table>

*Significant at $p < 0.05$

There was no statistical significant association between the one who catered for health care expenses for the household, the preferred source of health care in the household, the household practices, the caretakers perceptions ($\chi^2 = 0.009$, df = 1, $p = 0.925$), ($\chi^2 = 0.764$, df = 1, $P = 0.382$), ($\chi^2 = 3.729$, df = 2, $p = 0.155$), ($\chi^2 = 0.650$, df = 1, $p = 0.420$) and “timing of health facility consultation for ARI” respectively. Based on this observation, we failed to reject the null hypothesis that, “timing of health facility consultation for ARI” is not influenced by the one who catered for health care expenses for the household, the preferred source of health care in the
household, the household practices, the caretakers perceptions, and failed to accept the alternative hypothesis that “timing of health facility consultation for ARI” is influenced by the one who catered for health care expenses for the household, the preferred source of health care in the household, the household practices, the caretakers perceptions respectively. This is as presented in Table 4.3.

4.5 Knowledge of pneumonia as a determinant of health facility consultation

To determine knowledge of pneumonia, mothers were asked questions on causation, on risk factors, on signs and symptoms and prevention. When asked what causes pneumonia, (142, 59.2%) reported it was due to cold temperature, (90, 37.5%) said it was due to changes in climate, while only (38, 15%) said it was caused by a virus or bacteria. When asked to list the risk factors of pneumonia, (152, 63.3%) reported cold to be one of the risk factors, (54, 22.5%) listed malnutrition and (45, 18.8%) listed lack of vaccination. On their knowledge of pneumonia symptoms, (115, 47.9%) reported cough as a common symptom, and (104, 43.3%) reported difficulty/fast breathing.

A “knowledge index” was used to judge caretaker’s level of knowledge on pneumonia. Each question on knowledge was weighted based on number of responses. For a question with only one correct answer, a score of 1 was awarded for the correct answer, and 0 for a wrong answer. For those questions with >2 possible responses, participant that got more than half the responses correct, was termed as having good knowledge, while the opposite implied poor knowledge. An overall knowledge score was also calculated. This was accomplished by adding all the correct answers for every question asked. This amounted to 17 possible correct responses. A
score of 0-6 was termed as poor knowledge, a score of 7-12 as fair knowledge and a score of 12-17 as good knowledge.

Regarding causation of pneumonia, which had only one correct response (209, 87.1%) had poor knowledge. On knowledge of risk factors, which had 7 possible responses, majority, (237, 98.8%) knew less than 50% of the correct responses while only (3, 1.2%) knew more than 50% correct responses. Out of 5 correct possible responses regarding symptoms of pneumonia, majority (179, 74.6%) could not list have of these responses even when read out loud for them. On pneumonia prevention, most (208, 86.7%) had poor knowledge. On overall score on level of knowledge, more than half had fair knowledge (157, 65.4%), 65 (27.1%) had poor knowledge while only (18, 7.5%) had good knowledge of pneumonia.

Generally mothers had poor knowledge of pneumonia. Similarly, during FGDs it was noted that mothers lacked the correct information of pneumonia causation and symptoms. “Cold was the main reason (name of the child) developed a cough. I was not worried about the cough at first, but after two days, the cough was not over and the child was unable to breathe well. So I went to the health facility for him to be seen” a focused group discussant. Another focused group discussant reported as follows, “When (child name) developed a cough and fever, I thought it was “homa” (common cold). It was at night so I bought piriton and gave him. In the morning he was still unwell. His breathing was noisy. I then decided to take him to the health center.”
On bivariate analysis, poor knowledge of symptoms of pneumonia was shown to be associated with “timing of health facility consultation for ARI” ($\chi^2 = 7.348$, df = 1, $p = 0.007$). Since the calculated $p$ value was less than 0.05, the null hypothesis that “timing of health facility consultation for ARI” is not determined by caretaker’s level of knowledge of pneumonia signs and symptoms was rejected, and the alternative hypothesis that “timing of health facility consultation for ARI” is determined by caretaker’s level of knowledge of pneumonia signs and symptoms was accepted.

Caretakers level of knowledge of causation, risk factors and of preventive measures for pneumonia ($\chi^2 = 3.557$, df = 1, $p = 0.059$), ($\chi^2 = 0.027$, df = 1, $p = 0.869$) and ($\chi^2 = 2.290$, df = 1, $p = 0.130$) respectively, was not shown to be associated with “timing of health facility consultation for ARI”. Given that the calculated $p$ value for these individual factors was greater than 0.05, we failed to reject the null hypothesis that “timing of health facility consultation for ARI” is not determined by caretaker’s level of knowledge of pneumonia; causation, risk factors, preventive measures, and failed to accept the alternative hypothesis that “timing of health facility consultation for ARI” is determined by caretaker’s level of knowledge of pneumonia; causation, risk factors, preventive measures. Caretakers overall level of pneumonia knowledge was not shown to be associated with “timing of health facility consultation for ARI” ($\chi^2 = 0.509$, df = 2, $p = 0.775$). This data is presented in Table 4.4.
Table 4.4: Knowledge of pneumonia as a determinant of health facility consultation

<table>
<thead>
<tr>
<th>Knowledge of pneumonia</th>
<th>Timing of health facility consultation (n = 240)</th>
<th>Chi-square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Delayed</td>
<td>Prompt</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Causation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>125</td>
<td>83.9</td>
</tr>
<tr>
<td>Good</td>
<td>24</td>
<td>16.1</td>
</tr>
<tr>
<td>Risk factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>147</td>
<td>98.7</td>
</tr>
<tr>
<td>Good</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Signs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>120</td>
<td>80.5</td>
</tr>
<tr>
<td>Good</td>
<td>29</td>
<td>19.5</td>
</tr>
<tr>
<td>Prevention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>133</td>
<td>89.3</td>
</tr>
<tr>
<td>Good</td>
<td>16</td>
<td>10.7</td>
</tr>
<tr>
<td>Overall total score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>42</td>
<td>28.2</td>
</tr>
<tr>
<td>Fair</td>
<td>97</td>
<td>65.1</td>
</tr>
<tr>
<td>Good</td>
<td>10</td>
<td>6.7</td>
</tr>
</tbody>
</table>

*Significant at $p < 0.05$

4.6 Facility factors as determinants of health facility consultation

To establish health facility factors that influenced timing of health care seeking, caretakers were asked questions regarding approximate distance to the nearest health facility, previous costs at the health facility, time taken before assistance were provided in the previous health facility visit and previous experiences at the health facility. Regarding distance, (185, 77.1%) caretakers resided ≤ 2kms away from the nearest health facility. When asked how much cost they incurred at the health facility in the previous visit, (194, 80.8%) had used > 200 Kenya shillings. caretakers were said to have incurred high cost of care if they used > 200 Kenya shillings, while the opposite implied low cost. This was based on the average daily income. Most.
caretakers had no salaried income in this study. Their average daily income therefore was between 150 to 200 Kenya shillings.

When asked how long it took for them to be assisted by the HCW while at the health facility previously, (184, 76.7%) had waited for ≤ 1hr, while (56, 23.3%) waited for > 1hr. Caretakers were said to have had experienced delayed assistance/facility delays if they had waited for > 1hr at the health facility. The opposite implied prompt assistance. With regards to past experience at the health facility, majority (219, 91.2%) reported that they lacked medication for their child. The rest (21, 8.8%) said they experienced delays at the health facility and attributed this to long queues and few staffs.

On bivariate analysis, among health facility factors that were shown to be associated with “timing of health facility consultation for ARI” were, high costs of care at the health facility and long waiting time before assistance at the previous visit($\chi^2= 6.527$, df = 1, p = 0.011), ($\chi^2= 5.177$, df=1, P= 0.023) respectively. Since the calculated p value for the two individual factors was less than 0.05, the null hypothesis that “timing of health facility consultation for ARI” is not determined by cost of care at the health facility, waitingtime before assistance at the previous visit was rejected, and the alternative hypothesis that “timing of health facility consultation for ARI” is determined by cost of care at the health facility, long waiting time before assistance at the previous visit was accepted. Details of health facility factors influencing timing of facility consultation is presented in Table 4.5.
During FGDs with the mothers more information in regards to how health facility factors influenced timing of health consultation was revealed. One mother reported as follows, “I waited for like an hour for my child to be seen by the doctor the last time I was (name of the health facility). This time I decided to buy drugs at the shop than going to waste time queuing in the health facility.” Another mother reported as follows, “We queue for long before we are assisted in (name of health facility) so I waited to see if (child’s name) will get better before I went to the health center”.

In-depth interviews with the key informants provided further information on how facility factors influenced care seeking. One of the key informants reported the following in regards to delayed assistance at the health facility. “Some time we delay seeing the sick children because of the work load and their high number. Of course this discourages the mothers from seeking care but what can we do bearing in mind we are very few”. Another key informant reported as follows, “We are four staffs at this health facility, but only two of us report to work in a day. At times, one works as a laboratory technician, nurse and clinician. This is too much for one person to handle. Therefore, as much as we would want to assist the mothers with no delay, we can’t”.

Among health facility factors that were not shown to be associated with “timing of health facility consultation for ARI” were, past experiences at the health facility and distance to the nearest health facility ($\chi^2 = 3.651, df = 2, P = 0.161$),($\chi^2 = 3.434, df = 1, P = 0.064$) respectively. This data is presented in Table 4.5. Given that the calculated p value for these individual factors was greater than 0.05, we failed to reject the null hypothesis that “timing of health facility consultation for ARI” is not determined by past experiences at the health facility, distance to the nearest health facility, and failed
to accept the alternative hypothesis that “timing of health facility consultation for ARI” is determined by past experiences at the health facility, distance to the nearest health facility.

Table 4.5: Health facility factors as determinants of health facility consultation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Timing of health consultation (n = 240)</th>
<th>Chi-square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Delayed</td>
<td>Prompt</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Distance to the nearest health facility (in Kms)</td>
<td>≤2</td>
<td>109</td>
</tr>
<tr>
<td>Previous costs at HF (in Kshs)</td>
<td>≤200</td>
<td>21</td>
</tr>
<tr>
<td>Time taken before being assisted in the previous visit (in hours)</td>
<td>≤1</td>
<td>107</td>
</tr>
<tr>
<td>Past experience at the health facility</td>
<td>No medications</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>Long queues/delay</td>
<td>6</td>
</tr>
</tbody>
</table>

*Significant at p < 0.05

Though no statistical significant association was established between past experience at the health facility and timing of health facility consultation, information revealed during FGDs showed some association. “Every time I go to (name of the health facility), I am given a note to go and buy drugs at the chemist. Some time I like buying the drugs at the shop instead of going to the dispensary,” a focused group discussant.

In addition, several mothers reported the need to have ‘money at hand’ to attend a health facility. Many reported that they barely considered presenting the child at the health facility if they had no money. Another focused group discussant reported as
follows, “I waited for three days when (child name) was sick before going to the hospital. I had to look for money for buying the medication as the hospital always lacks.”

4.7 Multivariate analysis

Binary logistic regression was used to identify the independent determinants of “health facility consultation for ARI” among CUFY. Only variables that were significantly associated with timing of health facility consultation on bivariate analysis were included in multivariate analysis. These variables were run together simultaneously to identify which was the strongest determinant amongst them all. The strongest independent determinant of “health facility consultation for ARI” was having waited for >1 hour before service provision (delayed assistance) at the health facility (OR = 0.25; C.I (0.12- 0.56); p = 0.001). Mothers were 0.3 times less likely to delay consulting a health facility for their child, if they were assisted immediately (> 1 hour) in the previous visit at the health facility.

Mothers who had poor knowledge of pneumonia symptoms were 2.4 times more likely to have delayed visiting a health facility for their child compared to those who had good knowledge (OR = 2.36; C.I (1.19 – 4.67); p = 0.014). Mothers were 1.8 times more likely to delay visiting a health facility if their child was a female than male (OR = 1.81; CI (1.03 – 3.17); P = 0.038). Details of independent determinants of “health facility consultation for ARI” are presented in Table 4.6.
Table 4.6: Independent determinants of health facility consultation

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>(n = 240)</th>
<th>Timing of HF consultation</th>
<th>P value</th>
<th>OR</th>
<th>95% C.I. for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Delayed</td>
<td>Prompt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child’s sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>119</td>
<td>66</td>
<td>53</td>
<td></td>
<td>0.038*</td>
</tr>
<tr>
<td>Female</td>
<td>121</td>
<td>83</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key decision maker</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>151</td>
<td>85</td>
<td>66</td>
<td></td>
<td>0.036*</td>
</tr>
<tr>
<td>Father</td>
<td>89</td>
<td>64</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge on symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>179</td>
<td>120</td>
<td>59</td>
<td></td>
<td>0.014*</td>
</tr>
<tr>
<td>Good</td>
<td>61</td>
<td>29</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous costs at HF (in Ksh)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 200</td>
<td>46</td>
<td>21</td>
<td>25</td>
<td></td>
<td>0.036*</td>
</tr>
<tr>
<td>&gt; 200</td>
<td>194</td>
<td>128</td>
<td>66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous time taken before service (in hours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1</td>
<td>184</td>
<td>107</td>
<td>77</td>
<td></td>
<td>0.001*</td>
</tr>
<tr>
<td>&gt; 1</td>
<td>56</td>
<td>42</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at p < 0.05

In addition, mothers were 0.5 times less likely to delay consulting a health facility when they made the decision to seek care, unlike when fathers made the decision (OR = 0.53; CI (0.29 – 0.96); P = 0.036). Moreover, mothers who had incurred low cost of care in the previous health visit were 0.4 times less likely to delay consulting a health facility for their child, unlike those who had incurred high costs (OR = 0.43; CI (0.20 – 0.95); P = 0.036). Details of independent predictors of “delayed health facility visit for ARI” are presented in Table 4.6.
CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

The main objective of the study was to establish the determinants of “health facility consultation for ARI” among CUFY in Githunguri Sub – County. Specifically, the study set out to; 1) determine the prevalence of ARI among CUFY in Githunguri Sub – County, 2) determine the timing of “health facility consultation for ARI” among CUFY in Githunguri Sub – County, 3) establish the socio-demographic and household factors those determine “health facility consultation for ARI” among CUFY, 4) determine how caretakers’ level of pneumonia knowledge influence “health facility consultation for ARI” among CUFY and 5) determine facility factors that influence “health facility consultation for ARI” among CUFY.

5.1.1 Prevalence of ARI

The research question on this sub – objective was to determine the prevalence of ARI in Githunguri Sub – County. Findings from this study revealed that out of 323 children, 240 (74.3%) had ARI two weeks preceding the survey. Any child who had a cough and or difficulty in breathing or breathing fasters than usual was termed as having had ARI. Prevalence of ARI in Githunguri Sub – County was higher than the national prevalence in Kenya. According to KDHS(2014), 65.9% children had ARI in Kenya and in Central Province prevalence of ARI was 70.3%.

The prevalence was higher than expected compared to the national prevalence. This was assumed to be due to caretakers over-reporting or due to the characteristics of this
location. Githunguri Sub – County is a rural residence with a tea and coffee as the main cash crop. These crops grow in cold regions, and therefore predispose residents of such regions to cold weather. In addition, most mothers from this Sub – County work in these plantations carrying their children to earn their daily income. This was revealed by the fact that majority (291, 90%) of the study participants had unsalaried source of income, meaning most worked in these farm to earn a living. This practice puts their children at risk of ARI. Other practice like use of bio-mass as a source of fuel for most households was also assumed to increase the risk of ARI.

Other studies show that prevalence of ARI is higher in rural areas. In Ethiopia, out of (773, 7%) children who had ARI symptoms 2 weeks preceding the study, (703, 91%) were from rural areas of Ethiopia(Astale&Chenault, 2015). In Uganda, the prevalence of ARI for children living in urban region was 37% while those from rural area had 50% prevalence(Bbaale, 2011). In contrast, in India prevalence of ARI was high in urban areas (63.7%) than in rural areas (53.7%). This was due to high overcrowding in urban areas (Kumar et al., 2015).

5.1.2 Timing of health facility consultation for ARI

The second question on this sub- objective was to find out the “timing of health facility consultation for ARI” There were two possible outcomes; delayed or prompt health facility consultation. Findings from this study showed that, out of 240 children who had ARI, 149 (62.1%) had delayed consulting a health facility while the rest promptly sought health care.Use of home remedies and over- the- counter medications was the main reason for these delays. Mothers sought hospital care when these
interventions failed to work. This was not expected given that health care services for CUFY is free in all government hospital in Kenya.

In Kenya, no study has been conducted to determine timing of health facility consultation for ARI. However, studies carried out in Uganda and Ethiopia by Källander et al., (2008) and Demissie et al., (2014), revealed that caregivers delayed for >2 days before seeking appropriate care. Similar findings were reported in studies done by Memon et al., (2013) and Doracaj et al., (2015) in Pakistan and Albania among CUFY. In these studies, mothers waited for ≥ 2 days before seeking care for presumed pneumonia/ARI. Use of home remedies and home treatments were the main explanation for these delays.

5.1.3 Socio-demographic and household factors as determinants of health facility consultation

This study also sought to determine socio-demographic and household factors that influenced “timing of health facility consultation for ARI” Findings from this study revealed that caretakers were 1.8 times more likely to delay consulting a health facility if their child was a female than male. This was not expected as issues of gender equity have been discussed nationally through mass media and also in schools and religious denominations. As such, similar findings were reported in studies carried out by Memon et al., (2013), Malhotra & Upadhyay, (2013) and Noordam et al., (2015) in Pakistan, India and countries of Sub – Saharan Africa among children under five years, found sex of the child to contribute to delay hospital care seeking for ARI/presumed pneumonia. In these studies, cultural issues were attributed to this variation.
According to findings in this study, age of the child was not associated with timing of health facility consultation. This was further supported by what mothers reported during FGDs, that even if they wanted to seek care promptly for their younger children, external influences caused them to delay seeking health facility care. On the contrary, various studies carried out in Sub – Saharan Africa countries, Pakistan and Indonesia by Noordam et al., (2015), Memon et al., (2013) and Kresno et al., (2010) found age of the child to be associated with care seeking for ARI/presumed pneumonia. Prompt care seeking was sought more for the younger children than the older children.

Findings in this study showed no association between caretaker’s level of education and timing of facility consultation. Similar findings were reported in the KDHS, (2014) that mother’s education did not influence care seeking for childhood illness. This is in contrast to Keter et al., (2015) study findings in Nandi County, Kenya that found low education level to be associated with care seeking delays. Others studies carried out in Pakistan, Yemen and Ethiopia by Memon et al., (2013), Rehman et al., (2014), Webair & Bin-Gouth, (2013) and Mebratie et al., (2014) found that mothers with low level of education were more likely to delay in seeking health facility care than those with high level of education.

In this study, religion did not influence “timing of health facility consultation for ARI”. Majority (91.2%) of the study participants were of Christian faith. However, during FGDs with the caretakers, it was revealed that some caretakers of other religion like “Israeli fraternity” believed in power of spiritual healing and therefore preferred praying for their children rather than taking them to a health facility. This
was not pronounced as the proportion of caretakers from this religious denomination was minimal. However, according to Mebratie et al., (2014) study findings, care giver’s religion was associated with prompt care seeking. Christians were 3.7 times more likely to seek modern care as compared with Muslim-headed households. This calls for a need to address the issue of religious belief and health care seeking.

Among household factors, the key decision maker was shown to be associated with “timing of health facility consultation for ARI.” Mothers were 0.5 times less likely to delay consulting a health facility when they made the decision to seek care, unlike when fathers made the decision. Despite the fact that mothers were the key decision makers on health care seeking, they depended on the child’s father for financial provision. Similar findings were reported in studies done at Yemen and Niger by Webair& Bin-Gouth, (2013) and Bedford, (2012). Mothers were the key decision makers on care seeking but relied on the child’s father for financial provision. This caused further delays in seeking appropriate care for ARI.

With regards to family perceptions, most (92.9%) perceived the symptom comprising of cough and difficulty in breathing as signs of a serious disease. Nevertheless, mother’s perceptions were not associated with timing of health facility consultation. This could be explained due to the mother overdependence on the child father for financial help. Even though mothers perceived ARI symptoms to be threatening, they had to wait for the child father to provide the finances needed for transportation and care at the health facility. On the contrary, according to Webair& Bin-Gouth, (2013) and Keter et al., (2015) studies done at Yemen and Nandi County,
Kenya, care givers perceptions on a childhood illness was associated with care seeking. When caregivers perceived a childhood illness to be serious, they sought care immediately. It is expected that when a condition is perceived to be life threatening that caretakers seek prompt care. Nevertheless, mothers delayed anyway as they depended on the child’s father for financial provision. This was due to a forecast need of having “money at hand” for purchasing prescribed medications in case the facility lacked. This implicates that mothers need to be empowered economically so as they can make prompt decision regarding health care without delays.

5.1.4 Knowledge of pneumonia as a determinant of health facility consultation

This study also sought to determine whether level of pneumonia knowledge influenced “timing of health facility consultation for ARI” Findings from this study showed that, on overall score on level of knowledge, more than half had fair knowledge (157, 65.4%), 65 (27.1%) had poor knowledge while only (18, 7.5%) had good knowledge of pneumonia. This was not expected because as revealed during in depth interviews with the key informants, caretakers were being educated on common danger signs of common childhood illnesses (pneumonia included). Majority, (179, 74.6%) had poor knowledge of pneumonia symptoms. The odd of having “delayed health facility consultation for ARI” was 2.4 times for those caretakers who had poor knowledge of pneumonia symptoms compared to those who had good knowledge. This concurs with findings from an earlier study done in Kenya by Simiyu et al., (2003) that showed that mothers sought prompt care more when they were able to recognize difficulty in breathing and fast breathing than a mere cough. Similar findings were reported in a study done in Ethiopia by Demissie et al., (2014) which
revealed that, mothers with good knowledge of pneumonia symptoms were associated with immediate care seeking.

According to findings from this study, caretaker’s level of knowledge of pneumonia causation did not influence “timing health facility consultation for ARI.” This could have been due to the fact that majority (209, 87.1%) had poor knowledge of pneumonia causation. In addition, (142, 59.2%) reported it was due to cold temperature and keeping the child warm could help relief the symptoms. Similar findings were reported in a study done at Nigeria by Ekure et al., (2013) that cold caused pneumonia and reducing its exposure and wearing warm clothes would prevent it. This belief and practice was seen to be the main cause of delayed care seeking for ARI. This implicates that there is need to do health education to specifically capture causation of pneumonia to remove this overly cited misnomer.

Moreover, findings from this study revealed that caretaker’s level of knowledge on the risk factors of pneumonia was not associated with “timing health facility consultation for ARI”. This could be explained due to the fact that majority (237, 98.8%) had poor knowledge of the risk factors of pneumonia. Majority (152, 63.3%) reported cold to be one of the risk factor, (54, 22.5%) listed malnutrition as a risk factor and (45, 18.8%) listed lack of vaccination. The continued notion that cold causes pneumonia and risks pneumonia caused delayed care seeking as caretakers engaged more in home interventions. These findings suggest a need to conduct health education specifically on pneumonia causation, risk factors, symptoms and prevention as majority of the caretakers scored poorly in these areas.
5.1.5 Health facility determinants of timing of health facility consultation

This study also sought to determine facility factors that influenced “timing of health facility consultation for ARI”. Findings from this study revealed that time taken before service provision at the health facility strongly determined timing of health facility consultation for ARI (p = 0.001). The longer the waiting time in the previous health facility visit the more the mothers cited having delayed seeking care. This finding was supported by what HCWs reported during in-depth interviews that caregivers faced delays while at the health facility, due to few numbers of staff to provide the services compared to service demand. Similar findings were reported in a study carried out at Homa Bay County, Kenya, where long queues or delays at the health facility were found to contribute to delays in seeking care at the hospitals (Bedford & Sharkey, 2014). Regionally, similar findings were reported in studies done at South Africa, Australia and Central America by Sharkey et al., (2011), Van der Hoeven et al., (2012), Najnin et al., (2011) and Sakisaka et al., (2010) that found service provision delays to be associated with delayed care seeking.

From this study, previous cost at the health facility was shown associated with “timing of health facility consultation for ARI”. The higher the cost care at the health facility, the more likely did the caretakers delay seeking health care. It is a policy in Kenya that all children under five years should receive free health care in all government hospitals. Despite this, caretakers delayed seeking care at these health facilities. This was explained as due to lack of medications for common childhood illness at the facilities. Caretakers reported to have incurred high cost of care as they had to buy prescribed medications at the chemist. Caretakers therefore, opted to buy medications at the shops or chemists before seeking care at these facilities and only
visited the facility if the condition of their child worsened even after taking the medication.

Similar findings were reported in earlier studies carried out in Kenya by Taffa & Chepngen, (2005) and Irimu et al., (2008) that showed that cost of care at the health facility influenced care seeking. Though health care for children under five years is free, high cost of care was incurred as caregivers had to buy medications elsewhere. Other studies done at South Africa, Southeast Asia and Philippines by Van der Hoeven et al., (2012), Alvesson et al., (2012) and Kim et al., (2014) revealed that financial constraints influenced health care seeking for childhood illnesses.

Distance to the nearest health facility was not found to be not associated with “timing of health facility consultation for ARI.” More than three quarters, (185, 77.1%) resided ≤ 2kms away from the nearest health facility. This is in contrast to study findings done in Kenya by Irimu et al., (2008) and Bedford & Sharkey, (2014) that found poor access and long distances to be associated with delays in seeking appropriate care. Moreover, various studies done in Southeast Asia, Australia and Philippine, by Alvesson et al., (2012), Najnin et al., (2011) and Kosai et al., (2015) found that, mothers who traveled long distance to the facility, delayed or failed to seek health facility care for their child.

Findings from this study implicates that among facility factors, distance to the nearest health facility is not a major issue as most of the residents resided approximately <2Kms from the nearest health facility. However, there is a dire need to address causes of facility delays, that is, long queues due to few numbers of staff and lack of
medications at health facility so as to encourage prompt consultation at the health facility.

5.2 Conclusions

Based on the study findings the study made the following conclusions:

1. The prevalence of ARI in Githunguri Sub-County among CUFY was high at 74.3%. This was based on caretakers report on whether the child had symptoms of ARI two weeks prior the study.

2. On timing of health facility consultation, majority delayed (149, 62.1%) making this a rampant issue in Githunguri Sub – County.

3. Among socio-demographic and household factors influencing health facility consultation, child’s sex and key decision maker on care seeking was associated with “timing of health facility consultation for ARI”. Though religion was not associated with timing of health facility consultation, caretakers from “Israel religion” believed in power of spiritual healing and therefore preferred praying for their children rather than taking them to a health facility.

4. Only (18, 7.5%) had an overall good knowledge of pneumonia. Majority (209, 87.1%) had poor knowledge on causation. More than three quarters (237, 98.8%) had poor knowledge on risk factors and (208, 86.7%) didn’t know the correct preventive measures for pneumonia. Regarding pneumonia symptoms most (179, 74.6%) had poor knowledge. Mothers who had poor knowledge of pneumonia symptoms were 2.4 times more likely to have delayed consulting a health facility for their child compared to those who had good knowledge.
5. High cost of care, long waiting time and lack of medications at the health facility were associated with delayed facility consultation.

5.3 Recommendations

5.3.1 Recommendations for policy makers

The study makes the following recommendations for policy makers:

1. There is need to address the high prevalence of ARI among CUFY by the County Health Officer.

2. The study recommends enforcement of the Public Health Act by the Ministry of Health so as to ensure that no child misses health care services either due to religious beliefs or other factors.

3. The study recommends need to devise strategies to improve efficiency of services at all tiers of health care by the Ministry of Health. For instance need to stock the health facilities with the recommended medications for common childhood illness.

4. The County Health Management Team needs to develop staff establishment criteria to balance patient/client to health care worker ratio so as to avoid staff shortage and burn out, and as a result reduce the long waiting time before service provision at the health facility.

5.3.2 Recommendations for practice

The study makes the following recommendations for practice:
1. There is need for caretakers to practice gender equity while making decisions on health care consultation for CUFY.

2. There is need for male involvement (fathers) in health care management for their child so as to promote prompt decision making on health care consultation for CUFY.

3. There is need to educate primary caretakers on causes of pneumonia, on risk factors, on signs and symptoms and preventive measures for pneumonia at the community level by County Health Officer through community extension workers and community health volunteers.

5.4 Further research

The study recommends the following for further research:

i. A study that can investigate caretakers’ pre-hospital interventions that lead to delayed care seeking for acute respiratory infection.

ii. A study to determine varied perceptions of communities on health care seeking for sick children.

iii. A study that can investigate and compare how different socio-cultural beliefs and practices influence health care seeking for common childhood illness.
REFERENCES


Kumar, S. G., Majumdar, A., Kumar, V., Naik, B. N., Selvaraj, K., Balajee, K., & others. (2015). Prevalence of acute respiratory infection among under-five
children in urban and rural areas of Puducherry, India. *Journal of Natural Science, Biology and Medicine, 6*(1), 3.


Rehman, A., Shaikh, B. T., & Ronis, K. A. (2014). Health care seeking patterns and out of pocket payments for children under five years of age living in


APPENDICES

Appendix I: Kenyatta University Ethical Clearance

Kenyatta University Ethics Review Committee

Date: 9th October, 2014

Dear Wanjai,

ELU APPLICATION NUMBER: EUKU/243/1.221: "DETERMINANTS OF DELAYED HOSPITAL VISITS FOR SUSPECTED PNEUMONIA AMONG UNDER-FIVE CHILDREN IN GITHUNGURI SUB-COUNTY, Kiambu County."

1. IDENTIFICATION OF PROTOCOL

The application before the committee is for a research topic "Determinants of Delayed Hospital Visits for Suspected Pneumonia among Under-five Children in Githunguri Sub-County, Kiambu County."

2. APPLICANT

Elizabeth Wanjiku Ndirangu, Department of Community Health.

3. STUDY SITE

Githunguri Sub-County, Kiambu County, Kenya

4. RECOMMENDATION

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 3.2.2.3) and the Kenyatta University Ethics Review Committee Guidelines AND APPROVED that the research may proceed for a period of ONE year from 9th October, 2014.

5. ADVICE CONDITIONS

i. Progress reports are submitted to the EU-ERC every six months and a final report is submitted at the end of the study.

ii. Serious and unexpected adverse events related to the conduct of the study are reported to the ERC immediately they occur.

iii. Refer the Kenyatta University Ethics Committee of any amendments to the protocol.

iv. Submit an electronic copy of the protocol to EUERC.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions, write the same in the space provided below and return to EU-ERC a copy of the letter.

[Signatures and Date]

Chairman Ethics Review Committee

1. Elizabeth Wanjiku Ndirangu, accept the advice given and will fulfill the conditions therein.

Signature…………………………… Dated this day of …………… 2014

Vice-Chancellor

Director, Institute for Research Science and Technology
Appendix II: NACOSTI Permit

National Commission for Science, Technology and Innovation

NACOSTI/P/14/4674/3923

Elizabeth Wanjiku Ndungu
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “Determinants of delayed hospital visits for suspected pneumonia among under five children in Gilgil Sub-County, Kiamuu County”, I am pleased to inform you that you have been authorized to undertake research in Kiamuu County for a period ending 1st November, 2015.

You are advised to report to the County Commissioner, the County Director of Education and the County Coordinator of Health, Kiamuu County before embarking on the research project.

On completion of the research, you are expected to submit two hard copies and one soft copy in pdf of the research report/thesis to our office.

Said Hussein
For: Secretary/CEO

Copy to:

The County Commissioner
Kiamuu County.

The County Director of Education
Kiamuu County.
Appendix III: Kiambu County Commissioner Research Authorization

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT
COUNTY COMMISSIONER, KIAMBU

Telegraphic address: “Rais”
Telephone: +254-66-2022709
Fax: +254-66-2022644
E-mail: countycommissionerkiambu@yahoo.com
When replying please quote
ED.12/1/VOL II/53
Ref. No. …………………………………………..
and date

27th November 2014

Elizabeth Wanjiku Ndungu
Kenyatta University
P.O. Box 43844-00100
NAIROBI

RE: RESEARCH AUTHORIZATION

Reference is made to National Commission for Science, Technology and Innovation letter ref. no. NACOSTI/P/14/4674/3923 dated 24th November, 2014.

You have been authorized to conduct research on “Determinants of delayed hospital visits for suspected pneumonia among under five children in Githunguri Sub-County, Kiambu County” for a period ending 1st November, 2015.

You are requested to share your findings with the County Director of Education upon completion of your research.

DANIEL M. GICHURI
FOR: COUNTY COMMISSIONER
KIAMBU COUNTY

Cc: County Director of Education
KIAMBU COUNTY

National Commission for Science, Technology and Innovation
P.O. Box 30623-00100
NAIROBI
Appendix IV: Kiambu County Coordinator of Health Research Authorization

MINISTRY OF HEALTH
KIAMBU COUNTY

TO WHOM IT MAY CONCERN,

RE: CLEARANCE TO CONDUCT RESEARCH IN THE COUNTY

Kindly note that we have received a request by Ms. Elizabeth Wanjiku of Mount Kenya University to conduct research on Determinants of Delayed Hospital Visits for Suspected Pneumonia Among Under Five Children in Githunguri sub-county, Kiambu County.

We have duly inspected her documents and found that she has been cleared by the National Council of Science and Technology to carry out the research until 1st Dec 2015. She thus does not need any further clearance with another regulatory body in order to conduct research within the county of Kiambu.

However, it is incumbent upon the institution where she is carrying out research to ensure that she receives adequate supervision during the process of conducting the research. This note also accords her the duty to provide feedback on her research to the county at the conclusion of her research.

Dr M. N. Ndirangu, MBChB, MPhil, CRD
County Health Research & Development Unit,
KIAMBU COUNTY
Appendix V: Structured Questionnaire

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<th>Identifying data</th>
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<tr>
<td>Village name</td>
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<td>Interview date</td>
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<tr>
<td>Komothai:</td>
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<tr>
<td>Githunguri:</td>
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<td>Ikinu:</td>
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</table>

**Informed consent**

My name is Elizabeth Ndungu a student of Kenyatta University pursuing Masters in Public Health. I’m undertaking a research study on “Determinants of delayed health facility visit for ARI among children under five years old in Githunguri Sub – County.”

As one of the household with children under five years, I would like to ask you some questions about the health status of your child and other factors that may affect the health status of your child.

This interview will take 15 minutes to complete. Your participation is voluntary. If you do not wish to take part, please tell me now. If you do wish to take part then you can refuse to answer any questions and you can stop the interview at any time. You will not receive anything in exchange for taking part in this interview.

I will keep your responses confidential. Only researchers involved in this study will look at the findings.

Please do not be concerned if you do not know the answers to any questions. We are here to understand what people know and do not know!

Do you have any questions?

If you agree to be interviewed please append your signature below

Signature of the interviewee .......... Date.................
Instructions

1. All questions are to be addressed to mothers with children less than 59 months of age who had suspected pneumonia two weeks prior the study.
2. Ask for official documents regarding the child (immunization records, antenatal booklet, child clinic card)

<table>
<thead>
<tr>
<th>No</th>
<th>Questions</th>
<th>Coding categories</th>
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</table>
| 1.1| What is the name, sex, date of birth of your below five years old child?  | Name………………………………...  
Sex  
Male………….          Female……….  
Date of birth  
Day          month                year  
Age in months………………...  |
| 1.2| Age of the respondent                                                     | Age………………………………...  
Don’t know…………………………...|
| 1.3| What is your religion?                                                     | Protestant……………………….1  
Roman catholic………………………2  
Muslim………………………………3  
Adventist………………………..........4  
Other …………………………..........5  |
| 1.4| What is your current marital status?                                       | Single/never married…………………1  
Married……………………………….2  
Divorced/separated…………………...3  
Widowed………………………..........4  |
| 1.4| What is the highest level of education completed by you?                  | No formal education…………………1  
Primary Not Completed……………...2  
Primary Completed……………..........3  
Secondary Not Completed…………….4  
Secondary Completed……………….5  
Tertiary/college/university…………...6  |
| 1.5| What is the Main source of household (HH) income?                         | No reliable source of HH income……..1  
Salaried employment………………...2  
Casual labor/wage earner…………….3  
Assistant/handouts…………………4  
Business…………………………...5  
Crop farming………………………6  
Animal husbandry…………………...7  |
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<td></td>
<td><strong>Section 2: Prevalence of ARI</strong></td>
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<tr>
<td>2.1</td>
<td>Has (name) had an illness with a cough at any in the last two weeks?</td>
<td>Yes…………………………1</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>No…………………………2</td>
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<td></td>
<td></td>
<td>Don’t know……………………3</td>
<td></td>
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<tr>
<td>2.2</td>
<td>When (name) had an illness with a cough, did he/she have trouble</td>
<td>Yes…………………………1</td>
<td></td>
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<tr>
<td></td>
<td>breathing or breathe faster than usual with short, fast breathing?</td>
<td>No…………………………2</td>
<td></td>
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<td></td>
<td></td>
<td>Don’t know……………………3</td>
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<tr>
<td>3.1</td>
<td>Did you seek advice or treatment for the cough/fast breathing?</td>
<td>Yes…………………………1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No…………………………2</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Where did you go for the advice or treatment?</td>
<td><strong>Health facility</strong></td>
<td></td>
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<tr>
<td></td>
<td>(Please indicate the name of the hospital, health centre or dispensary</td>
<td>District hospital…………………1</td>
<td></td>
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<td></td>
<td>if one of them is the source)</td>
<td>Health centre……………………2</td>
<td></td>
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<td></td>
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<td>Dispensary……………………3</td>
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<td></td>
<td></td>
<td>Community health worker…………4</td>
<td></td>
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<td></td>
<td></td>
<td>Chemist……………………………6</td>
<td></td>
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<td></td>
<td></td>
<td>Shop……………………………7</td>
<td></td>
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<td></td>
<td></td>
<td>Friend/relative……………………8</td>
<td></td>
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<td></td>
<td></td>
<td>Traditional practitioner…………9</td>
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<td></td>
<td>Other, Specify……………………10</td>
<td></td>
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<tr>
<td>3.3</td>
<td>How long after you noticed (name’s) cough and fasting breathing did you</td>
<td>Same day…………………………1</td>
<td></td>
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<tr>
<td></td>
<td>seek treatment?</td>
<td>Next day…………………………2</td>
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<td></td>
<td></td>
<td>Two days…………………………3</td>
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<td>Three or more days……………………4</td>
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<th>Coding categories</th>
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<td>4.1</td>
<td>Who is the key decision maker on hospital care seeking in the family?</td>
<td>Father…………………………1</td>
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<td>Mother…………………………2</td>
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<td>Other, specify……………………3</td>
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<tr>
<td>4.2</td>
<td>If the key decision maker is not near, who Decides on need to seek</td>
<td>Father…………………………1</td>
<td></td>
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<td></td>
<td>hospital care seeking in the family?</td>
<td>Mother…………………………2</td>
<td></td>
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<td></td>
<td></td>
<td>In-laws…………………………3</td>
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<td>Neighbors/ Friends……………………4</td>
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<td>Other, specify……………………5</td>
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<tr>
<td>4.3</td>
<td>Who is responsible for catering for any expenses needed for the care</td>
<td>Father…………………………1</td>
<td></td>
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<td></td>
<td>need by the sick child in the family?</td>
<td>Mother…………………………2</td>
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<td></td>
<td>Other, specify……………………3</td>
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<tr>
<td>4.4</td>
<td>What is the family/ community</td>
<td>Hospital……………………………1</td>
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<tr>
<td><strong>Section 5: Knowledge on Pneumonia</strong></td>
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<tr>
<td>5.1</td>
<td>Have you ever heard of pneumonia?</td>
<td>Yes…………………………………1</td>
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<td></td>
<td></td>
<td>No…………………………………2</td>
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<tr>
<td>5.2</td>
<td>What is pneumonia?</td>
<td>A serious disease ………1</td>
<td></td>
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<td></td>
<td>(Do not read the choices probe for any other)</td>
<td>A respiratory infection that affects the lungs ………2</td>
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<td>A strong cold………………………3</td>
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<td>Don’t know…………………………4</td>
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<tr>
<td>5.3</td>
<td>What causes pneumonia?</td>
<td>Weather change…………………..1</td>
<td></td>
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<td></td>
<td>(Do not read the choices probe for any other)</td>
<td>Cold temperature……………2</td>
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<td>A virus/ germs………………3</td>
<td></td>
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<td>Lack of parental care…………4</td>
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<td>Other, specify…………………5</td>
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<td>Don’t know……………………………6</td>
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<tr>
<td>5.4</td>
<td>What factors increase the risk of having pneumonia?</td>
<td>Malnutrition…………………1</td>
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<td></td>
<td>(Do not read the choices probe for any other)</td>
<td>Underlying disease……………2</td>
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<td>Lack of vaccination…………3</td>
<td></td>
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<td></td>
<td>Overcrowding…………………..4</td>
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<td>Indoor air pollution………………5</td>
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<td>Ineffective breast feeding…….6</td>
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<td>Cold……………………………7</td>
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<td>Don’t know……………………………8</td>
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<td><strong>Total score:…………out of 7</strong></td>
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<td>5.5</td>
<td>What are the signs and symptoms of pneumonia?</td>
<td>Cough……………………………1</td>
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<td>(Do not read the choices probe for any other)</td>
<td>Rapid breathing………………2</td>
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<td>Chest in drawing………………3</td>
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<td>Difficulty in breathing…………4</td>
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<td>Fever……………………………..5</td>
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<td>Don’t know…………………………6</td>
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<td><strong>Total score:…………out of 5</strong></td>
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<tr>
<td>5.6</td>
<td>Can pneumonia be prevented?</td>
<td>Yes…………………………………1</td>
<td></td>
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<td>No…………………………………2</td>
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<td>Don’t know……………………………3</td>
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<tr>
<td>5.7</td>
<td>How is pneumonia prevented?</td>
<td>Exclusive breast feeding……………1</td>
<td></td>
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<td>Through immunization………………2</td>
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|     | (Do not read the choices probe for any other)                              | Tacking Vitamin A supplements…..3  
|     |                                                                            | Through Hand washing…………4  
|     |                                                                            | Others ………………………..5  
|     |                                                                            | Don’t know……………………6  
|     | **Total score:*********out of 4**                                         |                                                                                  |

### Section 6: Health facility factors influencing care seeking

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| 6.1 | Which is the nearest source of health care facility in the community?     | District hospital…………………1  
|     |                                                                            | Health Centre…………………..2  
|     |                                                                            | Dispensary……………………3  
|     |                                                                            | A clinic………………………4  
|     |                                                                            | A private hospital………………5  
|     |                                                                            | Any other health facility……….6  
| 6.2 | How many kilometers do you walk or travel to the nearest health care facility? | ******* kilometers                                                                  |
| 6.3 | How much does it cost you to travel to the nearest health care facility?  | ******* Kenya shillings                                                            |
| 6.4 | What means of transport did you use to access the source of health care?  | By foot…………………………1  
|     |                                                                            | By the bus/matatu……………….2  
|     |                                                                            | Personal means………………….3  
|     |                                                                            | A taxi…………………………4  
|     |                                                                            | Motorbike……………………..5  
| 6.5 | Were there any other costs involved for the care of (Names)                | Yes……………………………1  
|     |                                                                            | No ………………………………2  
| 6.6 | If yes, what **other costs** and how much did it cost you?                 | Buying children cards……………1  
|     |                                                                            | Doctor’s consultation……………2  
|     |                                                                            | Buying medicines………………….3  
|     |                                                                            | Other, specify……………………4  
|     |                                                                            | **Total cost in Kenya shillings**                                                  |
| 6.7 | How long did you wait for (Name’s) to be seen by the health practitioners? | ******* minutes                                                                  
|     |                                                                            | ******* hours                                                                  |
| 6.8 | What were your past experience on HF care                                  | No available medications……….1  
|     |                                                                            | Delays/long queues ………………2  
|     |                                                                            | Few staff……………………3  |
Appendix VI: Key Informant Interview Guide

Q1. Do caregivers of children under five years have knowledge on pneumonia? Explain

Q2. At what day do most of the mothers seek help for their children in case they notice cough or fast/difficulty in breathing? If not the same day, what do you think is the cause of delay?

Q3. Does the hospital have trained staffs on IMCI strategy and other child survival strategies to treat pneumonia?

Q4. Does the hospital have enough equipment and medications for common childhood illnesses, especially pneumonia?

Q5. In your view, does cost of care to this health facility discourage caregivers from seeking immediate help for cough and fast breathing/difficulty in breathing?

Q6. Would you like there be any changes in care provision for CU5 in this health facility? If so, what changes?
Appendix VII: Focused Group Discussion Guide

Q1. What is pneumonia?

Q2. What causes pneumonia?

Q3. When your child develop cough, fast/ difficulty in breathing, do you seek health facility care immediately after you notice the child is unwell?
If not, why?

Q4. Who is the key decision maker concerning health care seeking in this community?

Q5. In your view, does the answer in Q4 have any effect on timing of health facility attendance?
If yes, explain

Q6. What are the common family or community practices when a child develop cough, fast/ difficulty in breathing?

Q7. What are the common family/community perceptions/thoughts when a child develops a cough, fast/ difficulty in breathing?
Appendix VIII: Map of the Study Area

Map of Githunguri Sub-County showing its wards

IEBC REVISED GITHUNGURI CONSTITUENCY COUNTY ASSEMBLY WARDS

Legend
- Constituency Boundary
- Sub-Location Boundary
- Ward Name
  - KINU
  - KARATINA
  - GITHIGA
  - GITHUNGURI
  - KIMOTAI

SCALE: 1:100,000
0 2.5 5 Kilometers